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Implementation science: an introduction for primary care

Pallavi Prathivadi[1,*], Philippa Buckingham[1], Samantha Chakraborty[1], Lesley Hawes[1,2], Sajal K. Saha[1,2,3], Christopher Barton[1], Danielle Mazza[1,2], Grant Russell[1], Elizabeth Sturgiss[4]

[1]Department of General Practice, School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia, [2]National Centre for Antimicrobial Stewardship, Doherty Institute, Melbourne, Australia, [3]Global and Tropical Health Division, Menzies School of Health Research, Charles Darwin University, Darwin, Australia, [4]School of Primary and Allied Health Care, Monash University, Melbourne, Australia

*Corresponding author: Department of General Practice, Monash University, 1/270 Ferntree Gully Road, Notting Hill, 3168 Victoria, Australia. Email: Pallavi.prathivadi@monash.edu

What is implementation science?

Implementation science is the scientific study of the use of strategies to adopt and integrate evidence-based health interventions into clinical and community settings to improve individual outcomes and benefit population health.[1] This transdisciplinary field combines economics, management science, social sciences, psychology, public health, medicine, and other disciplines. Although implementation science has aligned goals with quality improvement to reduce the evidence-practice gap, the approaches are different in chronicity, use of theoretical models and generalizability, and the terms are not used interchangeably. The aim of this article is to highlight the role and key elements of implementation science in primary care research, and the benefits arising from application of its principles.

When is implementation science relevant to a research programme?

Implementation science can be used at all stages of research to inform practice and improve patient outcomes. In the planning phases, cultivating an understanding of the local context—including the needs of communities, health services and providers—can help predict potential differences in implementation, especially when combined with theory.[2,3] As the research is conducted, implementation science can help researchers identity unforeseen issues and adjust the implementation process iteratively. When assessing for sustainability or scale-up, implementation science can be used to rigorously evaluate the contributors to "success" or "failure" of interventions. If key implementation principles are not considered throughout the planning, implementation, evaluation, reporting, and dissemination stages of research, a study can be cost-ineffective, criticized by stakeholders or funders, not ready for scale-up, difficult to interpret, poorly communicated without use of a reporting checklist (such as the Standards for Reporting Implementation Studies statement[4]), and/or unsustainable (Box 1).

Why is implementation science relevant to primary care?

Implementing change in primary care is challenging. Although complexities in health care systems are widely acknowledged, primary care has unique elements that differentiate it from secondary and tertiary care. Firstly, primary care clinicians provide first-contact care and are gatekeepers to health and social care systems.[3] Secondly, primary care is delivered longitudinally and managed in partnership with patients and carers, and primary care clinicians are often tasked with coordinating and facilitating patient-centred care that is comprehensive, multisystem, and multidisciplinary.[3] Thirdly, primary care systems are associated with better access and availability of care provision compared with tertiary systems.[3] These unique elements mean that hospital-based innovations rarely translate easily to primary care settings. Furthermore, an intervention may be successful in one primary care practice yet fail in another due to context-dependent factors.[3]

How can implementation science be used to improve the conduct of primary care research?

We recommend primary care researchers develop an "implementation science mindset" to improve the reach, impact, and success of their research, or consider collaborating with colleagues with expertise in implementation science. We have 4 suggestions for the novice primary care researcher to engage with implementation science:

Box 1: Intervention, implementation, or evaluation failure? Two examples from primary care trials.

Example 1: Implementation[5]
A large primary care randomized control trial reported no improvement in quality of life following an intervention to improve management of multimorbidity. However, the highly pragmatic nature of the trial may have reflected implementation failure rather than intervention failure. Several methodologic limitations were identified including that only half of participants received the full intervention, low recruitment rates, and multiple testing that may have caused false-positive results. Researchers concluded this intervention still achieved important outcomes of improved *patient perception of care*, and therefore encouraged implementation, but later published a detailed process evaluation to examine implementation fidelity.

Example 2: Evaluation[6]
A feasibility study reported patient and community pharmacists' experiences in delivering a contraceptive injection. Although patients found the service excellent, several barriers were identified to implementation delivery, including high pharmacy staff turnover, lack of managerial support, burdensome corporate protocols, perceptions of pharmacist anxiety delivering the intervention, and contextual factors (differences in the operation of commercial chain and independent pharmacies) limiting its potential and future scale-up. A thorough evaluation to identify and address these implementation issues would help funders and other researchers, as well as code signing with pharmacists for subsequent trials.

