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REVIEW ARTICLE



A systematic review of interventions for developing athletes as leaders

Radhika Butalia^a, Kathi-Sue Rupp^a, Krizia Tuand ^b, Filip Boen ^a,
Niklas K. Steffens ^c, Lies Bongaerts^a, Todd M. Loughhead^d, Korneel Schepers ^a,
Marie-Laure Hendrickx^a and Katrien Fransen ^a

^aDepartment of Movement Sciences, KU Leuven, Leuven, Belgium; ^bKU Leuven Libraries – 2Bergen - Learning Centre Désiré Collen, KU Leuven, Leuven, Belgium; ^cSchool of Psychology, The University of Queensland, Brisbane, Australia; ^dDepartment of Kinesiology, University of Windsor, Windsor, Canada

ABSTRACT

This systematic review synthesises evidence on athlete leadership development interventions. A search across eight online databases identified 36 studies spanning descriptive, qualitative, quantitative, and mixed-methods designs. Findings highlight a rapidly growing field in which interventions target not only formal athlete leaders (e.g., team captains) but also informal athlete leaders and athletes without designated leadership roles. Interventions focused on developing a broad range of leadership behaviours, with a strong emphasis on interpersonal skills. Most interventions prioritised leader development, with durations ranging from brief sessions lasting a few hours to multi-year programmes. Study authors (including some trained sport psychologists) and coaches were the primary facilitators. Interventions were predominantly delivered in team sports, with most studies based in the United States. The methodological quality of studies examining intervention effectiveness was mixed. While qualitative studies scored well on critical appraisal and participants reported improvements in their leadership as well as in individual and team outcomes, quantitative studies – typically used to establish causality – performed relatively poorly. Consequently, quantitative evidence for intervention effectiveness should be interpreted with caution. Nonetheless, their findings suggest that the most effective interventions targeted the team's best athlete leaders (whether formal or informal), focused on leadership rather than leader development, were grounded in the identity leadership framework, and lasted three to five months. Moreover, coach-delivered interventions outperformed those led by study authors, including those with sport psychology training. Overall, our findings provide a foundation for advancing research and practice in athlete leadership development.


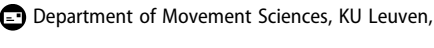
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The question of what distinguishes the best sporting teams from the rest remains a central research topic in sport psychology. Group processes that lie at the heart of the answer to this question include supportive team behaviour, communication, performance

CONTACT Radhika Butalia  Radhika.butalia@kuleuven.be 

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feedback, and, most importantly the key topic of this paper, leadership (Salcinovic et al., 2022) – defined by Northouse (2021, p. 5) as “a process whereby an individual influences a group of individuals to achieve a common goal.”

Traditionally, leadership in sports teams was thought to be mainly in the hands of the coach (Price & Weiss, 2011). However, researchers have shown that athletes within the team also play a critical role in providing leadership (e.g., Cotterill & Fransen, 2016). Such athletes, known as athlete leaders, are individuals in a team who hold either formal or informal leadership roles and enhance their team members’ willingness and ability to pursue common goals (Loughead et al., 2006). To be more specific, formal athlete leaders are athletes who are officially recognised as leaders and carry out pre-determined leadership responsibilities (e.g., by serving as captains or assistant captains). In contrast, informal athlete leaders are those who do not hold formal leadership positions but have gained their leadership status through everyday behaviour and interactions with their teammates (e.g., by giving players clarification on the coaches’ instructions or providing emotional support to athletes dealing with a performance slump; Loughead et al., 2006).

Regardless of their (formal or informal) leadership status, athletes are also found to occupy one or several of four leadership roles in their teams by serving as a task leader (i.e., providing tactical and technical advice); a motivational leader (i.e., encouraging teammates); a social leader (i.e., promoting a positive team atmosphere); and/or an external leader (i.e., representing the team to external entities like the board, fans, and press; Cotterill et al., 2022; Fransen et al., 2014).

Previous research showed that having high-quality athlete leaders on a sports team is an important determinant of a variety of individual and team-oriented outcomes. For instance, higher quality athlete leadership (on each of the four leadership roles) has been found to be positively related to team-oriented outcomes such as cohesion, collective efficacy, task-oriented peer motivational climate, social connectedness, team identification, and team performance (Fransen et al., 2015; Fransen et al., 2016; Fransen et al., 2020; López-Gajardo et al., 2021; Price & Weiss, 2011; Vincer & Loughead, 2010). Higher quality athlete leadership has also been shown to be associated with higher levels of pro-social behaviour, commitment to team goals, shared purpose, sacrifice for teammates (i.e., group members willingly initiating action or giving up their advantages for the sake of others), and physical and mental health (Fransen et al., 2020; Fransen et al., 2020; López-Gajardo et al., 2021). More recently, research has shown that high-quality athlete leadership – both formal and informal – plays a critical role in shaping team identification (Butalia et al., 2025a; Butalia et al., 2025b). In turn, stronger team identification enhances cohesion, which drives both team and individual performance, while also fostering social support, which promotes athlete mental health. These effects are evident across countries and cultures, highlighting the universal significance of athlete leadership.

Experimental research has corroborated the abovementioned cross-sectional evidence. For example, research in which the team confidence of athlete leaders was manipulated (i.e., by expressing team confidence, providing encouragement, and positive feedback) indicated that when athlete leaders expressed high (as opposed to low or neutral) confidence, team members (a) felt more confident about their team’s ability to succeed, (b) identified more strongly with the team, (c) were more intrinsically motivated, and (d) performed better (Fransen et al., 2015; Fransen et al., 2016; Fransen et al., 2018). In

addition, it was found that when the athlete leader expressed low team confidence, the performance and intrinsic motivation of team members decreased. Together, these studies demonstrate that while more confident athlete leaders can boost team functioning and performance, less confident leaders can hinder these processes.

Given the importance of athlete leadership quality, it is essential to explore how these qualities can be developed. Indeed, research aimed at doing this has surged in the last decade, resulting in the development and testing of numerous athlete leadership development interventions (e.g., Duguay et al., 2016; Mertens et al., 2021; Voight, 2012). However, this evidence remains fragmented: studies differ widely in design, scope, and quality, making it difficult to identify their defining characteristics and to draw conclusions about what works, under what conditions, and why.

A first attempt to consolidate knowledge in this area was provided by Cotterill and colleagues (2022), who conducted a narrative review of athlete leadership development. Their work offered a valuable starting point by describing contemporary approaches and identifying broad trends – such as the prevalence of face-to-face delivery, a focus on team sports, and variability in intervention duration. While informative, the review was primarily descriptive and, in line with the limitations often associated with narrative approaches, did not provide an integrative or systematic evaluation of the state of the art. In particular, it did not set out guiding research questions and offered limited transparency in its methodology (e.g., the eligibility criteria for including studies were not specified), which reduced the coherence and replicability of its conclusions. In addition, the absence of a systematic search strategy raises the possibility that the studies identified for inclusion were unrepresentative or provided incomplete coverage of the available evidence (Pae, 2015). The exclusion of unpublished work also means the review may have been affected by publication bias (Torgerson, 2006). Finally, the review did not include a formal appraisal of study quality, which is an important step in determining the strength of evidence, particularly when assessing intervention effectiveness (Tod et al., 2022).

To move the field forward, there is a need for a systematic review that synthesises the available interventions, evaluates their effectiveness and quality, and provides insights of both practical and theoretical relevance. Our review addresses this need by clarifying how athlete leadership development interventions have been designed, delivered, and implemented, and by drawing lessons from their outcomes and study quality.

Practically, the review can serve as a resource for coaches, sport psychologists, programme designers, and sport organisations by identifying features of interventions that are most promising and highlighting common pitfalls to avoid. Theoretically, it allows us to assess the extent to which existing models of athlete leadership development are supported by evidence, while also providing researchers with a consolidated snapshot of the gaps in the field and clear directions for future inquiry. Accordingly, the research questions pursued within our review are:

- (1) What are the key design elements (e.g., target audience, content, intervention duration) and delivery methods (e.g., intervention provider) that characterise athlete leadership development interventions?
- (2) In which contexts (e.g., level and type of sport) are athlete leadership development interventions delivered?

- (3) What is the quality of the available evidence in terms of the research design of athlete leadership development interventions?
- (4) What does the evidence regarding the effectiveness of athlete leadership development interventions suggest?

This study is underpinned by a pragmatic philosophy, which rejects the rigid dichotomy between positivism (the assumption of a single, objective reality best captured through quantitative methods) and constructivism (the assumption that reality is socially constructed and best understood through qualitative inquiry; Feilzer, 2009). Instead, pragmatism emphasises methodological flexibility, advocating the use of approaches – quantitative, qualitative, or both – that are most suitable for addressing the research question (Creswell & Creswell, 2017).

Materials and method

Protocol and registration

Our protocol was based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for Scoping Reviews (PRISMA-ScR; Peters et al., 2015) guidelines and was prospectively registered on the Open Science Framework Registries. Any divergences from the pre-registration are documented on OSF, where all study materials (i.e., pre-registration, final data extraction form, supplemental materials, and study data) are also available [https://osf.io/wyrtz/overview?view_only=509dbbc06049482fb2da63d5ca8b9205].

Eligibility criteria

Eligibility criteria were established based on prior literature and expert consultation. More specifically, we included studies focussing on describing and/or implementing a structured intervention to develop athlete leadership in competitive sports. We included both published and unpublished studies that were written in English. The decision to include only English-language studies was made due to practical constraints.

Next, to ensure conceptual coherence among the included studies and facilitate comparison, we applied the following exclusion criteria. First, studies were excluded if they did not explicitly state that they aimed to describe and/or deliver an athlete leadership development intervention. This criterion was necessary to ensure clarity regarding the study's intent; without an explicit statement from the authors, it would have been difficult to determine whether the study focused on athlete leadership development or if leadership-related outcomes emerged incidentally as part of a broader research objective. Second, we excluded studies that examined the natural development of athlete leadership (e.g., measuring leadership before and after a season without any targeted intervention), as it would have been difficult to determine whether changes were due to undocumented intervention strategies or natural progression. Third, studies that primarily focused on character or value development, with leadership development as a secondary component, were excluded. In these cases, isolating the aspects of the intervention that specifically targeted leadership development, as opposed to character development, would have been challenging, and including such studies would have diluted this review's focus. Finally, we also

excluded studies where athlete leadership was developed in controlled lab-based environments, as our focus was on interventions with high ecological validity.

