

The research-application gap in high performance football environments: Moving beyond the research-practice divide

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ABSTRACT

While the research-practice gap is a well-used phrase in sport science discourse, particularly in football, it no longer reflects the evolving realities of high-performance environments. Many practitioners in elite clubs are often research-literate: many have completed postgraduate taught and/or research degrees, are embedded in academic networks, and contribute actively to collaborative scholarly work. The persistent challenge, however, lies not in accessing knowledge, but in translating it into timely, context-sensitive action. This narrative review reframes the issue as a research-application gap: a problem rooted in implementation rather than awareness. Drawing on contemporary literature and applied examples, we explore structural, cultural, and interpersonal barriers to application of research in practice, including siloed teams, time pressures, resistance to change, and leadership misalignment. We advocate for systems-based solutions which might include embedding researchers within clubs, co-creating interventions, and recognising application as a skill set requiring investment, support, and strategic oversight. Ultimately, bridging this gap demands rethinking how to positively implement change and growth. Football is uniquely positioned to lead a paradigm shift in how sport science is translated into performance impact, and this paper proposes some possible ways forwards.

Introduction

In recent years, discourse around the so-called “research-practice gap” has become common within sports science, particularly in football [1,2]. However, this popular framing may not accurately reflect the realities of the modern high-performance football environment. Increasingly, practitioners in high-performance football settings are not only aware of the latest research developments, but they also often actively contribute to them [3,4]. The real challenge lies not in awareness or knowledge dissemination, but in translating that knowledge into meaningful, actionable practice [5]. This subtle shift, from a research-practice gap to a research-application gap, is more than a matter of semantics. It reframes the problem, identifies new solutions, and, most importantly, reassigns shared responsibility between researchers and practitioners. The research-practice divide has, traditionally, implied a lack of engagement or communication between those

generating knowledge and those tasked with implementing it. But in football, this divide is narrowing. Practitioners are embedded in research teams, contribute to peer-reviewed publications, and routinely engage in regular continued professional development activities (e.g., conference attendance). The “gap” is no longer about access to knowledge but rather the ability to apply that knowledge within the constraints, cultures, and environmental complexities of elite football.

In this narrative review, we argue that the notion of a research-practice gap may be outdated in the context of high-performance football environments. Instead, the issue is one of *application*: a nuanced, multifaceted challenge that spans the structural, cultural, logistical, and even philosophical domains of performance science. We explore the current state of practitioner-researcher collaboration, explore the barriers to application, and propose a path forward grounded in co-creation, contextualisation, and embedded research. By moving beyond a simplistic binary of *research* and *practice*, we can focus on

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implementation strategies that better reflect the lived realities of football environments. This requires acknowledging that evidence-based practice is not simply about applying *what works* but about adapting *what might work* to *what works here*. This review draws on purposively selected studies and applied experiences relevant to the authors' experience and the current landscape of high-performance football environments.

Methodology

This study adopted a qualitative, narrative review-based approach [6,7]. A narrative review was selected as the purpose of the paper is not to provide exhaustive or systematic synthesis of all available evidence [8], but to critically interpret findings and integrate literature relevant to the research-application gap in high-performance football environments. Consistent with the narrative review methodology, the paper draws purposively selected literature that was judged to be conceptually relevant to the central argument [7], alongside the authors' applied experienced working in and with high-performance football settings [5].

The review focussed on literature relating to research-practice relationships, knowledge translation, implementation science, complex adaptive systems, interdisciplinary working, and high-performance football environments. Studies were selected on the basis of their relevance to the aims of the paper, their contribution to conceptual development, and their usefulness in illuminating structural, cultural, and interpersonal barriers to the application of research in practice. Priority was given to literature that could support critical interpretation of how research is translated, adapted, or constrained within elite football contexts.

As a qualitative narrative review, this paper does not claim comprehensiveness or reproducibility in the manner of a systematic review [8]. Rather, its purpose is interpretive and analytical. The intention is to synthesise diverse strands of literature, identify recurring themes, and use these insights to develop a conceptually grounded argument [7,9] for reframing the issue from a research-practice gap to a research-application gap in high performance football. Applied examples are used illustratively to support interpretation, not as primary empirical data.

