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Review article

Self-determination theory in physical education: A systematic review of qualitative studies

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HIGHLIGHTS

- Novelty, choices, and challenges satisfy needs and enhance intrinsic motivation.
- Teacher focus on performance thwarts competence and promotes amotivation.
- Some teacher behaviours encourage students to undermine each other's' needs.
- Peer comparisons and peer teasing highlight incompetence and thwart relatedness.
- Positive peer relationships promote relatedness satisfaction and positive affect.

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ABSTRACT

This review examined qualitative evidence of self-determination theory tenets within physical education. We conducted systematic searches in four databases, included 34 studies, and thematically analysed data from all included studies. Results indicated that certain teaching strategies provided students with the opportunity to undermine other students' relatedness. Low relatedness and competence satisfaction were associated with negative affect and reduced participation, meaning teacher behaviours that undermined competence and enabled peer teasing were counterproductive to the purpose of physical education. Need satisfaction, however, was associated with positive affect and increased participation. Therefore, teaching in line with self-determination theory may improve student outcomes.

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1. Introduction

Not only is physical activity associated with improved aerobic fitness and muscular strength, and decreased adiposity (Poitras et al., 2016) but, physical activity among youth is also associated with reduced depression and anxiety and increased mental well-being (Biddle & Asare, 2011; Costigan et al., 2019). Further, physical activity is associated with improved self-esteem, self-concept (Biddle & Asare, 2011; Garn et al., 2019), and academic performance (Lubans et al., 2018). Indeed, physical education (PE) aims to achieve high levels of physical activity during lessons (Heikinaro-Johansson & Telama, 2005; National Core Curriculum for Basic Education, 2004; Sallis & McKenzie, 1991), and evidence shows that quality PE can increase students' health-related fitness and fundamental movement skills (García-Hermoso et al., 2020). However, evidence shows that as little as 35.9% of lesson time is spent in moderate-to-vigorous physical activity (MVPA) in secondary school (Hollis et al., 2017).

In addition to providing opportunities for physical activity and the development of physical competencies, PE aims to facilitate and promote lifelong physical activity participation (Bailey & Dismore, 2006; Fairclough et al., 2002). While evidence concerning the association between PE and out-of-class physical activity is limited and inconsistent (Slingerland & Borghouts, 2011), positive PE experiences do contribute to positive attitudes towards physical activity in adulthood (Ladwig et al., 2018), and are key drivers of future participation (Rhodes & Kates, 2015). Therefore, PE must also provide positive affective experiences if lifelong physical activity is the goal. As such, motivational processes must be considered, as motivation predicts participation in intentional behaviours (e.g., physical activity during PE and during adulthood) and higher quality motivation is associated with more positive cognitive and affective outcomes (Ryan & Deci, 2017).

Self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000b) differentiates types of motivation (i.e., behavioural regulations) along a continuum (Fig. 1) from amotivation, which represents a lack of motivation, to intrinsic motivation, which is an entirely volitional form of motivation where behaviours are undertaken due to inherent interest or enjoyment (Ryan & Deci, 2017). Within schools, intrinsic motivation is positively associated with academic achievement, school engagement, self-esteem, confidence, subjective wellbeing, and increased satisfaction with school (Ryan & Deci, 2020). Specifically, within PE, intrinsic motivation is positively associated with adaptive outcomes including enjoyment and physical activity intentions (Vasconcellos et al., 2019), and increased physical activity levels (Lonsdale et al., 2019). Extrinsically motivated behaviours however, are behaviours performed for a separable consequence, and therefore, vary in terms of how controlled (e.g., avoidance of punishment) versus autonomous (e.g., attainment of a valuable outcome) they are (Ryan & Deci, 2000a, 2017). Within PE, extrinsic motivation is positively associated with maladaptive outcomes including boredom and negative affect (Vasconcellos et al., 2019).

Embedded within SDT is basic psychological needs theory, which asserts that humans have three basic psychological needs; autonomy, competence, and relatedness, and environments that promote the satisfaction of these needs are more likely to facilitate the internalisation of motivation (Vansteenkiste et al., 2020). Autonomy is defined as "the need to self-regulate one's experiences and actions" (Ryan & Deci, 2017, p. 10) meaning behaviours that are

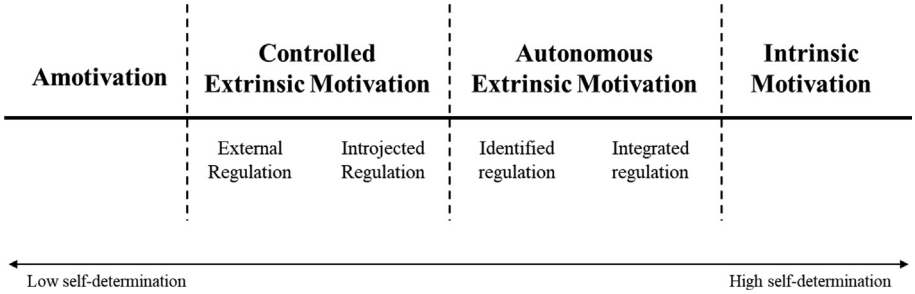

Fig. 1. The Self-determination continuum.

self-endorsed or consistent with one's interests and values are more likely to satisfy the need for autonomy. Competence is defined as the "basic need to feel effectance and mastery" (Ryan & Deci, 2017, p. 11), and physical activity behaviours that allow students to feel capable and operate effectively, satisfy competence. Alternatively, activities that are too challenging, and abundant negative feedback, undermine students' feelings of mastery and thwart competence. Relatedness refers to, "feeling socially connected" as an integral member of a social group (Ryan & Deci, 2017, p. 11) and therefore involves being able to contribute to others, and feeling cared for by others. Indeed, evidence shows that needs satisfaction in school contexts is associated with intrinsic motivation and affect (Garn et al., 2018). However, need satisfaction and need frustration are co-occurring and students with high need satisfaction and low need frustration are more autonomously motivated than students with high need satisfaction and high need frustration (Warburton et al., 2020).

PE teachers, being a social agent within PE, have the capacity to facilitate students' intrinsic motivation by creating a needs-supportive environment during class (Cheon & Reeve, 2013). Needs-supportive teacher behaviours include providing a meaningful rationale, giving choice, listening to students' ideas, acknowledging mastery, and minimising directives (Cheon et al., 2012; Lonsdale et al., 2019). Teacher interventions focused on these behaviours lead to need satisfaction and behavioural and emotional engagement, while controlling teacher behaviours are associated with need frustration and student disaffection (Curran & Standage, 2017). Peers are also a social agent in the PE context and can contribute to the motivational climate created (Warburton, 2017), and evidence shows that both peers and teachers have been shown to influence student motivation and enjoyment in PE (Cox et al., 2009).