All types of articles were initially considered in this review to capture a wide range of perspectives on athlete leadership development. These included empirical studies (e.g., experimental and observational research), theoretical papers, conference proceedings, reviews, book chapters, and practitioner-focused sources (e.g., coaching manuals, magazine articles). During full-text screening, however, we found that research-focused review articles ($n = 13$) and secondary data sources ($n = 5$; e.g., conference proceedings, books or book chapters) largely drew upon primary intervention studies that were already included in our review. While these sources sometimes offered additional description or commentary, they did not provide independent evidence of intervention design or effectiveness. To avoid duplication, we therefore excluded them from the main synthesis. Nevertheless, to ensure no relevant intervention studies were overlooked, we manually screened the reference lists of these secondary sources ($n = 18$).

No date filters were applied to ensure comprehensiveness, as this was the first review to amalgamate insights on the state of the field in athlete leadership development.

Information sources

To identify potentially relevant documents, five bibliographic databases were searched: Web of Science Core Collection (SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED); SportDiscus (via EBSCO), PubMed (including MEDLINE); Embase (via Embase.com); and Cochrane Library (CENTRAL and CDSR). The bibliographic database search was supplemented by a grey literature search on three platforms, including Open Access Theses and Dissertations (oatd.org), Google Scholar, and ProQuest Central filtering on theses and dissertations.

Articles that were included in this review were subjected to forward and backward citation searching procedures. Forward citation searching was conducted on Google Scholar, while backward citation searching was done by manually scanning the reference lists of included articles. In addition, we manually scanned the reference lists of all potentially relevant review articles and secondary data sources (shortlisted after full-text screening) that did not fulfil inclusion criteria of this review. As a final step, we contacted the authors of the articles included in this review to ask if they had authored any other relevant studies to ensure we had not overlooked any of their work. [Table 1](#) contains the relevant dates for each of the aforementioned information sources.

While the institutional library of this manuscript's first author provided access to key journals, we were still unable to obtain numerous identified articles. To address this, we first contacted the authors of the articles directly. If this approach was unsuccessful, we then consulted the first author's institutional library to determine whether any of these papers were publicly available. Despite these efforts, 54 articles remained inaccessible without incurring additional costs, which was not feasible due to limited funding. These consisted of 21 books or book chapters (all secondary sources that would have likely been excluded anyway), five master's theses (one of which would have been excluded as it was also a secondary source), 26 newsletters or magazine articles (for eight of these, even the authors who wrote them no longer had access), one journal article from *Sport, Business, and Management*, and one miscellaneous text.

Table 1. Information retrieval dates and search strategy DOI's.

Database name	Date the search was conducted	Search strategy DOI
Web of Science Core Collection (SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED)	01/05/2021	https://doi.org/10.1079/searchRxiv.2022.00013
SportDiscus (via EBSCO)	01/05/2021	https://doi.org/10.1079/searchRxiv.2022.00039
PubMed	01/05/2021	https://doi.org/10.1079/searchRxiv.2022.00040
Embase (via Embase.com)	01/05/2021	https://doi.org/10.1079/searchRxiv.2022.00045
Cochrane Library (CENTRAL and CDSR)	01/05/2021	https://doi.org/10.1079/searchRxiv.2022.00049
Open Access Theses and Dissertations	02/06/2021	https://doi.org/10.1079/searchRxiv.2022.00046
Google Scholar	21/05/2021	https://doi.org/10.1079/searchRxiv.2022.00048
ProQuest Central (filtering on theses and dissertations)	28/05/2021	https://doi.org/10.1079/searchRxiv.2022.00047
Forward and backward citation searching	23/03/2022–25/03/2022	
Manual scanning of review articles	27/03/2022–30/03/2022	
Retrieval of papers by contacting authors of articles included in this review	11/04/2022–25/04/2022	

Search

The first author of this manuscript drafted search strategies for all databases, which were reviewed by an experienced librarian. These searches are available on SearchRxiv (CABI Digital Library) via the links provided in Table 1. While developing the search strategy for the bibliographic databases, the main concept of “athlete leadership development in sport” was split into two parts: “athlete leadership” (i.e., concept 1) and “sport” (i.e., concept 2).

Thereafter, the sports psychology literature was reviewed to identify synonyms for athlete leadership (concept 1). For the second concept (i.e., sport), a comprehensive list of sports was created using SportDiscus, PubMed, Embase, Cochrane Library, and sport-related websites. Following this, researchers specialising in athlete leadership ($n = 3$) were consulted for feedback on the relevance of our free text terms.

Next, database-specific thesaurus terms were combined with the free text terms using an “OR” Boolean operator for each of the two concepts. Concepts 1 and 2 were then combined using an “AND” Boolean operator to ensure the relevance of the search. Given its sport-specific nature, the SportDiscus search strategy only consisted of concept 1. Moreover, a simplified search strategy for grey literature databases was also created. Whenever possible, filters were included to restrict the search to English.

Selection of evidence sources

Following the search, the results were exported to Endnote X9 (Clarivate) and subjected to a de-duplication procedure (as described by Bramer et al., 2016). Records were then imported to Rayyan (a web and mobile screening app; Ouzzani et al., 2016), where reviewers (i.e., two reviewers for the bibliographic databases and one for the grey

literature databases) independently screened titles and abstracts, excluding records that did not meet the eligibility criteria.

Records deemed suitable for inclusion, including those identified through forward and backward citation searching and those obtained from authors, were subjected to full-text screening by two reviewers. Disagreements between reviewers at all stages were resolved through discussion. When the reviewers were unable to reach an agreement, which only happened for one record, a third reviewer was assigned to read the document and decide whether it should be included or excluded from this study.

Data extraction and data items

The first author developed the data extraction form (on Microsoft Word) with input from all co-authors. This form was piloted (on Microsoft Excel) by two reviewers independently to ensure consistency and accuracy; it was modified iteratively throughout the data extraction process. The data extraction was completed by one reviewer and checked for completeness and accuracy by a second reviewer.

Critical appraisal

The quality of the evidence was assessed using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018). We chose this appraisal tool (see Table 4 notes for the full MMAT criteria) as it is, to our knowledge, the only tool specifically designed to assess qualitative, quantitative, and mixed-method studies within a single, standardised framework. Moreover, the MMAT was specifically developed to address the challenges of appraising mixed-method systematic reviews (Hong et al., 2018) and has demonstrated reliability and validity as an appraisal tool (Hong et al., 2019; Pace et al., 2012).

Appraisals were performed by the first and eighth authors of this paper. Both reviewers independently appraised each paper against the quality criterion without any discussion. After completing this process, they compared their ratings to determine whether they were in agreement. In cases where their ratings did not match, the reviewers discussed their reasoning and (if necessary) re-examined the papers. Consensus was achieved in all cases through this process.

A study was appraised only if it passed the MMAT screening criteria, meaning that reviewers answered “Yes” to both of the following: (a) are there clear research questions and (b) do the collected data allow to address the research questions. In critically appraising each qualitative and quantitative study, reviewers answered five questions, responding with “Yes”, “No”, or “Can’t tell”. For mixed-methods studies, these same judgments were applied to evaluate five key questions across the qualitative, quantitative, and mixed-method aspects of each study.

We also assigned each study an overall quality score based on the number of appraisal criteria that were met (Hong, 2022). A study that received a “Yes” for 1 out of 5 criteria scored 20%, with each additional “Yes” increasing the score by 20% (i.e., 2 criteria = 40%, 3 criteria = 60%, 4 criteria = 80%, and all 5 criteria = 100%). For mixed-method studies, however, the overall quality score could not exceed that of its weakest aspect (Hong, 2022). For example, if a mixed-method study’s qualitative aspect scored 100% on the MMAT, the quantitative aspect 40%, and the mixed-methods aspect 60%, the overall score would be 40%.

While overall quality scores provide a summary measure, they have limitations, including oversimplification of methodological nuances, arbitrary cut-offs, and failure to account for the relative importance of different appraisal criteria (Tod et al., 2022). To address these concerns, we have provided a detailed appraisal table (see Table 4), which presents individual checklist evaluations for each study. Readers can use this table to identify which appraisal items they consider more or less important and interpret them in conjunction with the overall quality score for a more nuanced assessment.

Results

A search across five bibliographic and three grey literature databases yielded 5,380 articles. After removing duplicates, 4,234 records underwent title and abstract screening, leading to 171 reports being sought for retrieval, of which 124 were retrieved. Full-text screening of these resulted in 27 articles meeting the eligibility criteria.

Furthermore, an additional 46 records were identified via contact with study authors ($n = 54$) and citation searching. Of these, 26 records were sought for retrieval, and 19 were retrieved. After full-text screening, nine reports were found to be eligible. In total, 36 articles were included in this review. Figure 1 presents the PRISMA-ScR flowchart, outlining the selection process and reasons for record exclusion (Tricco et al., 2018). Moreover, Figure 2 shows a steady rise in articles on developing athletes as leaders, peaking in 2020.

General study characteristics

About 75 percent ($n = 27$) of the included articles were published in peer-reviewed journals. Unpublished theses ($n = 7$; 19.44%) and magazine articles ($n = 2$; 5.55%) made up a

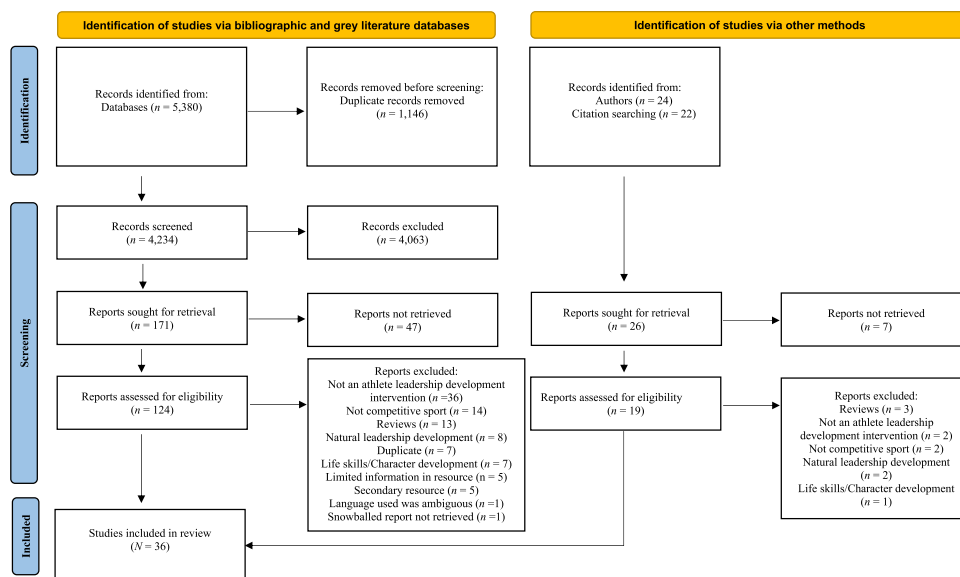


Figure 1. PRISMA-ScR flow-chart.