The research-practice relationship in football

High-performance football is one of the most research-engaged sports globally [10]. Over the last two decades, the integration of science into football environments has advanced significantly, both in scope and sophistication [11]. High-performance practitioners, routinely engage with scientific literature, generate in-house data, and participate in formal research projects, often in collaboration with educational institutions. In many cases, these practitioners act as the crucial link between academia and the competitive realities of professional football [4].

This evolution reflects a broader trend of professionalising performance support [12]. Clubs increasingly invest in infrastructure that supports evidence-informed decision-making, including research and innovation departments, data science units, and partnerships with universities. These collaborations enable the development of research that is not only scientifically robust but also contextually grounded. In this regard, football is not suffering from a lack of research awareness or uptake among practitioners, on the contrary, the knowledge ecosystem in football is saturated with research-informed thinking [13]. Furthermore, the reciprocal relationship between researchers and practitioners has shown to have improved [14]. Where research outputs may have once been disconnected from reality, there is now an established and growing culture of co-creation: researchers are embedded within clubs as dual-role professionals, straddling both applied and research domains, and the line between knowledge producer and end-user is increasingly blurred. Football's environment encourages iterative

learning cycles, where internal club research often informs practice more directly and rapidly than traditional academic publications [15]. However, while the relationship is strong, the challenge is execution and implementation. The mere presence of research-informed staff or access to literature does not guarantee high-fidelity application. The problem is not that practitioners don't know what the contemporary research says. Often, they do. Rather, the application of research in high-pressured, resource-variable, applied contexts is complex [16]. Decisions are time-sensitive, influenced by culture, experience, coaching priorities, and logistical limitations [17].

In such environments, evidence is just one input among many in decision-making. For example, while the literature may support certain load monitoring protocols or recovery modalities, implementation depends on coach buy-in [18], player preferences [19], travel schedules [20], and staff capacity [21]. Therefore, the notion of a passive gap between researchers and practitioners oversimplifies a more dynamic reality. In football, the barrier is not just communication, it is translation into action under constraint. This reframing lays the groundwork for understanding the true nature of the gap we, as an applied scientific community, face.

Practice versus application

The terms *research-practice gap* and *research-application gap* are often used interchangeably in sports science discourse [16], yet they imply distinct problems with different implications for both practice and policy. In football, this distinction matters: While a research-practice gap suggests a lack of connection, knowledge, or awareness between academics and practitioners, a research-application gap acknowledges that the connection exists, but translating knowledge into impactful practice remains difficult.

We propose that the research-practice gap is largely epistemological. It describes a world in which practitioners are unaware of, or dismissive of, academic findings, and where researchers are disconnected from the needs and realities of end users. This might have been true in the early 2000s, when applied sports science was still fighting for recognition and inclusion within elite environments, and academic knowledge was largely viewed as impractical or inaccessible [22,23]. But that context has shifted, with football now embracing practitioner-scholars, embedded researchers, and widespread use of evidence-informed methods [24]. Indeed, some performance staff can cite meta-analyses, critically evaluate studies, and contribute to peer-reviewed publications. Therefore, to continue diagnosing the core challenge as a "research-practice gap" mischaracterises the modern ecosystem as it is no longer a failure to *know* or *engage*, but rather a struggle to *implement*. The friction we observe is characteristic of implementation in complex adaptive systems (CAS): multiple interacting actors (i.e., coaches, performance analysts, sport scientists, strength and conditioning coaches, medical staff, players, executives), nonlinear feedback (i.e., corridor conversations, pitch side discussions), path-dependence (i.e., "we've always done it this way"), and continual adaptation. Contemporary implementation science similarly cautions that uptake depends on contextual interactions across system levels, not just evidence strength [25–28]. In elite football, where teams and coaching environments function as CAS, well-supported interventions can still falter when they collide with local constraints, incentive structures, calendars, and cultures. Reframing the problem as complexity-driven implementation aligns with CAS accounts in health/services research e.g., [26,29], and with sport-specific scholarship on teams and coaching as complex systems [30,31].