A recent meta-analysis of quantitative studies examining SDT in PE showed that both peer support and teacher support were positively correlated with need satisfaction in PE (Vasconcellos et al., 2019). However, there was a far greater number of studies examining teacher need support than peer support (Vasconcellos et al., 2019). Given evidence shows students who receive emotional support from their peers and their teacher have better quality motivation, it is crucial to better understand peer support in PE (Wentzel et al., 2017). The quantitative evidence base also includes far more empirical research on competence than autonomy or relatedness (Vasconcellos et al., 2019), meaning there is currently less understanding of student experiences of autonomy and relatedness.

Qualitative studies often explain in more specific detail from the student perspective, why certain aspects of the PE context lead to need satisfaction or need frustration, and how the satisfaction and frustration of needs is associated with physical, cognitive, social, and affective outcomes of PE. For example, our recent quantitative review showed that need satisfaction and autonomous motivation are associated with adaptive outcomes, while amotivation is associated with maldaptive outcomes. By including student perceptions, a review of qualitative evidence will demonstrate more specifically how the satisfaction and frustration of different needs affects different outcomes such as participation in class. Further, while some quantitative studies examine multiple psychological needs holistically (e.g., providing structure in an autonomy-supportive way; Cheon et al., 2020), many quantitative studies often measure the satisfaction or frustration of each need in isolation. Alternatively, qualitative findings often discuss autonomy, competence, and relatedness together, in terms of their impact on each other, and the peer and teacher behaviours that thwart or support multiple needs simultaneously (e.g., Ntoumanis et al., 2004). Without systematically combining qualitative data on needs satisfaction, in relation to motivation and the social conditions that promote need satisfaction, these results are less likely to inform future professional development for teachers, or lead to positive PE outcomes for students. Therefore, the purpose of the current systematic review was to synthesise the qualitative evidence regarding student perceptions of SDT tenets (i.e., need support/thwarting, need satisfaction/frustration, and motivation) within school PE. Synthesising this evidence would enable us to answer the following research questions:

1. How do student perceptions of need satisfaction and motivation influence cognitive, affective, and behavioural outcomes in PE?
2. Which social conditions within PE do students perceive satisfy or undermine their psychological needs?
3. How does the satisfaction and frustration of students' psychological needs influence their motivation?
4. How does the satisfaction and frustration of students' psychological needs influence their behavioural, cognitive, or affective outcomes?

2. Methods

The methods detailed below are reported in accordance with the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) statement (Tong et al., 2012).

2.1. Inclusion and exclusion criteria

Studies in this review met the following inclusion criteria: (a) English, full text, peer-reviewed journal articles published before June 23, 2020, (b) included children or adolescents in the sample, (c) conducted in the PE lesson context, and (d) qualitatively examined at least one of the following SDT constructs: needs support or needs thwarting (e.g., teacher support, peer support); needs satisfaction or frustration (e.g., autonomy, competence, relatedness); or motivation (at least one form of motivation

outlined in SDT). We only excluded studies that did not meet these inclusion criteria. As a variety of study types provide valuable insight on SDT constructs in PE (e.g., qualitative investigations or intervention evaluation studies including a qualitative component) we did not exclude any studies based on the type of study, provided they qualitatively examined an aspect of SDT in PE.

2.2. Search strategy

We conducted systematic searches in four electronic databases (Scopus, PsycINFO, PubMed, and SPORTDiscus) up until June 2020. We selected multiple databases to increase the likelihood of identifying relevant literature, including Scopus, which is one of the largest multi-disciplinary databases, and discipline-specific databases such as PsycINFO. However, for qualitative systematic reviews, it is more important to reach conceptual saturation, rather than integrate a numerical result from every potential study (Thomas & Harden, 2008). As conceptual saturation was achieved after only including journal articles, grey literature was not included. Searches involved different combinations of two groups of keywords; group one including SDT constructs and group two being "PE". Searches included article titles and abstracts in order to identify studies that related to at least one of the following three topics:

a) Social environment in PE ("need* support" or "autonomy support" or "competence support" or "relatedness support" or structure or involvement or "control* teach*" or "motivational climate" or "motivational atmosphere" or "need* thwart*" or hostil* or chaos or impersonal) AND "PE"; OR
b) Needs satisfaction in PE ("need* satisf*" or "need* fulfil*" or "need* frustrat*" or autonomy or competence or relatedness or "belonging*") AND "PE"; OR
c) Motivation in PE ("self-determin*" or "intrinsic motivation" or "intrinsic interest" or "extrinsic motivation" or "autonomous motivation" or "controlled motivation" or amotivation or "perceived locus of causality") AND "PE".

The search was not restricted by publication date. We exported search results into Endnote reference manager software and removed duplicates.

2.3. Study selection

Two researchers independently screened titles and abstracts for eligibility. We only excluded records recommended for exclusion by both researchers (details in Fig. 2). The same two researchers then reviewed each remaining full-text article, recommending each one for inclusion or exclusion. We excluded studies recommended for exclusion by both researchers, noted the reason for exclusion, and discussed any discrepancies with a third researcher until we reached consensus on all articles.

2.4. Data collection

The first author extracted the author, year, country, aim/research question, sample size, participants, data collection method, and methodological framework. Two researchers independently verified the descriptive data extracted by comparison with the original full-text article. As research findings in qualitative studies may be found outside the "results" section (Tong et al., 2012), data from the results, findings, and discussion sections were extracted for each included study. This process resulted in 506 pages of double-spaced text.

2.5. Data synthesis

To avoid a narrow review with little detail beyond the results of each individual study, we conducted thematic analysis of the results from the original articles (Thomas & Harden, 2008). This process first involved assigning descriptive codes to sections of text from the results of the original articles (Thomas & Harden, 2008). During this process, two researchers independently coded the same five randomly selected articles. These two researchers then met to conduct a process of critical dialogue, where each researcher gave voice to their interpretations, and the other researcher was able to provide critical feedback (Smith & McGannon, 2018). The purpose was not to achieve agreement or consensus but, to challenge ideas and to co-construct knowledge (Cowan et al., 2013) by exploring, and reflecting upon, multiple alternative explanations before agreeing on overall themes and ideas (Smith & McGannon, 2018). The same two authors then split the remaining studies to complete initial thematic analysis, before meeting again to discuss overall findings and interpretations. The lead author then grouped descriptive codes together under higher order concepts or headings, based on conversation and agreement between the two researchers (Thomas & Harden, 2008). This process grouped results on similar topics, strategies, or aspects of SDT together. The next stage involved reviewing and further coding the results under each higher order concept, which included results and quotations from a number of different studies. This stage enabled the development of more in-depth themes around how different strategies, activities, and behaviours are perceived to be associated with different SDT tenets and different PE outcomes. Through this process, more detailed and elaborate themes emerged by discussing multiple student perspectives from multiple studies and contexts together in detail (Thomas & Harden, 2008). All authors then discussed and reviewed these overarching themes before results were finalised.