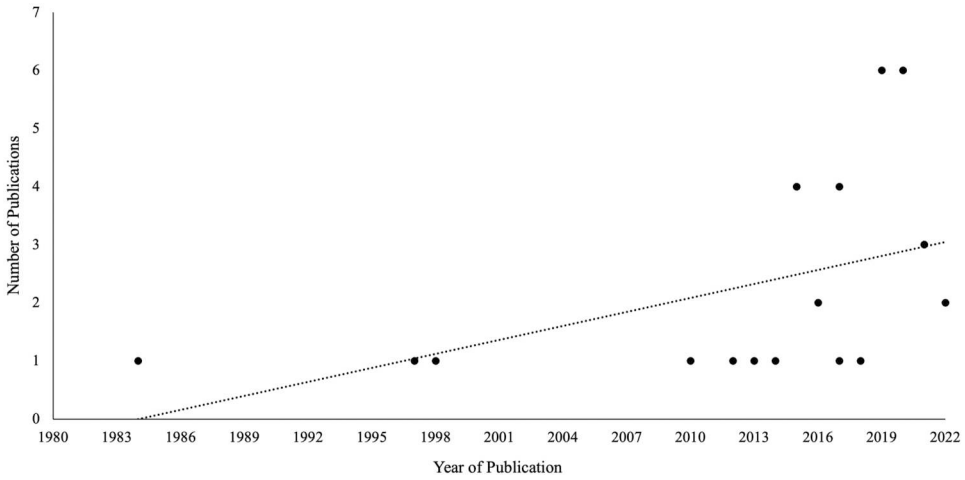


Figure 2. Timeline of athlete leadership development intervention publications.

relatively smaller proportion of the included articles. Overall sample information of the articles can be viewed in Appendix 1.

Figure 3 depicts the nomenclature in the field of athlete leadership development and the frequency with which each of the terms listed was used across studies. The studies focused on athlete leader(ship), team captain(s), formal leader(ship), student-athlete leader(ship), shared leader(ship), and peer leader(ship). Limited studies ($n = 13$) explicitly

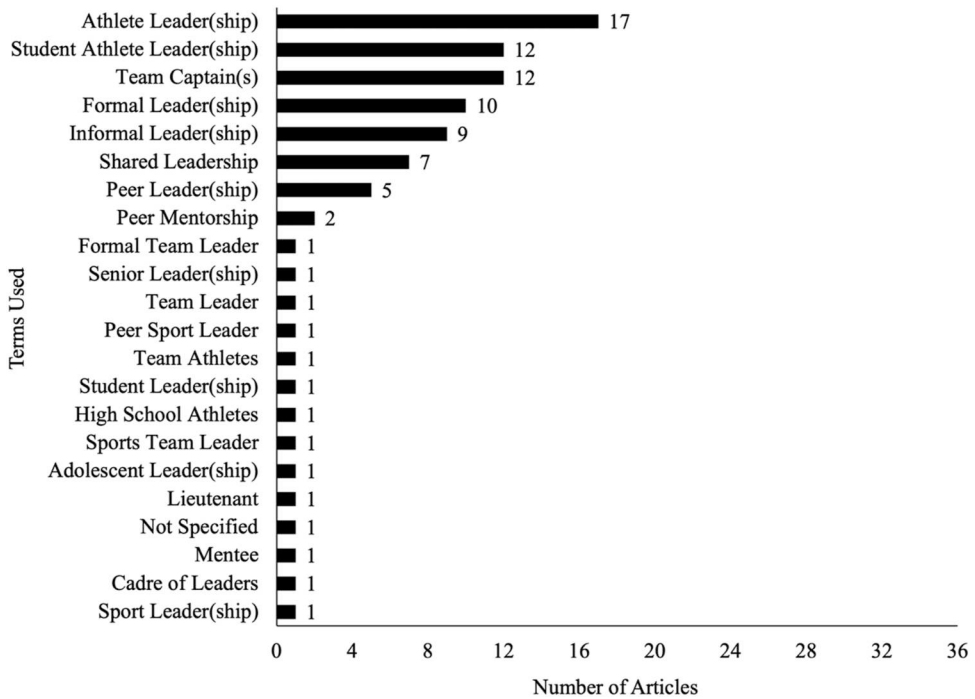


Figure 3. Nomenclature in the field of athlete leadership development.

define the terms they used, with definitions of athlete leader(ship), formal leader(ship), informal leader(ship), and sport leader(ship) conceptually corresponding with aspects of Loughhead et al.'s (2006) definition of athlete leadership. The studies also defined shared leadership aligned with the definition provided by Zhu et al. (2018). According to these definitions, athlete leadership refers to the formal and/or informal leadership exerted by an athlete within a team, while shared leadership refers to the distribution of leadership in a team, which can vary from leadership provided by two individuals to leadership provided by all team members.

RQ 1: Design and delivery characteristics of the interventions

Intervention design

Table 2 presents detailed information on intervention design.

Target. Most interventions aimed to develop the leadership of athletes from different teams (33.33%), followed by athletes from the same team (25%), and formal athlete leaders from different teams (16.66%).

Content. Interventions mostly focused on enhancing individual leaders' intrapersonal skills (i.e., leader development), while 33.33% aimed at developing the interpersonal

Table 2. Target, content, and duration of athlete leadership development interventions.

Target of interventions	n/36 (%)
Target	
Athletes (different teams)	12 (33.33)
Athletes (same team)	9 (25)
Formal athlete leaders (different teams)	6 (16.66)
Formal athlete leaders (same team)	3 (8.33)
Best athlete leaders on the team (regardless of their leadership status; intervention was delivered to the entire team)	3 (8.33)
Formal and informal athlete leaders (same team)	1 (2.77)
Athletes (same team and different teams)	1 (2.77)
Formal and informal athlete leaders (different teams)	1 (2.77)
Content of interventions	
Leader or leadership development	
Leader development	22 (61.11)
Leadership development	12 (33.33)
Leader and leadership development	2 (5.55)
Theory/framework-based vs. no-stated-theory/framework	
Theory/framework-based	24 (66.66)
No-stated-theory/framework	12 (33.33)
Multi-theory/framework or single-theory/framework	
Multi-theory/framework	12 (50)
Single theory/framework	11 (45.83)
Used a theory/framework but did not specify its name	1 (4.16)
Intervention Duration	
n/36 (%)	
< 4 h	2 (5.55)
1–3 Days	5 (13.88)
1–5 Months	12 (33.33)
> 5 Months – 1 year	2 (5.55)
Season-long	3 (8.33)
> 1–2 Years	2 (5.55)

skills of leaders and followers in a team (i.e., leadership development; Day, 2000). Only 5.55% addressed both leader and leadership development. Over half of the interventions (66.66%) relied on a theory or framework, describing and/or testing either a single theory or framework (45.83%) or multiple theories or frameworks (50%). Within the latter category, three articles (12.50%) did not state the name of all the theories/frameworks they used. The most frequently used theoretical approaches/frameworks (as shown in Figure 4) were the athlete leadership classification (Fransen et al., 2014), the social identity approach to leadership (Haslam et al., 2011), and the youth leadership development philosophy (Gould & Voelker, 2010). These were followed by different versions of the shared leadership approach (Fransen et al., 2014; Pearce, 2004; Zhu et al., 2018), transformational leadership theory (Bass, 1999), the full range model of leadership (Avolio et al., 2004), the multidimensional model of leadership styles (Chelladurai, 2007), the notions of leadership (Fertman & Van Linden, 1999), and the five practices of exemplary leadership (Kouzes & Posner, 2003).

Content analyses of the interventions' content helped identify behaviours targeted during the interventions, with motivational skills emerging as the most frequently ($n = 19$) occurring category (see Figure 5; Peters et al., 2020). Other frequently occurring categories included communication skills ($n = 15$), role-modelling ($n = 13$), social skills ($n = 11$), general leadership behaviours ($n = 7$), task leadership ($n = 7$), emphasising high performance ($n = 6$), building cohesion ($n = 6$), creating a shared vision ($n = 6$), resilience ($n = 5$), identity leadership ($n = 5$), and team-building skills ($n = 5$). The remaining behavioural categories were addressed in fewer than four articles, while four articles did not specify the athlete leadership behaviours they aimed to develop. It is important to note that behaviours derived from specific leadership theories or frameworks may not be immediately recognisable in these categories, as the behaviours were grouped into overarching themes during content analysis and may appear under broader or differently labelled behavioural constructs. For example, the inspirational motivation dimension of transformational leadership was categorised under motivation skills. Detailed descriptions of all interventions can be found at https://osf.io/wyrtz/overview?view_only=509dbbc06049482fb2da63d5ca8b9205.

