



SYSTEMATIC REVIEW AND META-ANALYSIS

# Nonpharmacologic Interventions for Reducing Blood Pressure in Adults With Prehypertension to Established Hypertension

Jinming Fu, PhD; Yupeng Liu, PhD; Lei Zhang, PhD; Lu Zhou, MSc; Dapeng Li, PhD; Hude Quan, PhD; Lin Zhu, PhD; Fulan Hu , PhD; Xia Li, PhD; Shuhan Meng, PhD; Ran Yan, MSc; Suhua Zhao, MSc; Justina Ucheojor Onwuka, MPH; Baofeng Yang, PhD; Dianjun Sun, PhD; Yashuang Zhao , PhD

**BACKGROUND:** Nonpharmacologic interventions that modify lifestyle can lower blood pressure (BP) and have been assessed in numerous randomized controlled trials and pairwise meta-analyses. It is still unclear which intervention would be most efficacious.

**METHODS AND RESULTS:** Bayesian network meta-analyses were performed to estimate the comparative effectiveness of different interventions for lowering BP. From 60 166 potentially relevant articles, 120 eligible articles (14 923 participants) with a median follow-up of 12 weeks, assessing 22 nonpharmacologic interventions, were included. According to the surface under the cumulative ranking probabilities and Grading of Recommendations Assessment, Development and Evaluation (GRADE) quality of evidence, for adults with prehypertension to established hypertension, high-quality evidence indicated that the Dietary Approach to Stop Hypertension (DASH) was superior to usual care and all other nonpharmacologic interventions in lowering systolic BP (weighted mean difference, 6.97 mm Hg; 95% credible interval, 4.50–9.47) and diastolic BP (weighted mean difference, 3.54 mm Hg; 95% credible interval, 1.80–5.28). Compared with usual care, moderate- to high-quality evidence indicated that aerobic exercise, isometric training, low-sodium and high-potassium salt, comprehensive lifestyle modification, breathing-control, and meditation could lower systolic BP and diastolic BP. For patients with hypertension, moderate- to high-quality evidence suggested that the interventions listed (except comprehensive lifestyle modification) were associated with greater systolic BP and diastolic BP reduction than usual care; salt restriction was also effective in lowering both systolic BP and diastolic BP. Among overweight and obese participants, low-calorie diet and low-calorie diet plus exercise could lower more BP than exercise.

**CONCLUSIONS:** DASH might be the most effective intervention in lowering BP for adults with prehypertension to established hypertension. Aerobic exercise, isometric training, low-sodium and high-potassium salt, comprehensive lifestyle modification, salt restriction, breathing-control, meditation and low-calorie diet also have obvious effects on BP reduction.

**Key Words:** hypertension ■ network meta-analysis ■ nonpharmacologic interventions ■ randomized controlled trial ■ systematic review

**H**ypertension is an important worldwide public health problem. As populations age, adopt unhealthy lifestyles, and increase their body weight,

the number of people with hypertension will continue to increase, reaching close to 1.5 billion by 2025.<sup>1</sup> Studies have proven that hypertension is a strong

Correspondence to: Yashuang Zhao, PhD, Department of Epidemiology, College of Public Health, Harbin Medical University, 157 Baojian Road, Harbin 150081, Heilongjiang Province, P.R. China. E-mail: zhao\_yashuang@263.net and Dianjun Sun, PhD, Center for Endemic Disease Control, Chinese Center for Disease Control and Prevention, Harbin Medical University, 157 Baojian Road, Harbin 150081, Heilongjiang Province, P.R. China. E-mail: hrbusdj@163.com  
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## CLINICAL PERSPECTIVE

### What Is New?

- Single interventions including Dietary Approach to Stop Hypertension (DASH; ranked first), aerobic exercise, isometric training, low-sodium and high-potassium salt, salt restriction, breathing-control, and meditation are associated with effective reduction of systolic blood pressure and diastolic blood pressure.
- Comprehensive lifestyle modification, as a combined intervention, can lower both systolic and diastolic blood pressure effectively.
- For patients who are overweight and obese, low-calorie diet or low-calorie diet plus exercise could lower blood pressure levels more than exercise alone.

### What Are the Clinical Implications?

- High-quality evidence suggests that DASH might be the most effective intervention to lower blood pressure for adults with prehypertension to established hypertension.
- Aerobic exercise, isometric training, low-sodium and high-potassium salt, comprehensive lifestyle modification, salt restriction, breathing-control, and meditation should also be recommended to lower blood pressure for patients with hypertension who are receiving pharmacotherapy.
- Weight loss from low-calorie diet or low-calorie diet plus exercise could lower blood pressure level more than exercise alone among people who are overweight and obese.

## Nonstandard Abbreviations and Acronyms

<b>CrI</b>	credible interval
<b>DASH</b>	Dietary Approach to Stop Hypertension
<b>DBP</b>	diastolic blood pressure
<b>GRADE</b>	Grading of Recommendations Assessment, Development and Evaluation
<b>SBP</b>	systolic blood pressure
<b>SUCRA</b>	surface under the cumulative ranking
<b>WMD</b>	weighted mean difference

risk factor for severe cardiovascular events, including myocardial infarction and stroke, if uncontrolled.<sup>2-4</sup> Compared with people who are normotensive, patients with prehypertension have a higher risk of developing sustained hypertension and cardiovascular disease.<sup>5,6</sup> Pharmacotherapy with first-line antihypertensive agents has significant effects in lowering blood

pressure (BP)<sup>7</sup> but also has side effects, treatment resistance, and financial burden.<sup>8</sup> Effective, widely available, low-cost, and sustainable strategies are needed to prevent and manage hypertension.

Numerous randomized controlled trials (RCT), systematic reviews, and meta-analyses have assessed the BP-lowering effects of nonpharmacologic interventions.<sup>9-11</sup> US, Canadian, and European guidelines for hypertension recommend different nonpharmacologic interventions to prevent and manage hypertension.<sup>12-14</sup> However, their suggestions were based on traditional meta-analysis, which can only compare the relative efficacy of pairs of interventions. A study that can compare the BP-lowering effects of different nonpharmacologic interventions comprehensively is urgently needed to provide concrete evidence of the practice of nonpharmacologic interventions. Network meta-analyses can synthesize direct and indirect evidence in a network of studies that compare multiple interventions. This approach has the potential to rank the competing treatments according to the studied outcome and determine the best available option for intervention.<sup>15-17</sup>

The aim of our study was to assess the comparative effectiveness of different nonpharmacologic interventions for reducing BP in adults with prehypertension to established hypertension and to determine the most efficacious intervention.

## METHODS

This network meta-analysis is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) extension statement for reporting of systematic reviews incorporating network meta-analyses of healthcare interventions.<sup>18</sup> All supporting data are available within the article and its online supplementary files. The study protocol can be found online ([https://www.crd.york.ac.uk/PROSPERO/display\\_record.php?RecordID=67522](https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=67522)). An extended description of the methods is reported in Data S1.

### Search Strategies, Eligibility Criteria, and Information Sources

We searched PubMed, Embase, Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the EU Clinical Trials Register up to July 1, 2019, to identify eligible studies. We limited searches to English-language publications and supplemented them by perusing reference lists of reviews and retrieved literature. The search strategies are presented in Data S1.

We included RCTs of at least 4 weeks' duration that compared the BP-lowering effects of nonpharmacologic interventions for adult patients (aged  $\geq 18$  years) with primary hypertension or prehypertension.

Patients with hypertension were defined as those with office systolic BP (SBP)  $\geq 140$  mm Hg and/or diastolic BP (DBP)  $\geq 90$  mm Hg without taking antihypertensive medication or those with established hypertension using antihypertensive medication, even if BP was  $< 140/90$  mm Hg.<sup>14</sup> Prehypertension was defined as an office SBP of 120 to 139 mm Hg and/or DBP of 80 to 89 mm Hg, according to the Joint National Committee in the Seventh Report.<sup>19</sup> Eligible interventions were different nonpharmacologic therapies. Comparators were other nonpharmacologic therapies or usual care as a control. We excluded studies that enrolled participants who had a history of heart failure, renal disease, stroke, serious mental or physical illness, malignancy, diabetes mellitus, or metabolic syndrome. We also excluded studies that focused on postmenopausal or pregnant women or single-sex populations. However, studies that focused on participants who used alcohol habitually or who were overweight or obese were included because those features could be modified.

### Study Selection and Data Collection Process

Two reviewers (Y.L. and D.L.) independently screened the titles and abstracts of all potentially eligible studies. Three reviewers (J.F., L. Zhang, and L. Zhou) performed full-text review to identify studies that met all criteria for inclusion in the quantitative synthesis. Disagreements were resolved by discussion.

Pairs of independent reviewers extracted relevant data from each eligible study in duplicate, and discrepancies were resolved by discussion among reviewers. We extracted data on characteristics and demographics of study participants, mean baseline and follow-up SBP and DBP, dropout, and other information.

### End Points and Handling of Missing Data

Reductions of SBP and DBP after intervention were separately evaluated as co-primary end points, and the summary estimates were calculated by using the mean difference and SE. If the SEs of the mean differences were not available from included articles, we either estimated SEs based on the sample size, median, and range<sup>20</sup> or based on the mean difference, sample size, and *P* value.<sup>21</sup> We also imputed these data by estimating correlation coefficient values between baseline and follow-up.<sup>21</sup>

### Statistical Analysis

Traditional meta-analyses were conducted using a random-effects model for every direct comparison.<sup>22</sup> Next, Bayesian random-effects network meta-analyses

were performed using the GeMTC package (R 3.4.3) based on the Markov-chain Monte Carlo method.<sup>23,24</sup> Comparative effect estimates are presented as the weighted mean difference (WMD) and 95% credible interval (CrI) because all end points were continuous variables. Trace plots and the Brooks–Gelman–Rubin statistic were assessed to ensure convergence.<sup>25</sup> Network consistency between direct and indirect evidence was analyzed by the node-splitting method, and its bayesian *P* value was reported.<sup>26</sup> Statistical heterogeneity of studies and the global heterogeneity of network meta-analysis were also examined using the *I*<sup>2</sup> statistic.<sup>27</sup>

The relative rankings of different nonpharmacologic interventions were calculated using surface under the cumulative ranking (SUCRA) probabilities and were presented graphically (WinBUGS 1.4.3 [BUGS Project] and Stata 14.0 [StataCorp]).<sup>28</sup> Sensitivity analyses were conducted by omitting data from specific studies, including studies with high risk of bias, studies started before 1999 (international diagnostic criteria for hypertension were issued by the World Health Organization in 1999),<sup>29</sup> studies with end points of home BP or 24-hour ambulatory BP, or studies targeted to special population (participants who used alcohol habitually or who were overweight or obese). Metaregression analyses were also performed by adding covariates (mean or median age, mean body mass index [BMI], proportion of participants taking antihypertensive medicine, and proportion of female patients). In addition, subgroup network meta-analyses were conducted in different subgroups defined by study duration or region of origin of study participants. Because all analyses were based on bayesian framework, no multiplicity was adjusted. Publication bias was assessed using the comparison-adjusted funnel plot and the *netfunnel* command (Stata 14.0).<sup>30</sup>

### Risk-of-Bias Assessment and Certainty of Evidence

Two reviewers (J.F. and L. Zhang) assessed the risk of bias separately for each included study using the Cochrane risk-of-bias tool (RevMan 5.3).<sup>31</sup> They also assessed the quality of evidence contributing to each direct, indirect, and network estimate independently using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method of network meta-analysis.<sup>32,33</sup> Discrepancies were resolved by discussion with another reviewer (Y.L.).

## RESULTS

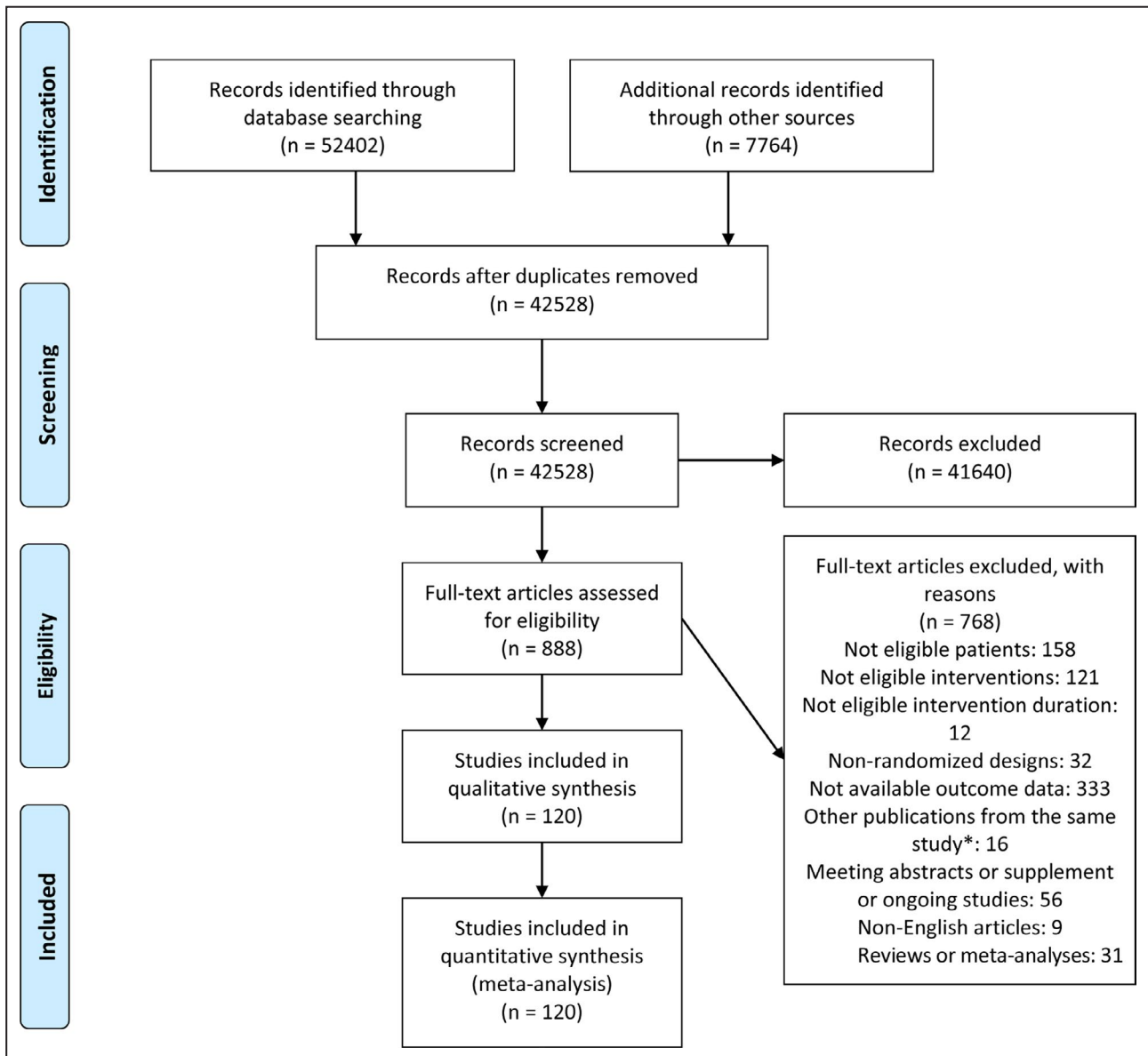
A total of 60 166 articles were identified in the initial systematic search, and 888 potentially eligible articles

were retrieved as full text. Overall, 120 articles (corresponding to 126 RCTs) with 14 923 participants met the inclusion criteria and were included in the network meta-analysis (Figure 1).

## Study Characteristics

This network meta-analysis covered 22 nonpharmacologic interventions including dietary approaches, physical exercise, approaches to reduce stress or lose weight, restriction of alcohol intake, combined interventions, and comprehensive lifestyle modification. All 22 interventions have been practiced in

clinical or community trials, and brief descriptions and median intensity of all interventions and usual care are presented in Table 1.<sup>34–63</sup> Baseline and basic characteristics of included studies are presented in Table S1. Overall, 8530 participants were randomly assigned to intervention groups and 6393 to usual care; the mean age of all participants was 51.2 years; the median proportion of female patients was 0.49 (range, 0.05–0.88); median study duration was 12 weeks (range, 4–144); studies recruited participants from Europe (49.20%), the United States (24.60%), Asia (13.49%), and Africa (3.18%), and included Black Americans (9.53%); of 126 included



**Figure 1. PRISMA flow chart of the study selection for the network meta-analysis.**

\*In case of multiple publications from the same population, only the study with the largest sample size was included. For studies published more than once, only the study with the most informative and complete data was included. Any additional publications were excluded to avoid double counting data from the same trial. PRISMA indicates Preferred Reporting Items for Systematic Reviews and Meta-analyses.

**Table 1. Coding Guide for Components of Nonpharmacologic Interventions**

Intervention/Abbreviation	Brief Descriptions	Median Intensity
Dietary approach		
DASH <sup>34,35</sup>	Participants' diet strictly follows the DASH eating pattern, which recommends a diet rich in fruits, vegetables, whole grains, and low-fat dairy with reduced sodium and saturated and total fat content	Eating on the DASH pattern every day
Low-sodium and high-potassium salt <sup>36,37</sup>	Participants receive either a salt substitute (25%–30% potassium chloride, 50%–65% sodium chloride, and 5%–10% calcium and magnesium sulfate) to cover all cooking, or test food cooked using salt substitution	5 g of low-sodium and high-potassium salt every day
Salt restriction <sup>38,39</sup>	The goal is to restrict daily sodium intake <100 mmol (5.85 g salt). Professional instructors give participants detailed advice about how to reduce their salt intake and to avoid foods that contain large amount of salt and also offer metric salt-spoon or placebo to participants	Restrict sodium intake <100 mmol (5.85 g salt) every day
Physical exercise		
Aerobic exercise <sup>40,41</sup>	Participants are supervised by project staff to perform exercise (eg, treadmill or brisk walking, jogging, bicycle training, swimming, ball games), at least 30 min/time; almost all were moderate or high intensity (60%–90% of the maximum heart rate or maximum oxygen consumption)	3 d/wk, 50 min/time
Isometric training <sup>42,43</sup>	Participants perform isometric training, which involves sustained contraction against an immovable load or resistance with no or minimal change in length of the involved muscle group. Training consisted of four 2-min isometric contractions at 30% MVC using alternate hands with a programmed handgrip dynamometer, with a 1-min rest period between each contraction for 3 d per week	3 d/wk, bilateral contractions at 30% of MVC
Resistance training <sup>44,45</sup>	Participants perform active movement progress through muscle to overcome external resistance, such as leg press, leg curl, knee extension, chest press, seated row, overhead press, triceps dip, and biceps curl, 50–60 min/d, 2–3 d/wk	3 d/wk
Tai chi <sup>46</sup>	Tai chi is a set of Chinese systematic calisthenic exercises with slow circular movements and requires the muscles to remain relaxed while making sustained movement. Participants are taught by instructors with expertise to finish each session, which includes warm-up exercises, tai chi practice, and cool-down exercise	3 d/wk, 50 min with 50% to 60% $\dot{V}O_2$ max
Qigong <sup>47</sup>	Qigong, a traditional Chinese health and fitness exercise, includes <i>qi gong ba duan jin</i> , <i>shu xin ping xue gong</i> and <i>dao yin shu qigong</i> . Qigong experts help participants to reconstruct this instrument using a warming-up exercise, qigong, and cool-down exercise	Qigong classes 2 d/wk, home practice 2 d/wk
Interventions to reduce stress		
Breathing control <sup>48,49</sup>	Use of a device guides participants toward slow and regular breathing in the evening (the goal is <10 breaths/min with accumulating $\geq$ 40 min of therapeutic breathing per week)	Every day, 15 min/time
Meditation <sup>50</sup>	Transcendental meditation is considered the principal approach for stress reduction. Participants are instructed by a professional meditation instructor and then practice 20 min twice a day while sitting comfortably with eyes closed	Practice meditation 20 min twice a day
MBSR <sup>51,52</sup>	MBSR is a multicomponent group intervention that provides systematic training in mindfulness meditation as a self-regulation approach to stress reduction and emotion management. It can be explored through activities including but not limited to gentle stretching and mindful yoga, a meditative body scan, mindful breathing, and mindful walking	Practice MBSR techniques 45 min every day
PMR <sup>53,54</sup>	PMR involves directing the participants' attention to tense and relax various muscle groups throughout the body systematically to achieve deep relaxation	Practice PMR techniques 15–20 min twice a day
Yoga <sup>55</sup>	Participants are instructed by a professional yoga instructor through yoga home training or a yoga class and practice yoga at least 30 min/d, 3 d/wk	Practice yoga 3 d/wk, 45 min
Interventions to lose weight		
Low-calorie diet <sup>56*</sup>	Participants who are overweight or obese using the low-calorie diet induce weight loss are provided with detailed guidelines on the daily number of servings from each food group and on fat intake to achieve weight loss of $\leq$ 10% of each participant's baseline body weight. To enhance compliance with the low-calorie diet, participants are provided with food diaries that assisted them in recording intake	Low-caloric diet every day for weight loss
Exercise <sup>56*</sup>	Participants who are overweight or obese in the exercise training group are provided with an individualized exercise prescription consisting of 30–40 min exercise (eg, aerobic exercise or others), at least 3 d/wk, keeping 60%–80% of the maximum heart rate. To enhance compliance, details of each exercise session are recorded in a training diary and reviewed by the study's counselor	Exercise 3 d/wk, reach 60%–80% peak heart rate

(Continues)

**Table 1. Continued**

Intervention/Abbreviation	Brief Descriptions	Median Intensity
Low-calorie diet plus exercise <sup>56*</sup>	Participants who are overweight or obese using the exercise training plus low-calorie diet for weight loss are provided with detailed guidelines on a low-calorie diet to achieve weight loss and decrease BMI. In addition, they perform systematic exercise training, 30–45 min/d, at least 3 d/wk, keeping 60%–80% of the maximum heart rate	Low-calorie diet for losing weight, with exercise 3 d/wk, reaching 60%–80% peak heart rate
Restrict alcohol		
Alcohol restriction <sup>57,58†</sup>	Participants reduce their alcohol consumption to <14 drinks weekly or 50% cut or total abstinence, with education for alcohol restriction provided by investigators	Reduce alcohol intake by half or abstain
Combined intervention		
Aerobic exercise+ DASH <sup>59</sup>	Participants follow the DASH eating pattern and perform aerobic exercise	At least 5 d/wk, 30–60 min aerobic exercise plus DASH
Aerobic exercise+ resistance training <sup>60</sup>	Participants attend an aerobic exercise session and a resistance training session at the center at least twice a week	At least 2 d/wk, endurance training and resistance training
Salt restriction+DASH <sup>65</sup>	Participants follow the DASH eating pattern with salt restriction (sodium intake <100 mmol/d)	Follow diet every day
Salt restriction+low-calorie diet plus exercise <sup>61*</sup>	Participants who are overweight or obese follow a low-sodium (80 mmol/d) diet with low-calorie intake to achieve weight loss of 4.5 kg	Low-sodium and low-calorie diet every day; 3 d/wk, reach 60%–80% peak heart rate
Comprehensive lifestyle modification		
Comprehensive lifestyle modification <sup>62,63</sup>	Participants are recommended to comprehensively modify their lifestyle, such as lose weight, restrict sodium intake, reduce alcohol consumption, increase physical exercise to a moderate degree, give up cigarette smoking, and learn to manage stress	Use lifestyle modification every day
Control group		
Usual care	Participants keep usual lifestyle and do not change during the period of intervention	

Brief descriptions of 22 interventions plus usual care (as control) are summarized, with 17 nonpharmacologic interventions targeted to the general population with hypertension or prehypertension. BMI indicates body mass index; DASH, Dietary Approaches to Stop Hypertension; MBSR, mindfulness-based stress reduction; MVC, maximum voluntary contraction; and PMR, progressive muscle relaxation.

\*Nonpharmacologic intervention targeted only people who were overweight and obese who had hypertension or prehypertension.

†Nonpharmacologic intervention targeted only people who used alcohol habitually who had hypertension or prehypertension.

studies, 91 (72.22%) recruited only patients with hypertension, 27 (21.43%) recruited patients with hypertension and prehypertension, and 8 (6.35%) recruited only patients with prehypertension (Table 2). The mean SBP and DBP levels of adults with prehypertension to established hypertension were 136.74 and 86.27 mm Hg, respectively. The mean SBP and DBP levels of patients with hypertension were 143.80 and 87.51 mm Hg, respectively.

### Risk of Bias Within Studies

Of 126 included RCTs, 41 (32.54%) were judged to have low risk of bias, and only 9 (7.14%) were judged to have high risk of bias; all other studies (60.32%) were judged to have moderate risk of bias (Table S2 and Figure S1). All comparison-adjusted funnel plots of network meta-analysis for outcomes did not show distinct asymmetry, which suggested no evidence of publication bias in this study (Figure S2).

### Network Meta-Analysis in Adults With Prehypertension to Established Hypertension (BP $\geq$ 120/80 mm Hg)

The results of traditional meta-analyses showed that, compared with usual care, 10 interventions

were more effective for lowering both SBP and DBP (Table S3).

Network meta-analysis included 126 RCTs (14 923 participants) with 22 interventions and usual care. All 22 nonpharmacologic interventions had direct comparison with usual care, and 14 interventions compared directly with at least one other intervention (Figure 2A). Comparative effect estimates of 22 nonpharmacologic interventions in lowering BP are presented in Figure S3. Because indirect comparisons provided observational evidence in network meta-analysis, we focused on the effective BP-lowering estimates of interventions that were supported by the combination evidence of direct and indirect comparisons (Figure S3).

In terms of lowering SBP, 15 interventions were shown to be more effective than usual care (Figure 3A). Based on SUCRA, the following interventions ranked ahead: tai chi (WMD, 13.47 mm Hg [95% CrI, 9.30–17.64]), Dietary Approaches to Stop Hypertension (DASH; WMD, 6.97 mm Hg [95% CrI, 4.50–9.47]), aerobic exercise plus DASH (WMD, 11.20 mm Hg [95% CrI, 2.81–19.61]), low-calorie diet (WMD, 6.50 mm Hg [95% CrI, 2.78–10.17]), aerobic exercise (WMD, 6.60 mm Hg [95% CrI, 4.98–8.23]), isometric training (WMD, 5.77 mm Hg [95% CrI, 1.41–10.16]), low-sodium and high-potassium salt (WMD,

**Table 2. Details of Included Studies (N=126)**

Study Details	n (%)
Region of origin of study participants	
Europe	62 (49.20)
America (all)	31 (24.60)
Asia	17 (13.49)
America (Black Americans)*	12 (9.53)
Africa	4 (3.18)
Year the study started	
1973–1998	54 (42.86)
1999–2019	72 (57.14)
Study design	
Parallel	108 (85.71)
Crossover	18 (14.29)
Study duration, wk	
<12	55 (43.65)
12–24	54 (42.86)
>24	17 (13.49)
Usage of antihypertensive medications	
Yes	43 (34.13)
No	65 (51.58)
Not reported	18 (14.29)
Health status of recruited participants	
Hypertension and prehypertension (mixed)	27 (21.43)
Hypertension only	91 (72.22)
Prehypertension only	8 (6.35)

\*America (Black Americans) studies are those from America that were done in Black participants.

8.21 mm Hg [95% CrI, 4.99–11.43]), comprehensive lifestyle modification (WMD, 4.63 mm Hg [95% CrI, 1.32–7.94]), and the others include salt restriction, salt restriction plus low-calorie diet and exercise, breathing-control, low-calorie diet plus exercise, meditation, yoga, and alcohol restriction (Figure 3A and Figure S4A). In addition, low-calorie diet lowered SBP level more than exercise (WMD, 5.36 mm Hg [95% CrI, 0.45–10.25]) for participants who were overweight and obese (Figure S3).

In terms of lowering DBP, based on SUCRA, low-calorie diet (WMD, 4.56 mm Hg [2.22–6.89]), tai chi (WMD, 7.76 mm Hg [95% CrI, 4.72–10.81]), DASH (WMD, 3.54 mm Hg [95% CrI, 1.80–5.28]), qigong (WMD, 6.74 mm Hg [95% CrI, 0.74–12.72]), aerobic exercise (WMD, 4.44 mm Hg [95% CrI, 3.31–5.57]), comprehensive lifestyle modification (WMD, 3.38 mm Hg [95% CrI, 1.01–5.76]), isometric training (WMD, 4.01 mm Hg [95% CrI, 1.07–6.93]), and low-calorie diet plus exercise (WMD, 3.35 mm Hg [95% CrI, 1.41–5.32]), followed by low-sodium and high-potassium salt, salt restriction plus low-calorie diet and exercise, breathing-control, yoga, and salt restriction, were more effective than usual care (Figure 3B and

Figure S4B). In addition, aerobic exercise was slightly better than salt restriction in lowering DBP (WMD, 1.82 mm Hg [95% CrI, 0.33–3.31]) (Figure S3).

The quality of evidence for interventions in comparisons with usual care are summarized in Table S4. We focused on high- or moderate-quality evidence given the large number of results from the GRADE framework. In terms of lowering SBP and DBP, the quality of evidence for DASH and meditation were rated as high, and as moderate for low-calorie diet, isometric training, aerobic exercise, comprehensive lifestyle modification, resistance training, alcohol restriction, breathing-control and progressive muscle relaxation. There was also moderate confidence supporting the use of low-sodium and high-potassium salt and yoga in lowering SBP and the use of salt restriction in lowering DBP (Figure 3 and Table S4).

### Network Meta-Analysis in Patients With Hypertension (BP $\geq$ 140/90 mm Hg)

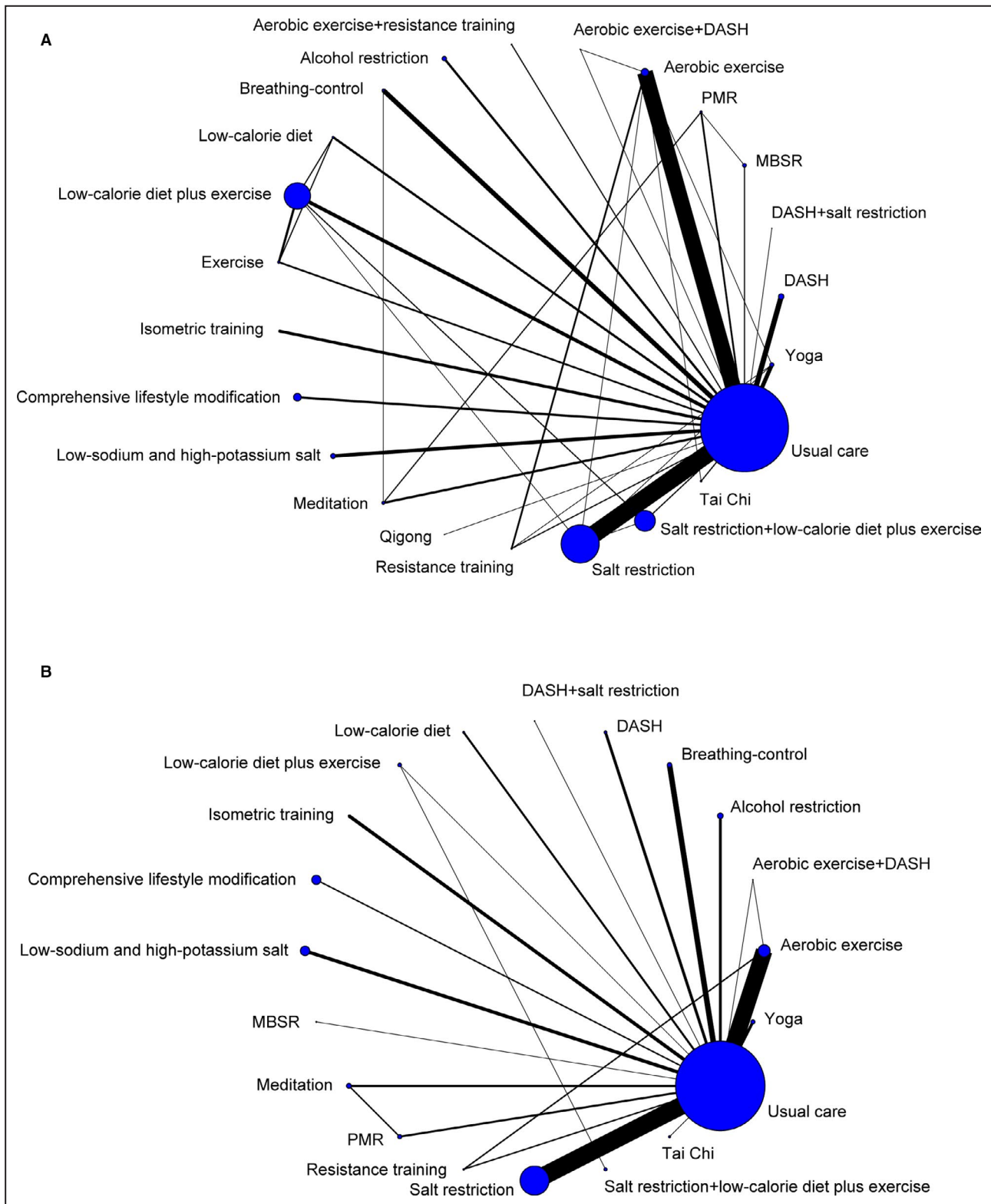
In traditional meta-analyses of patients with hypertension, 10 interventions were more effective in lowering BP compared with usual care (Table S3).

Network meta-analysis in patients with hypertension included 91 studies (7291 participants) with 19 interventions and usual care (Figure 2B). Comparative effect estimates were presented in Figure S5, and we focused on the effective BP-lowering estimates of interventions that were supported by the combination evidence of direct and indirect comparisons. Ten interventions were shown to be more effective than usual care in lowering SBP and DBP (Figure 4). Tai chi (WMD, 12.75 mm Hg [95% CrI, 6.54–18.98]), DASH (WMD, 8.69 mm Hg [95% CrI, 5.23–12.19]), and low-calorie diet (WMD, 7.78 mm Hg [95% CrI, 3.53–11.91]) were ranked first in lowering SBP; low-calorie diet (WMD, 4.98 mm Hg [95% CrI, 2.03–7.89]) was ranked higher in lowering DBP than DASH (WMD, 4.54 mm Hg [95% CrI, 1.91–7.18]); regardless of lowering either SBP or DBP, aerobic exercise, isometric training, low-sodium and high-potassium salt, yoga, meditation, salt restriction, and breathing-control followed low-calorie diet and DASH (Figure 4 and Figure S6).

The quality of evidence for interventions in comparisons with usual care in patients with hypertension was similar to that for adults with prehypertension to established hypertension (Table S5). In addition, the quality of evidence for salt restriction was rated as high regardless of lowering either SBP or DBP (Figure 4 and Table S5).

### Assessment of Heterogeneity and Inconsistency

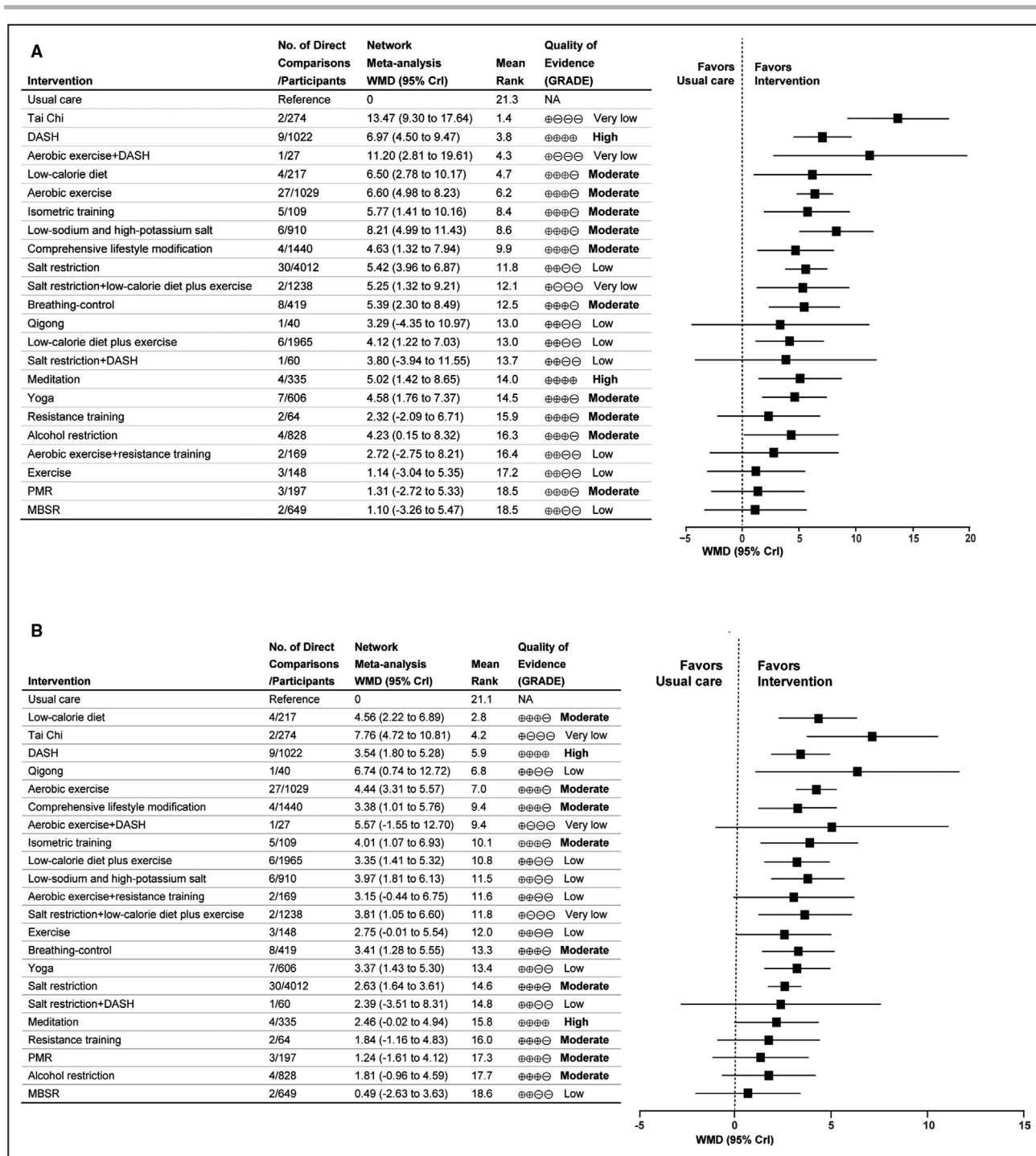
The global  $I^2$  values were 74.26% and 76.70% for mean SBP change and mean DBP change, respectively, in



**Figure 2. Network geometry used to assess the comparative effects of 22 nonpharmacologic interventions.**

**A**, Adult with prehypertension to established hypertension. **B**, Patients with hypertension. The nodes represent 22 nonpharmacologic interventions and usual care. The size of every node is proportional to the number of randomly assigned participants (sample size). Each line represents a direct comparison, and the width of the lines is proportional to the number of studies comparing every pair of interventions. The coding guide, which provides a description of each intervention component, can be found in Table 1. DASH indicates Dietary Approaches to Stop Hypertension; MBSR, mindfulness-based stress reduction; and PMR, progressive muscle relaxation.

