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Infographic. One small step for man, one giant leap for men's health: a meta-analysis of behaviour change interventions to increase men's physical activity

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Health promotion programmes focused on improving physical activity have traditionally failed to engage and retain men,(1) resulting in underrepresented outcomes and challenges with generalizability.(2) Recent interest and developments in men's health research has led to an increased number of interventions specifically targeted at engaging and retaining men.(3) In our recent systematic review and meta-analysis,(4) published in the *British Journal of Sports Medicine*, we aimed to determine the effects of behaviour change interventions on men's physical activity and to identify potential moderators of intervention effectiveness (e.g., theoretical underpinning, gender-tailored, contact frequency).

We identified 24 randomised control trials of behaviour change interventions that engaged men (≥ 18 years) where physical activity was an outcome and data were from men-only studies or disaggregated by sex. Twelve of the studies included an additional follow-up measure (≥ 12 month post-intervention). Study quality was mostly moderate, due to the real-world, pragmatic nature of many of the trials. The overall quality of evidence for post-intervention and ≥ 12 month follow-up was determined to be high and moderate, respectively, due to considerable heterogeneity ($I^2=80\%$) and relatively wide variance of point estimates across studies ≥ 12 month follow-up.

Using a random effects model, we found an overall mean intervention effect (Cohen's *d*) on men's physical activity of 0.35 (95% CI 0.26 to 0.45), which is consistent with an increase of approximately 97 min of total physical activity per week or 980 steps per day¹. For the 12 studies that included a long-term (i.e., ≥ 12 months) follow-up measure, we found an intervention effect of 0.32 (95% CI 0.15 to 0.48), suggesting that changes in physical activity may be sustained at long-term follow-up; however, more longitudinal research is needed. We also conducted a moderator analyses to explore potential variations in effectiveness due to

¹ Effect size was re-expressed as minutes/week and steps/day using studies from the analysis that reported data using the units of interest; therefore, values are not directly comparable.

differences in study, participant or intervention characteristics. Notably, interventions that (i) were based on a theoretical framework, (ii) were tailored to men's values and interests, (iii) included regular group contact (≥ 1 weekly), and/or (iv) employed multiple types of behaviour change techniques, appeared most effective.

In summary, behaviour change interventions can support men to make important improvements in their physical activity. Our findings suggest that a variety of intervention designs and approaches hold potential for influencing men's physical activity, and add to a growing body of literature that suggests the mode of programme delivery, as well as content, are integral to engaging men. Future research must continue to evaluate the extent to which changes are sustained following intervention completion and consider strategies to promote long-term behaviour change.

REFERENCES

1. Evans J, Frank B, Oliffe JL, Gregory D. Health, illness, men and masculinities (HIMM): a theoretical framework for understanding men and their health. *Journal of Men's Health*. 2011;8(1):7-15.
2. Conn VS, Hafdahl AR, Mehr DR. Interventions to increase physical activity among healthy adults: meta-analysis of outcomes. *American journal of public health*. 2011;101(4):751-8.
3. Botorff JL, Seaton CL, Johnson ST, Caperchione CM, Oliffe JL, More K, et al. An Updated Review of Interventions that Include Promotion of Physical Activity for Adult Men. *Sports Medicine*. 2015;45(6):775-800.
4. Sharp P, Spence JC, Botorff JL, Oliffe JL, Hunt K, Vis-Dunbar M, et al. One small step for man, one giant leap for men's health: a meta-analysis of behaviour change interventions to increase men's physical activity. *British Journal of Sports Medicine*. 2020.

One Small Step for Man, One Giant Leap for Men's Health: A Meta-Analysis of Behaviour Change Interventions to Increase Men's Physical Activity

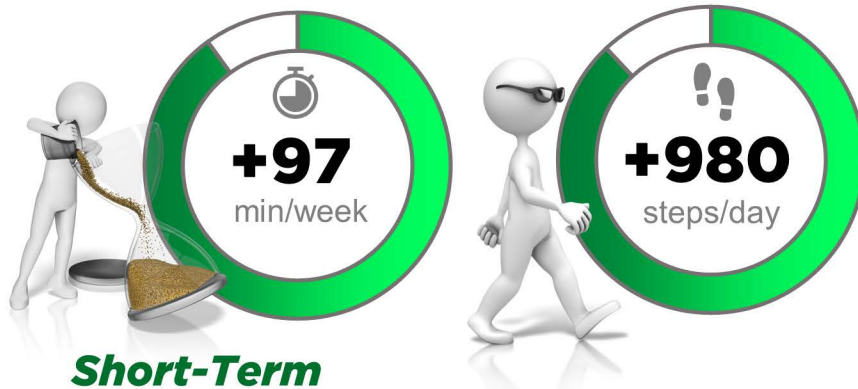
Meta-Analysis Details

The effects of behaviour change interventions on men's physical activity (e.g., steps per day, total physical activity per week) were assessed in **24 randomised control trials**, including a total of **12,040 adult men**.

Main Findings

- Behaviour change interventions had a small but significant positive effect on men's physical activity.
- Interventions that (1) were based on a theoretical framework, (2) were tailored to men's values and interests, (3) included regular group contact, and/or (4) employed multiple behaviour change strategies, appeared to be most effective.
- Although limited studies included long-term follow-up, a small effect was found for sustained physical activity change.

Effects of Interventions on Men's Physical Activity



Short-Term

Baseline to post-intervention

24 studies;
Effect size = 0.35 (0.26 to 0.45)

Long-Term

Follow-up \geq 12 months post-intervention

12 studies;
Effect size = 0.32 (0.15 to 0.48)

0 0.5 1
Effect size:
Cohen's d (95% CI)

Effects by Intervention Characteristics

Age

\leq 44 Years (9 studies)
 \geq 45 Years (15 studies)

Contact Frequency

$<$ 1x/Week (14 studies)
 \geq 1x/Week (10 studies)

Gender-Tailored

No (12 studies)
Yes (12 studies)

Intervention Duration

\leq 12 Weeks (13 studies)
 $>$ 13 Weeks (11 studies)

Physical Activity Measure

Self-reported (14 studies)
Device-based (10 studies)

Behaviour Change Techniques

\leq 3 Techniques (16 studies)
 \geq 4 Techniques (8 studies)

Theory-Based

No (5 studies)
Yes (19 studies)

◆ Small effect (<0.5)
◆ Moderate effect (0.5-0.79)
◆ Large effect (≥ 0.8)

0 0.5 1
Cohen's d (95% CI)