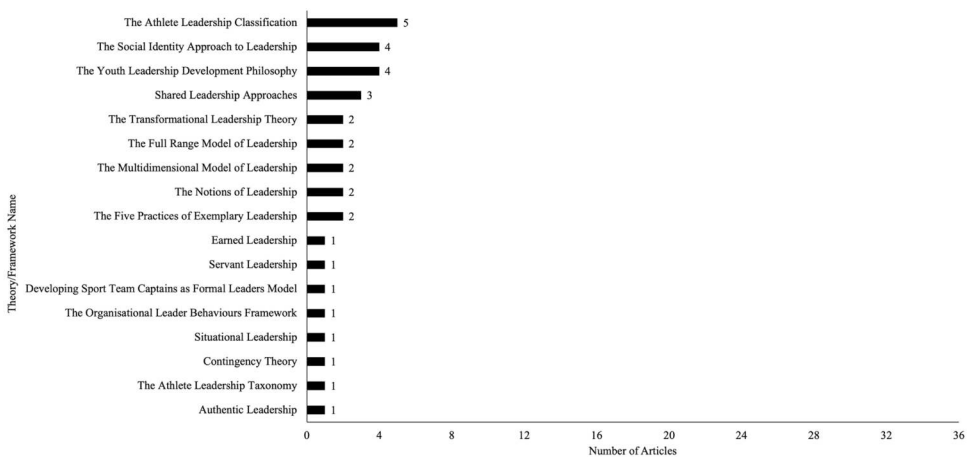


Figure 4. The frequency with which stated theories/frameworks were utilised.

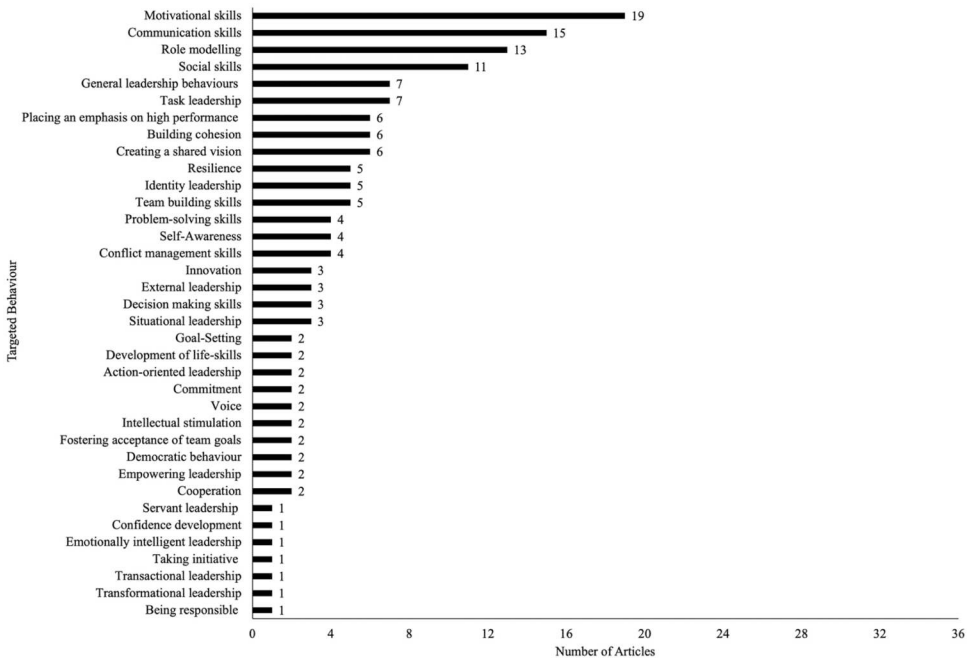


Figure 5. Behaviours targeted in athlete leadership development interventions.

Intervention duration. The interventions ranged in length from a few hours up to four years, with a third of interventions lasting between one month and five months. A more detailed breakdown of session length and the number and size of groups to which the intervention was delivered is provided in Appendix 2.

Intervention delivery

Intervention provider. Figure 6 shows that study authors – a minority of whom were applied sport psychologists – were the most frequent providers of interventions ($n = 12$); followed by coaches ($n = 9$; including team coaches, strength and conditioning coaches, and coaches from the same sport but another team); trained facilitators ($n = 5$); and students ($n = 4$).

RQ 2: Context of interventions

Table 3 offers a summary of the interventions' context. More than half the articles (58.33%) were conducted or authored by researchers based in the United States of America (USA). The interventions were primarily aimed at developing the leadership of both male and female athletes or teams (66.66%). Most interventions were delivered or intended to be delivered (as some interventions were not tested but only described) to athletes or teams competing at the university (38.88%) or school (30.55%) level.

Furthermore, over half of the interventions (55.55%) were focused on adult sports settings, with about one-third (36.11%) of the interventions centred on youth sports settings.

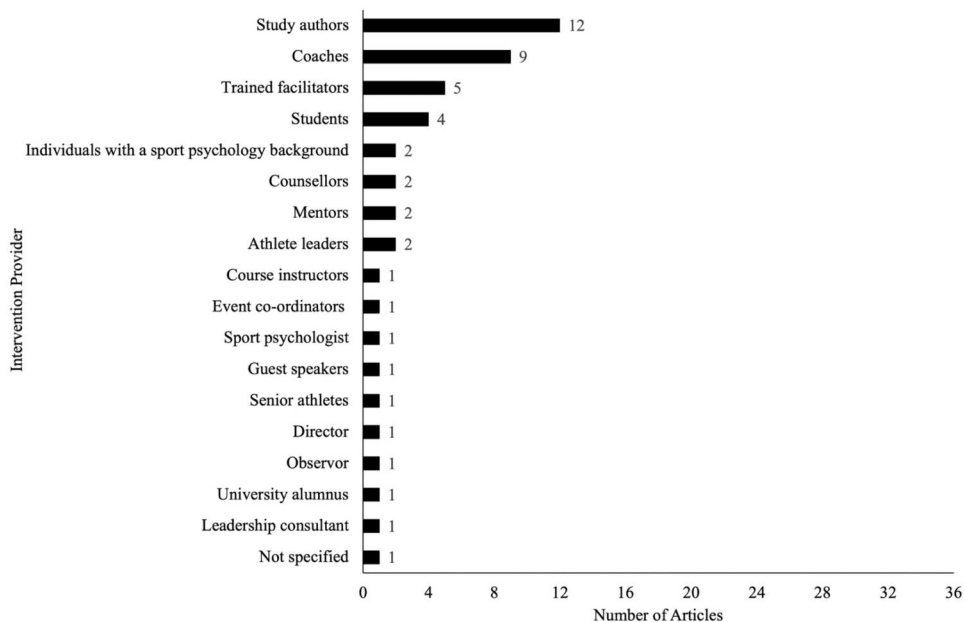


Figure 6. Intervention providers.

Many interventions were focused entirely on team sports (52.77%), compared to a small minority that focused exclusively on individual sports (5.55%). Furthermore, a quarter (25%) of all interventions focused on both individual and team sports. Another noteworthy finding is that almost all leadership development (i.e., the development of interpersonal leadership skills of both leaders and followers in a team) interventions targeted only team sports settings ($n = 10$; Day, 2000), with only one intervention aimed at targeting athletes and/or teams within individual sports settings.

RQ 3: Research design and critical appraisal of interventions

Research design

The interventions employed a variety of research designs, including qualitative designs ($n = 12$); descriptive designs (i.e., studies that either describe an intervention without testing its effects or evaluate an intervention's effectiveness without specifying the methods used to draw conclusions; $n = 10$); mixed method designs ($n = 7$); and quantitative designs ($n = 7$). Of the studies that employed quantitative designs ($n = 14$), just under half were before-and-after time series studies ($n = 6$), followed by randomised controlled trials ($n = 3$), non-randomised controlled trials ($n = 3$), and cross-sectional non-comparative studies ($n = 2$).

Critical appraisal

Table 4 shows the results of the critical appraisal. Of the 36 studies, 12 could not be appraised as they did not meet the MMAT screening criteria, which are prerequisites for conducting a critical appraisal. The appraised qualitative design-only studies

Table 3. Context of athlete leadership development interventions.

	<i>n</i> /36 (%)		<i>n</i> /36 (%)	<i>n</i> /36 (%)
Country where articles were conducted/written		Target gender of interventions		
USA	21 (58.33)	Male and female	24 (66.66)	
Canada	3 (8.33)	Male	6 (16.66)	
Belgium	3 (8.33)	Female	3 (8.33)	
United Kingdom	2 (5.55)	Not specified	3 (8.33)	
Singapore	1 (2.77)	Adult or youth sport		
Japan	1 (2.77)	Adult	20 (55.55)	
Netherlands	1 (2.77)	Youth	13 (36.11)	
Not specified	4 (11.11)	Not specified	3 (8.33)	
Type of sport targeted		Leader or leadership development	Type of sport targeted	
Team sport	19 (52.77)	Leader development	Individual and team sports	9 (25)
Team and individual sport	9 (25)		Team sports only	8 (22.22)
Individual sport	2 (5.55)		Individual sports only	1 (2.77)
Not specified	6 (16.66)		Not specified	4 (11.11)
Level of sport		Leadership development	Team sports only	10 (27.77)
University level	14 (38.88)		Individual sports only	1 (2.77)
School level	11 (30.55)		Not specified	1 (2.77)
2nd highest league of Volleyball in Belgium	1 (2.77)	Leader and leadership development	Team sports only	1 (2.77)
2nd highest level of minor Hockey in Canada	1 (2.77)		Not specified	1 (2.77)
National level	1 (2.77)			
Elite professional athletes	1 (2.77)			
International level	1 (2.77)			
Semi-elite level	1 (2.77)			
Junior elite level	1 (2.77)			
Multi-level	1 (2.77)			
Not specified	3 (8.33)			

performed well on the MMAT, with most meeting all five appraisal criteria ($n = 8$), while a minority met either 60% ($n = 1$) or 40% ($n = 2$) of the criteria.

Although the same MMAT criteria were applied for all qualitative studies, the criteria for quantitative studies varied based on whether they were (a) randomised controlled trials, (b) non-randomised studies (including both before-and-after time series studies and non-randomised controlled trials), or (c) descriptive (survey) studies. Overall, none of the seven quantitative design-only studies met more than 60% of the MMAT quality criteria.

Among the randomised controlled trials ($n = 3$), two met only 40% of the MMAT criteria, while the third met only 20%. It should be noted though that the primary methodological issue was that the three trials did not blind outcome assessors (e.g., participants) to whether they received the intervention – a criterion that is nearly impossible to achieve for the type of interventions being evaluated. A second methodological area where the randomised controlled trials did not perform well was the item related to incomplete data (due to participant dropout) for the outcome measures. In particular, two trials did not provide sufficient detail to assess their quality in this regard, while the remaining

study had a dropout rate of over 50%, exceeding the acceptable threshold set for this review. Finally, for two trials, it was unclear how randomisation was conducted, as this information was not reported by the authors.

