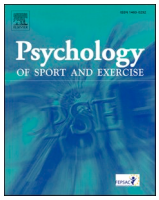
Psychology of Sport & Exercise 70 (2024) 102558

Contents lists available at ScienceDirect

Psychology of Sport & Exercise

journal homepage: www.elsevier.com/locate/psychsport



Review

The effects of interpersonal development programmes with sport coaches and parents on youth athlete outcomes: A systematic review and meta-analysis

Dennis Bengtsson [a,*], Andreas Stenling [b,d], Jens Nygren [a], Nikos Ntoumanis [c,a], Andreas Ivarsson [a]

[a] School of Health and Welfare, Halmstad University, Kristian IV:s väg 3, 301 18, Halmstad, Sweden
[b] Department of Psychology, Umeå University, Vindarnas torg, Mediagränd 14, 901 87, Umeå, Sweden
[c] Danish Centre of Motivation and Behaviour Science (DRIVEN), Department of Sports Sciences and Clinical Biomechanics, University of Southern Denmark, Denmark
[d] Department of Sports Science and Physical Education, University of Agder, Norway

ARTICLE INFO

Keywords:
Youth sport
Intervention
Design
Behaviour change
Effectiveness

ABSTRACT

Interpersonal coach-and parent development programmes (CDP and PDP, respectively), have the goal to foster positive youth sport experiences through high-quality relations between coaches, parents, and youth athletes. In this paper we systematically reviewed the extant literature and estimate the overall magnitude of such programmes and how they can inform future interventions. Specifically, we aimed to: (a) conduct a systematic review on the literature of interpersonal CDPs and PDPs within the youth sport context; (b) examine the effects of such interventions on youth athlete outcomes via a meta-analysis. English written peer-reviewed publications and grey literature was identified through electronic search in databases and manual searches of reference lists. By utilising a priori criteria for inclusion and exclusion, 33 studies describing interpersonal CDPs, and PDPs were identified in the systematic review. Studies that presented required data for estimation of Hedge's *g* effect sizes were included in the meta-analysis ($k = 27$). By and large, the included studies used a quasi-experimental design (58%), sampled from team sports (79%), and reported several delivery methods (e.g., workshops, audio feedback, observations, peer group discussions) and outcome measures (e.g., anxiety, autonomous motivation, self-confidence). Some interventions were based on the same delivery protocols (e.g., Coach Effectiveness Training, Mastery Approach to Coaching) or theoretical frameworks (e.g., Achievement Goal Theory, Self-Determination Theory). The meta-analysis showed statistically significant small, and medium, effect sizes on a subsample of youth athlete outcomes (e.g., task-related climate, fun and enjoyment, anxiety), indicating that coach interpersonal skills can contribute to positive youth sport experiences. Theory-based interpersonal CDPs and PDPs are recommended to expand the knowledge in this field of research.

Introduction

Participation in organised youth sport is recognised for its potential to foster long-term physical, social, and psychological health (Doré et al., 2019; Palomäki et al., 2018). Ideally, young athletes not only develop sport-related skills but also cultivate essential social attributes and positive self-beliefs, such as confidence, mental toughness, teamwork, and connectedness (Eime et al., 2013; Mahoney et al., 2017). By contributing to the personal growth of the athlete, such valuable attributes may also be transferred other life domains (Holt et al., 2017). However, the benefits of youth sport participation are not universal, as it can also be associated with negative outcomes such as aggressive and violent behaviours (Newman et al., 2021) and mental health risks, including burnout, abuse, and depression (Vella, 2019). The extent to which these outcomes manifest in youth athletes may be influenced by their social interactions, particularly with coaches (Langan et al., 2013) and parents (Burke et al., 2021).

Previous research highlights the importance of a perceived coach-created empowering motivational climate (Appleton et al., 2016), characterised by offering choices to the athletes and encouraging them

* Corresponding author.
E-mail address: Dennis.Bengtsson@hh.se (D. Bengtsson).

https://doi.org/10.1016/j.psychsport.2023.102558
Received 1 March 2023; Received in revised form 30 October 2023; Accepted 1 November 2023
Available online 20 November 2023

to try new skills, as well as parental support, which involves praising effort and validating feelings. These factors have been found to be negatively related over time to youth athlete sport-related violence and positively related to Grade Point Average (GPA), vitality, and sport enjoyment through intrinsic motivation (Krommidas et al., 2022). Additionally, a recent systematic review and meta-analysis indicated that social support from both coaches and parents can decrease the risk of dropout from team sports (Back et al., 2022).

Relating to this, Gaudreau et al. (2016) found that high parental autonomy support can compensate for low coach autonomy support, and vice versa. Lemelin et al. (2022) showed that both parent and coaches can have an independent and additive impact on youth athletes' perceived well-being and development, a finding that encourages both parental and coach educational initiatives. In contrast, coaches and parents who exert control and pressure may increase the athletes' anxiety levels and decrease their intrinsic motivation (Bartholomew et al., 2009; Knight & Holt, 2014; Smoll et al., 2007b). Therefore, facilitation of different knowledge such as professional (e.g., specialized instrumental skills and knowledge), intrapersonal (e.g., introspection and revision of one's behaviours), and interpersonal (e.g., the ability to nurture and maintain relations) hold relevance for the relations between the socialising agents and the athletes. These dynamics, in turn, can influence the athletes' psychological responses, performances, and behaviour (Côté & Gilbert, 2009).

In line with the presented empirical evidence, the number of behaviour-change interventions targeting coaches and parents in youth sports has increased in recent decades (Burke et al., 2021; Dorsch et al., 2022; Langan et al., 2013). For instance, initiatives have been launched with the ambition of promoting positive coach-athlete and parent-athlete relationships and youth athlete outcomes through adequate competencies and interpersonal practices (e.g., Coach Effectiveness Training – Smith et al., 1979; Mastery Approach to Coaching – Smith et al., 2007; autonomy supportive coaching e.g., Reynders et al., 2019; evidence-based sport parent education – Dorsch et al., 2017). In general, intervention studies with coaches based on such protocols show positive results for the participating coaches' interpersonal competence and their youth athletes increased autonomous motivation (Reynders et al., 2019), perceived task-related climate (McLaren et al., 2015; Smoll et al., 2007a), and decreased anxiety (Smith et al., 2007; Smoll et al., 2007b). Moreover, one study showed that youth athletes perceived their parents to be more supportive and less pressuring after their participation in an intervention focusing on the parent-athlete interpersonal relation (Dorsch et al., 2017). Despite the proliferation of such interventions, the existing literature reveals a diversity of delivery protocols and models, theories, and assessments of youth athlete outcomes. This variability has hindered previous systematic reviews to comprehensively evaluate their impact in the youth sport context (Burke et al., 2021; Evans et al., 2015; Langan et al., 2013; Raabe et al., 2019). Hence, the absence of comparative examinations between groups (e.g., intervention vs control group outcomes) in meta-analytical results limits any conclusions that can be drawn about the overall effectiveness of coach and parent interventions on youth athlete outcomes. Therefore, a comprehensive review of the extant literature is relevant for the development of future intervention studies in the field. Such an effort can address the potential strengths and limitations of previous research and inform about potentially effective delivery methods (Evans et al., 2015; Langan et al., 2013; Raabe et al., 2019).

Different terms to describe interventions targeting coach interpersonal behaviours have been used in previous research (Langan et al., 2013) revolving around the interpersonal skillset and the ability to connect with the athletes through appropriate, positive, and effective communication (Côté & Gilbert, 2009). In this paper, we will use a definition from Evans et al. (2015) which suggests that interpersonal coach development programmes (CDPs) encompass learning activities that are applied systematically and aimed directly at coaches to facilitate and/or change their interpersonal behaviours by using educational efforts, social interaction, and/or personal reflections. Accordingly, interpersonal CDPs target the mutual social benefit and positive relations between coaches, athletes, and teammates within the sport setting (Evans et al., 2015). These interventions illustrate a wide array of coach educative efforts with the common purpose to promote positive youth sport experiences through increased interpersonal competence among coaches (Langan et al., 2013). In addition to interpersonal CDPs, the educational efforts focused on parents' interpersonal knowledge and behaviours, and their relation to youth athlete outcomes represent a novel and important avenue for youth sport intervention research (Burke et al., 2021). By extending the definition by Evans et al. (2015), such efforts in our study will be referred to as interpersonal parent development programmes (PDPs). Although coaches and parents are two different central socialising agents influencing the youth athletes' sport experience (Dorsch et al., 2022), interpersonal CDPs and PDPs both aim to facilitate positive coach/parent-athlete interpersonal interactions and the athletes' youth sport experience and well-being (Dorsch et al., 2017; Smith et al., 2007). As an example, this constellation of coaches, parents and athletes was investigated by Smoll et al. (2007)b who implemented the Mastery Approach to Coaching Protocol with the participating coaches and an adapted version (Mastery Approach to Parenting in Sports) with the parents to investigate their effectiveness on youth athletes' anxiety.

To our knowledge, the last study to systematically review the literature regarding interpersonal CDPs on youth athlete outcomes was conducted a decade ago without any estimation concerning their overall mean effects on youth athlete outcomes (Langan et al., 2013). Furthermore, no prior research has quantified the magnitude of the impact of interpersonal PDPs on youth athlete outcomes. The scarcity of interpersonal CDP and PDP studies, along with the heterogeneity in study designs and outcome measurements, has previously hindered such comprehensive insights into the effectiveness of these interventions (Burke et al., 2021; Langan et al., 2013). Consequently, the absence of recent systematic reviews and the lack of meta-analytical estimations pose significant limitations to our understanding in this field of research. Hence, by addressing these gaps, this study provided new insights regarding the potential impact of interpersonal CDPs and PDPs on youth athlete outcomes beyond the results of individual studies. This was done by estimating the covariance between multiple effect sizes from within each empirical study and cluster them into a pool of overall mean effect sizes for each study variable (Cheung, 2014). Such an investigation can inform the future development of targeted and evidence-based interventions.

