Realist synthesis in sport and exercise medicine: 'Time to get real'

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In sport and exercise medicine (SEM), context is key. By context we mean: What works? For whom? How? And under what circumstances? These are 4 key questions for clinicians who aim to prevent injuries, treat patients, and guide return to sport with athletes.

To answer real-world challenges, clinicians will often bow to the Oxford levels of evidence and rely on findings of randomised controlled trials, (RCTs), systematic reviews (SRs) or meta-analyses. These methods are gold standards, recent debate[1] notwithstanding. However, in dynamic, changeable and less-controlled sports environments (e.g., soccer; rugby) where we strive to achieve optimal performance and health gains, we should challenge our own thinking and traditions to meet the demands of this unique environment.

Recognising a shift to a greater need for implementation science[2], we should consider looking beyond the accepted gold standard. Typically, SRs the focus on solely measuring and reporting intervention efficacy,[4] they omit implementation context.[3] The purpose of this editorial is to promote the value of Realist Synthesis—as a method that complements clinicians' use of the traditional levels of evidence.

What is a realist synthesis review and how does it differ from systematic reviews?

Realist Syntheses are based on realist philosophy of science, which has the specific aim of understanding the context—mechanism—outcome relationship, by considering their interactions. Realist synthesis can help to explain the success or failure of interventions within a given context.[2] Realist syntheses report on the *how* and *why* an intervention works, as opposed to simply *whether or not* it works?

It is common for SRs to only include RCTs.[1,5] A Realist Synthesis may complement the scope of knowledge of SRs by including a wider range of study designs to explain *why* and *how* interventions might work. Table 1[2,4,6,7,8,9] outlines key differences between SR and Realist Synthesis; Table 2[2,4,6,7] provides tips on how to undertake a Realist Synthesis.

What are the potential benefits of including realist syntheses when deciding on sport and exercise medicine practice?

Consider this scenario: Four RCTs with football teams that examine the FIFA 11+ exercises/program have been included as part of a SR. Two studies show that the FIFA 11+ reduced injury rates, two show a smaller reduction. A traditional SR would use these findings to report efficacy; the study might report an effect size calculated via meta-analysis. However, the studies where the FIFA 11+ program was less effective were coach-led, with the delivery supported by FIFA 11+ videos and posters. Where the FIFA11+ was more effective, the program was coach-led, with their delivery supported by videos and posters and coaches took the lead in delivering the FIFA 11+ after being trained in the delivery of the FIFA11+ programme expert clinicians. Whilst being trained in the FIFA 11+ delivery by clinicians, coaches had the opportunity to take part in the exercises and receive feedback from sports medicine staff. They also had the opportunity to observe each other performing the training programme and provide feedback to each other on movement quality etc.

What we see when we look beyond the statistics is that there are many mechanisms that might influence the effectiveness of the programme: the skill of the coach in leading the session, the ability of the coach to provide corrective feedback, possibly the confidence of the coach in leading the activities and many potential others. A standard systematic review design would not normally consider these factors, it would stop at the point where we know if the FIFA 11+ did or didn't work versus the control. While conducting sub-group analyses/meta-regression might highlight some of these differences further, they wouldn't necessarily clarify our understanding of mechanisms behind these differences, in a real-world context. Adopting the Realist Synthesis approach enables us to examine the potential mechanisms (i.e., in this hypothetical example, the medical staff influence on coach education, the impact of education on coach implementation, the impact of these on the

coach's ability to lead the intervention). It also allows more flexibility to refine and revise the purpose and inclusion criteria in light of emerging data, meaning that the RS may be more responsive to changes in thinking. This may be of particular benefit in the dynamic and changing world of sport, whereby very little work we do in the real-world is under strict controlled conditions often required in RCT studies. Consequently, with a RS approach, we are arguably in a stronger position to provide practical, real-world recommendations for intervention implementation.

Summary

Clinicians all want to answer the questions: 'What works?' 'For whom?' 'How?' and 'Under what circumstances?' because we know that the answers to these questions mean clinicians can provide the best quality of support for patients. Here we contend that Realist Synthesis is a complementary way to answer these questions—it complements and extends the knowledge traditionally gained through SRs. We encourage researchers and clinicians to collaborate, drawing on their respective research and real-world experiences and skillsets, and use these to get real with their reviews.

What is already known?

- Systematic reviews are the 'gold standard' for informing medical decision making
- Systematic reviews can vary in quality
- Clinicians require answers to real-world challenges to provide the highest quality of service to patients

What is the new perspective shared?

- Realist syntheses provide the potential for a more translational science appropriate to providing patient care in sport and exercise medicine environments
- Realist syntheses aim to address questions around how and why a treatment or intervention may or may not work, as opposed to simply discussing treatment or intervention efficacy
- Realist syntheses can provide answers to real-world challenges faced by clinicians

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Table 1. Main differences between SR and RS[2,4,6,7,8,9]

Systematic review	**Realist Synthesis**
1. Identify the review question	1. Clarify scope of review Identify review question Refine purpose of review Articulate key theories to be explored
2. Search for primary studies, using clear predefined inclusion and exclusion criteria	2. Search for relevant evidence, refining inclusion criteria in the light of emerging data
3. Conduct a risk of bias assessment, considering domain-based risk of bias and assessing review outcomes separately	3. Appraise quality of studies using judgement to supplement formal checklists, and considering relevance and rigour from a 'fitness for purpose' perspective
4. Extract standard items of data from all primary studies using template or matrix	4. Extract different data from different studies using an eclectic and iterative approach
5. Synthesise data to obtain effect size and confidence interval and/or transferable themes from qualitative studies	5. Synthesise data to determine what works for whom, how and under what circumstances
6. Make recommendations, especially with reference to whether findings are definitive or whether further research is needed	6. Make recommendations, especially with reference to implementation/contextual issues for particular policymakers at particular times.
7. Disseminate findings	7. Disseminate findings and evaluate extent to which existing programmes are adjusted to take account of elements of programme theory revealed by the review

Table 2. Outline of RS process[2,4,6,7]

Stage of RS	Action	Activities to undertake and questions to consider
Define the scope of the review	Identify the question	• What is the intervention? • What are the circumstances or context for its use? • What are the policy intentions or objectives? • What are the nature and form of its outcomes or impacts? • Undertake exploratory searches to inform discussions with stakeholders/decision-makers
	Clarify the purpose(s) of the review	• Theory integrity – does the intervention work as predicted? • Theory adjudication – which theories about the intervention seem to fit best? • Comparison – how does the intervention work in different settings, for different groups? • Reality testing – how does the policy intent of the intervention translate into practice?
	Find and articulate the programme theories	• Search for relevant theories in the literature • Draw up 'long list' of programme theories • Group, categorise or synthesise theories • Design a theoretically based evaluative framework to be 'populated' with evidence
Search for and appraise the evidence	Search for the evidence	• Decide and define purposive sampling strategy • Define search sources, terms and methods to be used (including cited reference searching) • Set the thresholds for stopping searching at saturation
	Appraise the evidence	• Test relevance – does the research address the theory under test? • Test rigour – does the research support the conclusions drawn from it by the researchers or the reviewers?
Extract and synthesise findings	Extract the results	• Develop data extraction forms or templates • Extract data to populate the evaluative framework with evidence
	Synthesise findings	• Compare and contrast findings from different studies • Use findings from studies to address purpose(s) of RS • Seek both confirmatory and contradictory findings • Refine programme theories in the light of evidence
Draw conclusions and make recommendations		• Involve stakeholders/commissioners/decision makers in review of findings and drafting professional practice/policy recommendations • Disseminate RS with findings, conclusions and recommendations