Of the four non-randomised studies, two met 60% of the MMAT criteria, while the other two met only 40%. The first appraisal item where these studies did not perform well, similar to the randomised controlled trials, was that three of the four studies did not clearly report participant dropout rates for the outcome measures. Another weakness was the failure to adequately account for ($n = 2$) or report on ($n = 1$) potential confounding factors in their design and analyses. Overall, quantitative design-only studies ($n = 7$) did not perform well on the MMAT.

In line with our observations for qualitative and quantitative-only designs, the qualitative aspect of the mixed-method studies performed well on the MMAT, with five of six studies meeting 100% of the MMAT criteria and the remaining study achieving 60%. The quantitative aspect, however, performed less well. Of the non-randomised studies, one met 80% of the criteria, one met 60%, two met 40%, and one met 20%. The most prevalent issues in the five studies were that none reported dropout rates for outcome measures, and four failed to account for potential confounds in their design or analyses. Additionally, participants in three studies were not representative of the target population.

The final aspect of the mixed-method study appraisal assessed the integration of the qualitative and quantitative aspects of the study. Most studies performed well, with one meeting 100% of the criteria, one meeting 80%, three meeting 60%, and only one meeting 40%. In addition to rating each aspect of the mixed-method studies, we also assigned overall quality scores. Two studies scored well, achieving over 80% of the MMAT criteria; one met 60%, two met 40%, and one met 20%. Generally, it was the quantitative aspect of a mixed-method study that lowered its overall score.

Overall, the qualitative studies performed well on the MMAT. Meanwhile, quantitative studies, whereby the primary goal is to establish causality did not perform well on the MMAT. These lower scores appeared to result from a failure to adopt key methodological practices (e.g., accounting for confounds) or a lack of transparency in reporting critical details (e.g., participant dropout rates). This highlights the need for higher-quality research designs that not only employ methods capable of providing a more rigorous test of causality but also ensure clarity in reporting, thereby strengthening the evidence base in the field. Until such improvements are made, conducting a meta-analysis to examine intervention effectiveness may be premature. Moreover, the substantial heterogeneity in study designs, outcome variables, and measurement tools further constrains the ability to aggregate findings meaningfully. Therefore, we adopt a narrative synthesis in the following section rather than a meta-analytic evaluation.

RQ 4: Evidence for the effectiveness of interventions

Interventions' effectiveness was reported on in 24 studies: seven qualitative, four descriptive, seven quantitative, and six mixed methods. In what follows, we present findings from studies using qualitative designs (including qualitative-only and mixed-method studies) and descriptive designs together, while findings from quantitative designs (including quantitative-only and mixed-method studies) are described separately. An exception is the quantitative portion of Walker and Gould's (2021) mixed-method study, which used

a cross-sectional survey to assess participants' perceptions of the programme's effectiveness in improving leadership knowledge and ability. These findings are summarised with the qualitative/descriptive studies rather than with those using quantitative designs.

Qualitative/Descriptive

Textual data on intervention effectiveness were content-analysed with results presented in Table 5 (Peters et al., 2020). Across all studies, except Wathen (2017), participants perceived the interventions to enhance leadership development by strengthening participants' or their teams' (1) leadership skills (e.g., communication); (2) understanding of leadership (e.g., how to motivate others); (3) self-awareness while practicing leadership; (4) confidence in their leadership abilities; (5) shared leadership. Participants also noted positive effects on team-oriented outcomes (e.g., stronger team identity) and individual-oriented outcomes (e.g., enhanced life skills).

Table 5. Evidence of intervention effectiveness (qualitative + descriptive + mixed-method studies).

Category	Sub-categories	n/16 (%)	
Leadership Development (n = 15; 93.75%)	Development of leadership skills	11 (68.75)	
	<ul style="list-style-type: none"> • Improved communication skills • Increased team building skills • Enhanced interpersonal skills • Greater sense of responsibility • Improved conflict management skills • Improved motivational skills • Greater resilience • Role-modelling • Improved stress management skills • Greater voice 	<ul style="list-style-type: none"> 3 (18.75) 2 (12.50) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 	
	Better understanding of leadership	8 (50.00)	
	<ul style="list-style-type: none"> • Shared leadership • Communication skills • Decision-making • Identity leadership • Motivational skills • Problem-solving • Role-modelling • Cohesion 	<ul style="list-style-type: none"> 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 1 (6.25) 	
	Increased self-awareness while practicing leadership	3 (18.75)	
	Increased confidence as a leader	3 (18.75)	
	More shared leadership	1 (6.25)	
	Team-Oriented Outcomes (n = 7; 43.75%)	Improved team functioning	4 (25.00)
		Improved team cohesion	3 (18.75)
		Improved team identity	2 (12.50)
		Improved team performance	2 (12.50)
		Improved understanding of team functioning	1 (6.25)
		Improved communication	1 (6.25)
	Individual-Oriented Outcomes (n = 7; 43.75%)	Improved communication skills	3 (18.75)
		Improved self-awareness	3 (18.75)
		Improved motivational skills	1 (6.25)
		Improved self-confidence	1 (6.25)
		Improved decision-making skills	1 (6.25)
		improved life skills	1 (6.25)
	Improved individual performance	1 (6.25)	

Quantitative

Results indicated that 12 (of the 24) studies quantitatively assessed intervention effectiveness. Nearly all provided some evidence supporting their effectiveness (as determined by significance testing), except for Boisvert (2018). Of these, 11 studies focused on leadership outcomes (e.g., transformational leadership), whereas far fewer examined intervention effects on team-oriented outcomes (e.g., team performance; $n = 6$) or individual-oriented outcomes (e.g., well-being; $n = 5$).

To identify patterns in intervention effectiveness, we selected specific intervention features (e.g., theoretical framework or model used) and assessed whether interventions within certain categories of these features (e.g., transformational leadership, identity leadership) differed in their effectiveness. To do this, we first computed Cohen's d for each tested relationship within a study, irrespective of statistical significance. Relationships with insufficient data to calculate effect sizes were excluded from further analyses. Next, we calculated the mean-weighted Cohen's d for each category (if applicable) within each intervention feature.

Intervention features included: (a) leadership, team-, and individual-oriented outcomes; (b) the specific type of team – and individual-oriented outcomes; (c) the target of the intervention; (d) whether the intervention focused on leader development, leadership development, or both; (e) the theoretical framework or model used; (f) intervention duration; and (g) the intervention provider. In addition to clustering intervention effects by category within the relevant features, we also calculated effects separately for leadership, team-, and individual-oriented outcomes where applicable. Finally, to assess overall intervention effectiveness, we calculated the mean-weighted Cohen's d at the study level using the following formula:

$$\bar{d}_{\text{weighted}} = \frac{\sum (N_i \cdot d_i)}{\sum N_i} .$$

More specifically, the effect size of each study (d_i , i.e., Cohen's d) is multiplied by its respective sample size ($N_i \cdot d_i$), and the sum of these values ($\sum (N_i \cdot d_i)$) is then divided by the total sample size across all studies ($\sum N_i$). This approach corrects for reduced accuracy in smaller samples and mitigates overestimation, ensuring comparability across studies with varying sample sizes (Powers & Emmelkamp, 2008).

Results in Table 6 highlight several key insights. First, the van Kruisbergen et al. (2020) shared leadership programme produced the strongest effects ($\bar{d}_w = 1.57$), followed closely by the 5R^S programme by Mertens and colleagues (2020; 2021; $\bar{d}_w = 1.12$ and 1.26), whereas Boisvert (2018) reported the weakest effects ($\bar{d}_w = .21$). Second, the interventions improved individual-oriented outcomes ($\bar{d}_w = 1.17$) more than team-oriented outcomes ($\bar{d}_w = .88$) and were least effective for leadership outcomes ($\bar{d}_w = .45$).

Third, among team-oriented outcomes, the strongest effects were observed for social identification ($\bar{d}_w = 1.77$), followed by social support ($\bar{d}_w = 1.65$) and collective efficacy ($\bar{d}_w = .66$), whereas the weakest effects were found for cohesion ($\bar{d}_w = .03$), followed by team performance ($\bar{d}_w = .10$). Fourth, all studies examining intervention effects on individual-oriented outcomes reported medium-to-large effects ($\bar{d}_w \text{ range} = .62\text{--}1.57$). The largest effects were observed for motivation ($\bar{d}_w = 1.57$), followed closely by health ($\bar{d}_w = 1.24$), hours practiced outside of training ($\bar{d}_w = 1.09$), and goal commitment ($\bar{d}_w = 1.08$).

Table 6. Evidence of intervention effectiveness (quantitative + mixed method studies).

Study Reference	Cohen's \bar{d}_w
Boisvert (2018)	.21
Lynch (2020)	.30
Richardson (1984)	.30
Maechel et al. (2022)	.37
DelleMonache (2019)	.40
Copper et al. (2021)	.55
Duguay et al. (2016)	.82
Slater and Barker (2019)	.75
Powless et al. (2017)	.76
van Kruijsbergen et al. (2020)	1.57
Mertens et al. (2020)	1.12
Mertens et al. (2021)	1.26
Outcomes: Leadership vs. Team Oriented vs. Individual Oriented	
Leadership outcomes	.45
- Richardson (1984)	
- Duguay et al. (2016)	
- Powless et al. (2017)	
- Boisvert (2018)	
- DelleMonache (2019)	
- van Kruijsbergen et al. (2020)	
- Lynch (2020)	
- Mertens et al. (2020)	
- Copper et al. (2021)	
- Mertens et al. (2021)	
- Maechel et al. (2022)	
Team-oriented outcomes	.88
- Duguay et al. (2016)	
- Boisvert (2018)	
- Slater and Barker (2019)	
- Mertens et al. (2020)	
- Mertens et al. (2021)	
Individual-oriented outcomes	1.17
- Duguay et al. (2016)	
- Powless et al. (2017)	
- Slater and Barker (2019)	
- Mertens et al. (2020)	
- Mertens et al. (2021)	
Team Oriented Outcomes	
Collective efficacy	.66
- Boisvert (2018)	
- Slater and Barker (2019)	
- Mertens et al. (2020)	
- Mertens et al. (2021)	
Team performance	.10
- Mertens et al. (2020)	
- Mertens et al. (2021)	
Social identification	1.77
- Slater and Barker (2019)	
- Mertens et al. (2020)	
- Mertens et al. (2021)	
Cohesion	.03
- Boisvert (2018)	
Motivational climate	.47
- Duguay et al. (2016)	
Social support	1.65
- Mertens et al. (2021)	