CAS clearly positions that knowing *what* to do is not the same as being able to *do it effectively*, especially in an environment like football where the context is often performance-focussed, fluid, hierarchical, emotionally charged, and often unpredictable [32,33], leading to a constant evaluation and repositioning of issues in the pursuit of success. Considering player monitoring protocols, when tools such as

session-RPE, GPS metrics, and wellness questionnaires are applied within a systematic programme of load management, they may contribute to attempts to reduce in the incidence of injury risk [34]. Yet, in practice, implementation of load management strategies varies widely between clubs; and in some instances has been demonstrated to diverge even between departments of the same clubs, with inconsistent communication and differing professional philosophies and views on the issue [35]. Monitoring may not be prioritised due to staff workload, ignored by coaches, or resisted by players [18,21]. Thus, despite high research literacy, application fails, not because practitioners don't understand the science, but because the system is not set up to utilise it.

Recognising the difference between practice and application redirects our attention from a deficit-based view of practitioners (i.e., they lack knowledge) to a systems-based view of the sport itself (i.e., constraints impede application). This repositioning has implications for how we conduct research, how we evaluate impact, and how we define success. To make meaningful progress, we must not only continue to implement better study designs, but also to supporting, developing, and sustaining environments that are better equipped to apply the subsequent results and findings [36]. In doing so, we would shift from a model of top-down dissemination to one of embedded translation (see Fig. 1), where implementation is not an afterthought, but an integral part of the research process itself.

Barriers to application

If a core challenge in football lies in application rather than awareness, then identifying the barriers to application becomes paramount. Various factors obstruct the seamless implementation of evidence-based interventions, and these barriers are often not technical or knowledge-based; instead, they are akin to those of a CAS: contextual, cultural, relational, and institutional.

The contextual complexity and time pressures associated with elite football cannot be undersold. Indeed, high-performance football is a fast-paced, high-stakes environment marked by constant change, driven by congested competition schedules, fluctuating player availability, complex travel logistics, and coaching preferences that can shift weekly, or even daily. In such dynamic contexts, time for reflective practice or structured implementation is scarce [38]. Practitioners often face the dichotomous position of *what is ideal* (according to research) and *what is possible* given reality [16]. For example, a club may invest in neuromuscular screening tool to help identify risk factors associated with soft tissue injuries; yet the value of this approach diminishes if daily schedules do not allow for consistent, longitudinal data collection, making it impossible to identify deviations from a player's typical response, which are essential for detecting heightened fatigue and, thus, mitigating injury risk.

Cultural and interpersonal dynamics also brings inherent barriers as

football clubs are social systems with deeply entrenched cultural norms and power dynamics [39]. Coaches, not scientists, often retain the final say on training loads, player selection, and recovery protocols [17]. Even when practitioners present compelling data, decisions may be overridden by subjective judgment (i.e., heuristics), tradition, or the "coach's eye" [40]. Furthermore, evidence-based practice can clash with athlete beliefs or routines [37,41]. For example, players might resist interventions like structured resistance training due to (a lack of) developmental experience, a lack of perceived importance, or coach endorsement and value. Without trust, education, and player-centred communication, even the most scientifically supported practices may falter [5].

These issues might be attributable to a lack of implementation frameworks. While sports science literature is rich in data, it often fails to adopt implementation models tailored for high-performance sport due to nonlinearity and adaptive realities [14]. Research has tended to emphasise efficacy under controlled conditions, offering limited guidance on how to embed findings sustainably within messy, applied environments. Implementation science frameworks (e.g., RE-AIM, CFIR), common in healthcare, offer potential for better integration and oversight of research activity, but these are rarely adopted/adapted for football environments [42–44]. Consequently, the leap from *what works* in controlled studies to *what works here* on the training ground is unsupported. Practitioners are often left to bridge this gap through iterative, real-time experimentation, which risks intervention fatigue and disengagement.

