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**WILEY**

[Intervention Review]

# Walking for hypertension

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## ABSTRACT

### Background

Increased physical activity has been recommended as an important lifestyle modification for the prevention and control of hypertension. Walking is a low-cost form of physical activity and one which most people can do. Studies testing the effect of walking on blood pressure have revealed inconsistent findings.

### Objectives

To determine the effect of walking as a physical activity intervention on blood pressure and heart rate.

### Search methods

We searched the following databases up to March 2020: the Cochrane Hypertension Specialised Register, CENTRAL (2020, Issue 2), Ovid MEDLINE, Ovid Embase, CINAHL, PsycINFO, SPORTDiscus, PEDro, the WHO International Clinical Trials Registry Platform, and ClinicalTrials.gov. We also searched the following Chinese databases up to May 2020: Index to Taiwan Periodical Literature System; National Digital Library of Theses and Dissertation in Taiwan; China National Knowledge Infrastructure (CNKI) Journals, Theses & Dissertations; and Wanfang Medical Online. We contacted authors of relevant papers regarding further published and unpublished work. The searches had no language restrictions.

### Selection criteria

Randomised controlled trials of participants, aged 16 years and over, which evaluated the effects of a walking intervention compared to non-intervention control on blood pressure and heart rate were included.

### Data collection and analysis

We used standard methodological procedures expected by Cochrane. Where data were not available in the published reports, we contacted authors. Pooled results for blood pressure and heart rate were presented as mean differences (MDs) between groups with 95% confidence intervals (CIs). We undertook subgroup analyses for age and sex. We undertook sensitivity analyses to assess the effect of sample size on our findings.

### Main results

A total of 73 trials met our inclusion criteria. These 73 trials included 5763 participants and were undertaken in 22 countries. Participants were aged from 16 to 84 years and there were approximately 1.5 times as many females as males. The characteristics of walking interventions in the included studies were as follows: the majority of walking interventions was at home/community (n = 50) but supervised (n = 36 out of 47 reported the information of supervision); the average intervention length was 15 weeks, average walking time per week was 153 minutes and the majority of walking intensity was moderate. Many studies were at risk of selection bias and performance bias.

### Walking for hypertension (Review)

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### Primary outcome

We found moderate-certainty evidence suggesting that walking reduces systolic blood pressure (SBP) (MD -4.11 mmHg, 95% CI -5.22 to -3.01; 73 studies, n = 5060). We found moderate-certainty evidence suggesting that walking reduces SBP in participants aged 40 years and under (MD -4.41 mmHg, 95% CI -6.17 to -2.65; 14 studies, n = 491), and low-certainty evidence that walking reduces SBP in participants aged 41 to 60 years (MD -3.79 mmHg, 95% CI -5.64 to -1.94,  $P < 0.001$ ; 35 studies, n = 1959), and those aged 60 years of over (MD -4.30 mmHg, 95% CI -6.17 to -2.44, 24 studies, n = 2610). We also found low certainty-evidence suggesting that walking reduces SBP in both females (MD -5.65 mmHg, 95% CI -7.89 to -3.41; 22 studies, n = 1149) and males (MD -4.64 mmHg, 95% CI -8.69 to -0.59; 6 studies, n = 203).

### Secondary outcomes

We found low-certainty evidence suggesting that walking reduces diastolic blood pressure (DBP) (MD -1.79 mmHg, 95% CI -2.51 to -1.07; 69 studies, n = 4711) and heart rate (MD -2.76 beats per minute (bpm), 95% CI -4.57 to -0.95; 26 studies, n = 1747). We found moderate-certainty evidence suggesting that walking reduces DBP for participants aged 40 years and under (MD -3.01 mmHg, 95% CI -4.44 to -1.58; 14 studies, n = 491) and low-certainty evidence suggesting that walking reduces DBP for participants aged 41 to 60 years (MD -1.74 mmHg, 95% CI -2.95 to -0.52; 32 studies, n = 1730) and those aged 60 years and over (MD -1.33 mmHg, 95% CI -2.40 to -0.26; 23 studies, n = 2490). We found moderate-certainty evidence that suggests walking reduces DBP for males (MD -2.54 mmHg, 95% CI -4.84 to -0.24; 6 studies, n = 203) and low-certainty evidence that walking reduces DBP for females (MD -2.69 mmHg, 95% CI -4.16 to -1.23; 20 studies, n = 1000). Only 21 included studies reported adverse events. Of these 21 studies, 16 reported no adverse events, the remaining five studies reported eight adverse events, with knee injury being reported five times.

### Authors' conclusions

Moderate-certainty evidence suggests that walking probably reduces SBP. Moderate- or low-certainty evidence suggests that walking may reduce SBP for all ages and both sexes. Low-certainty evidence suggests that walking may reduce DBP and heart rate. Moderate- and low-certainty evidence suggests walking may reduce DBP and heart rate for all ages and both sexes.

## PLAIN LANGUAGE SUMMARY

### The effect of walking on blood pressure control

#### Review question

Can walking lower blood pressure?

#### Background

Hypertension or elevated blood pressure is a major risk factor for cardiovascular diseases, such as coronary heart disease, stroke, and heart failure. Lowering blood pressure to normal levels is effective in reducing the risks of these diseases. Many of the risk factors relating to hypertension, such as physical inactivity, a diet high in salt and fat, or cigarette smoking, are related to lifestyle. Physical activity is recognised as an essential component of a healthy lifestyle. However many people may find it difficult to undertake exercise that fits into their daily lives. Walking is a low-cost activity and one which many people can do. Previous studies have shown inconsistent results of the effect of walking on blood pressure control.

#### Study characteristics

We included 73 trials involving 5763 participants from 22 countries, published up to March 2020. These trials included both males and females; with an age range from 16 to 84 years with approximately half aged over 60 (51%) and 39% aged 41 to 60 years with various health conditions. The types of walking activity varied, including home-, community-, school-, or gym-based walking several times a week with different intensity levels.

#### Key results

We found moderate-certainty evidence suggesting that walking reduces systolic blood pressure (SBP). We found moderate-certainty evidence suggesting that walking reduces SBP in participants aged 40 years and under and low-certainty evidence that walking reduces SBP in participants aged 41 and over. We also found low certainty-evidence suggesting that walking reduces SBP in females and males. We found low-certainty evidence suggesting that walking reduces diastolic blood pressure (DBP) and heart rate. Only 21 studies reported a total of eight adverse events, with knee injury reported five times as an adverse event. Many studies did not report how participants were allocated to the walking and control groups and whether those who assessed outcomes knew to which group a participant belonged. However, our outcomes of blood pressure and heart rate are objective measures and thus are less likely to be influenced by knowledge of whether a participant was in a walking or control group. Our findings suggest that moderate-intensity walking, three to five times per week, of 20 to 40 minutes duration, and 150 minutes per week for approximately three months could have an effect on lowering blood pressure.