2.6. Quality appraisal

As the quality of individual studies influences the results of a systematic review, it is important to consider how potential bias, or methodological strengths and weaknesses, may contribute to synthesised findings. While a risk of bias assessment is common in systematic reviews of quantitative research, Gunnell et al. (2019) explain that quality assessment and risk of bias assessment assess different aspects of an individual study. While the quality of a study refers to the degree to which the study was conducted in line with high methodological standards (Gunnell et al., 2019), bias refers to a systematic error that can result in a study over or under-estimating an effect, thereby deviating from the truth (Boutron et al., 2019). Based on the differentiation between these two types of assessments, and the ENTREQ statement, we used the Critical Appraisal Skills Programme (CASP; Public Health Resource Unit, 2013) tool to assess the methodological quality of each study, rather than the estimate risk of bias (Noyes et al., 2018). The CASP checklist includes 10 criteria based on the research aims, qualitative methodology, research design, recruitment strategy, data collection methods, consideration of the relationship between the researcher and the participants, ethical issues, rigorous data analysis, a clear statement of findings, and clear value of the research. The lead author examined each included study against the 10 criteria, and assigned a one to represent "yes", or a zero to represent "no" or "unclear".

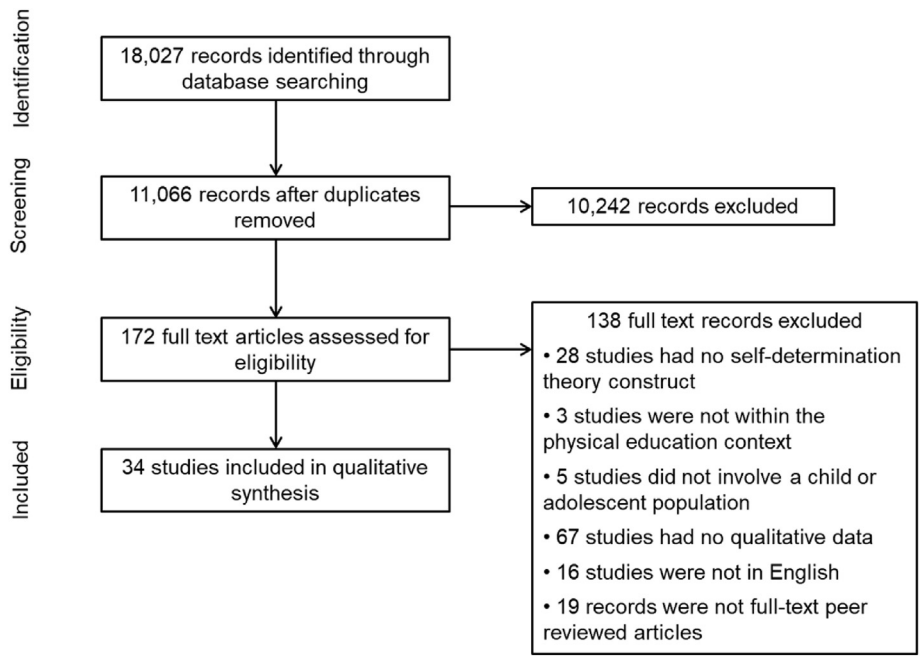

Fig. 2. Flow diagram of articles screened and included.

3. Results

3.1. Studies included

As shown in Fig. 2, the search yielded 18,027 records, with 11,066 remaining after deleting duplicates. After title and abstract screening, 174 full-text articles remained, and 34 met the inclusion criteria.

3.2. Study characteristics

Included studies were published between 1999 and 2020, and recruited students between seven and 19 years old. The sample sizes ranged from four to 759, with a total combined sample size of 1555. The majority of studies included interviews (56%) or focus groups (47%), with 21% including observations or field notes, 18% including open-ended questionnaire responses, and two studies including a reflective journal completed after class. Full study characteristics are in supplementary material (Supplementary Material Table 1).

3.3. Quality appraisal

Most included studies met the majority of the CASP items, with 79% of studies including ≥8 of the 10 criteria, and 94% of studies including ≥6 of the 10 criteria. Overall, these results indicated high quality of the included studies and we did not exclude any studies based on the quality appraisal results. The complete quality appraisal results are in supplementary material (Supplementary Material Table 2).

3.4. Synthesis of findings

Given the variety in the research aims of the original studies, and the different methods used, the data used for this review included perspectives from diverse samples, including males and females; primary and secondary school students; students in single sex and co-educational classes; students who participate in PE across ten different countries; amotivated students; and, students who completed autonomy-supportive interventions. As such, the data represented an array of perspectives and data analysis generated 437 initial descriptive codes, grouped into 30 higher-order concepts. Further analysis of the data within each of these 30 higher-order concepts led to the development of 16 new themes, each of which represented data across multiple studies, one or more aspects of SDT, and one or more PE outcomes. Given the nature of qualitative data, the themes do not fit solely within one SDT component (e.g., intrinsic motivation) but instead, explain the relationships between different components of SDT. As SDT explains that the interaction between individuals and their social context influences motivation and behaviour, and predicts likely outcomes, we grouped the themes into three overarching categories: (i) peers, (ii) teacher characteristics, and (iii) teacher behaviour and activities in Fig. 3.

