

Peer Review

Review of: "Increasing Physical Activity in Inactive Adults: A Randomized Crossover Trial Comparing Two Highly Popular Apps"

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Overall Evaluation

This manuscript presents a timely, well-designed evaluation of two widely used physical activity (PA) apps via a randomised crossover trial among inactive adults in the UK. It makes a valuable contribution to the growing but under-evaluated space of digital health interventions by assessing unmodified commercial tools under semi-controlled, real-world conditions. The crossover design is especially appropriate, offering efficient within-subject comparisons. Moreover, the use of both accelerometer and self-reported (IPAQ) measures strengthens the multidimensional assessment of PA outcomes. The study also gains public health relevance by targeting adults with low baseline activity—a population often underserved in digital health interventions. Nevertheless, there are important areas where the clarity of reporting, depth of analysis, and practical contextualisation could be improved to enhance its relevance and readability.

Writing

The manuscript would benefit from clearer sentence structure, especially in the *Methods* section. Several sentences are overly long, with multiple clauses that could be separated for improved readability.

- **Example (Page 5):**

The sentence beginning “Eligibility was restricted to adults identified as ‘moderately inactive’ or ‘inactive’...” could be split into two parts: one describing eligibility (based on PA levels and smartphone ownership), and the other addressing platform requirements. This would make the eligibility criteria easier to follow.

- **Additional Suggestions:**

- Standardise units across the paper—for instance, consistently use either “minutes per week” or “MET-minutes” for PA reporting.
- Combine single-sentence paragraphs (especially in the *Introduction* and *Methods*) to improve flow and maintain a cohesive narrative structure.

Methodology

Several key methodological elements would benefit from further elaboration to improve transparency and replicability:

- Explain the rationale for including the IPAQ alongside objective accelerometry data. Clarify how IPAQ responses were scored and whether any validity checks (e.g., logic filters or thresholds) were applied. Given the known issues with self-report accuracy, this clarification would strengthen interpretation.
- Specify the validated instruments used to measure constructs such as exercise self-efficacy and behavioural intentions. Were these based on standardised scales (e.g., Schwarzer’s Self-Efficacy Scale)?
- Clarify how participants were screened for contraindications to physical activity. Was this self-declared, or verified through any form of documentation or clinical review?
- Describe how app engagement data (e.g., screenshots submitted by participants) were stored and handled. Given GDPR requirements, confirm that data handling complied with institutional protocols for participant confidentiality.
- Weather is included in the sensitivity analysis, but it is not introduced in the *Methods* section. A brief mention of its relevance (e.g., how weather might affect daily PA) and how it was recorded (e.g., using local meteorological data) would improve transparency.

Results

While the findings are generally well reported, some results could be interpreted more fully or more clearly aligned with claims made in the *Discussion*.

- Acknowledge more explicitly that the higher self-reported increases in PA (vs. accelerometer data) are consistent with known biases in self-report instruments. This discrepancy should be discussed as a common, though still meaningful, limitation.
- The analysis currently focuses on periods rather than app type. It would strengthen the paper to include a comparison of whether App A or App B led to a greater proportion of participants achieving

the 20% MVPA increase. This would help readers draw more practical conclusions about app effectiveness.

- Variables such as “motivators for PA” appear in Table 1 but are not introduced in the *Methods* or referenced in the *Results*. If these were part of the screening or baseline questionnaires, this should be stated; otherwise, consider removing or clearly labelling them as exploratory/contextual data.
- Data collection occurred in 2018, which raises questions about the current relevance of the findings. It would be helpful to briefly discuss how app features, interface design, or user expectations may have evolved since then. For example, users today may expect more personalised feedback, gamification, or social sharing options—features not necessarily prominent in the apps assessed in 2018.

Discussion

- The reported decrease in MVPA for 13/51 participants—mentioned in the *Discussion*—should be explicitly reported in the *Results* section, ideally with descriptive statistics or confidence intervals to contextualise it alongside the MVPA increases.
- The unexpected decrease in outcome expectancy should be interpreted more deeply. One possible explanation is that users experienced a “reality check” about how difficult it is to maintain a PA routine, leading to reduced optimism about future behaviour. Referencing behavioural models (e.g., Health Action Process Approach or Expectancy-Value Theory) would help ground this discussion.
- The mention of EMA as a future direction is promising. Offering concrete examples—such as tracking participants’ mood, time of day, location, or social environment—would help illustrate how EMA could provide richer insights into PA engagement patterns and contextual triggers.

Declarations

Potential competing interests: No potential competing interests to declare.