The overall purpose of this study was to systematically review the interpersonal CDP and PDP literature by investigating the effects of such programmes on youth athletes' outcomes. The more specific aims were to: (a) conduct a systematic review on the literature of interpersonal CDPs and PDPs within the youth sport context; (b) examine the effects of such interventions on youth athlete outcomes via a meta-analysis.

Method

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA; Page et al., 2021) were used for this systematic review. Considering the protocol of this review, it was pre-registered at the Open Science Framework (linked under Registration and protocol below) and developed through the PRISMA-P checklist (Shamseer et al., 2016). The choice of meta-analytical models in the study deviated slightly from the original protocol. We decided to use a three-level cluster robust variance estimation model because it obtains unbiased estimates and performs well with small samples of clustered effect sizes (Gucciardi et al., 2022).

Literature search strategy

Following the guidelines by Page et al. (2021), a summary of the

search process is shown in Fig. 1. Electronic searches were undertaken from the earliest reported date up until February 28, 2022, using the databases PsychINFO, EBSCOHost online databases (Academic Search Elite, Eric, SPORTDiscus), Scopus, and Web of Science. An additional search was conducted between March 1, 2022 until January 18, 2023. These electronic searches were restricted to include only studies written in English and peer-reviewed journal articles. Additively, to broaden the scope, grey literature (i.e., dissertations) was searched separately, and reference lists of papers found in the literature search were inspected with the purpose to attain additional studies that were not captured by the electronic database search. The search string was combined of six separate groupings of terms: the sport context (Group 1: sport*); coaches and/or parents (Group 2: coach* OR parent*); and youth athletes (Group 3: child* OR youth* OR adolescen*); including an effort to influence interpersonal behaviours of coaches and/or parents (Group 4: skill* OR development OR educat* OR interpers*); through an intervention (Group 5: program* OR interven* OR experiment* OR train* OR workshop* OR course*) relating to youth athletes' outcomes (Group 6: effect* OR outcome* OR result*). Each clustered group was combined with the operator "AND" to produce the final search in each database.

Criteria and screening process

Retrieved records from the literature search were managed through the Rayyan web application (https://rayyan.qrci.org; Ouzzani et al., 2016) At the initial screening phase, studies were included if the

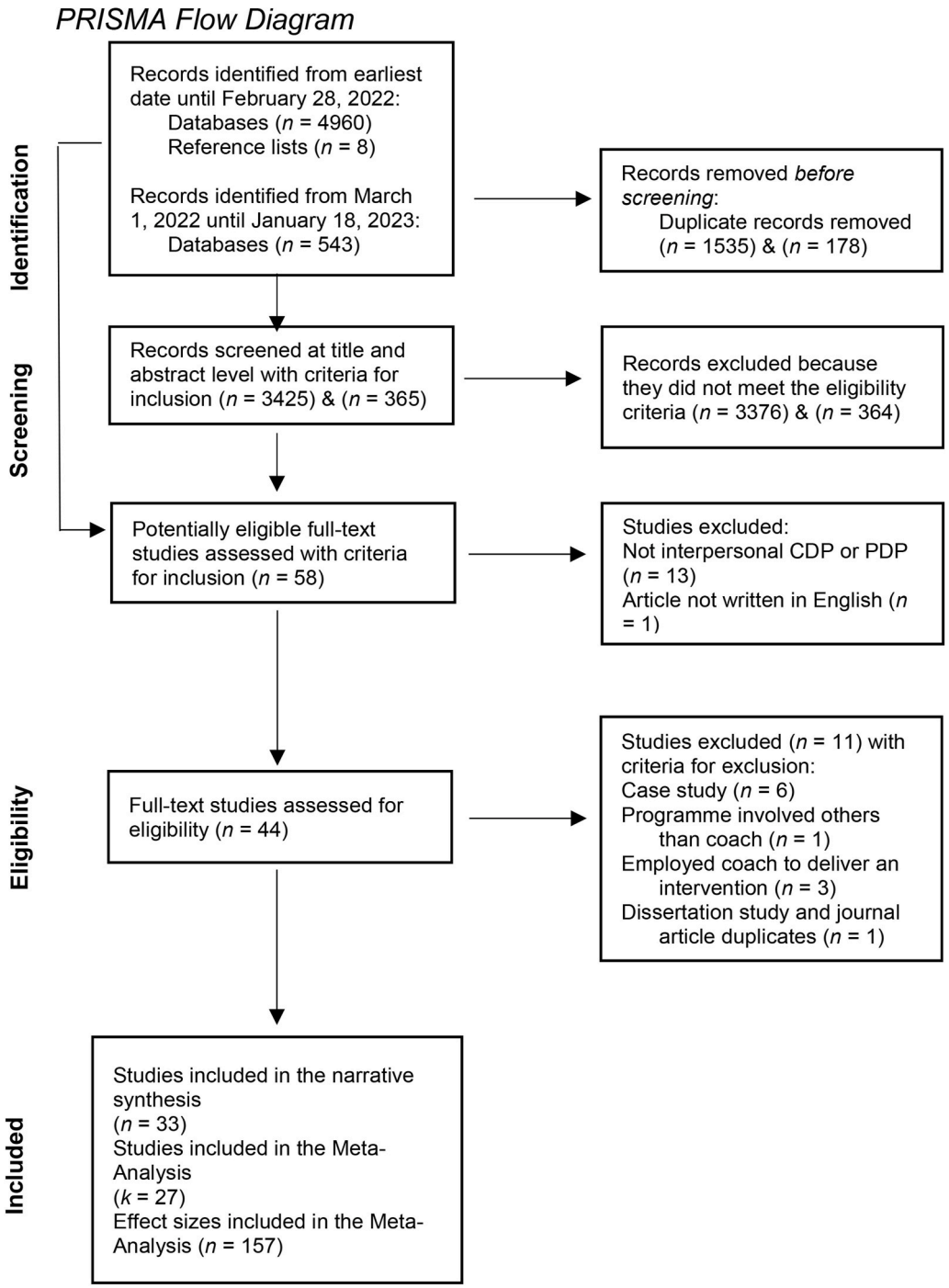


Fig. 1. PRISMA flow diagram.

following criteria were met: (a) written in the English language; (b) reporting randomised and nonrandomised controlled trials; (c) describing or evaluating a youth coach and/or parent (or both agents combined) development programme delivered by researchers attempting to alter coach and/or parental interpersonal behaviours; (d) measures (quantitative) of cognitive, affective, or behavioural youth athlete outcomes were taken. Our exclusion criteria were: (a) interventions were not in the sport domain; (b) coaches and/or parents also delivered the intervention; (c) trials where several groups other than coaches and parents were targeted (e.g., and organizational managers); (d) did not report (quantitatively) athlete cognitive, affective or behavioural outcomes; (e) were case studies, position papers, expository papers, or reviews; (f) full text was not available from the database search or via direct requests made to the corresponding author (i.e., 2 email requests/reminders, separated by 2 weeks).

The inclusion criteria were operational from identification of articles to the eligibility assessment of full-text articles. Subsequently, the exclusion criteria were applied to assess eligibility of articles initially selected via the inclusion criteria (cf. Evans et al., 2015). One author (blinded for review) independently assessed all the titles and abstracts of records found in the initial database search, followed by a second author (blinded for review) who randomly selected 20% of the articles and double screened them. Subsequently, a comparison between the two authors decisions was performed through the calculation of inter-rater reliability using Cohen's kappa coefficient (Cohen, 1960). This resulted in 99% inter-rater agreement and a kappa value of 0.80. Full-text articles of eligible records were then retrieved and assessed by the same two authors independently. Consensus was used to resolve any disagreements regarding the full-text articles; alternatively, if consensus could not be reached, a third author (blinded for review) was consulted. In cases where several articles were based on one single intervention, they were combined in the reported overview of included trials.

Quality assessment

The Mixed Methods Assessment Tool (MMAT; Hong et al., 2018) was used to assess the methodological quality of the included studies. The reliability and content validity of the MMAT has been supported in previous research (Hong et al., 2019; Pace et al., 2012). The quality assessment of each included study was done independently by two of the authors. Any disagreements were resolved through discussions and if necessary, a third author was consulted. See Supplementary Table S1 for information about the quality assessment ratings of each included study.

Meta-analysis

In accordance with Langan et al. (2013), a broad lens approach was used by including different youth athlete outcomes (see Supplementary Table S2). Some variables stemmed from theoretical frameworks, such as self-determination theory (Ryan & Deci, 2017); positive youth development (Holt et al., 2017); and achievement goal theory (Duda & Nicholls, 1992). Also, numerous study outcomes, not explicitly related to a specific theoretical framework, were summarized into different youth athlete outcomes, namely: performance related self-confidence (Hollenbeck & Hall, 2004); athlete perceived coach-athlete relationship (Horne & Carron, 1985); team social cohesion (Light Shields et al., 1997); coach competence and knowledge (Myers et al., 2006); intentions to continue sport participation (Vallerand, 2000); anxiety (Ford et al., 2017); self-esteem (Ahmed et al., 1985) fun and enjoyment (Visek et al., 2015); and observed sport skills performance (Harvey & Jarrett, 2014). In consultation with the last author, the first author categorized the reported outcome estimates by matching and grouping instruments, sub-scales, or items aligning with the same concepts (Braithwaite et al., 2011). Variables that were analysed in less than two studies were not included in the meta-analysis. Included studies from the systematic review that reported necessary data to calculate Hedge's *g* effect sizes were added to the meta-analysis. Alternatively, when the data necessary for calculation was insufficiently described in the article, supplementary information was requested from corresponding authors. Effect sizes were computed by using mean values, standard deviations, and sample sizes of post-intervention and follow-up outcome measurements from youth athletes of coaches or parents participating in experiment and control groups. Following the empirically derived guidelines of Lovakov and Agadullina (2021), the magnitude of the analysed effect sizes was interpreted accordingly: 0.15 = small effect; 0.36 = medium effect; 0.65 = large effect.