This also creates a perceived lack of impact due to gaps in evaluating these real-time experiments. As clubs operate under pressure to deliver short-term results, if a new evidence-based intervention does not yield visible improvements within a tight timeframe, it may be dropped regardless of its scientific merit [45,46]. This creates a feedback loop where the only valued metrics are those that align with immediate performance outcomes, sidelining more nuanced, long-term gains (e.g., improved markers of neuromuscular function and improved player availability for match days). Moreover, scientific language or complex data visualisations often fail to resonate with key decision-makers. Even scientifically literate practitioners can inadvertently communicate findings at a level misaligned with the priorities and vocabulary of coaches or managers [47]. This underscores the need for deliberate knowledge translation, whether through better training for practitioners in communication and contextual framing, or through embedding dedicated intermediaries within clubs who specialise in translating evidence into actionable, context-relevant recommendations for non-scientific stakeholders.

Such knowledge translation also requires the removal of siloed structures and ensuring there are no communication breakdowns. Indeed, despite good intentions, clubs may still operate in silos, creating weak couplings across sub-systems. Yet, research suggests that teams are

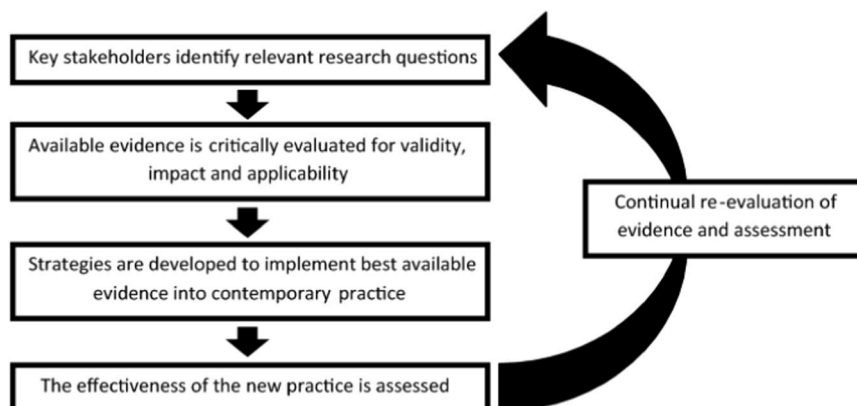


Fig. 1. The process of developing evidence-based practice. Source: Fullagar et al. [16], adapted from Coutts [37].

inclined to operate best when all staff members are working towards mutually agreed, definitive, and shared goals [48,49]. The structure and depth of multidisciplinary teams in football may ultimately result in data analysts, medical staff, and high performance practitioners working in parallel rather than in collaboration [50,51], leading to inter-disciplinary differences in approach and priorities, and resulting in challenges and potential conflict between key stakeholders [52,53]. This disconnect has the capability to disrupt the workings of multidisciplinary teams, such as impacting return to play following injury, diminishing the effectiveness of training, and influencing team performance outcomes [54,55]. When implementation is everyone's job, it can ultimately become no one's responsibility. Without clearly defined roles, regular interdisciplinary communication, and shared performance goals, the system can struggle to operationalise research insights.

The application gap: cultural, structural, and educational considerations

To close the research-application gap in football, we propose shifting the focus from simply producing more evidence to embedding research and innovation activities within the performance ecosystem. This means rethinking how we approach collaboration, leadership, communication, and practitioner development within applied football environments. Whilst not exhaustive, we present the following practical points that would support systemic change.

1. Co-creation, not dissemination

The traditional model of knowledge dissemination whereby researchers produce, and practitioners consume, is ill-suited to the high-performance football environment [56,57]. We contend that, instead, research must be co-created, involving key stakeholders in the ideation, research design, implementation, and evaluation [58]. Co-creation has been shown to increase buy-in, ensure contextual relevance, and support mutual respect between domains [59]. For example, a recent study on hamstring injury prevention that was co-designed with club physiotherapists and strength and conditioning staff considered logistical constraints, player preferences, and coaching philosophies, making implementation smoother and more likely to be sustainable [60]. Similarly, collaborative research between disciplines has the potential to uncover multidisciplinary challenges and novel solutions to common performance challenges within football clubs [61]. Whilst there is evidence of co-creation research activity taking place in high-performance sport generally [62,63], its adoption in high-performance football remains limited, with only anecdotal evidence available. However, the practise is gaining recognition elsewhere as a critical strategy for more impactful, contextually relevant, and ethically robust outcomes [63–66].