3.5. Peers

3.5.1. Peer relatedness can make PE more fun and less competitive

Across the included studies, peer relationships were fundamental to whether students perceived PE as fun and enjoyable, with one student stating *"I like sport, one is with friends, one can laugh"* (Cloes et al., 2002, p. 7). Alternatively, a lack of relatedness was associated with negative affect as Mitchell et al. (2015) explained that not knowing anyone in class caused anxiety and was one of the main causes of not enjoying PE. Therefore, peers played a crucial role in determining motivation towards PE. Students highly prioritised the importance of having fun with their friends, as one student stated that the ideal PE class *"should look like a bunch of friends having fun"* (Bernstein et al., 2011, p. 74). Studies also showed that peer relatedness was associated with positive affective outcomes, as one student explained the reason she was happy and cheerful during PE was because *"I am with my friends and my class is really great to be around and it is just fun"* (White et al., 2018, p. 115). Positive peer relationships were also perceived to reduce competition, or buffer against potential negative effects of competition, as students explained how competition and scoring

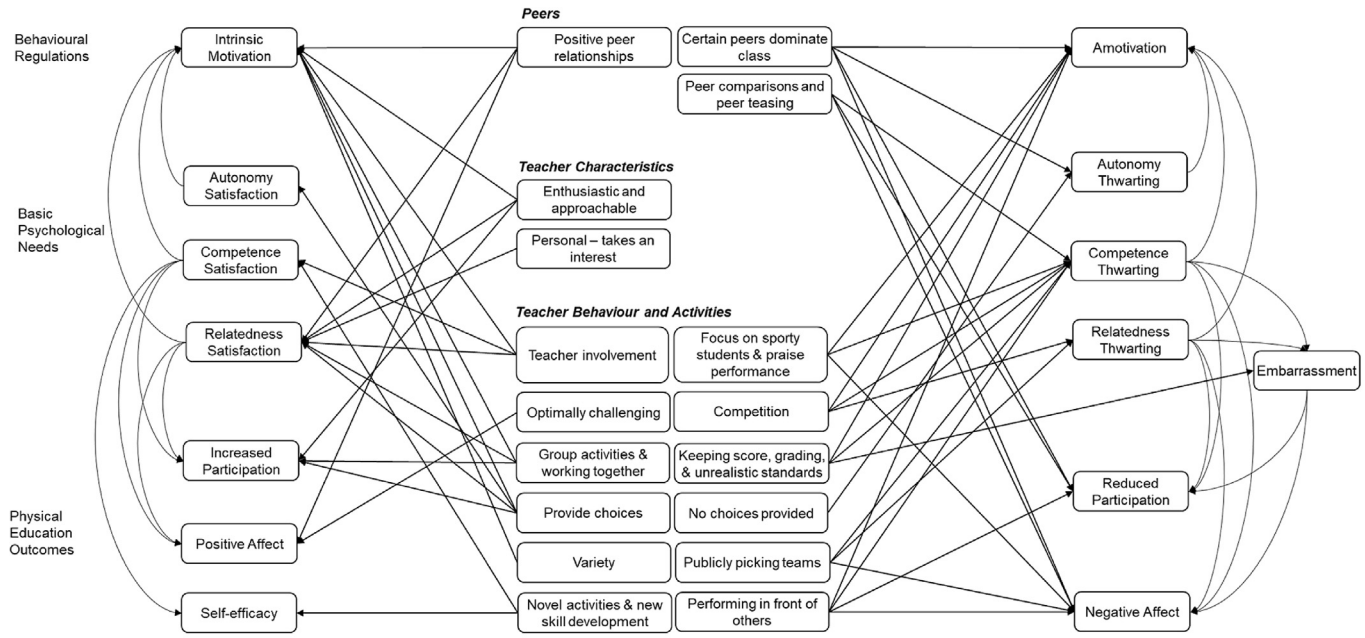

Fig. 3. Synthesis of themes into overarching social factors, and their relationship with motivation, needs satisfaction, and student outcomes.

were taken less seriously when playing with friends. Therefore, it appears that collectively across studies, friendships not only make PE fun and enjoyable but they also play important roles in buffering against potentially negative aspects of PE.

3.5.2. Peer domination can thwart autonomy, and reduce relatedness and intrinsic motivation

In general, peers made positive contributions to the satisfaction of relatedness, and were crucial to autonomous motivation across gender and age. However, some participants detailed experiences of poor motivation due to certain peers within their class dominating the game being played, the choices provided, or the overall PE context. This theme highlights the very specific and negative impact that some peers have within a PE class and indeed, Perlman (2012) identified that *"much of the information gathered from the amotivated students focused on their peers"* (p. 151). In terms of gameplay specifically, there was a noticeable separation between motivated and amotivated students, where field notes confirmed that the highly motivated students dominated (Perlman, 2010). Similarly, Hills (2007) explained that the most skilled students often colluded together to dominate the class and excluded others by only passing the ball between their group of friends. These types of antisocial behaviours among peers thwarted students' need for relatedness, and the lack of relatedness and inclusion then led to reduced participation.

In terms of choices provided to the class as a whole, or to a group of students, studies found that more competent students dominated any decision making and, were therefore, more likely to have their need for autonomy met (Gibbons & Humbert, 2008; Mitchell et al., 2015). Girls especially did not feel comfortable voicing an opinion because they would only end up doing the activity the boys chose – *"… our teacher says 'what do you want to do today?' and the boys yell 'dodgeball' … so it's dodgeball … we just stand there"* (Gibbons, 2008, p. 17). Some students even explained that despite choosing an activity, their choice was not granted, and their need for autonomy was thwarted.

> A couple of times our teacher let us vote for what we wanted to do in PE … one time, even though we had more votes, the boys refused to do it and the teacher let them go play on their own. Another time, when the boys won, we HAD to do their choice, I guess we have to be jerks like the boys then the teacher will let us go do our thing. (Gibbons & Humbert, 2008, p. 179)

In other cases, students did not have the confidence to make a choice that went against the majority of students, which thwarted autonomy and reinforced their lack of relatedness with the rest of the class (Mitchell et al., 2015). While different studies include results on different aspects of PE (e.g., dominating choices, dominating gameplay), the perception of some peers dominating the class was generally perceived as detrimental to motivation and affective outcomes.

3.5.3. Peer comparisons and peer teasing can undermine perceived competence and reduce participation

While the social nature of PE has clear benefits in terms of positive peer relationships, the presence of peers in PE also provided a social platform for students to assess their own competence relative to the performance of others. Across the studies, most discussion around students' competence focused on how skilled students believed they were in comparison to their peers. More specifically, students' perceived competence was the result of comparing themselves to the *sporty* students, which resulted in a perceived hierarchy of competence. Students appear to mentally position themselves within this hierarchy, and this process thwarted perceived competence for those who positioned themselves at the bottom. When specifically asked why students believed they were not good at PE, one student commented, *"because I'm always sort of behind what everybody's doing"* (Hayes, 2017, p. 526). This perception of not being as competent as others was then associated with less participation and less enjoyment (Aniszewski et al., 2019).

