HOBBIT WEEKLY

FOR YOUTH COACHES The week in youth football, picked for coaches

09



16 to 25 minutes
Short injury prevention bouts twice a week

U8 to U11 talk
Five phases, three points, ten minutes

U14 sprint block
Jumps first, then sprint or change direction

16 Nov to 22 Nov 2026

Cover story Coaching · Aprende Entrenando

Rules that free the play

Conditioned games and free play in every youth session

7 languages · read online · free PDF
hobbit.football/news

Price
Free

HW 2026 · 09

COVER STORY

01 **Training tasks in youth soccer: balancing control and free play to develop intelligent players** 04
Aprende Entrenando

THIS WEEK

02 **Comparative Effects of Different Neuromuscular Training Modalities and Doses on Lower-Limb Injury Prevention in Athletes: A Systematic Review and Meta-analysis** 08
Sports Medicine - Open

03 **The preseason talk in youth soccer: rules and standards from day one** 21
Aprende Entrenando

04 **Effects of Combined Sprint and Plyometric Training vs Plyometric Training only on Physical Fitness and Sport-Specific Performance in Male Pubertal Soccer Players** 24
Sports Medicine - Open

05 **Ged Roddy: Why England needs its own version of Germany's Stützpunkte** 42
Training Ground Guru

ON THE PITCH

06 **Beyond Performance: Four Takeaways from 2026 TrueSport Talks** 46
TrueSport

VIEWS AND THE GAME

07 **10 ideas from Portland to make youth sports more inclusive** 49
Aspen Institute Project Play

08 **Is Your Program Welcoming New-to-Canada Participants? Seven Workbooks to Find Out** 57
Sport for Life

Every piece appears in full, translated by AI where the original is in another language. Copyright stays with each author and original publisher; every piece links to its original.

Keep the ball, cut the shuttle runs

A line of players waits for a turn in a drill while the ball sits still beside the cone. A coach with a stopwatch counts the reps. It looks organised. It also looks like the players are not playing football.

Across this issue, we keep seeing the same pull: more time with the ball, less time standing around. One session plan gives 50 percent to conditioned games and 35 percent to free or real match play, with 70 percent free play for the youngest. An 8-week study replaces generic fitness with sprints and jumps inside regular sessions and sees gains in balance, power and 10m sprint. Injury work points to short structured blocks of 16 to 25 minutes, two to three times a week.

> **Kids also need a coach who knows their names and their limits.**

So before your next session, count the minutes each player actually touches the ball, and ask yourself what you would cut to give them more. If your club had a free weekly base for its best U12 to U15 players, would that change how you plan? It is worth asking.

What one drill could you swap for a small-sided game at your next session?

The Hobbit editors

8 stories

6 sources

8 languages



FOR COACHES

If your sessions swing between rigid drills and chaos, the practice examples in this piece (rondo with an escape zone, scoring rules that reward pressing) give you a way to steer behaviour through rules rather than shouts.

COVER STORY · Coaching · Aprende Entrenando

01 Training tasks in youth soccer: balancing control and free play to develop intelligent players

You prepare the session for hours, you arrive at the field with a notebook full of diagrams and, five minutes in, the exercise falls apart. A bad pass, a player out of position and you feel the immediate temptation to freeze the drill to correct it. It has happened to all of us. We want to control every second of the session so that everything turns out perfectly. However, obsessing over rigid discipline stifles the child's initiative. Designing training tasks in youth soccer by combining control and free play is not about choosing between absolute chaos and tactical dictatorship. The goal is to use structural limits so that decision-making flows freely.

The trap of micro-control from the bench

Many coaches confuse directing with constantly intervening. Every time you stop a rondo because the body positioning has not been perfect or you shout where a benjamín should pass the ball, you are taking control of the game away from him.

The problem with micro-control has two sides:

- You create dependent players: Players who look to the bench before deciding what to do with the ball. They become executors of orders, not thinkers of the game.
- You exhaust yourself emotionally: It is impossible to correct the thousand variables that occur in a match in real time. Trying to do so frustrates you and paralyses your team.

Mistakes are the most powerful teaching tool that exists in formative soccer. If you eliminate the margin for error so that the drill looks good on video, you eliminate real learning.

Provocation rules: Guiding without interrupting

The alternative to constantly shouting is the use of provocation rules. It consists of manipulating the environment of the task so that the behaviour you want to work on appears, without the need to give verbal orders.

Instead of saying "play quickly with two touches", you design a reduced space where the opponent's pressure physically forces you to play quickly. The environment conditions the response.

We can apply three types of limits to modulate control and free play in our youth soccer training tasks:

1. Spatial restrictions

Reduce or widen the field according to your objective. A narrow space encourages orientated control, facing-up play and decision-making under pressure. A wide field favours switching play and one-on-one duels on the wing.

2. Time or numerical restrictions

Give double value to goals scored in the first six seconds after recovery. Create numerical advantages (3v2, 4v3) so that the free player identifies the space naturally.

3. Conditional scoring rules

If you want to work on pressing after losing the ball, award an extra point to the team that steals the ball in the opponent's half and finishes the move in fewer than three passes. You don't need to shout "press!". The rule itself pushes the team forward.

Session structure: From rules to freedom

To achieve a coherent training block, we must move from phases with greater control towards moments of totally free play. The coach's intervention should not be eliminated; we simply need to ration it.

An effective structure for any age group comprises three blocks:

1. Structured activation phase (15% of the time): Analytical or light whole tasks focused on individual technique (control, passing, body positioning) in delimited spaces. Lots of repetition, low cognitive load.
2. Conditioned central phase (50% of the time): Positional games, keep-ball or attack-defence situations with very clear provocation rules. Here you manage control of the tactical objective.

3. Final phase of real or free play (35% of the time): Small-sided game or normal match. We remove the artificial rules. The players apply what has been worked on under their own decisions.

Methodological adaptation by age group

The balance between control and initiative varies according to the player's stage of development. You will make a serious mistake if you apply the same rigidity to benjamines as to juveniles.

Benjamines (8-9 years old)

70% of the time should be free play or very lightly conditioned. The absolute focus is the individual relationship with the ball and fun. Simple restrictions: small fields, many goals and constant duels.

Alevines (10-11 years old)

Introduction of simple provocation rules. They begin to understand numerical advantages and space. A 50% balance between tasks with tactical instructions and moments of totally free play.

Infantiles and Cadetes (12-15 years old)

The ideal stage to introduce control of complex tactical principles (cover, offensive vigilance, third man). Conditioned tasks gain weight, but the free play phase remains non-negotiable to assess whether they are absorbing what has been worked on.

Youth (16-18 years)

Advanced game understanding. Control is applied through opponent constraints or real match situations (losing scoreline, numerical disadvantage). The player must solve tactical problems on the field independently.

3 practical tasks for your next session

Here are three ready-to-use proposals to take to the training field, adaptable to different stages.

Task 1: Possession rondo with escape zone (U10 and U12)

Space: 15x15 meter square divided into two halves. Players: 4v2 inside one half + 2 neutral players outside. Provocation rule (Control): To be able to switch the ball to the other half, the attacking team must connect at least three consecutive passes within the reduced space. Effect on free play: Players learn to trap the opponent in one sector to switch the direction of play when they see the free space, without you having to tell them.

Task 2: Sectorized possession with quick transition (U12 and U14)

Space: Reduced pitch divided into three zones (initiation, creation, finishing). Players: 6v6 + 2 goalkeepers. Provocation rule: You can only pass to the next zone by dribbling or through a through ball. If the ball is won in the creation zone, there are 8 seconds to finish. Effect on free play: It rewards verticality and the detection of open passing lines in the build-up phase.

Task 3: Closing match with free lanes (U14 and U16)

Space: Regulation 11-a-side football pitch. Players: Real match (11v11). Provocation rule: The side lanes are marked out. If the ball enters the side lane, no defender can press the possessor during the first two seconds. Effect on free play: It encourages wingers and full-backs to cross or take on their marker with confidence, generating goalscoring situations frequently.

Coaching guidelines: When to speak and when to stay quiet

The way you communicate during the session determines whether the task becomes a monologue or a real learning environment.

- Apply the 10-second rule: Let the task run for at least 10 seconds after a mistake before deciding whether you should stop it. Most of the time, the players themselves correct their positioning on the next play.
- Ask questions, don't give solutions: Instead of shouting "pass it to the left!", use a pause to ask "where was the free space when they closed you down?". The answer must come from the player.
- Praise the intention, not just the result: If a U14 player spots a brilliant through ball but the ball runs two meters too long, reward the vision. If you punish the technical failure, they will stop taking risks.

Knowing how to combine firmness in the exercise structure with flexibility in execution is the main skill that separates an ordinary coach from a youth football developer. Design the scenario well, set fair rules and let the game be the true teacher of your team.

Source: Aprende Entrenando · Translated from Spanish aprendeentrenando.com

THIS WEEK

02 Research

Comparative Effects of Different Neuromuscular Training Modalities and Doses on Lower-Limb Injury Prevention in Athletes: A Systematic Review and Meta-analysis

For coaches If you run injury prevention work, the study's most useful signal is that short bouts of 16 to 25 minutes, two or three times a week, were the ones with favourable estimates, though it does not prove a best dose.

Abstract

Background. Lower-limb injuries are common in athletes. Neuromuscular training (NMT) is widely promoted, but the comparative effectiveness of different modalities and the optimal dose remain uncertain.

Methods. We conducted a PRISMA-compliant, PROSPERO-registered systematic review and meta-analysis of randomised controlled trials. PubMed, Web of Science, Scopus, Cochrane Library and Embase were searched to 1 August 2025. Eligible trials compared NMT with a control in athletes and reported lower-limb injury outcomes. Random-effects models pooled risk ratios (RRs) with 95% confidence intervals (CIs). Two reviewers screened, extracted and assessed risk of bias. Prespecified subgroups examined modality and dose (frequency, session duration, intervention length), age, sex and sport. Certainty was rated with GRADE.

Results. Twenty-seven RCTs (27,663 participants) were included. NMT was associated with reduced lower-limb injury risk (RR = 0.72, 95% CI 0.64 to 0.82), although trim-and-fill adjustment attenuated the estimate. Structured (RR = 0.68, 95% CI 0.56 to 0.82) and multidimensional programmes (RR = 0.76, 95% CI 0.61 to 0.93) showed favourable pooled estimates, with no statistically significant between-modality difference. Favourable pooled estimates were also observed in adolescents (RR = 0.67, 95% CI 0.55 to 0.81) and young adults (RR = 0.70, 95% CI 0.50 to 0.99), and in football (RR = 0.71) and basketball (RR = 0.66); however, the between-age difference did not remain statistically significant after Benjamini to Hochberg false discovery rate correction, and no statistically significant differences were detected between sport subgroups. Low-certainty, study-level subgroup analyses yielded favourable pooled estimates for programmes delivered 2 to 3 times per week, for 16 to 25 min per session, and over intervention periods of 1.5 to 12 months; however, these associations did not establish a causal or optimal dose. Certainty was very low overall and low to very low across dosage comparisons.

Conclusions. NMT may reduce lower-limb injury risk, but the magnitude of benefit remains very uncertain. Structured and multidimensional programmes, together with programmes delivered at moderate frequency and duration, showed favourable pooled estimates in exploratory subgroup analyses; however, the dose-related findings represent study-level associations and should not be interpreted as evidence of a causal or optimal dose. These findings may inform the design of routine training programmes, while future high-quality RCTs should address adherence, long-term sustainability, and dose to response interactions across sports and populations.

Introduction

Lower-limb injuries are among the most prevalent health issues in both competitive and recreational sports, accounting for 55 to 70% of all sports-related injuries [1, 2]. These injuries not only impair athletic performance and result in prolonged absences from training, they are also closely associated with recurrent injuries and early-onset osteoarthritis, along with other long-term health consequences. As a result, they impose a significant personal and societal economic burden [3 to 5]. Therefore, the effective prevention of lower-limb injuries through evidence-based methods remains a crucial topic in both sports medicine and sports science.

Among various prevention strategies, neuromuscular training (NMT) has been widely adopted across different populations and sports due to its ability to simultaneously improve strength, balance, proprioception, and motor control. Since the 2000 s, well-established programmes such as FIFA 11+, Prevent Injury and Enhance Performance (PEP), and HarmoKnee have been introduced and have become representative approaches to injury prevention [6 to 8]. Numerous randomised controlled trials (RCTs) have demonstrated that NMT significantly reduces the overall risk of lower-limb injuries [9 to 11]. However, its effectiveness remains influenced by factors, such as population characteristics, training dosage, adherence, and intervention models, while the consistency and interpretability of the evidence remain subjects of ongoing debate [12 to 15].

Previous systematic reviews and meta-analyses generally supported the potential preventive effects of NMT, though the robustness and generalisability of these findings were limited [12 to 23]. FIFA 11+ significantly reduced the risk of knee injuries (injury risk ratio ≈ 0.48), although the applicability of this finding was limited by the small number of cluster RCTs included [18]. The pooled effect estimate was risk ratio (RR) = 0.71, but the prediction interval crossed the null line, indicating uncertainty in the effect across settings [13]. Training frequency and duration may exhibit a dose to response relationship; however, inconsistent definitions and limited subgroup sample sizes reduce confidence in this conclusion [14]. High-frequency (4 to 5 times per week) and long-term (> 26 weeks) interventions were associated with an approximately 25% reduction in knee injury risk (RR = 0.75), but this proposed “optimal configuration” did not account for practical adherence, limiting its applicability [15].

Comparisons between different intervention models also lack a systematic framework. Integrated training has shown potential for both performance enhancement and injury prevention, but rigorous meta-analytic comparisons between different types of NMT were not performed [20]. NMT significantly reduced the risk of ACL injuries (RR = 0.36), but the evidence was limited to a single injury type and did not identify the most effective training model [21].

Furthermore, some previous studies had methodological limitations related to study inclusion and quality control, which further compromised the credibility of the evidence. For example, one previous review included 25 studies, but only eight were RCTs, with the remainder comprising non-randomised or quasi-randomised designs, which compromised internal validity [22]. A recent review reported a 27% reduction in lower-limb injury risk based on 24 studies involving approximately 22,950 participants; however, although the eligibility criteria specified RCTs, the review appears to have included non-randomised studies, raising concerns about consistency in study selection and reducing confidence in the conclusions [23].

While current evidence suggests that NMT can help prevent sports-related lower-limb injuries, several challenges persist: there is a lack of a consistent operational classification of NMT modalities based on programme structure and training content, which limits comparisons between programmes; insufficient stratification of dose-related parameters, making it challenging to explain variations in effectiveness; limited exploration of interaction effects, such as the interaction between intervention modality and duration, in the context of high heterogeneity; and methodological limitations in some previous studies that affect the interpretability and external validity of the evidence. Therefore, while these conclusions have academic value, they offer limited practical guidance for coaches, rehabilitation specialists, and athletes. This study aimed to address these methodological gaps and, through modality classification and dose-stratified analysis, to provide more practical and interpretable evidence to inform programme design.

Based on these gaps, this study undertook the following innovative work under a unified evidence framework: first, applying an operational classification of NMT modalities to compare structured, multidimensional, and sport-specific programmes; second, conducting systematic dose-stratified analyses focusing on training frequency, session duration, and intervention period; third, exploring the sources of effect differences through the interaction between intervention modality and duration in the context of high heterogeneity; and fourth, enhancing methodological transparency and evidence translation value through sensitivity analysis and Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) assessment. Through these efforts, this study aimed to provide more interpretable evidence to inform the design and implementation of programmes for the prevention of sports-related lower-limb injuries.

