

Physical activity research: time to scale up!

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Despite massive growth in the volume of physical activity research in the past 15 years,¹ we are yet to see an improvement in global physical activity levels.² So how do we enact real, measurable and sustainable change in population physical activity levels? If the goal of the WHO Global Action Plan on Physical Activity of a 15% relative reduction in physical inactivity by 2030 is to be met,³ then a shift in research focus and implementation strategy is needed. In this editorial, we argue for better reporting and more ‘scale-up’ of physical activity programmes and outline how this can be done.

WHAT IS GOING ON IN PHYSICAL ACTIVITY RESEARCH?

Intervention studies, whether they be preliminary/pilot, efficacy/effectiveness, replication or dissemination studies, are critical to informing policy decisions.⁴ Despite the importance of intervention research, observational studies continue to dominate physical activity research.¹ Though the proportion of intervention studies has increased slightly over time, replication and dissemination studies (defined in [box 1](#)) have actually decreased.¹ As a community of physical activity researchers, it is time we asked ourselves: are we studying what is easily carried out—or what is fundable—rather

Box 1 Differentiating efficacy and effectiveness, replication and dissemination studies¹

Efficacy and effectiveness studies investigate the impact of an intervention under *optimal conditions* (controlled (efficacy) or community (effectiveness) settings), with a scientific focus on the intervention causing increased physical activity as the primary outcome. However, efficacy and effectiveness studies can have poor generalisability as their effects are generated from volunteer samples with limited attention to process evaluation or contextual factors.

Replication studies evaluate the implementation of efficacious and/or effective interventions in new populations and ‘real-world’ settings. The focus in these studies shifts towards fidelity (whether the components of the original intervention are transferred to the real-world settings), rather than solely on health behaviours.

Dissemination studies examine/ describe the scaling-up and dissemination of interventions at the population level or in large populations.

than what really matters for population health?

There is also a problem of quality within the relatively small body of intervention studies. We screened the reference lists of 350 systematic reviews of physical activity interventions for older adults.⁵ Nearly two-thirds (61%) of 1124 randomised controlled trials (RCTs) were fair or poor quality, and sample sizes were generally small (median n=55). This problem of small, fair-quality studies is not unique to the older adult population.⁶ More efficacy/effectiveness studies are important but are not enough to improve population physical activity levels. Replication and dissemination studies are also needed to test physical activity programmes in

different ‘real-world’ settings and at scale ([box 1](#)).

WHY ARE THERE SO FEW REPLICATION AND DISSEMINATION STUDIES?

The relative increase in cross-sectional correlational studies over time suggests that these studies are being preferred by researchers.¹ Intervention studies are considered more expensive and time-consuming.⁷ Intervention studies are often conducted with levels of resources that are not feasible in the real world, although what is feasible, fundable and ‘real-world’ varies across settings. Obtaining funding and conducting physical activity intervention studies—particularly ‘real-world’ trials—is challenging but necessary.

Replication and dissemination studies are complex, requiring expertise in programme evaluation and implementation research, as well as strong collaborations with service providers, clinicians, policymakers and community stakeholders. Building—and sustaining—these relationships takes time and effort. Many intervention studies are carried out without input from end-users and as a result have little chance of being adopted into practice. This is arguably encouraged by funding models supporting investigator-led projects without effective end-user engagement.

WHAT CAN BE DONE?

One thing we need is improved *reporting* of interventions to support replication and population-wide translation.⁶ The Consensus on Exercise Reporting Template and Template for Intervention Description and Replication are excellent tools to enable detailed reporting. Some journals, including BJSM, now require such a checklist on submission—we call on all journals to follow suit. However, even if trials are well-conducted and reported, if there is limited potential for scale-up, these studies will fail to address the public health problem of physical inactivity.

What we *really* need is more physical activity programmes tested at scale. Community-based physical activity interventions are mostly effective when scaled up, although potentially with reduced effects.⁸ We need to strike a balance between building quality evidence on optimising scale-up (through implementation trials) and taking a more pragmatic approach to evaluating scaled-up programmes (ie, not necessarily testing through RCTs). Evaluation of complex programmes could investigate different intervention strategies within a specific

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context using clearly defined indicators and a supporting framework.⁹ Fidelity to original programmes—or documentation of any adaptations—is important to enable replication and dissemination studies. Primary study authors can assist by publishing protocol papers and including careful evaluation of programme implementation. Use of codesign methodologies with participants and other stakeholders is critical for success and sustainability.

There are four key steps involved in the scale-up of public health interventions:¹⁰

1. *Assess scalability*: confirm the intervention's effectiveness and assess readiness for scale-up, potential reach, alignment with the policy context, acceptability and feasibility.
2. *Develop a scale-up plan*: describe the intervention, situation and stakeholders, outline who could be involved and select the approach: vertical (introducing the intervention simultaneously across a whole system) and/or horizontal (phased introduction across different sites).
3. *Prepare for scale-up*: consult with stakeholders, gain support of decision makers and mobilise the community and financial resources.
4. *Scale-up the intervention*: put the plan into place, monitor effectiveness, reach, fidelity, acceptability, cost, efficiency and ensure sustainability.¹⁰

If the intent of physical activity research is to influence the health and well-being of whole populations, then scale-up must be planned *from the beginning* of effectiveness trials.¹⁰ We must involve clinicians and policy makers in knowledge generation regarding implementation and scale-up. We must also consider how research evidence—and practical recommendations—can be communicated to a wider audience. Finally, as resources are finite, clinical and population health

interventions with clear potential for scale-up and dissemination must be prioritised in resource decisions.

Correction notice This article has been corrected since it first published. The open access licence type has been changed to CC BY. 31st October 2023.

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REFERENCES

- 1 Lee K, Ding D, Grunseit A, et al. Many papers but limited policy impact? A Bibliometric review of physical activity research. *Transl J ACSM* 2021;6.
- 2 Guthold R, Stevens GA, Riley LM, et al. Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1.9 million participants. *Lancet Glob Health* 2018;6:e1077–86.
- 3 World Health Organization. Global action plan on physical activity 2018–2030: More active people for a healthier world. World Health Organization; 2018.
- 4 Beets MW, Pfledderer C, von Klinggraff L, et al. Fund behavioral science like the frameworks we endorse: the case for increased funding of preliminary studies by the National Institutes of health. *Pilot Feasibility Stud* 2022;8:218.
- 5 Pinheiro MB, Oliveira JS, Baldwin JN, et al. Impact of physical activity programs and services for older adults: a rapid review. *Int J Behav Nutr Phys Act* 2022;19.
- 6 Hansford HJ, Wewege MA, Cashin AG, et al. If exercise is medicine, why don't we know the dose? An overview of systematic reviews assessing reporting quality of exercise interventions in health and disease. *Br J Sports Med* 2022;56:692–700.
- 7 Hawe P, Potvin L. What is population health intervention research *Can J Public Health* 2009;100:Suppl
- 8 Lane C, McCrabb S, Nathan N, et al. How effective are physical activity interventions when they are scaled-up: a systematic review. *Int J Behav Nutr Phys Act* 2021;18.
- 9 Gray SM, McKay HA, Nettlefold L, et al. Physical activity is good for older adults-but is programme implementation being overlooked? A systematic review of intervention studies that reported Frameworks or measures of implementation. *Br J Sports Med* 2021;55:84–91.
- 10 Milat AJ, Newsom R, King L, et al. A guide to scaling up population health interventions. *Public Health Res Pract* 2016;26:e2611604.