Individual Oriented Outcomes			
Health			1.24
- Mertens et al. (2020)			
- Mertens et al. (2021)			
Motivation			1.57
- Mertens et al. (2020)			
- Mertens et al. (2021)			
Hours practiced outside of training			1.09
- Slater and Barker (2019)			
Athlete satisfaction			.90
- Duguay et al. (2016)			
Goal commitment			1.08
- Mertens et al. (2020)			
- Mertens et al. (2021)			
Mobilisation			.62
- Slater and Barker (2019)			
Self-efficacy			.70
- Powless et al. (2017)			
Target of the intervention	Leadership outcomes	Team-oriented outcomes Cohen's \bar{d}_w	Individual-oriented outcomes
Athletes from the same team	.58	.27	.90
- Duguay et al. (2016)			
- Boisvert (2018)			
- van Kruijsbergen et al. (2020)			
- Maechel et al. (2022)			
Athletes from different teams	.34		.70
- Lynch (2020)			
- Powless et al. (2017)			
Athletes from the same team + athletes from different teams	.40		
- DelleMonache (2019)			
The best athlete leaders on the team (regardless of their leadership status)	1.32	1.04	1.28
- Mertens et al. (2020)			
- Mertens et al. (2021)			
Formal athlete leaders (from the same team)	.30	Insufficient information	
- Richardson (1984)			
Formal athlete leaders (from different teams)	.55		
- Copper et al. (2021)			
Formal and informal athlete leaders (from the same team)		.61	.85
- Slater and Barker (2019)			
Leader vs leadership development			
Leadership development	.75	.91	1.26
- Boisvert (2018)			
- Slater and Barker (2019)			
- van Kruijsbergen et al. (2020)			
- Mertens et al. (2020)			
- Mertens et al. (2021)			
- Maechel et al. (2022)			
Leader development	.39		.70
- Richardson (1984)			
- Powless et al. (2017)			
- Lynch (2020)			
- Copper et al. (2021)			
Leader and leadership Development	.43	.47	.90
- Duguay et al. (2016)			
- DelleMonache (2019)			

(Continued)

Table 6. Continued.

Study Reference	Cohen's \bar{d}_w		
Type of theory/framework			
Transformational leadership - Duguay et al. (2016) - Boisvert (2018) - Lynch (2020)	.32	.27	1.12
The multidimensional model of leadership styles - Duguay et al. (2016) - Boisvert (2018) - Copper et al. (2021)	.61		
Identity leadership - Slater and Barker (2019) - Mertens et al. (2020) - Mertens et al. (2021)	1.32	1.02	.90
Athlete leadership classification/taxonomy - van Kruijsbergen et al. (2020) - Maechel et al. (2022)	.72		
Five exemplary practices of leadership - DelleMonache (2019)	.40		
Taxonomy of leader behaviors - Richardson (1984)	.30	Insufficient information	
Team perceptions of the team leader - Richardson (1984)	Insufficient information	Insufficient information	
Peer sport leadership behaviour - Powless et al. (2017)	.82		.70
Setting and maintaining standards - Copper et al. (2021)	.52		
Intervention duration			
3 Days - Lynch (2020) - Copper et al. (2021)	.40		
1.15 Months - DelleMonache (2019)	.40		
1.38 Months - Powless et al. (2017)	.82		.70
1.84 Months - Maechel et al. (2022)	.37		
3 Months - Duguay et al. (2016)	.38	.47	.90
3–4 Months - Mertens et al. (2021)	1.52	.27	1.21
5 Months - van Kruijsbergen et al. (2020) - Mertens et al. (2020)	1.37	1.25	1.35
6 Months - Boisvert (2018)	.23	.17	
1 Season - Richardson (1984)	.30		
1.83 Years - Slater and Barker (2019)		.61	.85
Intervention provider			
Study authors - Richardson (1984) - Duguay et al. (2016) - Boisvert (2018) - Mertens et al. (2020)	.41	.61	1.16
Study authors (some of whom were also sport psychologists) - Slater and Barker (2019) - van Kruijsbergen et al. (2020) - Maechel et al. (2022)	.72	.61	.85
Coaches (trained by researchers) - Mertens et al. (2021)	1.52	1.25	1.21

Trained facilitators - DelleMonache (2019) - Lynch (2020)	.36	
Faculty member who was also a sport psychologist and University Alumnus and athlete leaders and coaches - Copper et al. (2021)	.55	
Students and counsellor - Powless et al. (2017)	.82	.70

Fifth, interventions targeting the team's best athlete leaders were the most successful in improving leadership ($\bar{d}_w = 1.32$), individual-oriented ($\bar{d}_w = 1.28$), and team-oriented ($\bar{d}_w = 1.04$) outcomes. Sixth, interventions focused on leadership development, rather than solely on leader development or a combined leader and leadership development approach, were the most effective in improving individual-oriented ($\bar{d}_w = 1.26$), team-oriented ($\bar{d}_w = .91$), and leadership outcomes ($\bar{d}_w = .75$).

Seventh, interventions grounded in the identity leadership framework had by far the strongest impact on leadership outcomes ($\bar{d}_w = 1.32$) and on team-oriented outcomes ($\bar{d}_w = 1.02$). In contrast, interventions incorporating both transformational and multidimensional leadership models were most effective for individual-oriented outcomes ($\bar{d}_w = 1.12$), with identity leadership ($\bar{d}_w = .90$) following closely behind.

Eighth, interventions spanning (a) three to four months or (b) five months tended to yield the strongest effects across all outcome domains – leadership (\bar{d}_w range = 1.37–1.52), team-oriented (\bar{d}_w range = .27 – 1.25), and individual-oriented (\bar{d}_w range = 1.21–1.35). Lastly, coach-delivered interventions – where coaches were trained by researchers – were the most effective across all outcome domains (leadership $\bar{d}_w = 1.52$; team-oriented $\bar{d}_w = 1.25$; individual-oriented $\bar{d}_w = 1.21$). For team – and individual-oriented outcomes, interventions led by study authors were next most effective ($\bar{d}_w = .61$ and 1.16, respectively), with those led by study authors who were also sport psychologists performing similarly ($\bar{d}_w = .61$ and .85, respectively).

Discussion

This systematic review examined the available evidence on athlete leadership development interventions by identifying and analysing 36 studies. The following section outlines the key findings, evaluates the strengths and limitations of the reviewed research, and considers implications for both future studies and applied practice. While most findings are discussed within the sections corresponding to their respective research questions, select insights on intervention effectiveness (RQ4) are integrated across sections to avoid redundancy.

General study characteristics

We found that about one-third of the included articles explicitly defined athlete leadership and/or related terms. This is a shortcoming because the usefulness of research depends on how clearly concepts are communicated and applied. Clear definitions help researchers and practitioners identify what is being studied, avoid confusion with related ideas, and generate insights that can inform both theory and practice (Patten & Newhard, 2018). Definitions also shape the choices researchers make about methods and analysis in both quantitative

and qualitative work, and thus influence the kinds of knowledge that are produced. Accordingly, we recommend that future research on athlete leadership development explicitly state the definition they adopt, drawing on existing definitions where possible, and clarifying any adaptations they introduce and why.

RQ 1: Design and delivery characteristics of the interventions

Intervention design

Target. This review highlights that interventions have been directed not only at formal athlete leaders but also at informal athlete leaders – those who emerge as leaders through their natural interactions with team members (Loughead et al., 2006) – as well as at athletes who, to our knowledge, did not hold any formal or informal leadership roles. The diversity of interventions highlights that efforts to develop formal leadership have not come at the expense of initiatives aimed at informal leaders or athletes without a leadership status. Findings from RQ4 further suggest that the most effective interventions focused on developing the team’s best athlete leaders, regardless of their leadership status. This suggests that leadership development may be most impactful when directed toward individuals who are already sources of influence within the team, aligning with research emphasising the benefits of such an approach in enhancing team functioning, performance, and athlete mental health (Butalia et al., 2025a; Butalia et al., 2025b).

Content. Our analysis indicates that most interventions prioritised *leader development*, emphasising the cultivation of individual leaders’ intrapersonal skills (Day, 2000). In contrast, relatively few interventions targeted *leadership development* – focusing on the interpersonal skills of both leaders and followers. This mirrors trends in organisational research, where advancements in leader development have outpaced those in leadership development (Day et al., 2021). Such a focus on leader development may be because the traditional view of leaders suggests a heroic leadership figure who singlehandedly builds, transforms, or destroys a team – an individual-centric perspective that seems to be persistent in the leader(ship) development literature (Eva et al., 2021; Haslam et al., 2024). At the same time, programmes to develop the leadership of entire teams might be more difficult to design and implement (e.g., time-consuming) than those targeting individual leaders (Dalakoura, 2010; Zhu et al., 2018).

Despite these shortcomings, further research on athlete leadership development remains essential, given the prevalence of team-based structures in sport. This need is further underscored by findings answering RQ4, which indicate that leadership development interventions were more effective than leader development interventions in enhancing leadership, team-, and individual-oriented outcomes. This perspective aligns with the idea that leadership effectiveness is shaped by relationships between leaders and followers, rather than by individual leaders alone. As O’Connor and Quinn (2004, p. 423) argue, “when leadership is viewed as a property of whole systems (i.e., leaders and followers), as opposed to solely the property of individuals, effectiveness in leadership becomes more a product of those connections or relationships amongst the parts than the result of any one part of the system (i.e., the individual leaders).”

Another key finding of our review is that interventions targeted a wide range of behaviours, with interpersonal skills like motivation, communication, and social skills being the most frequent. Speaking to the importance of training such skills, research has highlighted the importance of interpersonal skills for leader effectiveness (Moran & Weiss, 2006; Price & Weiss, 2011). Indeed, in organisational contexts, leadership training that targets interpersonal skills has shown to be more effective than that targeting intrapersonal skills. For instance, Lacerenza et al. (2017) indicated that soft skill training (e.g., interpersonal) improved organisational and subordinate outcomes to a greater extent than hard-skill training (e.g., technical skills). However, it is also important to highlight here that some of the behavioural categories identified – such as resilience, team building, and cohesion – seem to focus more on the consequences of leadership rather than the leadership process itself, despite often being presented as leadership constructs.