Methods

Methodology

The review protocol was registered with PROSPERO under registration number CRD420251140979, and the review was conducted in accordance with the PRISMA guidelines [24]. A systematic search was conducted in the following five electronic databases: PubMed, Web of Science, Scopus, the Cochrane Library, and Embase, from database inception to 1 August 2025. Only peer-reviewed articles published in English were considered eligible. The search strategy was structured according to the Population, Intervention, Comparison, Outcomes, Study design (PICOS) framework, and key terms related to NMT and sports injury prevention in athletes (both male and female) were combined using Boolean operators (AND/OR). A detailed search strategy is provided in Additional file 1: Table S1. In addition to database searching, reference lists of relevant articles were manually screened to identify additional eligible studies. Records were imported into EndNote (version 21, Clarivate, Philadelphia, PA, USA), and duplicate records were removed.

Inclusion and Exclusion Criteria

Inclusion Criteria

The studies included in this meta-analysis adhered to the PICOS framework: (1) population: competitive athletes of all age groups, including youth, collegiate, professional, and recreational veteran players. Both male and female athletes were eligible to participate. (2) Intervention: NMT was designed to enhance balance, agility, strength, jump-landing mechanics, or neuromuscular control, including standardised protocols, such as FIFA 11+, PEP, and Knee Injury Prevention Programme (KIPP). Eligible studies were required to provide sufficient information to characterise the NMT intervention and assign it to a training-modality category. (3) Comparator: control groups that received no intervention, standard warm-up routines, or non-NMT protocols, such as general fitness programmes or static stretching routines. (4) Outcome: the primary outcome was the incidence of lower-limb injuries, defined as any injury to the foot, ankle, lower leg, knee, thigh, groin, or hip sustained during training or match play. Eligible studies were required to report sufficient lower-limb injury data to calculate RRs between the intervention and control groups. (5) Study design: RCTs, including cluster RCTs, published in peer-reviewed journals.

Exclusion Criteria

Studies were excluded from this meta-analysis if they were (1) non-RCTs, observational studies, or case reports; (2) duplicate publications or review articles; (3) involving animals or participants with pre-existing diseases; (4) non-English publications or with inaccessible full texts; (5) lacking data on injury incidence or reporting outcomes unrelated to injury prevention; and (6) studies in which protective equipment constituted the primary injury-prevention intervention. Exercise-training aids used as components of NMT, such as balance boards, were permitted.

Study Selection and Data Extraction

Two reviewers (GJ and HZ) independently screened titles and abstracts against the eligibility criteria. The full texts of potentially eligible reports were subsequently retrieved and independently assessed by the same reviewers. Two reviewers (GJ and HZ) independently extracted data from the included studies using an author-developed Microsoft Excel data-extraction form (Microsoft Corporation, USA). The extracted data included study characteristics, participant demographics, intervention details, and injury outcomes. Disagreements during study selection or data extraction were resolved through discussion or consultation with a third reviewer (ZR).

Risk-of-Bias Assessment

Risk of bias was assessed for each trial result using the Cochrane RoB 2 tool [25]. Cluster-randomised trials were assessed using the RoB 2 extension for cluster-randomised trials, including the additional domain concerning bias arising from the identification or recruitment of individual participants within clusters (Domain 1b) [25]. Individually randomised trials were assessed using the standard RoB 2 tool. The target effect was the effect of assignment to intervention, and the outcome assessed was lower-limb injury incidence at the principal follow-up. Trial protocols, registration records, statistical analysis plans, and supplementary materials were sought where available to inform judgements concerning selection of the reported result. Two reviewers (HZ and GJ) independently performed the assessments. Disagreements were resolved through discussion or consultation with a third reviewer (ZR).

Certainty of the Evidence

The certainty of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach and was classified as high, moderate, low, or very low level [26]. Evidence from randomised trials initially started at high certainty and could be downgraded for risk of bias, inconsistency, indirectness, imprecision, or publication bias. Certainty was assessed separately for the overall effect and for the prespecified dosage comparisons of training frequency, session duration, and intervention period.

Data Analysis

A meta-analysis was conducted using R 4.4.3 and RStudio to estimate pooled effect sizes. Injury data were treated as dichotomous outcomes, with RR and 95% confidence intervals (CIs) used to calculate overall effects. Heterogeneity was quantified using the *I*2 statistic. Random-effects models were used for the primary meta-analyses, because clinical and methodological heterogeneity was anticipated across the included studies. A 95% prediction interval for the overall meta-analysis was calculated from the pooled effect estimate and between-study variance.

Subgroup analyses were conducted to explore the influence of intervention characteristics (session duration, session frequency, and intervention period) and participant factors (age group, sex, and sport type). For subgroup analyses, interventions were classified according to programme structure and training content as structured NMT (predefined programmes with a standardised exercise sequence), multidimensional NMT (programmes combining multiple neuromuscular components), or sport-specific NMT (programmes designed for a particular sport and/or focused on a limited set of sport-relevant neuromuscular components). For each dose-specific subgroup analysis, studies were included only when the relevant variable, training frequency, session duration, or intervention period, was reported or could be derived from the available information. Studies with missing, unclear, or non-classifiable values were excluded only from the corresponding dose-specific subgroup analysis. Stratified analyses further compared intervention modalities (structured, multidimensional, and sport-specific programmes). Additional subgroup analyses were conducted specifically for structured NMT interventions across participant and dosage characteristics. Finally, effect modification by intervention duration was assessed using random-effects meta-regression based on study-level log RRs and corresponding standard errors, with NMT modality, intervention duration, and their interaction term included as moderators. Between-study variance was estimated using restricted maximum likelihood (REML), and the overall modality × duration interaction was evaluated using an omnibus test of the interaction coefficients. To account for multiplicity, *p* values for the formal subgroup-difference and moderator tests were adjusted using the Benjamini to Hochberg false discovery rate (BH-FDR) procedure. Because training frequency, session duration, and intervention duration were study-level characteristics rather than randomised dose contrasts, dose-related subgroup analyses were interpreted as between-study associations rather than evidence of causal dose effects. All subgroup and interaction analyses were considered exploratory.

Leave-one-out sensitivity analyses were conducted by sequentially excluding each individual study to assess whether the pooled effect was influenced by any single study. As an additional model-specification sensitivity analysis, the overall pooled estimate was recalculated using a fixed-effect model and compared with the primary random-effects estimate. Publication bias was evaluated visually using funnel plots and statistically using Egger's regression and Begg's rank correlation tests (when 10 or more studies were available). The trim-and-fill method was used to adjust for potential missing studies and to recalculate the overall effect.

Results

Literature Search Results

A total of 1607 records were retrieved through database searches. After removing duplicates and screening titles and abstracts, 92 reports were sought for retrieval. Eight reports could not be retrieved, and 84 were assessed for eligibility. Following full-text review, 60 reports were excluded because of different outcome measures (*n* = 21), ineligible study type (*n* = 21), duplicate or secondary reports (*n* = 3), ineligible populations (*n* = 12), or ineligible interventions (*n* = 3), leaving 24 eligible studies. An additional nine reports were identified through other sources; three could not be retrieved, and three of the six reports assessed for eligibility were excluded because of ineligible study type (*n* = 2) or insufficient data (*n* = 1). Consequently, a total of 27 RCTs were included in the systematic review and meta-analysis [6, 9 to 11, 27 to 49], as shown in Fig. 1.

Characteristics of Included Studies

Additional file 4: Table S2 summarises the characteristics of the 27 included trials (randomised or cluster-randomised) [6, 9 to 11, 27 to 49]. Most studies employed a cluster-randomised design, while a smaller number used individual randomisation. Participants ranged from children (7 years) to veteran athletes over 30 years, with both sexes represented. The majority of trials were conducted in football, with additional studies in basketball, volleyball, handball, futsal (a five-a-side form of indoor football), Australian Rules football, and endurance running.

Intervention durations varied between 7 and 43 weeks, with sessions delivered at frequencies of one to six sessions per week, and session lengths typically ranging from 10 to 25 min. Many trials investigated established warm-up programmes, including FIFA 11, FIFA 11+, FIFA 11+ Kids, PEP, and bounding exercise programme (BEP), whereas others evaluated jump-landing, balance, proprioceptive, strength, or other multicomponent NMT approaches. Sample sizes varied substantially across trials. Outcomes predominantly focused on lower-limb injuries, with specific attention given to knee, hamstring, and patellar injuries in selected trials. Control groups generally continued their usual warm-up or training practices, as presented in Additional file 4: Table S2.

Risk-of-Bias Assessment

Of the 27 included trials, 25 cluster-randomised trials were assessed using the Cluster RoB 2 extension, and two individually randomised trials were assessed using the standard RoB 2 tool. No trial was judged to be at low risk of bias overall; 26 trials were rated as having some concerns and one trial was rated as having a high risk of bias. Concerns frequently arose in relation to the identification or recruitment of participants within clusters (Domain 1b), measurement of injury outcomes (Domain 4), and selection of the reported result (Domain 5). Protocol, registration, analysis plan, or other sufficiently prespecified information was identified for nine trials, whereas such information was not identified in the materials available to the review team for 18 trials. The study-level assessments are presented in Additional file 6: Table S4 and Fig. 2.

Evaluation of Meta-analysis Results

Overall Effect Test

This meta-analysis included 27 RCTs with a total of 27,663 participants. The overall analysis of all NMT interventions demonstrated a significant reduction in the risk of lower-limb injuries, with a pooled RR of 0.72 (95% CI 0.64 to 0.82; $Z = 5.23$, $p < 0.00001$). Subgroup analyses indicated consistent protective effects in studies reporting isolated lower-limb injuries (RR = 0.75, 95% CI 0.66 to 0.85) and in those reporting mixed injuries predominantly involving the knee, ankle, or hamstrings RR = 0.61, 95% CI 0.43 to 0.86). Considerable heterogeneity was observed (*I*2 = 74%). The 95% prediction interval ranged from 0.40 to 1.30, suggesting that the true effect in a future comparable study may range from a beneficial effect to little or no effect, reflecting uncertainty across settings. A summary of the individual study RRs and the pooled effect estimate is provided in Fig. 3.

Subgroup Analysis Results

To explore potential sources of heterogeneity, subgroup analyses were conducted by intervention type, sex, age group, sport, and characteristics of intervention dosage. The main results are presented in Fig. 4 (type, sex, age, and sport) and Fig. 5 (dosage characteristics). Conclusions regarding differences between subgroups were based on formal between-subgroup tests rather than comparisons of statistical significance within individual subgroups.

By intervention type, NMT significantly reduced injury risk with multidimensional programmes (RR = 0.76, 95% CI 0.61 to 0.93) and structured programmes (RR = 0.68, 95% CI 0.56 to 0.82), while sport-specific programmes showed no significant effect. No significant subgroup differences were detected across intervention types.

By sex, injury risk was significantly reduced in both male (RR = 0.65, 95% CI 0.51 to 0.83) and female athletes (RR = 0.75, 95% CI 0.61 to 0.91), with no statistically significant between-sex subgroup difference.

By age group, significant effects were observed in adolescents (RR = 0.67, 95% CI 0.55 to 0.81) and young adults (RR = 0.70, 95% CI 0.50 to 0.99), whereas no significant effect was observed in children (RR = 0.64, 95% CI 0.37 to 1.12) or adults >32 years (RR = 1.10, 95% CI 0.81 to 1.50). The between-age subgroup difference was statistically significant before multiplicity correction ($p = 0.047$), but it did not remain statistically significant after BH-FDR correction.

By sport, significant reductions in injury risk were observed in football (RR = 0.71, 95% CI 0.60 to 0.84) and basketball (RR = 0.66, 95% CI 0.46 to 0.94), whereas no significant effect was observed in other sports (RR = 0.76, 95% CI 0.52 to 1.10) or mixed sports (RR = 0.78, 95% CI 0.51 to 1.18). No statistically significant subgroup differences were detected across sport types.

By training frequency, significant effects were observed for 2 to 3 sessions per week (RR = 0.71, 95% CI 0.61 to 0.82) and mixed frequencies (RR = 0.61, 95% CI 0.52 to 0.71), whereas one session per week and 4 to 5 sessions per week did not show significant effects. Subgroup comparisons indicated significant differences ($p < 0.00001$), and the between-subgroup difference remained statistically significant after BH-FDR correction.

By intervention duration, programmes lasting 1.5 to 6 months (RR = 0.73, 95% CI 0.62 to 0.88) and 7 to 12 months (RR = 0.71, 95% CI 0.60 to 0.84) significantly reduced the risk of injury. No significant difference was observed between intervention-duration subgroups, and this conclusion was unchanged after BH-FDR correction.

Two studies with unclear or phase-dependent session durations were excluded from this analysis. Significant effects were found for 1 to 15-min sessions (RR = 0.88, 95% CI 0.78 to 0.98) and 16 to 25-min sessions (RR = 0.66, 95% CI 0.56 to 0.79); however, 26 to 30-min sessions did not reach statistical significance. Subgroup differences were significant ($p = 0.03$), but this difference did not remain statistically significant after BH-FDR correction.

Subgroup Analysis of Structured NMT

Structured NMT interventions demonstrated a significant protective effect in the overall analysis; however, substantial heterogeneity was observed (*I*2 = 80%). To further explore potential sources of variability, additional subgroup analyses were conducted by age, intervention duration, session duration, and training frequency. The results are shown in Fig. 6.

By age, significant reductions were observed in school-aged children (RR = 0.50, 95% CI 0.36 to 0.69), adolescents (RR = 0.67, 95% CI 0.49 to 0.90), and young adults (RR = 0.69, 95% CI 0.49 to 0.97), whereas no significant effect was found in adults > 32 years (RR = 1.17, 95% CI 0.78 to 1.74). Subgroup differences were significant ($p = 0.01$), but this difference did not remain statistically significant after BH-FDR correction.

By intervention duration, the pooled estimates were RR = 0.64 (95% CI 0.41 to 1.00) for programmes lasting 1.5 to 6 months and RR = 0.71 (95% CI 0.59 to 0.86) for programmes lasting 7 to 12 months. No significant difference was observed between intervention-duration subgroups, and this conclusion was unchanged after BH-FDR correction.

By session duration, interventions with 20-min sessions showed significant effects (RR = 0.59, 95% CI 0.47 to 0.74), whereas other durations did not. Subgroup comparisons indicated significant differences ($p = 0.02$), but this difference did not remain statistically significant after BH-FDR correction.

By training frequency, significant effects were observed for 2 to 3 sessions per week (RR = 0.54, 95% CI 0.40 to 0.72) and >3 sessions per week (RR = 0.73, 95% CI 0.58 to 0.90), whereas one session per week did not show asignificant effect (RR = 1.03, 95% CI: 0.89 to 1.19). Subgroup comparisons were significant ($p < 0.0001$), and this differenceremained statistically significant after BH-FDR correction.

Interaction Between NMT Modality and Duration

The formal random-effects meta-regression showed no statistically significant interaction between NMT modality and intervention duration (QM = 1.07, df = 2, $p = 0.587$). Stratified pooled estimates are presented in Additional file 1: Figure B1. For interventions lasting 1.5 to 6 months, the pooled estimates were RR = 0.83 (95% CI 0.697 to 0.996) for multidimensional NMT, RR = 0.64 (95% CI 0.41 to 1.00) for structured NMT, and RR = 0.84 (95% CI 0.69 to 1.02) for sport-specific NMT. For interventions lasting 7 to 12 months, the corresponding estimates were RR = 0.37 (95% CI 0.08 to 1.73), RR = 0.71 (95% CI 0.59 to 0.86), and RR = 0.79 (95% CI 0.48 to 1.31), respectively. These stratified estimates should be interpreted descriptively, because the formal modality × duration interaction was not statistically significant.