Traditional meta-analytical models are restrained to the study-specific level, implicitly assuming independence among effect sizes within each study (Cheung, 2014). However, this practice is problematic due to the multiple effect sizes for a construct, follow-up assessments, and multiple comparison groups within a study; all these create dependencies in effect size estimates within a study (Cheung, 2014). In such cases, it is recommended to add a cluster effect through three-level meta-analytical models to estimate the overall mean effect size across studies, considering the covariance between multiple effect sizes from within each study (Cheung, 2014). Based on this advice, we employed a three-level working model meta-analysis with cluster-robust variance estimation (RVE), including Restricted Maximum Likelihood (REML) estimation (Pustejovsky & Tipton, 2022). Additionally, to assess for publication bias, potential asymmetry in effect size distribution, and credibility of the reviewed body of evidence, we used Egger's regression type test and checked all effect sizes through power-enhanced funnel plots (Gucciardi et al., 2022; Pustejovsky & Tipton, 2022). A significance level of $\alpha = 0.05$, 95% confidence intervals (CI), and the Hedges *g* effect size estimate were used in the meta-analysis. All analyses were made in R Version 4.2.1.

Results

Study characteristics

The literature search identified 5503 records of which 1713 duplicates were removed. 3740 records were excluded during screening of titles and abstracts, 14 and 11 studies were also excluded by applying the inclusion and exclusion criteria, respectively.

Eight studies were identified through reference lists of papers and assessed for eligibility criteria (see Fig. 1). In total, 33 studies were included that described an interpersonal CDP or PDP including youth athletes ($N = 33$), coaches ($N = 28$), and parents ($N = 5$) respectively. Primarily, 85% of the included studies investigating the effectiveness of interpersonal CDPs, 9% of interpersonal PDPs, and 6% of both an interpersonal CDP and PDP on youth athlete outcomes. Most of the included studies were based on youth team sports (79%) as opposed to individual sports (7%). Additionally, a few studies (14%) included both team and individual sport samples. Even though most of the included studies were not theory-based (60%), theories such as achievement goal theory (Duda & Nicholls, 1992), self-determination theory (Ryan & Deci, 2017), and transformational leadership theory (Bass & Riggio, 2006) were used in a subsample of studies (40%). The studies comprised youth athletes from recreational to competitive levels, in team and individual sports, exclusively situated in western countries (e.g., USA, Australia, Spain). The studies included in this systematic review span a period from 1979 to 2022, encapsulating four decades of evolution in interpersonal coaching and parenting development programmes (see Supplementary Table S3).

Interventions

Coach effectiveness training

Six of the studies were based on principles of the Coach Effectiveness Training. This program includes psychosocial skills training with role-playing and coach observations based on a cognitive behavioural

framework relating to the athletes' perceptions and evaluative responses of those interpersonal coach behaviours (Smith et al., 1979). On average, the studies included coaches with 2–8 years of coaching experience and reported athlete ages ranging from 7 to 18 years. Three of the included studies reported randomised controlled trials (Coatsworth & Conroy, 2006; Conroy and Coatsworth, 2004; Smith et al., 1979) and another three used a quasi-experimental design (Barnett et al., 1992; Smith et al., 1995; Smoll et al., 1993). The interventions were primarily delivered or supervised by the research teams during approximately 2 h of education, which included take-home booklets, handouts, and self-monitoring forms to be sent back to the authors. They also involved self-monitoring practices and consecutive contacts and/or meetings between the authors and coaches throughout the delivery. Coaches were provided with self-monitoring forms, acting as a tool for self-observation. After coaching a game, coaches were requested to assess how often they used the recommended behaviours (Smith et al., 1979). Additionally, three studies (Coatsworth & Conroy, 2006; Conroy and Coatsworth, 2004; Smith et al., 1979) implemented observations of the intervention coaches' practices after the education and compared them with control groups. Regarding youth athlete outcomes, the interpersonal CDPs were associated with lower levels of athlete sport attrition (e.g., 1 year after implementation; Barnett et al., 1992), reduced anxiety (e.g., post-season, 10 weeks after implementation; Smith et al., 1995), and increased self-esteem (e.g., post-season, 10 weeks after implementation; Smoll et al., 1993) from baseline to follow-up.

Mastery approach to coaching and parenting in sports

A few years later, four studies reported of the achievement goal theory-based Mastery Approach to Coaching Protocol. The interventions were delivered by the lead author(s) and comprised 75-min education sessions, which included role-playing, group discussions, self-monitoring forms, and take-home manuals. The primary objective was to enhance the participating coaches' ability to foster a task-related motivational youth sport climate. This involved actions such as reacting to good plays and athletes' efforts through reinforcement, demonstrating appreciation, and emphasising the value of their efforts (Smoll et al., 2007b). Like the Coach Effectiveness Training programmes, self-monitoring forms were utilized but in accordance with the Mastery Approach to Coaching Protocol (Smoll et al., 2007b). On average, the studies included coaches with 6–9 years of coaching experience and reported athlete ages ranging from 9 to 18 years. All four studies reported a quasi-experimental design (McLaren et al., 2015; Smith et al., 2007; Smoll et al., 2007a; 2007b). In addition, one of the studies (Smoll et al., 2007b) included a 60-min parent workshop (with a take-home manual and materials) instructing the parents to facilitate a mastery-involving motivational climate emphasising reinforcement of effort, enjoyment, and personal development in contrast to winning. No demographic information was provided for the participating parents.

Overall, the interpersonal CDPs contributed to increases in athletes' perceived task-related motivational climate. Results from both interpersonal CDPs and PDPs showed lower levels of anxiety among the youth athletes of participating coaches and parents, compared to the control group. The studies, in general, had one follow-up measurement 10–12 weeks after baseline (end of the season). One study (McLaren et al., 2015) included a third measurement 5 weeks from baseline (midseason).

Need supportive interventions

The results of this systematic review include six empirical studies (the earliest being from 2005) with intervention protocols of need-supportive interpersonal styles based on self-determination theory (Langan et al., 2015; Langdon et al., 2015; Mahoney et al., 2016; Pulido et al., 2017; Reynders et al., 2019; Sullivan, 2005). On average, the studies included coaches with 3–13 years of coaching experience and reported athlete ages of 8–17 years. Three of the included studies were randomised controlled trials (Sullivan, 2005; Langan et al., 2015; Reynders et al., 2019), and another three were quasi-experimental (Mahoney et al., 2016; Pulido et al., 2017), whereas one study (Langdon et al., 2015) only had an intervention group with no comparison group.

Essentially, the purpose in each study was to increase the interpersonal CDP coaches' need supportive behaviours and decrease their need thwarting practices through skill-based practices, planning of activities and the opportunity to apply their learnings in their coaching practices in-between sessions (e.g., Mahoney et al., 2016). The interventions were delivered by the main author(s) in four studies (Langdon et al., 2015; Langan et al., 2015; Mahoney et al., 2016; Sullivan, 2005), and/or by experienced sport psychologist (Reynders et al., 2019; Vella et al., 2021). One article did not describe the delivery agent sufficiently (Pulido et al., 2017). The delivery process varied from one to several sessions spanning over a varying number of weeks with recurring meetings and/or e-mail contacts (e.g., Langan et al., 2015), workshops (e.g., Reynders et al., 2019) or online modules for the coaches to partake (Langdon et al., 2015). The interpersonal CDPs had a few commonalities. For example, they implemented strategic time-gaps (i.e., two to three weeks) between workshops, enabling the coaches to apply their acquired skills from previous modules during training sessions and subsequently reflect upon this during the next workshop (Langan et al., 2015; Mahoney et al., 2016; Reynders et al., 2019).

Regarding the outcomes, some of the included studies reported of significantly increased youth athlete self-determined motivation, perceived need supportive coaching styles or need satisfaction one month after baseline (e.g., Pulido et al., 2017; Reynders et al., 2019), whereas others found no significant changes with follow-ups after 12 (Langan et al., 2015) and 19 weeks (Mahoney et al., 2016). However, Langan et al. (2015) revealed significantly lower levels of burnout in the intervention group compared to the control group at follow-up. No other significant results were found in the included studies. Statistical power (Langan et al., 2015), and delivery-related barriers (e.g., methods for delivery, recourses, contextual barriers for the coaches' ability to apply their learnings; Mahoney et al., 2016) were suggested as limitations in the studies with non-significant effects. Validated instruments for the assessed outcomes were used in the studies measuring the motivational regulations (e.g., Behavioural Regulation in Sport Questionnaire; Lonsdale et al., 2008), need supportive styles (e.g., Situations in Sports Questionnaire; Delrue et al., 2019), need satisfaction (e.g., Basic Needs Satisfaction in Sport Scale; Ng et al., 2011).

Miscellaneous interpersonal CDPs

The other included miscellaneous interpersonal CDPs ranged from the year 2006 (e.g., Chambers & Vickers, 2006) to 2021 (e.g., Eather et al., 2021). On average, the studies reported athlete ages of 9–16 years, and only a subsample reported coaching experience, averaging between 3 and 14 years among the sampled coaches (Blom et al., 2011; Chambers & Vickers, 2006; Eather et al., 2021; MacDonald et al., 2020; Pulido et al., 2021). Eight of the included studies were described as randomised controlled trials, and another six studies reported a quasi-experimental design (see Supplementary Table S3).

