

eHealth interventions for reducing cardiovascular disease risk in men: a systematic review and meta-analysis

James McMahon^a, David R Thompson^a, Michaela C Pascoe^b, Kevin Brazil^a, & Chantal F Ski^{a,c}

^a School of Nursing and Midwifery, Queen's University Belfast, Belfast, UK
^b Institute for Health & Sport, Victoria University, Melbourne, Australia
^c Integrated Care Academy, University of Suffolk, Ipswich, UK



Introduction

- Men remain at a higher risk of developing cardiovascular disease (CVD) than women¹
- Behavioural risk factor modification is an important preventive measure^{2,3}
- Engaging men in behaviour change interventions is challenging
- Although men often indicate a preference for gender-specific information and support, this rarely occurs⁴⁻⁶.
- eHealth interventions show potential to address this gap^{7,8}, though their effectiveness for reducing CVD risk in men is unclear.

Aim of review

The aim of this systematic review and meta-analysis was to evaluate the effectiveness of eHealth interventions for reducing CVD risk in men.

Methods

This review was conducted in accordance with the PRISMA statement and principles laid out by the Cochrane Handbook for Systematic Reviews.

Search strategy

A systematic search was conducted across five electronic databases using Cochrane (CENTRAL), Medline, CINAHL Plus, PsycINFO and SCOPUS. Relevant reference lists were manually searched for additional trials.

Eligibility criteria

- Randomised controlled trials (RCTs)
- eHealth as main intervention component
- Assessed a minimum of two CVD related risk factors
- Males aged 18 or older

Study selection and data extraction

- Titles and abstracts were screened independently by three reviewers
- Remaining studies then underwent full text screening by two reviewers
- Data extraction was conducted independently by two reviewers using a pre-designed data extraction form. The following data were extracted: country undertaken, aims, setting, participant and intervention characteristics, study methodology, and outcomes. Means (M), standard deviations (SD) and sample sizes (n) were also extracted.