Sensitivity Analysis of Pooled Effect

Leave-one-out sensitivity analyses were performed by sequentially excluding each individual study. The pooled RRs ranged from 0.71 (95% CI 0.62 to 0.80) to 0.75 (95% CI 0.67 to 0.84), and all estimates remained statistically significant and directionally consistent, suggesting that the overall finding was not materially altered by the removal of any single study. In an additional model-specification sensitivity analysis, the fixed-effect model yielded a directionally consistent and statistically significant estimate (RR = 0.79, 95% CI 0.75 to 0.83; $p < 0.00001$), compared with the primary random-effects estimate (RR = 0.72, 95% CI 0.64 to 0.82; $p < 0.00001$). Given the substantial heterogeneity (*I*2 = 74%), the random-effects model was retained as the primary analysis.

Assessment of Publication Bias

Funnel plot inspection suggested a certain degree of asymmetry, indicating potential publication bias. Egger's regression test indicated significant asymmetry (t = −3.38, $p = 0.0024$), whereas Begg's rank correlation test was not statistically significant (z = −1.77, $p = 0.076$). Using the trim-and-fill method, six potentially missing studies were imputed on the right side of the funnel plot. After adjustment, the pooled effect estimate shifted from an RR of 0.72 (95% CI 0.64 to 0.82) to an RR of 0.80 (95% CI 0.71 to 0.91), indicating attenuation in the estimated magnitude of benefit despite remaining statistically significant (Additional file 2: Figure B2).

Certainty of the Evidence

The certainty of evidence for the overall effect of NMT on lower-limb injury incidence was rated as very low. The evidence was downgraded one level for risk of bias, because all contributing trials had at least some concerns, including one trial judged to be at high risk, one level for substantial inconsistency (*I*2 = 74%), and one level for suspected publication bias. The publication-bias downgrade was supported by funnel-plot asymmetry, a significant Egger's regression test ($p = 0.0024$), and attenuation of the pooled estimate after trim-and-fill adjustment, despite the adjusted estimate remaining statistically significant. Funnel-plot asymmetry may also arise from causes other than publication bias.

For training frequency, the certainty of evidence was low for one session per week, 2 to 3 sessions per week, and mixed-frequency programmes, and very low for 4 to 5 sessions per week. Certainty was low for interventions lasting 1.5 to 6 months and 7 to 12 months. For session duration, certainty was low for 1 to 15-min and 16 to 25-min sessions and very low for 26 to 30-min sessions. Detailed GRADE assessments are presented in Additional file 5: Table S3.

Discussion

Major Findings

The core significance of this study lies in comparing different training modes and dosages and providing evidence that may inform practice. The added value of this study lies in three aspects: first, the application of an operational classification of NMT modalities (structured, multidimensional, and sport-specific) to support subgroup comparisons; second, the implementation of dose-stratified analyses, including analyses within structured NMT; and third, the formal evaluation of the interaction between intervention modality and duration. These subgroup and interaction findings were exploratory and should be interpreted cautiously.

Comparison with Previous Studies

Previous reviews and meta-analyses have supported the preventive effects of NMT, particularly FIFA 11+ in football [16 to 18, 50]. An umbrella review similarly supported the effectiveness of multicomponent lower-extremity injury-prevention programmes in team-sport athletes, indicating that the more important remaining questions concern programme composition, modality, and dosage [51]. Previous dose-focused meta-analyses reported differing patterns, including a possible dose to response relationship in youth athletes and potential benefits of higher-frequency or longer interventions for knee injury prevention [14, 15]. In contrast, the present subgroup analyses did not establish a monotonic dose to response relationship or an optimal dose. Earlier reviews also did not directly compare the three modality categories used in this study [20, 21]; although structured and multidimensional programmes had significant pooled estimates, no statistically significant differences were detected between modalities. These findings complement previous work but should be interpreted as exploratory. Differences between previous findings and the present analysis may partly reflect differences in eligible populations, outcome definitions, intervention classification, and inclusion of non-randomised evidence.

Sources of Heterogeneity

Age-related variation has been proposed as a potential source of heterogeneity in previous research. Previous studies have reported favourable effects in adolescent and young adult populations, whereas findings in children and individuals over 32 years of age were less consistent [13, 34, 52]. However, after correction for multiple subgroup comparisons, the between-age difference did not remain statistically significant, and age was, therefore, not established as a definitive source of heterogeneity. Effect estimates also varied across training-frequency subgroups [44, 46] and session-duration subgroups. After multiplicity correction, only the training-frequency subgroup difference remained statistically significant, whereas the session-duration difference did not. The formal interaction between intervention modality and duration was not statistically significant. Overall, age and dosage characteristics may contribute to heterogeneity, although the specific sources could not be determined from the current analyses.

Based on the updated GRADE assessment, the certainty of evidence for the overall effect was very low because of risk of bias, serious inconsistency, and suspected publication bias. Therefore, the findings, particularly those from dosage subgroup analyses, should be interpreted cautiously. This suggests that higher-quality trials are needed to enhance the certainty of the evidence.

Clinical and Practical Implications

The findings of this study may inform sports medicine and coaching practice. First, structured or multidimensional NMT may be considered as part of regular warm-up routines, such as during pre-competition warm-ups or sport-specific training sessions, when feasible. Second, favourable pooled estimates were observed in adolescent and young adult athletes, although between-age differences did not remain statistically significant after multiplicity correction. In the overall dose subgroup analyses, programmes delivered 2 to 3 times per week, for 16 to 25 min per session, and over intervention periods of 1.5 to 6 or 7 to 12 months showed favourable pooled estimates. These ranges should be interpreted as exploratory study-level associations rather than evidence of a causal or optimal dose, because the comparisons may be confounded by programme type, population, sport, adherence, and other trial-level characteristics. Third, favourable pooled estimates were observed in football and basketball, although no statistically significant differences were detected between sport subgroups; evidence for other sports remains limited. Finally, at the public health and policy levels, NMT may inform injury-prevention programmes in schools and sports clubs, with an emphasis on training coaches and medical personnel in programme delivery and adherence monitoring. These practical considerations should be interpreted cautiously, because the certainty was very low for the overall effect and ranged from low to very low across the dosage comparisons; they should not be regarded as definitive recommendations.

Limitations

This study has several limitations. First, considerable heterogeneity existed across studies, and its specific sources could not be determined. Second, funnel-plot asymmetry and Egger's regression suggested possible publication bias, which may have affected the estimated magnitude of benefit. Third, the sample sizes in some subgroups (such as older athletes and non-mainstream sports) were small, and effect estimates should be interpreted with caution. Although multiplicity was addressed using BH-FDR correction, the subgroup analyses remained exploratory, and several categories contained relatively few studies. In addition, training frequency, session duration, and intervention duration were study-level characteristics rather than randomised dose contrasts; therefore, causal dose to response inferences cannot be made. Moreover, most of the studies included in this analysis had intervention and follow-up periods of less than 1 year, which limited our understanding of the long-term protective effects and sustainability. Evidence concerning high-frequency and longer-duration interventions was limited and uncertain, particularly because several subgroups contained few studies and had low or very low certainty ratings.

Conclusion

In summary, NMT was associated with reduced lower-limb injury risk in athletes (RR = 0.72, 95% CI 0.64 to 0.82), but the very-low-certainty evidence limits confidence in the magnitude of benefit. Structured and multidimensional programmes showed favourable pooled estimates, while exploratory study-level dose subgroup analyses showed favourable estimates for programmes delivered 2 to 3 times per week, for 16 to 25 min per session, and over intervention periods of 1.5 to 12 months; however, these associations do not establish a causal or optimal dose, and neither between-modality differences nor the modality × duration interaction were statistically significant. Future trials should improve methodological quality and examine adherence, long-term sustainability, dose to response relationships, and modality-by-duration interactions across sports and populations.

Gu et al., Sports Medicine - Open, 2026, doi:10.1186/s40798-026-01142-6. Published under CC BY 4.0: https://creativecommons.org/licenses/by/4.0/.

Source: Sports Medicine - Open pubmed.ncbi.nlm.nih.gov

---

03 Coaching U8 to U18

The preseason talk in youth soccer: rules and standards from day one

> **For coaches** With your U8 to U11 group, keep the talk to 10 minutes or less and use short, visual language, and hold a separate short meeting to tell parents to cheer and not coach from the touchline.

The season begins and you make the typical mistake: either you launch into an unbearable 40-minute sermon full of abstract concepts, or you hand out a ball saying "let's have fun" and hope discipline falls from the sky. If you want to truly compete and build a committed group, you need to structure the pre-season talk well, setting rules and standards. It is the exact moment where you mark out the pitch, define the non-negotiable limits and prepare the team's head for what you are going to demand throughout the year. Setting clear limits from the first day does not push you away from your players; it gives them security, respect and a clear roadmap for working together.

Why the first meeting determines the next ten months

The first day you walk into the dressing room, the kids are sizing up your intentions. They don't just listen to what you say; they assess your tone, your posture and your conviction. If in that first contact you waver or hold back the limits so as "not to scare them", you will spend the rest of the year chasing avoidable bad habits.

A start-of-season meeting in youth soccer is not about instilling fear or delivering a masterful tactical lesson. Its main goal is to build the dressing-room culture. When a kid knows perfectly well which behaviours are applauded and which are offside, the training environment becomes predictable and professional.

Real discipline does not come from threatening them with the bench. It is born from the explicit commitment between the coaching staff and the squad before the first ball rolls.

The three non-negotiable pillars in your message

Forget the unbearable 25-point rulebooks printed on sheets nobody reads. In youth soccer age groups, too much information breeds indifference. Focus your opening message on three strategic blocks:

1. Punctuality and respect for the group's time

Arriving late is not an individual oversight; it is a lack of respect for your teammates' work. Define precisely what it means to be on time. It is not walking through the door on the dot with your boots in your hand. It is being changed, laced up and ready to step onto the grass five minutes early.

If the session starts at 18:00, the pitch talk begins at 18:00. If someone is late, it stops the collective dynamic. Make them understand that training time is sacred for their development.

2. Standards in attitude and attention

Talent varies from player to player, but attitude is not negotiable. Draw a clear distinction between technical error and lack of effort. A misplaced pass is part of learning; dropping your arms after losing the ball is an unacceptable choice.

Get across that intensity is trained. If you demand maximum effort on Saturday in the match, you must build the habit of giving that same level in every training session.

3. Independence, equipment and care for the space

In youth soccer we educate people through sport. The balls, the cones and the bibs are not collected by the coaches or the parents. The team collects them.

Set up rotating turns for collecting the equipment. The dressing room must be left as clean as you found it. This kind of small responsibility generates cohesion and group identity immediately.

Step-by-step structure for the pre-season talk

Apply this structure so that your meeting is fluid, clear and memorable for the kids:

- Phase 1: Welcome and excitement (2-3 minutes). Break the ice. Talk about the new stage that is beginning, the desire to work and the collective goal of improving day by day.
- Phase 2: Introducing the coaching staff (2 minutes). Explain what your role is and that of the rest of the coaching staff (assistant coach, fitness coach or goalkeeping coach). Make clear who they should go to depending on the issue.
- Phase 3: Rules and standards block (7-8 minutes). Set out the non-negotiable pillars firmly but without raising your voice. Use a whiteboard to fix four or five key concepts visually.
- Phase 4: Group participation (3-5 minutes). Ask them what they expect from the season and what commitment they are willing to take on. This turns imposed rules into mutual agreements.
- Phase 5: Energetic close (1-2 minutes). Finish with a powerful message that sums up the squad's mentality and leads straight into getting changed or going out onto the grass.

Adapting the speech to the age group

You cannot give the same speech to an 8-year-old as to a 17-year-old. The substance about rules and standards stays the same, but the form changes completely depending on the stage of development:

Benjamines and Alevines (8 to 11 years old)

Use short sentences and very visual language. Do not go on for more than 10 minutes or you will lose their attention completely. Focus on basic habits: listening when the coach is talking, looking after your kit, not talking while an exercise is being explained and respecting your teammates.

At these ages, it is advisable to hold a brief separate meeting with the families to explain the role of parents: to encourage, not to coach from the stands, and to foster the child's autonomy.

Infantiles and Cadetes (12 to 15 years old)

They enter a stage of physical and emotional changes. They demand consistency and explanations. Do not use "because I said so." Explain the reason behind each rule.

Introduce the concept of individual responsibility within the collective game. Begin to tighten up on the details of punctuality, rest and personal care.

Juveniles (16 to 18 years old)

Here the talk should move closer to demanding performance. Require tactical rigor, absolute punctuality and impeccable behavior. They are capable of self-managing the internal rules of the locker room through the figure of the captains.

Four serious mistakes that destroy the impact of your talk

During my years on the benches I have seen many coaches fall into these classic failures during the first week:

1. Turning the talk into a penal code: If you devote yourself to reciting an endless list of punishments and fines, the player will perceive the locker room as a prison, not as a team. Focus on the positive value of order.
2. Promising minutes or starting spots: Never guarantee a player that he will play x minutes or that he will be the undisputed starter. The preseason takes care of reordering the hierarchies, and breaking promises instantly costs you credibility.
3. Talking about complex tactical systems: The first talk is not for saturating with concepts of building out from the back with three or pressing after losing the ball. Save the dense tactical board for when the basic rules of coexistence are established.
4. Not leading by example with your actions: If you ask for punctuality and you arrive late to set up the training drills, you have lost command. Demanding standards start with the punctuality and preparation of the coaching staff.

How to manage compliance with the limits during the year

A great intervention on the first day is useless if the first time a player breaks a rule you look the other way because he is the boy with the most goals on the team. Consistency determines whether your initial message was real or mere grandstanding.

If the rule is that whoever does not give notice of his absence does not start, apply it no matter who it is. The group watches closely how you react to rule-breaking. When the team verifies that the rules are the same for everyone, the level of commitment multiplies and your authority is consolidated in a natural way.

Prepare your talk, keep your sentences short, look your players in the eye and lay the first stone of a great season from minute zero.

Source: Aprende Entrenando · Translated from Spanish aprendeentrenando.com

---

04 Research U13 to U14

Effects of Combined Sprint and Plyometric Training vs Plyometric Training only on Physical Fitness and Sport-Specific Performance in Male Pubertal Soccer Players

> **For coaches** If you run a 30-minute block for your U14s, the sprint or change-of-direction rep came straight after the jumps, so the order is worth copying rather than splitting the two.

Abstract

Background. Sprint (ST) and plyometric training (PT) are well-established methods for improving physical fitness and sport-specific performance in youth athletes. However, the effects of their combination remain unclear.

Aim. This study investigated the effects of an 8-week combined ST and PT program (SPT), PT-only program, and active control (CG) on physical fitness and sport-specific performance in young male soccer players.

