Author’s response to reviews

Title: Changing Behaviour 'more or less' - Do theories of behaviour inform strategies for implementation and de-implementation? A Critical Interpretive Synthesis

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Changing Behaviour 'more or less' - Does theory inform strategies for implementation and de-implementation? A Critical Interpretive Synthesis

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Implementation Science

Dear Dr. Wilson,

Thank you for the opportunity to address the minor comments from you and the editorial team. We appreciate your recognition of the behavioural perspective we have taken in our investigation into whether theories propose different strategies for implementation and de-implementation. However, after considerable discussion with the fellow authors we respectfully disagree with the assumption that behavioural theory-based strategies are useful for informing only “individual-level interventions” and provide evidence below showing that these theories have been used to inform interventions delivered at various levels of health care systems to target the practice that requires changing. In addition, behavioural theories can be utilised to address any of the de-implementation typologies described by Wang et al[1].
Behavioural theories can help identify appropriate change strategies that can be delivered at any level of a healthcare system. For example, in our own previous work we have used the Theoretical Domains Framework[2] (TDF; a framework based in the behavioural sciences) to identify barriers and enablers to routine pre-operative test ordering[3]. A pilot implementation intervention based on the findings from the barriers assessment and delivered at the hospital-level (in Canada) with uptake by the anaesthetic and surgical departments led to a 48% absolute reduction in pre-op test ordering (Kirkham manuscript in preparation). The Affinitie Programme used Control Theory[4] to develop and evaluate different ways of delivering feedback embedded in the existing series of audits conducted by the NHS Blood and Transplant National Comparative Audit programme (a system-level intervention; UK), to improve the uptake of evidence-based transfusion guidance and to reduce the unnecessary use of blood components by individuals and healthcare teams [5, 6].

The assumption that behavioural theories propose strategies useful only for individual-level interventions is pervasive not only in implementation research, but also in public and population health research. A recent commentary by Sniehotta and colleagues in the Lancet argued that, “Actors are central in any population health system—whether those actors are policy makers, industrialists, public health professionals, researchers, or members of the public. They engage in multiple actions, practices, and patterns of behaviour, linked in complex relationships with each other and their social and material world. […] To improve population health, individual behaviours should be recognised as key elements that affect population health; to intervene without a thorough understanding of behavioural complexities (eg, how they cause and respond to feedback loops, interactions, threshold effects, and unintended consequences) is to ignore a key part of the complex system of population health and to undermine the potential for effective interventions.”[7] The same can be said for implementation research: behavioural theories can aid in developing a better understanding of the main effects, mediators (mechanisms), and moderators (effect modifiers) between behavioural influences and interventions in the environments (policy, system, organization, team) [7] in which healthcare professionals work.

There have been major methodological and theoretical developments in field of health psychology in designing and evaluating multi-level interventions. Advances in intervention mapping using behavioural theories have improved design and implementation of health promotion interventions (community-level) and school based programmes (system-level)[8, 9]. In addition, the Behaviour Change Wheel (BCW), a guide for designing interventions with its foundation in the behavioural sciences, illustrates that interventions can be implemented at any level by including policy-, system-, and individual-level components[10]. The BCW has been used to characterise interventions within the English Department of Health's 2010 tobacco control strategy (system-level) and the National Institute of Health and Clinical Excellence's guidance on reducing obesity (policy-level)[11].

To the second point regarding conceptual clarification, Wang et al. proposed four different types of de-implementation related to organizational effort (partial reversal, complete reversal, related
replacement, unrelated replacement) [1]. Behaviour theories may help inform any of these four types, since the underlying foundation of all four is removing ineffective practice and performing the associated behaviour less often. The first two types focus on reducing the frequency of behaviour from either i) often to not at all for a sub group of patients (partial reversal – removing ineffective practice); or ii) often to not at all for the whole patient population (complete reversal - removing ineffective practice). The latter two types (related replacement, and unrelated replacement) again still initially involve removal of ineffective practice (from often to not at all). As we have highlighted in our manuscript, behaviour substitution is a behaviour change technique [12] and is a strategy that can be used to decrease an undesired behaviour but it is not a distinct form of de-implementation. Identification and implementation of the alternative behaviour should undergo the same investigation as any implementation intervention. Behavioural theories can be applied to the alternate behaviour to promote its uptake.

You have noted that this review will inform future research in the field. We believe that in the context of both implementation and de-implementation, the assumption that individual behaviour theories are useful for informing only individual-level interventions is a fundamental flaw. By perpetuating this assumption, we would be doing a disservice to the field of behavioural science and that of implementation research.

We appreciate the opportunity to address this point and have added a brief paragraph on page 17 to clarify the points we have argued (more extensively) in this letter.

A strength of the review is the focus on behaviours of healthcare professionals and teams, no matter where in a healthcare system an intervention is delivered. This is because, unless an implementation intervention that is delivered at system-level or organisational-level actually changes the care that a patient receives from healthcare teams and individual healthcare professionals, it fails to enhance care quality and therefore fails to improve health outcomes.

Best regards,

Dr. Andrea Patey


3. Patey, A.M., et al., Anesthesiologists' and surgeons' perceptions about routine pre-operative testing in low-risk patients: application of the Theoretical Domains Framework (TDF) to