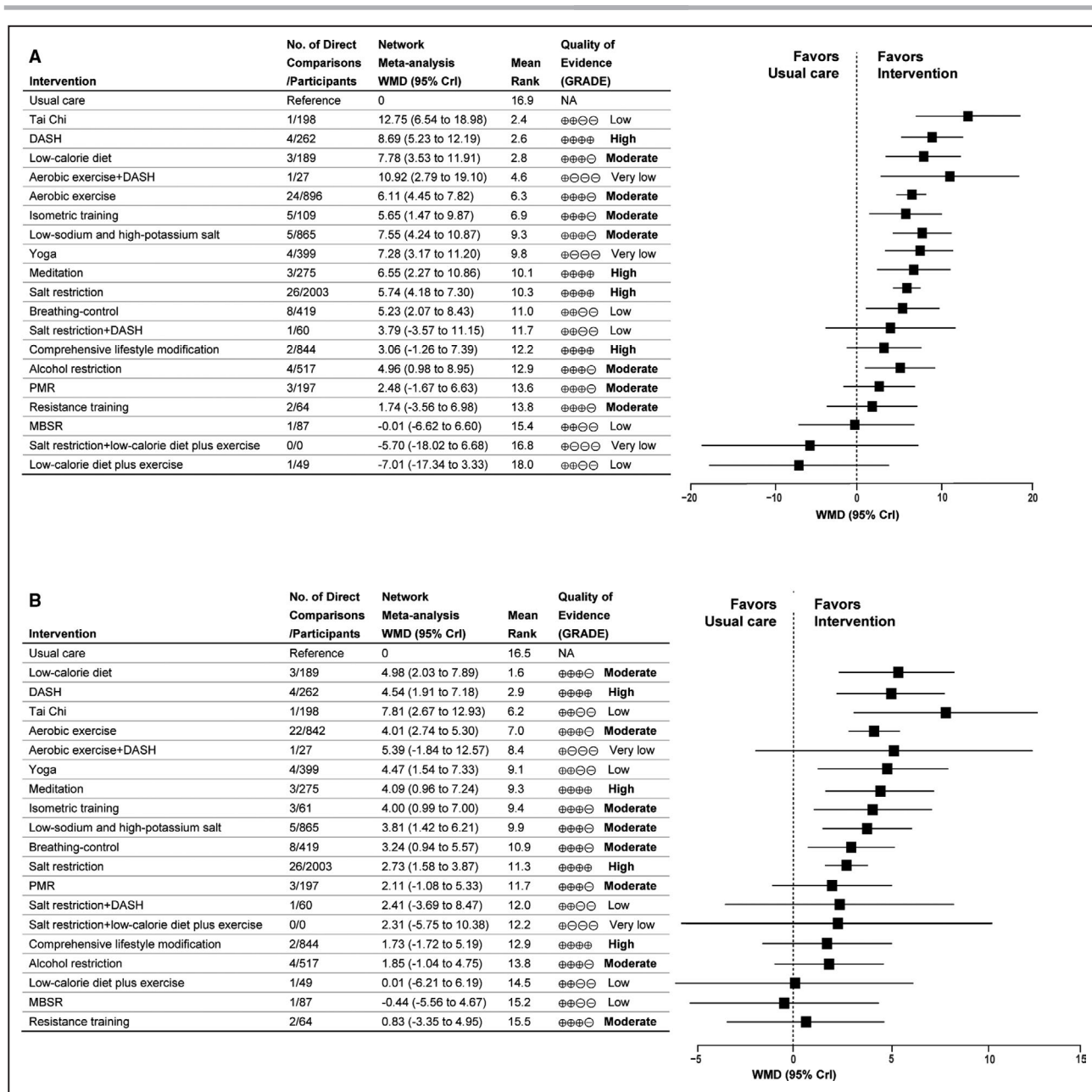




**Figure 3. Forest plots for mean changes of blood pressure in adults with prehypertension to established hypertension. A, Systolic blood pressure. B, Diastolic blood pressure.** Mean changes of blood pressure are reported in WMD and 95% CrI for intervention vs usual care. Rectangle represents the point estimate for the effect of each intervention. Horizontal lines indicate 95% CrI. Tables on the left of the forest plot show, for each intervention, the number of direct comparison studies, number of participants, rankings of SUCRA probabilities and quality of evidence. Interventions are ranked according to the rankings of SUCRA. The quality of evidence was classified as high, moderate, low, or very low. CrI indicates credible interval; DASH, Dietary Approaches to Stop Hypertension; MBSR, mindfulness-based stress reduction; NA, not available; PMR, progressive muscle relaxation; SUCRA, surface under the cumulative ranking; and WMD, weighted mean difference.

network meta-analysis of adults with prehypertension to established hypertension, and the global  $I^2$  values were 63.25% and 74.60% in the analysis of patients

with hypertension. The test of inconsistency showed significant differences in only 2 comparisons (tai chi versus usual care, tai chi versus aerobic exercise)



**Figure 4. Forest plots for mean changes of blood pressure in patients with hypertension.** **A**, Systolic blood pressure. **B**, Diastolic blood pressure. Mean changes of blood pressure are reported in WMD and 95% CrI for intervention vs usual care. Rectangle represent the point estimate for the effect of each intervention. Horizontal lines indicate 95% CrI. For each intervention, tables on the left of the forest plot show the number of direct comparison studies, number of participants, rankings of SUCRA probabilities, and quality of evidence. Interventions are ranked according to the rankings of SUCRA. The quality of evidence was classified as high, moderate, low, and very low. CrI indicates credible interval; DASH, Dietary Approaches to Stop Hypertension; MBSR, mindfulness-based stress reduction; NA, not available; PMR, progressive muscle relaxation; SUCRA, surface under the cumulative ranking; and WMD, weighted mean difference.

between direct and indirect results. Details of heterogeneity and consistency are given in Table S6.

### Network Sensitivity, Metaregression, and Subgroup Analyses

We conducted sensitivity, metaregression, and subgroup analyses based on all existing data. Sensitivity

analyses omitting studies with high risk of bias, studies started before 1999, or studies with end points of home BP or 24-hour ambulatory BP did not significantly alter the results of overall network meta-analysis (Table S7). Sensitivity analysis was carried out by omitting special populations along with specified interventions, and the SUCRA rankings of the other interventions did not change except that the

rankings of the deleted interventions were missing (Table S7). The results of metaregression analyses showed that covariates (mean age, mean body mass index, proportion of participants taking antihypertensive medicine, and proportion of female patients) did not affect the results of this study (Table S8). The BP-lowering effects of interventions among different subgroups defined by study duration and region of origin of study participants were not statistically different (Table S9).

## DISCUSSION

To the best of our knowledge, this study is the first to estimate the aggregate BP effects of 22 nonpharmacologic interventions through network meta-analysis including patients with hypertension and prehypertension. In the results, which combined the SUCRA rankings and GRADE quality of evidence and overcame the lack of head-to-head trials, DASH ranked as the most effective intervention for lowering BP, followed by aerobic exercise, isometric training, low-sodium and high-potassium salt, and comprehensive lifestyle modification. Meditation and breathing-control were considered to be relatively better among stress-reduction interventions but were less effective than the above-mentioned interventions. Salt restriction was also supported for lowering BP, especially in patients with hypertension.

Nonpharmacologic interventions, including dietary approaches, are a cornerstone for the prevention and treatment of hypertension.<sup>2</sup> The DASH diet promotes consumption of whole grains, vegetables and fruits, lean meat, and fat-free dairy products and the inclusion of micronutrients in the diet.<sup>64</sup> These foods are also naturally low in sodium and contain nutrients, which may help lower BP.<sup>64</sup> This diet can also decrease concentrations of total cholesterol and LDL (low-density lipoprotein), which may predict a reduction of  $\approx 13\%$  in the 10-year Framingham risk score for cardiovascular disease.<sup>65</sup> Our report demonstrates that eating a DASH diet every day has a significant effect on lowering BP compared to usual care, which is in keeping with previous meta-analysis.<sup>9</sup> In addition, our network meta-analysis suggests DASH to be the most effective intervention, based on its top SUCRA ranking and high-quality evidence supporting.

The World Health Organization has proposed that a 30% reduction in salt or sodium intake may reduce the risk of hypertension.<sup>66</sup> In our study, salt restriction (sodium intake  $< 100$  mmol, equivalent to 5.85 g salt) can significantly lower SBP, which is consistent with the result of a previously published meta-analysis.<sup>10</sup> Because the quality of evidence was rated down by

risk of bias, inconsistency, and publication bias, there is low confidence supporting the use of salt restriction for lowering SBP in adults with prehypertension to established hypertension. However, the risk of bias was due to a study that was published in 1973 with insufficient information,<sup>67</sup> and high heterogeneity ( $I^2=77.1\%$ ) was mainly produced by combining the results of participants with hypertension and prehypertension. In the analysis for only patients with hypertension, the quality of evidence for salt restriction was considered high.

For people with a long-established habit of high salt intake, it is difficult to attain and maintain long-term voluntary salt control, and alternative approaches with equivalent effects are needed.<sup>68</sup> A salt substitute with low-sodium and high-potassium content and an acceptable salty flavor would be an ideal population-wide preventative strategy. In our network meta-analysis, moderate-quality evidence supports the BP-lowering effect of low-sodium and high-potassium salt ( $\approx 5$ – $8$  g) in adults with prehypertension to established hypertension.

An extensive body of research suggested that physical activity may have beneficial effects on BP in people with hypertension. Published meta-analyses have also confirmed the efficacy of physical activity in lowering BP.<sup>11,69,70</sup> In our study, moderate- to high-intensity aerobic exercise (at least 3 days weekly, 30 minutes per time, achieving 60% to 90% of the maximum heart rate) and isometric training (3 days weekly, bilateral contractions at 30% of maximum voluntary contraction), followed behind DASH in lowering BP significantly.

Tai chi fared relatively better based on SUCRA rankings. However, highly ranked interventions would result in misleading inferences when most evidence is of low or very low quality.<sup>18</sup> Based on the very low quality of evidence (severe inconsistency, imprecision, and publication bias), tai chi disappeared from our recommendations. However, tai chi was still among the interventions with a potentially better effectiveness profile, although the BP-lowering effect was potentially spurious according to the analysis of existing data, and more RCTs should be conducted to evaluate this result further.

In addition to single nonpharmacologic interventions, comprehensive lifestyle modification is also effective in lowering BP and has been evaluated in several RCTs.<sup>62,63,71,72</sup> In our network meta-analysis, it is not surprising that moderate-quality evidence supported comprehensive lifestyle modification for lowering both SBP and DBP. However, based on SUCRA rankings, this intervention did not seem to be the most effective, possibly because different studies have different approaches to modify multiple unhealthy lifestyles, which may bring heterogeneity and affect the results. Benefits of other combined interventions (aerobic exercise plus

DASH, salt restriction plus low-calorie diet and exercise, salt restriction plus DASH, aerobic exercise plus resistance training) could not be judged because of insufficient studies and low quality of evidence until now.

This study also extends findings from previous traditional meta-analyses that aerobic exercise seems more effective than salt restriction with respect to lowering BP, whereas the differences in comparative effect among other effective nonpharmacologic interventions mentioned above were modest (Figures S3 and S5), signaling potential equivalence of these interventions for lowering BP. Low-calorie diet and low-calorie diet plus exercise could lower BP level more than exercise among participants who were overweight and obese because of participants' weight loss with these 2 interventions.

Considering that the BP-lowering effects of nonpharmacologic interventions may be affected by study duration, we performed subgroup analysis. The results showed that the BP-lowering effects of interventions among different subgroups were not statistically different. Despite the differences that were not statistically significant, we observed that low-sodium and high-potassium salt and aerobic exercise lowered BP more over 12 to 24 weeks, and the BP-lowering effects of salt restriction, low-calorie diet, and comprehensive lifestyle modification were decreased with the extension of duration. These results may be caused by different persistence over time. For breathing-control, DASH, and isometric training, the duration of most studies was <12 weeks. Consequently, more RCTs should be conducted to assess the long-term effects of nonpharmacologic interventions.

Our network meta-analysis strictly excluded studies involving adults with resistant hypertension, who are particularly salt-sensitive<sup>73</sup> and reacted differently from patients with primary hypertension in terms of salt-related interventions. Studies involving patients with diabetes mellitus or metabolic syndrome were also excluded because these conditions might influence the effects of nonpharmacologic interventions.<sup>74,75</sup> The participants who used alcohol habitually or who were overweight or obese in our study were also free of diabetes mellitus and metabolic syndrome; therefore, these special participants were treated equally as patients with hypertension and prehypertension. After omitting these specified interventions along with their corresponding participants, the SUCRA rankings of the other interventions did not change except that the rankings of the deleted interventions were missing.

This analysis has several limitations. First, for the 22 interventions included in the network meta-analysis, 8 were only directly compared with usual care. The effects of these interventions were estimated with direct evidence; however, this did not affect the

evaluation and rankings of these 8 interventions because direct evidence has a higher rating than indirect evidence. In addition, many indirect comparisons were assessed as being of low or very low quality in the GRADE framework, which largely restricts the interpretation of these results. Inconsistency existed in the comparison of tai chi versus aerobic exercise; however, this did not affect the estimates of other interventions seriously. Second, our study reported only the effectiveness of nonpharmacologic interventions in lowering BP, lacking secondary end points such as rate of BP control, incidence of hypertension, and mortality due to complications of hypertension, as most RCTs included in this study provided data of mean BP or changes in BP. Third, smoking cessation as a nonpharmacologic intervention was not included in our study because existing RCTs on smoking cessation in patients with hypertension or prehypertension were not truly intervened. Music therapy was also not included because of a wide variety of music was used, and there was no comparable control group. Fourth, most RCTs included in this study had short- or moderate-term follow-up. Fifth, we only reviewed publications in English.

## CONCLUSIONS

This network meta-analysis showed that, among 22 nonpharmacologic interventions, DASH was the most effective intervention in lowering BP for adults with prehypertension to established hypertension. Aerobic exercise, isometric training, low-sodium and high-potassium salt, comprehensive lifestyle modification, breathing control, meditation, and low-calorie diet also have obvious effects in lowering BP. Moreover, our findings suggest that salt restriction be used for lowering BP, especially in patients with hypertension.

## ARTICLE INFORMATION

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### Affiliations

From the Department of Epidemiology, College of Public Health, Harbin Medical University, Harbin, Heilongjiang Province, P.R. China (J.F., Y.L., L.Z., L.Z., D.L., L.Z., F.H., X.L., S.M., R.Y., S.Z., J.U.O., Y.Z.); Department of Community Health Sciences, University of Calgary, Alberta, Canada (H.Q.); Department of Pharmacology and the State-Province Key Laboratory of Biomedicine and Pharmaceutics (B.Y.) and Center for Endemic Disease Control, Chinese Center for Disease Control and Prevention, Harbin Medical University, Harbin, Heilongjiang Province, P.R. China (D.S.).

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### Disclosures

None.

## Supplementary Materials

### Data S1

### Tables S1–S9

### Figures S1–S6

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## REFERENCES

- Lip GYH, Coca A, Kahan T, Boriani G, Manolis AS, Olsen MH, Oto A, Potpara TS, Steffel J, Marin F, et al. Hypertension and cardiac arrhythmias: executive summary of a consensus document from the European Heart Rhythm Association (EHRA) and ESC Council on Hypertension, endorsed by the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLEACE). *Eur Heart J Cardiovasc Pharmacother*. 2017;3:235–250.
- James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, Lackland DT, LeFevre ML, MacKenzie TD, Oggedegbe O, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311:507–520.
- Oparil S, Acelajado MC, Bakris GL, Berlowitz DR, Cifkova R, Dominiczak AF, Grassi G, Jordan J, Poulter NR, Rodgers A, et al. Hypertension. *Nat Rev Dis Primers*. 2018;4:18014.
- Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, Marczak L, Alexander L, Estep K, Hassen Abate K, Akinyemiju TF, et al. Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990–2015. *JAMA*. 2017;317:165–182.
- Vasan RS, Larson MG, Leip EP, Evans JC, O'Donnell CJ, Kannel WB, Levy D. Impact of high-normal blood pressure on the risk of cardiovascular disease. *N Engl J Med*. 2001;345:1291–1297.
- Gupta AK, McGlone M, Greenway FL, Johnson WD. Prehypertension in disease-free adults: a marker for an adverse cardiometabolic risk profile. *Hypertens Res*. 2010;33:905–910.
- Thomopoulos C, Parati G, Zanchetti A. Effects of blood pressure lowering on outcome incidence in hypertension: 4. Effects of various classes of antihypertensive drugs—overview and meta-analyses. *J Hypertens*. 2015;33:195–211.
- French MT, Mundt MP, Fleming M, Zavala SK. The cost of medical care for patients with diabetes, hypertension and both conditions: does alcohol use play a role? *J Intern Med*. 2005;258:45–54.
- Saneei P, Salehi-Abargouei A, Esmailzadeh A, Azadbakht L. Influence of Dietary Approaches to Stop Hypertension (DASH) diet on blood pressure: a systematic review and meta-analysis on randomized controlled trials. *Nutr Metab Cardiovasc Dis*. 2014;24:1253–1261.
- He FJ, Li J, Macgregor GA. Effect of longer term modest salt reduction on blood pressure: cochrane systematic review and meta-analysis of randomised trials. *BMJ*. 2013;346:f1325.
- Whelton SP, Chin A, Xin X, He J. Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials. *Ann Intern Med*. 2002;136:493–503.
- Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, DePalma SM, Gidding S, Jamerson KA, Jones DW, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APHA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2018;138:e484–e594.
- Leung AA, Daskalopoulou SS, Dasgupta K, McBrien K, Butalia S, Zarnke KB, Nerenberg K, Harris KC, Nakhla M, Cloutier L, et al. Hypertension Canada's 2017 guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults. *Can J Cardiol*. 2017;33:557–576.
- Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, Clement DL, Coca A, de Simone G, Dominiczak A, et al. 2018 ESC/ESH guidelines for the management of arterial hypertension. *Eur Heart J*. 2018;39:3021–3104.
- Cipriani A, Higgins JP, Geddes JR, Salanti G. Conceptual and technical challenges in network meta-analysis. *Ann Intern Med*. 2013;159:130–137.
- Mills EJ, Ioannidis JP, Thorlund K, Schunemann HJ, Puhani MA, Guyatt GH. How to use an article reporting a multiple treatment comparison meta-analysis. *JAMA*. 2012;308:1246–1253.
- Riley RD, Jackson D, Salanti G, Burke DL, Price M, Kirkham J, White IR. Multivariate and network meta-analysis of multiple outcomes and multiple treatments: rationale, concepts, and examples. *BMJ*. 2017;358:j3932.
- Hutton B, Salanti G, Caldwell DM, Chaimani A, Schmid CH, Cameron C, Ioannidis JP, Straus S, Thorlund K, Jansen JP, et al. The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: checklist and explanations. *Ann Intern Med*. 2015;162:777–784.
- Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, et al. The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. *JAMA*. 2003;289:2560–2572.
- Hozo SP, Djulbegovic B, Hozo I. Estimating the mean and variance from the median, range, and the size of a sample. *BMC Med Res Methodol*. 2005;5:13.
- Higgins JP, Green S. *Cochrane Handbook for Systematic Reviews of Interventions*. Hoboken, NJ: John Wiley & Sons; 2011.
- Greenland S. Quantitative methods in the review of epidemiologic literature. *Epidemiol Rev*. 1987;9:1–30.
- Madden LV, Piepho HP, Paul PA. Statistical Models And Methods For Network Meta-Analysis. *Phytopathology*. 2016;106:792–806.
- Neupane B, Richer D, Bonner AJ, Kibret T, Beyene J. Network meta-analysis using R: a review of currently available automated packages. *PLoS One*. 2014;9:e115065.
- Brooks SP, Gelman A. General methods for monitoring convergence of iterative simulations. *J Comput Graph Stat*. 1998;7:434–455.
- van Valkenhoef G, Dias S, Ades A, Welton N. Automated generation of node-splitting models for assessment of inconsistency in network meta-analysis. *Res Synth Methods*. 2016;7:80–93.
- Wei J, Zeng C, Lei G-H. Heterogeneity, consistency and model fit should be assessed in Bayesian network meta-analysis. *Ann Rheum Dis*. 2016;75:e5.
- Salanti G, Ades AE, Ioannidis JP. Graphical methods and numerical summaries for presenting results from multiple-treatment meta-analysis: an overview and tutorial. *J Clin Epidemiol*. 2011;64:163–171.
- Chalmers J, MacMahon S, Mancia G, Whitworth J, Beilin L, Hansson L, Neal B, Rodgers A, Ni Mhurchu C, Clark T. 1999 World Health Organization-International Society of Hypertension Guidelines for the management of hypertension. Guidelines sub-committee of the World Health Organization. *Clin Exp Hypertens*. 1999;21:1009–1060.
- Chaimani A, Higgins JP, Mavridis D, Spyridonos P, Salanti G. Graphical tools for network meta-analysis in STATA. *PLoS One*. 2013;8:e76654.
- Higgins JP, Altman DG, Gotzsche PC, Juni P, Moher D, Oxman AD, Savovic J, Schulz KF, Weeks L, Sterne JA. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*. 2011;343:d5928.
- Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coeillo P, Schunemann HJ. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;336:924–926.
- Puhan MA, Schunemann HJ, Murad MH, Li T, Brignardello-Petersen R, Singh JA, Kessels AG, Guyatt GH. A GRADE Working Group approach for rating the quality of treatment effect estimates from network meta-analysis. *BMJ*. 2014;349:g5630.
- Svetkey LP, Simons-Morton D, Vollmer WM, Appel LJ, Conlin PR, Ryan DH, Ard J, Kennedy BM. Effects of dietary patterns on blood pressure: subgroup analysis of the Dietary Approaches to Stop Hypertension (DASH) randomized clinical trial. *Arch Intern Med*. 1999;159:285–293.
- Zou P, Dennis CL, Lee R, Parry M. Dietary approach to stop hypertension with sodium reduction for Chinese Canadians (DASHNa-CC): a pilot randomized controlled trial. *J Nutr Health Aging*. 2017;21:1225–1232.
- Sarkkinen ES, Kastarinen MJ, Niskanen TH, Karjalainen PH, Venalainen TM, Udani JK, Niskanen LK. Feasibility and antihypertensive effect of replacing regular salt with mineral salt -rich in magnesium and potassium- in subjects with mildly elevated blood pressure. *Nutr J*. 2011;10:88.
- Zhao X, Yin X, Li X, Yan LL, Lam CT, Li S, He F, Xie W, Sang B, Luobo G, et al. Using a low-sodium, high-potassium salt substitute to reduce blood pressure among Tibetans with high blood pressure: a patient-blinded randomized controlled trial. *PLoS One*. 2014;9:e110131.

38. Cappuccio FP, Markandu ND, Carney C, Sagnella GA, MacGregor GA. Double-blind randomised trial of modest salt restriction in older people. *Lancet*. 1997;350:850–854.
39. Swift PA, Markandu ND, Sagnella GA, He FJ, MacGregor GA. Modest salt reduction reduces blood pressure and urine protein excretion in black hypertensives: a randomized control trial. *Hypertension*. 2005;46:308–312.
40. Molmen-Hansen HE, Stolen T, Tjonna AE, Aamot IL, Ekeberg IS, Tyldum GA, Wisloff U, Ingul CB, Stoylen A. Aerobic interval training reduces blood pressure and improves myocardial function in hypertensive patients. *Eur J Prev Cardiol*. 2012;19:151–160.
41. Rogers MW, Probst MM, Gruber JJ, Berger R, Boone JB Jr. Differential effects of exercise training intensity on blood pressure and cardiovascular responses to stress in borderline hypertensive humans. *J Hypertens*. 1996;14:1369–1375.
42. Badrov MB, Horton S, Millar PJ, McGowan CL. Cardiovascular stress reactivity tasks successfully predict the hypotensive response of isometric handgrip training in hypertensives. *Psychophysiology*. 2013;50:407–414.
43. Taylor AC, McCartney N, Kamath MV, Wiley RL. Isometric training lowers resting blood pressure and modulates autonomic control. *Med Sci Sports Exerc*. 2003;35:251–256.
44. Blumenthal JA, Siegel WC, Appelbaum M. Failure of exercise to reduce blood pressure in patients with mild hypertension. Results of a randomized controlled trial. *JAMA*. 1991;266:2098–2104.
45. Cononie CC, Graves JE, Pollock ML, Phillips MI, Summers C, Hagberg JM. Effect of exercise training on blood pressure in 70- to 79-year-old men and women. *Med Sci Sports Exerc*. 1991;23:505–511.
46. Tsai JC, Wang WH, Chan P, Lin LJ, Wang CH, Tomlinson B, Hsieh MH, Yang HY, Liu JC. The beneficial effects of Tai Chi Chuan on blood pressure and lipid profile and anxiety status in a randomized controlled trial. *J Altern Complement Med*. 2003;9:747–754.
47. Park JE, Hong S, Lee M, Park T, Kang K, Jung H, Shin KM, Liu Y, Shin M, Choi SM. Randomized, controlled trial of qigong for treatment of prehypertension and mild essential hypertension. *Altern Ther Health Med*. 2014;20:21–30.
48. Elliot WJ, Izzo J, White WB, Rosing DR, Snyder CS, Alter A, Gavish B, Black HR. Graded blood pressure reduction in hypertensive outpatients associated with use of a device to assist with slow breathing. *J Clin Hypertens (Greenwich)*. 2004;6:553–559; quiz 560–551.
49. Grossman E, Grossman A, Schein MH, Zimlichman R, Gavish B. Breathing-control lowers blood pressure. *J Hum Hypertens*. 2001;15:263–269.
50. Castillo-Richmond A, Schneider RH, Alexander CN, Cook R, Myers H, Nidich S, Haney C, Rainforth M, Salerno J. Effects of stress reduction on carotid atherosclerosis in hypertensive African Americans. *Stroke*. 2000;31:568–573.
51. Blom K, Baker B, How M, Dai M, Irvine J, Abbey S, Abramson BL, Myers MG, Kiss A, Perkins NJ, et al. Hypertension analysis of stress reduction using mindfulness meditation and yoga: results from the HARMONY randomized controlled trial. *Am J Hypertens*. 2014;27:122–129.
52. Hughes JW, Fresco DM, Myerscough R, van Dulmen MH, Carlson LE, Josephson R. Randomized controlled trial of mindfulness-based stress reduction for prehypertension. *Psychosom Med*. 2013;75:721–728.
53. Schneider RH, Staggars F, Alexander CN, Sheppard W, Rainforth M, Kondwani K, Smith S, King CG. A randomized controlled trial of stress reduction for hypertension in older African Americans. *Hypertension*. 1995;26:820–827.
54. Schneider RH, Alexander CN, Staggars F, Orme-Johnson DW, Rainforth M, Salerno JW, Sheppard W, Castillo-Richmond A, Barnes VA, Nidich SI. A randomized controlled trial of stress reduction in African Americans treated for hypertension for over one year. *Am J Hypertens*. 2005;18:88–98.
55. Wolff M, Sundquist K, Larsson Lonn S, Midlov P. Impact of yoga on blood pressure and quality of life in patients with hypertension—a controlled trial in primary care, matched for systolic blood pressure. *BMC Cardiovasc Disord*. 2013;13:111.
56. Gordon NF, Scott CB, Levine BD. Comparison of single versus multiple lifestyle interventions: are the antihypertensive effects of exercise training and diet-induced weight loss additive? *Am J Cardiol*. 1997;79:763–767.
57. Cushman WC, Cutler JA, Hanna E, Bingham SF, Follmann D, Harford T, Dubbert P, Allender PS, Dufour M, Collins JF, et al. Prevention and Treatment of Hypertension Study (PATHS): effects of an alcohol treatment program on blood pressure. *Arch Intern Med*. 1998;158:1197–1207.
58. Lang T, Nicaud V, Darne B, Rueff B. Improving hypertension control among excessive alcohol drinkers: a randomised controlled trial in France. The WALPA Group. *J Epidemiol Community Health*. 1995;49:610–616.
59. Edwards KM, Wilson KL, Sadja J, Ziegler MG, Mills PJ. Effects on blood pressure and autonomic nervous system function of a 12-week exercise or exercise plus DASH-diet intervention in individuals with elevated blood pressure. *Acta Physiol (Oxf)*. 2011;203:343–350.
60. Stewart KJ, Bacher AC, Turner KL, Fleg JL, Hees PS, Shapiro EP, Tayback M, Ouyang P. Effect of exercise on blood pressure in older persons: a randomized controlled trial. *Arch Intern Med*. 2005;165:756–762.
61. The Trials of Hypertension Prevention Collaborative Research Group. Effects of weight loss and sodium reduction intervention on blood pressure and hypertension incidence in overweight people with high-normal blood pressure. The Trials of Hypertension Prevention, phase II. *Arch Intern Med*. 1997;157:657–667.
62. Elmer PJ, Obarzanek E, Vollmer WM, Simons-Morton D, Stevens VJ, Young DR, Lin PH, Champagne C, Harsha DW, Svetkey LP, et al. Effects of comprehensive lifestyle modification on diet, weight, physical fitness, and blood pressure control: 18-month results of a randomized trial. *Ann Intern Med*. 2006;144:485–495.
63. Burke V, Bellin LJ, Cutt HE, Mansour J, Wilson A, Mori TA. Effects of a lifestyle programme on ambulatory blood pressure and drug dosage in treated hypertensive patients: a randomized controlled trial. *J Hypertens*. 2005;23:1241–1249.
64. Challa HJ, Ameer MA, Uppaluri KR. DASH Diet (Dietary Approaches to Stop Hypertension). In *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2020.
65. Siervo M, Lara J, Chowdhury S, Ashor A, Oggioni C, Mathers JC. Effects of the Dietary Approach to Stop Hypertension (DASH) diet on cardiovascular risk factors: a systematic review and meta-analysis. *Br J Nutr*. 2015;113:1–15.
66. World Health Organization. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. WHO IRIS; 2013. Available at: <https://apps.who.int/iris/handle/10665/94384>. Accessed November 14, 2013.
67. Parijs J, Joossens JV, Van der Linden L, Verstreken G, Amery AK. Moderate sodium restriction and diuretics in the treatment of hypertension. *Am Heart J*. 1973;85:22–34.
68. Tsunematsu N. The actual amount of reductions in salt intake among those on a restricted salt diet: from the INTERMAP Japan. *J Jpn Soc Prev Cardiovasc Dis*. 2004;39:149–155.
69. Inder JD, Carlson DJ, Dieberg G, McFarlane JR, Hess NC, Smart NA. Isometric exercise training for blood pressure management: a systematic review and meta-analysis to optimize benefit. *Hypertens Res*. 2016;39:88–94.
70. Rossi AM, Moullec G, Lavoie KL, Gour-Provencal G, Bacon SL. The evolution of a Canadian Hypertension Education Program recommendation: the impact of resistance training on resting blood pressure in adults as an example. *Can J Cardiol*. 2013;29:622–627.
71. Marquez-Celedonio FG, Texon-Fernandez O, Chavez-Negrete A, Hernandez-Lopez S, Marin-Rendon S, Berlin-Lascurain S. [Clinical effect of lifestyle modification on cardiovascular risk in prehypertensives: PREHIPER I study]. *Rev Esp Cardiol*. 2009;62:86–90.
72. Mattila R, Malmivaara A, Kastarinen M, Kivela SL, Nissinen A. Effectiveness of multidisciplinary lifestyle intervention for hypertension: a randomised controlled trial. *J Hum Hypertens*. 2003;17:199–205.
73. Pimenta E, Gaddam KK, Oparil S, Aban I, Husain S, Dell'Italia LJ, Calhoun DA. Effects of dietary sodium reduction on blood pressure in subjects with resistant hypertension: results from a randomized trial. *Hypertension*. 2009;54:475–481.
74. Cohen JD. Overview of physiology, vascular biology, and mechanisms of hypertension. *J Manag Care Pharm*. 2007;13:S6–S8.
75. de Jongh RT, Serne EH, Ijzerman RG, de Vries G, Stehouwer CD. Free fatty acid levels modulate microvascular function: relevance for obesity-associated insulin resistance, hypertension, and microangiopathy. *Diabetes*. 2004;53:2873–2882.
76. Altena MR, Kleefstra N, Logtenberg SJ, Groenier KH, Houweling ST, Bilo HJ. Effect of device-guided breathing exercises on blood pressure in patients with hypertension: a randomized controlled trial. *Blood Press*. 2009;18:273–279.

77. Anderson DE, McNeely JD, Windham BG. Regular slow-breathing exercise effects on blood pressure and breathing patterns at rest. *J Hum Hypertens*. 2010;24:807–813.
78. Anderssen S, Holme I, Urdal P, Hjermann I. Diet and exercise intervention have favourable effects on blood pressure in mild hypertensives: the Oslo Diet and Exercise Study (ODES). *Blood Press*. 1995;4:343–349.
79. Australian National Health & Medical Research Council Dietary Salt Study Management Committee. Effects of replacing sodium intake in subjects on a low sodium diet: a crossover study. *Clin Exp Hypertens A*. 1989;11:1011–1024.
80. Australian National Health and Medical Research Council Dietary Salt Study Management Committee. Fall in blood pressure with modest reduction in dietary salt intake in mild hypertension. *Lancet*. 1989;1:399–402.
81. Appel LJ, Espeland MA, Easter L, Wilson AC, Folmar S, Lacy CR. Effects of reduced sodium intake on hypertension control in older individuals: results from the Trial of Nonpharmacologic Interventions in the Elderly (TONE). *Arch Intern Med*. 2001;161:685–693.
82. Baros AM, Wright TM, Latham PK, Miller PM, Anton RF. Alcohol consumption, %CDT, GGT and blood pressure change during alcohol treatment. *Alcohol Alcohol*. 2008;43:192–197.
83. Barros CL, Sousa AL, Chinem BM, Rodrigues RB, Jardim TS, Carneiro SB, Souza WK, Jardim PC. Impact of light salt substitution for regular salt on blood pressure of hypertensive patients. *Arq Bras Cardiol*. 2015;104:128–135.
84. Beard TC, Cooke HM, Gray WR, Barge R. Randomised controlled trial of a no-added-sodium diet for mild hypertension. *Lancet*. 1982;2:455–458.
85. Benetos A, Xiao YY, Cuhe JL, Hannaert P, Safar M. Arterial effects of salt restriction in hypertensive patients. A 9-week, randomized, double-blind, crossover study. *J Hypertens*. 1992;10:355–360.
86. Blumenthal JA, Sherwood A, Gullette EC, Babyak M, Waugh R, Georgiades A, Craighead LW, Tweedy D, Feinglos M, Appelbaum M, et al. Exercise and weight loss reduce blood pressure in men and women with mild hypertension: effects on cardiovascular, metabolic, and hemodynamic functioning. *Arch Intern Med*. 2000;160:1947–1958.
87. Chen ST, Maruthur NM, Appel LJ. The effect of dietary patterns on estimated coronary heart disease risk: results from the Dietary Approaches to Stop Hypertension (DASH) trial. *Circ Cardiovasc Qual Outcomes*. 2010;3:484–489.
88. Cohen DL, Bloedon LT, Rothman RL, Farrar JT, Galantino ML, Volger S, Mayor C, Szapary PO, Townsend RR. Iyengar yoga versus enhanced usual care on blood pressure in patients with prehypertension to stage I hypertension: a randomized controlled trial. *Evid Based Complement Alternat Med*. 2011;2011:546428.
89. Collier SR, Kanaley JA, Carhart R Jr, Frechette V, Tobin MM, Hall AK, Luckenbaugh AN, Fernhall B. Effect of 4 weeks of aerobic or resistance exercise training on arterial stiffness, blood flow and blood pressure in pre- and stage-1 hypertensives. *J Hum Hypertens*. 2008;22:678–686.
90. Conlin PR, Erlinger TP, Bohannon A, Miller ER III, Appel LJ, Svetkey LP, Moore TJ. The DASH diet enhances the blood pressure response to losartan in hypertensive patients. *Am J Hypertens*. 2003;16:337–342.
91. Cooper AR, Moore LA, McKenna J, Riddoch CJ. What is the magnitude of blood pressure response to a programme of moderate intensity exercise? Randomised controlled trial among sedentary adults with unmedicated hypertension. *Br J Gen Pract*. 2000;50:958–962.
92. Cottier C, Shapiro K, Julius S. Treatment of mild hypertension with progressive muscle relaxation. Predictive value of indexes of sympathetic tone. *Arch Intern Med*. 1984;144:1954–1958.
93. Croft PR, Brigg D, Smith S, Harrison CB, Branthwaite A, Collins MF. How useful is weight reduction in the management of hypertension? *J R Coll Gen Pract*. 1986;36:445–448.
94. Erlinger TP, Conlin PR, Macko RF, Bohannon AD, Miller ER III, Moore TJ, Svetkey LP, Appel LJ. The impact of angiotensin II receptor blockade and the DASH diet on markers of endogenous fibrinolysis. *J Hum Hypertens*. 2002;16:391–397.
95. Erwtman TM, Nagelkerke N, Lubsen J, Koster M, Dunning AJ. Beta blockade, diuretics, and salt restriction for the management of mild hypertension: a randomised double blind trial. *Br Med J (Clin Res Ed)*. 1984;289:406–409.
96. Farah BQ, Rodrigues SLC, Silva GO, Pedrosa RP, Correia MA, Barros MVG, Deminice R, Marinello PC, Smart NA, Vianna LC, et al. Supervised, but not home-based, isometric training improves brachial and central blood pressure in medicated hypertensive patients: a randomized controlled trial. *Front Physiol*. 2018;9:961.
97. Farahani AV, Mansournia MA, Asheri H, Fotouhi A, Yunesian M, Jamali M, Ziaee V. The effects of a 10-week water aerobic exercise on the resting blood pressure in patients with essential hypertension. *Asian J Sports Med*. 2010;1:159–167.
98. Farinatti P, Monteiro WD, Oliveira RB. Long term home-based exercise is effective to reduce blood pressure in low income Brazilian hypertensive patients: a controlled trial. *High Blood Press Cardiovasc Prev*. 2016;23:395–404.
99. Ferreira JB, Plentz RD, Stein C, Casali KR, Arena R, Lago PD. Inspiratory muscle training reduces blood pressure and sympathetic activity in hypertensive patients: a randomized controlled trial. *Int J Cardiol*. 2013;166:61–67.
100. Fotherby MD, Potter JF. Effects of moderate sodium restriction on clinic and twenty-four-hour ambulatory blood pressure in elderly hypertensive subjects. *J Hypertens*. 1993;11:657–663.
101. Gates PE, Tanaka H, Hiatt WR, Seals DR. Dietary sodium restriction rapidly improves large elastic artery compliance in older adults with systolic hypertension. *Hypertension*. 2004;44:35–41.
102. Geleijnse JM, Witteman JC, Bak AA, den Breeijen JH, Grobbee DE. Reduction in blood pressure with a low sodium, high potassium, high magnesium salt in older subjects with mild to moderate hypertension. *BMJ*. 1994;309:436–440.
103. Grobbee DE, Hofman A, Roelandt JT, Boomsma F, Schalekamp MA, Valkenburg HA. Sodium restriction and potassium supplementation in young people with mildly elevated blood pressure. *J Hypertens*. 1987;5:115–119.
104. Guimaraes GV, Ciolac EG, Carvalho VO, D'Avila VM, Bortolotto LA, Bocchi EA. Effects of continuous vs. interval exercise training on blood pressure and arterial stiffness in treated hypertension. *Hypertens Res*. 2010;33:627–632.
105. Hagins M, Rundle A, Consedine NS, Khalsa SB. A randomized controlled trial comparing the effects of yoga with an active control on ambulatory blood pressure in individuals with prehypertension and stage 1 hypertension. *J Clin Hypertens (Greenwich)*. 2014;16:54–62.
106. Haynes RB, Harper AC, Costley SR, Johnston M, Logan AG, Flanagan PT, Sackett DL. Failure of weight reduction to reduce mildly elevated blood pressure: a randomized trial. *J Hypertens*. 1984;2:535–539.
107. He FJ, Marciniak M, Visagie E, Markandu ND, Anand V, Dalton RN, MacGregor GA. Effect of modest salt reduction on blood pressure, urinary albumin, and pulse wave velocity in white, black, and Asian mild hypertensives. *Hypertension*. 2009;54:482–488.
108. Higashi Y, Sasaki S, Sasaki N, Nakagawa K, Ueda T, Yoshimizu A, Kurisu S, Matsuura H, Kajiyama G, Oshima T. Daily aerobic exercise improves reactive hyperemia in patients with essential hypertension. *Hypertension*. 1999;33:591–597.
109. Higashi Y, Sasaki S, Kurisu S, Yoshimizu A, Sasaki N, Matsuura H, Kajiyama G, Oshima T. Regular aerobic exercise augments endothelium-dependent vascular relaxation in normotensive as well as hypertensive subjects: role of endothelium-derived nitric oxide. *Circulation*. 1999;100:1194–1202.
110. Hikmat F, Appel LJ. Effects of the DASH diet on blood pressure in patients with and without metabolic syndrome: results from the DASH trial. *J Hum Hypertens*. 2014;28:170–175.
111. Izadi MR, Ghardashi Afousi A, Asvadi Fard M, Babaei Bigi MA. High-intensity interval training lowers blood pressure and improves apelin and NOx plasma levels in older treated hypertensive individuals. *J Physiol Biochem*. 2018;74:47–55.
112. Jablonski KL, Fedorova OV, Racine ML, Geolfos CJ, Gates PE, Chonchol M, Fleenor BS, Lakatta EG, Bagrov AY, Seals DR. Dietary sodium restriction and association with urinary marinobufagenin, blood pressure, and aortic stiffness. *Clin J Am Soc Nephrol*. 2013;8:1952–1959.
113. Jalakanen L. The effect of a weight reduction program on cardiovascular risk factors among overweight hypertensives in primary health care. *Scand J Soc Med*. 1991;19:66–71.
114. Jones CU, Sangthong B, Pachirat O. An inspiratory load enhances the antihypertensive effects of home-based training with slow deep breathing: a randomised trial. *J Physiother*. 2010;56:179–186.
115. MacGregor GA, Markandu ND, Best FE, Elder DM, Cam JM, Sagnella GA, Squires M. Double-blind randomised crossover trial of moderate sodium restriction in essential hypertension. *Lancet*. 1982;1:351–355.