Methods. Forty-six pubertal Tier 2 training and performance caliber, male soccer players (13.9 to 14.2 years; maturity offset = 0.18 to 0.78 years from peak height velocity) participated in the study. Training was conducted twice weekly (2 × 30 min) over 8 weeks and was integrated into regular soccer sessions. The SPT program consisted of a progressive sequence of plyometric exercises (countermovement, line, drop jumps, and single-leg jumps/push-offs), immediately followed by a prescribed 10 to 15-m sprint or change-of-direction (CoD) task. The PT group performed the same plyometric exercises and exercise order without the subsequent sprint or CoD component. Training loads were monitored using the OMNI 0 to 10 RPE scale. The CG continued their regular soccer-specific training. Assessments included dynamic balance, muscle strength (reactive strength) and power (standing long jump, countermovement jump, five-jump test), speed (10-m and 30-m linear sprints), CoD speed with and without the ball, and sport-specific performance (throw-in and standing-kick tests).

Results. Significant group × time interactions were observed for most outcomes ($p < 0.05$), with partial eta-squared (ηp2) values ranging from 0.33 to 0.81. Significant interactions were found for dynamic balance (ηp2 = 0.66), reactive strength (ηp2 = 0.33), power (ηp2 = 0.65 to 0.81), 10-m sprint performance (ηp2 = 0.42), CoD speed (ηp2 = 0.44 to 0.45), and sport-specific performance (ηp2 = 0.73 to 0.78). Bonferroni-adjusted between-group comparisons indicated significant differences between SPT and PT for selected outcomes, including dynamic balance, power (five-jump and countermovement jump tests), speed (10-m sprint and 15-m CoD without the ball), and throw-in performance, whereas no significant SPT to PT differences were detected for the remaining outcomes. Significant pre to post-improvements were observed across the assessed outcomes in the SPT group, while PT also produced significant improvements in several measures and the CG showed limited or non-significant changes. Although both SPT and PT significantly improved 30-m sprint performance, the group × time interaction did not reach statistical significance ($p = 0.060$, ηp2 = 0.12).

Conclusions. An 8-week combined SPT intervention was associated with greater performance than PT alone for selected physical fitness and sport-specific outcomes, particularly dynamic balance, power and throw-in performance, in pubertal male Tier 2 soccer players. However, these benefits were outcome-specific and were not observed across all assessed measures.

Background

Soccer is a dynamic and physically demanding sport that requires players to perform a wide range of explosive actions throughout a match [1, 2]. These actions such as rapid accelerations and decelerations, changes of direction (CoD), powerful jumps, and maximal sprinting are fundamental to both offensive and defensive performance [3, 4]. Given the intermittent nature of match play and the frequent need for high-intensity efforts, optimizing key physical capacities in youth soccer players is essential for enhancing performance, supporting long-term talent development [5].

Youth athletes are particularly responsive to training stimuli due to ongoing physical maturation and neuromuscular performance, making targeted training interventions especially effective during this developmental stage [5]. Although regular soccer practice contributes to general fitness, it may be insufficient to elicit maximal improvements in neuromuscular qualities (e.g., sprint and CoD speed, jump height) required for elite-level soccer performance [6]. Consequently, structured supplementary training methods are commonly integrated into youth development programs to address specific performance-related attributes.

Among these methods, plyometric training (PT) characterized by exercises utilizing the stretch-shortening cycle (SSC) has consistently been shown to enhance muscular power, jump performance, acceleration, and CoD speed [5, 7, 8]. These adaptations are underpinned by improvements in muscle to tendon stiffness, neural activation, and rate of force development [9]. In addition, sprint training (ST) plays a crucial role in developing linear sprint and CoD speed, acceleration capacity, and repeated sprint ability, all of which are decisive determinants of soccer performance [2, 10]. A strong rationale, therefore, exists for combining these two modalities to provide complementary physiological and neuromuscular stimuli.

PT enhances the neuromuscular system's ability to generate force rapidly [9], while ST reinforces sport-specific motor patterns during high-velocity running [11]. The combined approach of PT and ST (SPT) may elicit greater performance gains than either modality alone, potentially through mechanisms, such as post-activation performance enhancement (PAPE), whereby PT acutely enhances subsequent sprint performance [12 to 15]. Supporting this concept, Niering, Heckmann [16] demonstrated that a SPT program produced greater improvements in both linear sprint and CoD speed compared with ST alone in youth soccer players with Tier 2 training and performance caliber. Similarly, Aloui, Souhail [1] reported significant improvements in dynamic balance, following an 8-week SPT intervention in U-15 Tier 2 male soccer players. Collectively, these findings indicate that SPT effectively enhances reactive strength- and power-related performance in youth soccer players [1, 17, 18]. However, it remains unclear whether SPT provides superior benefits compared with PT alone, particularly across a broad range of physical and sport-specific outcomes, as most previous studies have compared combined sprint and plyometric training with control conditions rather than with PT-only interventions. Participants in the present study were at or near peak height velocity (circa-PHV), a developmental stage during which rapid growth and biological maturation can substantially influence training responsiveness, physical performance, and injury risk [19, 20]. Around PHV, rapid changes in body dimensions, neuromuscular coordination, and musculoskeletal structures may temporarily alter movement efficiency and increase susceptibility to growth-related and overuse injuries, particularly when training loads are excessive or poorly managed [21, 22]. Consequently, training during this period requires careful consideration of exercise selection, mechanical loading, progression, recovery, and individual maturation status [22]. There is extensive literature demonstrating the effectiveness of PT programs in youth without injuries [20, 23 to 27]. Importantly, this does not imply that ST or PT is inherently inappropriate during circa-PHV. Much rather, training loads should be appropriately managed and progressively adjusted according to the athlete's developmental status [22]. Sprint and power adaptations may also differ across pre-, circa-, and post-PHV athletes [28 to 30]. In particular, circa-PHV youth may demonstrate reduced responsiveness to ST despite greater absolute sprint performance, potentially reflecting transient coordination and movement-efficiency changes associated with rapid growth, sometimes described as "adolescent awkwardness" [30]. Therefore, examining the effects of SPT, specifically in circa-PHV players is warranted while considering both its potential performance benefits and the need for appropriate training-load management during this sensitive developmental stage [20, 22, 27].

Despite these challenges, combined SPT has the potential to improve measures of strength, power, linear sprint, and CoD speed, and sport-specific performance during circa-PHV. The high-velocity, reactive nature of both modalities also supports adaptation to maturational changes, facilitating performance gains despite temporary coordination constraints. Although some models propose sensitive periods for training, scientific evidence supports continuous development of strength, power, and speed across maturation stages [21, 30]. This study adds to limited evidence that SPT may outperform PT alone in circa-PHV youth, highlighting the importance of maturation-informed, individualized programming.

Therefore, the purpose of this study was to compare the effects of a SPT program with a PT-only and an active control group (CG) training program on dynamic balance (Y-balance test composite score: CS-YBT), reactive strength index (RSI) and power (standing long jump: SLJ, countermovement jump: CMJ, five-jump test: FJT, and absolute leg stiffness), linear sprint (10- and 30-m sprint) and CoD speed with (CoDB) and without (CoD) the ball, and sport-specific performance (throwing-in and standing kick) in Tier 2 male pubertal soccer players. Based on the existing literature [1, 16, 18], it was hypothesized that SPT would elicit greater improvements in physical fitness than PT alone and CG. It was further hypothesized that both training interventions would result in greater performance gains than an active control condition. Findings of this study may assist practitioners in making evidence-based decisions regarding the inclusion of SPT for optimizing physical fitness in youth soccer players.

Methods

Study Design

The present study employed a three-arm, parallel-group randomized controlled trial to investigate the effects of an 8-week PT program compared with PT and an active CG on physical fitness and sport-specific performance in male pubertal soccer players. The study was conducted in Manouba, Tunisia, during March and April, 2025. Participants were assessed before and after the intervention using a pre-test-to-post-test design. Training was performed twice weekly for approximately 30 min per session and integrated into the players' regular soccer-training schedule.

The SPT group performed SPT exercises, in which each PT exercise was followed immediately by a short sprint or CoD effort. The PT group performed the corresponding PT exercises without the subsequent sprint or CoD component, whereas the CG continued its regular soccer-specific training without an additional structured plyometric or sprint intervention. The training programs were progressively prescribed over the 8-week intervention, with exercise volume and loading monitored according to the pre-defined training schedule (Table 3). Training exposure was, therefore, documented for each condition rather than assumed to be fully equivalent across groups.

The primary outcomes comprised physical fitness and sport-specific performance measures, including dynamic balance, RSI, CMJ, SLJ, FJT, leg stiffness, 10- and 30-m sprint performance, CoD performance with and without the ball, throwing-in distance, and standing-kick performance. Group differences in changes from pre- to post-intervention were examined using group × time analyses. This design allowed assessment of whether the addition of sprint training to PT training resulted in greater changes in physical fitness and sport-specific performance than PT alone or regular soccer training.

Participants

The sample size estimation was computed using G*Power software (version 3.1.6). Based on findings from a related study [1] examining the effects of SPT on 5-m linear sprint speed (Cohen's f = 0.255) in Tier 2 U-17 male soccer players, an a priori power analysis with a type I error of 0.05% and 80% statistical power was computed. The analysis indicated that 42 participants would represent a sufficient sample. Accordingly, a total of 46 trained male pubertal soccer players from the same soccer team were recruited to participate in this study. According to the classification proposed by McKay, Stellingwerff [28], the participants were classified as Tier 2 (trained/developmental) soccer players. Players were randomly assigned to the SPT (n = 16), PT (n = 15), or CG (n = 15) (Table 1). All participants practiced systematic soccer training for at least 3 to 4 years prior to study participation. Sport-specific training mainly focused on enhancing soccer specific technical skills. Of note, all groups followed the same soccer-training program under the supervision of the same coaches. The SPT and the PT groups conducted two weekly training sessions implemented following the warm-up of regular soccer-training sessions (Table 2). Participants' biological maturity status was estimated based on the maturity-offset method using the prediction equation of Mckay et al. [28]. Participants were eligible if they were male youth soccer players within the targeted pubertal stage, regularly participated in organized football/soccer training and competition, and met the pre-defined maturity and training-level criteria of the study. Players were excluded if they had a current musculoskeletal injury or medical condition preventing full participation in training or testing, had undergone surgery or sustained a major injury during the preceding period, or were unable to complete the study protocol. Participants were also excluded from the final analysis if they failed to attend the required training sessions or post-intervention assessments according to the pre-defined adherence criteria.

Attendance and adherence were monitored throughout the intervention. Participants who withdrew voluntarily, sustained an injury or illness that prevented completion of the intervention, or failed to meet the pre-defined attendance requirements were considered dropouts. The number and reasons for participant withdrawal were recorded and reported in the study flow diagram. The final analysis included only participants who completed the required assessments and intervention protocol.

Before participation in this study, the subjects were given a letter that included written information about the study and a request for consent from the parents to allow their children to participate in the study. Legal representatives and subjects provided informed consent after thorough explanation of the objectives and scope of this project, the procedures, risks, and benefits of the study. This study was conducted following the latest version of the Declaration of Helsinki and the protocol was approved by the Local Ethics Committee of the National Center of Medicine and Science of Sports of Tunis (CNMSS-LR09SEP01) before the commencement of the study. None of the participating players had a history of psychological and musculoskeletal, neurological, or orthopedic disorders 6 months prior to the start of the study.

Procedure

One week prior to the start of the study, a familiarization session was scheduled to allow players to become acquainted with the tests and SPT and PT exercises. Participants of the SPT and PT groups received instructions on the proper exercise techniques. The same test sequence was applied during pre- and post-tests. More specifically, athletes performed the Y-balance, RSI, power (SLJ, CMJ and submaximal hopping), followed by the 10-, 20- and 30-m linear sprint and CoDB and CoD, and sport-specific performance (throwing and standing kicking) tests. Before testing, all participants conducted a standardized 10-min warm-up which consisted of submaximal running (e.g., running, skipping), balance exercises (e.g., forward or backward beam walking, single-leg stance on unstable devices) and landing drills (e.g., snap downs, 1-leg drop squat). All tests were separated by a 5 to 10-min rest period. The rest between test trials was 3 min. The best of two trials was used for further statistical analyses.

Anthropometrics

Standing height and body mass were measured using a wall-mounted stadiometer (Florham Park, NJ, USA) and an electronic scale (Baty International, West Sussex, UK), respectively. Subcutaneous adiposity was estimated from the sum of skinfold measurements obtained with Harpenden calipers. All anthropometric assessments were performed using standardized procedures. Biological maturation was estimated non-invasively using the Moore et al. [29] approach, which combines chronological age and standing height to estimate maturity offset relative to peak height velocity (PHV). The maturity-offset equation applied to the male participants was: maturity offset = − 7.999994 + (0.0036124 × age × height). The resulting value represents the estimated number of years before or after PHV.

Physical Fitness Tests

Dynamic Balance

Dynamic postural control was evaluated using the YBT following a standardized procedure adapted from previously published protocols [31, 32]. All assessments were performed barefoot. Participants maintained a single-leg stance on the dominant limb, positioning the most distal aspect of the great toe at the designated central point of the YBT platform. While maintaining this position, they reached as far as possible with the non-stance limb in the anterior, posteromedial, and posterolateral directions. The heel of the supporting limb had to remain in contact with the platform throughout each trial. Reach distances were recorded to the nearest 0.5 cm using the YBT measurement system. A trial was repeated if the participant lost balance, displaced the stance foot, lifted the heel, or failed to return the reaching limb to the starting position in a controlled manner. For each direction, the best successful reach distance was retained. The composite YBT score (CS-YBT) was calculated as

Data from our own laboratory indicated a good test to retest reliability of the CS-YBT (ICC = 0.85; SEM = 6.56%).

Reactive Strength Index

RSI was predicted from the maximal hopping protocols and was performed in the same manner as previously described [33]. The maximal hopping protocol involved participants performing five repeated bilateral maximal vertical hops in place (stationary) on the contact mat. Participants were instructed to maximize jump height and minimize ground-contact time [34]. The first jump in each trial was not included in the analysis. Jump height and ground-contact time were averaged across the four remaining hops and used to calculate the RSI as follows:

Our data indicated good test to retest reliability with ICC = 0.81 and SEM = 5.48%.

Proxies of Power

Horizontal Jumps

For the SLJ test, participants stood stationary with the toes aligned level with the start line and were instructed to push-off vigorously and jump forward as far as possible. Participants were allowed the use of a countermovement with arms and body swing. The distance jumped from the start line at takeoff to the position of the heel upon landing was measured in centimeters using a metal tape measure. Data from our own laboratory indicated an excellent, test to retest reliability with ICC = 0.95 and SEM = 3.27%.

The FJT was applied in accordance with recommendations provided by Sabato, Walch [35]. From an upright standing position, with both feet flat on the ground, players tried to cover as much horizontal distance as possible with five forward bouncing strides by alternating left-leg and right-leg ground contacts. The covered distance was measured to the nearest 1 cm using a tape measure. Data from our own laboratory indicated an excellent, test to retest reliability with an ICC = 0.96 and SEM = 0.21% for youth soccer players.

Vertical Jump and Hopping Assessments

Two vertical performance tasks were administered, the CMJ and a submaximal bilateral hopping test. During both tests, participants kept their hands on their hips to restrict the contribution of the upper limbs and reduce lateral or horizontal movement. They were instructed to take off and land with the knees and ankles extended and to maintain a consistent landing position. Jump and hopping characteristics were measured with an Ergojump system (ErgojumpP; Globus Italia, Codognè, Italy), which automatically recorded flight and ground-contact times. At least 5 min of passive recovery was provided between the different tests.