1. **Consider the community and socio-political, economic, historical, and cultural context in which the research is being undertaken**
   Primary care is a collection of organizational macrocosms in which change and innovation occurs at multiple levels: practitioner, patient, teams, and organization.[7] For an intervention to be successful at the level of a practice, a detailed knowledge of practice workforce is needed, with an understanding of specific team interactions and professional roles and responsibilities.[7] In addition to assessing availability of time and resources, researchers need to consider if practice staff are willing to engage in the research, and if the resources and funding arrangements are in place to support implementation.[5,7] Lack of "need" as perceived by participants is a significant barrier to practice engagement; therefore, a needs analysis may help pragmatically assess if the research is needed, wanted, or valued before commencing, and to check if existing resources may deem the proposed intervention redundant. Intervention implementation may also be hindered by political factors; changes in political administration or legislation may impact practice behaviours in areas such as drugs of addiction, or provision of contraceptive and abortion services, especially considering that governments provide research funding, propose legislation, set health care priorities, and in some countries, allocate budgets and funding for primary health care provision.[8] Incorporating policy advisory groups to projects may help consider these factors and allow rapid adaptation of methodology. Economic viability is also a powerful motivator: whether primary care providers are government-funded or small private businesses, new innovations must fit within their context of health care delivery and resource availability.[9] Furthermore, dynamic cultural, historical, and contextual barriers and enablers may be identified using mixed methods approaches and significantly influence implementation.[9]

2. **Involve stakeholders, consumers, and end-users**
   The importance of consumer and stakeholder involvement in primary care research is increasingly recognized.[10] However, involvement needs to be meaningful, in-depth, longitudinal, and considered in 3 different capacities; stakeholders (who have important roles in funding, dissemination, translation, and scaling of interventions), patients and carers (end-users of health care systems), and practitioners (end-users of interventions and health care providers)—although these 3 groups may have widely differing views and concerns. Stakeholders (including programme developers, administrator, system leaders, and policy makers) can be involved through formative research, workshops, group feedback, and implementation training to improve collaboration and support culturally appropriate implementation. A multilevel stakeholder evaluation of a 2016 mental health implementation programme illustrates the importance of such involvement; all 3 stakeholder groups endorsed the importance of coordinated collaboration to successful implementation but had varying convergent and divergent views about specific intervention barriers and enablers.[11] Working collegially with consumer and stakeholder groups will help identify and address these views throughout the research process.

3. **Explore, understand, and apply theory**
   Despite evidence that interventions designed with a theoretical underpinning are more likely to be successful by predicting, planning, and understanding what may influence or explain outcomes, theory is uncommonly or only superficially used in research.[2] Over 100 transdisciplinary theories are relevant to primary care research, and can be used to identify barriers and facilitators, inform data collection, enhance methodology, inform data analysis, and frame evaluation.[12] For brevity, we will highlight a few examples, but recommended the interested reader to explore related references or the website dissemination-implementation.org. Theories can be categorized by their level of abstraction as grand, mid-level, or programme theory.[13] Alternatively, theories can be grouped by their originating discipline or field.[13] In an example of a behaviour change intervention, the relevant implementation science theories could be grouped as (i) theories describing the *process of translating research into practice*, such as the transtheoretical model of change[14] which can guide researchers to understand a recipient's readiness for change and therefore drive a relevant intervention to inform change; (ii) theories describing the *mechanism that influences change*, such as social learning theory[15] which proposes that reciprocal engagement with people contributes to learning and changing behaviours; and (iii) theories seeking to *evaluate implementation*, such as complexity theory[16] which describes complex adaptive systems and recognizes that primary care is a system comprising individuals, clinical best practice, information management, education, legislation, and more. For an intervention to be sustain-

able in this context, it is useful to monitor how the system reacts to an intervention and how the system may evolve. Normalization process theory, a mid-level theory, further supports this and describes specific efforts and factors needed for individuals and groups to sustain behaviour change and normalize innovation in routine practice.[17]

4. **Understand, apply, or develop frameworks**
Although theories help to understand how and why an intervention may or may not work, they require frameworks so that they can be operationalized. Structured approaches are commonly used, such as the Reach, Effectiveness, Adoption, Implementation, and Maintenance framework[18] or the Consolidated Framework for Implementation Research,[19] and typically consist of domains to help identify specific factors that should be modified to improve acceptability, appropriateness, feasibility, effectiveness, and the data/variables that will be used to assess these outcomes. However, a single framework may not address all relevant factors, and multiple frameworks may be used in unison to expand on the information collected—although the Theoretical Domains Framework[20] is frequently used due to its holistic approach. Researchers may even develop their own implementation framework to advance knowledge of implementation theory. Importantly, frameworks should be applied *with* underlying theory to maximize predictability and understanding of outcomes and could be considered as a practical "mind map" of the implementation process. This may also help sustain behaviour change or innovation after conclusion of the trial and therefore improve "real-world" outcomes.

Conclusion

Implementation science can improve translation of evidence into primary care practice. Patient- and end-user-centred approaches are important, and all stages of intervention development, implementation, and evaluation should involve implementation principles. Furthermore, stakeholders and policy makers are more likely to fund interventions with higher likelihood of effectiveness, cost-effectiveness, and greater community need. Finally, pragmatic implementation will support the translation, adaptability, sustainability, and scaling of innovation across complex international primary care settings. To achieve these goals, the primary care community needs to prioritize implementation science and ensure the principles are routinely applied to research and practice.

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Ethical approval

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Conflict of interest

None declared.

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