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Letter to the Editor

Care must be taken that research participates in the cumulative science of behavior change?

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We read with great interest the article by Şekerci and Kitiş [1] describing a Transtheoretical Model (TTM) based intervention delivered by motivational interview to improve physical exercise in women with diabetes. Although the TTM has been regularly criticized, the Şekerci and Kitiş [1] study illustrates that TTM interventions are effective to improve physical activity (PA) in adults. However, based on their investigation, we would like to highlight three points. First, this study illustrates that TTM-based interventions to promote PA in clinical practices are effective, but secondly, the implementation is generally not based on the revised TTM assumptions. Last, from a research perspective, the lack of details and information provided about the intervention represent an important obstacle to future reproducibility.

Transtheoretical Model is effective to promote physical activity.

It is now clear that theory-based interventions, including those based on the TTM, improve physical activity (PA). Indeed, Gurlan et al. [2] found an overall significant effect for TTM-based interventions (31 randomized controlled trials) with a medium effect size ($d=0.31$, 95% confidence interval: 0.11 – 0.32). This finding was confirmed in an updated meta-analysis in 2018 [3]. Nevertheless, and as confirmed by previous systematic investigations, most of TTM interventions are TTM-inspired rather than TTM-based. Therefore, it suggests that TTM based interventions should be carefully implemented [4, 5].

A physical activity specific Transtheoretical Model

When investigating the TTM in PA research, it is worthy to highlight that two TTM assumptions specific to smoking cessation were not verified in PA research: the processes of change pattern and the stage-matched counseling. Observational and intervention studies found that empirical processes of change distributions across stages of change were different from seminal assumptions validated in smoking cessation context. Indeed, Prochaska et al. [6] suggested that adults in pre-action stages preferentially used experiential processes of change and those in post-action stages were more likely to use behavioral processes of change to progress and maintain their behavior. Nevertheless, most of the time, this dynamic pattern was not found to be accurate in physical activity behavior since studies, including meta-analysis, showed that adults use all ten processes of change (the five experiential, and the five behavioral) to adopt or maintain PA [4] and this finding was, one more time, found in the Şekerci and Kitiş intervention [1]. For instance, PA increase was associated with a higher use of both experiential and behavioral processes of change in previous interventional investigations including inactive overweight adults with type 2 diabetes [7, 8].

Also, in the Şekerci and Kitiş [1] intervention, the contents were provided according to participants' current stage of change. In other words, Şekerci and Kitiş [1] developed a stage-matched intervention. However, there is no evidence that stage-matched interventions are more effective to increase PA behavior. Indeed, in their meta-analysis, Romain et al. concluded that TTM-based interventions efficacy targeting PA behavior was not moderated by stages of change [3] but by processes of change and self-efficacy.

Şekerci and Kitiş [1] presented a description of their TTM-based intervention for each stage of change however the amount of information provided (e.g., mode of delivery and behavior change techniques) is not sufficient enough for the intervention to be reproduced. It would have been interesting to have access to the content of the exercise guide, especially the different strategies (or processes of change) included for the patients. In this perspective, it constitutes a limitation to understand the role and use of the other TTM constructs (i.e., self-efficacy, processes of change, decisional balance) associated with PA behavior change [9]. To illustrate this point, one could refer to the different stages of change definition. Indeed, according to Prochaska [6], the stage of precontemplation is not only limited to people who are unaware or unwilling to change; it also includes people who don't think they can change, which refers partially to the concept of self-efficacy. This lack of information is particularly important because a higher level of PA after a TTM-based intervention was found in interventions using a higher number of theoretical constructs [3]. In conclusion, there is still a necessity to better implement TTM-based interventions by including all theoretical components and previous evidence about TTM efficacy.

Conflicts of Interest: Bernard P, Romain AJ, and Desjarlais A declare that they have no conflicts of interest.

Co-Author Agreement: We the authors agree to the sharing of this preprint on SportRxiv

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