2. Embedding researchers within clubs

One promising strategy is to embed researchers directly within football environments, either as full-time staff or through formalised partnerships with academic institutions. These dual-role professionals can act as translators, bridging the scientific rigor of academia with the agility and pragmatism of applied football environments [5]. Embedded researchers are uniquely positioned to understand context, build long-term relationships, and iterate interventions in real time [4,67]. Their presence also elevates the quality of internal data collection and fosters a culture where research is not external or occasional but continuous and living [68].

3. Leadership and structural alignment

Application is unlikely without support from leadership, but clubs must recognise that implementing evidence-informed practices is a strategic asset, not a luxury [16,69]. This requires alignment across departments, disciplines, and stakeholders. When high-performance teams are siloed or undervalued, the pathway from insight to action often collapses [56]. Clubs, in an effort to promote this alignment,

have appointed to roles such as a Head of Performance, Head of Performance Services, or Director of Performance; with titles and remits depending on what best fits organisational structure and drivers. These roles could theoretically ensure that research initiatives align with the team's competitive objectives and that interventions have a clear implementation pathway. Delivery of these roles varies from club-to-club, and achievement of the intended broader remit requires clubs to consciously create protected space within these individuals' work programmes – free from immediate operational pressures. In practice, however, these individuals' operational responsibilities often take over, and their alignment between strategic and operational can become blurred. This may arise for several reasons but commonly reflects variations in individuals' professional backgrounds and experiences across operational, strategic, and research domains. As a result, attention may be directed toward particular elements of the role, often operational, as that aligns most closely with prior experience. More recently, some clubs have opted to appoint specialist, research personnel with a focus solely on leading research and innovation agendas, ensuring clear alignment with the club's strategic priorities. Indeed, a lack of leadership alignment and role understanding is a systemic barrier to evidence-informed practice; eroding the value of the role and the long-term integration of sport science into the club's strategy [70]. Without structural clarity and senior leader endorsement, these types of roles suffer from diminished influence on performance planning, innovation, and applied research translation [16].

4. Educational uplift and contextual literacy

All practitioners do not need to become research and innovation leaders; instead, they must develop the contextual literacy necessary to meaningfully engage with research informed processes. This includes the ability to interpret evidence within the specific constraints of their discipline, question established norms, and contribute insightfully to innovation development processes [71]. To foster this, clubs should invest in a structured educational uplift across the performance department. This would involve, for example, developing core capabilities in critical thinking data interpretation, behavioural science, and systems thinking, whilst fostering a shared language between practitioners and researchers. Such activities would enhance decision-making processes and provide shared understanding across teams and individuals, that would enable research and innovation activity to translate more easily into practice [65,71]. Importantly, these activities do not replace the need for formal leadership in this space. Instead, they enable more effective collaboration with a designated research and innovation (R&I) lead who is strategically positioned with responsibility for coordination of R&I efforts, ensuring alignment with team and club objectives, and translating external research into actionable strategies [52,64]. Positioning R&I as a collective mindset and a dedicated leadership function allows for strategic agility without overburdening frontline practitioners. Such distributed, yet anchored, models are particularly effective in high-performance environments where trust, expertise, and contextual relevance co-exist [72]. Ultimately, the success of any R&I strategy is dependent on a systemic culture of inquiry, where all staff are empowered to question, adapt, and evolve practice; supported by clear leadership and shared capability [63,66]. Thus, a combined, broad educational uplift and contextual literacy can be seen as essential for sustained, applied R&I in high-performance football environments.