Intervention duration. The duration of the identified interventions ranged from brief single-session interventions to extensive multi-year programmes. One possibility is that this variability reflects the need to tailor interventions to the practical needs of specific athletes/teams, rather than assuming one standard approach. Another possibility is that it reflects differences in the factors shaping intervention length – such as the leadership frameworks/theories chosen, the leadership level targeted (e.g., formal or informal), the role selected (e.g., task or external leader), the leadership behaviours prioritised, the timing of support and follow-up, athletes' developmental stage, and the team's culture.

For instance, leadership interventions rooted in classical leadership theories (e.g., contingency approaches) tend to show effects more quickly than those based on newer theories (e.g., transformational leadership; Avolio et al., 2009). Likewise, leadership development may unfold more gradually at higher management levels than at lower ones (Avolio et al., 2009). Furthermore, Kragt and Day (2020) found that more complex leadership competencies (e.g., challenging the status quo) take longer to develop than simpler skills (e.g., managing stress). Additionally, timing is critical when designing and testing leadership interventions, as poorly timed assessments can obscure real progress (Day et al., 2021), especially when development follows non-linear paths where initial setbacks precede long-term improvements (Day & Sin, 2011; Miscenko et al., 2017). Finally, intervention duration may also depend on the team's cultural climate. In teams with a strong, positive culture and established social norms that support leadership development, interventions may be more easily adopted, requiring less time and intensity. In contrast, the process may take longer in teams with a more hierarchical culture, as a preliminary phase involving formal leaders may be necessary to build openness and readiness for shared leadership practices (e.g., sharing leadership with informal leaders).

At the same time, results of RQ4 suggest that longer interventions are not automatically more effective. Instead, some of the most promising outcomes were observed for programmes lasting either 3–4 months or around 5 months. From a practical standpoint, this indicates that time-bounded interventions can sometimes deliver greater benefits than lengthier, resource-heavy ones. Rather than assuming a single optimal duration, it may be more useful to consider how intervention length aligns with the team's goals, resources, and readiness for change. This perspective helps explain why findings in sport settings do not always mirror organisational research, where some studies point

to a linear positive relationship between intervention length and effectiveness (Lacerenza et al., 2017), while others find no clear effect (Taylor et al., 2009). These inconsistencies highlight the importance of applied research that focuses less on identifying universal rules and more on clarifying the conditions under which different durations are most useful – taking into account programme quality, design and delivery methods, and content relevance in practice.

Intervention Delivery

Intervention Provider. Our findings indicate that study authors were the most common providers of athlete leadership development interventions, aligning with previous research showing that psychological interventions in sport are typically delivered by researchers (Brown & Fletcher, 2017). However, findings from RQ4 suggest that interventions were most effective when delivered by coaches who had been trained by researchers. This highlights the importance of approaches that bring together the contextual expertise of facilitators embedded within the team (i.e., coaches), who can translate interventions into team-relevant terms, with the research-based insights of external providers (i.e., researchers). In this way, “train-the-trainer” models appear particularly valuable for ensuring that interventions are both scientifically informed and practically effective.

One possible explanation for this finding, from a social identity perspective, is that messages from an individual embedded within the team (e.g., a coach) are more readily accepted and internalised because they come from “one of us” rather than “one of them” (Haslam et al., 2020). Additionally, those internal to the team are more likely to have a deep understanding of team dynamics, culture, and needs, allowing them to tailor interventions in ways that enhance their relevance and impact. Furthermore, their direct presence enables them to adapt interventions in real time in ways that external providers might not be able to.

Beyond effectiveness, interventions delivered by internal team members also offer a cost-effective and sustainable approach to leadership development. Unlike externally delivered programmes (e.g., those facilitated by researchers), which often require substantial financial investment, train-the-trainer programmes prepare individuals already embedded within the team (e.g., coaches) to adapt and apply leadership practices informed by both research evidence and team-specific knowledge. This helps reduce costs and promotes long-term continuity. Importantly, such train-the-trainer approaches should not be seen as a top-down transfer of knowledge from “leadership experts” (e.g., researchers) to passive learners. Rather, they should be conceived and implemented as collaborative partnerships, where external providers and internal team members share expertise and co-develop contextually relevant strategies that fit the needs of their particular team. Moreover, when designed in this way, such models can also enhance equity of access: by reducing costs and disseminating evidence-informed practices more widely, they may help extend leadership development opportunities to teams and organisations that would otherwise lack the resources to engage external providers.

RQ 2: Context of interventions

Nearly all studies in our review – except two – were based in North American or European contexts, raising questions about the extent to which existing interventions apply in and

resonate with other cultural settings (e.g., Confucian Asian, African). This is because leadership is not a culturally neutral phenomenon; rather, it is shaped by the values, norms, and expectations of those involved (House et al., 2014). While recent evidence suggests that identity leadership – whether enacted by formal or informal athlete leaders – predicts sport performance and athlete mental health across cultures (Butalia et al., 2025a; Butalia et al., 2025b), it remains unclear how well other leadership theories underpinning the interventions identified in this review can be applied in different cultural contexts. Without this understanding, it is difficult to anticipate how interventions grounded in these theories might need to be adapted to ensure cross-cultural relevance and effectiveness.

Future research should therefore take two complementary steps: first, explore how commonly used athlete leadership frameworks and theories are understood and taken up in different cultural settings, identifying where their assumptions align – or fail to align – with local values and practices; second, work with local stakeholders to co-design adaptations that make interventions relevant, acceptable, and effective for the populations they are intended to serve.

Another finding of our review was that many interventions ($n = 13$) were conducted in youth sports settings. This is notable because most theoretical, measurement, and nomological advances in athlete leadership have occurred in adult, not youth sports. This was also evident in the youth interventions we reviewed, as several used athlete leadership frameworks developed for adult sports – an approach that may be ill-suited for youth populations. Indeed, Gould and Voelker (2012) cautioned against directly applying adult leadership theories to youth due to differences in age, experience, and developmental level. Supporting such assertions, Mortensen et al. (2014) found that while youth share some views on leadership with adults, they also have their own unique perspectives (e.g., on leadership characteristics, on the goal of the leader).

Taken together, these findings highlight the need for future research to develop genuinely youth-centric athlete leadership development interventions. This requires work along three main lines: (1) theory-building around what leadership means for young people – how they understand it, what they view as effective leadership, and how power dynamics, which are inherently intertwined with leadership processes, unfold in youth sport; (2) examining whether theoretical frameworks used to study leadership in adult populations also apply to youth populations, as some theories may transcend age groups and remain relevant across them (e.g., as evidenced by the social identity approach to leadership; Butalia et al., 2024), while others may not; and (3) integrating these insights by combining youth-specific perspectives with relevant elements of existing theoretical frameworks to develop leadership programmes tailored to youth contexts.

Results also showed that almost all leadership (not leader) development interventions were situated in team sports contexts (Day, 2000). This is unsurprising given that research on group dynamics in sport psychology has typically favoured team sports over individual sports, assuming that group processes like leadership, cohesion, and motivational climate only occur when team members interact during competition (Evans et al., 2012). However, there is evidence to challenge this presumption, whereby research found the cohesion-performance relationship to be equally (positively) strong in both team and individual sports (Carron et al., 2002). Furthermore, players in

individual sports teams (e.g., long-distance running) saw their team as (a) an essential motivation for their participation in elite sport, (b) a driver of their individual performance, and (c) influencing their goal pursuit (Evans et al., 2013). These players also reported relying on their teammates for social support and encouragement. In yet another study, jiu-jitsu athletes, who were most central in their club networks, identified more strongly with their club, which then drove the athlete's adherence to club activities (Rodrigues et al., 2019). Given these findings, we recommend further research on athlete leadership development in individual sports teams (e.g., training groups of track and field athletes).

RQ 3: Research design and critical appraisal of interventions

Most articles in this body of evidence employed qualitative or descriptive designs, and the quality of the qualitative studies we appraised was generally high. Fourteen studies employed quantitative designs; however, among these, half lacked a control group. This makes it more difficult to make causal inferences and rule out alternative explanations such as history (i.e., when events other than the intervention influence study results), maturation (i.e., changes within participants during the intervention that are unrelated to it), or testing effects (i.e., exposure to the pre-test influencing participants' post-test scores; Martin et al., 2021).

Moreover, the 13 (of the 14) quantitative studies that could be appraised did not perform well on the MMAT, mainly due to failure to account for confounds in their design and analyses or use of samples that were unrepresentative of the target population. These studies also failed to report on important methodological features, such as the proportion of participant dropouts' post-intervention, making it difficult to assess whether post-intervention measures were complete enough to support the study's claims.

In sum, high-quality evidence from stronger research designs, including wait-list randomised experimental trials, is needed. This is crucial because "the method of science, as stodgy and grumpy as it may seem, is far more important than the findings of science" (Sagan, 1996, p. 22), as it determines the confidence readers can have in study results (Tod et al., 2022). At the same time, qualitative approaches remain valuable for understanding participants' experiences and the contextual factors that shape intervention processes.

RQ 4: Evidence for the effectiveness of interventions

Two-thirds of the included studies went beyond merely describing interventions, either by providing insights into participants' experiences of how the intervention benefitted them or by examining its effects on relevant outcomes (e.g., well-being, performance). Among these, nearly all (23 out of 24) reported at least some evidence of positive impact from athlete leadership development programmes.

The qualitative studies were generally of high quality and provided rich insights into how participants experienced the interventions. The reported benefits included strengthened leadership skills, greater understanding of leadership, increased self-awareness while practicing leadership, enhanced confidence in leadership abilities, and stronger

shared leadership. Participants also noted positive effects on team-oriented and individual-oriented outcomes.

The quantitative studies – typically designed to establish causality – were comparatively weaker in quality, which limited the strength of the conclusions that could be drawn. Among these studies, not all interventions proved equally effective; the strongest evidence was found for a shared leadership intervention designed to enhance task and motivational leadership of team members ($\bar{d}_w = 1.57$; van Kruijsbergen et al., 2020). This was followed by the 5R^S programme, which identifies the best athlete leaders within teams and trains them in (social) identity leadership ($\bar{d}_w = 1.26$; 1.12; Mertens et al., 2020; Mertens et al., 2021).