Several of the included studies varied in their behaviour change models, implementation, and timeframes. They also reported varying kinds of follow-up methods with the coaches throughout delivery (e.g., mentoring sessions, observations and feedback, telephone calls, online forums) and number of measurements after baseline (e.g., one or two subsequent measurement points). Examples of estimated youth athlete outcomes included increased levels of enjoyment (e.g.,Pulido et al., 2021; Sampol et al., 2020), game skills and sport performance (e.g., Chambers & Vickers, 2006; Eather et al., 2021), and athletes' perceived relation to the coach (e.g., Blom et al., 2011; Falcão et al., 2020). Some of the miscellaneous interpersonal CDPs also measured youth athlete motivational regulations with no significant effects (e.g., Eather et al., 2021; Guagliano et al., 2015) using the same or similar questionnaires (e.g., Situational Motivation Scale; Standage et al., 2003) as in the

self-determination theory-based need supportive interventions described above.

Moreover, the comprehensiveness and detail of the described methods (including their conceptual or theoretical fundament) varied among the included studies. A small number of the included studies were based on and/or inspired by more than one theory (e.g., Eather et al., 2021; Legg et al., 2018; Pulido et al., 2021) and other single studies on varying models or concepts (e.g., humanistic coaching; Falcão et al., 2020). Concerning similarities, the interpersonal CDPs were often delivered by the lead researcher(s) and focused on the facilitation of positive coach-athlete relations and youth athlete experiences (e.g., intrinsic motivation, mental and physical well-being) through methods such as face-to-face group and individual sessions, practical activities (e.g., role play), online learning modules, and/or self-monitoring materials. Some studies delivered sessions at one (e.g., Vella et al., 2013; Power and Seroczynski, 2015) or two occasions (e.g., Guagliano et al., 2015; Vella et al., 2021) totalling one to 3 h in total. Moreover, a subsample of the included studies described interventions with approximately 10–15 h of education modules, spanning over several weeks, divided in smaller sessions (e.g., Eather et al., 2021; Macdonald et al., 2020; Wilczyńska et al., 2021). One interpersonal CDP provided coaches with a course booklet and checklist of the suggested behavioural approach, examples of training activities and planning tasks to implement, combined with ongoing online support. They also included a mid-intervention 1-h training session to reinforce the coaches' use of the materials combined with practical examples of how to use the checklist via assessing high and low-quality coaching sessions. Such mid-interventions often ended with reflective group discussions. Subsequently, the intervention coaches from the same club were required to undertake two peer observations of a colleague using the same checklist, followed by a dialogue between the two (Eather et al., 2021). In another example, three interpersonal CDPs (Chambers & Vickers, 2006; Legg et al., 2018; Meeûs et al., 2010) implemented video feedback interventions based on behavioural observation tools as feedback to the coaches after training sessions. For example, Legg et al. (2018), used an observation checklist based on the elements of a coach-created empowering and disempowering motivational climate. The intervention coaches were observed mid-season for one game followed by recommendations for behaviour change in line with an empowering motivational climate. No significant differences were found between the two arms with regard to athletes' perceived coach-created motivational climates.

Miscellaneous interpersonal PDPs

Four studies between the years 2017 and 2022 reported on interpersonal PDPs with similar purposes to facilitate positive parental involvement, communication and supportive practices relating to their athletes' youth sport experiences. The reported age of the athletes was on average between 8 and 15 years in the included studies. One study (Azimi and Tamminen, 2022) provided demographic information about the parents' origin, and another about the average age of the parents (37 years; Dorsch et al., 2017).

The studies were all designed as quasi-experimental and varied in their format of delivery. A 1-h workshop was delivered by the main researcher (Vella et al., 2021), another based on a 1-h online module delivered via a sport governing body (Tamminen et al., 2020). Two studies lacked detail of the delivery agent but were delivered through 45-min workshops (Azimi and Tamminen, 2022; Dorsch et al., 2017). Overall, the studies reported of supplementary take home materials to the parents of how to support their children and facilitate positive parental involvement. One study also included audio diaries and reflective tasks of the parents' involvement and interactions with their athletes throughout the study period (Azimi & Tamminen et al., 2022). The follow-up periods varied between each study from one month (e.g., Azimi and Tamminen, 2022) to three years (Tamminen et al., 2020). Considering reported youth athlete outcomes, one of the included studies reported of increased athlete perceived parental support (Dorsch et al., 2017), while another found no significant changes in such behaviours (Azimi and Tamminen, 2022). For more information on these outcomes, see Supplementary Table S3.

Meta-analysis

The meta-analysis comprised 27 of 33 (82%) included studies from the systematic review, with reports of youth athlete outcomes ($k = 27$) stemming from an interpersonal CDP ($k = 25$) or PDP ($k = 2$). The average small and medium effect sizes of the statistically significant results (presented in Table 1), show the magnitude of the interventions on the youth athlete outcomes. These effect size estimates were based on the difference between athletes of coaches who participated in an interpersonal CDP and athletes of coaches who were in the control groups. Additionally, a substratum of the statistically significant outcomes (i.e., task-related climate; team social cohesion, coach competency and knowledge and fun and enjoyment) were based on studies of interpersonal CDPs with team sport coaches (i.e., baseball, basketball, football/soccer, netball, volleyball). The remaining two statistically significant outcomes (i.e., anxiety and self-esteem) were based on interpersonal CDPs with coaches of both individual (i.e., swimming, gymnastics)- and team sports (i.e., baseball, basketball, football/soccer,

Table 1
Estimated youth athlete outcomes of the interpersonal CDPs and PDPs.

	k	*g*	SE	95% CI	*p*
Autonomous motivation	5	0.01	0.16	[−0.30, 0.33]	0.931
Controlled motivation	5	0.02	0.15	[−0.26, 0.30]	0.884
Amotivation	4	−0.15	0.13	[−0.41, 0.11]	0.254
Overall level of self-determined motivation	3	0.29	0.36	[−0.42, 0.99]	0.427
Perceived coach interpersonal needs supportive behaviours	4	0.19	0.12	[−0.05, 0.43]	0.129
Perceived coach interpersonal needs thwarting behaviours	4	−0.11	0.10	[−0.30, 0.09]	0.288
Basic psychological needs satisfaction	2	0.17	0.26	[−0.34, 0.68]	0.507
Basic psychological needs frustration	2	0.02	0.09	[−0.15, 0.20]	0.791
Task-related climate	**3**	**0.31**	**0.08**	**[0.15, 0.47]**	**0.000**
Positive youth development	3	0.22	0.22	[−0.21, 0.64]	0.323
Performance related self-confidence	3	−0.08	0.22	[−0.51, 0.36]	0.720
Perceived relationship with coach	9	0.20	0.16	[−0.11, 0.51]	0.211
Team social cohesion	**4**	**0.38**	**0.07**	**[0.25, 0.51]**	**0.000**
Coach competency and knowledge	**3**	**0.20**	**0.05**	**[0.10, 0.31]**	**0.000**
[a]Perceived parent support	2	0.69	0.57	[−0.43, 1.81]	0.230
Intentions to continue sport participation	4	0.19	0.12	[−0.05, 0.44]	0.113
Anxiety	**5**	**−0.37**	**0.15**	**[−0.66, −0.08]**	**0.013**
Self-esteem	**3**	**0.20**	**0.07**	**[0.07, 0.33]**	**0.003**
Fun and enjoyment	**5**	**0.15**	**0.05**	**[0.06, 0.25]**	**0.002**
Sport skills performance	2	0.33	0.37	[−0.40, 1.07]	0.369

Note. *k* indicates the number of included studies within each average effect size. *Estimated statistically significant effects (CI 95%); $p < 0.05$ are presented in bold.

[a] "Perceived parent support" is an average effect size pertaining to interpersonal PDPs.

handball). The presentation of effect sizes accompanied with 95% CIs and p-values, are illustrated in Table 1.

Estimated youth athlete outcomes

A statistically significant small to medium positive effect was found for *task-related climate* ($g = 0.31$, 95% CI [0.15, 0.47], $p < 0.001$), showing that athletes with coaches participating in an interpersonal CDP perceived a higher motivational climate emphasising individual effort and skill mastery. Furthermore, the statistically significant medium and negative effect on *anxiety* ($g = -0.37$, 95% CI [−0.66, 0.08], $p < 0.013$) indicates lower levels of somatic tensions, concentration disruption, and worry following the coaches' participation in the interpersonal CDPs. The statistically significant small to medium positive effect on *self-esteem* ($g = 0.20$, 95% CI [0.07, 0.33], $p < 0.003$), suggests that an interpersonal CDP contributed to higher levels of general self-evaluation of overall worthiness. A statistically significant medium and positive effect was found on *team social cohesion* ($g = 0.38$, CI [0.25, 0.51], $p < 0.001$), illustrating that the youth athletes perceived higher levels of social unity with team-mates through the interpersonal CDP. The statistically significant small to medium positive effect on *coach competency and knowledge* ($g = 0.20$, 95% CI [0.10, 0.31], $p < 0.001$) illustrate a higher perception of the coach as knowledgeable and a competent role model in the sport. Lastly, a statistically significant small positive effect was found on *fun and enjoyment* ($g = 0.15$, CI [0.06, 0,25], $p < 0.002$), indicating that youth athletes of interpersonal CDP coaches perceived higher levels of enjoyable experiences in their sport participation. No other statistically significant effects were found.

Publication bias assessment

Regarding publication bias, the Egger's regression test was not statistically significant ($p = 0.34$), and the visual inspection of the funnel plot indicated that the individual effects were roughly symmetrical and evenly distributed with a few individual effects falling outside the dark shaded significance contours at the 0.05 and 0.01 levels. No included study met the typically adopted criteria for 80% power (see Supplementary Figure 1). Moderator analysis was not carried out due to the small numbers of included studies.