For the CMJ, participants started from an upright standing position, performed a rapid downward countermovement to a self-selected depth, and immediately jumped vertically as high as possible. Three attempts were completed, with approximately 2 min of recovery between trials, and the highest jump was retained for analysis. Data from our own laboratory indicated a good test to retest reliability (ICC = 0.87; SEM = 0.80%).

Absolute leg stiffness was estimated from bilateral submaximal hopping using the relationship between flight and ground-contact times [34, 35]. Participants completed 20 consecutive hops at a target frequency of 2.0 Hz, maintained using an electronic metronome. To minimize the influence of acceleration and fatigue, the first five and final five hops were excluded. The middle 10 hops were averaged for the analysis. Leg stiffness (kN · m^{-}1) was subsequently calculated from mean contact and flight times and participant body mass [34]. The test demonstrated good test to retest reliability (ICC = 0.87; SEM = 2.80%) in our laboratory.

Linear Sprint Performance

Sprint performance was assessed over 10 and 30 m to characterize short-distance acceleration and longer-distance sprinting capacity. For the 10-m test, participants began from a stationary standing position immediately behind the first timing gate and sprinted maximally through the 10-m distance. For the 30-m assessment, participants adopted a standing position 30 cm behind the starting line and were instructed to accelerate and run maximally over 30 m. Timing was recorded automatically using photocell gates (Brower Timing Systems, Salt Lake City, UT, USA), positioned approximately 0.4 m above the ground and accurate to 0.01 s. Two attempts were completed for each distance, with a minimum of 2 min recovery between trials. The fastest time recorded for each distance was used for statistical analysis. Laboratory reliability testing demonstrated excellent reliability for both sprint distances (ICC = 0.93 to 0.94; SEM = 1.17 to 1.19%).

Change-of-Direction Performance

CoD speed was evaluated using 15-m tests performed with (15-m CoDB) and without the ball (15-m CoD) [36]. Participants began 3 m before the first timing gate, completed an initial 3-m straight section, and then negotiated a 3-m slalom formed by three 1.6-m high markers positioned 1.5-m apart. After the slalom, participants cleared a 0.5-m hurdle located 2 m beyond the final marker and completed a final 7-m straight sprint before crossing the second timing gate.

The ball-based version followed the same course but required participants to maintain ball control throughout the task. During the hurdle section, the ball was passed underneath the hurdle, while the participant jumped over it. The ball was then directed toward one of two small targets positioned diagonally to either side of the hurdle before the participant completed the final 7-m sprint [33].

Two trials were performed for each condition, separated by approximately 3 min of recovery. The fastest trial was retained for analysis. Test to retest reliability in our laboratory was excellent (ICC = 0.90 to 0.93; SEM = 0.57 to 0.68%).

Soccer-Specific Performance

Throw-In

A proxy of upper-body power was assessed using a standardized maximal-distance throw-in test [34]. From a standing position, participants used both hands to perform a regulation-style soccer throw-in and were instructed to achieve maximal distance. The landing distance of the ball was measured to the nearest 0.2 m. The test demonstrated good test to retest reliability (ICC = 0.88; SEM = 2.47%).

Standing Kick

Standing-kick performance was assessed as a measure combining lower-limb muscle power and soccer kicking performance [9, 35]. Participants kicked a stationary ball maximally without a preceding run-up. The non-kicking foot was positioned beside the ball, while the kicking leg was moved backward before a maximal forward kicking action. The distance from the initial ball position to the first point of ground contact was measured to the nearest 0.2 m using a 50-m measuring tape. Participants received the same instruction for each attempt: to kick the ball as far as possible. Test to retest reliability was excellent (ICC = 0.90; SEM = 3.19%).

Training Programs

During the 2025 in-season period (February to March), participants completed an 8-week intervention consisting of two supervised sessions per week. The SPT and PT programs were integrated into the regular soccer sessions and replaced the general conditioning component, while the CG continued its usual soccer-specific training. Each session lasted approximately 90 min and comprised a standardized 15-min warm-up, a 30-min experimental training block, approximately 40 min of soccer-specific training, and a 5-min cool-down. The warm-up included submaximal running (forward, backward, and lateral), dynamic stretching, accelerations, and jumping activities (approximately 10 min), followed by 5 min of passing exercises. The cool-down consisted of jogging and dynamic stretching. No additional conditioning activities were performed on these days.

The SPT program combined plyometric exercises with immediately subsequent sprint or CoD efforts. The exercise sequence was standardized across sessions and consisted of: (1) CMJ followed by a 10-m sprint; (2) line jumps followed by a 4 × 5-m CoD drill; (3) drop jump + one-step followed by a 15-m CoD sprint; (4) single-leg cone jumps in the front-to-back direction followed by a 10-m sprint; (5) single-leg cone jumps in the side-to-side direction followed by a 10-m CoD effort; and (6) single-leg box push-offs. The sprint or CoD effort was performed immediately after the corresponding PT exercise. The weekly progression of sets and repetitions is presented in Table 3.

The PT-only program used the same plyometric exercises and exercise order as the SPT group but without the subsequent sprint or CoD component. The weekly progression in sets and repetitions is presented in Table 3. Importantly, according to the actual training schedule shown in Table 3, the SPT and PT conditions did not involve identical numbers of plyometric repetitions. The distinction between the two conditions was based on the addition of sprint/CoD efforts to the plyometric exercises in SPT, together with the prescribed progression in plyometric volume.

For both intervention groups, training load was progressively increased across the 8-week period. The prescribed progression is detailed in Table 3, with the number of sets and repetitions increasing during weeks 1 to 4 and then being adjusted during weeks 5 to 8. Exercise intensity and technical quality were monitored throughout each session. Perceived exertion was progressively increased across the intervention, from approximately 3 to 9 on the 0 to 10 OMNI scale, according to the planned progression and participant tolerance.

The CG continued its regular soccer-specific training without the additional SPT or PT intervention. The soccer component consisted of technical and tactical exercises and small-sided games and was delivered for approximately 40 min within the same overall session structure.

All intervention sessions were supervised by qualified coaches and sport scientists to ensure standardized exercise execution, appropriate progression, and adherence to the prescribed program. Participants were instructed to prioritize movement quality and technical execution, and training was modified when necessary according to individual tolerance and maturation-related considerations. A detailed description of the weekly progression for both intervention conditions is provided in Table 3.

Statistical Analyses

Data are presented as group means and standard deviations (SD). After confirming data normality using the Shapiro to Wilk test, a MANOVA was performed to examine baseline between-group differences. A 3 × 2 mixed ANOVA was then conducted with group (SPT, PT, and CG) as the between-subject factor and time (pre-test and post-test) as the within-subject factor to determine training effects. For each outcome, the main effect of time and the group × time interaction were examined. When a significant group × time interaction was detected, Bonferroni-adjusted pairwise between-group comparisons (SPT vs PT, SPT vs CG, and PT vs CG) were performed, and mean differences with their corresponding 95% confidence intervals (CIs) and adjusted *p* values were reported. Effect sizes for the main effects and group × time interactions were reported as partial eta-squared (ηp2) directly from the mixed ANOVA, without conversion to Cohen's *d*. Within-group pre to post-Cohen's *d* values were additionally calculated as the mean change divided by the pooled SD of the pre- and post-test scores: d = (Mpost − Mpre)/SDpooled. Cohen's *d* values were interpreted as small (0.20 to 0.49), moderate (0.50 to 0.79), and large (≥ 0.80) [37]. Intra-session reliability was assessed during a single test session by comparing repeated measurements obtained under the same conditions. Participants completed a familiarization session before testing to ensure that they understood and could correctly perform each test. The reliability results, therefore, reflect the consistency of repeated measurements within the same session. Statistical significance was set at $p < 0.05$. All pairwise comparisons were adjusted for multiple comparisons using the Bonferroni procedure. All analyses were performed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA).

Results

All participants received the treatments as allocated. The overall rate of compliance to training interventions was 95%. No significant between-group baseline differences were observed for any descriptive variable or physical fitness measure. The main effects of time, and group-by-time interactions are displayed in Table 4. Where appropriate, Bonferroni-adjusted pairwise comparisons were used to further examine between-group differences.

Dynamic Balance

Findings indicated a significant group × time interaction for the CS-YBT (ηp2 = 0.66; $p < 0.001$) (Table 4). Bonferroni-adjusted between-group comparisons indicated higher performance in SPT than PT (MD = 9.697, 95% CI [3.985, 15.410], $p < 0.001$) and CG (MD = 6.015, 95% CI [0.303, 11.728], $p = 0.036$), whereas PT and CG did not differ significantly ($p = 0.364$). Within groups, SPT showed a large pre-to-post-improvement (Δ = 18.03%; $p < 0.001$; $d = 2.70$), while PT also improved significantly (Δ = 7.54%; $p < 0.001$; $d = 1.05$). In contrast, no significant improvement was observed in CG (Δ = 0.58%; $d = 0.07$; $p > 0.05$).

Reactive Strength Index

Training resulted in a significant group × time interaction for RSI (ηp2 = 0.33; $p < 0.001$). However, the pairwise between-group comparisons were not statistically significant (SPT vs PT: $p = 1.000$; SPT vs CG: $p = 0.163$; PT vs CG: $p = 0.132$). Within groups, a large pre-to-post-improvement was observed in SPT (Δ = 43.92%; $p < 0.001$; $d = 1.41$), while PT also improved significantly (Δ = 18.14%; $p < 0.001$; $d = 0.41$). According to the pre-defined thresholds, the magnitude of the latter effect was small rather than moderate. No significant change was found in CG (Δ = 1.41%; $d = 0.05$; $p > 0.05$).

Proxies of Power

The Standing Long Jump Test

A significant group × time interaction was observed for the SLJ (ηp2 = 0.81; $p < 0.001$) (Table 4). Nevertheless, Bonferroni-adjusted pairwise comparisons did not identify statistically significant differences between SPT and PT ($p = 0.066$), SPT and CG ($p = 0.354$), or PT and CG ($p = 1.000$). Within groups, SPT showed a large pre-to-post-improvement (Δ = 12.22%; $p < 0.001$; $d = 1.47$), while PT also improved significantly (Δ = 5.49%; $p < 0.001$; $d = 0.61$). No significant change was observed in CG (Δ = 0.27%; $d = 0.03$; $p > 0.05$).

The Five Jump Test

A significant group × time interaction was identified for the FJT (ηp2 = 0.81; $p < 0.001$) (Table 4). Bonferroni-adjusted comparisons indicated a significant difference between SPT and PT (MD = 1.055 m, 95% CI [0.206, 1.904], $p = 0.010$), whereas SPT vs CG ($p = 0.128$) and PT vs CG ($p = 0.983$) were not statistically significant. Within groups, SPT showed a large improvement (Δ = 22.46%; $p < 0.001$; $d = 2.70$), while PT also improved significantly (Δ = 7.89%; $p < 0.001$; $d = 0.66$). No significant improvement was observed in CG (Δ = 0.53%; $d = 0.05$; $p > 0.05$).

The Countermovement Jump

A significant group × time interaction was identified for the CMJ (ηp2 = 0.65; $p < 0.001$). Pairwise comparisons indicated a significant difference between SPT and PT (MD = 4.833 cm, 95% CI [0.931, 8.735], $p = 0.011$), whereas SPT vs CG ($p = 0.200$) and PT vs CG ($p = 0.727$) were not significant. SPT showed a large within-group improvement (Δ = 17.32%; $p < 0.001$; $d = 1.31$), while PT showed a moderate improvement (Δ = 10.01%; $p < 0.001$; $d = 0.57$). No significant improvement was detected in CG (Δ = 0.44%; $d = 0.03$; $p > 0.05$).

Absolute Leg Stiffness

Findings showed a significant group × time interaction for leg stiffness (ηp2 = 0.36; $p < 0.001$). However, none of the Bonferroni-adjusted pairwise comparisons was statistically significant (SPT vs PT: MD = 16.452 N/kg, 95% CI [− 9.162, 42.066], $p = 0.351$; SPT vs CG: MD = − 0.705 N/kg, 95% CI [− 26.319, 24.908], $p = 1.000$; PT vs CG: MD = − 17.157 N/kg, 95% CI [− 43.181, 8.866], $p = 0.323$). SPT showed a pre-to-post-improvement (Δ = 55.80%; $d = 0.50$), whereas PT (Δ = 0.21%; $d = 0.00$) and CG (Δ = 0.26%; $d = 0.00$) showed negligible changes.

Linear Sprint Speed

A significant group × time interaction was found for the 10-m sprint (ηp2 = 0.42; $p < 0.001$), whereas the group × time interaction for the 30-m sprint was not statistically significant (ηp2 = 0.12; $p = 0.060$) (Table 4). For the 10-m sprint, Bonferroni-adjusted comparisons indicated significant differences between SPT And PT (MD = − 0.122 s, 95% CI [− 0.238, − 0.005], $p = 0.039$) and SPT and CG (MD = − 0.183 s, 95% CI [− 0.300, − 0.066], $p = 0.001$), whereas PT and CG did not differ significantly (MD = − 0.062 s, 95% CI [− 0.180, 0.057], $p = 0.607$). Within groups, SPT significantly improved both 10-m (Δ = 13.53%; $p < 0.001$; $d = 1.97$) and 30-m sprint performance (Δ = 4.35%; $p < 0.001$; $d = 0.76$). PT also showed significant improvements in the 10-m (Δ = 5.09%; $p < 0.001$; $d = 0.71$) and 30-m (Δ = 2.94%; $p < 0.001$; $d = 0.47$) sprints. No significant pre-to-post-changes were observed in CG for either sprint outcome (both $p > 0.05$). Despite the significant pairwise differences in marginal means reported for the 30-m sprint, the group × time interaction was not statistically significant ($p = 0.060$); therefore, no differential training effect or superiority of SPT is inferred for this outcome.

Change-of-Direction Speed

The 15-m Change-of-Direction Speed Test Without the Ball

A significant group × time interaction was observed for the 15-m CoD test (ηp2 = 0.45; $p < 0.001$) (Table 4). Bonferroni-adjusted comparisons indicated a significant difference between SPT and PT (MD = − 0.266 s, 95% CI [− 0.436, − 0.097], $p = 0.001$). In contrast, SPT vs CG (MD = − 0.099 s, 95% CI [− 0.269, 0.070], $p = 0.454$) and PT vs CG (MD = 0.167 s, 95% CI [− 0.005, 0.339], $p = 0.060$) were not statistically significant. Within groups, SPT showed a large improvement (Δ = 9.21%; $p < 0.001$; $d = 1.43$), while PT also improved significantly (Δ = 2.83%; $p < 0.001$; $d = 0.52$). CG showed no significant improvement (Δ = 0.61%; $d = 0.07$; $p > 0.05$).

The 15-m Change-of-Direction Speed Test with the Ball

A significant group × time interaction was observed for the 15-m CoD with ball test (ηp2 = 0.44; $p < 0.001$). None of the Bonferroni-adjusted pairwise comparisons was statistically significant (SPT vs PT: MD = − 0.210 s, 95% CI [− 0.472, 0.053], $p = 0.160$; SPT vs CG: MD = − 0.205 s, 95% CI [− 0.468, 0.058], $p = 0.175$; PT vs CG: MD = 0.004 s, 95% CI [− 0.263, 0.271], $p = 1.000$). Within groups, SPT showed a large improvement (Δ = 8.71%; $p < 0.01$; $d = 1.79$), while PT also improved significantly (Δ = 4.93%; $p < 0.001$; $d = 0.68$). No significant change was observed in CG (Δ = 0.36%; $d = 0.06$; $p > 0.05$).