Taken together, these findings point to the practical value of approaches that build athlete leadership through shared leadership and identity leadership. More specifically, the effectiveness of the 5R^S programme suggests that interventions may be impactful when they equip athletes to lead in ways that create, advance, represent, and embed their team's shared identity (Fransen et al., 2020). Importantly, this was not unique to the 5R^S programme: across studies, interventions grounded in the identity leadership framework consistently outperformed those based on alternative leadership theories in the contexts where they were tested.

Another key finding from the quantitative evidence relates to the scope of intervention evaluations. Although the effect of interventions on leadership outcomes (e.g., transformational leadership) was frequently assessed ($n = 11$), relatively few studies examined their impact on team-oriented outcomes (e.g., team performance; $n = 6$) and individual-oriented outcomes (e.g., well-being; $n = 5$). This imbalance highlights the need for further research into how athlete leadership interventions translate into broader team and personal benefits. Moreover, such outcomes are typically less susceptible to perceptual biases and common method variance than leadership ratings, making them a more robust test of intervention effectiveness (Steffens et al., 2021).

Quantitative findings also indicated that interventions tended to have larger effects on individual-oriented outcomes ($\bar{d}_w = 1.17$) than on team-oriented outcomes ($\bar{d}_w = 0.88$). One possible explanation is that leadership unfolds primarily through interactions between leaders and followers, meaning that improvements in leadership may be more immediately felt at the individual level (Day et al., 2004; Lacerenza et al., 2017). In contrast, the pathways through which leadership impacts team-level outcomes are often less direct (Lacerenza et al., 2017).

Beyond traditional outcomes such as performance and well-being, future research should begin to examine athlete leadership's potential to shape the inclusivity of sport environments – an area that, to date, has received little (to no) attention. This is particularly important because sport often reflects, and at times reinforces, wider social inequalities, making it an exclusionary space for minority and stigmatised groups (Denison et al., 2021). In this context, athlete leaders who actively foster tolerance, belonging, and fairness may help to counter prevailing discriminatory norms and create climates that are more inclusive. Importantly, such leadership does not only advance social justice within sport, but also serves broader public health goals. Members of marginalised groups are typically less likely to participate in organised sport and other forms of physical activity (Dumith et al., 2011; Guthold et al., 2018). If athlete leaders can help to create environments that feel safe and inclusive, this may

Table 7. Urgent research priorities for athlete leadership development research.

1. Evaluate athlete leadership development interventions through wait-list randomised controlled trials to establish their effectiveness, but complement this with high-quality qualitative research that speaks to the processes and contexts through which they work.
2. Evaluate athlete leadership interventions in terms of their impact on individual (e.g., well-being), team (e.g., cohesion), and social justice (e.g., tolerance, inclusion, diversity) outcomes.
3. Prioritise development and testing of athlete *leadership development* interventions (fostering leadership across the team) over narrow *leader development* approaches.
4. De-colonise athlete leadership research by exploring cross-cultural perspectives beyond WEIRD countries to inform future interventions.
5. Investigate how youth understand and define leadership, identify which elements of existing leadership frameworks are meaningful to them, and use these insights to design genuinely youth-centred interventions.

increase participation among these marginalised communities, thereby supporting both their health and their well-being.

Taken together, study insights – spanning design, delivery, context, quality and effectiveness – point to the need for a more comprehensive research agenda. Accordingly, drawing on the findings from RQ1 to RQ4, we set out five key priorities for future research on athlete leadership development, as summarised in [Table 7](#).

Practical implications

The findings of this review provide useful guidance for developing athlete leadership in ways that enhance both individual and team functioning. Based on the approaches that showed the strongest evidence so far, an important first step is identifying a leadership group made up of the team's best athlete leaders. One way to do this is through Shared Leadership Mapping, where all team members rate each other's leadership quality (Fransen et al., 2020). Aggregating these ratings allows intervention providers to pinpoint those who are most widely recognised as leaders – regardless of whether they hold formal leadership roles or not.

Once identified, interventions might then focus on developing these leaders' ability to strengthen a shared sense of "us." Findings from this review indicate that identity leadership training – such as the 5R^S, 5R, or 3R programmes – has been particularly useful in the contexts where it was applied (Haslam et al., 2017; Mertens et al., 2020; Mertens et al., 2021; Slater & Barker, 2019). Specifically, such training should equip leaders to represent the team's values and goals, advance its collective interests, create structures that embed a shared identity (e.g., a pre-game team routine like the Haka or a shared team mantra), and define what it means to belong to the team.

For interventions to have maximum impact, both their design and delivery are also crucial. Our findings indicate that interventions are most effective when delivered by coaches who have been trained by researchers. This is likely because those within the team have a deeper understanding of its culture and context, making them well placed to translate ideas in ways that resonate with members and to provide input on what may or may not work in that setting. Researchers, in turn, contribute insights and frameworks grounded in prior evidence and theory, which – combined with coaches' contextual expertise – can support the success of these interventions. Together, this combination ensures that interventions are both scientifically robust and practically meaningful. Moreover, leadership development should engage both leaders and

followers, reinforcing the idea that leadership is not just about enhancing individual skills but about fostering positive collective team processes.

Finally, studies in this review suggest that interventions lasting three to four months or around five months were linked to stronger outcomes. This underscores that leadership development should not be treated as a one-off event but as an ongoing process. While these durations may serve as useful benchmarks, the optimal length of an intervention is likely also to depend on contextual factors such as the adaptability of leadership to change, the complexity of behaviours targeted, and the team's cultural climate.

Strengths and limitations

This review has four key strengths. First, it is the only study in the field that provides a broad, integrative overview of athlete leadership development interventions. This enabled us to highlight current strengths and limitations and to suggest directions for future research and practice that may be useful across different contexts. Second, our review includes a significantly broader range of studies compared to previous work. More specifically, while Cotterill et al. (2022) reviewed only 11 studies (that met our inclusion criteria), our systematic search identified more than three times as many (a total of 36). Even when considering only peer-reviewed journal articles while ignoring grey literature (as Cotterill et al., 2022 did), our review still identified 27 studies – more than twice as many as were identified in theirs. This broader scope provides a richer evidence base and allows for more nuanced insights into how athlete leadership interventions are designed, delivered, and experienced, thereby extending both the theoretical and practical value of the findings.

Third, by conducting a systematic review with a broad scope, we not only generated a structured overview of existing studies and their contributions, but also mapped key themes, highlighted gaps, and identified insights that can guide future research and practice. Finally, we collaborated with a multidisciplinary team, including experts in athlete leadership, research methodologies, and an academic librarian.

We recognise that this review also has some limitations. First, we may have missed articles published after our search was conducted (see Table 1 for specific dates). As new studies emerge, the conclusions of this review should be revisited and extended so that the evidence base continues to reflect the latest developments. Second, the exclusion of non-English language papers may have influenced the scope of findings. However, research suggests that such language restrictions rarely introduce systematic bias in summary intervention effects (Jüni et al., 2002; Morrison et al., 2012). That said, the evidence is less clear regarding their impact on individual systematic reviews.

Third, our assessment of study quality is based on the MMAT criteria, and since different critical appraisal tools apply distinct evaluation criteria, using an alternative tool may have resulted in different judgments about study quality. However, given the lack of a universally accepted gold standard for critical appraisal, we selected the tool that best suited this review and provided a justification for its use in accordance with methodological recommendations (Tod et al., 2022).

Fourth, despite extensive efforts to retrieve all identified articles – including directly contacting all study authors and working with the institutional libraries of this paper's first author to procure physical copies – we were unable to access 54 records (books or book chapters =

21; newsletters or magazine articles = 26; master's theses = 5; journal article = 1; miscellaneous text = 1). However, it is important to note that 22 of these records would have likely been excluded regardless, as they were secondary sources. Additionally, for eight of these records, even the authors who wrote them no longer had access.

Fifth, the absence of a meta-analysis limits the precision and robustness of our conclusions on intervention effectiveness, requiring cautious interpretation. However, a meta-analysis was not feasible due to the low volume and quality of quantitative studies, diverse study designs (e.g., observational, non-randomised, and randomised controlled trials), and heterogeneous measurement tools, all of which hinder the comparability of intervention effects across studies.

Conclusions

This review provides the most comprehensive evaluation to date of athlete leadership development interventions, offering insights into their design, delivery, context, quality, and effectiveness. Specifically, we found that interventions targeted both formal and informal leaders, with the most effective programmes focusing on the team's best athlete leaders (regardless of their leadership status). Additionally, most interventions emphasised leader development over leadership development, yet our synthesis indicates that leadership development is more impactful for achieving meaningful outcomes. Furthermore, the review highlighted a significant gap in research on interventions across diverse cultural and individual sporting contexts, limiting the generalisability and real-world application of current evidence.

Our assessment of study quality also revealed considerable variability in methodological rigour. While qualitative studies were generally well-conducted, many quantitative studies lacked control groups, failed to account for confounding variables, or used samples unrepresentative of the target population. Finally, we found evidence supporting the effectiveness of athlete leadership interventions, with nearly all studies demonstrating at least some positive impact. However, programmes informed by identity leadership and shared leadership – such as the 5R^S and 3R – consistently outperformed interventions grounded in other leadership theories. Notably, the identified interventions were found to be most effective when delivered by coaches (that were trained by researchers), engaged both leaders and followers, and lasted between 3–4 and 5 months. Taken together, these findings provide a practical evidence base for coaches, sport psychologists, and organisations seeking to design interventions that not only strengthen athlete leadership but also enhance individual well-being and team success. By mapping the strengths and limitations of existing interventions, this review also points to clear priorities for future research.

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Data availability statement

The data is openly available on this project's osf page: https://osf.io/wyrtz/overview?view_only=509dbbc06049482fb2da63d5ca8b9205.

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ORCID

Krizia Tuand  <http://orcid.org/0000-0003-2670-5415>

Filip Boen  <http://orcid.org/0000-0002-5295-4776>

Niklas K. Steffens  <http://orcid.org/0000-0002-3990-2592>

Korneel Schepers  <http://orcid.org/0009-0008-0865-9084>

Katrien Fransen  <http://orcid.org/0000-0001-6294-7257>

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