116. MacGregor GA, Markandu ND, Sagnella GA, Singer DR, Cappuccio FP. Double-blind study of three sodium intakes and long-term effects of sodium restriction in essential hypertension. *Lancet*. 1989;2:1244–1247.
117. MacMahon SW, Macdonald GJ, Bernstein L, Andrews G, Blacket RB. Comparison of weight reduction with metoprolol in treatment of hypertension in young overweight patients. *Lancet*. 1985;1:1233–1236.
118. Makela P, Vahlberg T, Kantola I, Vesalainen R, Jula A. The effects of a 6-month sodium restriction on cardiac autonomic function in patients with mild to moderate essential hypertension. *Am J Hypertens*. 2008;21:1183–1187.
119. Malloy-McFall J, Barkley JE, Gordon KL, Burzminski N, Glickman EL. Effect of the DASH Diet on pre- and stage 1 hypertensive individuals in a free-living environment. *Nutr Metab Insights*. 2010;3:15–23.
120. Maruf FA, Akinpelu AO, Salako BL, Akinyemi JO. Effects of aerobic dance training on blood pressure in individuals with uncontrolled hypertension on two antihypertensive drugs: a randomized clinical trial. *J Am Soc Hypertens*. 2016;10:336–345.
121. McCarron DA, Weder AB, Egan BM, Krishna GG, Morris CD, Cohen M, Oparil S. Blood pressure and metabolic responses to moderate sodium restriction in isradipine-treated hypertensive patients. *Am J Hypertens*. 1997;10:68–76.
122. Meland E, Laerum E, Aakvaag A, Ulvik RJ, Hostmark AT. Salt restriction: effects on lipids and insulin production in hypertensive patients. *Scand J Clin Lab Invest*. 1997;57:501–505.
123. Meles E, Giannattasio C, Failla M, Gentile G, Capra A, Mancia G. Nonpharmacologic treatment of hypertension by respiratory exercise in the home setting. *Am J Hypertens*. 2004;17:370–374.
124. Miller ER III, Erlinger TP, Young DR, Jehn M, Charleston J, Rhodes D, Wasan SK, Appel LJ. Results of the Diet, Exercise, and Weight Loss Intervention Trial (DEW-IT). *Hypertension*. 2002;40:612–618.
125. Modesti PA, Ferrari A, Bazzini C, Costanzo G, Simonetti I, Taddei S, Biggeri A, Parati G, Gensini GF, Sirigatti S. Psychological predictors of the antihypertensive effects of music-guided slow breathing. *J Hypertens*. 2010;28:1097–1103.
126. Moore TJ, Vollmer WM, Appel LJ, Sacks FM, Svetkey LP, Vogt TM, Conlin PR, Simons-Morton DG, Carter-Edwards L, Harsha DW. Effect of dietary patterns on ambulatory blood pressure: results from the Dietary Approaches to Stop Hypertension (DASH) Trial. DASH Collaborative Research Group. *Hypertension*. 1999;34:472–477.
127. Nakamura M, Aoki N, Yamada T, Kubo N. Feasibility and effect on blood pressure of 6-week trial of low sodium soy sauce and miso (fermented soybean paste). *Circ J*. 2003;67:530–534.
128. Nelson L, Jennings GL, Esler MD, Korner PI. Effect of changing levels of physical activity on blood-pressure and haemodynamics in essential hypertension. *Lancet*. 1986;2:473–476.
129. Nualnim N, Parkhurst K, Dhindsa M, Tarumi T, Vavrek J, Tanaka H. Effects of swimming training on blood pressure and vascular function in adults >50 years of age. *Am J Cardiol*. 2012;109:1005–1010.
130. Ohkubo T, Hozawa A, Nagatomi R, Fujita K, Sauvaget C, Watanabe Y, Anzai Y, Tamagawa A, Tsuji I, Imai Y, et al. Effects of exercise training on home blood pressure values in older adults: a randomized controlled trial. *J Hypertens*. 2001;19:1045–1052.
131. Ohta Y, Kawano Y, Minami J, Iwashima Y, Hayashi S, Yoshihara F, Nakamura S. Effects of daily walking on office, home and 24-h blood pressure in hypertensive patients. *Clin Exp Hypertens*. 2015;37:433–437.
132. Okumiya K, Matsubayashi K, Wada T, Kimura S, Doi Y, Ozawa T. Effects of exercise on neurobehavioral function in community-dwelling older people more than 75 years of age. *J Am Geriatr Soc*. 1996;44:569–572.
133. Patel C, Marmot M. Can general practitioners use training in relaxation and management of stress to reduce mild hypertension? *Br Med J (Clin Res Ed)*. 1988;296:21–24.
134. Pinjuh Markota N, Rumboldt M, Rumboldt Z. Emphasized warning reduces salt intake: a randomized controlled trial. *J Am Soc Hypertens*. 2015;9:214–220.
135. Punita P, Trakroo M, Palamalai S, Subramanian S, Bhavanani A, Madhavan C. Randomized controlled trial of 12-week yoga therapy as lifestyle intervention in patients of essential hypertension and cardiac autonomic function tests. *Natl J Physiol Pharm Pharmacol*. 2016;6:19.
136. Puska P, Iacono JM, Nissinen A, Korhonen HJ, Vartiainen E, Pietinen P, Dougherty R, Leino U, Mutanen M, Moisio S, et al. Controlled, randomised trial of the effect of dietary fat on blood pressure. *Lancet*. 1983;1:1–5.
137. Ramos RM, Coelho-Júnior HJ. Moderate aerobic training decreases blood pressure but no other cardiovascular risk factors in hypertensive overweight/obese elderly patients. *Gerontol Geriatr Med*. 2018;4:2333721418808645.
138. Richards AM, Nicholls MG, Espiner EA, Ikram H, Maslowski AH, Hamilton EJ, Wells JE. Blood-pressure response to moderate sodium restriction and to potassium supplementation in mild essential hypertension. *Lancet*. 1984;1:757–761.
139. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, Obarzanek E, Conlin PR, Miller ER III, Simons-Morton DG, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. *N Engl J Med*. 2001;344:3–10.
140. Schein MH, Gavish B, Herz M, Rosner-Kahana D, Naveh P, Knishkowsky B, Zlotnikov E, Ben-Zvi N, Melmed RN. Treating hypertension with a device that slows and regularises breathing: a randomised, double-blind controlled study. *J Hum Hypertens*. 2001;15:271–278.
141. Seals DR, Reiling MJ. Effect of regular exercise on 24-hour arterial pressure in older hypertensive humans. *Hypertension*. 1991;18:583–592.
142. Shou XL, Wang L, Jin XQ, Zhu LY, Ren AH, Wang QN. Effect of Tai Chi exercise on hypertension in young and middle-aged in-service staff. *J Altern Complement Med*. 2019;25:73–78.
143. Silman AJ, Locke C, Mitchell P, Humpherson P. Evaluation of the effectiveness of a low sodium diet in the treatment of mild to moderate hypertension. *Lancet*. 1983;1:1179–1182.
144. Sohn AJ, Hasnain M, Sinacore JM. Impact of exercise (walking) on blood pressure levels in African American adults with newly diagnosed hypertension. *Ethn Dis*. 2007;17:503–507.
145. Steffen PR, Sherwood A, Gullette EC, Georgiades A, Hinderliter A, Blumenthal JA. Effects of exercise and weight loss on blood pressure during daily life. *Med Sci Sports Exerc*. 2001;33:1635–1640.
146. Stevens VJ, Corrigan SA, Obarzanek E, Bernauer E, Cook NR, Hebert P, Mattfeldt-Beman M, Oberman A, Sugars C, Dalcin AT, et al. Weight loss intervention in phase 1 of the Trials of Hypertension Prevention. The TOHP Collaborative Research Group. *Arch Intern Med*. 1993;153:849–858.
147. Stillier-Moldovan C, Kenno K, McGowan CL. Effects of isometric hand-grip training on blood pressure (resting and 24 h ambulatory) and heart rate variability in medicated hypertensive patients. *Blood Press Monit*. 2012;17:55–61.
148. Subramanian H, Soudarssanane MB, Jayalakshmy R, Thiruselvakumar D, Navasakthi D, Sahai A, Satharishi L. Non-pharmacological interventions in hypertension: a community-based cross-over randomized controlled trial. *Indian J Community Med*. 2011;36:191–196.
149. Sujatha T, Judie A. Effectiveness of a 12-week yoga program on physiopsychological parameters in patients with hypertension. *Int J Pharm Clin Res*. 2014;6:329–335.
150. Suppa G, Pollavini G, Alberti D, Savonitto S. Effects of a low-sodium high-potassium salt in hypertensive patients treated with metoprolol: a multicentre study. *J Hypertens*. 1988;6:787–790.
151. Tanaka H, Bassett DR Jr, Howley ET, Thompson DL, Ashraf M, Rawson FL. Swimming training lowers the resting blood pressure in individuals with hypertension. *J Hypertens*. 1997;15:651–657.
152. The Trials of Hypertension Prevention Collaborative Research Group. The effects of nonpharmacologic interventions on blood pressure of persons with high normal levels. Results of the Trials of Hypertension Prevention, Phase I. *JAMA*. 1992;267:1213–1220.
153. Thiagarajan R, Pal P, Pal GK, Subramanian SK, Trakroo M, Bobby Z, Das AK. Additional benefit of yoga to standard lifestyle modification on blood pressure in prehypertensive subjects: a randomized controlled study. *Hypertens Res*. 2015;38:48–55.
154. Tsai JC, Chang WY, Kao CC, Lu MS, Chen YJ, Chan P. Beneficial effect on blood pressure and lipid profile by programmed exercise training in Taiwanese patients with mild hypertension. *Clin Exp Hypertens*. 2002;24:315–324.
155. Tsai JC, Yang HY, Wang WH, Hsieh MH, Chen PT, Kao CC, Kao PF, Wang CH, Chan P. The beneficial effect of regular endurance exercise training on blood pressure and quality of life in patients with hypertension. *Clin Exp Hypertens*. 2004;26:255–265.
156. Vollmer WM, Sacks FM, Ard J, Appel LJ, Bray GA, Simons-Morton DG, Conlin PR, Svetkey LP, Erlinger TP, Moore TJ, et al. Effects of diet



- and sodium intake on blood pressure: subgroup analysis of the DASH-sodium trial. *Ann Intern Med*. 2001;135:1019–1028.
157. Watt GC, Edwards C, Hart JT, Hart M, Walton P, Foy CJ. Dietary sodium restriction for mild hypertension in general practice. *Br Med J (Clin Res Ed)*. 1983;286:432–436.
  158. Whelton PK, Appel LJ, Espeland MA, Applegate WB, Ettinger WH Jr, Kostis JB, Kumanyika S, Lacy CR, Johnson KC, Folmar S, et al. Sodium reduction and weight loss in the treatment of hypertension in older persons: a randomized controlled trial of nonpharmacologic interventions in the elderly (TONE). TONE Collaborative Research Group. *JAMA*. 1998;279:839–846.
  159. Whitt-Glover MC, Hunter JC, Foy CG, Quandt SA, Vitolins MZ, Leng I, Hornbuckle LM, Sanya KA, Bertoni AG. Translating the Dietary Approaches to Stop Hypertension (DASH) diet for use in underresourced, urban African American communities, 2010. *Prev Chronic Dis*. 2013;10:120088.
  160. Wilson GB, Wray C, McGovern R, Newbury-Birch D, McColl E, Crosland A, Speed C, Cassidy P, Tomson D, Haining S, et al. Intervention to reduce excessive alcohol consumption and improve comorbidity outcomes in hypertensive or depressed primary care patients: two parallel cluster randomized feasibility trials. *Trials*. 2014;15:235.
  161. Young DR, Appel LJ, Jee S, Miller ER III. The effects of aerobic exercise and Tai Chi on blood pressure in older people: results of a randomized trial. *J Am Geriatr Soc*. 1999;47:277–284.
  162. Zhou X, Liu JX, Shi R, Yang N, Song DL, Pang W, Li YM. Compound ion salt, a novel low-sodium salt substitute: from animal study to community-based population trial. *Am J Hypertens*. 2009;22:934–942.

## SUPPLEMENTAL MATERIAL

### Data S1.

#### Supplemental Methods

##### Search Strategies, Eligibility Criteria, and Information Sources

We searched PubMed, Embase and Cochrane Central Register of Controlled Trials up to July 1, 2019, to identify eligible studies. We queried ClinicalTrials.gov and the EU Clinical Trials Register up to July 1, 2019, to identify ongoing or completed yet unpublished trials. We limited searches to English-language publications and supplemented them by perusing reference lists of reviews and retrieved literature. The search strategies were based on the search terms including combinations of Medical Subject Headings (MeSH) terms and corresponding free-text words (see Search strategy in Data S1).

We included RCTs of at least 4 weeks' duration that compared the blood pressure (BP)-lowering effects of nonpharmacologic interventions for adult patients (aged  $\geq 18$  years) with primary hypertension or prehypertension. Patients with hypertension were defined as those with office systolic BP (SBP)  $\geq 140$  mm Hg and/or diastolic BP (DBP)  $\geq 90$  mm Hg without taking antihypertensive medication or those with established hypertension using antihypertensive medication, even if BP was  $< 140/90$  mm Hg<sup>14</sup> Studies were also eligible when the usage of antihypertensive medicines were balanced among different groups. Prehypertension was defined as an office SBP of 120 to 139 mmHg and/or DBP of 80 to 89 mmHg, according to the Joint National Committee in the Seventh Report.<sup>19</sup> Eligible interventions were different nonpharmacologic therapies; for diet related interventions, we only included widely accepted dietary patterns and excluded single nutritional supplements or foods.

Comparators were other nonpharmacologic therapies or usual-care as a control. We excluded studies that enrolled participants who had a history of heart failure, renal disease, stroke, serious mental or physical illness, malignancy, diabetes mellitus, or metabolic syndrome. We also excluded studies that focused on postmenopausal or pregnant women or single-sex populations. However, studies that focused on participants who used alcohol habitually or who were overweight or obese were included because those features could be modified.

### **Study Selection and Data Collection Process**

Two reviewers (Y.L. and D.L.) independently screened the titles and abstracts of all potentially eligible studies. Three reviewers (J.F., L. Zhang, and L. Zhou) performed full-texts review to identify studies that met all criteria for inclusion in the quantitative synthesis. Disagreements were resolved by discussion.

Pairs of independent reviewers (J.F., L. Zhang, L. Zhou, L. Zhu, F.H. and X. Li) extracted relevant data from each eligible study in duplicate, and discrepancies were resolved by discussion among reviewers. We extracted data on publication (first author, journal, year of publication, country of origin), study design (parallel or crossover), study characteristics (study duration, sample size, number of arms, diagnostic criteria for hypertension, inclusion criteria, exclusion criteria, type of intervention, consumption or frequency of intervention), demographics of participants (number of subjects in different arms, mean age, proportion of males and females, mean body mass index [BMI], history of antihypertensive treatment), mean baseline/follow-up SBP and DBP, method of BP measurement, dropout and other information.

### **End Points and Handling of Missing Data**

Reductions of SBP and DBP after intervention were separately evaluated as co-primary end

points, and the summary estimates were calculated by using the mean difference and SE. If the SEs of the mean difference were not available from included articles, we either estimated the SEs based on the sample size, median and range, with the method suggested by Hozo and colleagues<sup>20</sup>, or based on the mean difference, sample size and *P* value.<sup>21</sup> We also imputed these data by assuming correlation coefficient values between baseline and follow-up, as described in detail in the Cochrane Handbook.<sup>21</sup>

### **Data Analysis**

Traditional meta-analyses were conducted using a random-effects model for every direct comparison.<sup>22</sup> Next, Bayesian random-effects network meta-analyses were performed using the GeMTC package (R 3.4.3) based on the Markov-chain Monte Carlo method.<sup>23,24</sup> Comparative effect estimates are presented as the weighted mean difference (WMD) and 95% credible interval (CrI) because all end points were continuous variables. Trace plots and the Brooks-Gelman-Rubin statistic were assessed to ensure convergence.<sup>25</sup> Network consistency between direct and indirect evidence were analyzed by the node-splitting method, and its Bayesian *P* value was reported.<sup>26</sup> Statistical heterogeneity of studies and the global heterogeneity of network meta-analysis were also examined using the  $I^2$  statistic.<sup>27</sup>

The relative rankings of different nonpharmacologic interventions were calculated using the surface under the cumulative ranking (SUCRA) probabilities and were presented graphically (WinBUGS 1.4.3 [BUGS Project] and Stata 14.0 [StataCorp]).<sup>28</sup> Large SUCRA scores might indicate a more effective intervention (ranging from 1, indicating that the treatment has a high likelihood to be best, to 0, indicating the treatment has a high likelihood to be worst). Sensitivity analyses were conducted by omitting data from specific studies, including studies with high

risk of bias, studies started before 1999 (international diagnostic criteria for hypertension was issued by World Health Organization in 1999)<sup>29</sup>, studies with end points of home BP or 24-hour ambulatory BP, or studies targeted to special population (participants who used alcohol habitually or who were overweight or obese).

Meta regression analyses were also performed by adding covariates (mean or median age, mean body mass index [BMI], proportion of participants taking antihypertensive medicine and proportion of female patients). In addition, subgroup network meta-analyses were conducted in different subgroups defined by study duration or region of origin of study participants. Because all analyses were based on bayesian framework, no multiplicity was adjusted. Publication bias was assessed using the comparison-adjusted funnel plot and the *netfunnel* command (Stata 14.0).<sup>30</sup>

### **Risk of Bias Assessment and Certainty of Evidence**

Two reviewers (J.F. and L. Zhang) assessed the risk of bias separately for each included study using the Cochrane risk-of-bias tool (RevMan 5.3)<sup>31</sup>, which included the following: (1) sequence generation of the allocation, (2) allocation concealment, (3) blinding of participants, personnel, and outcome assessors, (4) incomplete outcome data, (5) selective outcome reporting, and (6) other sources of bias. Discrepancies were resolved by discussion with another author. Overall risk of bias was low when all domains were deemed to have low risk. Overall risk of bias was considered probably to be low when all domains, except blinding of participants and personnel, were deemed to have low risk. For studies of nonpharmacologic interventions, it was difficult to blind participants and/or personnel, which did not seriously affect the outcome measurement. Overall risk of bias was high when at least 1 domain, except

blinding of participants, personnel were deemed to have high risk. In other cases, studies were judged to have some concerns (unclear risk) about bias.

They also assessed the quality of evidence contributing to each direct, indirect, and network estimate independently using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method for network meta-analysis.<sup>32</sup> The quality of the evidence for direct estimates started as high and was decreased to moderate, low, or very low based on limitations (based on risk-of-bias assessment), imprecision, inconsistency, indirectness and publication bias.<sup>32,33</sup> The quality of indirect evidence starts at the lower rating of the two direct comparisons that contribute as first order loops to the indirect estimate, but can be rated down further for intransitivity (differences between studies in terms of clinical or methodological characteristics). When only direct or indirect evidence was available for a given comparison, the network quality rating was based on that estimate. If both direct and indirect evidence were available for a comparison (without inconsistency), the higher of the two quality ratings can be assigned to the network meta-analysis estimates. Discrepancies were resolved by discussion with another reviewer (Y.L.).

## Search strategy for the network meta-analysis

### I. Pubmed

#1 hypertension [MeSH Terms]

#2 blood pressure [MeSH Terms]

#3 hypertension [Title/Abstract]

#4 blood pressure [Title/Abstract]

#5 (#1 OR #2 OR #3 OR #4)

#6 breathing exercises [MeSH Terms]

#7 Meditation [MeSH Terms]

#8 Qigong [MeSH Terms]

#9 yoga [MeSH Terms]

#10 physical fitness [MeSH Terms]

#11 exercise [MeSH Terms]

#12 resistance training [MeSH Terms]

#13 Tai Ji [MeSH Terms]

#14 overweight [MeSH Terms]

#15 weight loss [MeSH Terms]

#16 obesity [MeSH Terms]

#17 smoking cessation [MeSH Terms]

#18 life style [MeSH Terms]

#19 non-pharmacological interventions OR salt substitute OR salt substitution OR low sodium

salt OR mineral salt OR smart salt OR potassium-enriched salt OR sodium reduced salt OR

sodium replacement OR breath-control OR Transcendental Meditation OR progressive muscle relaxation OR PMR OR Mindfulness-based stress reduction OR MBSR OR physical activity OR aerobic exercise OR Isometric exercise OR resistance exercise OR Tai chi OR weight reduction OR weight OR alcohol reduction OR alcohol restriction OR home heating OR room heating OR sleep OR community-based lifestyle intervention OR lifestyle

#20 (#6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19)

#21 diet [MeSH Terms]

#22 sodium intake OR sodium restriction OR sodium reduction OR salt intake OR salt restriction OR salt reduction OR sodium chloride intake OR sodium chloride restriction OR sodium chloride reduction OR DASH OR dietary approach to stop hypertension OR Mediterranean OR low carbohydrate OR high protein OR low fat OR Vegetarian OR vegans OR Palaeolithic OR low glycaemic index OR low glycaemic load

#23 (#21 AND #22)

#24 (#20 OR #23)

#25 randomized controlled trial [Publication Type]

#26 controlled clinical trial [Publication Type]

#27 Controlled Clinical Trials as Topic [MeSH Major Topic]

#28 Randomized Controlled Trials as Topic [MeSH Major Topic]

#29 randomized [Title/Abstract] OR randomly [Title/Abstract] OR placebo [Title/Abstract] OR trial [Title/Abstract]

#30 (#25 OR #26 OR #27 OR #28 OR #29)



#31 (#5 AND #24 AND #30)

## II. Embase

[1] 'Hypertension'/exp OR 'blood pressure'/exp OR 'Hypertension':ab,ti OR 'blood pressure':ab,ti

[2] 'breathing exercise'/exp OR 'meditation'/exp OR 'qigong'/exp OR 'yoga'/exp OR 'aerobic exercise'/exp OR 'exercise'/exp OR 'resistance training'/exp OR 'tai chi'/exp OR 'body weight loss'/exp OR 'obesity'/exp OR 'smoking cessation'/exp OR 'lifestyle'/exp OR 'transcendental meditation'/exp OR 'physical activity'/exp OR 'sodium intake'/exp OR 'sodium restriction'/exp OR 'salt intake'/exp OR 'dash diet'/exp OR 'mediterranean diet'/exp OR 'low carbohydrate diet'/exp OR 'vegetarian diet'/exp OR 'high glycemic index diet'/exp OR 'low calorie diet'/exp OR 'non-pharmacological interventions' OR 'salt substitute' OR 'salt substitution' OR 'low sodium salt' OR 'mineral salt' OR 'smart salt' OR 'potassium-enriched salt' OR 'sodium reduced salt' OR 'sodium replacement' OR 'breath-control' OR 'progressive muscle relaxation' OR 'pmr' OR 'mindfulness-based stress reduction' OR 'mbsr' OR 'physical fitness' OR 'isometric exercise' OR 'resistance exercise' OR 'weight reduction' OR weight OR overweight OR 'alcohol reduction' OR 'alcohol restriction' OR 'home heating' OR 'room heating' OR 'sleep' OR 'community-based lifestyle intervention' OR 'sodium reduction' OR 'salt restriction' OR 'salt reduction' OR 'sodium chloride intake' OR 'sodium chloride restriction' OR 'sodium chloride reduction' OR 'dash' OR 'dietary approach to stop hypertension' OR 'high protein diet' OR 'vegans diet' OR 'palaeolithic diet' OR 'low glycaemic load diet'

[3] 'randomized-controlled trial':it OR 'controlled clinical trial':it OR 'randomized controlled

trial (topic)/mj OR 'controlled clinical trial (topic)/mj OR 'randomized':ab,ti OR  
'randomly':ab,ti OR 'placebo':ab,ti OR 'trial':ab,ti

[4] [1] AND [2] AND [3]

### **III. Cochrane Library**

#1 MeSH descriptor: [Hypertension] explode all trees

#2 MeSH descriptor: [Blood Pressure] explode all trees

#3 (hypertension):ti,ab,kw

#4 (blood pressure):ti,ab,kw

#5 #1 OR #2 OR #3 OR #4

#6 MeSH descriptor: [Breathing Exercises] explode all trees

#7 MeSH descriptor: [Meditation] explode all trees

#8 MeSH descriptor: [Qigong] explode all trees

#9 MeSH descriptor: [Yoga] explode all trees

#10 MeSH descriptor: [Physical Fitness] explode all trees

#11 MeSH descriptor: [Exercise] explode all trees

#12 MeSH descriptor: [Resistance Training] explode all trees

#13 MeSH descriptor: [Tai Ji] explode all trees

#14 MeSH descriptor: [Overweight] explode all trees

#15 MeSH descriptor: [Weight Loss] explode all trees

#16 MeSH descriptor: [Obesity] explode all trees

#17 MeSH descriptor: [Smoking Cessation] explode all trees

#18 MeSH descriptor: [Life Style] explode all trees

#19 non-pharmacological interventions OR salt substitute OR salt substitution OR low sodium salt OR mineral salt OR smart salt OR potassium-enriched salt OR sodium reduced salt OR sodium replacement OR breath-control OR Transcendental Meditation OR progressive muscle relaxation OR PMR OR Mindfulness-based stress reduction OR MBSR OR physical activity OR aerobic exercise OR Isometric exercise OR resistance exercise OR Tai chi OR weight reduction OR weight OR alcohol reduction OR alcohol restriction OR home heating OR room heating OR sleep OR community-based lifestyle intervention OR lifestyle

#20 MeSH descriptor: [Diet] explode all trees

#21 sodium intake OR sodium restriction OR sodium reduction OR salt intake OR salt restriction OR salt reduction OR sodium chloride intake OR sodium chloride restriction OR sodium chloride reduction OR DASH OR dietary approach to stop hypertension OR Mediterranean OR low carbohydrate OR high protein OR low fat OR Vegetarian OR vegans OR Palaeolithic OR low glycaemic index OR low glycaemic load OR low-calorie

#22 #20 AND #21

#23 #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR

#16 OR #17 OR #18 OR #19 OR #22

#24 ("randomized-controlled trial"):pt

#25 (controlled clinical trial):pt

#26 MeSH descriptor: [Controlled Clinical Trials as Topic] explode all trees

#27 MeSH descriptor: [Randomized Controlled Trials as Topic] explode all trees

#28 (randomized):ti,ab,kw

#29 (randomly):ti,ab,kw

#30 (placebo):ti,ab,kw

#31 (trial):ti,ab,kw

#32 #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31

#33 #5 AND #23 AND #32

**Table S1. Characteristics of Studies Included in the Network Meta-analysis.**

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Altena, 2009 <sup>76</sup>	Breathing-control Usual care	Every day, < 10 breaths/min	RCT, single-blind	9	Netherlands	30 (15/15) [15,15]	59.5	16.7	SBP: 140-160
Anderson, 2010 <sup>77</sup>	Breathing-control Meditation	15 min/day, < 10 breaths/min, practice meditation	RCT	4	America	40 (20/20) [21,19]	53.2	NR	SBP: 130-160 DBP < 100
Anderssen, 1995 <sup>78</sup>	Diet Exercise Diet plus exercise Usual care	Low-caloric diet, body weight reduction 0.5-1 kg monthly; Exercise 3 days weekly, reach 60-80% peak heart rate	RCT	52	Norway	72 (16/20/24/12) [Not reported]	45.0	NR	DBP: 86-99
ANHMRC, 1989a <sup>79</sup>	Salt restriction Usual care	Every day, < 80 mmol sodium intake	RCT, double-blind	8	Australia	103 (50/53) [Not reported]	58.0	0	DBP: 90-100
ANHMRC, 1989b <sup>80</sup>	Salt restriction Usual care	Every day, < 80 mmol sodium intake	RCT, double-blind, crossover	16	Australia	88 [Not reported]	59.0	0	DBP: 90-100
Appel, 2001 <sup>81</sup>	Salt restriction Usual care	Every day, < 80 mmol sodium intake	RCT, double-blind	14	America	613 (317/296) [325,288]	60-80	NR	SBP: 140-159 DBP: 90-99
Badrov, 2013 <sup>42</sup>	Isometric training Usual care	3 days weekly, bilateral contractions at 30% of MVC	RCT	10	Canada	24 (12/12) [13,11]	64.0	83.3	SBP ≥ 140 DBP ≥ 90
Baros, 2008 <sup>82</sup>	Alcohol restriction Usual care	Totally drinking abstinence	RCT	12	America	120 (46/74) [93,27]	44.0	NR	SBP ≥ 140 DBP ≥ 90
Barros, 2015 <sup>83</sup>	Low-sodium salt Common salt (Usual care)	Every day, 3g of low-sodium and high-potassium salt	RCT, single-blind	4	Brazil	35 (19/16) [12,23]	55.5	100	SBP ≥ 140 DBP ≥ 90

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Beard, 1982 <sup>84</sup>	Salt restriction Usual care	Every day, < 80 mmol sodium intake	RCT	12	Australia	90 (45/45) [51,39]	25-69	100	SBP < 200 DBP: 95-109
Benetos, 1992 <sup>85</sup>	Salt restriction Usual care	Every day, 60-90 mmol sodium intake	RCT, double-blind, crossover	9	France	20 [9,11]	42.0	0	DBP: 90-115
Blom, 2014 <sup>51</sup>	MBSR Usual care	45 min/day, practice MBSR techniques	RCT	12	Canada	87 (46/41) [37,50]	56.1	0	SBP: 140-159 DBP: 90-99
Blumenthal, 1991 <sup>44</sup>	Aerobic exercise Resistance training Usual care	3 days weekly, 35 min with at least 70% Vo <sub>2</sub> max; 50 min strength training	RCT	16	America	92 (39/31/22) [57,35]	45.2	43.8	SBP: 140-179 DBP: 90-105
Blumenthal, 2000 <sup>86</sup>	Exercise Diet plus exercise Usual care	Exercise 3 to 4 days weekly, reach 70% peak heart rate; Low-caloric take with exercise, body weight reduction 0.5-1 kg weekly;	RCT	26	America	112 (44/46/22) [58,54]	47.0	26.0	SBP: 130-179 DBP: 85-109
Burke, 2005 <sup>63</sup>	Lifestyle Usual care	Comprehensively education and behavior modification	RCT	16	Australia	204 (106/98) [91,113]	56.2	100	SBP: 140-159 DBP: 90-99
Cappuccio, 1997 <sup>38</sup>	Salt restriction Usual care	Every day, 80 mmol sodium intake	RCT, double-blind, crossover	8	UK	47 [24,23]	66.8	0	SBP: 123-205 DBP: 64-112
Castillo-Richmond, 2000 <sup>50</sup>	Meditation Usual care	20 minutes twice a day, practice meditation	RCT	36	America	60 (31/29) [19,41]	53.9	70.0	SBP: 130-179 DBP: 80-109

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Chen, 2010 <sup>87</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	8	America	290 (146/144) [149,141]	44.5	0	SBP: 120-159 DBP:80-95
Cohen, 2011 <sup>88</sup>	Yoga Usual care	70 min yoga classes 1 or 2 days weekly	RCT	12	America	57 (26/31) [Not reported]	48.2	0	SBP: 130-159 DBP < 100
Collier, 2008 <sup>89</sup>	Aerobic exercise Resistance training	3 days weekly, 30 min with 65% Vo2max; Resistance	RCT	4	America	30 (15/15) [20,10]	48.4	0	SBP: 120-159 DBP: 80-99
Conlin, 2003 <sup>90</sup>	DASH Usual care	Every day, DASH diet feeding	RCT, double-blind	4	America	55 (27/28) [25,30]	52.0	0	SBP < 180 DBP: 90-109
Cononie, 1991 <sup>45</sup>	Aerobic exercise Resistance training Usual care	3 days weekly, 35 to 40 min with 75-85% VO <sub>2</sub> max; 3 days weekly, resistance	RCT	24	America	17 (6/6/5) [Not reported]	72.0	NR	SBP: 140-179 DBP:90-99
Cooper, 2000 <sup>91</sup>	Aerobic exercise Usual care	At least 5 days weekly, 30 min with 60% VO <sub>2</sub> max	RCT	6	UK	86 (47/39) [Not reported]	47.7	0	SBP: 150-179 DBP: 91-109
Cottier, 1984 <sup>92</sup>	PMR Usual care	Once a week, practice PMR techniques	RCT	6	Switzerland	26 (17/9) [19,7]	34.7	52.9	SBP: 140-170 DBP: 90-115
Croft, 1986 <sup>93</sup>	Diet Usual care	Every day, low-caloric diet to lose weight	RCT	24	UK	97 (47/50) [Not reported]	35-60	0	SBP < 200 DBP < 114
Cushman, 1998 <sup>57</sup>	Alcohol restriction Usual care	Reduce alcohol intake; <14 drinks weekly or 50% cut	RCT	96	America	535 (251/284) [Not reported]	57.2	21.4	SBP < 179 DBP: 80-99
Edwards, 2011 <sup>59</sup>	Aerobic exercise Aerobic exercise + DASH Usual care	At least 5 days weekly, 30-60 min with 60-75% Vo2max; Aerobic exercise plus DASH	RCT	12	America	52 (25/12/15) [25,27]	46.4	0	SBP: 120-170 DBP: 80-105

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Elliot, 2004 <sup>48</sup>	Breathing-control Usual care	15 min/day, < 10 breaths/min	RCT, double-blind	8	America	136 (79/57) [98,38]	59.2	76.5	SBP: 140-179 DBP < 110
Elmer, 2006 <sup>62</sup>	Lifestyle Usual care	Comprehensively education and behavior modification	RCT	72	America	515 (258/257) [Not reported]	50.0	0	SBP: 120-159 DBP: 80-95
Erlinger, 2002 <sup>94</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	8	America	55 (27/28) [24,31]	52.7	0	SBP < 180 DBP: 90-109
Erwteman, 1984 <sup>95</sup>	Salt restriction Usual care	Every day, < 70 mmol sodium intake	RCT	24	Netherlands	94 (44/50) [58,36]	45.8	0	DBP: 95-110
Farah, 2018 <sup>96</sup>	Isometric training (home) Usual care	3 days weekly, bilateral contractions at 30% of MVC	RCT	12	Brazil	30 [9,21]	58.47	100	SBP ≥ 140 DBP ≥ 90
Farah, 2018 <sup>96</sup>	Isometric training (supervised) Usual care	3 days weekly, bilateral contractions at 30% of MVC	RCT	12	Brazil	34 [9,25]	59.59	100	SBP ≥ 140 DBP ≥ 90
Farahani, 2010 <sup>97</sup>	Aerobic exercise Usual care	3 days weekly, 55 min water- aerobic training	RCT	10	Iran	40 (12/28) [Not reported]	NR	NR	SBP: 140-179 DBP: 90-109
Farinatti, 2016 <sup>98</sup>	Aerobic exercise Usual care	3 days weekly, 30 min reach 60 to 85 % of maximum heart rate	RCT	64	Australia	43 (29/14) [12,31]	51.4	0	SBP ≥ 140 DBP ≥ 90
Ferreira, 2013 <sup>99</sup>	Breathing-control Usual care	Every day, 15 to 20 deep breaths/min	RCT, double-blind	8	Brazil	13 (6/7) [5,8]	56.6	100	SBP ≥ 140 DBP ≥ 90
Fotherby, 1993 <sup>100</sup>	Salt restriction Usual care	Every day, 80-100 mmol sodium intake	RCT, double-blind, crossover	10	UK	17 [3,14]	73.0	0	SBP > 160 DBP > 95