Quality assessment

The critical appraisal of each included study revealed that 67% met at least three of five criteria on the MMAT. In detail, most studies reported on three (42%) or four (21%) indicators according to the assessment. Some of the included studies reported on two (9%) or one (18%) indicator of these criteria. One study met zero of the MMAT criteria. Two studies (6%) met all 5 quality criteria. Primarily, the appraised studies were of a quasi-experimental design with non-randomisation of participants (58%), followed by randomised controlled trials (42%). For the quasi-experimental studies, clear and detailed reporting of the participants' representativeness of the target population (MMAT criteria 3.1), or whether the intervention was administered as intended (MMAT criteria 3.5), were most often missing. Considering the randomised controlled trials, whether randomisation was appropriately performed (MMAT criteria 2.1), or if the participants adhered to the assigned intervention (MMAT criteria 2.5), were in general least reported.

Discussion

This study presents a comprehensive examination of over four decades of research on interpersonal CDPs and PDPs within the youth sport setting. The systematic review, coupled with a meta-analysis, shed light on the effectiveness of the interventions on various youth athlete outcomes. The findings of this review contribute to the existing body of knowledge and highlight important considerations for future intervention research in this field.

Thirty-three studies of interpersonal CDPs or PDPs were identified. All of these included a behaviour change intervention towards the adult socialising agents accompanied with youth athlete outcome assessments. We identified a broad variation of studies with respect to their protocols, outcome assessments and accompanied results. Nevertheless, some were based on similar principles and delivery protocols (i.e., Coach Effectiveness Training – Smith et al., 1979; Mastery Approach to Coaching Protocol – Smith et al., 2007), or theoretical frameworks (e.g., Self-Determination Theory – Ryan & Deci, 2017). Moreover, the meta-analysis revealed statistically significant small and medium effects of the interpersonal CDPs on a subsample of youth athlete outcomes, yielding valuable insights on the impact of such intervention research. The estimated findings suggest that an interpersonal CDP can bolster the coaches' ability to create a favourable motivational sport climate through encouragement and reinforcement, and acknowledgement of the youth athletes' personal growth and task mastery. Consequently, interpersonal CDPs that encompass such skills can increase the youth athletes' perceived task-related climate, self-esteem, and decrease in anxiety. Associations between these nurturing coaching skills and athlete responses are supported in the extant literature of empirical research within the youth sport context (Duda et al., 2014). Considering team sport, the interpersonal CDPs effect on social cohesion among teammates highlight the coaches' increased ability to scaffold prosperous social interactions and bonds between their youth athletes (McLaren et al., 2015). Moreover, our results highlight that the youth athletes' experiences of fun and enjoyment, and their perception of the coach as knowledgeable and competent, increased due to their coaches' participation in an interpersonal CDP. Indeed, such findings support the importance of youth coaches' professional and interpersonal skills (Côté & Gilbert, 2009), encompassing a supportive and relations-building approach, and the structuring of an environment that stimulates high levels of activity, involvement, and skills-related development (Cronin & Allen, 2015). In essence, this analysis not only underscores the potential efficacy of interpersonal CDPs on various youth athlete outcomes but also highlights the benefits of coaches possessing a well-rounded interpersonal skill set that extends beyond technical expertise.

Only one non-significant average effect size was estimated regarding the interpersonal PDPs. Parents are major social agents in their sporting children's life, including their sport-related experiences and well-being (Back et al., 2022; Krommidas et al., 2022; Lemelin et al., 2022). Nevertheless, the scarcity of interpersonal PDPs identified in this review highlights a critical gap in our understanding of the impact of parental involvement in youth sports. While this evidence gap limits our ability to draw conclusions, it also emphasizes a compelling avenue for future research. Therefore, further studies investigating the potential effectiveness of interpersonal PDPs on youth athlete outcomes are warranted. Such investigations will not only contribute to the existing knowledge base but may also offer practical insights for fostering positive parent-child interactions within the youth sport context.

Many of the statistically significant outcomes in our meta-analysis were derived from interpersonal CDP studies that were based on/or inspired by principles of the Coach Effectiveness Training (Smith et al., 1979), and Mastery Approach to Coaching (Smith et al., 2007), interpersonal styles grounded on the tenets of self-determination theory (Ryan & Deci, 2017) and/or achievement goal theory (Duda & Nicholls, 1992). This underscores the importance of theory-based, or at the very least, theory-informed, interpersonal CDPs (Langan et al., 2013). Such interventions may be more effective in relation to youth athlete outcomes, as their targeted mechanisms for behaviour change and outcome measurements are systematically guided by evidence-based theoretical frameworks (Duda et al., 2014). Notably, theoretical underpinnings can be traced to the Coach Effectiveness Training whereas its behavioural guidelines align with a task-oriented motivational climate (Smith et al., 2007; Smoll et al., 2007a). This is accomplished, for instance, by fostering positive coach-athlete interactions through emphasis on self-referenced personal improvement and the importance of enjoyment

rather than solely winning. Both the Coach Effectiveness Training and Mastery Approach to Coaching Protocol focus on such interpersonal coaching behaviours and the skills to provide encouragement and reinforcement of athletes' efforts and individual development, steering away from punitive instructions and punishments (Smith et al., 2007). Despite the noted similarities between the two protocols, the Mastery Approach to Coaching explicitly links coaching behaviours to either a task-oriented (e.g., setting mastery goals, reinforcing good performance and effort) or ego-oriented (punitive instructions and a focus on winning) motivational climate based on achievement goal theory (Smith et al., 2007). In relation to the results of this study, the behaviour-change guidelines from these two protocols demonstrate relevance to several youth athlete outcomes, such as anxiety, self-esteem, social cohesion, and perceived task-related climate. However, it's noteworthy that the studies based on the Mastery Approach to Coaching Protocol employed only quasi-experimental designs, which may impact their methodological quality, given that such designs often yield statistically significant results more frequently than controlled studies (Raabe et al., 2019). Future research is encouraged to assess this protocol in a randomised controlled trial design to enable more robust conclusions regarding its potential effectiveness on youth athlete outcomes.

From another perspective, not all the included interpersonal CDPs assessing self-determination theory-related outcomes (i.e., youth athlete perceived basic psychological needs satisfaction, coach need supportive or thwarting style, motivational regulations) demonstrated the expected effects. Most studies that assessed motivational regulations using commonly employed instruments (e.g., the Behavioural Regulations in Sport Questionnaire; Lonsdale et al., 2008), were explicitly based on the self-determination theory (e.g., Langan et al., 2015; Reynders et al., 2019) or were combined with other theories or models (e.g., Eather et al., 2021; Wilczyńska et al., 2021). Despite this common aspect considering measurements, the heterogeneity of the need supportive intervention protocols is important to consider in light of the estimated outcomes.

One of the included studies implemented a self-determination theory-based need supportive intervention (Reynders et al., 2019) largely inspired by a previously tested and effective protocol in the physical education context (Aelterman et al., 2014). This initiative opens a potential avenue for future need supportive interpersonal CDPs, wherein intervention protocols developed and tested in adjacent contexts (e.g., physical education) can be adapted and examined in the youth sport context. Consequently, this approach can contribute to uniformity among theory-based interpersonal CDPs and offer a more comprehensive understanding of their effectiveness on youth athlete outcomes.

Many of the included studies employed a quasi-experimental design due to aspects such as geographical position (e.g., Smith et al., 2007), league (e.g., Smith et al., 1995) or club membership (e.g., Mahoney et al., 2016). Indeed, quasi-experimental designs can be pragmatic in relation to such challenges (Langan et al., 2013). They may also be less intrusive compared to a randomised controlled trial when implemented without any major interruption on the coaches naturalistic setting and practices. The absence of adequate group randomisation, however, prevents conclusions of causal associations between a studied intervention and the estimated outcomes (Campbell & Stanley, 2015). To strengthen the study rigour, some of the reviewed studies included stratification of participants based on their coaching experience. One quasi-experimental study used a placebo control group where the coaches received a general introduction about sport psychology and youth athlete stress and anxiety (McLaren et al., 2015). Two other studies used a partial-implementation group where the participants received the same initial education session (Blom et al., 2011), or a sport-guide handout (Dorsch et al., 2017), as the intervention group. Such implementation-related efforts can strengthen the conclusions drawn about an interventions effect on the participants' behaviour change (Langan et al., 2013).

Considering the variation in follow-up measurements among the included interpersonal CDPs and PDPs, it is noteworthy that only a minority of studies (e.g., Chambers & Vickers, 2006; Coatsworth & Conroy, 2006; Mahoney et al., 2016; McLaren et al., 2015) incorporated more than one follow-up measurement after baseline. This approach is valuable for both estimating and controlling underlying trends in the data, particularly in understanding how outcomes (e.g., perceived self-esteem) are expected to change over time. To enhance the validity of research (Campbell & Stanley, 2015), careful consideration of the time needed to observe an expected change, along with the frequency of follow-up measurements, is essential in the planning of interpersonal CDPs or PDPs and the assessment of youth athlete outcomes. Such planning can be systematically guided by theoretical frameworks and empirical research (Ntoumanis et al., 2017).