Sport-Specific Performance

The Throwing-in Test

A significant group × time interaction was found for the throw-in test (ηp2 = 0.73; $p < 0.001$). Bonferroni-adjusted comparisons indicated significant differences between SPT and PT (MD = 1.762 m, 95% CI [0.223, 3.301], $p = 0.020$) and SPT and CG (MD = 1.781 m, 95% CI [0.242, 3.321], $p = 0.018$), whereas PT and CG did not differ significantly (MD = 0.019 m, 95% CI [− 1.545, 1.583], $p = 1.000$). Within groups, SPT showed a large improvement (Δ = 31.86%; $p < 0.001$; $d = 2.01$), while PT also improved significantly (Δ = 11.63%; $p < 0.001$; $d = 0.68$). CG showed no significant change (Δ = 0.11%; $d = 0.01$; $p > 0.05$).

The Standing Kick

A significant group × time interaction was found for the standing-kick test (ηp2 = 0.78; $p < 0.001$). However, none of the Bonferroni-adjusted pairwise comparisons reached statistical significance (SPT vs PT: MD = 4.642 m, 95% CI [− 0.095, 9.380], $p = 0.056$; SPT vs CG: MD = 3.285 m, 95% CI [− 1.452, 8.023], $p = 0.274$; PT vs CG: MD = − 1.357 m, 95% CI [− 6.170, 3.456], $p = 1.000$). Within groups, SPT showed a large improvement (Δ = 31.17%; $p < 0.001$; $d = 2.01$), while PT showed a moderate improvement (Δ = 15.50%; $p < 0.001$; $d = 0.72$). No significant improvement was observed in CG (Δ = 0.03%; $d = 0.01$; $p > 0.05$).

Discussion

In this study, we examined the effects of an 8-week SPT program compared with PT alone and a CG, integrated into soccer-specific training sessions, on physical fitness and sport-specific performance in male pubertal and trained (Tier 2 training and performance caliber) soccer players. Overall, twice-weekly SPT produced significant improvements across a broad range of physical fitness and sport-specific outcomes, with generally larger effects than those observed following PT or soccer-specific training alone. The clearest between-group advantages were observed for dynamic balance, reactive strength, power, short-distance sprinting, CoD, and sport-specific performance. These findings are broadly consistent with previous research reporting beneficial effects of combined sprint and PT in youth soccer players [1, 12]. However, the magnitude and statistical significance of the training effects varied across outcomes, and the 30-m sprint interaction did not reach statistical significance ($p = 0.06$). Therefore, the findings should be interpreted as evidence of broader performance benefits of SPT rather than uniformly superior effects across sprint measure.

SPT was associated with significant improvements in dynamic balance, and the PT group also demonstrated significant and large within-group improvements. Therefore, the present findings do not indicate that improvements in dynamic balance were exclusive to SPT. Rather, the observed group × time effect suggests that the magnitude of change differed among the training conditions. Dynamic balance is relevant to soccer, because it contributes to postural control during acceleration, deceleration, and directional changes [38]. The present findings are broadly consistent with Aloui et al. [1], who reported improvements in Y-balance performance following SPT training in U-19 male soccer players. However, differences in training protocols and participant characteristics should be considered when comparing these findings.

Significant improvements were also observed in RSI and several measures of lower-limb power performance, including SLJ, FJT, CMJ, and absolute leg stiffness, particularly following SPT. PT also produced significant improvements in several of these outcomes. Thus, the findings support the effectiveness of both training approaches for developing reactive and power performance, while the significant group × time effects observed for some variables suggest potentially greater improvements following SPT. These findings are consistent with previous studies reporting beneficial effects of PT and SPT on power performance in youth soccer players [1, 12]. Because physiological and neuromuscular mechanisms were not directly assessed, the present results cannot determine the specific mechanisms responsible for these adaptations.

Leg stiffness also improved following the training interventions, with greater changes observed following SPT. Leg stiffness is relevant to efficient force production during high-velocity movements [16], and previous research has reported improvements in stiffness-related characteristics following PT [39]. However, the present study did not include direct biomechanical or neuromuscular assessments; therefore, explanations concerning changes in force transmission, muscle activation, or stretch-reflex function remain speculative.

For sprint performance, both SPT and PT produced significant within-group improvements in the 10- and 20-m sprint tests, whereas the group × time interaction for the 30-m sprint did not reach statistical significance ($p = 0.06$). Accordingly, the findings indicate that both training approaches may improve short-distance sprint performance, while evidence for a differential advantage of SPT is stronger for some sprint outcomes than for the 30-m distance. This is relevant to soccer, because many sprint actions occur over relatively short distances [40]. Previous research has also reported improvements in sprint performance following both PT and SPT [15, 41]. Differences in participant maturation, training status, sprint distance, and intervention design should nevertheless be considered when comparing results across studies.

SPT also resulted in significant improvements in CoD performance with and without the ball, with the magnitude of change generally exceeding that observed in the other groups. CoD performance requires effective braking, force production, and re-acceleration [42]. The present findings suggest that incorporating sprint and CoD efforts alongside plyometric exercises may be beneficial for developing this performance quality. Similar improvements following combined training have been reported in youth soccer players [1, 15]. Nevertheless, the present study cannot determine whether these effects resulted from greater movement specificity, differences in mechanical loading, or other training-related factors.

Finally, SPT improved throwing-in distance and standing-kick performance, indicating improvements in these selected soccer-specific performance measures. Similar improvements in sport-specific performance following combined training have been reported previously [1, 12]. However, because the present study did not directly assess technical execution, movement strategy, or underlying physiological mechanisms, the observed improvements should be interpreted strictly as changes in measured performance outcomes. In particular, the present data do not allow definitive conclusions regarding training transfer or the mechanisms responsible for these changes.

An important consideration when interpreting these findings is the maturational status of the participants. The circa-PHV period is characterized by rapid changes in body dimensions, neuromuscular coordination, and musculoskeletal structures, which may influence training responsiveness and increase susceptibility to growth-related and overuse injuries when training loads are excessive or poorly managed [20, 22, 27]. This consideration is particularly relevant when prescribing PT because of its repeated mechanical impact. However, PT should not be considered inherently unsafe during puberty. Rather, the potential risk is likely to depend on the magnitude and management of the training stimulus, including exercise selection, volume, intensity, progression, recovery, previous training exposure, and individual maturation status [20, 22, 27]. Recent evidence also indicates that appropriately prescribed PT can improve power performance in adolescent soccer players, while adaptations may differ according to maturation status [43]. Accordingly, SPT around PHV should be progressively implemented and individualized, with practitioners monitoring overall training load and potential musculoskeletal symptoms.

Future research should investigate the dose to response relationship between sprint and plyometric loading and performance across different maturational stages. Longitudinal studies incorporating systematic injury surveillance are also warranted to determine whether different plyometric doses can optimize performance while minimizing growth-related injury risk in circa-PHV soccer players. Further biomechanical and physiological investigations may help clarify the mechanisms underlying the observed adaptations.

This study is not without limitations. First, the sample consisted exclusively of male pubertal Tier 2 soccer players; therefore, the findings cannot be generalized to female players, athletes of different maturation status, or players from other competitive levels. Second, although SPT was compared with PT and a CG, it was not contrasted with other relevant training modalities, such as isolated strength training or sprint-only programs. As a result, it cannot be determined whether the observed benefits were specific to the combined nature of SPT or would also occur following other single-mode interventions. In addition, the study focused on performance-based outcomes and did not directly assess physiological or neuromuscular mechanisms underpinning the observed improvements. Consequently, mechanistic interpretations remain speculative. Future research should compare SPT with other commonly implemented training approaches (e.g., resistance training or sprint-only training) and, where possible, include complementary assessments that help clarify the mechanisms underlying performance adaptations. Finally, the study included only male pubertal soccer players, which limits the generalizability of the findings to female youth soccer players or adults. Although the sample was appropriate for the study population and research objectives, future studies should replicate the intervention in female players to determine whether similar responses are observed across sexes.

Conclusions

Both SPT and PT were associated with improvements in several physical fitness and sport-specific performance outcomes in pubertal, trained (Tier 2) soccer players. However, the benefits of SPT over PT were outcome-specific, with significant between-group differences favoring SPT for dynamic balance, five-jump test performance, 10-m sprint, 15-m CoD performance without the ball, countermovement jump, and throw-in performance. No significant between-group differences were observed for the SLJ, RSI, leg stiffness, 15-m CoD performance with the ball, or standing kick. Although both groups improved 30-m sprint performance, the group × time interaction was not significant. These findings suggest that combining sprint and plyometric training may offer additional benefits over PT alone for selected physical fitness and sport-specific performance outcomes in pubertal Tier 2 soccer players, rather than providing a consistent advantage across all measures. Coaches may, therefore, consider incorporating appropriately designed sprint and plyometric exercises into youth soccer training when targeting specific performance qualities.

Chaouachi et al., Sports Medicine - Open, 2026, doi:10.1186/s40798-026-01155-1. Published under CC BY 4.0: https://creativecommons.org/licenses/by/4.0/.

Source: Sports Medicine - Open pubmed.ncbi.nlm.nih.gov

05 Policy and clubs U12 to U15

Ged Roddy: Why England needs its own version of Germany's Stützpunkte

For coaches If your players are at a grassroots club, the German model keeps them there while adding one free extra session a week, so watch whether your county becomes a pilot.

England needs a bridge between its Academies and the grassroots game like Germany's Stützpunkte, according to Ged Roddy MBE, the architect of the Elite Player Performance Plan (EPPP).

Roddy is the former Premier League Head of Youth and oversaw the creation of EPPP in 2012. Now he is a High Performance Expert for FIFA, meaning he sees the youth development programmes of countries around the world up close.

Whereas England's Academies, especially at Category One level, are now the envy of the world, the grassroots game is lagging behind.

"Our Academies have taken off and our grassroots has to a certain extent got left behind," Roddy told TGG Live 2025 in a talk now available to TGG Members.

"In Germany, they have 350 Stützpunkt training centres that sit between the Academies and grassroots game. If we have a finite talent pool, we need to think about how we bridge those gaps. So, mind the gap."

The DFB has a network of just under 350 Stützpunkte, supporting around 14,000 players with just under 1,280 coaches. The best Under-12 to U15 players are nominated for an extra weekly session, which is free, while continuing to play for their grassroots clubs.

Stützpunkt coaches must hold at least a DFB B licence and each base holds "training dialogues" with players' club coaches twice a season to discuss their development and runs information evenings for local coaches.

Roddy has since told TGG this is "one of the big differences between the English and German systems" and he wants England to build its own bridge through a network of FA County Development Centres.

"I have always seen the Category Three environment as untapped potential and the opportunity to join up and link up the grassroots via FA-led development centres is a missing link in the country's ecosystem," he said.

Roddy believes the Centres could be built on permanent training grounds for Category Three clubs.

“In the past, I found Category Three clubs spending up to 80% of their youth development funding on rented facilities because they didn’t own their own training grounds,” he said.

“I could see a world where maybe the Football Foundation or some other independent acted as a trust for the development of training grounds for these clubs. Building a permanent football infrastructure that could then also act as the regional hubs for FA Development Centres.”

Roddy said this would solve three problems at once: Category Three clubs’ lack of facilities, the need for venues for Regional Development Centres and the creation of a “breathing system” that would allow players to move in and out of the Academy system.

“This approach would protect the talent pool, create tangible opportunities for late developers,” he said.

Roddy suggested the cost could be met partly through the redistribution of money from the Premier League to the rest of the pyramid.

“It could, or should, be part of the settlement regarding the redistribution of wealth through the pyramid, given this would have direct player development benefits in communities right across the country.

“Of course this would all cost a few quid. I ran the numbers when I was still working in England and the saving on Academy rentals alone could be used to support the capital expenditure.”

The Premier League has offered the EFL a 10-year funding package, reported to be worth an additional £1.8bn, as part of talks over a new financial settlement.

Roddy said the Centres would need a new workforce of “talent coaches” and pointed to the FA Skills Programme, which Sir Trevor Brooking launched in 2007 as the FA’s Director of Football Development. It started with 66 specialist coaches working with five to 11-year-olds, and had nearly 160 by 2014.

“Sir Trevor created his Tesco Skills Coaches and they were a really well-trained group,” said Roddy. “Unfortunately they never had County Development Centres to work from. Many of them got jobs in the new Academy system once EPPP was launched. Could be time to dust off the template.”

The centres could serve both the boys’ and girls’ game.

“The County Development Centres would surely be venues for the development of boys and girls, creating a breathing Academy system for both pathways.”

Roddy stressed that his proposal was not a criticism of English youth development.

“You only have to look at how we played in Spain to see the quality we have,” he said. “On the other hand we can’t afford to stand still.”

England won 3-2 in Madrid on Sunday, ending Spain's 43-match unbeaten run, and finished third at this summer's World Cup.

Inside the Stützpunkte

At TGG Live, Roddy cited André Schürrle, the forward who crossed for Mario Götze's winning goal in the 2014 World Cup final, as an example of the power of the Stützpunkte.

Schürrle played for his local club, Ludwigshafener SC, and was discovered and supported at the Stützpunkte in Bobenheim-Roxheim and Ludwigshafen before moving to Mainz's Academy in 2006.

Andre Schurrle: Poster boy for the Stützpunkte

The DFB says nine players in Germany's squad for this summer's World Cup came through a Stützpunkt, including Joshua Kimmich, Antonio Rüdiger, Jonathan Tah and Deniz Undav, who played amateur football in Germany before moving to Belgium and then Brighton.

Bayern Munich apply a similar principle at club level. In 2020, they announced they would phase out their U9 and U10 teams, so that matches at the FC Bayern Campus start at U11.

Holger Seitz, then Deputy Sporting Director at the Campus, said: "With this step, it should be possible for the children to develop longer in the familiar setting of their home club without the pressure to perform and without additional time commitment."

Bayern still work with younger players. Boys aged U7 to U9 train in a development squad at five locations, while the U10 group trains centrally at the Campus. The club says games and tournaments for players' home clubs take priority when dates clash.

The English picture

In England, 34% of Academy players join at U9 and more than half are recruited after that age, according to the Premier League's 2024 EPPP report. Research on Premier League Academies shows weekly training and match sessions rising from four at U9 to nine at U16.

Outside of the Academies, the FA's mid-point review of its grassroots strategy, published in September, reports a record 1.6 million affiliated players across more than 124,500 teams, and more than 186,000 registered coaches. It does not say how many of those coaches are qualified, or to what level.

The Football Foundation has told Parliament that England has half as many 3G pitches as Germany, with 970 players for every artificial pitch compared with 421 in Germany.

A survey of 409 UK clubs by equipment firm FORZA this summer found that only 15% owned their facilities, and that 34% cited the cost of coaching qualifications as a challenge for their volunteers.

Building bridges

Manchester United's Emerging Talent Centres, launched in February 2020 to link schools and grassroots clubs across the North West with its Academy at Carrington, are still running, albeit in a slightly different form from the original model.

The club's original Emerging Talent Centre ran for 44 weeks of the year for players aged U9 to U14, in addition to their work with their schools and grassroots clubs,. The club aimed to put at least 500 grassroots coaches a year through CPD workshops.

Nick Cox, then Head of Academy, said at the launch: "We're aware of our responsibility to enrich the local football community by sharing resources and knowledge."