Student behaviours that highlighted, promoted, and reinforced the competence hierarchy further added to students' thwarted

sense of competence. For example, when peers made insensitive comments about their peers' abilities, feelings of incompetence were highlighted, leading to lower levels of participation in class (Devís-Devís et al., 2015; Hayes, 2017; Hilland et al., 2018). Comments *"often involved offensive and derogatory comments and criticism which instigated negative beliefs about perceptions of PE ability"* (Hilland et al., 2018, p. 172) and ranged from *"oh you're rubbish at this"* (Hilland et al., 2018, p. 170) to *"ohhh we have Catrin on our team!"* (Hayes, 2017). This type of negative peer feedback then provided students with a frame of reference to evaluate their own performance against (Watkins et al., 2019). And, indeed when Kirk et al. (2018) asked students "what would make participation possible?", their answers included *"stop making fun of everybody"* and *"don't judge people"* (p. 232).

3.5.4. Poor perceived competence can reduce participation because of embarrassment and poor relatedness

Poor competence led to negative affective outcomes such as stress, nervousness, and embarrassment. Hills (2007) explained that being unable to meet the demands of PE was a significant source of emotional stress for female students. One study showed that half of all students who reported experiencing negative affect during PE explained this was because they felt *"judged by others, or compared to their classmates that had a higher ability"* (White et al., 2018, p. 116). The relationship between poor competence and negative affect existed for male and female students, as Mitchell et al. (2015) reported that girls' worries increased when they felt conscious of their inadequacies compared to boys, and Naess et al. (2014) reported that a male student stated *"[it's] embarrassing to fall behind when running together, then I have to be 'a man' and run as fast as I can to catch up"* (p. 307).

Synthesising these studies together made it apparent that these experiences of stress, nervousness, and embarrassment explained why poor competence was associated with reduced involvement in class activities, as students appeared to intentionally withdraw from activities to avoid negative affective outcomes. For example, Cloes et al. (2002) explained that students attempted to avoid situations where failure could be witnessed by others. Similarly, through detailed observations and field notes, Hills (2007) explained that some girls physically removed themselves from active situations in a game after making a mistake, disappearing to a position where they could avoid gameplay. *"Katie is removed from playing a base after missing a ball as someone says, 'She can't catch'. Shamura misses one and immediately leaves the base. Jen is moved to home, misses one and Jo takes over"* (Hills, 2007, p. 329). Hills (2007) further explained that this process varied for different students depending on their social status, as some girls removed themselves from gameplay after they made a mistake, while those with a higher social status remained in play. It appears as though a student who was at the centre of the peer group remained playing after making a mistake due to the protection offered by his or her sense of relatedness. Alternatively, students who feel like they don't belong, or are not valued by the group, attempt to *disappear* within the class where others cannot see their lack of competence. This theme demonstrates how complex the social environment is in PE, in that the design of an activity (e.g., whether or not it places someone on display), the students' perceived relatedness with other students, and the students' physical ability interact to predict affective outcomes, which then influence the students' decision making around their level and type of participation. Overall, participating without a sense of relatedness, and with a sense of incompetence, heightened students' susceptibility to negative affect and reduced participation.

3.6. Teacher characteristics

3.6.1. Friendly and enthusiastic nature enhances relatedness and motivation

Different students discussed different aspects of their teachers that they perceived enhanced relatedness and motivation. However, overall, across the studies examining students' perceptions of their teachers, the most notable characteristics were happy, approachable, and enthusiastic, and these characteristics were perceived as essential to building relatedness (Sparks et al., 2015). Other students explained the importance of teacher enthusiasm more specifically, as they perceived that their enthusiasm in PE was positively correlated with their teacher's level of enthusiasm (Timken et al., 2019). These findings together suggest that an enthusiastic teacher not only enhances relatedness, but also influences students' autonomous motivation, and therefore, may increase participation in PE.

3.6.2. Taking an interest in students on a personal level promotes relatedness

Students also highly valued when their teachers care about them as individuals, as opposed to merely PE students. While different studies described this value differently based on different student quotes, the desire for teachers to take an interest in students outside PE was common. Specifically, Beni et al. (2019) explained that students appreciated when teachers took an interest in them as individuals and spoke to them about aspects of their life that were not related to PE. A student in another study stated *"[the teacher asked] us about what we did on the weekend, and then we explained what we did and ask her stuff, and then you can kind of relate"* (Sparks et al., 2015, p. 226) and this was viewed as important to teacher relatedness support. In addition to teachers speaking with students about matters unrelated to PE, students perceived that teachers who were available for discussion outside of class satisfied their need for relatedness. Lastly, students perceived a greater sense of relatedness when their teacher was aware of individual students' abilities and interests and was concerned with issues that took place within PE such as *"picking up on the emotional cues of students"* (Sparks et al., 2015, p. 227). While the examples and specific conditions varied from study to study, the association between students feeling as though their teachers know them individually and relatedness satisfaction was a shared theme across studies, and this type of familiarity with teachers increased student effort, made PE more relaxed, and encouraged students to look forward to PE.

3.7. Teacher behaviours and activities

3.7.1. Teacher involvement

Some students reported that they desired for their teachers to be more involved in their lessons. For some students, teacher involvement referred to their teachers physically participating in activities with them, and giving them more pointers and feedback (Timken et al., 2019). In other studies, students whose teacher was more involved in lessons noted the reason they liked their teacher being involved was because it shows they care (Domville et al., 2019), thereby supporting their need for relatedness. Alternatively, when teachers *"just stand to the side" or "just go off, and won't watch you" and "just tell you what to do"* students perceive that their teacher has no interest in PE (Domville et al., 2019, p. 212).

3.7.2. Focusing on sporty students and rewarding performance reduces perceived competence

Amotivated students reported that teachers focused more of

their attention on the more competent students. Students perceived that this lack of attention indicated that teachers had a negative view of their ability. For instance, Mitchell et al. (2015) found that the less competent students felt invisible and undervalued, which reduced motivation to partake in class. Although not the most common finding, students who perceived their teachers as threatening and patronising experienced more negative emotional outcomes, and this was particularly the case for *non-sporty* students – *"he like shouts a bit more than he should do … He makes you feel like dead small"* (Hilland et al., 2018, p. 173). While some students strongly believed praising skill and performance impaired their motivation (Lee et al., 1999), students also explained that focusing on, and providing praise for, effort, promoted autonomous motivation (Lee et al., 1999) and increased perceived support (Li et al., 2013) and relatedness (Sparks et al., 2015).

