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Talent Development and the Attainment of Excellence in High-Performance Sport: A Systematic Review of Developmental, Psychological, Environmental, and Organisational Factors

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ADMINISTRATIVE INFORMATION

Support - No support.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202690110**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 September 2026 and was last updated on 24 September 2026.

INTRODUCTION

Review question / Objective To critically synthesise empirical evidence on factors associated with talent development and progression towards high-performance and elite sport, integrating developmental and training pathways, psychological and well-being characteristics, socio-cultural and environmental influences, performance-support factors, and coaching, organisational, and systemic conditions.

Rationale The development of talent and attainment of excellence in high-performance sport are complex processes shaped by interactions between individual characteristics, developmental experiences, and the environments in which athletes progress. Despite growing recognition of the dynamic and multidimensional nature of talent, the evidence remains fragmented across different sporting contexts and explanatory domains. Thus, it is aimed to critically synthesise empirical evidence on factors associated with talent

development and progression towards high-performance and elite sport, integrating developmental and training pathways, psychological and well-being characteristics, socio-cultural and environmental influences, performance-support factors, and coaching, organisational, and systemic conditions.

Condition being studied Talent development and progression towards high-performance and elite sport, integrating developmental and training pathways, psychological and well-being characteristics, socio-cultural and environmental influences, performance-support factors, and coaching, organisational, and systemic conditions.

METHODS

Search strategy The review was conducted in accordance with the PRISMA 2020 statement. Web of Science Core Collection and Scopus were systematically searched for peer-reviewed empirical studies published from 2014 onwards till

July 2026 in English, Spanish, or Portuguese. The searches identified 1,245 records, of which 871 remained after duplicate removal and 185 proceeded to full-text assessment. Eligibility was established using an adapted PICOS framework. Methodological quality and risk of bias were assessed using design-specific Joanna Briggs Institute critical appraisal tools. Owing to substantial methodological and conceptual heterogeneity, findings were integrated through structured narrative synthesis.

Participant or population Eligible studies included athletes participating in organised competitive sport at elite, international, Olympic, professional, semi-professional, national, or recognised high-performance levels. Studies involving youth, junior, developing, academy, or sub-elite athletes were also eligible when they explicitly examined talent development, progression towards elite performance, transitions between developmental stages, or factors associated with subsequent high-performance or Olympic participation.

No restrictions were imposed on sex or age. Studies involving different age groups were eligible provided that the population and research question were directly relevant to the development or attainment of sporting expertise. Studies exclusively involving recreational participants, general physical activity populations, physical education students, or non-athletic populations were excluded unless athlete-specific data meeting the eligibility criteria could be extracted separately.

Studies involving coaches, practitioners, parents, administrators, or other stakeholders were eligible only when their data directly concerned the identification, development, progression, support, or performance of athletes within high-performance pathways.

Intervention Relevant exposures were conceptually grouped into the following domains: (a) developmental and training factors, including practice history, training volume and structure, competitive exposure, specialisation or diversification, developmental trajectories, career transitions, and talent identification or development processes; (b) psychological factors, including motivation, resilience, self-regulation, coping, confidence, athletic identity, psychological skills, and well-being; (c) socio-cultural and environmental factors, including family and parental support, coach-athlete relationships, peer influences, socio-economic conditions, birthplace or community characteristics, and access to training opportunities; (d) organisational and

systemic factors, including talent development programmes, coaching structures, multidisciplinary support, club or federation systems, institutional resources, and high-performance policies; and (e) performance-support factors, including recovery, sleep, training monitoring, and other variables when explicitly examined in relation to expertise or long-term performance development.

Comparator Where available, relevant comparisons included differences according to competitive level (e.g., elite vs. sub-elite), developmental stage (e.g., junior vs. senior), performance trajectory, sex, sporting discipline, training or developmental environment, selection status, or other theoretically relevant contextual characteristics. Within-athlete comparisons across developmental stages were also considered eligible.

Study designs to be included Observational.

Eligibility criteria Eligible studies included athletes participating in organised competitive sport at elite, international, Olympic, professional, semi-professional, national, or recognised high-performance levels. Studies involving youth, junior, developing, academy, or sub-elite athletes were also eligible when they explicitly examined talent development, progression towards elite performance, transitions between developmental stages, or factors associated with subsequent high-performance or Olympic participation.

Information sources Published studies in WOS and SCOPUS.