Jen Mildenhall, who set up and ran the programme until she left to become Player Care Lead at Chelsea in late 2024, added: "We finished last season with a milestone of 50 boys signing from grassroots football into the Academy, more than 350 boys signing to other professional Academies, 3,000 local grassroots coaches signed up to our Friends of the Academy initiative and hundreds of schools, grassroots clubs, players and parents hopefully having had a truly fantastic experience at this wonderful club."

In the girls' game, the Premier League-funded Emerging Talent Centres, which replaced the FA's Advanced Coaching Centres, increased the number of girls in England's talent pathway from 1,722 to almost 5,000 across 73 centres in under two years. At Tottenham's centre, players must also play for a grassroots club or another sport.

Roddy ended his TGG Live keynote with a warning: "The world is not sleeping. We do great things in this country, but don't forget that there is a big world out there that is keen to copy and also beat us."

Source: Training Ground Guru trainingground.guru

ON THE PITCH

06 Safety and welfare

Beyond Performance: Four Takeaways from 2026 TrueSport Talks

> **For coaches** The TEAM approach gives you a concrete pause-and-check routine to share with players and parents around posts, comments and performance feedback.

For young athletes, pressure doesn't always end when practice does. Social media, performance feedback, and stories told about success can keep athletes connected to expectations long after they leave the field of play. At 2026 TrueSport Talks, those challenges framed a day focused on protecting athlete mental wellness and preserving the joy, connection, and growth that make sport meaningful.

Broadcast live from the U.S. Olympic & Paralympic Museum on November 4, the event brought together athletes, mental health experts, medical professionals, and media voices to explore the relationship between digital culture, storytelling, and athlete well-being. Four themes emerged from this year's symposium and connected those conversations to practical action: "Shape the Story," "Disconnect to Reconnect," "Protect Your Battery," and "Master Your Mind Moves."

Shape the Story: See the Person Beyond the Performance

What happens when an athlete's story centers only on results? The event's storytelling sessions addressed the importance of recognizing the person behind the performance and considering how public narratives influence athletes' understanding of themselves.

"Beyond the Podium: Lessons from the 2026 Winter Games on Telling the Whole Athlete Story" brought together moderator Jessica Bartley, PsyD, and Team USA athletes Jessie Diggins, OLY, Maxim Naumov, OLY, and Jack Wallace, PLY. The session connected stories of pressure, setbacks, and success at the elite level to the experiences of developing athletes and the adults supporting them.

Diggins shared, "The people who mind, don't matter. And the people who matter don't mind." The reminder challenged the pressure to be constantly available or responsive online and reinforced the value of focusing on the people and relationships that genuinely support your well-being.

That focus continued in “Media, Myths, and Mental Wellness: How Storytelling Shapes Sport Culture,” moderated by Senior Director of TrueSport & Awareness, Jennifer Royer, PhD, alongside Steve Borelli and Christine Brennan from USA Today, USADA Board of Directors Vice Chair and Olympian Kara Goucher, and Kate Hartman Rosenzweig, USOPC Chief External Affairs Officer. The session examined how messages about toughness, perfection, and success can shape sport environments, and how more intentional storytelling can support resilience, psychological safety, and help-seeking.

A key takeaway from both sessions was the importance of seeing athletes as people first, not just performers. Move beyond wins, losses, rankings, and the pressure to appear perfect. Make room for growth, learning, resilience, and identity beyond sport. The conversations also challenged the myth that strong athletes don’t struggle, recognizing self-awareness and seeking support as parts of strength.

Disconnect to Reconnect: Create Space for Healthier Digital Habits

The workshop “Always On: Hyperconnectivity, Social Media Pressure, and the New Performance Environment” turned attention to a sport experience shaped by constant visibility. Featuring TrueSport Expert Deborah Gilboa, MD, Trevon Jenifer, PLY, and Mya Wilson, the session addressed pressures associated with social media, recruiting platforms, performance data, and emerging technologies, including AI-generated and manipulated content. Its focus included setting boundaries and protecting trust in an increasingly connected environment.

The “Disconnect to Reconnect” theme translated those concerns into a practical framework athletes can use before engaging online. The TEAM approach encouraged athletes to:

- Take a minute before replying, posting, or scrolling.
- Evaluate whether content is accurate, safe, and worth their attention.
- Act on their values by choosing a response or boundary that protects themselves and respects others.
- Message a trusted adult when struggling and keep screenshots of concerning interactions.

Rather than treating every notification or comment as something that requires an immediate response, the framework creates space to pause, assess, and seek support.

Protect Your Battery: Make Recovery Part of the Plan

Digital pressure also has a physical dimension. In “Wired and Tired: The Mind-Body Cost of an Evolving Sport Landscape,” TrueSport Expert Michele LaBotz, MD, FAAP, and Jeffrey Durmer, MD, PhD, addressed the connections between constant connectivity, sleep, recovery, body image pressures, and ongoing exposure to performance feedback. The workshop focused on healthier digital habits and strategies to support sustainable performance.

The corresponding “Protect Your Battery” message put recovery at the center of athlete preparation: Rest is recovery, not inactivity. The guidance encouraged athletes and their support teams to plan with recovery in mind, build a wind-down ritual, and step away from late-night screens.

This theme broadened the conversation beyond what athletes do during training to include whether their daily routines leave enough room to recover.

Master Your Mind Moves: Practice the Response to Pressure

The final workshop, “The Modern Pressure Playbook: Your Emotional Regulation Toolkit,” focused on how athletes respond when pressure arrives. Led by TrueSport Expert Kevin Chapman, PhD, the session centered on accessible strategies such as journaling, elite self-talk, pre-performance routines, and recovery rituals to support emotional regulation and mental wellness.

“Master Your Mind Moves” distilled that work into three steps:

1. Notice and name the feeling.
2. Reset by breathing, grounding, or pausing.
3. Refocus on the next helpful step.

The emphasis was not on eliminating every difficult emotion. Instead, the approach focused on building skills, support, and consistent habits that help athletes move through pressure.

A Shared Responsibility for Healthier Sport

Together, the four themes connected the stories athletes hear, the digital environments they navigate, the recovery they need, and the mental skills they practice. The playbook also made clear that athletes should not carry this work alone: Parents and coaches can protect boundaries and celebrate the person; media and fans can tell stories with context and care; and athletes can build skills while protecting their joy.

That shared responsibility offers a practical direction for youth sport, one that supports performance without losing sight of the person pursuing it.

Source: TrueSport truesport.org

VIEWS AND THE GAME

07 Policy and clubs

10 ideas from Portland to make youth sports more inclusive

> **For coaches** If cost or access keeps families in your area away, these are practical models to compare with how your club registers players, loans kit and recruits coaches.

Across the country, coaches, program directors, parents and so many more are working to fix a youth sports system increasingly defined by high costs and exclusion. One of the best parts of producing Aspen Institute State of Play community reports is finding the local leaders who are actually pulling it off.

Portland, Oregon, the focus of our 2026 State of Play Portland report, has no shortage of these people. Local providers are tackling systemic hurdles with practical, community-driven solutions built around what families actually need. From rolling registration and adaptive equipment loans to mentorship-first coaching and free camps, these 10 Portland ideas show what happens when programs put access first, and offer models others can bring to their own community.

IDEA: OFFER Culturally responsive sports formats that welcome excluded students

The beauty of McDaniel High School's stomp and shake cheerleading team is that it engages many students who previously avoided organized sports. This high-energy style, originating from Southern historically Black colleges and universities, features synchronized foot stomps, hand claps, full-body shakes and rhythmic chants.

Daniel Ponce, a senior when we spoke with him and the only boy on the varsity squad, never played sports before joining. "I never felt included or welcomed in other sports," he said.

Aiva Anderson, who is Black, quit gymnastics after coaches neglected her compared to White peers. "I would be asking [coaches] the same questions as all the other White girls who were getting help, and I wasn't getting as in-depth answers," recalled Aiva, a sophomore when we spoke with her. "I was kind of left on my own, and a lot of other Black girls had that experience too."

Led by McDaniel coach Sharlivia Slaughter, the team rejects cliquey stereotypes and body-type judgments many students find common in traditional cheer, swimming or gymnastics. There are White, Mexican, Asian and Black students of all shapes and sizes.

“Coach always tells us that we’re as strong as our weakest link and we have to help each other,” Aiva said. “We’re all on the same level, so there’s not really comparing with each other, which I think helps with inclusion.”

The Aspen Institute’s survey of Portland youth ranked cheer/stomp and shake among the top five organized sports for Black youth. Despite this popularity, the team faces skepticism regarding its status as a “real” sport. In state competitions, McDaniel loses points for omitting traditional stunts and tumbling. While other local schools adapt to traditional routines, Slaughter advocates for the Oregon School Activities Association to recognize stomp and shake officially.

Daniel and Aiva refuse to water down their team’s culture to fit traditional standards. “Getting second place is not nothing because people know how good we are,” Daniel said.

Aiva notes the racial double standard in these athletic debates. “Especially because there’s always underlying racism to it, you know? I think if stomp and shake was a White thing, there wouldn’t be that much argument about whether or not it’s a sport, or whether or not we should be included.”

As it is, Aiva said, many Black girls don’t feel welcomed by teammates or coaches on sports teams, as she experienced in gymnastics. She plans to attend college in the South and continue cheering.

“Joining stomp and shake,” Aiva said, “was the first time I’ve been treated equally in sports.”

IDEA: Fund free summer camps for low-income kids through a buy-one-give-one model

At first glance, Elite Sports Academy (ESA) sounds like an exclusive, high-priced training ground for top youth athletes. In reality, it is a nonprofit founded in 2015 by Executive Director Andy White to provide completely free summer sports camps to under-resourced youth. White settled on the seemingly contradictory name with a deliberate goal: eradicating the stigma attached to free programs.

White recognized that low-budget camps often look the part, forcing kids to play basketball with worn-out volleyballs. Knowing children research camps online themselves, White wanted campers to feel genuine excitement rather than charity. With brand-new equipment every year, high-quality camp shirts and guest appearances from local pro athletes, ESA delivers a top-tier experience at zero cost. Even though at least two grant-making organizations have turned ESA down under the false assumption that it is a private, exclusionary club, White refuses to change the name, viewing the pride it instills in campers as central to the mission.

Over its first decade, ESA served roughly 3,500 children in grades K-8, with youth of color making up about 90% of enrollment. Partnering with principals, teachers and counselors at Title I schools, ESA recruits families who qualify for free or reduced lunch and offers something few specialty camps can match: all-summer, full-day coverage. Demand consistently outpaces supply; at one school, registration drew 170 applications within three hours for 80 open spots.

Relying exclusively on grants and donations for its first eight years capped how quickly ESA could expand and forced White to turn away middle- and upper-income families who wanted to enroll. To break that bottleneck, he launched “Go to Camp, Give a Camp,” a buy-one-give-one model inspired by TOMS Shoes and Bombas Socks. ESA pairs paid Sponsor Camps in more affluent communities with free Impact Camps at Title I schools. Sponsor Camps cost $250 for a 25-hour week, set well below the national camp average of roughly $375 for 20 hours so middle-income families aren't priced out.

Every paid registration at a Sponsor Camp directly underwrites one child’s free attendance at a sister Impact Camp, covering staffing, insurance and brand-new equipment for both sites while rolling surplus revenue into new paired locations the following year. White describes the initiative as “parents helping parents.”

On the fields and courts, ESA counters early sports specialization with fun-first, multisport rotations, mixing soccer, basketball, flag football and dodgeball with a camper-chosen “sport of the day,” a nutrition and wellness classroom session and a clubhouse lounge break.

iDEA: Offer free, no-tryout soccer with rolling registration and family support

Community-rooted models like Portland Community Football Club (PCFC) reflect how many families have always organized sports: collectively, flexibly and with mutual care for children. This stands in stark contrast to the premier club model, which represents a market-driven approach.

PCFC serves a population where up to 90% of players are not White and 70% receive free or reduced-price lunch. PCFC makes participation entirely free. Instead of tryouts, PCFC uses a skill-based evaluation during practices. Kids start playing in their age group, and based on skill demonstrated over time, get sorted into competitive or developmental teams. Players can move between these levels. PCFC advocates on behalf of skilled players to try out for larger clubs, if they so choose, but there’s an open-door environment and players often return to hang out or play with their siblings. The club funds its operations through grants, donations and sponsorships and treats soccer as a mechanism for family stability.

Its most impactful innovation is the integration of wraparound services. PCFC operates a monthly food pantry, uniquely open from 6 p.m. to 9 p.m. to accommodate working parents, so that families don't have to choose between a child's practice and a nutritious meal. "Food is actually more important than play right now," PCFC Interim Executive Director Jerika Ferguson said.

PCFC utilizes rolling registration to reach low-income and underserved youth. This open-door policy supports children who need community regardless of the season. While PCFC competes against travel teams and must adhere to certain Oregon Youth Soccer Association timelines, its flexible model identifies overlooked talent and accommodates children who prefer practice over sanctioned games.

Rolling registration does present logistical hurdles. PCFC coaches find attendance difficult to predict, and high demand forced the club to move to paper registration to manage digital literacy issues and document collection (headshots, birth certificates and international clearances). Despite these challenges, Ferguson advocates for the model.

"Kids just need to start having fun again," she said. "Let's reduce the amount of organized play. Even within club sports, I think we can make things more chill."

Idea: Shift baseball to summer play tailored to neighborhood youth

Extra Innings, a free summer baseball league serving under-resourced children, launched in 2024 in the historically Black Albina neighborhood. It is part of community-led efforts to invest in Albina in ways that honor Albina's history and support Black residents' ongoing presence.

The goal for Extra Innings: increase the number of Black children ages 13-14 playing baseball and softball. Aspen's survey of Portland-area youth found that Black children are half as likely as White and Latino/a youth to have ever tried baseball.

Extra Innings participation grew from 70 to almost 500 children in the first three years. About 70% to 80% of the participants are youth of color, Black, Latino/a, Pacific Islander and Native American. Many had never tried organized baseball and needed to first learn how to play catch.

Led by Dave Gunderson and Gerald Bolden, the league's success is rooted in its barrier-free philosophy. They use rolling registration, meaning a child can join the league at any time without the hurdle of complex paperwork or proof-of-income requirements. By operating during the summer months, from June through August, they avoid Portland's rainy season, which often forces other leagues to cancel games.

This simple shift in scheduling helps children get the repetitions they need to fall in love with the game. Extra Innings demonstrates that by removing administrative friction and providing free equipment, traditional barrier sports like baseball can become inclusive again.

IDEA: Use basketball as an entry point for academic mentoring and identity-safe play

Imani Muhammad, founder of Youth Organized and United to Help (Y.O.U.TH), highlights the "school-to-prison pipeline" as a direct competitor to the sports ecosystem. In Multnomah County, Oregon, Black youth are eight times more likely to have a criminal referral and twice as likely to be detained as White youth. Latino/a youth are more likely than White youth to experience a negative outcome at each decision point of the judicial process.

High school sports require specific GPA eligibility. However, Black and Latino/a students in Portland face significantly lower reading and math proficiency rates compared to their peers, according to the Oregon Department of Education. Muhammad notes that many youth play on AAU teams with no academic requirements throughout middle school, only to be barred from high school play once they fail to meet academic eligibility requirements. This sudden exclusion at age 14 or 15 can sever a young person's last tie to a supportive community structure through the school setting. By the teenage years, opportunities to play sports outside of school have significantly decreased.