3.7.3. Competition, keeping score, and grading thwart competence and make PE less fun

While some students reported that competition was fun in PE, the majority of students raised concerns. In general, keeping score was perceived to make PE less fun (Beni et al., 2019), often because the corresponding competitiveness among students who prioritised winning, meant that other students who were not as talented or competent were left out (Watkins et al., 2019). Alternatively, students who were amotivated explained that they did not like competitions during PE because they highlighted their lack of ability – *"I'd think, oh no, I'm going to lose and I'm going to be the worst"* (Ntoumanis et al., 2004, p. 207). Activities based on competition included winners and losers, or a ranking of students, making it impossible for all students' need for competence to be satisfied, and in fact, those with poor competence are then either left out, or required to display their lack of competence to the class, both leading to negative affective outcomes. Interestingly however, even highly skilled students believed that PE was *"a place to learn and have fun with your friends, rather than to take part in a high-stakes competition"* (Bernstein et al., 2011, p. 74). Røset et al. (2019) did explain though that for those who enjoyed competition, the enjoyment was likely because competition provides students with an opportunity to demonstrate their competence and skill and therefore, enhance their self-esteem and social status. However, this notion means that competence is necessary for competition to be enjoyable.

Interestingly, conflict in class was often related to gender, not because of poor relatedness between male and female students but because activities that involved competition or keeping score, created division between students. Boys were typically viewed as more likely to be competitive - *"The boys always started the arguments because they always want to try to win everything"* (Gray et al., 2018, p. 167). This unequal interest in winning created conflict between students and led to arguments, thereby undermining relatedness in addition to thwarting competence. Some students were equally displeased with grading in PE, reporting that grades are associated with elevated negative affective outcomes and amotivation, for reasons similar to competition (Røset et al., 2019). Unlike other academic subjects where *"you can choose to keep [your grade] for yourself,"* in PE, you cannot keep your grade hidden. Instead, *"you can easily see who doesn't keep up … and then it is easy to start comparing"* (Røset et al., 2019, p. 625).

3.7.4. Individual challenges or team activities that are optimally challenging satisfy the need for competence and promote self-efficacy and autonomous motivation

While students perceived competitions negatively in terms of competence, challenges were associated with a sense of achievement, competence, and autonomous motivation (Gray et al., 2018). Students drew connections between being optimally challenged and having fun (Mandigo et al., 2008) as they enjoyed *"the challenge of improving in an activity"* (Bernstein et al., 2011, p. 74). One student stated, *"the most fun I've had is, like, when basketball, was the most educating, and, ah, I tried my hardest. I felt like it really challenged me a lot"* (Bernstein et al., 2011, p. 74). Nation-Grainger (2017) provided students with wrist-worn devices to track steps, calories, and kilometres during a PE running program. The devices delivered immediate feedback and facilitated individual goal-setting. Even students who did not enjoy competitive activities in PE enjoyed the personal challenge and sense of accomplishment that was experienced during these lessons. The sense of accomplishment resulted in more positive affective outcomes and more autonomous motivation because no pressure came from the teachers. Instead, any pressure placed on the students came from the students themselves trying to improve. Alternatively, challenges or goals that were set by the teacher at an unrealistic level, or challenges where all students needed to achieve the same time, distance, or score, thwarted competence and led to poorer motivation. For instance, one study implemented a running group during PE where students chose how far they ran, how fast they ran, and how and with whom they ran; in comparison to a group running activity where the class were forced to run together at the same speed for a set distance. When the class ran at the same speed, competent students were bored and irritated and less competent students were frustrated and amotivated:

> Some fell behind, looking tired and frustrated; others were running in front, looking impatient. One of the boys in front shook his head in irritation and said: 'The usual whining'. Mona is the first one to fall behind and says, with a frustration: 'I hate uphills!' … Martin and Mons described the lesson as boring. They expressed a desire to run faster and longer. Maren felt a pressure during that lesson. 'When we had to run together, I felt I had to run as fast as them … It decreased my motivation when others were running faster than me. (Naess et al., 2014)

When students were given the opportunity to challenge themselves, and were relieved of the class target, students *"experienced the enjoyment of running, creating a desire to run more"* (Naess et al., 2014, p. 310), meaning autonomous motivation and participation increased when students chose the way they completed an activity.

3.7.5. Providing choices enhanced autonomous motivation and leads to more positive outcomes

Students reported poor motivation towards activities where they felt controlled and had no choice – *"I didn't like having to be told to run around the track … it was very controlled. I felt like I didn't have a say in it at all"* (Timken et al., 2019). Instead, many students explained a desire to have input into class activities and be provided with choices (Beni et al., 2018). A number of positive outcomes arose from providing students with choices. For instance, choosing whom they participated with made students feel more comfortable. Feeling more comfortable and engaging in activities that students perceived to be enjoyable led to increased participation. Providing students with a choice as to what role they undertook (e.g., player, referee, coach) as per the sport education model of teaching, also led to increased perceived autonomy and increased satisfaction of competence as students could select an activity that suited their ability (Knowles et al., 2018). Therefore, providing choices also enhanced feelings of competence, and ultimately led to increased involvement. However, students also explained that not only was being given a choice important, but that at least one of the choices had to be enjoyable as one student stated *"they would give you choices, but the choices were never*

anything that I liked so I just felt very controlled and I don't like that" (Timken et al., 2019). Students also explained that if provided with a choice, they felt the teacher had to listen to the students' views when making decisions (Aniszewski et al., 2019).

3.7.6. Type of activity – exercise, sport, or games

Some students report being more autonomously motivated towards more lifestyle-related exercises such as walking and yoga, as opposed to more traditional sport activities. For some students, this was because of a negative view towards playing games in PE – *"I don't like PE cause of the games that we play cause they're kind of childish and we don't really get a workout"* (Timken et al., 2019, p. 115). For others, this result was due to the unique benefits of exercise-based activities. When provided with a choice between sport activities or motion activities, many female students enjoyed motion activities such as yoga as they perceived this activity was more relaxing than traditional sport-based activities (Abildsnes et al., 2017). While male students engaging in motion enjoyment preferred other activities such as swimming, they explained that this was due to experiencing increased self-efficacy and enjoyment compared to normal sport based activities. One study that only included female students who participated in an exercise-based health club PE intervention in a gym setting (Timken et al., 2019) further explained that students viewed this activity as more grown up. It made them feel more independent, and better prepared them to be active adults after school – *"PE class should be … learning about what you can do outside of school … you're getting ready for the future, right?"* (Timken et al., 2019, p. 116).

3.7.7. Publicly choosing teams highlighted students' lack of relatedness and incompetence

Students reported that their autonomy was thwarted when teachers picked teams without any student consultation (Barney et al., 2016). Alternatively, other students explained that a teacher selecting groups was not a negative experience, provided the teacher ensured an equal match of abilities (Beni et al., 2019). However, some students perceived that being able to choose their own groups was more desired as this enabled students to make the activities more optimally challenging as students typically choose to go with other students of a similar ability (Beni et al., 2019). While allowing students to pick their own groups or partners collectively may enhance competence and motivation, allowing certain students to publicly select their team highlighted some students' lack of competence and relatedness to other students. Further, this process also thwarted competence and relatedness as being picked last served as reinforcement of their poor skill and lack of a sense of belonging. This is because students were aware that peers selected based on skill or friendship, which meant students were publicly recognised for being incompetent, or not valued by the dominant social group. Barney et al. (2016) stated:

> If they are picked last, they are like, nobody wanted them on their team … because of their ability and how much they were liked. Mostly ability. The kids that were picked last were upset. They know what happened and realized (p. 245).