<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Gates, 2004 <sup>101</sup>	Salt restriction Usual care	Every day, 80 mmol sodium intake	RCT, double-blind, crossover	8	America	12 [6,6]	64.0	0	SBP: 140-159 DBP: 90-99
Geleijnse, 1994 <sup>102</sup>	Low-sodium salt Common salt (Usual care)	Every day, 5.2g of low-sodium and high-potassium salt	RCT, double-blind	24	Netherlands	100 (49/51) [51,49]	66.4	0	SBP: 140-200 DBP: 85-110
Gordon, 1997 <sup>56</sup>	Diet Exercise Diet plus exercise	10% of body weight loss; 3 to 5 days weekly, 30-45 min with 60-85% Vo2max	RCT	12	America	48 (15/14/19) [Not reported]	48.4	0	SBP: 130-179 DBP: 85-109
Grobbee, 1987 <sup>103</sup>	Salt restriction Usual care	Every day, 80 mmol sodium intake	RCT, double-blind, crossover	12	Netherlands	40 [34,6]	24.0	0	SBP: 140-159 DBP: 90-99
Grossman, 2001 <sup>49</sup>	Breathing-control Usual care	10 min/day, < 10 breaths/min	RCT, double-blind	8	Israel	33 (18/15) [23,10]	51.2	54.6	SBP ≥ 140 DBP ≥ 90
Guimaraes, 2010 <sup>104</sup>	Aerobic exercise Usual care	3 days weekly, 60 min at 60 to 80% of maximum heart rate	RCT	16	Japan	27 (16/11) [9,18]	48.8	100	SBP ≥ 140 DBP ≥ 90
Hagins, 2014 <sup>105</sup>	Yoga Resistance training	20 minutes each week for three sessions; Resistance	RCT	12	America	68 (36/32) [10,58]	54.5	NR	SBP: 120-159 DBP: 80-99
Haynes, 1984 <sup>106</sup>	Diet Usual care	Every day, low-caloric diet, weight loss 1 lb weekly	RCT	24	Canada	54 (28/26) [Not reported]	46.5	0	DBP: 85-104
He, 2009 <sup>107</sup>	Salt restriction Usual care	Every day, 90 mmol sodium intake	RCT, double-blind, crossover	12	UK	169 [113,56]	50.0	0	SBP: 140-170 DBP: 90-105

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Higashi, 1999a <sup>108</sup>	Aerobic exercise Usual care	5 to 7 days weekly, 30 min at 60% of maximum heart rate	RCT	12	Japan	27 (20/7) [20,7]	24.1	NR	SBP: 140-170 DBP: 90-110
Higashi, 1999b <sup>109</sup>	Aerobic exercise Usual care	5 to 7 days weekly, 30 min at 60% of maximum heart rate	RCT	12	Japan	17 (10/7) [13,4]	47.0	NR	SBP ≥ 140 DBP ≥ 90
Hikmat, 2014 <sup>110</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	8	America	204 (103/101) [100,104]	44.2	0	SBP < 160 DBP: 80-95
Hughes, 2013 <sup>52</sup>	MBSR PMR	45 min/day, 6 days weekly, practice PMR/MBSR	RCT, single-blind	8	Canada	56 (28/28) [24,32]	50.3	0	SBP: 120-139 DBP: 80-89
Izadi, 2018 <sup>111</sup>	Aerobic exercise Usual care	3 days weekly, 45 min at 85 to 90% of maximum heart rate	RCT	6	Iran	30 (15/15) [17,13]	61.7	100	SBP ≥ 140 DBP ≥ 90
Jablonski, 2013 <sup>112</sup>	Salt restriction Usual care	Every day, 65 mmol sodium intake	RCT, double-blind, crossover	10	America	11 [8,3]	60.0	0	SBP: 130-159 DBP < 99
Jalkanen, 1991 <sup>113</sup>	Diet plus exercise Usual care	Every day, low-caloric diet of 1500 kcal with exercise	RCT	52	Finland	49 (24/25) [Not reported]	49.0	36.7	SBP > 95
Jones, 2010 <sup>114</sup>	Breathing-control Usual care	30 min/day, slow deep breathing	RCT, single-blind	8	Thailand	20 (10/10) [7,13]	51.5	100	SBP: 140-179 DBP: 90-109
Lang, 1995 <sup>58</sup>	Alcohol restriction Usual care	Reduce alcohol intake; <14 drinks weekly or 50% cut	RCT	48	France	106 (50/56) [101,5]	42.9	19.4	SBP: 140-159 DBP: 90-95
MacGregor, 1982 <sup>115</sup>	Salt restriction Usual care	Every day, 60-80 mmol sodium intake	RCT, double-blind, crossover	4	UK	19 [14,5]	49.0	0	DBP: 90-110

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
MacGregor, 1989 <sup>116</sup>	Salt restriction Usual care	Every day, 100 mmol sodium intake	RCT, double-blind, crossover	8	UK	20 [11,9]	56.0	0	DBP: 90-110
MacMahon, 1985 <sup>117</sup>	Diet Usual care	Every day, low-caloric diet by 1000 calories	RCT	25	Australia	38 (20/18) [9,29]	41.1	0	DBP: 90-109
Mäkelä 2008 <sup>118</sup>	Salt restriction Usual care	Every day, ≤ 70 mmol sodium intake	RCT	24	Finland	80 (40/40) [53,27]	44.1	0	SBP: 160-200 DBP: 90-110
Malloy-McFall, 2010 <sup>119</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	4	America	20 (10/10) [12,8]	38.3	0	SBP: 120-159 DBP: 80-99
Marquez-Celedonio, 2009 <sup>71</sup>	Lifestyle Usual care	Comprehensively education and behavior modification	RCT, Open-label	24	Mexico	81 (38/43) [Not reported]	43.2	0	SBP: 120-139 DBP: 80-89
Maruf, 2016 <sup>120</sup>	Aerobic exercise Usual care	3 sessions weekly, 45 min 50 to 70% of maximum heart rate	RCT, double-blind	12	Nigeria	120 (60/60) [35,85]	52.8	75.0	SBP: 140-179 DBP:90-109
Mattila, 2003 <sup>72</sup>	Lifestyle Usual care	Comprehensively education and behavior modification	RCT	48	Finland	640 (331/309) [Not reported]	49.9	63.6	SBP: 140-179 DBP:90-109
McCarron, 1997 <sup>121</sup>	Salt restriction Usual care	Every day, 100 mmol sodium intake	RCT, double-blind, crossover	8	America	99 [57,42]	51.6	100	DBP: 95-115
Meland, 1997 <sup>122</sup>	Salt restriction Usual care	Every day, additional 50 mmol sodium intake reduction	RCT, double-blind, crossover	8	Norway	16 [13,3]	50.0	0	DBP < 115

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Meles, 2004 <sup>123</sup>	Breathing-control Usual care	15 min/day, < 10 breaths/min	RCT	8	Italy	73 (47/26) [42,31]	54.2	86.3	SBP: 140-159 DBP: 90-99
Miller, 2002 <sup>124</sup>	Salt restriction + diet plus exercise Usual care	Every day, low-sodium and caloric diet; 3 days weekly, reach 60-80% peak heart rate	RCT	9	America	45 (22/23) [17,28]	54.0	100	SBP: 130-170 DBP: 80-100
Modesti, 2010 <sup>125</sup>	Breathing-control Usual care	30 min/day, < 10 breaths/min	RCT, double-blind	24	Italy	53 (29/24) [30,23]	58.0	NR	SBP: 140-179 DBP: 90-109
Molmen-Hansen, 2012 <sup>40</sup>	Aerobic exercise Usual care	3 days weekly, 47 min reach 70% of maximum heart rate	RCT	12	Norway	50 (25/25) [Not reported]	51.9	0	SBP: 140-179 DBP: 90-109
Moore, 1999 <sup>126</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	8	America	68 (31/37) [Not reported]	45.2	NR	SBP < 160 DBP: 80-95
Nakamura, 2003 <sup>127</sup>	Salt restriction Usual care	Low-sodium soy sauce and miso	RCT, double-blind	6	Japan	26 (10/16) [Not reported]	46.9	23.4	SBP ≥ 140 DBP ≥ 90
Nelson L, 1986a <sup>128</sup>	Aerobic exercise (low) Usual care	3 days weekly, 45 min with 60-70% Vo2max	RCT, crossover	12	Australia	13 [7,6]	44.0	0	SBP: 140-179 DBP: 90-109
Nelson L, 1986b <sup>128</sup>	Aerobic exercise (moderate) Usual care	7 days weekly, 45 min with 60-70% Vo2max	RCT, crossover	12	Australia	13 [7,6]	44.0	0	SBP: 140-179 DBP: 90-109
Nualnim, 2012 <sup>129</sup>	Aerobic exercise Usual care	3 to 4 days weekly, 45 min at 75% of maximal heart rate	RCT	12	America	43 (24/19) [32,11]	59.3	0	SBP: 120-159 DBP < 99
Ohkubo, 2001 <sup>130</sup>	Aerobic exercise + resistance training Usual care	At least 2 days weekly, endurance training and resistance training session	RCT	25	China (Taiwan)	65 (32/33) [32,33]	67.1	0	SBP < 160 DBP < 90

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Ohta, 2015 <sup>131</sup>	Aerobic exercise Usual care	Every day, 30–60 min to achieve 10000 steps	RCT, crossover	8	Japan	65 [26,39]	60.0	0	SBP ≥ 140 DBP ≥ 90
Okumiya, 1996 <sup>132</sup>	Aerobic exercise Usual care	2 days weekly, 60 min with 60% Vo2max	RCT	24	Japan	42 (21/21) [18,24]	78.8	NR	SBP: 120-159 DBP: 80-99
Parijs, 1973 <sup>67</sup>	Salt restriction Usual care	Every day, additional 50 mmol sodium intake reduction	RCT, double-blind	4	Belgium	30 (15/15) [Not reported]	41.0	0	SBP ≥ 140 DBP ≥ 90
Park, 2014 <sup>47</sup>	Qigong Usual care	Qigong classes 2 days weekly, home practice 2 days weekly	RCT, single-blind	8	Korea	40 (19/21) [26,14]	53.1	NR	SBP: 120-159 DBP: 80-99
Patel, 1988 <sup>133</sup>	Meditation Usual care	20 minutes twice a day, practice meditation	RCT	8	UK	103 (49/54) [52,51]	35-64	30.1	DBP: 90-109
Pinjuh Markota, 2015 <sup>134</sup>	Salt restriction Usual care	Every day, additional 35 mmol sodium intake reduction	RCT	8	Bosnia and Herzegovina	150 (76/74) [73,77]	59.4	100	SBP ≥ 140 DBP ≥ 90
Punita, 2016 <sup>135</sup>	Yoga Usual care	45 min, 3 days weekly, practice yoga at home	RCT	12	India	55 (25/30) [44,11]	43.4	100	SBP ≥ 140 DBP ≥ 90
Puska, 1983 <sup>136</sup>	Salt restriction Usual care	Every day, 77 mmol sodium intake	RCT	6	Finland	34 (15/19) [Not reported]	30-50	0	DBP ≥ 90
Ramos, 2018 <sup>137</sup>	Aerobic exercise Usual care	3 days weekly, 50 min reach 60% of maximal heart rate	RCT	12	Brazil	24 (12/12) [4,20]	60.6	100	SBP ≥ 140 DBP ≥ 90
Richards, 1984 <sup>138</sup>	Salt restriction Usual care	Every day, 80 mmol sodium intake	RCT, double-blind, crossover	6	New Zealand	12 [8,4]	19-52	0	SBP: 140-179 DBP: 90-105

<b>Author, publication year*</b>	<b>Interventions</b>	<b>Frequency, target</b>	<b>Study design</b>	<b>Follow-up period (weeks)</b>	<b>Country</b>	<b>No. of participants (intervention/control) [males, females]</b>	<b>Age (range or mean)</b>	<b>Drug therapy (%)</b>	<b>Baseline BP of subjects (mmHg)†</b>
Rogers, 1996a <sup>41</sup>	Aerobic exercise (low) Usual care	3 days weekly, 45 min at 40 to 50% maximal oxygen uptake	RCT	12	America	11 (6/5) [Not reported]	42.7	0	SBP: 140-159 DBP:90-95
Rogers, 1996b <sup>41</sup>	Aerobic exercise (moderate) Usual care	3 days weekly, 45 min at 70 to 80% maximal oxygen uptake	RCT	12	America	12 (7/5) [Not reported]	39.5	0	SBP: 140-159 DBP:90-95
Sacks, 2001 <sup>139</sup>	Salt restriction Usual care	Every day, 100 mmol sodium intake	RCT, Multi-center	4	America	76 [Not reported]	52.0	0	SBP: 140-159 DBP: 90-95
Sarkkinen, 2011 <sup>36</sup>	Low-sodium salt Common salt (Usual care)	Every day, 5.3g of low-sodium and high-potassium salt	RCT, double-blind	8	Finland	45 (22/23) [23,22]	55.5	0	SBP: 130-159 DBP: 85-99
Schein, 2001 <sup>140</sup>	Breathing-control Usual care	10 min/day, < 10 breaths/min	RCT, double-blind	8	Israel	61 (32/29) [31,30]	57.2	83.1	SBP ≥ 140 DBP ≥ 90
Schneider, 1995 <sup>53</sup>	Meditation PMR Usual care	Twice a day for 20 min, meditation; twice a day for 15 to 20 min, PMR	RCT, single-blind	12	America	111 (36/37/38) [47,64]	66.8	50.5	SBP: 140-179 DBP: 90-109
Schneider, 2005 <sup>54</sup>	Meditation PMR Usual care	Twice a day for 20 min, meditation; twice a day for 15 to 20 min, PMR	RCT	48	America	150 (54/52/44) [71,79]	48.5	100	SBP: 140-179 DBP: 90-109
Seals, 1991 <sup>141</sup>	Aerobic exercise Usual care	3 days weekly, 30 min reach 40-50% of maximal heart rate	RCT	24	Japan	26 (14/12) [19,7]	51.0	0	DBP: 90-105
Shou, 2018 <sup>142</sup>	Tai Chi Usual care	Every day, 40 to 90 min with 50-60% Vo2max	RCT	12	China	198 (98/100) [103,95]	51.6	0	SBP: 140-160 DBP: 90-100
Silman, 1983 <sup>143</sup>	Salt restriction Usual care	Every day, 100 mmol sodium intake	RCT	48	UK	25 (10/15) [Not reported]	50-64	0	DBP: 95-104

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Sohn, 2007 <sup>144</sup>	Aerobic exercise Usual care	5 to 7 days weekly, 30 min walking	RCT	24	America	18 (8/10) [6,12]	44.2	0	SBP ≥ 140 DBP ≥ 90
Steffen, 2001 <sup>145</sup>	Exercise Diet plus exercise Usual care	3 to 4 days weekly, 35 min with 70-85% Vo2max; weight loss 1 to 2 lb weekly	RCT	24	America	92 (35/42/15) [38,54]	48.0	NR	SBP: 130-179 DBP:85-105
Stevens, 1993 <sup>146</sup>	Diet plus exercise Usual care	Low-caloric diet with exercise, weight loss 4.5 kg	RCT	72	America	564 (308/256) [385,179]	42.8	0	DBP: 80-89
Stewart, 2005 <sup>60</sup>	Aerobic exercise + resistance training Usual care	At least 2 days weekly, endurance training and resistance training session	RCT	24	America	104 (53/51) [51,53]	63.6	0	SBP: 130-159 DBP: 85-99
Stiller-Moldovan, 2012 <sup>147</sup>	Isometric training Usual care	3 days weekly, bilateral contractions at 30% of MVC	RCT	8	Canada	20 (11/9) [10,10]	61.2	100	SBP ≥ 140 DBP ≥ 90
Subramanian, 2011 <sup>148</sup>	Salt restriction Aerobic exercise Yoga Usual care	Reduced daily salt intake by half; 50 to 60 min, 3 to 4 weekly; 30 to 45 min per day, at least 5 days weekly	RCT	8	India	94 (21/23/25/25) [61,33]	23.5	NR	SBP: 120-159 DBP: 80-99
Sujatha, 2014 <sup>149</sup>	Yoga Usual care	5 days weekly, 30 to 45 min yoga practise at home	RCT	12	India	238 (118/120) [110,128]	30-60	0	SBP: 140-169 DBP: 90-109
Suppa, 1988 <sup>150</sup>	Low-sodium salt Common salt (Usual care)	Every day, 4 g of low-sodium and high-potassium salt	RCT, double-blind	4	Italy	322 (163/159) [202,120]	47.4	100	DBP ≥ 95
Svetkey, 1999a <sup>34</sup>	DASH Usual care	Every day, DASH diet feeding	RCT, single-blind	8	America	84 (37/47) [Not reported]	48.9	NR	SBP: 140-160 DBP: 90-95

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Svetkey, 1999b <sup>34</sup>	DASH Usual care	Every day, DASH diet feeding	RCT, single-blind	8	America	221 (114/107) [Not reported]	48.9	NR	SBP < 140 DBP: 80-89
Swift, 2005 <sup>39</sup>	Salt restriction Usual care	Every day, 5 g salt with 12 matched placebo tablets	RCT, double-blind, crossover	8	UK	40 [17,23]	50.0	0	SBP ≥ 140 DBP ≥ 90
Tanaka, 1997 <sup>151</sup>	Aerobic exercise Usual care	3 days weekly, 60 min swimming	RCT	10	America	18 (12/6) [10,8]	47.7	5.6	SBP: 140-179 DBP: 90-109
Taylor, 2003 <sup>43</sup>	Isometric training Usual care	3 days weekly, bilateral contractions at 30% of MVC	RCT	10	Canada	17 (9/8) [10,7]	66.9	100	SBP ≥ 140 DBP ≥ 85
The TOHP Research Group, 1992a <sup>152</sup>	Salt restriction Usual care	Every day, 80 mmol sodium intake	RCT, single-blind	72	America	744 (327/417) [531,213]	43.0	0	DBP: 80-89
The TOHP Research Group, 1992b <sup>152</sup>	MBSR Usual care	45 min/day, practice MBSR techniques	RCT, single-blind	72	America	562 (242/320) [398,164]	43.2	0	DBP: 80-89
The TOHP Research Group, 1997 <sup>61</sup>	Diet plus exercise Salt restriction Salt restriction + diet plus exercise Usual care	Weight-reduction program; Low-sodium diet; Weight-reduction program with low-sodium diet	RCT	144	America	2382 (595/594/597/596) [1578,804]	43.6	0	DBP: 80-89
Thiyagarajan, 2015 <sup>153</sup>	Yoga Usual care	3 days weekly, 45 min yoga practise	RCT	12	India	100 (51/49) [62,38]	43.3	0	SBP: 120-139 DBP: 80-89



Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Tsai, 2002 <sup>154</sup>	Aerobic exercise Usual care	3 days weekly, 50 min reach 60 to 70% maximal heart rate	RCT	12	China (Taiwan)	23 (12/11) [12,11]	48.0	0	SBP: 140-160 DBP: 90-95
Tsai, 2003 <sup>46</sup>	Tai Chi Usual care	3 days weekly, 50 min tai chi practise	RCT	12	China (Taiwan)	76 (37/39) [38,38]	51.0	0	SBP: 130-159 DBP: 85-99
Tsai, 2004 <sup>155</sup>	Aerobic exercise Usual care	3 days weekly, 50 min reach 60 to 70% maximal heart rate	RCT	10	China (Taiwan)	102 (52/50) [47,55]	49.0	0	SBP: 140-179 DBP: 90-109
Vollmer, 2001 <sup>156</sup>	Salt restriction Usual care	Every day, < 50 mmol sodium intake	RCT	4	America	83 [Not reported]	50.3	0	SBP: 140-159 DBP: 90-95
Watt, 1983 <sup>157</sup>	Salt restriction Usual care	Every day, < 80 mmol sodium intake	RCT, double-blind, crossover	8	UK	18 [6,12]	52.0	0	SBP ≥ 140 DBP ≥ 90
Whelton, 1998 <sup>158</sup>	Diet plus exercise Salt restriction + diet plus exercise	Every day, low-sodium and caloric diet;	RCT	12	America	289 (144/145) [122,167]	66.0	100	SBP ≥ 140 DBP ≥ 90
Whitt-Glover, 2013 <sup>159</sup>	DASH Usual care	Every day, DASH diet feeding	RCT	12	America	25 (14/11) [3,22]	50.7	76.0	SBP: 120-159 DBP: 80-99
Wilson, 2014 <sup>160</sup>	Alcohol restriction Usual care	Reduce alcohol intake using leaflet education	RCT, parallel-cluster	24	UK	67 (28/39) [Not reported]	64.3	NR	SBP ≥ 140 DBP ≥ 90
Wolff, 2013a <sup>55</sup>	Yoga (classes) Usual care	60 minutes yoga class once a week, 30 min at home	RCT	12	Sweden	54 (28/26) [20,34]	63.6	92.0	SBP ≥ 140 DBP ≥ 90
Wolff, 2013b <sup>55</sup>	Yoga (at home) Usual care	Every day, 15 min yoga practise	RCT	12	Sweden	52 (26/26) [18,34]	62.4	92.0	SBP ≥ 140 DBP ≥ 90

Author, publication year*	Interventions	Frequency, target	Study design	Follow-up period (weeks)	Country	No. of participants (intervention/control) [males, females]	Age (range or mean)	Drug therapy (%)	Baseline BP of subjects (mmHg)†
Young, 1999 <sup>161</sup>	Aerobic exercise Tai Chi	4 to 5 days weekly, 30 to 45 min with 60% Vo <sub>2</sub> max;	RCT	12	America	62 (31/31) [13,49]	66.7	0	SBP: 130-159 DBP < 95
Zhao, 2014 <sup>37</sup>	Low-sodium salt Common salt (Usual care)	Every day, low-sodium and high-potassium salt intake	RCT, single-blind	12	China	282 (141/141) [116,166]	63.1	56.8	SBP ≥ 140 DBP ≥ 90
Zhou, 2009 <sup>162</sup>	Low-sodium salt Common salt (Usual care)	Every day, 8.5g of low-sodium and high-potassium salt	RCT, single-blind	24	China	126 (62/64) [54,72]	66.6	54.0	SBP ≥ 140 DBP ≥ 90
Zou, 2016 <sup>35</sup>	Salt restriction + DASH Usual care	Every day, Low-sodium DASH feeding	RCT	8	China	60 (30/30) [30,30]	>45	0	SBP: 140-159 DBP: 90-99

\* Citations correspond to the references list in the main text.

† Baseline BP of subjects was defined as the office blood pressure of subjects measured without previous antihypertensive treatment

ANHMRC indicates Australian National Health and Medical Research Council; DASH indicates Dietary Approach to Stop Hypertension. DBP indicates diastolic blood pressure; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; MVC indicates maximal voluntary contraction; NR indicates not reported; PMR indicates progressive muscle relaxation; RCT indicates randomized controlled trial; SBP indicates systolic blood pressure; The TOHP Research Group indicates The Trials of Hypertension Prevention Collaborative Research Group; Vo<sub>2</sub>max indicates maximum oxygen consumption.

**Table S2. Risk of Bias Results.**

<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Altena, 2009	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
Anderson, 2010	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Anderssen, 1995	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
ANHMRC, 1989a	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
ANHMRC, 1989b	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Appel, 2001	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Badrov, 2013	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Baros, 2008	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Barros, 2015	High risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	High
Beard, 1982	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Benetos, 1992	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Blom, 2014	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Blumenthal, 1991	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Unclear risk	Moderate
Blumenthal, 2000	Unclear risk	Unclear risk	High risk	Low risk	High risk	Low risk	Low risk	High
Burke, 2005	Low risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Cappuccio, 1997	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Castillo-Richmond, 2000	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Moderate
Chen, 2010	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Cohen, 2011	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Collier, 2008	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate



<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Grossman, 2001	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low risk	Moderate
Guimaraes, 2010	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Hagins, 2014	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Haynes, 1984	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
He, 2009	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Higashi, 1999a	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Higashi, 1999b	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Hikmat, 2014	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Hughes, 2013	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Izadi, 2018	Low risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Jablonski, 2013	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Jalkanen, 1991	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Jones, 2010	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Lang, 1995	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
MacGregor, 1982	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
MacGregor, 1989	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
MacMahon, 1985	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Mäkelä 2008	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Malloy-McFall, 2010	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Marquez-Celedonio, 2009	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Maruf, 2016	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk	High

<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Mattila, 2003	Low risk	Low risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
McCarron, 1997	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Meland, 1997	Low risk	Low risk	Low risk	Low risk	Unclear risk	Low risk	Low risk	Moderate
Meles, 2004	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	High risk	High
Miller, 2002	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Modesti, 2010	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low risk	Moderate
Molmen-Hansen, 2012	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Moore, 1999	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Nakamura, 2003	Low risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Moderate
Nelson L, 1986a	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Nelson L, 1986b	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Nualnim, 2012	High risk	High risk	High risk	Low risk	Low risk	Low risk	Low risk	High
Ohkubo, 2001	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Ohta, 2015	Low risk	Low risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Okumiya, 1996	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Parijs, 1973	Low risk	Unclear risk	High risk	High risk	Low risk	Low risk	Low risk	High
Park, 2014	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
Patel, 1988	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Pinjuh Markota, 2015	Low risk	Low risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Punita, 2016	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Puska, 1983	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate

<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Ramos, 2018	unclear	unclear	high	unclear	low	low	low	Moderate
Richards, 1984	Unclear risk	Unclear risk	High risk	Low risk	Unclear risk	Low risk	Unclear risk	Moderate
Rogers, 1996a	Unclear risk	Unclear risk	High risk	Low risk	Unclear risk	Low risk	Low risk	Moderate
Rogers, 1996b	Unclear risk	Unclear risk	High risk	Low risk	Unclear risk	Low risk	Low risk	Moderate
Sacks, 2001	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Sarkkinen, 2011	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Schein, 2001	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Schneider, 1995	Low risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Schneider, 2005	Low risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Seals, 1991	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Shou, 2018	unclear	unclear	high	low	low	low	unclear	Moderate
Silman, 1983	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Sohn, 2007	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Steffen, 2001	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Stevens, 1993	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Stewart, 2005	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate
Stiller-Moldovan, 2012	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Subramanian, 2011	Low risk	Low risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Sujatha, 2014	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Suppa, 1988	Unclear risk	Unclear risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Svetkey, 1999a	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low

<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Svetkey, 1999b	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
Swift, 2005	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Tanaka, 1997	High risk	High risk	High risk	Low risk	Low risk	Low risk	Unclear risk	High
Taylor, 2003	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Unclear risk	Moderate
The TOHP Research Group, 1992a	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
The TOHP Research Group, 1992b	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
The TOHP Research Group, 1997	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Thiyagarajan, 2015	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Tsai, 2002	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Tsai, 2003	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Tsai, 2004	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Vollmer, 2001	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Unclear risk	Moderate
Watt, 1983	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low
Whelton, 1998	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low
Whitt-Glover, 2013	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Unclear risk	Moderate
Wilson, 2014	Low risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Wolff, 2013a	High risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	High
Wolff, 2013b	High risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	High
Young, 1999	Unclear risk	Unclear risk	High risk	Low risk	Low risk	Low risk	Low risk	Moderate



<b>Author, year</b>	<b>1. Sequence generation of the allocation</b>	<b>2. Allocation concealment</b>	<b>3. Blinding of participants, personnel</b>	<b>4. Blinding of outcome assessors</b>	<b>5. Incomplete outcome data</b>	<b>6. Selective outcome reporting</b>	<b>7. Other sources of bias</b>	<b>Risk of bias for study</b>
Zhao, 2014	Low risk	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low
Zhou, 2009	Low risk	Low risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Moderate
Zou, 2016	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk	Low

Studies were judged to be at high, moderate or low risk of bias based on the assessment of sequence generation of the allocation, allocation concealment, blinding of participants, personnel, and outcome assessors, incomplete outcome data, selective outcome reporting and other sources of bias.

ANHMRC indicates Australian National Health and Medical Research Council; The TOHP Research Group indicates The Trials of Hypertension Prevention Collaborative Research Group.

**Table S3. Traditional Meta-analysis Results. (A) Adults with Prehypertension to Established Hypertension**

Comparison	No. of studies	No. of patients	Weighted mean difference (95% CrI)	<i>I</i> <sup>2</sup>
<b>Systolic blood pressure</b>				
Low-sodium salt vs Usual care	6	910	<b>8.21 (5.10 to 11.33)</b>	65.5%
Alcohol restriction vs Usual care	4	828	<b>4.20 (0.22 to 8.21)</b>	73.0%
Breathing-control vs Usual care	8	419	<b>5.24 (2.05 to 8.46)</b>	10.4%
Meditation vs Usual care	4	335	<b>5.14 (0.91 to 9.36)</b>	49.7%
Qigong vs Usual care	1	40	3.31 (-4.21 to 10.91)	0.0%
Yoga vs Usual care	7	606	<b>4.53 (1.51 to 7.45)</b>	91.5%
PMR vs Usual care	3	197	2.37 (-2.26 to 6.99)	0.0%
MBSR vs Usual care	2	649	0.27 (-4.27 to 4.87)	0.0%
DASH vs Usual care	9	1022	<b>6.95 (4.56 to 9.36)</b>	77.4%
Salt restriction vs Usual care	30	4012	<b>5.30 (3.87 to 6.76)</b>	76.4%
Diet vs Usual care	4	217	<b>7.84 (3.60 to 12.04)</b>	73.5%
Exercise vs Usual care	3	148	1.98 (-5.01 to 9.01)	0.0%
Diet plus exercise vs Usual care	6	1965	2.18 (-1.29 to 5.65)	52.9%
Aerobic exercise vs Usual care	26	1007	<b>6.14 (4.51 to 7.83)</b>	65.8%
Tai chi vs Usual care	2	274	<b>16.83 (12.05 to 21.68)</b>	95.1%
Resistance training vs Usual care	2	64	-0.22 (-7.26 to 6.78)	0.0%
Isometric training vs Usual care	5	109	<b>5.71 (1.49 to 9.92)</b>	38.6%
Lifestyle vs Usual care	4	1440	<b>4.59 (1.49 to 7.81)</b>	91.4%
Aerobic exercise+DASH vs Usual care	1	27	10.02 (-2.24 to 22.19)	0.0%
Salt restriction+DASH vs Usual care	1	60	3.78 (-3.81 to 11.33)	0.0%
Salt restriction+diet plus exercise vs Usual care	2	1238	4.25 (-0.54 to 9.12)	96.0%
Aerobic exercise+resistance training vs Usual care	2	169	2.70 (-2.62 to 7.98)	49.6%
Meditation vs Breathing-control	1	40	-0.97 (-9.00 to 7.00)	0.0%
PMR vs Meditation	2	179	-3.99 (-9.99 to 2.14)	0.0%
Salt restriction vs Yoga	1	46	2.20 (-7.03 to 11.54)	0.0%
Aerobic exercise vs Yoga	1	48	5.06 (-3.33 to 13.48)	0.0%
Resistance training vs Yoga	1	68	-4.41 (-13.75 to 4.97)	0.0%
MBSR vs PMR	1	56	4.12 (-6.66 to 14.78)	0.0%
Diet plus exercise vs Salt restriction	1	1189	0.10 (-6.12 to 6.29)	0.0%
Aerobic exercise vs Salt restriction	1	44	2.85 (-6.21 to 11.88)	0.0%
Salt restriction+diet plus exercise vs Salt restriction	1	1193	-0.12 (-6.35 to 6.07)	0.0%
Exercise vs Diet	2	65	-2.85 (-11.04 to 5.32)	0.0%
Diet plus exercise vs Diet	2	74	0.67 (-7.37 to 8.72)	0.0%
Diet plus exercise vs Exercise	4	244	4.16 (-0.19 to 8.52)	0.0%
Salt restriction+diet plus exercise vs Diet plus exercise	2	1480	0.48 (-4.18 to 5.12)	2.1%
Tai chi vs Aerobic exercise	1	62	-1.40 (-8.91 to 6.06)	0.0%

Comparison	No. of studies	No. of patients	Weighted mean difference (95% CrI)	I <sup>2</sup>
<b>Systolic blood pressure</b>				
Aerobic exercise+DASH vs Aerobic exercise	1	37	5.37 (-4.56 to 15.28)	0.0%
Resistance training vs Aerobic exercise	3	112	-1.81 (-7.38 to 3.72)	0.0%
<b>Diastolic blood pressure</b>				
Low-sodium salt vs Usual care	6	910	<b>3.96 (1.86 to 6.06)</b>	40.2%
Alcohol restriction vs Usual care	4	828	1.80 (-0.86 to 4.50)	63.7%
Breathing-control vs Usual care	8	419	<b>3.22 (0.98 to 5.46)</b>	20.5%
Meditation vs Usual care	4	335	2.17 (-0.71 to 5.07)	61.3%
Qigong vs Usual care	1	40	<b>6.72 (0.81 to 12.62)</b>	0.0%
Yoga vs Usual care	7	606	<b>3.31 (1.22 to 5.36)</b>	87.8%
PMR vs Usual care	3	197	2.56 (-0.83 to 5.97)	31.7%
MBSR vs Usual care	2	649	0.24 (-3.06 to 3.54)	39.6%
DASH vs Usual care	9	1022	<b>3.54 (1.82 to 5.24)</b>	49.7%
Salt restriction vs Usual care	30	4012	<b>2.57 (1.57 to 3.57)</b>	63.0%
Diet vs Usual care	4	217	<b>5.06 (2.33 to 7.75)</b>	96.9%
Exercise vs Usual care	3	148	<b>4.60 (0.10 to 9.21)</b>	0.0%
Diet plus exercise vs Usual care	6	1965	<b>2.59 (0.25 to 4.98)</b>	65.9%
Aerobic exercise vs Usual care	26	1007	<b>4.26 (3.08 to 5.42)</b>	79.5%
Tai chi vs Usual care	2	274	<b>9.76 (6.14 to 13.43)</b>	0.0%
Resistance training vs Usual care	2	64	-0.01 (-5.04 to 5.02)	0.0%
Isometric training vs Usual care	5	109	<b>4.03 (1.09 to 6.90)</b>	21.1%
Lifestyle vs Usual care	4	1440	<b>3.37 (1.05 to 5.68)</b>	95.8%
Aerobic exercise+DASH vs Usual care	1	27	3.49 (-6.28 to 13.46)	0.0%
Salt restriction+DASH vs Usual care	1	60	2.40 (-3.38 to 8.17)	0.0%
Salt restriction+diet plus exercise vs Usual care	2	1238	2.49 (-0.94 to 5.99)	92.9%
Aerobic exercise+resistance training vs Usual care	2	169	3.14 (-0.35 to 6.68)	38.7%
Meditation vs Breathing-control	1	40	-2.20 (-8.00 to 3.55)	0.0%
PMR vs Meditation	2	179	-2.91 (-6.74 to 0.92)	0.0%
Salt restriction vs Yoga	1	46	-0.41 (-7.74 to 6.98)	0.0%
Aerobic exercise vs Yoga	1	48	3.65 (-1.92 to 9.23)	0.0%
Resistance training vs Yoga	1	68	-3.53 (-9.38 to 2.27)	0.0%
MBSR vs PMR	1	56	0.72 (-7.17 to 8.54)	0.0%
Diet plus exercise vs Salt restriction	1	1189	0.38 (-4.09 to 4.88)	0.0%
Aerobic exercise vs Salt restriction	1	44	4.11 (-2.18 to 10.34)	0.0%
Salt restriction+diet plus exercise vs Salt restriction	1	1193	0.11 (-4.39 to 4.67)	0.0%
Exercise vs Diet	2	65	-1.59 (-6.48 to 3.19)	0.0%
Diet plus exercise vs Diet	2	74	0.22 (-4.06 to 4.58)	0.0%
Diet plus exercise vs Exercise	4	244	1.59 (-1.35 to 4.57)	0.0%
Salt restriction+diet plus exercise vs Diet plus exercise	2	1480	0.89 (-2.40 to 4.21)	84.7%

<b>Comparison</b>	<b>No. of studies</b>	<b>No. of patients</b>	<b>Weighted mean difference (95% CrI)</b>	<b><i>I</i><sup>2</sup></b>
<b>Diastolic blood pressure</b>				
Tai chi vs Aerobic exercise	1	62	-0.82 (-5.97 to 4.39)	0.0%
Resistance training vs Aerobic exercise	3	112	-0.89 (-4.55 to 2.72)	27.6%
Aerobic exercise+DASH vs Aerobic exercise	1	37	2.90 (-6.14 to 11.95)	0.0%

**Table S3. Traditional Meta-analysis Results. (B) Patients with Hypertension**

<b>Comparison</b>	<b>No. of studies</b>	<b>No. of patients</b>	<b>Weighted mean difference (95% CrI)</b>	<b>I<sup>2</sup></b>
<b>Systolic blood pressure</b>				
Low-sodium salt vs Usual care	5	865	<b>7.56 (4.23 to 10.89)</b>	67.8%
Alcohol restriction vs Usual care	4	517	<b>4.95 (0.93 to 8.94)</b>	44.9%
Breathing-control vs Usual care	8	419	<b>5.22 (2.10 to 8.42)</b>	10.0%
Meditation vs Usual care	3	275	<b>6.46 (1.75 to 11.20)</b>	46.6%
Yoga vs Usual care	4	399	<b>7.32 (3.24 to 11.17)</b>	91.6%
PMR vs Usual care	3	197	2.36 (-2.10 to 6.90)	0.0%
MBSR vs Usual care	1	87	0.05 (-6.55 to 6.51)	0.0%
DASH vs Usual care	4	262	<b>8.67 (5.24 to 12.18)</b>	82.5%
Salt restriction vs Usual care	26	2003	<b>5.75 (4.19 to 7.29)</b>	45.5%
Diet vs Usual care	3	189	<b>7.78 (3.58 to 11.90)</b>	82.6%
Diet plus exercise vs Usual care	1	49	-7.03 (-17.34 to 3.36)	0.0%
Aerobic exercise vs Usual care	23	874	<b>6.12 (4.47 to 7.87)</b>	68.5%
Resistance training vs Usual care	2	64	-0.21 (-7.20 to 6.81)	0.0%
Isometric training vs Usual care	5	109	<b>5.64 (1.54 to 9.86)</b>	66.0%
Lifestyle vs Usual care	2	844	3.07 (-1.21 to 7.36)	50.6%
Aerobic exercise+DASH vs Usual care	1	27	10.13 (-2.14 to 22.23)	0.0%
Salt restriction+DASH vs Usual care	1	60	3.78 (-3.54 to 11.04)	0.0%
Tai Chi vs Usual care	1	198	<b>12.75 (6.52 to 18.88)</b>	0.0%
PMR vs Meditation	2	179	-3.91 (-9.82 to 1.99)	0.0%
Salt restriction+diet plus exercise vs Diet plus exercise	1	289	1.31 (-8.00 to 5.47)	0.0%
Resistance training vs Aerobic exercise	2	100	-2.41 (-8.89 to 4.05)	9.8%
Aerobic exercise+DASH vs Aerobic exercise	1	37	5.42 (-4.38 to 15.08)	0.0%
<b>Diastolic blood pressure</b>				
Low-sodium salt vs Usual care	5	865	<b>3.80 (1.45 to 6.21)</b>	47.5%
Alcohol restriction vs Usual care	4	517	1.86 (-1.02 to 4.76)	56.7%
Breathing-control vs Usual care	8	419	<b>3.23 (0.97 to 5.51)</b>	20.1%
Meditation vs Usual care	3	275	<b>3.56 (0.16 to 6.97)</b>	10.6%
Yoga vs Usual care	4	399	<b>4.48 (1.59 to 7.37)</b>	87.2%
PMR vs Usual care	3	197	2.58 (-0.95 to 6.09)	32.5%
MBSR vs Usual care	1	87	-0.43 (-5.52 to 4.60)	0.0%
DASH vs Usual care	4	262	<b>4.55 (1.94 to 7.16)</b>	0.0%
Salt restriction vs Usual care	26	2003	<b>2.73 (1.58 to 3.86)</b>	45.6%
Diet vs Usual care	3	189	<b>4.98 (2.03 to 7.89)</b>	98.0%
Diet plus exercise vs Usual care	1	49	-0.04 (-6.15 to 6.26)	0.0%
Aerobic exercise vs Usual care	23	874	<b>4.04 (2.76 to 5.32)</b>	81.3%
Resistance training vs Usual care	2	64	-0.01 (-5.22 to 5.19)	0.0%
Isometric training vs Usual care	5	109	<b>4.02 (1.01 to 7.01)</b>	20.3%

Comparison	No. of studies	No. of patients	Weighted mean difference (95% CrI)	<i>I</i> <sup>2</sup>
<b>Diastolic blood pressure</b>				
Lifestyle vs Usual care	2	844	1.74 (-1.72 to 5.16)	0.0%
Aerobic exercise+DASH vs Usual care	1	27	3.65 (-6.21 to 13.59)	0.0%
Salt restriction+DASH vs Usual care	1	60	2.41 (-3.57 to 8.46)	0.0%
Tai Chi vs Usual care	1	198	<b>7.80 (2.69 to 12.90)</b>	
PMR vs Meditation	2	179	-2.91 (-6.87 to 1.04)	0.0%
Salt restriction+diet plus exercise vs Diet plus exercise	1	289	2.29 (-7.49 to 2.75)	0.0%
Resistance training vs Aerobic exercise	2	100	-2.18 (-7.13 to 2.70)	48.5%
Aerobic exercise+DASH vs Aerobic exercise	1	37	2.92 (-6.37 to 12.17)	0.0%

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S4. GRADE Summary of Findings Table with Quality of Evidence and Absolute Anticipated Benefits for All Nonpharmacologic Interventions over Usual Care in Adult with Prehypertension to Established Hypertension.**

Using GRADE to rate quality of evidence from a network meta-analysis involved several steps: First, we rated quality of evidence for direct comparisons; second, we rated quality of evidence for indirect estimates (starting at the lowest rating of the two pairwise direct estimates that contribute as first-order loops to the indirect estimate, which can be rated down further for imprecision or intransitivity), and then third, rating the quality of evidence for the network combining direct and indirect estimates. In this step, if direct and indirect estimates from second-order comparisons are similar, the higher of the ratings was assigned to the network meta-analysis estimates.

Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension					
Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care groups (95% CrI)	Mean difference with intervention
<b>Low-sodium and high-potassium salt compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	910 (6 studies) 4-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias	8.21 (4.99 to 11.43)	The mean systolic blood pressure reduction in the control groups was <b>0.47</b>	The mean systolic blood pressure reduction in the intervention groups was <b>8.70 higher</b> (5.79 to 11.61 higher)
<b>Diastolic blood pressure reduction</b>	910 (6 studies) 4-24 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, publication bias	3.97 (1.81 to 6.13)	The mean diastolic blood pressure reduction in the control groups was <b>0.18</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.20 higher</b> (3.11 to 5.11 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Breathing-control compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	419 (8 studies) 4-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias	5.39 (2.30 to 8.49)	The mean systolic blood pressure reduction in the control groups was <b>4.16</b>	The mean systolic blood pressure reduction in the intervention groups was <b>9.25 higher</b> (7.39 to 11.10 higher)
<b>Diastolic blood pressure reduction</b>	419 (8 studies) 4-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias	3.41 (1.28 to 5.55)	The mean diastolic blood pressure reduction in the control groups was <b>1.41</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.60 higher</b> (2.64 to 6.56 higher)
<b>Meditation compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	335 (4 studies) 6-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	5.02 (1.42 to 8.65)	The mean systolic blood pressure reduction in the control groups was <b>2.35</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.48 higher</b> (4.55 to 10.41 higher)
<b>Diastolic blood pressure reduction</b>	335 (4 studies) 6-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	2.46 (-0.02 to 4.94)	The mean diastolic blood pressure reduction in the control groups was <b>2.31</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.49 higher</b> (2.86 to 6.12 higher)



### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	1022 (9 studies) 4-12 weeks	⊕⊕⊕⊕ <b>HIGH</b>	6.97 (4.50 to 9.47)	The mean systolic blood pressure reduction in the control groups was <b>0.77</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.48 higher</b> (5.62 to 9.34 higher)
<b>Diastolic blood pressure reduction</b>	1022 (9 studies) 4-12 weeks	⊕⊕⊕⊕ <b>HIGH</b>	3.54 (1.80 to 5.28)	The mean diastolic blood pressure reduction in the control groups was <b>0.57</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>3.89 higher</b> (2.90 to 4.88 higher)
<b>Salt restriction compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	4012 (30 studies) 4-144 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias inconsistency, publication bias, greater precision	5.42 (3.96 to 6.87)	The mean systolic blood pressure reduction ranged across control groups from <b>0.56</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.92 higher</b> (4.42 to 7.41 higher)
<b>Diastolic blood pressure reduction</b>	4012 (30 studies) 4-144 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias, publication bias, greater precision	2.63 (1.64 to 3.61)	The mean diastolic blood pressure reduction ranged across control groups from <b>1.19</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>3.65 higher</b> (2.77 to 4.52 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Low-calorie diet compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	217 (4 studies) 24-52 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	6.50 (2.78 to 10.17)	The mean systolic blood pressure reduction in the control groups was <b>3.05</b>	The mean systolic blood pressure reduction in the intervention groups was <b>10.76 higher</b> (7.46 to 14.07 higher)
<b>Diastolic blood pressure reduction</b>	217 (4 studies) 24-52 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	4.56 (2.22 to 6.89)	The mean diastolic blood pressure reduction in the control groups was <b>1.74</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>6.81 higher</b> (2.52 to 11.10 higher)
<b>Exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	148 (3 studies) 24-52 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, imprecision	1.14 (-3.04 to 5.35)	The mean systolic blood pressure reduction in the control groups was <b>-1.72</b>	The mean systolic blood pressure reduction in the intervention groups was <b>1.34 higher</b> (4.92 to 7.60 higher)
<b>Diastolic blood pressure reduction</b>	148 (3 studies) 24-52 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, imprecision	2.75 (-0.01 to 5.54)	The mean systolic blood pressure reduction in the control groups was <b>0.48</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.78 higher</b> (3.45 to 6.11 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Low-calorie diet plus exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	1965 (6 studies) 24-144 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, inconsistency	4.12 (1.22 to 7.03)	The mean systolic blood pressure reduction in the control groups was <b>2.25</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.87 higher</b> (1.91 to 7.82 higher)
<b>Diastolic blood pressure reduction</b>	1965 (6 studies) 24-144 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, inconsistency	3.35 (1.41 to 5.32)	The mean systolic blood pressure reduction in the control groups was <b>3.71</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.30 higher</b> (4.53 to 8.23 higher)
<b>Aerobic exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	1007 (26 studies) 6-64 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias, publication bias, greater precision	6.60 (4.98 to 8.23)	The mean systolic blood pressure reduction in the control groups was <b>0.84</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.92 higher</b> (6.13 to 11.71 higher)
<b>Diastolic blood pressure reduction</b>	1007 (26 studies) 6-64 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias, inconsistency, greater precision	4.44 (3.31 to 5.57)	The mean systolic blood pressure reduction in the control groups was <b>1.48</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.39 higher</b> (4.00 to 6.78 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Qigong compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	40 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	3.29 (-4.35 to 10.97)	The mean systolic blood pressure reduction in the control groups was <b>4.61</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.90 higher</b> (4.16 to 11.64 higher)
<b>Diastolic blood pressure reduction</b>	40 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	6.74 (0.74 to 12.72)	The mean systolic blood pressure reduction in the control groups was <b>0.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.72 higher</b> (3.55 to 9.90 higher)
<b>Tai Chi compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	274 (2 studies) 12 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to severe inconsistency, imprecision, publication bias	13.47 (9.30 to 17.64)	The mean systolic blood pressure reduction in the control groups was <b>-6.40</b>	The mean systolic blood pressure reduction in the intervention groups was <b>15.60 higher</b> (13.27 to 17.93 higher)
<b>Diastolic blood pressure reduction</b>	274 (2 studies) 12 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to severe inconsistency, imprecision, publication bias	7.76 (4.72 to 10.81)	The mean systolic blood pressure reduction in the control groups was <b>-3.40</b>	The mean systolic blood pressure reduction in the intervention groups was <b>8.80 higher</b> (6.55 to 11.05 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Isometric training compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	109 (5 studies) 8-12 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	5.77 (1.41 to 10.16)	The mean systolic blood pressure reduction in the control groups was <b>0.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.89 higher</b> (2.01 to 11.78 higher)
<b>Diastolic blood pressure reduction</b>	109 (5 studies) 8-12 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	4.01 (1.07 to 6.93)	The mean systolic blood pressure reduction in the control groups was <b>0.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.07 higher</b> (1.31 to 6.82 higher)
<b>Aerobic exercise plus DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	27 (1 studies) 12 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, publication bias	11.20 (2.81 to 19.61)	The mean systolic blood pressure reduction in the control groups was <b>2.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>12.10 higher</b> (6.48 to 17.73 higher)
<b>Diastolic blood pressure reduction</b>	27 (1 studies) 12 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, publication bias	5.57 (-1.55 to 12.70)	The mean systolic blood pressure reduction in the control groups was <b>3.50</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.10 higher</b> (1.85 to 12.35 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Aerobic exercise plus resistance training compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	169 (2 studies) 24-25 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	2.72 (-2.75 to 8.21)	The mean systolic blood pressure reduction in the control groups was <b>3.03</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.57 higher</b> (3.30 to 7.85 higher)
<b>Diastolic blood pressure reduction</b>	169 (2 studies) 24-25 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	3.15 (-0.44 to 6.75)	The mean systolic blood pressure reduction in the control groups was <b>0.12</b>	The mean systolic blood pressure reduction in the intervention groups was <b>3.41 higher</b> (2.33 to 4.50 higher)
<b>Comprehensive lifestyle modification compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	1440 (4 studies) 8-72 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	4.63 (1.32 to 7.94)	The mean systolic blood pressure reduction in the control groups was <b>2.75</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.37 higher</b> (4.52 to 10.23 higher)
<b>Diastolic blood pressure reduction</b>	1440 (4 studies) 8-72 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	3.38 (1.01 to 5.76)	The mean systolic blood pressure reduction in the control groups was <b>1.32</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.69 higher</b> (2.32 to 7.07 higher)

## Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Alcohol restriction compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	828 (4 studies) 12-96 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	4.23 (0.15 to 8.32)	The mean systolic blood pressure reduction in the control groups was <b>3.29</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.44 higher</b> (3.51 to 11.37 higher)
<b>Diastolic blood pressure reduction</b>	828 (4 studies) 12-96 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	1.81 (-0.96 to 4.59)	The mean systolic blood pressure reduction in the control groups was <b>1.95</b>	The mean systolic blood pressure reduction in the intervention groups was <b>3.86 higher</b> (1.25 to 6.46 higher)
<b>Yoga compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	606 (7 studies) 12 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias.	4.58 (1.76 to 7.37)	The mean systolic blood pressure reduction in the control groups was <b>1.93</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.78 higher</b> (1.57 to 9.98 higher)
<b>Diastolic blood pressure reduction</b>	606 (7 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, publication bias	3.37 (1.43 to 5.30)	The mean systolic blood pressure reduction in the control groups was <b>1.05</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.06 higher</b> (1.86 to 6.26 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>PMR compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	197 (3 studies) 6-48 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	1.31 (-2.72 to 5.33)	The mean systolic blood pressure reduction in the control groups was <b>-0.08</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.11 higher</b> (0.03 to 4.18 higher)
<b>Diastolic blood pressure reduction</b>	197 (3 studies) 6-48 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	1.24 (-1.61 to 4.12)	The mean systolic blood pressure reduction in the control groups was <b>0.14</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.66 higher</b> (1.55 to 3.78 higher)
<b>Resistance training compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	64 (2 studies) 12-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	2.32 (-2.09 to 6.71)	The mean systolic blood pressure reduction in the control groups was <b>2.67</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.17 higher</b> (-4.37 to 14.71 higher)
<b>Diastolic blood pressure reduction</b>	64 (2 studies) 12-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	1.84 (-1.16 to 4.83)	The mean systolic blood pressure reduction in the control groups was <b>2.71</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.72 higher</b> (-4.42 to 9.86 higher)



### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>MBSR compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	649 (2 studies) 8-72 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias.	1.10 (-3.26 to 5.47)	The mean systolic blood pressure reduction in the control groups was <b>2.25</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.38 higher</b> (-1.34 to 6.10 higher)
<b>Diastolic blood pressure reduction</b>	649 (2 studies) 8-72 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias.	0.49 (-2.63 to 3.63)	The mean diastolic blood pressure reduction in the control groups was <b>0.44</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>1.07 higher</b> (-1.34 to 3.49 higher)
<b>Salt restriction plus DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	60 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias.	3.80 (-3.94 to 11.55)	The mean systolic blood pressure reduction in the control groups was <b>6.90</b>	The mean systolic blood pressure reduction in the intervention groups was <b>10.70 higher</b> (7.31 to 14.09 higher)
<b>Diastolic blood pressure reduction</b>	60 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias.	2.39 (-3.51 to 8.31)	The mean systolic blood pressure reduction in the control groups was <b>3.10</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.50 higher</b> (2.68 to 8.32 higher)

### Nonpharmacologic interventions on blood pressure in adult with prehypertension to established hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Mean difference with usual care	Mean difference with intervention groups (95% CrI)
<b>Salt restriction combined with low-calorie diet plus exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	1238 (2 studies) 9 -144weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, inconsistency, publication bias.	5.25 (1.32 to 9.21)	The mean systolic blood pressure reduction in the control groups was <b>-0.23</b>	The mean systolic blood pressure reduction in the intervention groups was <b>5.40 higher</b> (-4.30 to 15.10 higher)
<b>Diastolic blood pressure reduction</b>	1238 (2 studies) 9 -144weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, inconsistency, publication bias.	3.81 (1.05 to 6.60)	The mean diastolic blood pressure reduction in the control groups was <b>1.78</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.19 higher</b> (1.39 to 6.98 higher)

The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% credible interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CrI).

CrI: Credible interval;

GRADE Working Group grades of evidence

**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

**Very low quality:** We are very uncertain about the estimate.

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates

low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S5. GRADE Summary of Findings Table with Quality of Evidence and Absolute Anticipated Benefits for All Nonpharmacologic Interventions over Usual Care in Patients with Hypertension.**

Using GRADE to rate quality of evidence from a network meta-analysis involved several steps: First, we rated quality of evidence for direct comparisons; second, we rated quality of evidence for indirect estimates (starting at the lowest rating of the two pairwise direct estimates that contribute as first-order loops to the indirect estimate, which can be rated down further for imprecision or Intransitivity), and then third, rating the quality of evidence for the network combining direct and indirect estimates. In this step, if direct and indirect estimates from second-order comparisons are similar, the higher of the ratings was assigned to the network meta-analysis estimates.

<b>Nonpharmacologic interventions on blood pressure in patients with hypertension</b>					
<b>Outcomes</b>	<b>No of Participants (studies) Follow up</b>	<b>Quality of the evidence (GRADE)</b>	<b>Relative effect (95% CrI)</b>	<b>Anticipated absolute effects</b>	
				<b>Risk difference with usual care</b>	<b>Risk difference with intervention groups (95% CrI)</b>
<b>Low-sodium and high-potassium salt compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	865 (5 studies) 4-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias	7.55 (4.24 to 10.87)	The mean systolic blood pressure reduction in the control groups was <b>1.38</b>	The mean systolic blood pressure reduction in the intervention groups was <b>8.83 higher</b> (5.46 to 12.21 higher)
<b>Diastolic blood pressure reduction</b>	865 (5 studies) 4-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias	3.81 (1.42 to 6.21)	The mean diastolic blood pressure reduction in the control groups was <b>0.53</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.25 higher</b> (3.14 to 5.36 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Aerobic exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	874 (23 studies) 6-64 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias, publication bias, greater precision.	6.11 (4.45 to 7.82)	The mean systolic blood pressure reduction in the control groups was <b>3.61</b>	The mean systolic blood pressure reduction in the intervention groups was <b>9.56 higher</b> (6.53 to 12.58 higher)
<b>Diastolic blood pressure reduction</b>	874 (23 studies) 6-64 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias, inconsistency, greater precision,	4.01 (2.74 to 5.30)	The mean diastolic blood pressure reduction in the control groups was <b>1.71</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>5.33 higher</b> (3.78 to 6.88 higher)
<b>Breathing-control compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	419 (8 studies) 8-24 weeks	⊕⊖⊖⊖ <b>LOW</b> due to risk of bias, publication bias	5.23 (2.07 to 8.43)	The mean systolic blood pressure reduction in the control groups was <b>4.20</b>	The mean systolic blood pressure reduction in the intervention groups was <b>9.45 higher</b> (7.39 to 11.52 higher)
<b>Diastolic blood pressure reduction</b>	419 (8 studies) 8-24 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to risk of bias.	3.24 (0.94 to 5.57)	The mean diastolic blood pressure reduction in the control groups was <b>1.67</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.99 higher</b> (2.96 to 7.02 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	262 (4 studies) 8 weeks	⊕⊕⊕⊕ <b>HIGH</b>	8.69 (5.23 to 12.19)	The mean systolic blood pressure reduction in the control groups was <b>1.30</b>	The mean systolic blood pressure reduction in the intervention groups was <b>9.19 higher</b> (7.33 to 11.05 higher)
<b>Diastolic blood pressure reduction</b>	262 (4 studies) 8 weeks	⊕⊕⊕⊕ <b>HIGH</b>	4.54 (1.91 to 7.18)	The mean diastolic blood pressure reduction in the control groups was <b>0.67</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.98 higher</b> (4.58 to 5.39 higher)
<b>Isometric training compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	109 (5 studies) 8-10 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	5.65 (1.47 to 9.87)	The mean systolic blood pressure reduction in the control groups was <b>0.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.89 higher</b> (2.01 to 11.78 higher)
<b>Diastolic blood pressure reduction</b>	109 (5 studies) 8-10 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	4.00 (0.99 to 7.00)	The mean diastolic blood pressure reduction in the control groups was <b>0.00</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.07 higher</b> (1.31 to 6.82 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Comprehensive lifestyle modification compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	844 (2 studies) 16-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	3.06 (-1.26 to 7.39)	The mean systolic blood pressure reduction in the control groups was <b>1.88</b>	The mean systolic blood pressure reduction in the intervention groups was <b>4.98 higher</b> (1.86 to 8.10 higher)
<b>Diastolic blood pressure reduction</b>	844 (2 studies) 16-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	1.73 (-1.72 to 5.19)	The mean diastolic blood pressure reduction in the control groups was <b>0.43</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>2.17 higher</b> (1.13 to 3.21 higher)
<b>Meditation compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	275 (3 studies) 8-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	6.55 (2.27 to 10.86)	The mean systolic blood pressure reduction in the control groups was <b>0.94</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.51 higher</b> (3.68 to 11.33 higher)
<b>Diastolic blood pressure reduction</b>	275 (3 studies) 8-48 weeks	⊕⊕⊕⊕ <b>HIGH</b>	4.09 (0.96 to 7.24)	The mean diastolic blood pressure reduction in the control groups was <b>0.99</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.74 higher</b> (2.74 to 6.75 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Salt restriction compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	2003 (26 studies) 4-48 weeks	⊕⊕⊕⊕ <b>HIGH</b> due to risk of bias, greater precision	5.74 (4.18 to 7.30)	The mean systolic blood pressure reduction in the control groups was <b>0.55</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.16 higher</b> (4.45 to 7.87 higher)
<b>Diastolic blood pressure reduction</b>	2003 (26 studies) 4-48 weeks	⊕⊕⊕⊕ <b>HIGH</b> due to risk of bias, greater precision	2.73 (1.58 to 3.87)	The mean diastolic blood pressure reduction in the control groups was <b>1.06</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>3.66 higher</b> (2.51 to 4.82 higher)
<b>Alcohol restriction compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	517 (4 studies) 12-96 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	4.96 (0.98 to 8.95)	The mean systolic blood pressure reduction in the control groups was <b>2.78</b>	The mean systolic blood pressure reduction in the intervention groups was <b>7.86 higher</b> (4.32 to 11.39 higher)
<b>Diastolic blood pressure reduction</b>	517 (4 studies) 12-96 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision	1.85 (-1.04 to 4.75)	The mean diastolic blood pressure reduction in the control groups was <b>1.94</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>3.88 higher</b> (1.08 to 6.69 higher)



## Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Low-calorie diet compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	189 (3 studies) 24-25 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	7.78 (3.53 to 11.91)	The mean systolic blood pressure reduction in the control groups was <b>3.78</b>	The mean systolic blood pressure reduction in the intervention groups was <b>11.16 higher</b> (7.47 to 14.86 higher)
<b>Diastolic blood pressure reduction</b>	189 (3 studies) 24-25 weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to inconsistency	4.98 (2.03 to 7.89)	The mean diastolic blood pressure in the control groups was <b>1.91</b>	The mean diastolic blood pressure in the intervention groups was <b>6.72 higher</b> (1.60 to 11.85 higher)
<b>Aerobic exercise plus DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	27 (1 study) 8 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, publication bias	10.92 (2.79 to 19.10)	The mean systolic blood pressure reduction in the control groups was <b>2.00</b>	The mean systolic blood pressure reduction in the intervention groups was <b>12.10 higher</b> (6.48 to 17.73 higher)
<b>Diastolic blood pressure reduction</b>	27 (1 study) 8 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to imprecision, publication bias	5.39 (-1.84 to 12.57)	The mean diastolic blood pressure reduction in the control groups was <b>3.50</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>7.10 higher</b> (1.85 to 13.35 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Salt restriction plus DASH compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	60 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	3.79 (-3.57 to 11.15)	The mean systolic blood pressure reduction in the control groups was <b>6.90</b>	The mean systolic blood pressure reduction in the intervention groups was <b>10.70 higher</b> (7.31 to 14.09 higher)
<b>Diastolic blood pressure reduction</b>	60 (1 studies) 8 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	2.41 (-3.69 to 8.47)	The mean diastolic blood pressure reduction in the control groups was <b>3.10</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>5.50 higher</b> (2.68 to 8.32 higher)
<b>MBSR compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	87 (1 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	-0.01 (-6.62 to 6.60)	The mean diastolic blood pressure reduction in the control groups was <b>0.41</b>	The mean systolic blood pressure reduction in the intervention groups was <b>0.40 higher</b> (-1.54 to 2.34 higher)
<b>Diastolic blood pressure reduction</b>	87 (1 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	-0.44 (-5.56 to 4.67)	The mean diastolic blood pressure reduction in the control groups was <b>0.40</b>	The mean systolic blood pressure reduction in the intervention groups was <b>-0.04 higher</b> (-1.45 to 1.37 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>PMR compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	197 (3 studies) 6 - 48weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	2.48 (-1.67 to 6.63)	The mean systolic blood pressure reduction in the control groups was <b>-0.08</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.11 higher</b> (0.03 to 4.18 higher)
<b>Diastolic blood pressure reduction</b>	197 (3 studies) 6 - 48weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	2.11 (-1.08 to 5.33)	The mean diastolic blood pressure reduction in the control groups was <b>0.14</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>2.66 higher</b> (1.55 to 3.78 higher)
<b>Resistance training compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	64 (2 studies) 12 - 24weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	1.74 (-3.56 to 6.98)	The mean systolic blood pressure reduction in the control groups was <b>2.67</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.41 higher</b> (-5.35 to 10.17 higher)
<b>Diastolic blood pressure reduction</b>	64 (2 studies) 12 - 24weeks	⊕⊕⊕⊖ <b>MODERATE</b> due to imprecision.	0.83 (-3.35 to 4.95)	The mean systolic blood pressure reduction in the control groups was <b>2.71</b>	The mean systolic blood pressure reduction in the intervention groups was <b>2.72 higher</b> (-4.26 to 9.70 higher)

### Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Yoga compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	399 (4 studies) 12 weeks	⊕⊖⊖⊖ <b>VERY LOW</b> due to risk of bias, imprecision, inconsistency	7.28 (3.17 to 11.20)	The mean systolic blood pressure reduction in the control groups was <b>0.75</b>	The mean systolic blood pressure reduction in the intervention groups was <b>6.99 higher</b> (0.46 to 13.53 higher)
<b>Diastolic blood pressure reduction</b>	399 (4 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to risk of bias, inconsistency	4.47 (1.54 to 7.33)	The mean diastolic blood pressure reduction in the control groups was <b>0.43</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>4.19 higher</b> (0.30 to 8.07 higher)
<b>Low-calorie diet plus exercise compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	49 (1 studies) 52 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	-7.01 (-17.34 to 3.33)	The mean diastolic blood pressure reduction in the control groups was <b>15.00</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>8.00 higher</b> (1.30 to 14.70 higher)
<b>Diastolic blood pressure reduction</b>	49 (1 studies) 52 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	0.01 (-6.21 to 6.19)	The mean diastolic blood pressure reduction in the control groups was <b>11.01</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>11.00 higher</b> (7.71 to 14.29 higher)

## Nonpharmacologic interventions on blood pressure in patients with hypertension

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CrI)	Anticipated absolute effects	
				Risk difference with usual care	Risk difference with intervention groups (95% CrI)
<b>Tai Chi compared to usual care</b>					
<b>Systolic blood pressure reduction</b>	198 (1 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	12.75 (6.54 to 18.98)	The mean systolic blood pressure reduction in the control groups was <b>-0.01</b>	The mean systolic blood pressure reduction in the intervention groups was <b>12.74 higher</b> (0.46 to 13.53 higher)
<b>Diastolic blood pressure reduction</b>	198 (1 studies) 12 weeks	⊕⊕⊖⊖ <b>LOW</b> due to imprecision, publication bias	7.81 (2.67 to 12.93)	The mean diastolic blood pressure reduction in the control groups was <b>-0.89</b>	The mean diastolic blood pressure reduction in the intervention groups was <b>6.92 higher</b> (0.30 to 8.07 higher)

The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% credible interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CrI).

**CI:** Credible interval;

GRADE Working Group grades of evidence

**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

**Very low quality:** We are very uncertain about the estimate.

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S6. Statistical Heterogeneity ( $I^2$ ) and Consistency ( $P$ ) for All Pairwise Comparisons. (A) Adults with Prehypertension to Established Hypertension.**

Pairwise comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )
<b>Compared with Usual care</b>						
Low-sodium salt	6	65.6%	NA	6	40.1%	NA
Alcohol restriction	4	73.0%	NA	4	64.1%	NA
Breathing-control	8	10.4%	0.86	8	16.9%	0.63
Meditation	4	49.7%	0.85	4	49.8%	0.68
Qigong	1	0.0%	NA	1	0.0%	NA
Yoga	7	90.0%	0.62	7	85.7%	0.43
PMR	3	0.0%	0.32	3	44.1%	0.52
MBSR	2	22.2%	0.38	2	0.0%	0.66
DASH	9	77.6%	NA	9	49.5%	NA
Salt restriction	30	77.1%	NA	30	63.2%	NA
Diet	4	85.5%	0.21	4	96.6%	0.54
Exercise	3	0.0%	0.94	3	0.0%	0.33
Diet plus exercise	6	80.9%	0.24	6	79.8%	0.59
Aerobic exercise	26	68.7%	0.09	26	82.3%	0.43
Tai chi	2	92.0%	0.01	2	80.2%	0.06
Resistance training	2	4.1%	0.47	2	0.0%	0.36
Isometric training	5	40.0%	NA	5	0.0%	NA
Lifestyle	4	91.4%	NA	4	95.8%	NA
Aerobic exercise+DASH	1	0.0%	NA	1	0.0%	NA

Pairwise comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )
<b>Compared with Usual care</b>						
Salt restriction+DASH	1	0.0%	NA	1	0.0%	NA
Salt restriction+diet plus exercise	2	94.8%	0.73	2	94.2%	0.29
Aerobic exercise+resistance training	2	49.5%	NA	2	39.3%	NA
<b>Compared with Meditation</b>						
Breathing-control	1	0.0%	0.86	1	0.0%	0.60
PMR	2	0.0%	0.88	2	46.0%	0.14
<b>Compared with Yoga</b>						
Salt restriction	1	0.0%	0.60	1	0.0%	0.86
Aerobic exercise	1	8.6%	0.38	1	56.1%	0.28
Resistance training	1	0.0%	0.55	1	16.1%	0.40
<b>Compared with PMR</b>						
MBSR	1	12.6%	0.38	1	0.0%	0.69
<b>Compared with Salt restriction</b>						
Diet plus exercise	1	71.2%	0.68	1	0.0%	0.83
Aerobic exercise	1	0.0%	0.62	1	3.3%	0.36
Salt restriction+diet plus exercise	1	0.0%	0.73	1	75.7%	0.40
<b>Compared with Diet</b>						
Exercise	2	0.0%	0.29	2	0.0%	0.92
Diet plus exercise	2	0.0%	0.29	2	0.0%	0.40
<b>Compared with Diet plus exercise</b>						
Exercise	4	0.0%	0.40	4	0.0%	0.21

Pairwise comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )
<b>Compared with Diet plus exercise</b>						
Salt restriction+diet plus exercise	2	41.1%	0.33	2	59.6%	0.93
<b>Compared with Aerobic exercise</b>						
Tai chi	1	93.6%	0.02	1	89.9%	0.06
Resistance training	3	37.4%	0.39	3	61.8%	0.33
Aerobic exercise+DASH	1	0.0%	NA	1	0.0%	NA



**Table S6. Statistical Heterogeneity ( $I^2$ ) and Consistency ( $P$ ) for All Pairwise Comparisons. (B) Patients with Hypertension.**

Pairwise comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )
<b>Compared with Usual care</b>						
Low-sodium salt	5	67.9%	NA	5	48.0%	NA
Alcohol restriction	4	45.0%	NA	4	56.7%	NA
Breathing-control	8	11.1%	NA	8	20.4%	NA
Meditation	3	46.5%	NA	3	31.3%	NA
Yoga	4	91.6%	NA	4	87.6%	NA
PMR	3	0.0%	NA	3	33.1%	NA
MBSR	1	0.0%	NA	1	0.0%	NA
DASH	4	82.3%	NA	4	0.0%	NA
Salt restriction	26	45.3%	NA	26	45.5%	NA
Diet	3	82.8%	NA	3	98.0%	NA
Diet plus exercise	1	0.0%	NA	1	0.0%	NA
Aerobic exercise	23	69.4%	NA	23	84.2%	NA
Tai Chi	1	0.0%	NA	1	0.0%	NA
Resistance training	2	24.0%	NA	2	0.0%	NA
Isometric training	5	36.2%	NA	5	0.0%	NA
Lifestyle	2	51.1%	NA	2	0.0%	NA
Aerobic exercise+DASH	1	0.0%	NA	1	0.0%	NA
Salt restriction+DASH	1	0.0%	NA	1	0.0%	NA
<b>Compared with Meditation</b>						
PMR	2	0.0%	0.93	2	0.0%	0.26

Pairwise comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )	No. of studies	Heterogeneity ( $I^2$ )	Consistency ( $P$ )
<b>Compared with Diet plus exercise</b>						
Salt restriction+diet plus exercise	1	0.0%	NA	1	0.0%	NA
<b>Compared with Aerobic exercise</b>						
Resistance training	2	61.9%	NA	2	72.1%	NA
Aerobic exercise+DASH	1	0.0%	NA	1	0.0%	NA

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S7. Results of Sensitivity Analyses. (A) Based on Omitting Studies with High Risk of Bias.**

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Low-sodium salt vs Usual care</b>						
Overall analysis	6	8.21 (4.99 to 11.43)	0.90	6	3.96 (1.82 to 6.12)	0.79
Omit low quality studies	5	8.41 (4.95 to 11.84)		5	3.75 (1.42 to 6.11)	
<b>Alcohol restriction vs Usual care</b>						
Overall analysis	4	4.23 (0.15 to 8.32)	1.00	4	1.82 (-0.94 to 4.56)	1.00
Omit low quality studies	4	4.24 (0.06 to 8.41)		4	1.83 (-0.96 to 4.60)	
<b>Breathing-control vs Usual care</b>						
Overall analysis	8	5.39 (2.30 to 8.49)	0.98	8	3.42 (1.26 to 5.57)	0.93
Omit low quality studies	7	5.39 (2.11 to 8.68)		7	3.28 (1.02 to 5.54)	
<b>Meditation vs Usual care</b>						
Overall analysis	4	5.02 (1.42 to 8.65)	1.00	4	2.46 (-0.03 to 4.93)	1.00
Omit low quality studies	4	5.03 (1.38 to 8.68)		4	2.43 (-0.06 to 4.92)	
<b>Qigong vs Usual care</b>						
Overall analysis	1	3.30 (-4.35 to 10.97)	0.99	1	6.72 (0.73 to 12.75)	0.99
Omit low quality studies	1	3.31 (-4.48 to 11.12)		1	6.70 (0.64 to 12.71)	
<b>Yoga vs Usual care</b>						
Overall analysis	7	4.59 (1.76 to 7.37)	0.76	7	3.37 (1.44 to 5.29)	0.93
Omit low quality studies	5	5.33 (2.17 to 8.45)		5	3.51 (1.36 to 5.64)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>PMR vs Usual care</b>						
Overall analysis	3	1.31 (-2.72 to 5.33)	1.00	3	1.25 (-1.61 to 4.12)	1.00
Omit low quality studies	3	1.32 (-2.76 to 5.40)		3	1.23 (-1.62 to 4.12)	
<b>MBSR vs Usual care</b>						
Overall analysis	2	1.09 (-3.26 to 5.47)	1.00	2	0.50 (-2.64 to 3.64)	1.00
Omit low quality studies	2	1.09 (-3.47 to 5.62)		2	0.48 (-2.66 to 3.63)	
<b>DASH vs Usual care</b>						
Overall analysis	9	6.96 (4.50 to 9.46)	1.00	9	3.54 (1.80 to 5.30)	1.00
Omit low quality studies	9	6.98 (4.44 to 9.53)		9	3.53 (1.77 to 5.29)	
<b>Salt restriction vs Usual care</b>						
Overall analysis	30	5.41 (3.96 to 6.87)	0.88	30	2.62 (1.65 to 3.61)	0.94
Omit low quality studies	29	5.40 (3.87 to 6.91)		29	2.69 (1.70 to 3.69)	
<b>Diet vs Usual care</b>						
Overall analysis	4	6.51 (2.78 to 10.17)	1.00	4	4.56 (2.23 to 6.88)	1.00
Omit low quality studies	4	6.33 (2.49 to 10.08)		4	4.36 (1.99 to 6.73)	
<b>Exercise vs Usual care</b>						
Overall analysis	3	1.14 (-3.04 to 5.35)	0.56	3	2.75 (-0.03 to 5.54)	0.68
Omit low quality studies	2	0.52 (-4.18 to 5.32)		2	2.15 (-1.02 to 5.29)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Diet plus exercise vs Usual care</b>						
Overall analysis	6	4.11 (1.22 to 7.03)	0.82	6	3.37 (1.41 to 5.35)	0.72
Omit low quality studies	5	3.75 (0.68 to 6.81)		5	2.93 (0.85 to 5.01)	
<b>Aerobic exercise vs Usual care</b>						
Overall analysis	26	6.60 (4.98 to 8.23)	0.76	25	4.44 (3.30 to 5.59)	0.76
Omit low quality studies	23	6.78 (5.04 to 8.52)		22	4.67 (3.47 to 5.86)	
<b>Tai Chi vs Usual care</b>						
Overall analysis	2	13.47 (9.30 to 17.64)	1.00	1	7.76 (4.73 to 10.81)	0.89
Omit low quality studies	2	13.54 (9.27 to 17.79)		1	7.84 (4.79 to 10.92)	
<b>Resistance training vs Usual care</b>						
Overall analysis	2	2.32 (-2.09 to 6.71)	0.99	2	1.82 (-1.22 to 4.82)	0.92
Omit low quality studies	2	2.54 (-1.87 to 7.05)		2	1.99 (-1.00 to 4.96)	
<b>Isometric training vs Usual care</b>						
Overall analysis	5	5.76 (1.41 to 10.16)	1.00	3	4.00 (1.06 to 6.94)	1.00
Omit low quality studies	5	5.75 (1.37 to 10.23)		3	4.02 (1.06 to 6.93)	
<b>Lifestyle vs Usual care</b>						
Overall analysis	4	4.62 (1.32 to 7.94)	1.00	4	3.37 (1.03 to 5.77)	1.00
Omit low quality studies	4	4.63 (1.25 to 8.05)		4	3.38 (1.00 to 5.76)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Aerobic exercise+DASH vs Usual care</b>						
Overall analysis	1	11.20 (2.81 to 19.61)	0.99	1	5.57 (-1.52 to 12.74)	0.98
Omit low quality studies	1	11.22 (2.79 to 19.80)		1	5.67 (-1.36 to 12.75)	
<b>Salt restriction+DASH vs Usual care</b>						
Overall analysis	1	3.79 (-3.94 to 11.55)	0.99	1	2.42 (-3.47 to 8.37)	0.99
Omit low quality studies	1	3.83 (-4.05 to 11.64)		1	2.37 (-3.58 to 8.28)	
<b>Salt restriction+diet plus exercise vs Usual care</b>						
Overall analysis	2	5.25 (1.32 to 9.21)	0.95	2	3.80 (1.09 to 6.60)	0.95
Omit low quality studies	2	5.12 (1.09 to 9.26)		2	3.64 (0.86 to 6.41)	
<b>Aerobic exercise+resistance training vs Usual care</b>						
Overall analysis	2	2.72 (-2.75 to 8.21)	1.00	2	3.16 (-0.41 to 6.74)	0.99
Omit low quality studies	2	2.74 (-2.78 to 8.32)		2	3.15 (-0.43 to 6.74)	
<b>Meditation vs Breathing-control</b>						
Overall analysis	1	-0.36 (-4.73 to 4.02)	1.00	1	-0.96 (-3.98 to 2.07)	1.00
Omit low quality studies	1	-0.36 (-4.88 to 4.10)		1	-0.85 (-3.91 to 2.26)	
<b>PMR vs Meditation</b>						
Overall analysis	2	-3.70 (-8.27 to 0.85)	1.00	2	-1.23 (-4.36 to 1.90)	1.00
Omit low quality studies	2	-3.70 (-8.37 to 0.92)		2	-1.20 (-4.33 to 1.96)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Salt restriction vs Yoga</b>						
Overall analysis	1	0.83 (-2.27 to 3.99)	0.45	1	-0.74 (-2.88 to 1.38)	1.00
Omit low quality studies	1	0.06 (-3.30 to 3.50)		1	-0.82(-3.15 to 1.54)	
<b>Aerobic exercise vs Yoga</b>						
Overall analysis	1	2.02 (-1.09 to 5.19)	0.66	1	1.07 (-1.08 to 3.25)	0.97
Omit low quality studies	1	1.44 (-1.98 to 4.95)		1	1.16 (-1.19 to 3.54)	
<b>Resistance training vs Yoga</b>						
Overall analysis	1	-2.27 (-7.17 to 2.64)	0.44	1	-1.55 (-4.83 to 1.73)	0.99
Omit low quality studies	1	-2.77 (-7.75 to 2.32)		1	-1.54 (-4.91 to 1.82)	
<b>MBSR vs PMR</b>						
Overall analysis	1	-0.23 (-5.66 to 5.29)	0.99	1	-0.74 (-4.67 to 3.21)	1.00
Omit low quality studies	1	-0.20 (-5.86 to 5.34)		1	-0.76 (-4.70 to 3.18)	
<b>Diet plus exercise vs Salt restriction</b>						
Overall analysis	1	-1.31 (-4.46 to 1.85)	0.85	1	0.74 (-1.38 to 2.89)	1.00
Omit low quality studies	1	-1.64 (-4.96 to 1.67)		1	0.23 (-2.00 to 2.48)	
<b>Aerobic exercise vs Salt restriction</b>						
Overall analysis	1	1.18 (-0.97 to 3.34)	0.92	1	1.82 (0.33 to 3.30)	0.96
Omit low quality studies	1	1.38 (-0.89 to 3.69)		1	1.97 (0.43 to 3.53)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Salt restriction+diet plus exercise vs Salt restriction</b>						
Overall analysis	1	-0.16 (-4.19 to 3.92)	0.92	1	1.19 (-1.65 to 4.07)	1.00
Omit low quality studies	1	-0.28 (-4.43 to 3.99)		1	0.94 (-1.92 to 3.81)	
<b>Exercise vs Diet</b>						
Overall analysis	2	-5.37 (-10.23 to -0.52)	0.84	2	-1.81 (-4.93 to 1.34)	1.00
Omit low quality studies	2	-5.80 (-10.94 to -0.50)		2	-2.21 (-5.55 to 1.10)	
<b>Diet plus exercise vs Diet</b>						
Overall analysis	2	-2.41 (-6.57 to 1.86)	0.94	2	-1.19 (-3.80 to 1.45)	1.00
Omit low quality studies	2	-2.58 (-6.88 to 1.79)		2	-1.44 (-4.11 to 1.27)	
<b>Diet plus exercise vs Exercise</b>						
Overall analysis	4	2.97 (-0.92 to 6.91)	0.78	4	0.62 (-2.00 to 3.24)	1.00
Omit low quality studies	3	3.19 (-1.24 to 7.60)		3	0.77 (-2.16 to 3.74)	
<b>Salt restriction+diet plus exercise vs Diet plus exercise</b>						
Overall analysis	2	1.14 (-2.86 to 5.21)	0.95	2	0.45 (-2.38 to 3.30)	1.00
Omit low quality studies	2	1.36 (-2.76 to 5.59)		2	0.71 (-2.19 to 3.55)	
<b>Tai Chi vs Aerobic exercise</b>						
Overall analysis	1	6.89 (2.58 to 11.19)	0.99	1	3.32 (0.21 to 6.42)	0.99
Omit low quality studies	1	6.77 (2.34 to 11.17)		1	3.17 (0.06 to 6.34)	



Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Resistance training vs Aerobic exercise</b>						
Overall analysis	3	-4.28 (-8.75 to 0.17)	1.00	3	-2.62 (-5.65 to 0.34)	0.95
Omit low quality studies	3	-4.22 (-8.71 to 0.31)		3	-2.69 (-5.68 to 0.27)	
<b>Aerobic exercise+DASH vs Aerobic exercise</b>						
Overall analysis	1	4.58 (-3.90 to 12.98)	1.00	1	1.14 (-5.94 to 8.27)	0.99
Omit low quality studies	1	4.47 (-3.94 to 12.95)		1	1.01 (-6.02 to 8.08)	

**Table S7. Results of Sensitivity Analyses. (B) Based on Omitting Studies Started before 1999.**

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Low-sodium salt vs Usual care</b>						
Overall analysis	6	8.21 (4.99 to 11.43)	0.61	6	3.96 (1.82 to 6.12)	0.75
Started after 1998	4	9.85 (5.47 to 14.26)		4	4.72 (1.66 to 7.80)	
<b>Alcohol restriction vs Usual care</b>						
Overall analysis	4	4.23 (0.15 to 8.32)	0.73	4	1.82 (-0.94 to 4.56)	0.53
Started after 1998	2	4.82 (-2.23 to 11.81)		2	3.16 (-1.69 to 7.99)	
<b>Breathing-control vs Usual care</b>						
Overall analysis	8	5.39 (2.30 to 8.49)	0.80	8	3.42 (1.26 to 5.57)	0.80
Started after 1998	8	5.04 (1.75 to 8.38)		8	3.24 (0.90 to 5.63)	
<b>Meditation vs Usual care</b>						
Overall analysis	4	5.02 (1.42 to 8.65)	0.48	4	2.46 (-0.03 to 4.93)	0.53
Started after 1998	2	2.26 (-2.83 to 7.39)		2	0.78 (-2.88 to 4.46)	
<b>Qigong vs Usual care</b>						
Overall analysis	1	3.30 (-4.35 to 10.97)	0.97	1	6.72 (0.73 to 12.75)	0.98
Started after 1998	1	3.27 (-4.95 to 11.45)		1	6.74 (0.15 to 13.36)	
<b>Yoga vs Usual care</b>						
Overall analysis	7	4.59 (1.76 to 7.37)	0.93	7	3.37 (1.44 to 5.29)	0.89
Started after 1998	7	4.76 (1.65 to 7.81)		7	3.56 (1.37 to 5.77)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>PMR vs Usual care</b>						
Overall analysis	3	1.31 (-2.72 to 5.33)	0.55	3	1.25 (-1.61 to 4.12)	0.44
Started after 1998	1	-1.13 (-7.77 to 5.46)		1	-0.93 (-5.69 to 3.87)	
<b>MBSR vs Usual care</b>						
Overall analysis	2	1.09 (-3.26 to 5.47)	0.94	2	0.50 (-2.64 to 3.64)	0.81
Started after 1998	1	0.94 (-5.71 to 7.55)		1	-0.38 (-5.28 to 4.55)	
<b>DASH vs Usual care</b>						
Overall analysis	9	6.96 (4.50 to 9.46)	0.56	9	3.54 (1.80 to 5.30)	0.58
Started after 1998	6	6.43 (3.01 to 9.80)		6	3.15 (0.65 to 5.65)	
<b>Salt restriction vs Usual care</b>						
Overall analysis	30	5.41 (3.96 to 6.87)	0.45	30	2.62 (1.65 to 3.61)	0.75
Started after 1998	9	7.16 (4.33 to 10.02)		9	3.29 (1.26 to 5.31)	
<b>Aerobic exercise vs Usual care</b>						
Overall analysis	26	6.60 (4.98 to 8.23)	0.71	25	4.44 (3.30 to 5.59)	0.87
Started after 1998	15	7.07 (5.06 to 9.11)		14	5.11 (3.59 to 6.61)	
<b>Tai Chi vs Usual care</b>						
Overall analysis	2	13.47 (9.30 to 17.64)	0.78	1	7.76 (4.73 to 10.81)	0.84
Started after 1998	2	13.58 (9.00 to 18.13)		1	7.99 (4.49 to 11.48)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Isometric training vs Usual care</b>						
Overall analysis	5	5.76 (1.41 to 10.16)	0.88	3	4.00 (1.06 to 6.94)	0.93
Started after 1998	4	5.23 (0.41 to 10.18)		2	3.98 (0.46 to 7.46)	
<b>Lifestyle vs Usual care</b>						
Overall analysis	4	4.62 (1.32 to 7.94)	0.77	4	3.37 (1.03 to 5.77)	0.72
Started after 1998	4	4.64 (1.04 to 8.33)		4	3.39 (0.61 to 6.19)	
<b>Aerobic exercise+DASH vs Usual care</b>						
Overall analysis	1	11.20 (2.81 to 19.61)	0.96	1	5.57 (-1.52 to 12.74)	1.00
Started after 1998	1	11.48 (2.65 to 20.39)		1	5.93 (-1.61 to 13.41)	
<b>Salt restriction+diet plus exercise vs Usual care</b>						
Overall analysis	2	5.25 (1.32 to 9.21)	0.23	2	3.80 (1.09 to 6.60)	0.74
Started after 1998	1	9.38 (1.03 to 17.80)		1	5.31 (-0.90 to 11.40)	
<b>Salt restriction+DASH vs Usual care</b>						
Overall analysis	1	3.79 (-3.94 to 11.55)	0.96	1	2.42 (-3.47 to 8.37)	0.96
Started after 1998	1	3.81 (-4.54 to 12.12)		1	2.40 (-4.18 to 8.88)	
<b>Aerobic exercise+resistance training vs Usual care</b>						
Overall analysis	2	2.72 (-2.75 to 8.21)	0.90	2	3.16 (-0.41 to 6.74)	0.90
Started after 1998	2	2.70 (-3.10 to 8.70)		2	3.17 (-0.91 to 7.27)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Meditation vs Breathing-control</b>						
Overall analysis	1	-0.36 (-4.73 to 4.02)	0.57	1	-0.96 (-3.98 to 2.07)	0.69
Started after 1998	1	-2.79 (-8.22 to 2.70)		1	-2.46 (-6.45 to 1.51)	
<b>PMR vs Meditation</b>						
Overall analysis	2	-3.70 (-8.27 to 0.85)	0.90	2	-1.23 (-4.36 to 1.90)	0.88
Started after 1998	1	-3.39 (-10.44 to 3.56)		1	-1.70 (-6.71 to 3.28)	
<b>Salt restriction vs Yoga</b>						
Overall analysis	1	0.83 (-2.27 to 3.99)	0.68	1	-0.74 (-2.88 to 1.38)	0.73
Started after 1998	1	2.41 (-1.60 to 6.49)		1	-0.28 (-3.20 to 2.61)	
<b>Aerobic exercise vs Yoga</b>						
Overall analysis	1	2.02 (-1.09 to 5.19)	0.99	1	1.07 (-1.08 to 3.25)	0.90
Started after 1998	1	2.31 (-1.21 to 5.90)		1	1.55 (-1.04 to 4.10)	
<b>Resistance training vs Yoga</b>						
Overall analysis	1	-2.27 (-7.17 to 2.64)	0.65	1	-1.55 (-4.83 to 1.73)	0.57
Started after 1998	1	-1.55 (-9.11 to 5.99)		1	-0.46 (-5.27 to 4.30)	
<b>MBSR vs PMR</b>						
Overall analysis	1	-0.23 (-5.66 to 5.29)	0.69	1	-0.74 (-4.67 to 3.21)	0.70
Started after 1998	1	2.08 (-5.63 to 9.82)		1	0.55 (-5.18 to 6.29)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Aerobic exercise vs Salt restriction</b>						
Overall analysis	1	1.18 (-0.97 to 3.34)	0.42	1	1.82 (0.33 to 3.30)	0.53
Started after 1998	1	-0.10 (-3.52 to 3.35)		1	1.81 (-0.65 to 4.29)	
<b>Tai Chi vs Aerobic exercise</b>						
Overall analysis	1	6.89 (2.58 to 11.19)	0.81	1	3.32 (0.21 to 6.42)	0.82
Started after 1998	1	6.53 (1.77 to 11.24)		1	2.88 (-0.70 to 6.51)	
<b>Resistance training vs Aerobic exercise</b>						
Overall analysis	3	-4.28 (-8.75 to 0.17)	0.47	3	-2.62 (-5.65 to 0.34)	0.51
Started after 1998	2	-3.87 (-11.46 to 3.76)		2	-2.02 (-6.82 to 2.73)	
<b>Aerobic exercise+DASH vs Aerobic exercise</b>						
Overall analysis	1	4.58 (-3.90 to 12.98)	0.93	1	1.14 (-5.94 to 8.27)	0.94
Started after 1998	1	4.40 (-4.42 to 13.21)		1	0.84 (-6.68 to 8.26)	

**Table S7. Results of Sensitivity Analyses. (C) Based on Omitting Studies with Outcomes of Home BP/24h Ambulatory BP.**

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Low-sodium salt vs Usual care</b>						
Overall analysis	6	8.21 (4.99 to 11.43)	0.94	6	3.96 (1.82 to 6.12)	0.90
Omit studies whose outcomes were HBP/24hABP	5	8.43 (4.93 to 11.86)		5	3.77 (1.35 to 6.17)	
<b>Alcohol restriction vs Usual care</b>						
Overall analysis	4	4.23 (0.15 to 8.32)	0.99	4	1.82 (-0.94 to 4.56)	0.99
Omit studies whose outcomes were HBP/24hABP	4	4.24 (0.08 to 8.43)		4	1.83 (-1.03 to 4.66)	
<b>Breathing-control vs Usual care</b>						
Overall analysis	8	5.39 (2.30 to 8.49)	0.83	8	3.42 (1.26 to 5.57)	0.82
Omit studies whose outcomes were HBP/24hABP	7	5.06 (1.57 to 8.57)		7	3.15 (0.80 to 5.51)	
<b>Meditation vs Usual care</b>						
Overall analysis	4	5.02 (1.42 to 8.65)	0.90	4	2.46 (-0.03 to 4.93)	0.82
Omit studies whose outcomes were HBP/24hABP	4	5.22 (1.15 to 9.26)		4	2.74 (-0.03 to 5.52)	
<b>Qigong vs Usual care</b>						
Overall analysis	1	3.30 (-4.35 to 10.97)	0.94	1	6.72 (0.73 to 12.75)	0.95
Omit studies whose outcomes were HBP/24hABP	1	3.36 (-4.65 to 11.11)		1	6.71 (0.53 to 12.90)	
<b>Yoga vs Usual care</b>						
Overall analysis	7	4.59 (1.76 to 7.37)	0.99	7	3.37 (1.44 to 5.29)	0.86
Omit studies whose outcomes were HBP/24hABP	6	4.63 (1.49 to 7.73)		6	3.16 (0.98 to 5.32)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>PMR vs Usual care</b>						
Overall analysis	3	1.31 (-2.72 to 5.33)	0.96	3	1.25 (-1.61 to 4.12)	0.91
Omit studies whose outcomes were HBP/24hABP	3	1.47 (-2.70 to 5.62)		3	1.42 (-1.54 to 4.41)	
<b>MBSR vs Usual care</b>						
Overall analysis	2	1.09 (-3.26 to 5.47)	0.84	2	0.50 (-2.64 to 3.64)	0.80
Omit studies whose outcomes were HBP/24hABP	1	1.82 (-3.90 to 7.62)		1	1.14 (-3.06 to 5.37)	
<b>DASH vs Usual care</b>						
Overall analysis	9	6.96 (4.50 to 9.46)	0.84	9	3.54 (1.80 to 5.30)	0.86
Omit studies whose outcomes were HBP/24hABP	8	6.58 (3.88 to 9.29)		8	3.30 (1.37 to 5.19)	
<b>Salt restriction vs Usual care</b>						
Overall analysis	30	5.41 (3.96 to 6.87)	0.99	30	2.62 (1.65 to 3.61)	0.99
Omit studies whose outcomes were HBP/24hABP	30	5.39 (3.91 to 6.89)		30	2.62 (1.59 to 3.64)	
<b>Diet vs Usual care</b>						
Overall analysis	4	6.51 (2.78 to 10.17)	0.97	4	4.56 (2.23 to 6.88)	0.64
Omit studies whose outcomes were HBP/24hABP	3	6.61 (2.51 to 10.69)		3	5.39 (2.65 to 8.11)	
<b>Exercise vs Usual care</b>						
Overall analysis	3	1.14 (-3.04 to 5.35)	0.97	3	2.75 (-0.03 to 5.54)	0.91
Omit studies whose outcomes were HBP/24hABP	3	1.01 (-3.27 to 5.33)		3	2.97 (0.14 to 5.88)	



Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Diet plus exercise vs Usual care</b>						
Overall analysis	6	4.11 (1.22 to 7.03)	0.90	6	3.37 (1.41 to 5.35)	0.94
Omit studies whose outcomes were HBP/24hABP	6	3.84 (0.80 to 6.88)		6	3.44 (1.39 to 5.52)	
<b>Aerobic exercise vs Usual care</b>						
Overall analysis	26	6.60 (4.98 to 8.23)	0.64	25	4.44 (3.30 to 5.59)	0.77
Omit studies whose outcomes were HBP/24hABP	23	7.11 (5.38 to 8.88)		22	4.68 (3.44 to 5.91)	
<b>Tai Chi vs Usual care</b>						
Overall analysis	2	13.47 (9.30 to 17.64)	0.94	1	7.76 (4.73 to 10.81)	0.96
Omit studies whose outcomes were HBP/24hABP	2	13.64 (9.37 to 17.87)		1	7.83 (4.67 to 10.99)	
<b>Resistance training vs Usual care</b>						
Overall analysis	2	2.32 (-2.09 to 6.71)	0.74	2	1.82 (-1.22 to 4.82)	0.71
Omit studies whose outcomes were HBP/24hABP	2	3.17 (-1.87 to 8.23)		2	2.59 (-0.91 to 6.12)	
<b>Isometric training vs Usual care</b>						
Overall analysis	5	5.76 (1.41 to 10.16)	0.46	3	4.00 (1.06 to 6.94)	0.67
Omit studies whose outcomes were HBP/24hABP	4	7.48 (1.58 to 13.39)		2	4.64 (1.18 to 8.05)	
<b>Lifestyle vs Usual care</b>						
Overall analysis	4	4.62 (1.32 to 7.94)	0.85	4	3.37 (1.03 to 5.77)	0.82
Omit studies whose outcomes were HBP/24hABP	3	4.84 (0.96 to 8.83)		3	3.82 (1.02 to 6.66)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Aerobic exercise+DASH vs Usual care</b>						
Overall analysis	1	11.20 (2.81 to 19.61)	0.96	1	5.57 (-1.52 to 12.74)	0.98
Omit studies whose outcomes were HBP/24hABP	1	11.43 (2.89 to 20.01)		1	5.75 (-1.36 to 13.11)	
<b>Salt restriction +DASH vs Usual care</b>						
Overall analysis	1	3.79 (-3.94 to 11.55)	0.99	1	2.42 (-3.47 to 8.37)	0.98
Omit studies whose outcomes were HBP/24hABP	1	3.86 (-4.06 to 11.71)		1	2.40 (-3.59 to 8.41)	
<b>Salt restriction+diet plus exercise vs Usual care</b>						
Overall analysis	2	5.25 (1.32 to 9.21)	0.68	2	3.80 (1.09 to 6.60)	0.87
Omit studies whose outcomes were HBP/24hABP	1	3.91 (-0.82 to 8.57)		1	3.43 (0.13 to 6.80)	
<b>Aerobic exercise+resistance training vs Usual care</b>						
Overall analysis	2	2.72 (-2.75 to 8.21)	0.68	2	3.16 (-0.41 to 6.74)	0.76
Omit studies whose outcomes were HBP/24hABP	1	0.82 (-6.52 to 8.21)		1	2.19 (-2.85 to 7.27)	
<b>PMR vs Meditation</b>						
Overall analysis	2	-3.70 (-8.27 to 0.85)	0.97	2	-1.23 (-4.36 to 1.90)	0.94
Omit studies whose outcomes were HBP/24hABP	2	-3.71 (-8.61 to 1.08)		2	-1.32 (-4.58 to 2.00)	
<b>Salt restriction vs Yoga</b>						
Overall analysis	1	0.83 (-2.27 to 3.99)	1.00	1	-0.74 (-2.88 to 1.38)	0.88
Omit studies whose outcomes were HBP/24hABP	1	0.76 (-2.63 to 4.20)		1	-0.55 (-2.91 to 1.84)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Aerobic exercise vs Yoga</b>						
Overall analysis	1	2.02 (-1.09 to 5.19)	0.80	1	1.07 (-1.08 to 3.25)	0.76
Omit studies whose outcomes were HBP/24hABP	1	2.48 (-0.98 to 6.03)		1	1.52 (-0.94 to 3.97)	
<b>MBSR vs PMR</b>						
Overall analysis	1	-0.23 (-5.66 to 5.29)	0.89	1	-0.74 (-4.67 to 3.21)	0.89
Omit studies whose outcomes were HBP/24hABP	1	0.35 (-6.08 to 6.73)		1	-0.28 (-4.95 to 4.35)	
<b>Diet plus exercise vs Salt restriction</b>						
Overall analysis	1	-1.31 (-4.46 to 1.85)	0.91	1	0.74 (-1.38 to 2.89)	0.94
Omit studies whose outcomes were HBP/24hABP	1	-1.55 (-4.85 to 1.68)		1	0.83 (-1.40 to 3.09)	
<b>Aerobic exercise vs Salt restriction</b>						
Overall analysis	1	1.18 (-0.97 to 3.34)	0.70	1	1.82 (0.33 to 3.30)	0.81
Omit studies whose outcomes were HBP/24hABP	1	1.72 (-0.53 to 4.03)		1	2.06 (0.47 to 3.66)	
<b>Salt restriction+diet plus exercise vs Salt restriction</b>						
Overall analysis	1	-0.16 (-4.19 to 3.92)	0.68	1	1.19 (-1.65 to 4.07)	0.88
Omit studies whose outcomes were HBP/24hABP	1	-1.48 (-6.33 to 3.26)		1	0.81 (-2.55 to 4.27)	
<b>Exercise vs Diet</b>						
Overall analysis	2	-5.37 (-10.23 to -0.52)	0.95	2	-1.81 (-4.93 to 1.34)	0.79
Omit studies whose outcomes were HBP/24hABP	2	-5.62 (-10.71 to -0.41)		2	-2.40 (-5.71 to 0.91)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Diet plus exercise vs Diet</b>						
Overall analysis	2	-2.41 (-6.57 to 1.86)	0.90	2	-1.19 (-3.80 to 1.45)	0.71
Omit studies whose outcomes were HBP/24hABP	2	-2.79 (-7.30 to 1.79)		2	-1.94 (-4.87 to 0.97)	
<b>Diet plus exercise vs Exercise</b>						
Overall analysis	4	2.97 (-0.92 to 6.91)	0.95	4	0.62 (-2.00 to 3.24)	0.95
Omit studies whose outcomes were HBP/24hABP	4	2.83 (-1.21 to 6.85)		4	0.47 (-2.22 to 3.17)	
<b>Salt restriction+diet plus exercise vs Diet plus exercise</b>						
Overall analysis	2	1.14 (-2.86 to 5.21)	0.74	2	0.45 (-2.38 to 3.30)	0.83
Omit studies whose outcomes were HBP/24hABP	2	0.07 (-4.49 to 4.59)		2	-0.01 (-3.23 to 3.24)	
<b>Tai Chi vs Aerobic exercise</b>						
Overall analysis	1	6.89 (2.58 to 11.19)	0.94	1	3.32 (0.21 to 6.42)	0.94
Omit studies whose outcomes were HBP/24hABP	1	6.53 (2.06 to 10.93)		1	3.15 (-0.06 to 6.36)	
<b>Resistance training vs Aerobic exercise</b>						
Overall analysis	3	-4.28 (-8.75 to 0.17)	0.89	3	-2.62 (-5.65 to 0.34)	0.79
Omit studies whose outcomes were HBP/24hABP	3	-3.93 (-8.92 to 1.00)		3	-2.08 (-5.52 to 1.36)	
<b>Aerobic exercise+DASH vs Aerobic exercise</b>						
Overall analysis	1	4.58 (-3.90 to 12.98)	0.96	1	1.14 (-5.94 to 8.27)	0.98
Omit studies whose outcomes were HBP/24hABP	1	4.34 (-4.20 to 12.83)		1	1.06 (-6.12 to 8.44)	

**Table S7. Results of Sensitivity Analyses. (D) Based on Omitting Studies Targeted to Special Population.**

Comparison	Systolic blood pressure				Diastolic blood pressure			
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank
<b>Tai Chi vs Usual care</b>								
Overall analysis	2	13.47 (9.30 to 17.64)	0.98	1.4	1	7.76 (4.73 to 10.81)	1.00	4.2
Omit studies targeted to special population	2	13.48 (9.28 to 17.69)		1.4	1	7.76 (4.67 to 10.88)		3.1
<b>DASH vs Usual care</b>								
Overall analysis	9	6.96 (4.50 to 9.46)	1.00	3.8	9	3.54 (1.80 to 5.30)	1.00	5.9
Omit studies targeted to special population	9	6.98 (4.48 to 9.52)		3.3	9	3.53 (1.77 to 5.31)		4.5
<b>Aerobic exercise+DASH vs Usual care</b>								
Overall analysis	1	11.20 (2.81 to 19.61)	1.00	4.3	1	5.57 (-1.52 to 12.74)	1.00	9.4
Omit studies targeted to special population	1	11.13 (2.70 to 19.67)		3.6	1	5.59 (-1.52 to 12.75)		7.2
<b>Isometric training vs Usual care</b>								
Overall analysis	5	5.76 (1.41 to 10.16)	1.00	8.4	3	4.00 (1.06 to 6.94)	1.00	10.1
Omit studies targeted to special population	5	5.77 (1.34 to 10.17)		6.9	3	4.01 (1.04 to 6.94)		7.7
<b>Aerobic exercise vs Usual care</b>								
Overall analysis	26	6.60 (4.98 to 8.23)	1.00	6.2	25	4.44 (3.30 to 5.59)	1.00	7.0
Omit studies targeted to special population	26	6.61 (4.98 to 8.24)		5.3	25	4.44 (3.29 to 5.58)		5.4
<b>Low-sodium salt vs Usual care</b>								
Overall analysis	6	8.21 (4.99 to 11.43)	1.00	8.6	6	3.96 (1.82 to 6.12)	1.00	11.5
Omit studies targeted to special population	6	8.20 (4.95 to 11.48)		7.1	6	3.98 (1.77 to 6.16)		8.9

Comparison	Systolic blood pressure				Diastolic blood pressure			
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank
<b>Lifestyle vs Usual care</b>								
Overall analysis	4	4.62 (1.32 to 7.94)	1.00	9.9	4	3.37 (1.03 to 5.77)	1.00	9.4
Omit studies targeted to special population	4	4.63 (1.27 to 8.01)		8.2	4	3.40 (1.01 to 5.77)		7.2
<b>Salt restriction vs Usual care</b>								
Overall analysis	30	5.41 (3.96 to 6.87)	0.23	11.8	30	2.62 (1.65 to 3.61)	1.00	14.6
Omit studies targeted to special population	30	5.58 (4.06 to 7.12)		9.4	30	2.65 (1.60 to 3.67)		11.2
<b>Breathing-control vs Usual care</b>								
Overall analysis	8	5.39 (2.30 to 8.49)	1.00	12.5	8	3.42 (1.26 to 5.57)	1.00	13.3
Omit studies targeted to special population	8	5.39 (2.27 to 8.55)		10.1	8	3.41 (1.27 to 5.54)		10.3
<b>Qigong vs Usual care</b>								
Overall analysis	1	3.30 (-4.35 to 10.97)	1.00	13.0	1	6.72 (0.73 to 12.75)	1.00	6.8
Omit studies targeted to special population	1	3.28 (-4.47 to 11.14)		10.4	1	6.72 (0.67 to 12.79)		5.1
<b>Salt restriction+DASH vs Usual care</b>								
Overall analysis	1	3.79 (-3.94 to 11.55)	1.00	13.7	1	2.42 (-3.47 to 8.37)	1.00	14.8
Omit studies targeted to special population	1	3.81 (-3.99 to 11.66)		10.9	1	2.38 (-3.55 to 8.43)		11.7
<b>Meditation vs Usual care</b>								
Overall analysis	4	5.02 (1.42 to 8.65)	1.00	14.0	4	2.46 (-0.03 to 4.93)	1.00	15.8
Omit studies targeted to special population	4	5.03 (1.37 to 8.69)		11.2	4	2.45 (-0.03 to 4.97)		12.3

Comparison	Systolic blood pressure				Diastolic blood pressure			
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank
<b>Yoga vs Usual care</b>								
Overall analysis	7	4.59 (1.76 to 7.37)	1.00	14.5	7	3.37 (1.44 to 5.29)	1.00	13.4
Omit studies targeted to special population	7	4.58 (1.72 to 7.45)		11.6	7	3.37 (1.42 to 5.32)		10.3
<b>Resistance training vs Usual care</b>								
Overall analysis	2	2.32 (-2.09 to 6.71)	1.00	15.9	2	1.82 (-1.22 to 4.82)	1.00	16.0
Omit studies targeted to special population	2	2.31 (-2.11 to 6.78)		12.6	2	1.81 (-1.21 to 4.83)		12.5
<b>Aerobic exercise+resistance training vs Usual care</b>								
Overall analysis	2	2.72 (-2.75 to 8.21)	1.00	16.4	2	3.16 (-0.41 to 6.74)	1.00	11.6
Omit studies targeted to special population	2	2.74 (-2.86 to 8.29)		13.0	2	3.15 (-0.49 to 6.82)		8.9
<b>PMR vs Usual care</b>								
Overall analysis	3	1.31 (-2.72 to 5.33)	1.00	18.5	3	1.25 (-1.61 to 4.12)	1.00	17.3
Omit studies targeted to special population	3	1.32 (-2.75 to 5.38)		14.6	3	1.24 (-1.62 to 4.15)		13.6
<b>MBSR vs Usual care</b>								
Overall analysis	2	1.09 (-3.26 to 5.47)	1.00	18.5	2	0.50 (-2.64 to 3.64)	1.00	18.6
Omit studies targeted to special population	2	1.10 (-3.30 to 5.59)		14.6	2	0.49 (-2.65 to 3.68)		14.7
<b>Meditation vs Breathing-control</b>								
Overall analysis	1	-0.36 (-4.73 to 4.02)	1.00	NA	1	-0.96 (-3.98 to 2.07)	1.00	NA
Omit studies targeted to special population	1	-0.38 (-4.78 to 4.00)		NA	1	-0.97 (-4.01 to 2.10)		NA

Comparison	Systolic blood pressure				Diastolic blood pressure			
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank
<b>PMR vs Meditation</b>								
Overall analysis	2	-3.70 (-8.27 to 0.85)	1.00	NA	2	-1.23 (-4.36 to 1.90)	1.00	NA
Omit studies targeted to special population	2	-3.72 (-8.39 to 1.00)		NA	2	-1.21 (-4.35 to 1.94)		NA
<b>Salt restriction vs Yoga</b>								
Overall analysis	1	0.83 (-2.27 to 3.99)	0.95	NA	1	-0.74 (-2.88 to 1.38)	1.00	NA
Omit studies targeted to special population	1	1.00 (-2.19 to 4.21)		NA	1	-0.73 (-2.92 to 1.47)		NA
<b>Aerobic exercise vs Yoga</b>								
Overall analysis	1	2.02 (-1.09 to 5.19)	1.00	NA	1	1.07 (-1.08 to 3.25)	1.00	NA
Omit studies targeted to special population	1	2.02 (-1.14 to 5.27)		NA	1	1.07 (-1.11 to 3.24)		NA
<b>Resistance training vs Yoga</b>								
Overall analysis	1	-2.27 (-7.17 to 2.64)	1.00	NA	1	-1.55 (-4.83 to 1.73)	1.00	NA
Omit studies targeted to special population	1	-2.26 (-7.18 to 2.66)		NA	1	-1.54 (-4.87 to 1.75)		NA
<b>MBSR vs PMR</b>								
Overall analysis	1	-0.23 (-5.66 to 5.29)	1.00	NA	1	-0.74 (-4.67 to 3.21)	1.00	NA
Omit studies targeted to special population	1	-0.21 (-5.77 to 5.33)		NA	1	-0.76 (-4.70 to 3.23)		NA
<b>Aerobic exercise vs Salt restriction</b>								
Overall analysis	1	1.18 (-0.97 to 3.34)	0.92	NA	1	1.82 (0.33 to 3.30)	0.95	NA
Omit studies targeted to special population	1	1.02 (-1.19 to 3.22)		NA	1	1.80 (0.26, 3.31)		NA



Comparison	Systolic blood pressure				Diastolic blood pressure			
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	Mean rank
<b>Aerobic exercise+DASH vs Aerobic exercise</b>								
Overall analysis	1	4.58 (-3.90 to 12.98)	1.00	NA	1	1.14 (-5.94 to 8.27)	1.00	NA
Omit studies targeted to special population	1	4.55 (-3.88 to 13.04)		NA	1	1.13 (-6.00 to 8.29)		NA
<b>Tai Chi vs Aerobic exercise</b>								
Overall analysis	1	6.89 (2.58 to 11.19)	1.00	NA	1	3.32 (0.21 to 6.42)	1.00	NA
Omit studies targeted to special population	1	6.89 (2.53 to 11.20)		NA	1	3.32 (0.17 to 6.51)		NA
<b>Resistance training vs Aerobic exercise</b>								
Overall analysis	3	-4.28 (-8.75 to 0.17)	1.00	NA	3	-2.62 (-5.65 to 0.34)	1.00	NA
Omit studies targeted to special population	3	-4.29 (-8.72 to 0.18)		NA		-2.62 (-5.62 to 0.36)		NA

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S8. Results of Meta Regression Analyses. (A) By Adding Mean Age as Covariates.**

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by mean age	
<b>Systolic blood pressure</b>				
Low-sodium salt	6	8.21 (5.08 to 11.33)	7.61 (4.48 to 10.76)	0.76
Alcohol restriction	3	3.27 (-1.25 to 7.82)	3.00 (-1.38 to 7.45)	0.92
Breathing-control	4	7.07 (2.48 to 11.71)	6.80 (2.25 to 11.36)	0.88
Meditation	3	4.91 (0.89 to 8.93)	4.77 (0.84 to 8.69)	0.92
Qigong	1	3.31 (-4.13 to 10.73)	3.30 (-3.93 to 10.54)	0.97
Yoga	3	3.46 (-0.09 to 7.09)	4.03 (0.48 to 7.60)	0.80
PMR	3	1.39 (-2.60 to 5.35)	1.62 (-2.28 to 5.48)	0.93
MBSR	1	1.71 (-3.68 to 7.19)	2.18 (-3.07 to 7.47)	0.88
DASH	9	6.94 (4.55 to 9.35)	7.30 (4.95 to 9.68)	0.81
Salt restriction	25	5.68 (4.18 to 7.21)	5.82 (4.35 to 7.32)	0.87
Diet	3	4.71 (0.25 to 9.15)	5.21 (0.81 to 9.62)	0.86
Exercise	3	0.64 (-3.52 to 4.85)	1.00 (-3.12 to 5.14)	0.88
Diet plus exercise	6	3.84 (0.90 to 6.81)	4.21 (1.32 to 7.11)	0.83
Aerobic exercise	23	6.78 (5.02 to 8.60)	6.94 (5.32 to 8.60)	0.86
Tai Chi	2	13.47 (9.30 to 17.64)	13.59 (9.69 to 17.51)	0.97
Resistance training	2	3.51 (-0.43 to 7.47)	3.63 (-0.18 to 7.44)	0.99
Isometric training	5	5.76 (1.41 to 10.16)	4.91 (0.68 to 9.22)	0.78
Lifestyle	1	10.79 (4.22 to 17.36)	11.35 (4.96 to 17.72)	0.90
Aerobic exercise+DASH	1	11.30 (3.02 to 19.61)	11.55 (3.42 to 19.69)	0.95

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by mean age	
<b>Systolic blood pressure</b>				
Salt restriction+diet plus exercise	2	5.14 (0.94 to 9.45)	5.30 (1.23 to 9.44)	0.95
Aerobic exercise+resistance training	2	2.67 (-2.64 to 8.01)	1.68 (-3.65 to 7.05)	0.76
<b>Diastolic blood pressure</b>				
Low-sodium salt	6	3.94 (1.97 to 5.93)	3.72 (1.61 to 5.84)	0.94
Alcohol restriction	3	2.13 (-0.76 to 5.07)	2.04 (-0.98 to 5.07)	0.98
Breathing-control	4	4.90 (1.87 to 7.94)	4.79 (1.68 to 7.90)	0.96
Meditation	3	2.91 (0.24 to 5.57)	2.85 (0.10 to 5.59)	0.98
Qigong	1	6.69 (1.07 to 12.32)	6.71 (0.94 to 12.49)	0.98
Yoga	3	2.39 (0.03 to 4.78)	2.74 (0.24 to 5.25)	0.94
PMR	3	1.47 (-1.26 to 4.19)	1.53 (-1.26 to 4.34)	0.98
MBSR	1	1.12 (-2.55 to 4.82)	1.34 (-2.50 to 5.20)	0.97
DASH	9	3.53 (1.94 to 5.13)	3.68 (2.00 to 5.37)	0.95
Salt restriction	25	2.67 (1.69 to 3.63)	2.70 (1.69 to 3.71)	0.99
Diet	3	2.97 (0.47 to 5.51)	3.19 (0.58 to 5.84)	0.95
Exercise	3	2.29 (-0.33 to 4.96)	2.48 (-0.25 to 5.22)	0.97
Diet plus exercise	6	3.16 (1.31 to 5.07)	3.35 (1.39 to 5.34)	0.95
Aerobic exercise	23	4.25 (3.06 to 5.45)	4.64 (3.49 to 5.80)	0.95
Tai Chi	2	7.76 (4.73 to 10.81)	7.81 (4.92 to 10.71)	0.99
Resistance training	2	2.75 (0.13 to 5.39)	3.06 (0.37 to 5.77)	0.99
Isometric training	5	4.00 (1.06 to 6.94)	3.71 (0.78 to 6.62)	0.93
Lifestyle	1	9.30 (4.95 to 13.67)	9.54 (4.97 to 14.12)	0.99

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by mean age	
<b>Diastolic blood pressure</b>				
Aerobic exercise+DASH	1	5.49 (-1.38 to 12.35)	5.76 (-1.20 to 12.70)	0.99
Salt restriction+diet plus exercise	2	3.01 (0.19 to 5.88)	3.12 (0.18 to 6.10)	0.99
Aerobic exercise+resistance training	2	3.13 (-0.14 to 6.42)	2.72 (-0.79 to 6.26)	0.92