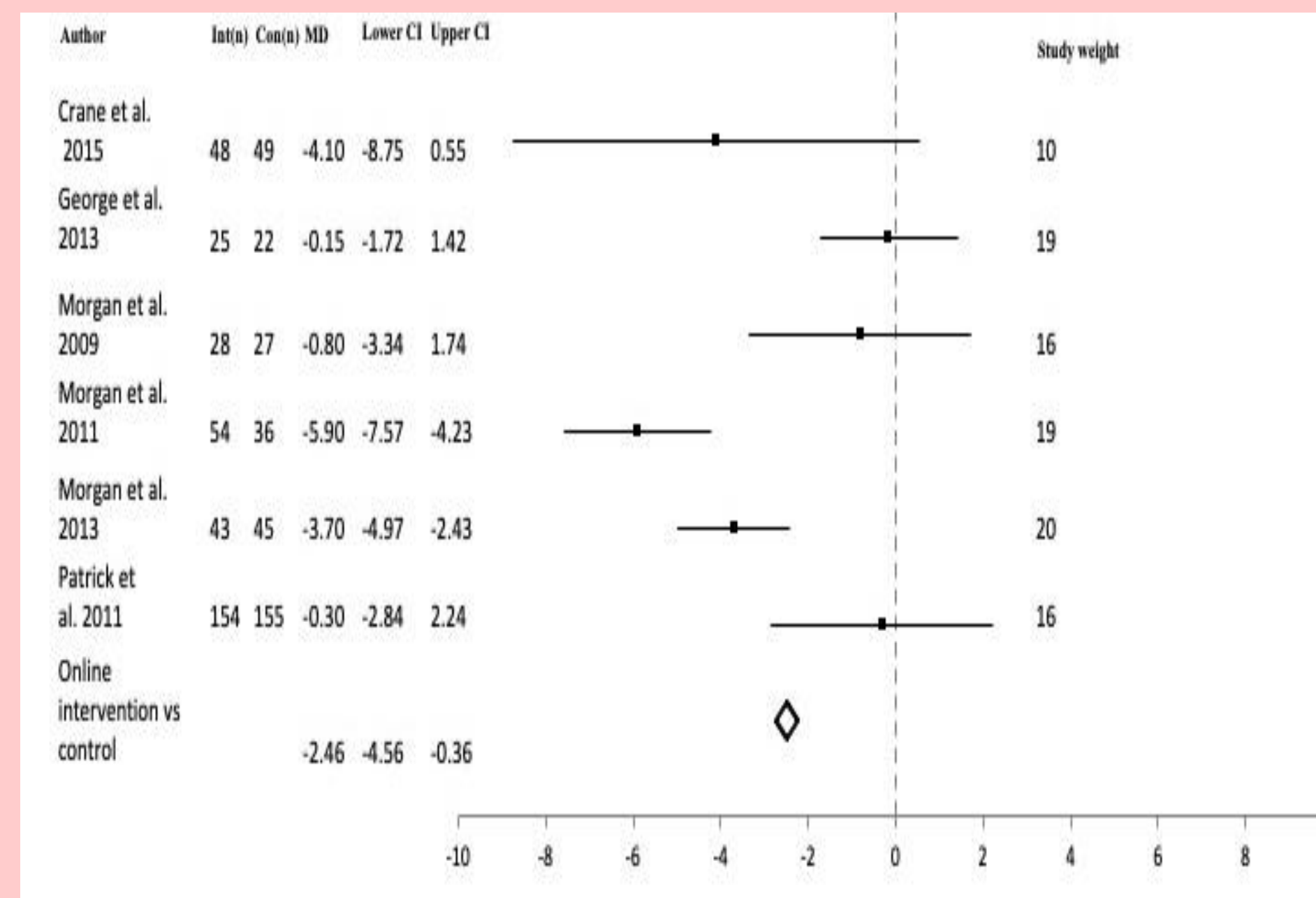


Figure 2. Forest plot – effect of online intervention vs control for waist circumference (cm)

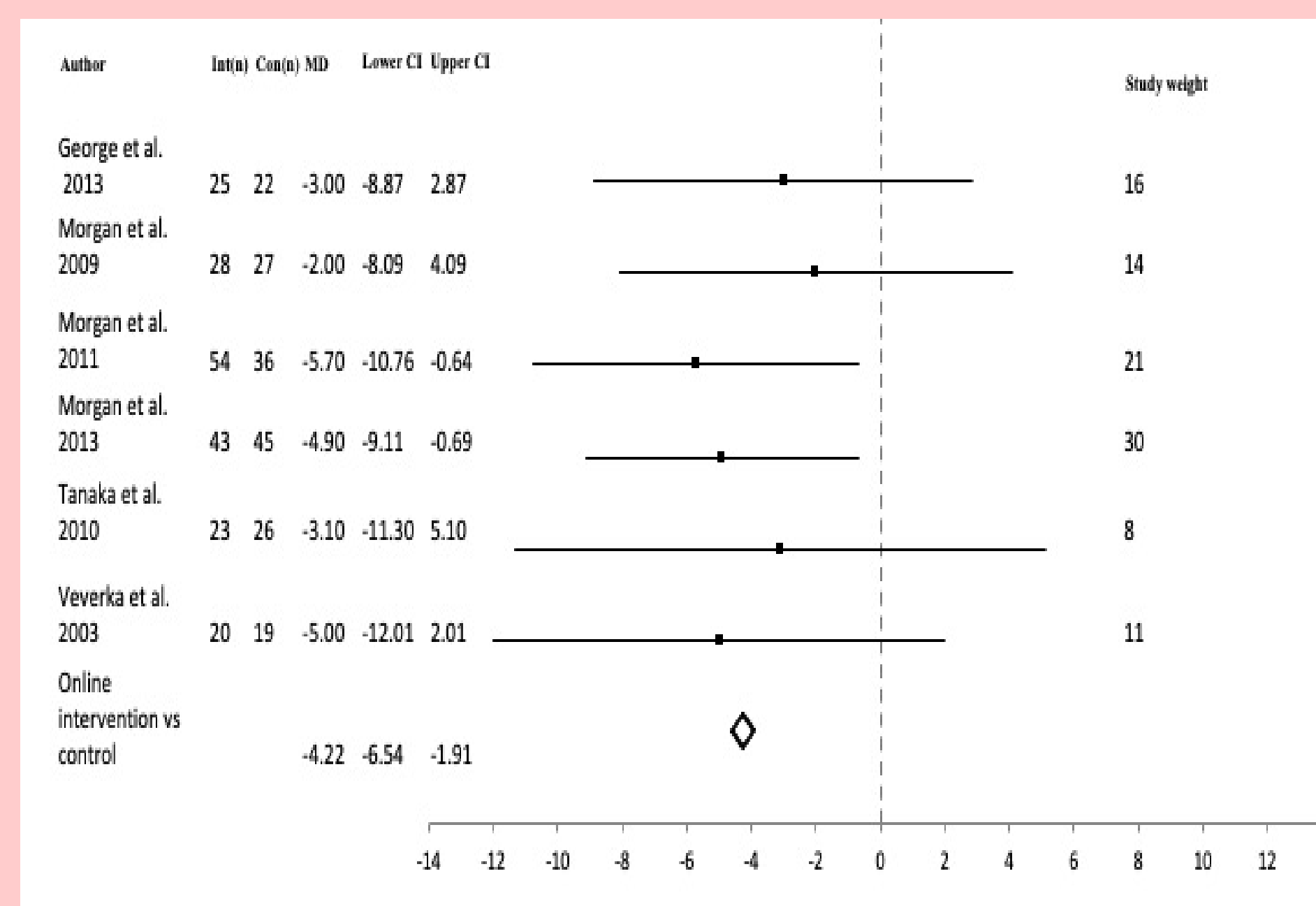


Figure 3. Forest plot – effect of online intervention vs control for systolic blood pressure (mmHg)