With regard to whether an intervention was delivered as intended, this systematic review include studies that used implementation fidelity assessments based on audio recordings of coaches during training sessions at both baseline and follow-up (Langan et al., 2015; Mahoney et al., 2016). The assessments encompassed criteria of need supportive (e.g., autonomy support, structure, involvement) and need thwarting styles (e.g., controlling use of rewards, negative conditional regard, intimidation) evaluated by independent observers. This form of assessment provides an understanding of the degree to which the delivery process adhered to the study protocol, relating to the expected behaviour change process (Nelson et al., 2012). Thus, by integrating fidelity assessments (e.g., checklists of delivery contents, interviews, observations), future research on interpersonal CDPs and PDPs can pinpoint successful or challenging aspects of the delivery model. This information can then guide future intervention research, suggesting elements that are replicable or in need of improvement (Nelson et al., 2012).

Limitations

This systematic review and meta-analysis contain limitations which should be taken for consideration. First, the limitation to search for and include only English-written articles may have contributed to a potential loss of eligible studies written in other languages.

Second, the small number of effect sizes within each studied youth athlete outcome have plausibly reduced the accurateness of the meta-analytic estimates, as opposed to if there was a greater number of clustered effect sizes, potentially generating more robust results (Pustejovsky & Tipton, 2022). Additionally, the low-powered design and test combinations in the included studies likely impacted the credibility of the evidence in the meta-analysis (Gucciardi et al., 2022). Therefore, it is advisable to interpret our results with caution. Notably, the power-enhanced funnel plot indicated that all included studies were underpowered, emphasising the importance of employing more rigorous power estimation procedures in future intervention studies.

Third, only studies that addressed youth athlete outcomes were included. Only a few of the eligible studies quantitatively described both youth athletes, coaches, and/or parent outcomes. Based on this, investigations focusing on the effects of interpersonal CPDs or PDPs on coach/parent outcomes, alongside the athletes, can be valuable to inform future intervention studies.

Finally, due to the small number of included studies in our analysis, we did not differentiate studies with individual and team sports samples; hence, presuming that the delivery of an interpersonal CDP or PDP, and the participating coaches or parents' enactment of their learning, is independent of sport type. This can be problematic because, compared with team sport coaches monitoring several youth athletes simultaneously, individual sports coaches can presumably allocate more time with each athlete, relating to their outcomes (Reynders et al., 2019). Hence, given that most of the studies included in this study represent results relating to youth team sport outcomes, our findings may be most generalisable to this sport type setting.

Conclusions and practical implications

The meta-analysis indicates that interpersonal CDPs can influence various youth athlete outcomes, highlighting the importance of coaches' interpersonal skills for shaping the youth sports environment. However, the diversity among interpersonal CDPs, including their designs, protocols (based on or inspired by different theories and/or models), and findings, constrains the generalisability and the conclusions that can be drawn regarding their effectiveness on youth athlete outcomes. Nonetheless, our results show the effectiveness of studies grounded in the Coach Effectiveness Training or Mastery Approach to Coaching Protocol across diverse youth athlete outcomes (e.g., anxiety, self-esteem, task-oriented climate). These findings underscore the benefits of educating coaches on the principles of a mastery-oriented motivational climate in youth sport. Hence, a theoretical framework (e.g., achievement goal theory) can systematically guide the intervention protocol (e.g., behavioural guidelines) and inform the assessment of youth athlete outcomes (e.g., McLaren et al., 2015; Smith et al., 2007). Moreover, drawing insights from the strengths and limitations from the implementation of previous intervention protocols and taking inspiration from bordering fields of research (e.g., physical education; Aelterman et al., 2014, the exercise context; Ntoumanis et al., 2017), future intervention studies can extend our understanding in this important field of research.

From an applied perspective, demonstrations of adequate practices (Eather et al., 2021), problem-based learning (e.g., role play, group dynamics, and trust activities; Pulido et al., 2021), and reflective group sessions can scaffold the transfer of learning and skills to real-life contexts for intervention participants. Moreover, our findings highlight that coaches' learning and behaviour-change may be best facilitated through concrete materials outlining behavioural 'dos and don'ts,' such as the guidelines provided in the Mastery Approach to Coaching Protocol (Smoll et al., 2007b). Nevertheless, persistent heterogeneity in interpersonal CDP protocols and findings remains, even when using similar outcome assessments. Drawing from the insights gained in this systematic review and meta-analysis, there is a compelling case for the development of standardised guidelines informing the delivery of interpersonal CDP and PDP protocols. This approach may not only facilitate uniformity among studies but also enhance our understanding of the effectiveness of interventions, particularly those grounded in theoretical frameworks. Furthermore, implementation of interpersonal CDPs or PDPs in sports organisations and clubs is recommended. Such initiatives, subject to thorough evaluation by researchers, have the potential to significantly impact youth athlete outcomes. Ultimately, these investments can play an important role in elevating coaches' professional and interpersonal skills, contributing to the cultivation of a positive and supportive environment for youth athletes.

Funding

This research project was funded by grants from the Swedish Ice Hockey Association. The funding body was not involved in any part of the study.

Registration and protocol

This study was pre-registered in the Open Science Format (DOI 10.17605/OSF.IO/HCX23).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgements

We would like to acknowledge and thank Dr. Anton Kalén for his counsel in relation to the meta-analysis procedure.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2023.102558.

References

Single asterisk signify studies included in the meta-analysis; double asterisk.signify studies included in the meta-analysis; double asterisk
signifies studies included in the review only.

Aelterman, N., Vansteenkiste, M., Van den Berghe, L., De Meyer, J., & Haerens, L. (2014). Fostering a need-supportive teaching style: Intervention effects on physical education teachers' beliefs and teaching behaviors. *Journal of Sport & Exercise Psychology, 36*(6), 595–609. https://doi.org/10.1123/jsep.2013-0229

Ahmed, S. M. S., Valliant, P. M., & Swindle', D. (1985). Psychometric properties of coppersmith self-esteem inventory. *Perceptual and Motor Skills, 61*, 1235–1241. https://doi.org/10.2466/pms.1985.61.3f.1235

Appleton, P., Ntoumanis, N., Viladrich, C., Quested, E., & Duda, J. L. (2016). Initial validation of the coach-created empowering and disempowering motivational climate questionnaire (EDMCQ-C). *Psychology of Sport and Exercise, 22*, 53–65. https://doi.org/10.1016/j.psychsport.2015.05.008

** Azimi, S., & Tamminen, K. A. (2022). Parental communication and reflective practice among youth sport parents. *Journal of Applied Sport Psychology, 34*(1), 109–132. https://doi.org/10.1080/10413200.2019.1705433.

Back, J., Johnson, U., Svedberg, P., McCall, A., & Ivarsson, A. (2022). Drop-out from team sport among adolescents: A systematic review and meta-analysis of prospective studies. *Psychology of Sport and Exercise, 61*, Article 102205. https://doi.org/10.1016/j.psychsport.2022.102205. Elsevier Ltd.

** Barnett, N. P., Smoll, F. L., & Smith, R. E. (1992). Effects of enhancing coach-athlete relationships on youth sport attrition. *The Sport Psychologist, 6*(2), 111–127. https://doi.org/10.1123/tsp.6.2.111.

Bartholomew, K. J., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2009). A review of controlling motivational strategies from a self-determination theory perspective: Implications for sports coaches. *International Review of Sport and Exercise Psychology, 2*(2), 215–233. https://doi.org/10.1080/17509840903235330

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Psychology press. https://doi.org/10.4324/9781410617095

Comment Blom, L. C., Watson, J. C., & Spadaro, N. (2011). The impact of a coaching intervention on the coach-athlete dyad and athlete sport experience. *Athletic Insight Journal, 2*(3), 187–203.

Braithwaite, R., Spray, C. M., & Warburton, V. E. (2011). Motivational climate interventions in physical education: A meta-analysis. *Psychology of Sport and Exercise, 12*(6), 628–638. https://doi.org/10.1016/j.psychsport.2011.06.005

Burke, S., Sharp, L. A., Woods, D., & Paradis, K. F. (2021). Enhancing parental support through parent-education programs in youth sport: A systematic review. *International Review of Sport and Exercise Psychology*, 1–28. https://doi.org/10.1080/1750984X.2021.1992793

Campbell, D. T., & Stanley, J. C. (2015). *Experimental and quasi-experimental designs for research*. Ravenio books.

Comment Chambers, K. L., & Vickers, J. N. (2006). Effects of bandwidth feedback and questioning on the performance of competitive swimmers. *The Sport Psychologist, 20*(2), 184–197 https://psycnet.apa.org/doi/10.1123/tsp.20.2.184.

Cheung, M. W.-L. (2014). Modeling dependent effect sizes with three-level meta-analyses: A structural equation modeling approach. *Psychological Methods, 19*(2), 211–229. https://doi.org/10.1037/a0032968

Comment Coatsworth, J. D., & Conroy, D. E. (2006). Enhancing the self-esteem of youth swimmers through coach training: Gender and age effects. *Psychology of Sport and Exercise, 7*(2), 173–192. https://doi.org/10.1016/j.psychsport.2005.08.005.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*(1), 37–46. https://doi.org/10.1177/001316446002000104

Comment Conroy, D. E., & Coatsworth, J. D. (2004). The effects of coach training on fear of failure in youth swimmers: A latent growth curve analysis from a randomized, controlled trial. *Journal of Applied Developmental Psychology, 25*(2), 193–214. https://doi.org/10.1016/j.appdev.2004.02.007.