Main outcome(s) To be eligible, studies were required to report outcomes directly related to talent development, progression towards expertise, or high-performance sport. Outcomes included, but were not limited to, attainment or maintenance of elite, international, professional, or Olympic status; progression through recognised talent pathways; competitive performance or ranking; transition from junior to senior competition; retention within or dropout from high-performance pathways; development of expertise-related skills or competencies; and indicators of sustained performance development.

Studies examining psychological, social, environmental, organisational, or recovery-related outcomes were eligible when these outcomes were explicitly connected to talent development, athlete progression, expertise, or high-performance participation.

Because the review aimed to synthesise evidence across heterogeneous methodological traditions,

studies were not required to demonstrate a statistically significant association between an exposure and an outcome.

Quality assessment / Risk of bias analysis The Joanna Briggs Institute (JBI) critical appraisal tools were used as the primary framework for quantitative observational studies.

Strategy of data synthesis Given the anticipated and observed heterogeneity in study designs, sporting disciplines, participant characteristics, developmental stages, exposures, outcome definitions, and measurement approaches, a quantitative meta-analysis was not considered appropriate. The evidence was therefore integrated using a structured narrative synthesis designed to identify patterns of convergence, divergence, and uncertainty across the included studies while preserving relevant methodological and contextual differences.

Studies were initially organised according to the principal domain addressed and subsequently compared across populations, sporting contexts, developmental stages, competitive levels, and methodological designs. Based on the conceptual framework of the review, evidence was synthesised across five interrelated domains: (1) developmental pathways and training exposure; (2) psychological and well-being factors; (3) socio-cultural and environmental influences; (4) physical performance, recovery, and performance-support factors; and (5) coaching, organisational, and systemic influences. Cognitive and perceptual factors were considered within the most relevant domain or reported separately when they constituted a distinct component of the evidence base.

Within each domain, quantitative findings were synthesised according to the direction, magnitude, and consistency of reported associations or group differences. Effect estimates and measures of uncertainty were retained when reported by the original studies; however, no attempt was made to statistically pool results when substantial clinical, conceptual, or methodological heterogeneity precluded meaningful aggregation. Findings based solely on statistical significance were interpreted cautiously, with greater emphasis placed on the magnitude and consistency of observed effects and on the methodological characteristics of the contributing studies.

Qualitative evidence was integrated thematically using the themes and interpretations reported in the primary studies. Recurring concepts, contextual influences, and developmental mechanisms relevant to talent development and high-performance progression were compared

across studies and examined for convergence or divergence with quantitative findings. For mixed-methods studies, findings from both components were considered jointly where their integration contributed to understanding the developmental process under investigation.

The synthesis also examined potential sources of heterogeneity, including sporting discipline, sex, age or developmental stage, competitive level, geographical and socio-cultural context, and study design, whenever sufficient information was available. Particular attention was given to whether similar developmental factors were associated with different outcomes across junior and senior stages or across distinct high-performance environments. Methodological quality and risk-of-bias considerations were incorporated into the interpretation of the evidence rather than used as numerical weights. Findings from studies presenting important methodological limitations were interpreted more cautiously, particularly when they represented isolated results or conflicted with evidence from methodologically stronger studies. Conversely, greater confidence was placed in findings that were replicated across independent studies, populations, sporting contexts, or methodological approaches.

The final synthesis was therefore intended not merely to catalogue factors associated with sporting excellence, but to examine how developmental, psychological, environmental, performance-support, and organisational influences interact across the pathway towards high-performance and elite sport. Particular emphasis was placed on identifying consistent patterns, contradictory findings, under-researched domains, and methodological limitations that may inform future longitudinal and multidimensional research.

Subgroup analysis Search results and study selection

Characteristics of the included studies

Methodological quality and risk-of-bias assessment

Developmental pathways and training exposure

Psychological and well-being factors

Socio-cultural and environmental influences

Performance-support, recovery, cognitive, and perceptual factors

Coaching, organisational, and systemic influences

Cross-domain integration and methodological patterns.

Sensitivity analysis Not applicable. No formal sensitivity analysis was performed because the review employed a qualitative/narrative synthesis rather than a quantitative meta-analysis.

Language restriction English.

Country(ies) involved Portugal and Spain.

Keywords talent development; sporting excellence; high-performance sport; elite athletes; developmental pathways; talent identification; athlete development; systematic review.

Contributions of each author

Author 1 - Alberto Rocha - Author 1 drafted the manuscript, made the analysis and conducted the research in databases.

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