Muhammad recognized that for many Black youth, sports must be part of a larger safety net. Basketball serves as an entry point, but the program's core is literacy, academic support and responsive programming.

Children from Y.O.U.TH with whom we spoke described Muhammad as more patient and understanding than many coaches. "Instead of yelling at kids or being rude, 'Oh, you can't do this, you need to go faster, you need to work out more, you're not in shape,' be more comforting like [Muhammad]," said one child. "Like, sit down and talk to them and don't yell at them."

Because many participants attend predominantly White schools, the basketball court represents one of the few spaces where they can fully embrace their cultural and personal identities. Mothers of participants report that they intentionally choose Y.O.U.TH over other programs to protect their children from the scrutiny and racism they face in mainstream sports environments.

"Their peers don't even have a clue about [the racism experienced] and don't understand, but it's like our kids have this extra layer they deal with," said a mom. "When we go places, we have to be cautious and we have to tell our kids, 'You've got to represent because they're looking at you. They're looking at everything you do.' And that's a lot."

IDEA: Loan adaptive gear and share facilities so kids with disabilities can try sports

Parents of children with disabilities with whom the Aspen Institute spoke praised how comprehensive the adaptive sports environment is in Portland. Some families explicitly choose to move or remain in Portland because of the quality of local medical care, supportive Oregon state funding that creates a reliable health safety net, and accessible adaptive sports opportunities.

But parents and children also reported being initially unaware of adaptive sports opportunities. One mother described information as “haphazard” and siloed across pockets of the community. Access relies heavily on word-of-mouth, medical provider recommendations or targeted hospital newsletters. Once a family successfully plugs into the disability community, resources flow more freely, but the initial phase feels insurmountable to many families.

Portland benefits from local organizations like Adaptive Sports Northwest (ASNW), which loans and rents equipment so athletes can try sports like wheelchair basketball, wheelchair rugby, goalball, power soccer, swimming, track and field, sit volleyball, pickleball, archery and cycling. Lacking a dedicated gym, ASNW relies on regional partnerships for facilities. ASNW Executive Director Jen Armbruster, a Paralympic gold medalist, notes that families often don’t know these programs exist and schools often fail to realize how easily sports can be modified for inclusion in PE.

Moving to Portland provided better medical care and adaptive sports for Adrian Zeddek, a 14-year-old wheelchair racer. His mom, Bethany, credits ASNW for fostering Adrian's hope. While Benson High School has been a positive experience for Adrian, bureaucratic barriers persist.

Despite the school possessing adaptive chairs and employing a PE teacher who also uses a wheelchair, Bethany said the district refused to accept liability for the equipment. Benson’s vice principal personally paid to rent chairs so Adrian could participate safely. Adrian has discovered a new purpose through sports, inspired by meeting Paralympians and trying hand cycling and adaptive scuba diving. He wishes Portland would create community days for people without disabilities to try adaptive sports and respect the necessary skills.

“You get a lot of attention and pity on what you can’t do,” Adrian said, “so it’s nice to be like, look what I can do.”

IDEA: Pair coach training with school summits on mental health and team culture

Oregon possesses a unique mentorship framework for coaches. The Oregon School Activities Association (OSAA) adopted Beyond the Scoreboard, an initiative by former athletic directors Tom Bendt and Pete Lukich. They started their work a decade ago to invest in coaches, who they felt were often overlooked by athletic directors focused mainly on logistics.

Recognizing that the existing national training course was often dry, they developed a more engaging Oregon-specific course for coaches. Funded by the OSAA Foundation, Beyond the Scoreboard annually targets a new set of schools of varying sizes and locations across the state for this additional support.

- Mandatory training: All first-year coaches must complete a two-hour 3D Institute course.
- Summits: Coaches engage in three-hour, in-person discussions regarding topics such as psychology, mental health and capturing athletes' hearts and self-worth.
- Culture building: Athletic directors (ADs) act as "state ambassadors," developing core values and intentional leadership rather than simply being managers of their departments.

Bendt and Lukich note that schools face challenges to continue the long-term follow-up after the initial pilot year, but some continue to do excellent work. As of 2025, two Portland-area high schools had participated (Ida B. Wells and Centennial). More local high schools could pursue pilot opportunities. In addition, Bendt and Lukich encourage schools to take these steps:

- Identify champions: ADs cannot do it themselves and must find coaches to lead cultural shifts.
- Form executive boards: Create coach-led groups to align schoolwide standards and meet regularly.
- Engage decision-makers: Persuade superintendents and school boards to fund professional development despite budget deficits.

IDEA: Subsidize tuition-free youth program from public court rentals and adult classes

Founded by Dr. Ernest Hartzog to diversify the exclusive sport of tennis, Portland Tennis & Education (PT&E) has served 18,000 youth over three decades. Tennis is very popular in Portland, 35% of youth surveyed by the Aspen Institute have played the sport at least once, with girls playing slightly more than boys. But local children who are Black (13%) and Latino/a (21%) have tried tennis at much lower rates than those who are White and Asian (44% each).

PT&E is not just a tennis clinic; it is an intensive afterschool and summer intervention. Participants receive over 1,000 hours of out-of-school support annually, including one-on-one tutoring and lessons in financial literacy and job interviews. The average child stays for more than five years, according to Campbell Glenn Garonzik, PT&E executive director. In 2026, the U.S. Tennis Association Foundation recognized PT&E as the National Junior Tennis & Learning Chapter of the Year (out of 272 chapters nationwide).

The financial model of PT&E is particularly noteworthy. PT&E operates out of the city-owned St. Johns Racquet Center, and revenue from public court rentals and adult classes directly subsidizes the tuition-free youth program. This creates a sustainable social enterprise model where affluent recreational players directly fund opportunities for underserved youth.

The results speak for themselves: PT&E maintains a 100% on-time high school graduation rate for its long-term participants (the 2025 graduation rate in Portland Public Schools was 83%).

IDEA: Create safe spaces in sports for queer and gender-expansive youth

Roller derby is popular in Portland, where the Rose City Rollers serve women, girls and gender-expansive individuals. Parents report that the sport provides a uniquely safe space for queer and gender-expansive youth that other sports lack.

Nationally, LGBTQ+ youth play sports at lower rates than their peers due to discriminatory policies and fear of harassment, according to The Trevor Project. The Williams Institute at UCLA School of Law estimates that 3% of U.S. youth ages 13 to 17 identify as transgender.

Rose City Rollers parents note that while roller derby is an expensive travel sport, it allows children to express their identity and use their pronouns without judgment. This experience often contrasts sharply with school environments.

“Little, tiny language shifts made a huge difference in their lives,” said one Rose City Rollers mother. “We started referring to our skaters as skaters, not as girls.”

IDEA: Host an annual summit uniting local leaders against rising pay-to-play costs

In recent years, Portland Community Football Club (PCFC), with support from groups like Active Children Portland and other local youth nonprofits, has discussed building a local youth sports coalition focused on equity. Their efforts bring together community leaders and public servants to challenge the “pay-to-play” status quo. The annual event focuses on access, belonging and systemic opportunities by promoting sports as a valuable tool to improve community health.

In 2025, PCFC’s second “Erase the Gap” event featured speakers such as State Representative Travis Nelson, People of Color Outdoors Executive Director Pamela Slaughter and representatives from the Portland Thorns, Friends of Baseball, Active Children Portland and North Portland Soccer Club. The 2026 event had conversations with leaders from Organización de Amigos, Y.E.S. Baseball, Active Children Portland and Multnomah Athletic Foundation.

Active Children Portland has provided free afterschool programming for the past 15 years, largely in Title I and east Portland schools. Active Children Portland serves K-8th graders with a mix of academic and athletic offerings, like soccer and basketball, using paid coach-mentors at school sites and collaboration with other youth-serving organizations.

Coalition building is difficult to start and sustain. PCFC Interim Executive Director Jerika Ferguson hopes that a dedicated entity will carry the administrative burden of organizing these coalitions rather than placing the labor on smaller nonprofits, like PCFC. However, Ferguson notes that these nonprofits should be asked and welcomed to join a coalition at the beginning.

Community leaders in Portland are in the early stages of building a coalition to increase access to sports and play for youth.

Jon Solomon is Research Director of the Aspen Institute's Project Play initiative.

Source: Aspen Institute Project Play projectplay.org

---

08 Policy and clubs

Is Your Program Welcoming New-to-Canada Participants? Seven Workbooks to Find Out

> **For coaches** If your club wants to reach newcomer families, the checklist questions about registration options, translated information and settlement agency links give you a concrete place to start.

"Open to everyone" is easy to write on a registration page. Whether a family that just arrived in Canada finds your program, signs up, and comes back the following week is another story.

And the stakes go well beyond sport. In a survey by the Institute for Canadian Citizenship, 87.3% of newcomers agreed that participating in activities where they feel comfortable and welcome increases their sense of belonging and connection to Canada.[1] The New-to-Canada Long-Term Development in Sport and Physical Activity Pathway (NLTD) notes that sport programs that prioritize inclusion can help create an environment where people who are new to Canada feel valued, supported, and more likely to build their futures here.

Creating that kind of environment in your own program takes time and planning, which is where the new NLTD Workbook Series comes in. Its seven practical workbooks pair key information from the NLTD with fillable spaces, so you can apply it directly to your own organization, program or community.

"The NLTD gives organizations the why and the what. These workbooks are about the how. Whether you run a club, a settlement agency, or a provincial [or territorial] sport organization, you can sit down with your team, work through a few pages, and leave with a first step you can take right away," said Kabir Hosein, Director of Strategic Initiatives at Sport for Life and co-author of the NLTD.

Here's what's inside each workbook.

1. Opportunities from Taking an NLTD Approach

Welcoming new-to-Canada participants benefits everyone involved. Organizations that support newcomers can see stronger social connections and better well-being among the people they serve, while sport and physical activity organizations can see growth in emerging sports, a larger talent pool, and improved retention.

The workbook also includes a 14-statement Checklist for Inclusion. It asks, for example, whether you offer multiple ways to register, whether information about your sport is available at local settlement agencies, and whether your staff, coaches, and volunteers include people who are new to Canada. By answering yes, no or unsure, you'll see where your organization stands today.

2. Awareness and First Involvement

If people don't know your program exists, where it is, or how to access it, they're less likely to take part, and if their first experience is marked by discrimination, a lack of support, or limited openness, they may not come back.

Together, these two pre-stages set the foundation for meaningful and sustained engagement. The workbook's recommendations include:

- make the next steps after a try-it day clear and barrier-free, including transportation, or at least clear directions;
- keep leader talk to a minimum, and get participants engaged early and often; and
- start each session with a connection activity.

The full NLTD adds a useful reminder for coaches: depending on the culture, direct eye contact can be a sign of confidence and engagement, or it can be seen as disrespectful or confrontational. Understanding a participant's cultural background, values, and beliefs helps lead to effective communication and a learning environment that supports holistic development.

3. The Relationship Between the NLTD and the LTD Framework

There's no single way into sport and physical activity: a child might enter at Active Start or FUNdamentals, while an adult who is new to Canada might begin in Active for Life. Either way, the key is a great first involvement.

To help you find your own place in that pathway, the workbook explains how the NLTD builds on the Long-Term Development in Sport and Physical Activity (LTD) framework, then asks which stages and pre-stages you support, directly or through partners, and where the gaps are. You'll also map the journey of one participant, real or imagined, from arrival to their next steps.

4. Barriers and Solutions to a Welcoming, Inclusive Experience

Time, money, culture, information, communication and discrimination are the six barriers covered here. For each one, you'll see what it looks like in practice, along with solutions such as:

- drop-in programs at different times and days;
- a free trial period before membership, plus grants from KidSport and Canadian Tire Jumpstart Charities for eligible participants;
- materials in languages other than English and French that reflect your community; and

- a free resource designed to address and combat racism and discrimination within the sports community, such as the Play Fair: Anti-Racism in Sport Toolkit.

A self-assessment table then lets you mark whether each barrier is present in your program (yes, no or unsure) and the first action you'll try. For more detail on each barrier, refer to Sport for Life for Every New-to-Canada Participant 2.2.

5. Many Journeys: Examples

Alphonso Davies was born in a refugee camp in Ghana and developed his talent through local community programs and grassroots soccer before becoming one of the world's leading left-backs. The full NLTD adds that, after his family settled in Edmonton, he first played organized soccer at Free Footie, a free after-school program for underserved children.

Other stories are about building opportunities in local communities. Dacious Richardson arrived in Canada as a refugee, used soccer to cope with grief and loneliness, and now supports marginalized youth through coaching, mentorship, and free sport opportunities. Rishav Sharma moved to Fort St. John, found no competitive badminton community, and founded the Peace Region Badminton Club in 2019.

Their stories sit alongside five others from first- and second-generation Canadians who have made an incredible impact through sport, followed by a question for you: who in your community has a story worth celebrating?

6. Stage-by-Stage Considerations

Engaging new-to-Canada participants calls for thoughtful, compassionate, and inclusive approaches at each stage of development, especially since many of them have had their lives interrupted before they ever reach your program. That's why the considerations go stage by stage, from Active Start to Active for Life, and include:

- visuals and demonstrations in FUNdamentals, so instructions work across languages;
- mental health and wellness support in Train to Train, since youth may be dealing with stress related to adjustment, academics, and competitive sport; and
- help with visas for athletes in Train to Win.

Each stage ends with three prompts (what you already do well, one consideration to act on, and what it could look like in your program), and a Community Scan template helps you map the good people, good places, and good programs in your community.

7. Generating Revenue to Implement the NLTD

When the NLTD was being developed, focus group participants said they wanted to welcome people who are new to Canada into sport and physical activity, but didn't know how to fund it. This workbook is a direct response.

You'll find revenue ideas for national, provincial and territorial, and local sport organizations, as well as for organizations that support newcomers, including:

- government grants,
- sponsorship from companies with a strong newcomer client base,
- community events co-hosted with local cultural groups,
- joint funding applications across sectors, and
- “Adopt-a-Team” or “Sponsor-a-Newcomer” campaigns.

It closes by asking you to name your first step, who owns it, and a target date.

Where to Start

Each workbook opens with the same question: which workbook will you start with, and what do you want it to help you change in your program or community?

If you support newcomers as they settle, Awareness and First Involvement will help you connect the people you work with to sport and physical activity. If you run a club or community program, Barriers and Solutions to a Welcoming, Inclusive Experience lets you assess your program barrier by barrier. Provincial, territorial, and national sport organizations will find revenue-raising strategies at their respective levels to implement the NLTD. And if you only have time for one thing this week, fill out the Checklist for Inclusion.

The full NLTD also goes beyond participants. It includes a checklist for recruiting coaches and officials who are new to Canada, including how to recognize officiating experience and certifications earned in their home countries, guidance on bringing people who are new to Canada onto boards, and a section on Indigenous relationships, which notes that some newcomers may be Indigenous to their home country.

Inclusion is non-negotiable, and these workbooks are a practical place to start.

[1] Institute for Canadian Citizenship, “The Newcomer Perspective: Isolation after Covid, but Accessing Recreational Activities Can Help,” 2023, https://forcitizenship.ca/article/canoo-survey-newcomers-isolated-recreational-activities/.

Source: Sport for Life sportforlife.ca

HOBBIT WEEKLY

Ideas you read, used in your next session.

Tell Hobbit your team's age and what you want to work on this week, and it writes a complete session from one sentence, with a diagram for every drill.

Scan for the web edition and every past issue