

**Title:** A Systematic Review of Behaviour Change Techniques in Digital Health Interventions with Midlife Women

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**Background:** Digital health interventions (DHIs) are efficacious in health-promoting behaviours (e.g., healthy eating and regular physical activity) that mitigate health risks and menopausal symptoms in midlife, however, integrated evidence-based knowledge about the mechanism of change in these interventions is unclear.

**Objectives:** This systematic review aims to comprehensively evaluate studies on behaviour change techniques (BCTs) and mechanisms of change in DHIs aimed to promote health-enhancing behaviours in midlife women.

**Methods:** A systematic literature search of electronic databases was conducted. The mechanism of action and intervention functions of eligible studies were evaluated using the Behaviour Change Wheel (BCW) framework. The psychological theory used and BCTs were presented as descriptive statistics.

**Results:** Thirteen interventions (including 1308 women) reviewed used  $13 \pm 4.30$  (range 6–21) BCTs per intervention on average. ‘Shaping knowledge’ and ‘Repetition and substitution’ behaviour change categories were used most frequently with 12 interventions (92%) implementing at least one of these BCTs from these two categories. Only 14% (169/1209) of the 93 available BCTs were used, with ‘Instructions on behaviour’ most frequently utilised (12 of 13 studies).

**Conclusions:** The findings of this review indicate an overall weak use of theory, low levels of treatment fidelity, insignificant outcomes, and insufficient description of several interventions to support assessment of how specific BCTs were activated.