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Title: Is self-determined motivation associated with the effects of an intervention aimed to increase physical activity and exercise levels? An 80-day follow-up

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Abstract:

Objective: State-of-the-art technologies, for instance smart watches and smartphones, have the potential to positively influence physical activity and exercise in sedentary populations. Psychological factors, such as self-determined (SD) motivation, might influence the impact state-of-the-art technologies have on level of physical activity and exercise. The aim of this study was to investigate if self-determined motivation influences an intervention on both physical activity (PA) and exercise in a sedentary population.

Methods: 16 participants (men = 5, women = 11) with a self-reported low level of PA over the last year and predominantly sedentary jobs volunteered to participate in the study. PA data (steps and exercise time) were collected over an 80-day period using a wrist-worn accelerometer (Apple-watch and iPhone). Motivation was measured with the Behavioral Regulation in Exercise Questionnaire-2. At the start of the study, each participant completed the questionnaire and received their Apple-watches. Data analysis: All PA and exercise data were recorded through the Apple-watch and via Health App. Data for PA (steps) and exercise time were then extracted and aggregated to daily totals. Statistical analysis: Group means and standard deviations were calculated. A linear regression analysis was used to analyze the relationship between exercise time, PA, and SD, the R^2 value effect size (ES) was used to estimate the magnitude of the differences. All data analyses were performed in MatLab (software, R2016b).

Results/findings: SD motivation (3.9 ± 0.9) had a medium ($R^2 = 0.09$) but not statistically significant ($p = .26$) effect on the amount of moderate to high-intensity exercise time (33.3 ± 39.6 minutes) during the 80-day period. There was no statistically significant effect ($R^2 = 0.003$, $p = .84$) of SD on PA (12953 ± 7717 steps).

Conclusions: Given the small sample size, achieving a medium effect size has meaningful significance despite not achieving statistical significance. This result suggests that self-determined motivation affects the amount of daily exercise but not PA in a sedentary population. Combining technology and other strategies (e.g., motivational interviewing, coaching) to promote behavior change is promising, and these interventions should include theoretically derived behaviour change techniques and take level of SD motivation into account.