Côté, J., & Gilbert, W. (2009). An integrative definition of coaching effectiveness and expertise. *International Journal of Sports Science & Coaching, 4*(3), 307–323. https://doi.org/10.1260/174795409789623892

Cronin, L. D., & Allen, J. B. (2015). Developmental experiences and well-being in sport: The importance of the coaching climate. *The Sport Psychologist, 29*(1), 62–71. https://doi.org/10.1123/tsp.2014-0045

Delrue, J., Reynders, B., Broek, G. V., Aelterman, N., De Backer, M., Decroos, S., … Vansteenkiste, M. (2019). Adopting a helicopter-perspective towards motivating and demotivating coaching: A circumplex approach. *Psychology of Sport and Exercise, 40*, 110–126. https://doi.org/10.1016/j.psychsport.2018.08.008

Doré, I., Sabiston, C. M., Sylvestre, M. P., Brunet, J., O'Loughlin, J., Nader, P. A., Gallant, F., & Bélanger, M. (2019). Years participating in sports during childhood predicts mental health in adolescence: A 5-year longitudinal study. *Journal of Adolescent Health, 64*(6), 790–796. https://doi.org/10.1016/j.jadohealth.2018.11.024

Comment Dorsch, T. E., King, M. Q., Dunn, C. R., Osai, K.v., & Tulane, S. (2017). The impact of evidence-based parent education in organized youth sport: A pilot study. *Journal of Applied Sport Psychology, 29*(2), 199–214. https://doi.org/10.1080/10413200.2016.1194909.

Dorsch, T. E., Smith, A. L., Blazo, J. A., Coakley, J., Côté, J., Wagstaff, C. R., … King, M. Q. (2022). Toward an integrated understanding of the youth sport system. *Research Quarterly for Exercise & Sport, 93*(1), 105–119. https://doi.org/10.1080/02701367.2020.1810847

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*(3), 290–299. https://doi.org/10.1037/0022-0663.84.3.290

Duda, J. L., Papaioannou, A. G., Appleton, P. R., Quested, E., & Krommidas, C. (2014). Creating adaptive motivational climates in sport and physical education. In A. G. Papaioannou, & D. Hackfort (Eds.), *Routledge companion to sport and exercise psychology: Global perspectives and fundamental concepts* (pp. 544–558). Taylor & Francis Group.

Comment Eather, N., Miller, A., Jones, B., & Morgan, P. J. (2021). Evaluating the impact of a coach development intervention for improving coaching practices and player outcomes in netball: The MASTER coaching randomized control trial. *International Journal of Sports Science & Coaching, 16*(3), 439–455. https://doi.org/10.1177/1747954120976966.

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity, 10*(1), 1–21. https://doi.org/10.1186/1479-5868-10-98

Evans, M. B., McGuckin, M., Gainforth, H. L., Bruner, M. W., & Côté, J. (2015). Coach development programmes to improve interpersonal coach behaviours: A systematic review using the re-aim framework. *British Journal of Sports Medicine, 49*(13), 871–877. https://doi.org/10.1136/bjsports-2015-094634

Comment Falcão, W. R., Bloom, G. A., & Sabiston, C. M. (2020). The impact of humanistic coach training on youth athletes' development through sport. *International Journal of Sports Science & Coaching, 15*(5–6), 610–620. https://doi.org/10.1177/1747954120933975.

Ford, J., Ildefonso, K., Jones, M., & Arvinen-Barrow, M. (2017). Sport-related anxiety: Current insights. *Open Access Journal of Sports Medicine, 8*, 205–212. https://doi.org/10.2147/oajsm.s125845

Gaudreau, P., Morinville, A., Gareau, A., Verner-Filion, J., Green-Demers, I., & Franche, V. (2016). Autonomy support from parents and coaches: Synergistic or compensatory effects on sport-related outcomes of adolescent-athletes? *Psychology of Sport and Exercise, 25*, 89–99. https://doi.org/10.1016/j.psychsport.2016.04.006

Comment Guagliano, J. M., Lonsdale, C., Kolt, G. S., Rosenkranz, R. R., & George, E. S. (2015). Increasing girls' physical activity during a short-term organized youth sport basketball program: A randomized controlled trial. *Journal of Science and Medicine in Sport, 18*(4), 412–417. https://doi.org/10.1016/j.jsams.2015.01.014.

Gucciardi, D. F., Lines, R. L., & Ntoumanis, N. (2022). Handling effect size dependency in meta-analysis. *International Review of Sport and Exercise Psychology, 15*(1), 152–178. https://doi.org/10.1080/1750984X.2021.1946835

Harvey, S., & Jarrett, K. (2014). A review of the game-centred approaches to teaching and coaching literature since 2006. *Physical Education and Sport Pedagogy, 19*(3), 278–300. https://doi.org/10.1080/17408989.2012.754005

Hollenbeck, G. P., & Hall, D. T. (2004). Self-confidence and leader performance. *Organizational Dynamics, 33*(3), 254–269. https://doi.org/10.1016/j.orgdyn.2004.06.003

Holt, N. L., Neely, K. C., Slater, L. G., Camiré, M., Côté, J., Fraser-Thomas, J., Macdonald, D., Strachan, L., & Tamminen, K. A. (2017). A grounded theory of positive youth development through sport based on results from a qualitative meta-study. *International Review of Sport and Exercise Psychology, 10*(1), 1–49. https://doi.org/10.1080/1750984X.2016.1180704

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., & Vedel, I. (2018). *Mixed methods appraisal tool (MMAT)*. Industry Canada: Canadian Intellectual Property Office. registration of copyright (#1148552).

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., & Vedel, I. (2019). Improving the content validity of the mixed methods appraisal tool: A modified e-Delphi study. *Journal of Clinical Epidemiology, 111*, 49–59. https://doi.org/10.1016/j.jclinepi.2019.03.008

Horne, T., & Carron, A. V. (1985). Compatibility in coach-athlete relationships. *Journal of Sport & Exercise Psychology, 7*(2), 137–149. https://doi.org/10.1123/jsp.7.2.137

Knight, C. J., & Holt, N. L. (2014). Parenting in youth tennis: Understanding and enhancing children's experiences. *Psychology of Sport and Exercise, 15*(2), 155–164. https://doi.org/10.1016/j.psychsport.2013.10.010

Krommidas, C., Papaioannou, A. G., Comoutos, N., Kouali, D., Galanis, E., & Chroni, S."A. (2022). Effects of parental support and coach-initiated motivational climate on young athletes' psychosocial behaviors and well-being. *Asian Journal of Sport and Exercise Psychology, 2*(3), 140–150. https://doi.org/10.1016/j.ajsep.2022.06.002

Langan, E., Blake, C., & Lonsdale, C. (2013). Systematic review of the effectiveness of interpersonal coach education interventions on athlete outcomes. *Psychology of Sport and Exercise, 14*(1), 37–49. https://doi.org/10.1016/j.psychsport.2012.06.007

Comment Langan, E., Toner, J., Blake, C., & Lonsdale, C. (2015). Testing the effects of a self-determination theory-based Intervention with youth gaelic football coaches on athlete motivation and burnout. *The Sport Psychologist, 29*(4), 293–301. https://doi.org/10.1123/tsp.2013-0107.

** Langdon, J., Schlote, R., Harris, B., Burdette, G., & Rothberger, S. (2015). Effects of a training program to enhance autonomy supportive behaviors among youth soccer coaches. *Journal of Human Sport and Exercise, 10*(1), 1–14. https://doi.org/10.14198/jhse.2015.101.01.

Comment Legg, E., Newland, A., & Bigelow, R. (2018). Somebody's eyes are watching: The impact of coaching observations on empowering motivational climates and positive youth development. *Journal of Park and Recreation Administration, 36*(4), 90–106. https://doi.org/10.18666/jpra-2018-v36-i4-8885.

Lemelin, E., Verner-Filion, J., Carpentier, J., Carbonneau, N., & Mageau, G. A. (2022). Autonomy support in sport contexts: The role of parents and coaches in the promotion of athlete well-being and performance. *Sport, Exercise, and Performance Psychology, 11*(3), 305–319. https://doi.org/10.1037/spy0000287

Light Shields, D. L., Gardner, D. E., Light Bredemeier, B. J., & Bostro, A. (1997). The relationship between leadership behaviors and group cohesion in team sports. *The Journal of Psychology: Interdisciplinary and Applied, 131*(2), 196–210. https://doi.org/10.1080/00223989709601964

Lonsdale, C., Hodge, K., & Rose, E. A. (2008). The behavioral regulation in sport questionnaire (BRSQ): Instrument development and initial validity evidence. *Journal of Sport & Exercise Psychology, 30*(3), 323–355. https://doi.org/10.1123/jsep.30.3.323

Lovakov, A., & Agadullina, E. R. (2021). Empirically derived guidelines for effect size interpretation in social psychology. *European Journal of Social Psychology, 51*(3), 485–504. https://doi.org/10.1002/ejsp.2752

Comment MacDonald, D. J., Camiré, M., Erickson, K., & Santos, F. (2020). Positive youth development related athlete experiences and coach behaviors following a targeted coach education course. *International Journal of Sports Science & Coaching, 15*(5–6), 621–630. https://doi.org/10.1177/1747954120942017.

Mahoney, J. W., Gucciardi, D. F., Gordon, S., & Ntoumanis, N. (2017). Psychological needs support training for coaches: An avenue for nurturing mental toughness. In S. T. Cotterill, G. Breslin, & N. Weston (Eds.), *Sport and exercise psychology: Practitioner cases* (pp. 193–213). Wiley.

Comment Mahoney, J. W., Ntoumanis, N., Gucciardi, D. F., Mallett, C. J., & Stebbings, J. (2016). Implementing an autonomy-supportive intervention to develop mental toughness in adolescent rowers. *Journal of Applied Sport Psychology, 28*(2), 199–215. https://doi.org/10.1080/10413200.2015.1101030.

Comment McLaren, C. D., Eys, M. A., & Murray, R. A. (2015). A coach-initiated motivational climate intervention and athletes' perceptions of group cohesion in youth sport. *Sport, Exercise, and Performance Psychology, 4*(2), 113–126. https://doi.org/10.1037/spy0000026.