5. Reframing evidence and success

Finally, clubs must rethink what counts as evidence and how success is measured. Recognition that evidence, from randomised controlled trials or meta-analyses to experiential knowledge or internal case studies are all of value. This may require an informed 'shift' away from the traditional academic hierarchy of quality of source or methodological design, and towards more translatable and logistically achievable

research. Indeed, a broader, more inclusive view of evidence that is aligned with the concept of practice-based evidence might help clubs recognise and document the effectiveness of contextually adapted strategies [34,73]. Similarly, success should not be judged solely on immediate performance metrics: Implementation timelines, adherence rates, stakeholder buy-in, and learning cycles are equally important [74]. By adopting more realistic benchmarks, clubs can build resilient systems where application is iterative, not all-or-nothing.

A call for co-creation and embedded research

The idea that football suffers from a research-practice gap no longer holds; practitioners are informed, engaged, and often, eager to integrate evidence into their work [67]. As suggested in this paper, what we face instead is a research-application gap: the persistent difficulty of translating research awareness into applied impact due to the CAS-nature of football clubs. Closing this gap demands a shift in how we conceptualise both research and practice. It requires moving beyond the idea that research is a product to be delivered, toward a vision of research as a process of continuous dialogue, testing, and refinement. This is where the model of *embedded, co-created research* becomes powerful. Not as a buzzword, but as a functional system for operationalising evidence in elite football environments. To achieve this, the following guiding principles are essential:

Mutual respect and shared ownership: Research cannot be something done *for* practitioners. It must be done *with* them. Co-creation fosters mutual understanding, builds trust, and ensures that interventions are shaped by research and practice-based evidence, and situational relevance.

Systems thinking and implementation design: Football environments are complex systems. Successful application requires researchers and practitioners to account for dynamic interactions across individuals, departments, and hierarchies. Implementation science, a discipline still underutilised in sport, offers practical frameworks for navigating this complexity.

Adaptive capacity over perfect fidelity: While scientific control values consistency and standardisation, applied environments demand flexibility. Clubs need to be agile in adapting interventions to suit their unique environments. “Good enough” implementation, done consistently, often outperforms theoretically perfect plans that never gets off the ground.

Long-term investment in culture: Embedding R&I into performance culture takes time. It requires leadership commitment, staff development, and sustained alignment between performance goals and evidence-informed strategies. Without cultural buy-in, even the best-designed initiatives will fail.

Reframing success: Impact should not be judged solely by performance outcomes or academic citations. Instead, we should value learning cycles, improved decision-making, and increased resilience within performance systems. These are quieter wins, but no less significant.

Conclusion

Bridging the divide between research and practice in high-performance football is no longer a purely a question of awareness, but of application with relevance. The contemporary practitioner is, typically, research literate, yet the persistent challenge lies in discerning what is meaningful for their specific environment. Knowing what is ideal, according to the evidence, and what is possible given the resources available, must be further complimented by nuanced understanding and recognition of what is *appropriate* for the unique culture, constraints, and objectives of the given team.

The research-application gap, therefore, reflects a systems challenge as opposed to a knowledge deficit. It is an issue rooted in the complex, adaptive nature of high-performance football environments. Effective

implementation requires not only methodological rigour, but also contextual literacy, interpersonal sensitivity, and organisational alignment. This means embedding research within performance ecosystems through co-creation, shared ownership, and long-term cultural investment as opposed to treating it as an external product to be delivered. Therefore, research interventions must be evidence informed, but also contextually resonant; fitting the day-to-day rhythm of environment, lived realities of players, and shared understanding from practitioners. Thus, success should be considered as adaptive, sustainable application that enhances decision-making and resilience within the system. The research-application gap is not a deficit to be blamed on either side; it is a shared challenge, an implementation problem, a systems problem, a people problem, but it is also an opportunity: Football is uniquely positioned to lead the way in redefining what applied science really means in high-performance sport.

CRedit authorship contribution statement

Simon J. Roberts: Writing – review & editing, Writing – original draft. **Warren Gregson:** Writing – review & editing. **John Iga:** Writing – review & editing, Writing – original draft. **James H. Dugdale:** Writing – review & editing, Writing – original draft. **Matthew J. Reeves:** Writing – review & editing, Writing – original draft, Project administration, Conceptualization.

Declaration of Competing Interest

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

Data availability

No data was used for the research described in the article.

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