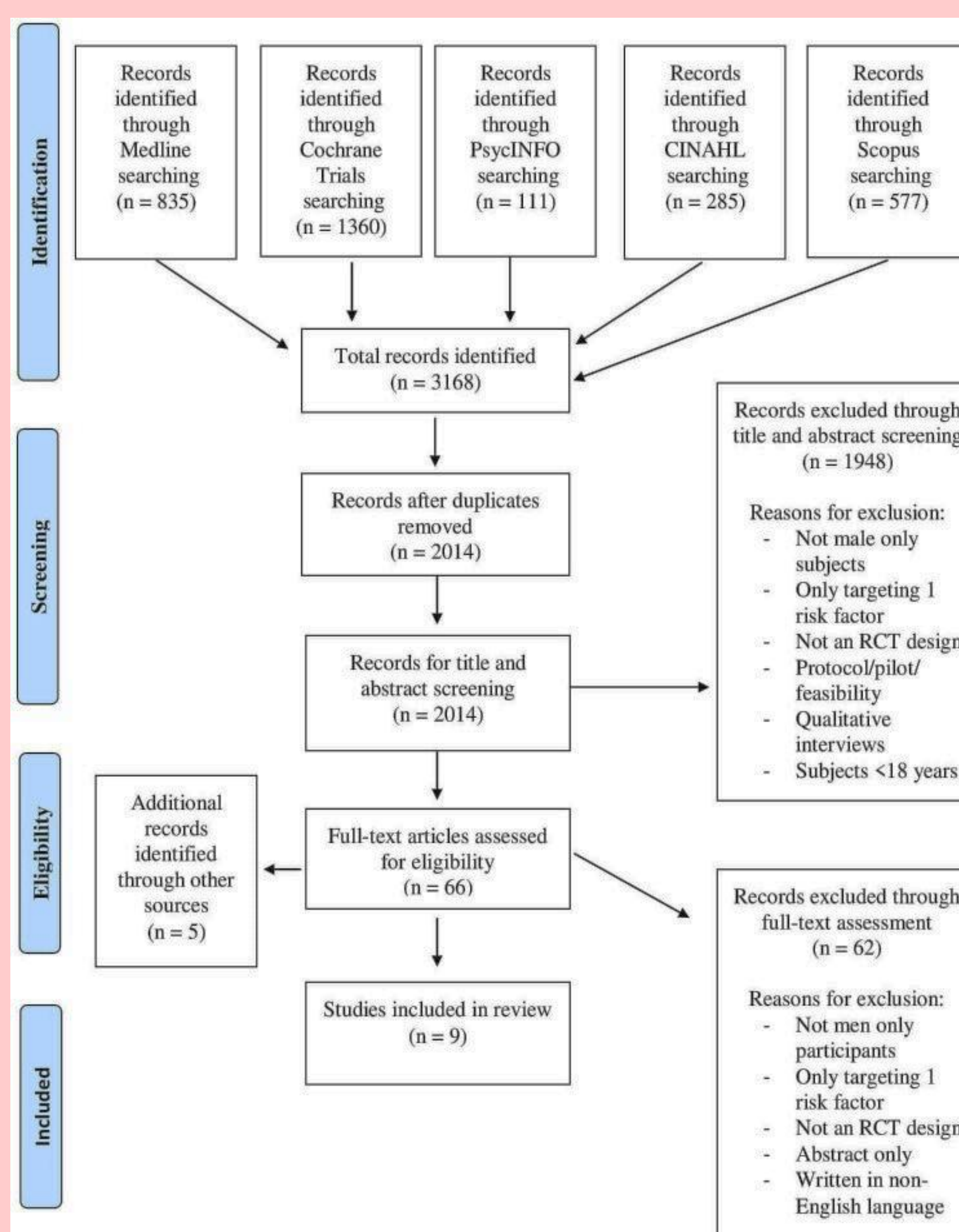


Figure 1. PRISMA flow diagram

Analysis

Meta-analysis was undertaken using Comprehensive Meta-Analysis Version 3. A random-effects model was used in all analyses, with publication bias assessed using a forest plot and study quality assessed using the Cochrane risk of bias tool.

Results were reported as the mean difference, along with the confidence interval, z-value, p-value and I² statistic¹². For those outcomes not included in the meta-analysis, a narrative synthesis was provided.

Results

A total of 3168 records were retrieved through the database search with nine trials included in this review following the screening process.

Compared to those in a control group or receiving printed materials, participants randomised to an eHealth intervention had statistically significant improvements in BMI (Z=-2.75, p=0.01), body weight (Z=-3.25, p=0.01), waist circumference (Z= 2.30, p=0.02) and systolic (Z=-3.57, p=0.01) and diastolic (Z=-3.56, p=0.01) blood pressure.

Though less evident, there were also improvements in physical activity and diet in favour of the intervention group.

Discussion

- Findings of this review highlight the potential effectiveness of eHealth interventions for reducing a range of CVD risk factors in men
- Higher attrition rates were observed in those trials utilising an 'active control', providing participants with resources related to the online intervention
- Poor participant adherence rates were observed with the online intervention and warrants being addressed in future research
- Interventions based on a theoretical framework seemingly produced greater improvements in CVD related outcomes, yet the extent to which they influenced these outcomes is difficult to ascertain

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