Comment Meeûs, M. P. S., Serpa, S., & de Cuyper, B. (2010). The effects of video feedback on coaches' behavior and the coach-athlete relationship. *Journal of Clinical Sport Psychology, 4*, 323–340. https://doi.org/10.1123/jcsp.4.4.323.

Myers, N. D., Feltz, D. L., Maier, K. S., Wolfe, E. W., & Reckase, M. D. (2006). Athletes' evaluations of their head coach's coaching competency. *Research Quarterly for Exercise & Sport, 77*(1), 111–121. https://doi.org/10.1080/02701367.2006.10599337

Nelson, M. C., Cordray, D. S., Hulleman, C. S., Darrow, C. L., & Sommer, E. C. (2012). A procedure for assessing intervention fidelity in experiments testing educational and behavioral interventions. *The Journal of Behavioral Health Services & Research, 39*, 374–396. https://doi.org/10.1007/s11414-012-9295-x

Newman, T. J., Magier, E., Kimiecik, C., & Burns, M. (2021). The relationship between youth sport participation and aggressive and violent behaviors: A scoping review of the literature. *Journal of the Society for Social Work and Research, 12*(2), 371–389. https://doi.org/10.1086/714421

Ng, J. Y., Lonsdale, C., & Hodge, K. (2011). The basic needs satisfaction in sport scale (BNSSS): Instrument development and initial validity evidence. *Psychology of Sport and Exercise, 12*(3), 257–264. https://doi.org/10.1016/j.psychsport.2010.10.006

Ntoumanis, N., Quested, E., Reeve, J., & Cheon, S. H. (2017). Need-supportive communication: Implications for motivation in sport, exercise, and physical activity. In *Persuasion and communication in sport, exercise, and physical activity* (pp. 155–169).

Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan-a web and mobile app for systematic reviews. *Systematic Reviews, 5*(1). https://doi.org/10.1186/s13643-016-0384-4

Pace, R., Pluye, P., Bartlett, G., Macaulay, A. C., Salsberg, J., Jagosh, J., & Seller, R. (2012). Testing the reliability and efficiency of the pilot Mixed Methods Appraisal Tool (MMAT) for systematic mixed studies review. *International Journal of Nursing Studies, 49*(1), 47–53. https://doi.org/10.1016/j.ijnurstu.2011.07.002

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Systematic Reviews, 10*(1). https://doi.org/10.1186/s13643-021-01626-4

Palomäki, S., Hirvensalo, M., Smith, K., Raitakari, O., Männistö, S., Hutri-Kähönen, N., & Tammelin, T. (2018). Does organized sport participation during youth predict healthy habits in adulthood? A 28-year longitudinal study. *Scandinavian Journal of Medicine & Science in Sports, 28*(8), 1908–1915. https://doi.org/10.1111/sms.13205

** Power, F. C., & Seroczynski, A. D. (2015). Promoting character development through coach education. *Journal of Character Education, 11*(2), 87–107.

Comment Pulido, J. J., Leo, F. M., González-Ponce, I., López-Gajardo, M. A., & Sánchez-Oliva, D. (2021). Methodological intervention with soccer coaches to improve athlete-perceived coaching competency, satisfaction with the coach, enjoyment and intention to persist. *International Journal of Sports Science & Coaching, 16*(1), 16–26. https://doi.org/10.1177/1747954120952069.

Comment Pulido, J. J., Sánchez-Oliva, D., Leo, F. M., Matos, S., & García-Calvo, T. (2017). Effects of an interpersonal style intervention for coaches on young soccer players' motivational processes. *Journal of Human Kinetics, 59*(1), 107–120. https://doi.org/10.1515/hukin-2017-0151.

Pustejovsky, J. E., & Tipton, E. (2022). Meta-analysis with robust variance estimation: Expanding the range of working models. *Prevention Science, 23*(3), 425–438. https://doi.org/10.1007/s11121-021-01246-3

Raabe, J., Schmidt, K., Carl, J., & Höner, O. (2019). The effectiveness of autonomy support interventions with physical education teachers and youth sport coaches: A systematic review. *Journal of Sport & Exercise Psychology, 41*(6), 345–355. https://doi.org/10.1123/jsep.2019-0026

Comment Reynders, B., Vansteenkiste, M., van Puyenbroeck, S., Aelterman, N., de Backer, M., Delrue, J., de Muynck, G. J., Fransen, K., Haerens, L., & Broek, G. V. (2019). Coaching the coach: Intervention effects on need-supportive coaching behavior and athlete motivation and engagement. *Psychology of Sport and Exercise, 43*, 288–300. https://doi.org/10.1016/j.psychsport.2019.04.002.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.

Comment Sampol, P. P., Díaz, J. M. B., Rotger, P. A. B., & Verdaguer, F. J. P. (2020). Effects of an educational intervention regarding fair play on sports team coaches. *Journal of Human Sport and Exercise, 15*(2), 419–431. https://doi.org/10.14198/jhse.2020.152.16.

Shamseer, L., Moher, D., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., … Stewart, L. A. (2016). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: Elaboration and explanation. *BMJ, 349*. https://doi.org/10.1136/bmj.i4086

Comment Smith, R. E., Smoll, F. L., & Barnett, N. P. (1995). Reduction of children's sport performance anxiety through social support and stress-reduction training for coaches. *Journal of Applied Developmental Psychology, 16*, Article 125142. https://doi.org/10.1016/0193-3973(95)90020-9.

Comment Smith, R. E., Smoll, F. L., & Cumming, S. P. (2007). Effects of a motivational climate intervention for coaches on young athletes' sport performance anxiety. *Journal of Sport & Exercise Psychology, 29*(1), 39–59. https://doi.org/10.1123/jsep.29.1.39.

Comment Smith, R. E., Smoll, F. L., & Curtis, B. (1979). Coach effectiveness training: A cognitive-behavioral approach to enhancing relationship skills in youth sport coaches. *Journal of Sport Psychology, 1*, 59–75. https://doi.org/10.1123/jsp.1.1.59.

Comment Smoll, F. L., Smith, R. E., Barnett, N. P., & Everett, J. J. (1993). Enhancement of children's self-esteem through social support training for youth sport coaches. *Journal of Applied Psychology, 78*(4), 602–610 https://psycnet.apa.org/doi/10.1037/0021-9010.78.4.602.

Comment Smoll, F. L., Smith, R. E., & Cumming, S. P. (2007a). Effects of a motivational climate intervention for coaches on changes in young athletes' achievement goal orientations. *Journal of Clinical Sport Psychology, 1*(1), 23–46. https://doi.org/10.1123/jcsp.1.1.23.

** Smoll, F. L., Smith, R. E., & Cumming, S. P. (2007b). Effects of coach and parent training on performance anxiety in young athletes: A systemic approach. *Journal of Youth Development, 2*(1), 19–36. https://doi.org/10.5195/jyd.2007.358.

Standage, M., Duda, J. L., Treasure, D. C., & Prusak, K. A. (2003). Validity, reliability, and invariance of the Situational Motivation Scale (SIMS) across diverse physical activity contexts. *Journal of Sport & Exercise Psychology, 25*(1), 19–43. https://doi.org/10.1123/jsep.25.1.19

Comment Sullivan, G. S. (2005). *The effects of a coaching education workshop on the self-regulated motivation of 6th grade male and female basketball players. [dissertation study, Ohio State University]*. The Ohio State University ProQuest Dissertations Publishing https://www.proquest.com/openview/268ed8a177c2c4e7c1026db801edc4a4/1?cbl=18750&diss=y&pq-origsite=gscholar.

** Tamminen, K. A., McEwen, C. E., Kerr, G., & Donnelly, P. (2020). Examining the impact of the respect in sport parent program on the psychosocial experiences of minor hockey athletes. *Journal of Sports Sciences, 38*(17), 2035–2045. https://doi.org/10.1080/02640414.2020.1767839.

Vallerand, R. J. (2000). Deci and Ryan's self-determination theory: A view from the hierarchical model of intrinsic and extrinsic motivation. *Psychological Inquiry, 11*(4), 312–318. https://www.jstor.org/stable/1449629.

Vella, S. A. (2019). Mental health and organized youth sport. *Kinesiology Review, 8*(3), 229–236. https://doi.org/10.1123/kr.2019-0025

Comment Vella, S. A., Oades, L. G., & Crowe, T. P. (2013). A pilot test of transformational leadership training for sports coaches: Impact on the developmental experiences of adolescent athletes. *International Journal of Sports Science & Coaching, 8*(3), 513–530. https://doi.org/10.1260/1747-9541.8.3.513.

Comment Vella, S. A., Swann, C., Batterham, M., Boydell, K. M., Eckermann, S., Ferguson, H., Fogarty, A., Hurley, D., Liddle, S. K., Lonsdale, C., Miller, A., Noetel, M., Okely, A. D., Sanders, T., Schweickle, M. J., Telenta, J., & Deane, F. P. (2021). An intervention for mental health literacy and resilience in organized sports. *Medicine & Science in Sports & Exercise, 53*(1), 139–149. https://doi.org/10.1249/MSS.0000000000002433.

Visek, A. J., Achrati, S. M., Mannix, H. M., McDonnell, K., Harris, B. S., & DiPietro, L. (2015). The fun integration theory: Toward sustaining children and adolescents sport participation. *Journal of Physical Activity and Health, 12*(3), 424–433. https://doi.org/10.1123/jpah.2013-0180

Comment Wilczyńska, D., Łysak-Radomska, A., Podczarska-Głowacka, M., Krasowska, K., Perzanowska, E., Walentukiewicz, A., Lipowski, M., & Skrobot, W. (2021). Effect of workshops for coaches on the motor ability of balance in children practicing sports in late childhood. *BMC Sports Science, Medicine and Rehabilitation, 13*(1), 155. https://doi.org/10.1186/s13102-021-00388-9.