**Table S8. Results of Meta Regression Analyses. (B) By Adding BMI as Covariates.**

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by BMI	
<b>Systolic blood pressure</b>				
Low-sodium salt	5	9.56 (5.77 to 13.34)	9.63 (5.77 to 13.47)	0.94
Alcohol restriction	1	8.99 (-0.05 to 18.09)	9.09 (0.05 to 18.09)	0.96
Breathing-control	4	6.81 (1.79 to 11.86)	6.84 (1.85 to 11.86)	0.99
Meditation	1	3.92 (-2.46 to 10.33)	3.94 (-2.33 to 10.23)	1.00
Yoga	3	7.34 (3.27 to 11.44)	7.42 (3.32 to 11.51)	0.96
PMR	1	0.52 (-7.27 to 8.28)	0.53 (-7.02 to 8.11)	1.00
DASH	7	6.99 (3.91 to 10.10)	6.95 (3.91 to 10.03)	0.96
Salt restriction	9	7.78 (4.94 to 10.11)	7.81 (4.99 to 10.64)	0.95
Diet	2	4.63 (-0.79 to 10.12)	4.50 (-1.07 to 10.09)	0.92
Exercise	3	0.64 (-4.06 to 5.44)	0.51 (-4.31 to 5.41)	0.92
Diet plus exercise	5	3.76 (-0.14 to 7.73)	3.65 (-0.37 to 7.69)	0.91
Aerobic exercise	15	6.94 (4.66 to 9.30)	7.00 (4.92 to 9.12)	0.95
Tai Chi	2	13.47 (9.30 to 17.64)	13.67 (9.12 to 18.20)	0.95
Resistance training	1	3.49 (-1.77 to 8.78)	3.55 (-1.64 to 8.74)	0.97
Isometric training	4	5.40 (-0.34 to 11.27)	5.18 (0.34 to 10.06)	0.95
Lifestyle	1	10.79 (3.43 to 18.14)	10.66(3.37 to 17.96)	0.98
Aerobic exercise+DASH	1	11.36 (2.57 to 20.15)	11.37 (2.69 to 20.08)	0.99
DASH+salt restriction	1	3.81 (-4.41 to 11.99)	3.96 (-4.35 to 12.26)	0.94
Salt restriction+diet plus exercise	1	9.39 (1.07 to 17.68)	9.20 (0.73 to 17.69)	0.93

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by BMI	
<b>Systolic blood pressure</b>				
Aerobic exercise+resistance training	2	2.73 (-3.03 to 8.60)	2.78 (-2.96 to 8.53)	0.98
<b>Diastolic blood pressure</b>				
Low-sodium salt	5	4.48 (2.05 to 6.92)	4.77 (2.21 to 7.33)	0.95
Alcohol restriction	1	6.00 (0.14 to 11.86)	6.38 (0.36 to 12.39)	0.97
Breathing-control	4	4.89 (1.55 to 8.23)	5.02 (1.63 to 8.40)	0.99
Meditation	1	2.91 (-1.31 to 7.11)	2.96 (-1.31 to 7.25)	1.00
Yoga	3	4.26 (1.58 to 6.95)	4.54 (1.75 to 7.36)	0.96
PMR	1	0.23 (-4.78 to 5.23)	0.25 (-4.84 to 5.36)	0.99
DASH	7	3.52 (1.47 to 5.56)	3.40 (1.28 to 5.51)	0.96
Salt restriction	9	3.70 (1.86 to 5.51)	3.81 (1.91 to 5.69)	0.98
Diet	2	3.97 (0.63 to 7.37)	3.50 (-0.06 to 7.10)	0.94
Exercise	3	2.88 (-0.11 to 5.96)	2.45 (-0.74 to 5.70)	0.94
Diet plus exercise	5	3.81 (1.36 to 6.32)	3.42 (0.79 to 6.12)	0.95
Aerobic exercise	15	4.69 (3.14 to 6.24)	5.17 (3.70 to 6.64)	0.98
Tai Chi	2	7.86 (3.95 to 11.80)	8.31 (5.06 to 11.56)	0.90
Resistance training	1	2.61 (-0.65 to 5.87)	2.99 (-0.32 to 6.33)	0.97
Isometric training	4	4.17 (-0.06 to 8.26)	3.76 (0.46 to 7.05)	0.99
Lifestyle	1	9.31 (4.43 to 14.16)	8.91 (3.84 to 13.99)	0.98
Aerobic exercise+DASH	1	5.72 (-1.43 to 12.84)	5.83 (-1.36 to 13.04)	0.99
DASH+salt restriction	1	2.40 (-3.55 to 8.34)	3.05 (-3.17 to 9.27)	0.94
Salt restriction+diet plus exercise	1	5.31 (-0.26 to 10.84)	4.54 (-1.35 to 10.46)	0.95

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by BMI	
<b>Diastolic blood pressure</b>				
Aerobic exercise+resistance training	2	3.14 (-0.49 to 6.78)	3.41 (-0.34 to 7.17)	0.97

**Table S8. Results of Meta Regression Analyses. (C) By Adding the Proportion of Taking Medicines as Covariates.**

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by proportion of taking medicines	
<b>Systolic blood pressure</b>				
Low-sodium salt	6	8.20 (4.77 to 11.67)	8.36 (4.89 to 11.83)	0.98
Alcohol restriction	1	1.80 (-5.47 to 9.06)	1.76 (-5.40 to 8.94)	1.00
Breathing-control	4	7.64 (2.01 to 13.28)	7.93 (2.20 to 13.69)	0.96
Meditation	4	5.18 (0.95 to 9.42)	5.40 (1.10 to 9.69)	0.97
Yoga	4	6.36 (2.29 to 10.41)	6.34 (2.31 to 10.34)	0.99
PMR	3	1.35 (-2.99 to 5.67)	1.55 (-2.83 to 5.90)	0.98
MBSR	2	1.16 (-3.61 to 5.97)	1.05 (-3.70 to 5.84)	0.99
DASH	6	6.42 (3.01 to 9.85)	6.27 (2.84 to 9.69)	0.99
Salt restriction	28	5.56 (3.92 to 7.23)	5.47 (3.81 to 7.16)	0.99
Diet	3	6.59 (2.24 to 10.87)	6.44 (2.09 to 10.74)	0.98
Exercise	1	2.43 (-3.86 to 8.75)	2.33 (-3.93 to 8.61)	0.99
Diet plus exercise	4	3.56 (-0.13 to 7.27)	3.47 (-0.21 to 7.15)	0.98
Aerobic exercise	20	6.14 (4.07 to 8.25)	6.28 (4.36 to 8.23)	1.00
Tai Chi	2	13.47 (9.30 to 17.64)	13.26 (8.73 to 17.78)	0.99
Resistance training	1	4.55 (-0.61 to 9.75)	4.68 (-0.41 to 9.79)	0.99
Isometric training	5	5.76 (1.41 to 10.16)	6.32 (1.36 to 11.34)	0.97
Lifestyle	2	6.29 (1.10 to 11.49)	6.12 (0.93 to 11.30)	0.99
Aerobic exercise+DASH	1	10.91 (2.02 to 19.81)	10.90 (2.11 to 19.70)	0.99
DASH+salt restriction	1	3.82 (-4.50 to 12.11)	3.62 (-4.66 to 11.89)	0.99



Intervention	No. of study	Weighted mean difference (95% CrI)		
		Network meta-analysis	Adjusted by proportion of taking medicines	P value
<b>Systolic blood pressure</b>				
Salt restriction+diet plus exercise	2	5.18 (0.38 to 10.06)	5.25 (0.49 to 10.08)	0.97
Aerobic exercise+resistance training	2	2.76 (-3.13 to 8.65)	2.59 (-3.28 to 8.47)	0.99
<b>Diastolic blood pressure</b>				
Low-sodium salt	6	3.98 (1.68 to 6.29)	3.94 (1.53 to 6.36)	0.95
Alcohol restriction	1	1.00 (-4.03 to 6.02)	1.01 (-4.18 to 6.19)	1.00
Breathing-control	4	4.81 (1.00 to 8.64)	4.73 (0.78 to 8.71)	0.93
Meditation	4	2.71 (0.17 to 5.58)	2.63 (-0.38 to 5.63)	0.95
Yoga	4	3.68 (0.87 to 6.49)	3.67 (0.78 to 6.55)	0.99
PMR	3	1.36 (-1.71 to 4.44)	1.29 (-1.90 to 4.49)	0.95
MBSR	2	0.53 (-2.83 to 3.90)	0.57 (-2.89 to 4.05)	0.99
DASH	6	3.16 (0.80 to 5.52)	3.20 (0.74 to 5.66)	0.98
Salt restriction	28	2.68 (1.56 to 3.78)	2.70 (1.54 to 3.86)	0.98
Diet	3	4.57 (1.85 to 7.27)	4.60 (1.78 to 7.41)	0.96
Exercise	1	2.81 (-1.16 to 6.79)	2.85 (-1.20 to 6.92)	0.99
Diet plus exercise	4	3.13 (0.71 to 5.60)	3.17 (0.67 to 5.69)	0.99
Aerobic exercise	20	3.92 (2.48 to 5.38)	4.32 (2.93 to 5.70)	0.99
Tai Chi	2	7.76 (4.73 to 10.81)	7.77 (4.42 to 11.13)	0.99
Resistance training	1	4.17 (0.70 to 7.69)	4.49 (0.95 to 8.05)	0.99
Isometric training	5	4.00 (1.06 to 6.94)	3.86 (0.46 to 7.26)	0.95
Lifestyle	2	5.06 (1.43 to 8.71)	5.12 (1.34 to 8.90)	0.99

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by proportion of taking medicines	
<b>Diastolic Blood Pressure</b>				
Aerobic exercise+DASH	1	5.29 (-2.04 to 12.63)	5.53 (-1.84 to 12.90)	0.99
DASH+salt restriction	1	2.41 (-3.86 to 8.63)	2.46 (-3.93 to 8.86)	0.99
Salt restriction+diet plus exercise	2	3.10 (-0.27 to 6.51)	3.10 (-0.40 to 6.62)	0.99
Aerobic exercise+resistance training	2	3.16 (-0.69 to 7.03)	3.22 (-0.77 to 7.21)	0.98

**Table S8. Results of Meta Regression Analyses. (D) By Adding Proportion of Female Patients as Covariates.**

Intervention	No. of study	Weighted mean difference (95% CrI)		
		Network meta-analysis	Adjusted by proportion of female patients	<i>P</i> value
<b>Systolic blood pressure</b>				
Low-sodium salt	6	8.21 (5.06 to 11.37)	8.16 (4.99 to 11.32)	0.97
Alcohol restriction	2	8.14 (2.13 to 14.11)	8.66 (2.30 to 14.99)	0.99
Breathing-control	8	5.37 (2.33 to 8.41)	5.44 (2.39 to 8.50)	0.98
Meditation	4	5.01 (1.46 to 8.63)	4.97 (1.41 to 8.55)	0.99
Qigong	1	3.27 (-4.30 to 10.85)	3.51 (-4.08 to 11.08)	0.97
Yoga	6	4.81 (1.86 to 7.69)	4.87 (1.94 to 7.76)	0.97
PMR	3	1.34 (-2.60 to 5.27)	1.39 (-2.58 to 5.32)	0.99
MBSR	2	1.06 (-3.19 to 5.34)	1.18 (-3.12 to 5.49)	0.97
DASH	6	6.39 (3.27 to 9.49)	6.33 (3.24 to 9.42)	0.99
Salt restriction	22	5.37 (3.75 to 7.03)	5.49 (3.81 to 7.20)	0.96
Diet	1	5.93 (-1.71 to 13.51)	5.47 (-2.36 to 13.30)	0.91
Exercise	2	-0.39 (-6.22 to 5.47)	-0.39 (-6.20 to 5.47)	1.00
Diet plus exercise	4	4.08 (0.83 to 7.40)	4.19 (0.89 to 7.54)	0.98
Aerobic exercise	21	6.16 (4.41 to 7.94)	6.10 (4.30 to 7.90)	0.89
Tai Chi	2	13.36 (9.26 to 17.41)	13.33 (9.22 to 17.45)	0.96
Resistance training	1	2.42 (-2.42 to 7.27)	2.46 (-2.43 to 7.33)	1.00
Isometric training	5	5.73 (1.46 to 10.05)	5.65 (1.34 to 10.02)	0.96
Lifestyle	1	4.03 (-2.30 to 10.31)	3.89 (-2.51 to 10.29)	0.97
Aerobic exercise+DASH	1	10.93 (2.56 to 19.32)	10.89 (2.59 to 19.22)	0.99

Intervention	No. of study	Weighted mean difference (95% CrI)		
		Network meta-analysis	Adjusted by proportion of female patients	P value
<b>Systolic blood pressure</b>				
DASH+salt restriction	1	3.77 (-3.83 to 11.34)	3.79 (-3.82 to 11.39)	1.00
Salt restriction+diet plus exercise	2	5.20 (1.30 to 9.20)	5.27 (1.37 to 9.24)	0.98
Aerobic exercise+resistance training	2	2.71 (-2.63 to 8.13)	2.66 (-2.73 to 8.08)	0.99
<b>Diastolic blood pressure</b>				
Low-sodium salt	6	3.96 (1.88 to 6.05)	3.88 (1.79 to 5.99)	0.94
Alcohol restriction	2	3.25 (-0.66 to 7.21)	4.05 (-0.15 to 8.24)	0.85
Breathing-control	8	3.40 (1.32 to 5.49)	3.49 (1.41 to 5.58)	0.95
Meditation	4	2.46 (0.03 to 4.87)	2.38 (-0.04 to 4.80)	0.96
Qigong	1	6.73 (0.89 to 12.56)	7.02 (1.16 to 12.89)	0.95
Yoga	6	3.48 (1.52 to 5.45)	3.56 (1.59 to 5.53)	0.96
PMR	3	1.24 (-1.52 to 4.01)	1.28 (-1.50 to 4.06)	0.99
MBSR	2	0.46 (-2.56 to 3.47)	0.62 (-2.40 to 3.64)	0.94
DASH	6	3.18 (1.03 to 5.28)	3.06 (0.93 to 5.19)	0.93
Salt restriction	22	2.68 (1.59 to 3.77)	2.86 (1.72 to 3.99)	0.93
Diet	1	3.59 (-1.58 to 8.76)	2.98 (-2.25 to 8.22)	0.86
Exercise	2	3.00 (-0.50 to 6.59)	3.03 (-0.49 to 6.56)	0.99
Diet plus exercise	4	3.22 (0.99 to 5.49)	3.36 (1.14 to 5.63)	0.93
Aerobic exercise	21	4.71 (3.47 to 5.94)	4.64 (3.41 to 5.87)	0.96
Tai Chi	2	7.84 (4.91 to 10.79)	7.81 (4.86 to 10.77)	0.97
Resistance training	1	2.43 (-0.63 to 5.50)	2.46 (-0.61 to 5.53)	0.99

Intervention	No. of study	Weighted mean difference (95% CrI)		P value
		Network meta-analysis	Adjusted by proportion of female patients	
<b>Diastolic blood pressure</b>				
Isometric training	5	4.02 (1.14 to 6.90)	3.89 (1.02 to 6.77)	0.95
Lifestyle	1	2.00 (-2.66 to 6.65)	1.86 (-2.79 to 6.51)	0.97
Aerobic exercise+DASH	1	5.76 (-1.20 to 12.78)	5.67 (-1.34 to 12.67)	0.98
DASH+salt restriction	1	2.37 (-3.36 to 8.18)	2.37 (-3.39 to 8.13)	1.00
Salt restriction+diet plus exercise	2	3.74 (1.02 to 6.53)	3.82 (1.11 to 6.56)	0.95
Aerobic exercise+resistance training	2	3.13 (-0.32 to 6.63)	3.09 (-0.37 to 6.56)	0.99

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Table S9. Results of Subgroup Analyses. (A) Defined by Study Duration**

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Low-sodium salt vs Usual care</b>						
<12 weeks	3	6.38 (2.14 to 10.63)	0.41	3	3.58 (1.06 to 6.24)	0.81
12-24 weeks	3	9.44 (3.78 to 15.14)		3	4.16 (0.09 to 8.21)	
>24 weeks	0	NA		0	NA	
<b>Alcohol restriction vs Usual care</b>						
<12 weeks	0	NA	0.85	0	NA	0.48
12-24 weeks	2	4.61 (-3.44 to 12.68)		2	3.06 (-2.49 to 8.56)	
>24 weeks	2	2.78 (-0.01 to 6.63)		2	0.94 (-1.18 to 3.08)	
<b>Breathing-control vs Usual care</b>						
<12 weeks	7	5.14 (2.04 to 8.32)	0.68	7	3.35 (1.35 to 5.40)	0.96
12-24 weeks	1	6.17 (-3.70 to 15.73)		1	2.45 (-4.71 to 9.80)	
>24 weeks	0	NA		0	NA	
<b>Meditation vs Usual care</b>						
<12 weeks	1	5.74 (0.55 to 10.96)	0.55	1	1.78 (-1.61 to 5.18)	0.61
12-24 weeks	1	10.71 (0.50 to 21.22)		1	6.41 (-1.14 to 13.95)	
>24 weeks	2	1.74 (-2.48 to 5.94)		2	1.28 (-1.61 to 3.94)	
<b>Yoga vs Usual care</b>						
<12 weeks	1	1.38 (-3.97 to 6.71)	0.27	1	1.70 (-1.94 to 5.43)	0.41
12-24 weeks	6	5.04 (1.00 to 9.11)		6	3.52 (0.66 to 6.37)	
>24 weeks	0	NA		0	NA	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>PMR vs Usual care</b>						
<12 weeks	1	2.96 (-3.05 to 9.01)	0.75	1	4.51 (-0.39 to 9.58)	0.25
12-24 weeks	1	4.76 (-5.76 to 15.38)		1	3.29 (-4.26 to 10.87)	
>24 weeks	1	-0.64 (-5.78 to 4.60)		1	-0.71 (-4.00 to 2.49)	
<b>MBSR vs Usual care</b>						
<12 weeks	0	NA	0.94	0	NA	0.74
12-24 weeks	1	-0.03 (-9.26 to 9.43)		1	-0.43 (-7.30 to 6.34)	
>24 weeks	1	0.47 (-2.97 to 4.07)		1	0.82 (-1.68 to 3.39)	
<b>DASH vs Usual care</b>						
<12 weeks	8	6.76 (4.84 to 8.92)	0.87	8	3.46 (2.08 to 4.83)	0.67
12-24 weeks	1	5.62 (-10.06 to 21.01)		1	5.50 (-4.73 to 15.76)	
>24 weeks	0	NA		0	NA	
<b>Salt restriction vs Usual care</b>						
<12 weeks	20	6.18 (4.54 to 7.78)	0.20	20	2.52 (1.38 to 3.61)	0.54
12-24 weeks	7	4.82 (1.22 to 8.45)		7	3.08 (0.48 to 5.76)	
>24 weeks	3	1.61 (-0.50 to 4.28)		3	1.00 (-0.28 to 3.04)	
<b>Diet vs Usual care</b>						
<12 weeks	0	NA	0.85	0	NA	0.50
12-24 weeks	2	6.72 (0.33 to 12.84)		2	5.36 (1.15 to 9.52)	
>24 weeks	2	5.48 (1.05 to 10.17)		2	3.41 (0.64 to 6.27)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Exercise vs Usual care</b>						
<12 weeks	0	NA	0.97	0	NA	0.69
12-24 weeks	1	1.22 (-7.19 to 9.46)		1	3.73 (-1.92 to 9.43)	
>24 weeks	2	1.27 (-4.49 to 7.39)		2	2.15 (-1.00 to 5.37)	
<b>Diet plus exercise vs Usual care</b>						
<12 weeks	0	NA	0.51	0	NA	0.27
12-24 weeks	1	5.84 (-2.50 to 14.00)		1	5.47 (-0.17 to 11.17)	
>24 weeks	5	2.11 (0.43 to 4.58)		5	1.85 (0.79 to 3.78)	
<b>Aerobic exercise vs Usual care</b>						
<12 weeks	6	5.71 (3.02 to 8.52)	0.34	6	4.39 (2.53 to 6.16)	0.45
12-24 weeks	19	7.32 (4.86 to 9.81)		19	4.83 (3.05 to 6.60)	
>24 weeks	1	3.15 (-0.65 to 6.83)		1	1.66 (-1.72 to 5.17)	
<b>Tai Chi vs Usual care</b>						
<12 weeks	1	12.74 (7.58 to 17.98)	0.86	1	7.83 (3.90 to 11.70)	0.94
12-24 weeks	1	14.21 (7.23 to 21.22)		1	8.10 (2.86 to 13.22)	
>24 weeks	0	NA		0	NA	
<b>Isometric training vs Usual care</b>						
<12 weeks	4	5.49 (1.47 to 9.98)	0.90	4	3.61 (1.31 to 5.92)	0.92
12-24 weeks	1	4.08 (-5.27 to 13.59)		1	3.72 (-2.49 to 9.77)	
>24 weeks	0	NA		0	NA	



Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	P value	No. of study	Weighted mean difference (95% CrI)	P value
<b>Lifestyle vs Usual care</b>						
<12 weeks	0	NA	0.26	0	NA	0.24
12-24 weeks	2	7.28 (0.81 to 13.93)		2	5.66 (0.86 to 10.47)	
>24 weeks	2	2.09 (-0.49 to 4.80)		2	2.68 (0.84 to 4.58)	
<b>Salt restriction+diet plus exercise vs Usual care</b>						
<12 weeks	1	9.44 (2.67 to 16.06)	0.08	1	5.30 (0.58 to 9.90)	0.15
12-24 weeks	0	NA		0	NA	
>24 weeks	1	1.44 (-1.42 to 4.73)		1	1.27 (-0.58 to 3.09)	
<b>Aerobic exercise+resistance training vs Usual care</b>						
<12 weeks	0	NA	0.48	0	NA	0.61
12-24 weeks	1	0.83 (-8.74 to 10.09)		1	2.24 (-4.61 to 9.00)	
>24 weeks	1	5.45 (-0.99 to 12.05)		1	4.27 (0.78 to 7.92)	
<b>PMR vs Meditation</b>						
<12 weeks	0	NA	0.78	0	NA	0.89
12-24 weeks	1	-6.00 (-16.40 to 4.59)		1	-3.08 (-10.22 to 4.18)	
>24 weeks	1	-2.39 (-7.36 to 2.65)		1	-2.00 (-5.01 to 1.31)	
<b>Exercise vs Diet</b>						
<12 weeks	0	NA	0.84	0	NA	0.88
12-24 weeks	1	-5.49 (-13.92 to 2.90)		1	-1.57 (-7.15 to 3.91)	
>24 weeks	1	-4.92 (-11.52 to 1.10)		1	-1.25 (-5.01 to 2.59)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Diet plus exercise vs Diet</b>						
<12 weeks	0	NA	0.69	0	NA	0.66
12-24 weeks	1	-0.93 (-9.23 to 7.48)		1	0.13 (-5.41 to 5.68)	
>24 weeks	1	-3.32 (-8.00 to 1.53)		1	-1.49 (-4.31 to 1.61)	
<b>Diet plus exercise vs Exercise</b>						
<12 weeks	0	NA	0.50	0	NA	0.54
12-24 weeks	2	4.58 (-2.57 to 11.72)		2	1.74 (-3.19 to 6.77)	
>24 weeks	2	1.54 (-3.14 to 6.09)		2	-0.23 (-3.23 to 2.91)	
<b>Salt restriction+diet plus exercise vs Diet plus exercise</b>						
<12 weeks	0	NA	0.70	0	NA	0.39
12-24 weeks	1	1.27 (-8.17 to 10.78)		1	2.30 (-4.78 to 9.26)	
>24 weeks	1	-0.67 (-4.04 to 2.24)		1	-0.75 (-3.17 to 1.25)	

**Table S9. Results of Subgroup Analyses. (B) Defined by Region of Origin of Study Participants**

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Low-sodium salt vs Usual care</b>						
America (Black Americans)	0	NA	0.70	0	NA	0.44
America (all)	0	NA		0	NA	
Asia	2	9.91 (1.94 to 17.82)		2	4.43 (-2.39 to 11.28)	
Europe	4	7.28 (2.94 to 11.60)		4	3.73 (0.91 to 6.60)	
<b>Alcohol restriction vs Usual care</b>						
America (Black Americans)	0	NA	0.77	0	NA	0.53
America (all)	2	4.47 (-1.25 to 10.39)		2	2.70 (-0.52 to 6.27)	
Asia	0	NA		0	NA	
Europe	2	3.92 (-3.11 to 10.85)		2	0.19 (-4.21 to 4.66)	
<b>Breathing-control vs Usual care</b>						
America (Black Americans)	0	NA	0.34	0	NA	0.64
America (all)	1	4.33 (-2.58 to 11.28)		1	2.32 (-1.73 to 6.56)	
Asia	1	14.05 (0.26 to 27.86)		1	6.99 (-3.40 to 17.44)	
Europe	6	5.31 (1.18 to 9.48)		6	3.52 (0.73 to 6.25)	
<b>Meditation vs Usual care</b>						
America (Black Americans)	2	1.76 (-2.85 to 6.35)	0.48	2	1.01 (-3.25 to 4.78)	0.66
America (all)	1	6.92 (-0.44 to 14.12)		1	3.27 (-1.10 to 7.85)	
Asia	0	NA		0	NA	
Europe	1	7.28 (-1.48 to 16.04)		1	2.18 (-3.38 to 7.76)	

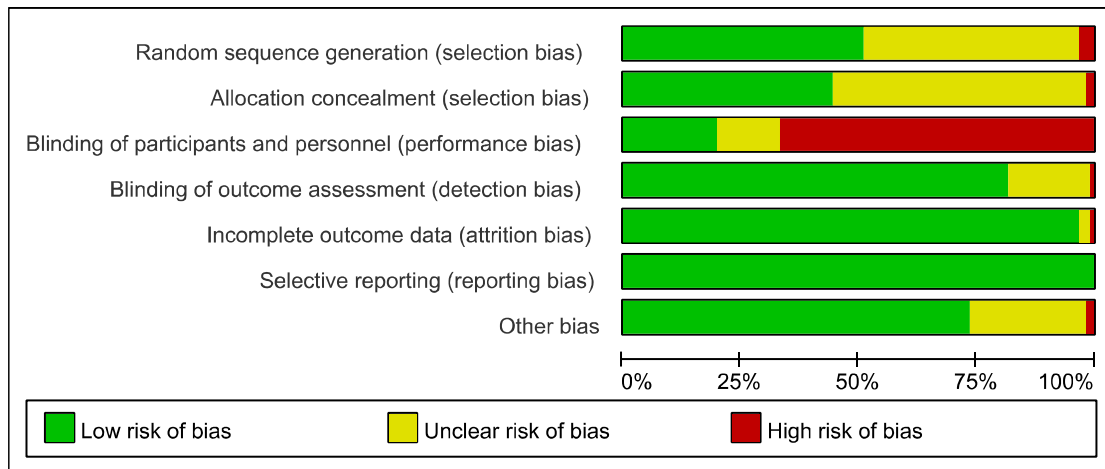
Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Yoga vs Usual care</b>						
America (Black Americans)	1	1.94 (-6.25 to 10.04)	0.71	1	2.99 (-3.53 to 9.48)	1.00
America (all)	0	NA		0	NA	
Asia	0	NA		0	NA	
Europe	6	4.63 (1.24 to 7.98)		6	3.24 (1.00 to 5.47)	
<b>PMR vs Usual care</b>						
America (Black Americans)	1	-0.59 (-6.28 to 5.01)	0.91	1	-0.78 (-5.89 to 4.12)	0.48
America (all)	1	0.52 (-6.77 to 7.93)		1	1.44 (-3.77 to 6.71)	
Asia	0	NA		0	NA	
Europe	1	1.22 (-5.77 to 8.03)		1	2.92 (-2.21 to 8.07)	
<b>MBSR vs Usual care</b>						
America (Black Americans)	0	NA	0.69	0	NA	0.88
America (all)	1	0.52 (-6.77 to 7.93)		1	0.82 (-3.48 to 5.15)	
Asia	0	NA		0	NA	
Europe	1	1.65 (-5.07 to 8.41)		1	0.73 (-3.86 to 5.40)	
<b>DASH vs Usual care</b>						
America (Black Americans)	4	6.28 (3.54 to 9.07)	0.43	4	3.61 (0.90 to 6.42)	0.93
America (all)	5	7.41 (3.90 to 11.08)		5	3.44 (1.30 to 5.55)	
Asia	0	NA		0	NA	
Europe	0	NA		0	NA	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Salt restriction vs Usual care</b>						
America (Black Americans)	2	5.85 (2.37 to 9.40)	0.11	2	3.12 (-0.42 to 6.69)	0.42
America (all)	6	5.56 (2.30 to 9.09)		6	2.50 (0.65 to 4.50)	
Asia	1	5.77 (-8.24 to 19.94)		1	1.30 (-10.15 to 12.62)	
Europe	21	5.35 (3.41 to 7.27)		21	2.61 (1.32 to 3.88)	
<b>Exercise vs Usual care</b>						
America (Black Americans)	0	NA	0.81	0	NA	0.95
America (all)	2	0.37 (-5.06 to 6.05)		2	2.61 (-0.40 to 5.92)	
Asia	0	NA		0	NA	
Europe	1	1.45 (-7.12 to 10.04)		1	2.45 (-3.66 to 8.62)	
<b>Diet plus exercise vs Usual care</b>						
America (Black Americans)	0	NA	0.81	0	NA	0.56
America (all)	4	4.16 (0.35 to 8.21)		4	3.64 (1.37 to 5.91)	
Asia	0	NA		0	NA	
Europe	2	2.40 (-4.74 to 9.49)		2	2.80 (-1.68 to 7.22)	
<b>Aerobic exercise vs Usual care</b>						
America (Black Americans)	1	9.90 (4.66 to 15.11)	<b>0.005</b>	1	7.99 (2.82 to 13.19)	<b>0.009</b>
America (all)	7	5.28 (1.49 to 9.18)		7	2.03 (-0.34 to 4.50)	
Asia	8	4.59 (0.19 to 8.95)		8	4.20 (0.55 to 7.86)	
Europe	9	7.77 (5.04 to 10.65)		9	5.57 (3.67 to 7.52)	

Comparison	Systolic blood pressure			Diastolic blood pressure		
	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value	No. of study	Weighted mean difference (95% CrI)	<i>P</i> value
<b>Lifestyle vs Usual care</b>						
America (Black Americans)	1	2.07 (-2.53 to 6.67)	0.42	1	0.99 (-3.94 to 5.93)	0.17
America (all)	0	NA		0	NA	
Asia	0	NA		0	NA	
Europe	3	5.51 (1.27 to 9.79)		3	4.20 (1.28 to 7.11)	
<b>Aerobic exercise+resistance training vs Usual care</b>						
America (Black Americans)	0	NA	0.55	0	NA	0.93
America (all)	1	0.76 (-7.28 to 8.90)		1	2.20 (-2.27 to 6.67)	
Asia	1	5.37 (-6.45 to 17.07)		1	4.30 (-5.43 to 13.97)	
Europe	0	NA		0	NA	

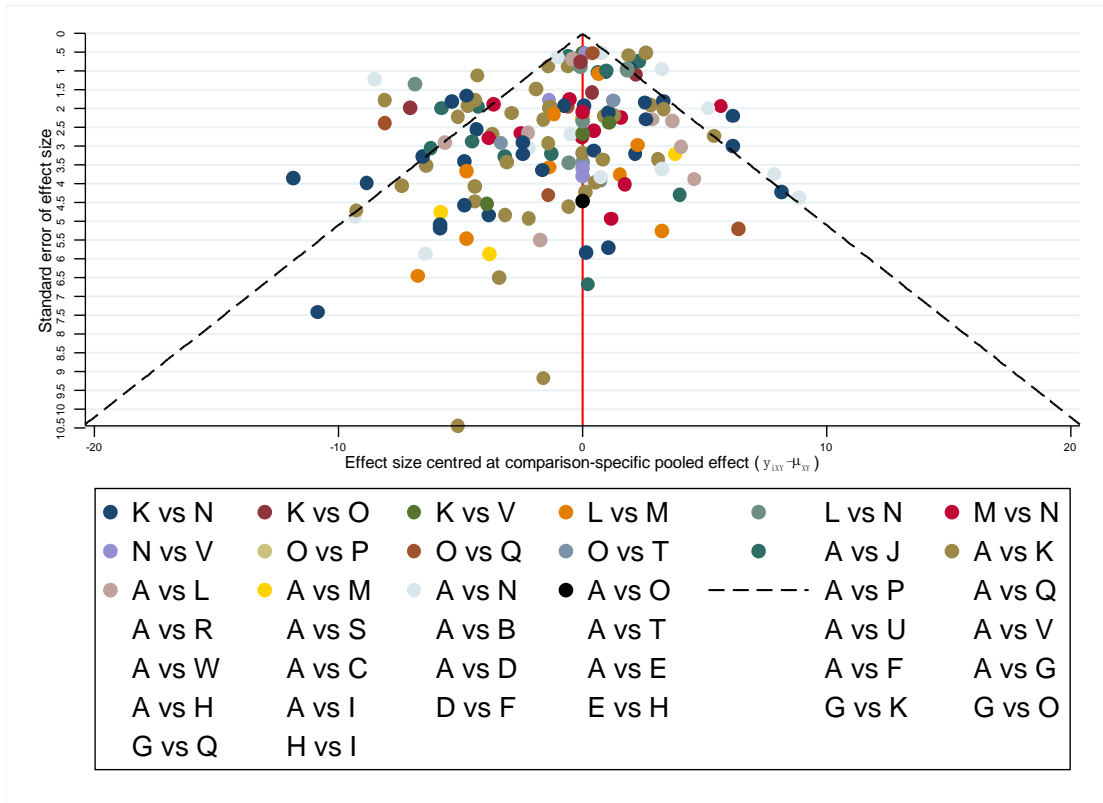
America (Black American) studies are those from America that were done in Black participants. DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.

**Figure S1. Risk of Bias Graph of Included Studies.**

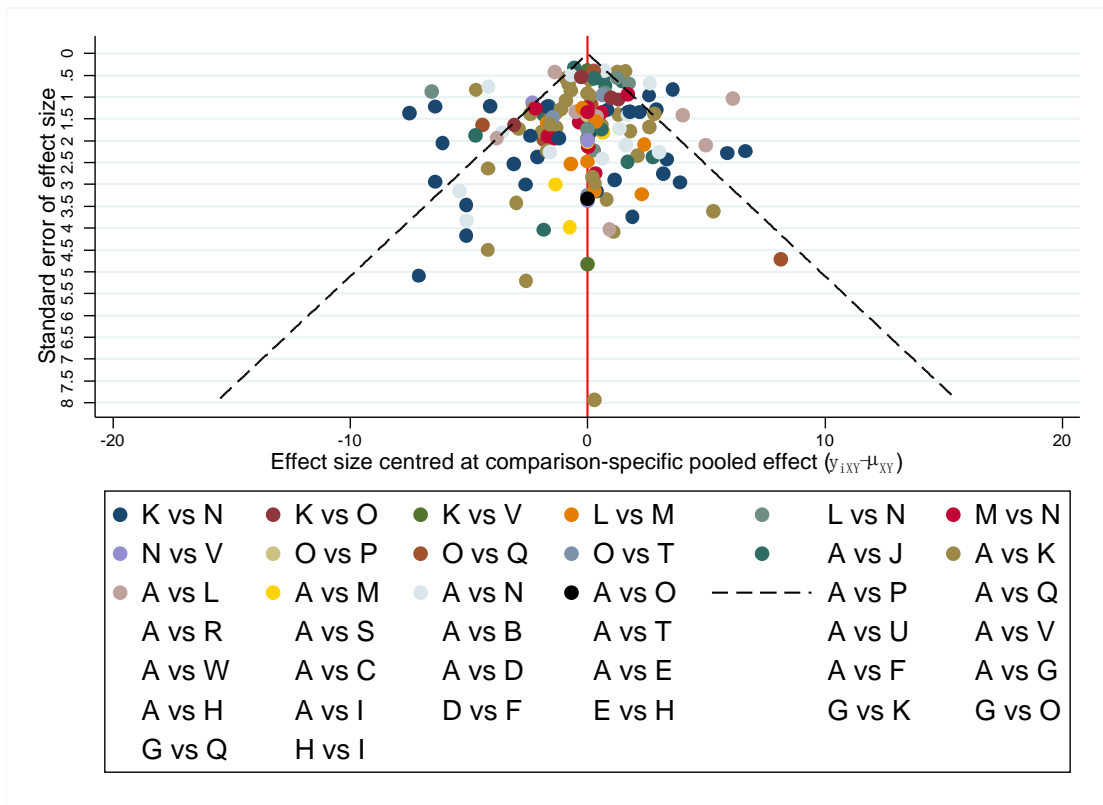


Studies were judged to be high, moderate or low risk of bias based on the assessment of sequence generation of the allocation, allocation concealment, blinding of participants, personnel, and outcome assessors, incomplete outcome data, selective outcome reporting and other sources of bias.