Therefore, having captains who pick teams publicly influenced competence, relatedness, and affective outcomes. Alternatively, when students chose their own teams as a group process where all students have a say, students typically participate more as they experience a sense of belonging with their team (Smither & Xihe, 2011). Overall, the findings highlighted that teacher decisions as to how teams are chosen, had a large impact on whether students experienced positive or negative affect.

3.7.8. Performing in front of others highlighted students' incompetence and increased negative affect

Tasks performed in front of the class highlighted students' incompetence and increased the experience of negative affect. As explained in the Peers section, students acknowledged that perceived competence played a role in how stressed or embarrassed they felt during PE. However, the social nature of PE also played a role. For example, Hills (2007) explained that different activities either disguised or highlighted incompetence as *"in gymnastics the students must perform publicly in small groups, while in basketball the flow of the game is perceived to accommodate errors with less notice"* (p. 325). However, the way the teachers designed certain activities also played a role as many teachers commonly singled students out to perform in front of the class. Performing individually in front of the class thwarted competence and increased negative affect – *"When I have to do things in front of lots of people I don't enjoy myself and can feel humiliated when I do something wrong"* (White et al., 2018, p. 116). Alternatively, reducing the need for students to display their level of competence in front of others (e.g., aerobics – where all students are active at the same time) enhanced autonomous motivation and reduced negative affect.

3.7.9. Novelty and variety increased autonomous motivation

This theme emphasises students' strong desire to participate in a range of different activities within PE. In fact, many students perceived a lack of variety to be a negative aspect of PE. For example, *"we always play the same thing over and over … kickball, kickball, kickball"* (Gibbons, 2008, p. 17). In one study that specifically recruited amotivated students, the authors stated that students *"felt a wider variety of activities should be provided"* (Ntoumanis et al., 2004, p. 211). Students also expressed that *"any class we don't do British bulldog or dodgeball is a good class"* (Gibbons, 2008, p. 17) highlighting the valuable impact that adding variety had in terms of students' enjoyment. Students who participated in interventions where activities varied weekly, reported that *"they appreciated the variety of activities"* on offer (Abildsnes et al., 2017, p. 7).

Not only did students explain that they enjoyed variety in PE, they also explained that the range of activities they engage in during PE should include new activities they have not tried before (i.e., novelty). Talking about their favourite PE lessons, many students listed activities that were uncommon. Not only were these activities more fun but, novel activities were also associated with competence in two ways. Firstly, students perceived that their class had similar competence levels when completing an activity they had never experienced – *"even if you couldn't do it, everyone else was just the same. Like they couldn't do it. And, we were all learning like it new"* (Hills, 2007, p. 326). The similar level of competence between peers promoted autonomous motivation and increased interest and participation. Increased competence was then also associated with positive affect as students explained *"I didn't know how to play before and now I know; I feel good because I have learned how … I have seen that I am a better player; I feel good because I used to fail a lot"* (Morales-Belando et al., 2018, p. 668). Novel activities are especially important because they offered new opportunities for feeling competent and increasing self-efficacy (Beni et al., 2019), and the enjoyment associated with mastering new skills promoted more autonomous motivation. *"[It's] fun to play something you haven't played before, because you could go through not being able to do anything, to being able to do it"* (Bernstein et al., 2011, p. 75). This same perspective was shared by female students who participated in gym-based health club intervention during PE – *"It was really fun to feel like a change … to learn something new"* (Timken et al., 2019, p. 115).

3.7.10. Group work activities increase peer relatedness, in turn increasing motivation and participation

A number of studies explained that working together on tasks is more fun (Beni et al., 2019), and more specifically, working together as a team towards a common objective, increased relatedness, motivation, and participation (Fernandez-Rio et al., 2015). As explained in the Peers section, greater relatedness made PE more fun and enjoyable, and students who engaged in group-work interventions confirmed they experienced more relatedness and more enjoyment than in their previous PE classes. Perhaps setting group tasks and objectives enhanced relatedness between the group and encouraged greater involvement in the class by students who typically participated less. Perlman (2012) noted: "*You can see evidence of the amotivated students becoming more involved within the lesson … during game play … it is becoming more common to let others play instead of taking over the game*" (p. 152). Being included and passed the ball further satisfied the need for relatedness for those with poor competence, as "*being 'passed to' affords not only physical involvement in the game but also represents inclusion on a meaningful social level*" (Hills, 2007, p. 328). The greater sense of relatedness developed through group activities also led to cheering and encouraging even the least competent students. This helped to satisfy many amotivated students' sense of competence as they contributed to their team's success, and increased relatedness, participation, and a sense of competence.

> Valerie was asked to run and stand in the middle of the field. Her teammates told her to stand and block the best player on the other team … Valerie was in the middle of the field and provided a critical block allowing her teammate to get open for a touchdown. After the play, Valerie was celebrating as if she had just scored the touchdown. (Perlman & Karp, 2010, p. 410)

4. Discussion

This article systematically reviewed qualitative evidence on students' perceptions of SDT tenets in school PE. The results suggested that peers may be the most crucial social aspect of the PE environment, in terms of motivation, needs satisfaction, participation, and affective outcomes, as supportive peer relationships were associated with relatedness satisfaction, intrinsic motivation, and positive affect. In previous school-based research, only teacher relatedness predicted student interest and enjoyment (Fedesco et al., 2019). Perhaps peer relatedness plays a more fundamental role in influencing student outcomes in PE compared to other educational subjects due to the social nature of the subject. However, peers can equally thwart students' need for relatedness as peer comparisons, peer teasing, and the presence of peers who dominate games and choices, were associated with competence thwarting, autonomy thwarting, amotivation, reduced participation, and negative affect. In fact, one of the most common complaints about PE was peer teasing and isolation due to poor competence. Similar to previous research showing that relatedness is associated with less victimisation (i.e., repeated attempts to inflict discomfort through words, gestures, or exclusion) during school break periods such as recess (Lodewyk et al., 2019), students with higher relatedness in PE appeared protected from victimisation or peer harassment. When students experienced poor competence and felt their relatedness need was undermined, they actively withdrew from physical activity, in an attempt to avoid negative affective outcomes. This deeper level of detail explains previous quantitative findings associating poor needs satisfaction with lower levels of moderate-to-vigorous physical activity during PE (Kalajas-Tilga et al., 2020).

While some peer behaviours undermined relatedness, teacher behaviours including individualised conversation, enthusiasm, awareness of emotional states, and caring, provided relatedness support (Sparks et al., 2017) and increased relatedness satisfaction (Sparks et al., 2016). However, research shows that students with high need support are likely to be more autonomously motivated than students with high need support and high need frustration (Warburton et al., 2020). Therefore, preventing or reducing relatedness thwarting may be as crucial as providing relatedness support. While relatedness was more often thwarted by peers than teachers, teacher behaviours and teaching strategies influence the degree to which students have the opportunity to undermine each other's' relatedness needs and highlight incompetence. Perhaps, future teacher professional development should focus on helping teachers to promote relatedness between peers so that teachers can play a greater role not only in providing relatedness support, but in facilitating students to provide relatedness support to each other. Improved relatedness support from fellow peers may help overcome negative outcomes (e.g., frustration, reduced participation, amotivation) that are common among students with poor competence.

Teachers however can play a much greater role in influencing student outcomes beyond merely providing relatedness support. Many of the most common student complaints about teaching in PE centred on their teacher using commanding and threatening language that invoked a feeling of compliance or feelings of shame. These perceptions of teacher behaviour reflect demanding and domineering motivational approaches, which are inversely associated with need satisfaction in sport (Delrue et al., 2019). Alternatively, students perceived that teachers who were personal and approachable and took an interest in students created positive emotions towards PE. These teaching characteristics reflect an autonomy-supportive teaching style, and more specifically according to the circumplex approach, reflect an attuning motivational approach which is associated with need satisfaction (Delrue et al., 2019). Other common complaints about teacher behaviour included an undesirable focus on performance, in terms of teachers creating a performance motivational climate, and displaying more personal interest in students who could perform to expectations. This perception of teacher behaviour is important given previous research shows that a performance motivational climate in PE is associated with need frustration, boredom and amotivation (García-González et al., 2019). Alternatively, a mastery motivational climate is associated with need satisfaction, autonomous motivation, positive affect, and consequently, a greater intention to engage in physical activity (Di Battista et al., 2019; García-González et al., 2019).

Variety and the inclusion of novel activities are essential to students' autonomous motivation, as boredom from repeatedly playing the same games is associated with amotivation. While this finding addresses the dark side of motivation in that boredom is associated with amotivation, it also aligns with previous quantitative research on the benefits of including novel activities, as evidence shows that novelty predicts intrinsic motivation in PE (González-Cutre et al., 2016). Evidence also shows that novelty satisfaction in PE is associated with satisfaction towards PE in general, and predicts enjoyment and vitality in physical activity contexts, through increased autonomous motivation (González-Cutre et al., 2019).

It could also be important to know whether the type of activity moderates the impact of poor relatedness. While autonomy and competence are central to intrinsic motivation (Deci & Ryan, 2000), in that one cannot be intrinsically motivated without autonomy satisfaction and competence satisfaction, relatedness is more separable to the activity itself (Ryan & Deci, 2017). For those who

are inherently interested in an activity and experience a sense of competence, relatedness may not be required. However, for those who are not naturally intrinsically motivated, experiencing positive interpersonal interactions can make an activity more enjoyable and can internalise motivation (Ryan & Deci, 2017) leading to improved student outcomes. As such, relatedness may not be as essential to participation in activities where everyone is sufficiently competent, or to activities completed without observation where competence levels are not displayed. However, in activities where a single student stands out, or where the difficulty is increased, relatedness may be crucial to protect students from their poor competence and promote autonomous motivation.

4.1. Strengths and limitations

This study provides the first systematic review of qualitative studies on SDT tenets in PE. The results overcome limitations with previous systematic reviews that included more evidence regarding teacher needs support compared to peer support due to the nature of the quantitative studies included. Further, this study combines and synthesises student perspectives on the specific behaviours and actions of peers and teachers that support autonomy, competence, and relatedness satisfaction, and influence motivation, affective outcomes, and participation in PE, that are absent in reviews of quantitative studies only. Despite its strengths, this review is limited by the number and type of studies included. A number of the studies recruited male or female participants only, meaning some results only reflect the perspectives of male or female students. Given most qualitative data is inductively coded and that when discussing perceptions of PE, students mostly use language that resembles autonomous motivation (e.g., enjoyment and fun) and amotivation (e.g., no point) far more than controlled motivation (e.g., guilt or pressure), meaning there is a lack of qualitative evidence regarding the impact of controlled motivation within PE. Lastly, the individual studies included a number of different methodologies ranging from open-ended survey questions, to interviews, to in-depth ethnographic studies. While the results are representative of all data, some topics are discussed in more depth due to the data collection method used. The types of studies included are also a limitation in that they influenced the results. For example, intervention studies that included a qualitative evaluation component are likely to include more positive results on aspects of PE that promote intrinsic motivation and need satisfaction due to the participants having participated in an intervention program, while studies that specifically recruited amotivated students included results centred around need thwarting. Finally, this study focused on student perceptions of PE and therefore only included data from students. Future reviews could consider including teachers' perceptions, as these would provide valuable results around how teachers implement activities and adopt teaching strategies in line with SDT.

5. Conclusions

Findings suggest that students perceive variety, novelty, choice, and praise based on effort to enhance autonomous motivation towards PE. Positive peer relationships are associated with relatedness satisfaction, and a higher sense of relatedness is associated with competence satisfaction and positive affective outcomes. Alternatively, peer comparisons, the process of more competent students dominating lessons, and activities requiring one student to demonstrate their incompetence in front of others thwart students' competence and relatedness, and are associated with amotivation, reduced participation in lessons, and negative affective outcomes. Therefore, a lack of competence, relatedness, and autonomy are counterproductive to the aim of increasing participation within class, and are unlikely to promote lifelong physical activity. Instead, teaching, and designing interventions and professional learning, in line with SDT, are likely to improve student outcomes and increase the likelihood of long-term physical activity participation.

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Author contributions

RLW led the design of the study, contributed to screening, completed data extraction and data analysis, and led the writing of the manuscript. AB completed data extraction and data analysis, and contributed to writing the manuscript. DV lead development of the search strategy and completed screening. RC completed screening and reviewed the final manuscript. TH completed screening and reviewed the final manuscript. KO completed screening and reviewed the final manuscript. CL led the design of the study, lead development of the search strategy, and helped draft the manuscript. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

Appendix A. Supplementary data

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