(A)

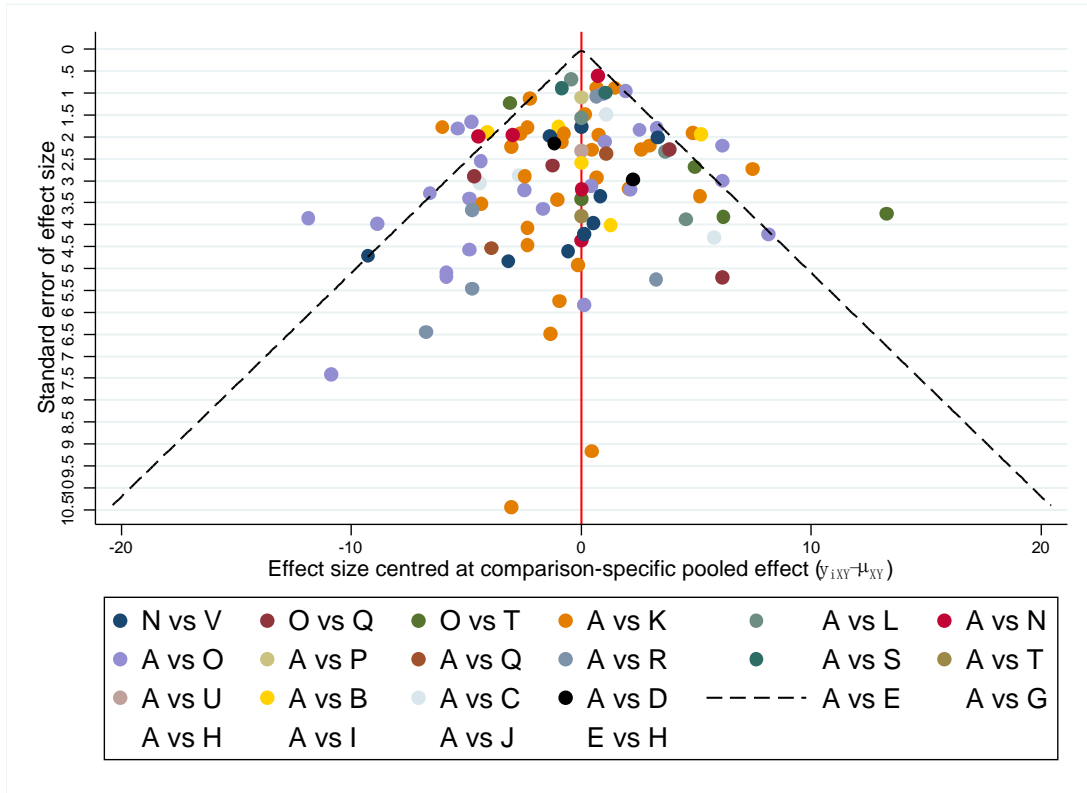


(B)

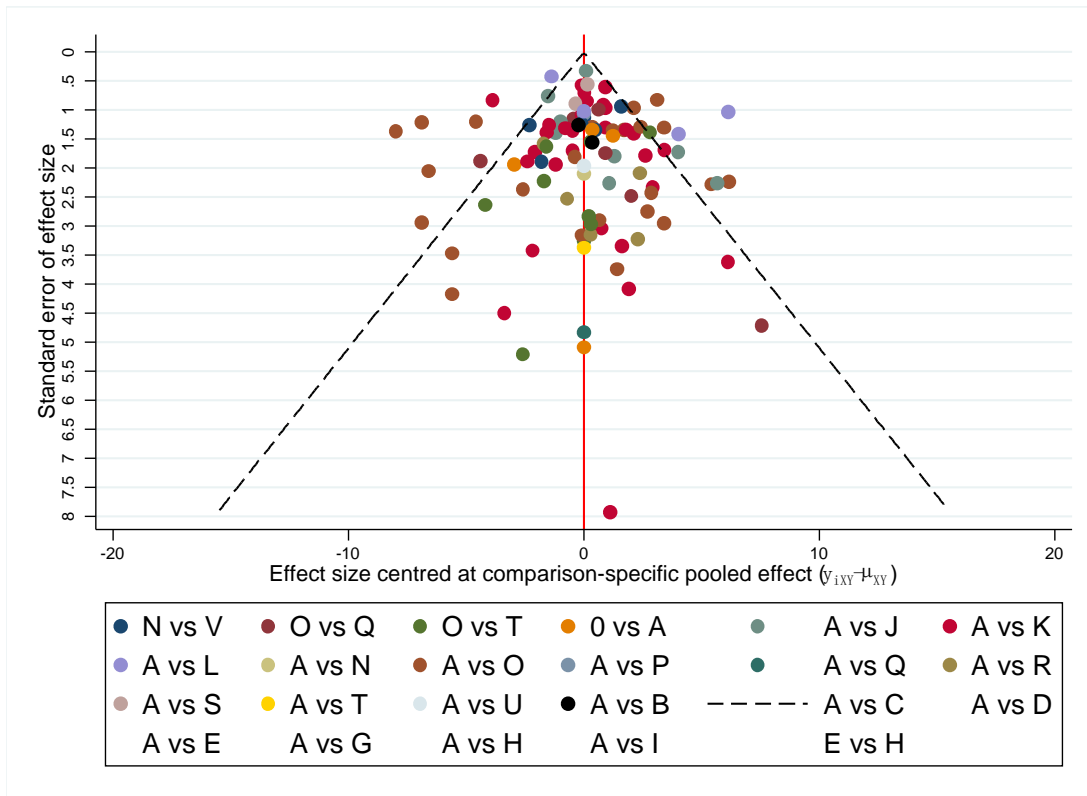




(C)



(D)



**Figure S2. Comparison-adjusted Funnel Plots of Mean Blood Pressure Change. A, Mean Systolic Blood Pressure Change in Adults with Prehypertension to Established Hypertension. B, Mean Diastolic Blood Pressure Change in Adults with Prehypertension to Established Hypertension. C, Mean Systolic Blood Pressure Change in Patients with Hypertension. D, Mean Diastolic Blood Pressure Change in Patients with Hypertension.**

The red line represents the null hypothesis that the study-specific effect sizes do not differ from the respective comparison-specific pooled effect estimates. The two black dashed lines represent a 95% CrI for the difference between study-specific effect sizes and comparison-specific summary estimates.  $y_{ixy}$  is the noted effect size in study  $i$  that compares  $x$  with  $y$ .  $\mu_{xy}$  is the comparison-specific summary estimate for  $x$  versus  $y$ .

A indicates Usual care; B indicates Low-sodium and high-potassium salt; C indicates Alcohol restriction; D indicates Breathing-control; E indicates Meditation; F indicates Qigong; G indicates Yoga; H indicates progressive muscle relaxation (PMR); I indicates mindfulness-based stress reduction (MBSR); J indicates Dietary Approach to Stop Hypertension (DASH); K indicates Salt restriction; L indicates Low-calorie diet; M indicates Exercise; N indicates Low-calorie diet plus exercise; O indicates Aerobic exercise; P indicates Tai Chi; Q indicates Resistance training; R indicates Isometric training; S indicates Comprehensive lifestyle modification; T indicates Aerobic exercise+DASH; U indicates Salt restriction+DASH; V indicates Salt restriction+low-calorie diet plus exercise; W indicates Aerobic exercise+resistance training.

**Figure S3. Comparative Effect Estimates for Blood Pressure Reduction in Adults with Prehypertension to Established Hypertension.**

		Diastolic blood pressure reduction																					
Systolic blood pressure reduction	Usual care	<b>3.97</b> (1.81 to 6.13)	1.81 (-0.96 to 4.59)	<b>3.41</b> (1.28 to 5.55)	2.46 (-0.02 to 4.94)	<b>6.74</b> (0.74 to 12.72)	<b>3.37</b> (1.43 to 5.30)	1.24 (-1.61 to 4.12)	0.49 (-2.63 to 3.63)	<b>3.54</b> (1.80 to 5.28)	<b>2.63</b> (1.64 to 3.61)	<b>4.56</b> (2.22 to 6.89)	2.75 (-0.01 to 5.54)	<b>3.35</b> (1.41 to 5.32)	<b>4.44</b> (3.31 to 5.57)	<b>7.76</b> (4.72 to 10.81)	1.84 (-1.16 to 4.83)	<b>4.01</b> (1.07 to 6.93)	<b>3.38</b> (1.01 to 5.76)	5.57 (-1.55 to 12.70)	2.39 (-3.51 to 8.31)	<b>3.81</b> (1.05 to 6.60)	3.15 (-0.44 to 6.75)
	<b>8.21</b> (4.99 to 11.43)	Low-sodium salt	-2.15 (-5.67 to 1.36)	-0.55 (-3.59 to 2.48)	-1.51 (-4.80 to 1.79)	2.77 (-3.60 to 9.13)	-0.60 (-3.50 to 2.30)	-2.72 (-6.31 to 0.87)	-3.48 (-7.28 to 0.33)	-0.43 (-3.21 to 2.35)	-1.34 (-3.72 to 1.03)	0.59 (-2.60 to 3.77)	-1.21 (-4.71 to 2.31)	-0.61 (-3.51 to 2.31)	0.48 (-1.96 to 2.91)	3.80 (0.06 to 7.53)	-2.13 (-5.82 to 1.55)	0.05 (-3.60 to 3.67)	0.05 (-3.79 to 2.62)	0.05 (-5.83 to 9.05)	1.61 (-7.86 to 4.72)	-1.57 (-3.67 to 3.37)	-0.15 (-5.00 to 3.80)
	<b>4.23</b> (0.15 to 8.32)	Alcohol restriction	-3.92 (-9.16 to 1.24)	1.60 (-1.90 to 5.10)	0.65 (-3.08 to 4.36)	4.92 (-1.69 to 11.53)	1.59 (-1.83 to 4.94)	-0.57 (-4.56 to 3.43)	-1.32 (-5.51 to 2.87)	1.73 (-1.56 to 5.01)	0.81 (-2.14 to 3.75)	2.74 (-0.88 to 6.37)	0.94 (-2.98 to 4.89)	1.54 (-1.85 to 4.95)	2.63 (-0.37 to 5.63)	<b>5.95</b> (1.83 to 10.07)	0.02 (-4.07 to 4.10)	2.20 (-1.84 to 6.23)	1.57 (-2.07 to 5.22)	2.20 (-3.87 to 11.38)	2.20 (-5.93 to 7.10)	0.59 (-1.92 to 5.94)	1.34 (-3.20 to 5.89)
	<b>5.39</b> (2.30 to 8.49)	Breathing-control	-2.82 (-7.27 to 1.67)	1.16 (-3.97 to 6.27)	-0.95 (-3.02 to 2.06)	3.32 (-3.02 to 9.66)	-0.05 (-2.94 to 2.83)	-2.17 (-5.65 to 1.32)	-2.92 (-6.70 to 0.85)	0.13 (-2.64 to 2.88)	1.14 (-3.14 to 1.56)	1.14 (-2.02 to 4.30)	-0.66 (-4.14 to 2.84)	-0.06 (-2.94 to 2.83)	1.03 (-1.39 to 3.44)	<b>4.35</b> (0.05 to 8.06)	-1.58 (-5.28 to 2.09)	0.60 (-3.05 to 4.21)	-0.03 (-3.23 to 3.15)	2.17 (-5.29 to 9.57)	1.01 (-7.31 to 5.26)	0.40 (-3.10 to 3.91)	-0.26 (-4.44 to 3.92)
	<b>5.02</b> (1.42 to 8.65)	Meditation	-3.19 (-8.04 to 1.65)	0.79 (-4.68 to 6.27)	-0.37 (-4.74 to 3.97)	4.28 (-2.23 to 10.77)	0.91 (-2.25 to 4.05)	-1.21 (-4.34 to 1.92)	-1.97 (-5.87 to 1.94)	1.08 (-1.95 to 4.11)	0.17 (-2.50 to 2.84)	2.10 (-1.31 to 5.51)	0.29 (-3.42 to 4.04)	0.90 (-2.25 to 4.07)	1.99 (-0.74 to 4.72)	<b>5.30</b> (1.38 to 9.24)	-0.62 (-4.52 to 3.25)	1.55 (-2.31 to 5.38)	0.92 (-2.51 to 4.37)	3.12 (-4.41 to 10.65)	-0.06 (-6.48 to 6.35)	1.35 (-2.37 to 5.10)	0.70 (-3.66 to 5.06)
	3.29 (-4.35 to 10.97)		-4.92 (-13.23 to 3.39)	-0.94 (-9.62 to 7.75)	-2.10 (-10.40 to 6.17)	-1.73 (-10.23 to 6.77)	<b>Qigong</b>	-3.37 (-9.65 to 2.94)	-5.49 (-12.12 to 1.15)	-6.25 (-13.02 to 0.52)	-3.20 (-10.17 to 1.97)	-4.11 (-8.59 to 4.24)	-2.18 (-10.56 to 2.64)	-3.98 (-9.65 to 2.92)	-3.38 (-8.38 to 3.82)	1.03 (-5.69 to 7.74)	1.03 (-11.62 to 1.81)	-4.90 (-9.38 to 3.93)	-2.72 (-9.77 to 3.11)	-3.36 (-10.42 to 8.17)	-1.16 (-12.74 to 4.07)	-4.34 (-9.48 to 3.68)	-2.92 (-10.56 to 3.58)
	<b>4.58</b> (1.76 to 7.37)	Yoga	-3.63 (-7.91 to 0.63)	0.35 (-4.63 to 5.29)	-0.81 (-5.02 to 3.36)	-0.44 (-5.05 to 4.12)	1.29 (-6.88 to 9.44)	-2.12 (-5.57 to 1.35)	-2.88 (-6.54 to 0.81)	0.17 (-2.43 to 2.77)	1.19 (-2.89 to 1.41)	0.81 (-1.84 to 4.21)	0.61 (-3.97 to 2.78)	-0.01 (-2.75 to 2.74)	1.08 (-1.08 to 3.24)	<b>4.39</b> (0.80 to 8.00)	-1.53 (-4.82 to 1.75)	0.65 (-2.87 to 4.16)	0.01 (-3.04 to 3.09)	2.21 (-5.16 to 9.56)	-0.97 (-7.19 to 5.27)	0.45 (-2.93 to 3.85)	-0.21 (-4.29 to 3.87)
	1.31 (-2.72 to 5.33)		-6.80 (-12.06 to -1.75)	-2.92 (-9.06 to 0.88)	-4.08 (-8.30 to 0.87)	-3.71 (-10.67 to 6.68)	-1.98 (-8.16 to 1.64)	-3.27 (-4.68 to 3.18)	-0.75 (-1.05 to 5.65)	2.29 (-1.66 to 6.99)	1.38 (-0.40 to 6.99)	3.31 (-2.47 to 5.52)	1.51 (-1.34 to 5.58)	2.11 (0.12 to 6.28)	<b>6.52</b> (2.34 to 10.71)	0.60 (-3.56 to 4.72)	2.77 (-1.35 to 6.86)	2.14 (-1.59 to 5.85)	4.33 (-3.33 to 11.98)	1.15 (-5.44 to 7.72)	2.57 (-1.40 to 6.57)	1.91 (-2.68 to 6.50)	
	1.10 (-3.26 to 5.47)		-7.11 (-12.53 to -1.66)	-3.14 (-9.11 to 2.85)	-4.30 (-9.63 to 1.05)	-3.93 (-9.47 to 1.63)	-3.49 (-11.00 to 6.65)	-0.22 (-8.66 to 1.74)	-0.22 (-5.63 to 5.54)	3.05 (-1.15 to 5.14)	2.44 (0.16 to 7.95)	2.26 (-1.91 to 6.46)	2.87 (-0.82 to 6.56)	<b>3.95</b> (0.02 to 7.27)	<b>7.27</b> (2.90 to 11.64)	1.35 (-3.00 to 5.66)	3.52 (-0.78 to 7.80)	2.89 (-1.04 to 6.81)	5.09 (-2.69 to 12.84)	1.91 (-4.78 to 8.58)	3.32 (-0.87 to 7.52)	2.66 (-2.09 to 7.43)	
	<b>6.97</b> (4.50 to 9.47)		-1.24 (-5.28 to 2.83)	2.74 (-2.05 to 7.53)	1.58 (-2.40 to 5.54)	1.95 (-2.42 to 6.34)	3.68 (-4.37 to 11.76)	2.39 (-1.34 to 6.17)	<b>5.66</b> (0.93 to 10.39)	<b>5.87</b> (0.86 to 10.90)	<b>DASH</b>	-0.91 (-2.92 to 1.09)	1.02 (-1.90 to 3.93)	-0.79 (-4.05 to 2.49)	-0.18 (-2.78 to 2.45)	0.90 (-1.18 to 2.99)	<b>4.22</b> (0.71 to 7.73)	-1.70 (-5.18 to 1.77)	0.47 (-2.95 to 3.87)	-0.16 (-3.10 to 2.78)	1.02 (-5.28 to 9.35)	2.84 (-7.30 to 5.01)	0.27 (-3.00 to 3.57)
	<b>5.42</b> (3.96 to 6.87)		-2.79 (-6.32 to 0.75)	1.18 (-3.15 to 5.53)	0.03 (-3.39 to 3.44)	0.39 (-3.52 to 4.30)	2.12 (-5.68 to 9.92)	1.84 (-2.27 to 3.98)	4.10 (-0.17 to 8.40)	4.32 (-0.28 to 8.92)	-1.55 (-4.43 to 1.31)	<b>Salt restriction</b>	1.93 (-0.59 to 4.45)	0.13 (-2.79 to 3.06)	0.73 (-1.38 to 2.87)	<b>1.82</b> (0.33 to 3.31)	<b>5.14</b> (1.94 to 8.34)	-0.79 (-3.94 to 2.35)	1.39 (-1.72 to 4.47)	0.76 (-1.81 to 3.33)	2.95 (-4.24 to 10.12)	-0.23 (-6.22 to 5.76)	0.53 (-1.67 to 4.08)
	<b>6.50</b> (2.78 to 10.17)		-1.71 (-6.84 to 3.17)	2.27 (-3.28 to 7.77)	1.11 (-3.75 to 5.89)	1.48 (-3.72 to 6.63)	3.21 (-4.37 to 11.76)	1.92 (-1.34 to 6.17)	5.19 (0.93 to 10.39)	5.41 (0.86 to 10.90)	-0.47 (-4.96 to 3.95)	1.09 (-2.90 to 5.02)	<b>Diet</b>	-1.80 (-4.91 to 1.33)	-1.20 (-3.84 to 1.46)	-0.11 (-2.70 to 2.49)	3.20 (-0.63 to 7.04)	-2.72 (-6.50 to 1.06)	-0.54 (-4.29 to 3.20)	-1.18 (-4.49 to 2.16)	1.02 (-6.46 to 8.52)	-2.16 (-8.51 to 4.20)	-1.40 (-4.22 to 2.77)
	1.14 (-3.04 to 5.35)		-7.07 (-12.34 to -1.77)	-3.09 (-8.91 to 2.77)	-4.25 (-9.43 to 0.97)	-3.88 (-9.42 to 1.67)	-2.15 (-10.90 to 6.61)	-3.44 (-8.47 to 1.65)	-0.17 (-5.98 to 5.66)	0.05 (-6.03 to 6.11)	-5.83 (-10.69 to -0.94)	-4.27 (-8.67 to 0.14)	<b>-5.36</b> (-10.25 to -0.45)	<b>Exercise</b>	0.60 (-2.03 to 3.23)	1.69 (-1.33 to 4.67)	<b>5.01</b> (0.86 to 9.13)	-0.92 (-5.02 to 3.15)	1.26 (-2.80 to 5.29)	0.63 (-3.05 to 4.27)	2.82 (-4.85 to 10.46)	-0.36 (-6.90 to 6.15)	1.06 (-2.59 to 4.72)
	<b>4.12</b> (1.22 to 7.03)		-4.09 (-8.41 to 0.25)	-0.12 (-5.13 to 4.91)	-1.27 (-5.52 to 2.96)	-0.91 (-5.54 to 3.75)	0.83 (-7.39 to 9.04)	-0.46 (-4.50 to 3.59)	2.80 (-2.16 to 7.79)	3.02 (-2.23 to 8.27)	-2.85 (-6.69 to 0.97)	-1.30 (-4.45 to 1.86)	-2.39 (-6.56 to 1.85)	2.97 (-0.96 to 6.91)	<b>Diet + exercise</b>	1.09 (-1.18 to 3.34)	<b>4.41</b> (0.79 to 8.01)	-1.52 (-5.12 to 2.04)	0.66 (-2.89 to 4.16)	0.02 (-3.05 to 3.10)	2.22 (-5.17 to 9.59)	-0.96 (-7.19 to 5.24)	0.46 (-2.39 to 3.31)
	<b>6.60</b> (4.98 to 8.23)		-1.61 (-5.20 to 2.00)	2.37 (-2.02 to 6.77)	1.21 (-2.28 to 4.70)	1.57 (-2.38 to 5.54)	3.31 (-4.53 to 11.15)	2.02 (-1.12 to 5.20)	<b>5.20</b> (0.95 to 9.66)	<b>5.50</b> (0.88 to 10.17)	-0.37 (-3.34 to 2.60)	1.18 (-0.97 to 3.34)	0.09 (-3.92 to 4.17)	2.48 (0.95 to 9.95)	2.48 (-0.85 to 5.80)	<b>Aerobic exercise</b>	3.32 (0.21 to 6.43)	-2.61 (-5.59 to 0.36)	-1.06 (-3.58 to 2.07)	-1.06 (-3.69 to 1.57)	1.13 (-5.97 to 8.24)	-0.63 (-8.06 to 3.98)	-1.29 (-3.62 to 2.38)
	<b>13.47</b> (9.30 to 17.64)		5.26 (-0.01 to 10.52)	<b>9.24</b> (3.40 to 15.07)	<b>8.08</b> (2.88 to 13.27)	<b>8.45</b> (2.92 to 13.96)	<b>10.18</b> (1.45 to 18.92)	<b>8.89</b> (3.89 to 13.91)	<b>12.16</b> (6.36 to 17.96)	<b>12.37</b> (6.31 to 18.40)	<b>6.50</b> (1.63 to 11.35)	<b>8.05</b> (3.63 to 12.45)	<b>6.96</b> (1.42 to 12.54)	<b>12.33</b> (6.40 to 18.22)	<b>9.35</b> (4.25 to 14.43)	<b>6.87</b> (2.56 to 11.16)	<b>Tai Chi</b>	-5.93 (-10.15 to -1.72)	-3.75 (-7.99 to 0.48)	-4.38 (-8.24 to -0.52)	2.18 (-9.87 to 5.51)	1.56 (-12.02 to 1.27)	-5.36 (-8.06 to 0.17)
	2.32 (-2.09 to 6.71)		-5.89 (-11.36 to -0.42)	-1.91 (-7.93 to 4.09)	-3.07 (-8.47 to 2.30)	-2.71 (-8.42 to 2.98)	-0.97 (-9.83 to 7.86)	-2.26 (-7.14 to 2.62)	1.01 (-4.97 to 6.96)	1.22 (-5.01 to 7.43)	-4.65 (-9.73 to 0.39)	-3.10 (-7.74 to 1.52)	-4.19 (-9.93 to 1.59)	1.18 (-4.91 to 7.23)	-1.80 (-7.08 to 3.47)	-4.28 (-8.68 to 0.10)	<b>11.15</b> (-17.14 to -5.15)	<b>Resistance training</b>	2.18 (-2.02 to 6.37)	1.55 (-2.25 to 5.38)	3.74 (-3.92 to 11.41)	0.56 (-6.07 to 7.19)	1.98 (-2.09 to 6.08)
	<b>5.77</b> (1.41 to 10.16)		-2.44 (-7.85 to 3.00)	1.53 (-4.44 to 7.54)	0.38 (-4.96 to 5.75)	0.74 (-4.93 to 6.47)	2.48 (-6.35 to 11.32)	1.19 (-3.96 to 6.41)	4.45 (-1.45 to 10.44)	4.67 (-1.50 to 10.87)	-0.87 (-6.64 to 4.92)	0.35 (-4.25 to 4.98)	-0.74 (-6.43 to 6.12)	4.63 (-1.43 to 10.69)	1.65 (-3.59 to 6.91)	-0.84 (-5.50 to 3.84)	<b>-7.70</b> (-13.73 to -1.64)	3.45 (-2.72 to 9.68)	-0.63 (-4.39 to 3.15)	1.56 (-6.11 to 9.25)	-1.61 (-8.23 to 4.99)	-0.86 (-4.23 to 3.86)	
	<b>4.63</b> (1.32 to 7.94)		-3.58 (-8.18 to 1.02)	0.40 (-4.88 to 5.67)	-0.76 (-5.30 to 3.77)	-0.40 (-5.27 to 4.50)	1.34 (-7.02 to 9.67)	0.05 (-4.28 to 4.40)	3.31 (-1.90 to 8.52)	3.53 (-1.97 to 9.01)	-2.35 (-6.55 to 1.84)	-0.79 (-4.41 to 2.81)	3.49 (-6.80 to 3.11)	0.51 (-1.87 to 8.80)	1.97 (-3.90 to 4.90)	1.70 (-5.66 to 1.70)	<b>-8.84</b> (-14.14 to -3.52)	2.31 (-3.19 to 7.84)	-1.14 (-6.65 to 4.33)	2.20 (-5.31 to 9.69)	-0.98 (-7.36 to 5.36)	0.43 (-3.22 to 4.10)	
	<b>11.20</b> (2.81 to 19.61)		2.99 (-5.97 to 11.99)	5.80 (-2.39 to 16.33)	6.17 (-3.15 to 14.78)	6.16 (-1.95 to 15.31)	7.90 (-3.47 to 19.27)	6.61 (-2.21 to 15.46)	<b>9.88</b> (0.56 to 19.21)	<b>10.10</b> (0.64 to 19.58)	4.23 (-4.53 to 13.00)	5.78 (-2.74 to 14.32)	4.69 (-4.44 to 13.88)	7.08 (0.70 to 19.42)	7.08 (-1.79 to 15.96)	1.61 (-3.77 to 12.98)	<b>6.57</b> (-11.59 to 7.07)	8.88 (-0.50 to 18.30)	6.57 (-4.06 to 14.87)	<b>Aerobic exercise + DASH</b>	5.43 (-2.46 to 15.61)	-3.18 (-12.42 to 6.05)	-1.77 (-9.40 to 5.88)
3.80 (-3.94 to 11.55)		-4.41 (-12.80 to 3.97)	-0.44 (-9.18 to 8.30)	-1.59 (-9.94 to 6.75)	-1.23 (-9.78 to 7.31)	0.51 (-10.20 to 11.41)	-0.78 (-9.03 to 7.46)	2.48 (-6.22 to 11.23)	2.70 (-6.18 to 11.58)	-3.17 (-11.30 to 4.96)	-1.62 (-9.52 to 6.25)	-2.71 (-11.28 to 5.89)	2.66 (-6.18 to 11.44)	-0.32 (-8.59 to 7.92)	-2.80 (-10.71 to 5.10)	<b>-9.67</b> (-18.45 to -0.87)	1.48 (-7.44 to 10.37)	-1.97 (-10.85 to 6.91)	-0.83 (-9.24 to 7.60)	-7.40 (-18.82 to 4.01)	1.41 (-5.11 to 7.97)		
<b>5.25</b> (1.32 to 9.21)		-2.96 (-8.01 to 2.15)	1.02 (-4.64 to 6.70)	-0.14 (-5.12 to 4.86)	0.23 (-5.11 to 5.58)	1.96 (-6.65 to 10.58)	0.67 (-4.14 to 5.55)	3.94 (-1.67 to 9.57)	4.16 (-1.74 to 10.03)	-1.72 (-6.38 to 2.94)	-0.16 (-4.24 to 3.92)	-1.25 (-6.46 to 4.01)	1.14 (-1.22 to 9.43)	1.14 (-2.91 to 5.21)	-1.35 (-5.59 to 2.91)	<b>-8.22</b> (-13.91 to -2.47)	2.93 (-2.96 to 8.87)	-0.51 (-6.42 to 5.35)	0.63 (-4.51 to 5.79)	1.46 (-15.21 to 3.32)	-0.67 (-7.22 to 10.16)		
2.72 (-2.75 to 8.21)		-5.49 (-11.84 to 0.87)	-2.30 (-8.34 to 5.32)	-2.30 (-9.00 to 3.67)	-0.57 (-8.84 to 4.25)	1.86 (-10.00 to 8.85)	-0.57 (-8.00 to 4.31)	1.51															

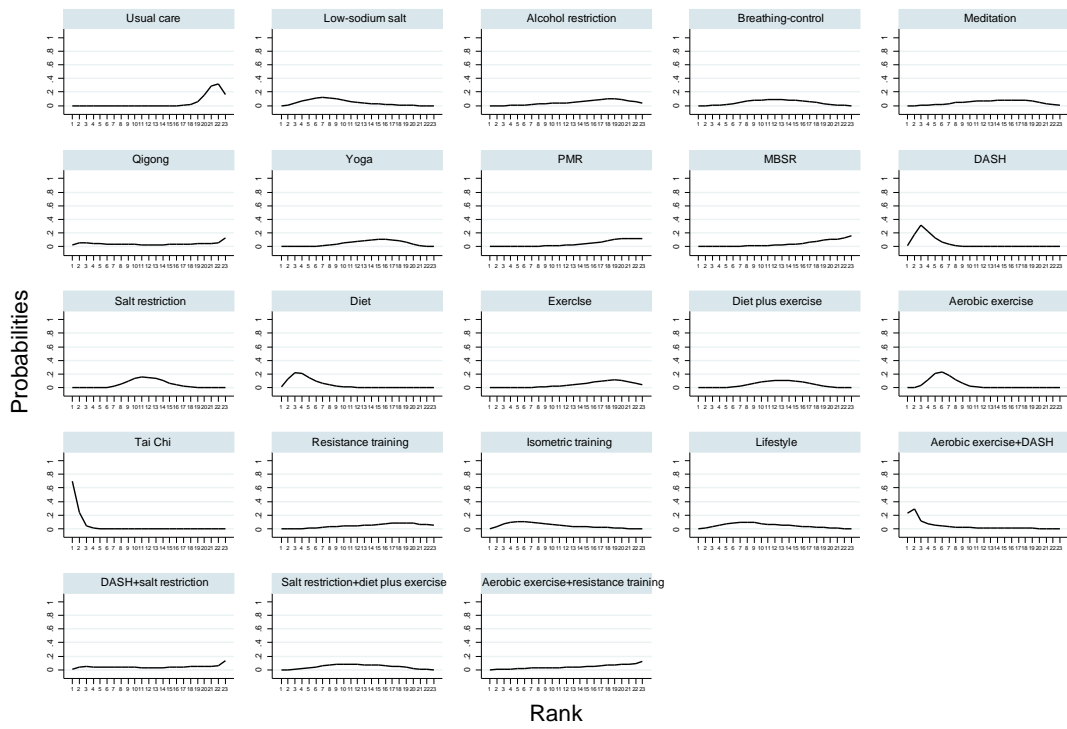
of the column-defining intervention and the row-defining intervention, and be reported in weighted mean difference and 95% credible intervals.

The effective BP-lowering estimates that were supported by the combination evidence of direct and indirect comparisons were bolded and underlined, and the effective BP-lowering estimates that were supported only by indirect evidence were underlined.

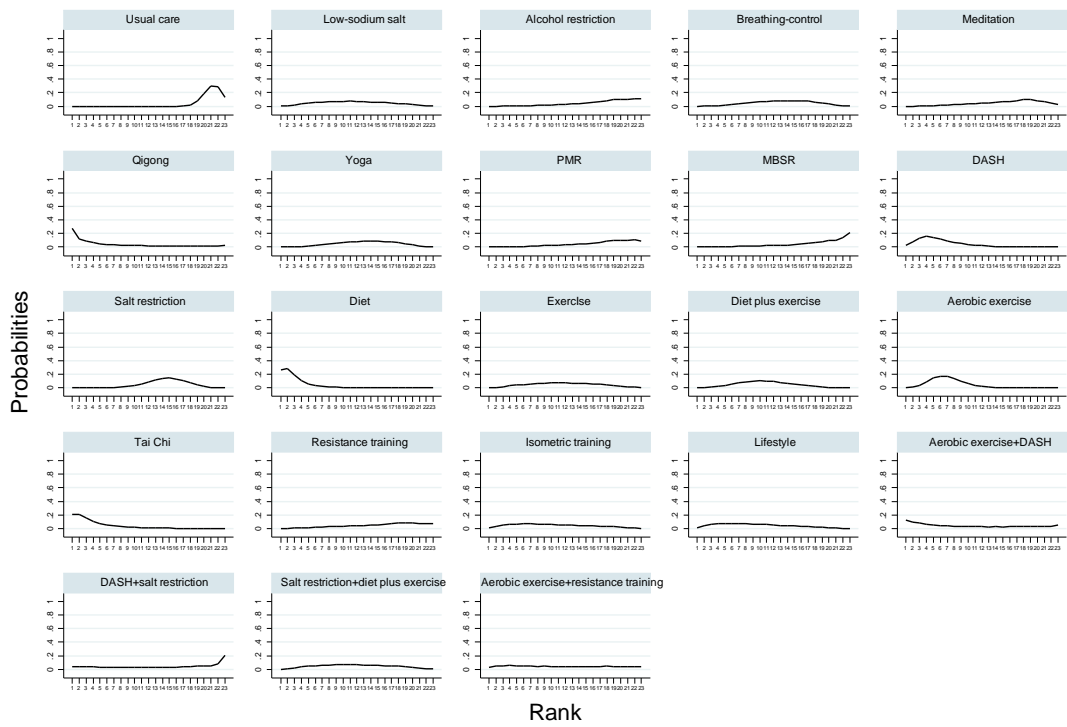
DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification;

Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation

(A)



(B)



**Figure S4. The Surface Under the Cumulative Ranking (SUCRA) Probabilities**

**Plots in Adults with Prehypertension to Established Hypertension. A, Mean Systolic Blood Pressure Change. B, Mean Diastolic Blood Pressure Change.**

This visually depicts the uncertainty in the ranking distribution of interventions.

Ranking positions from 1 (best) to 23 (worst) for all intervention.

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation

**Figure S5. Comparative Effect Estimates for Blood Pressure Reduction in Patients with Hypertension.**

		Diastolic blood pressure reduction																		
Systolic blood pressure reduction	Usual care	3.81 (1.42 to 6.21)	1.85 (-1.04 to 4.75)	3.24 (0.94 to 5.57)	4.09 (0.96 to 7.24)	4.47 (1.54 to 7.33)	2.11 (-1.08 to 5.33)	-0.44 (-5.56 to 4.67)	4.54 (1.91 to 7.18)	2.73 (1.58 to 3.87)	4.98 (2.03 to 7.89)	0.01 (-6.21 to 6.19)	4.01 (2.74 to 5.30)	7.81 (2.67 to 12.93)	0.83 (-3.35 to 4.95)	4.00 (0.99 to 7.00)	1.73 (-1.72 to 5.19)	5.39 (-1.84 to 12.57)	2.41 (-3.69 to 8.47)	2.31 (-5.75 to 10.38)
	7.55 (4.24 to 10.87)	Low-sodium salt	-1.96 (-5.74 to 1.81)	-0.57 (-3.89 to 2.76)	0.28 (-3.66 to 4.23)	0.65 (-3.14 to 4.37)	-1.70 (-5.70 to 2.31)	-4.25 (-9.33 to 1.40)	0.73 (-2.83 to 4.29)	-1.08 (-3.74 to 1.57)	1.16 (-2.65 to 4.94)	-3.82 (-10.47 to 2.83)	0.20 (-2.52 to 2.92)	4.00 (-1.68 to 9.66)	-2.99 (-7.81 to 1.80)	0.18 (-3.66 to 4.03)	1.57 (-6.30 to 2.13)	1.57 (-6.03 to 9.11)	-1.41 (-7.96 to 5.12)	-1.51 (-9.92 to 6.90)
	4.96 (0.96 to 8.95)	Alcohol restriction	-2.59 (-7.78 to 2.59)	1.39 (-2.30 to 5.09)	2.24 (-2.03 to 6.49)	2.61 (-1.52 to 6.68)	0.27 (-4.05 to 4.58)	-2.29 (-8.16 to 3.59)	2.69 (-1.22 to 6.60)	0.88 (-2.24 to 4.00)	3.12 (-1.01 to 7.24)	-1.85 (-8.68 to 5.01)	2.17 (-0.99 to 5.34)	5.96 (0.06 to 11.86)	-1.03 (-6.11 to 4.02)	2.15 (-2.06 to 6.31)	-0.12 (-4.64 to 4.40)	3.53 (-4.24 to 11.28)	0.56 (-6.19 to 7.27)	0.45 (-8.11 to 9.02)
	5.23 (2.07 to 8.43)	Breathing-control	-2.32 (-6.88 to 2.31)	0.27 (-4.81 to 5.39)	0.85 (-3.05 to 4.74)	1.22 (-2.51 to 4.90)	-1.13 (-5.08 to 2.82)	-3.68 (-9.33 to 1.91)	1.30 (-2.20 to 4.79)	-0.51 (-3.11 to 2.05)	1.73 (-2.04 to 5.45)	-3.24 (-9.86 to 3.40)	0.77 (-1.86 to 3.40)	4.57 (-1.09 to 10.18)	-2.42 (-7.20 to 2.30)	0.75 (-3.05 to 4.54)	-1.51 (-5.69 to 2.64)	2.14 (-5.43 to 9.66)	-0.83 (-7.34 to 5.63)	-0.94 (-9.34 to 7.44)
	5.55 (2.27 to 10.86)	Meditation	-1.00 (-6.42 to 4.45)	1.59 (-4.26 to 7.46)	1.31 (-4.04 to 6.65)	0.37 (-3.92 to 4.62)	-1.98 (-5.44 to 1.50)	-4.53 (-10.54 to 1.46)	0.45 (-3.66 to 4.54)	-1.36 (-4.71 to 1.97)	0.88 (-3.44 to 5.16)	-4.09 (-11.04 to 2.86)	-0.08 (-3.47 to 3.31)	3.72 (-2.30 to 9.73)	-3.27 (-8.50 to 1.92)	-1.00 (-4.46 to 4.25)	-2.36 (-7.05 to 2.30)	1.29 (-6.59 to 9.14)	-1.68 (-8.55 to 5.11)	-1.79 (-10.45 to 6.85)
	7.28 (3.17 to 11.20)	Yoga	-0.27 (-5.55 to 4.84)	2.32 (-3.42 to 7.89)	2.05 (-3.19 to 7.08)	0.73 (-5.25 to 6.54)	-2.35 (-6.64 to 2.01)	-4.90 (-10.74 to 1.00)	0.08 (-3.81 to 4.02)	-1.73 (-4.82 to 1.40)	0.51 (-3.60 to 4.64)	-4.46 (-11.29 to 2.40)	-0.45 (-3.58 to 2.75)	3.35 (-2.52 to 9.27)	-3.64 (-8.70 to 1.42)	-0.47 (-4.64 to 3.73)	-2.73 (-7.23 to 1.82)	0.92 (-6.86 to 8.68)	-2.05 (-8.78 to 4.71)	-2.16 (-10.73 to 6.45)
	2.48 (-1.67 to 6.63)	PMR	-5.07 (-10.40 to 0.25)	-2.48 (-8.25 to 3.27)	-2.75 (-8.01 to 2.46)	-4.07 (-8.87 to 0.71)	-4.80 (-10.49 to 1.05)	-2.55 (-8.60 to 3.46)	2.43 (-1.74 to 6.56)	0.61 (-2.80 to 4.01)	2.86 (-1.51 to 7.17)	-2.12 (-9.12 to 4.88)	1.90 (-1.56 to 5.35)	5.69 (-0.37 to 11.74)	-1.29 (-6.59 to 3.94)	1.88 (-2.53 to 6.27)	-0.38 (-5.10 to 4.33)	3.27 (-4.64 to 11.11)	0.29 (-6.61 to 7.14)	0.19 (-8.51 to 8.88)
	-0.01 (-6.62 to 6.60)	MBSR	-7.56 (-14.92 to -0.14)	-4.97 (-12.68 to 2.72)	-5.24 (-12.60 to 2.09)	-6.56 (-14.48 to 1.30)	-7.30 (-14.88 to 0.56)	-2.49 (-10.29 to 5.29)	4.98 (-0.76 to 10.75)	3.17 (-2.07 to 8.42)	5.41 (-0.49 to 11.30)	0.44 (-7.80 to 8.48)	4.45 (-0.82 to 9.74)	8.25 (1.02 to 15.49)	1.26 (-5.35 to 7.82)	4.43 (-1.51 to 10.37)	5.82 (-3.99 to 8.36)	2.85 (-3.04 to 14.66)	2.85 (-5.08 to 10.77)	2.74 (-6.86 to 12.30)
	8.69 (5.23 to 12.19)	DASH	1.14 (-3.68 to 5.97)	3.73 (-1.56 to 9.04)	2.14 (-1.26 to 8.16)	1.41 (-3.39 to 7.67)	1.41 (-3.79 to 6.84)	6.21 (0.79 to 11.65)	8.70 (1.26 to 16.19)	-1.81 (-4.70 to 1.06)	0.43 (-3.52 to 4.36)	-4.54 (-11.28 to 2.20)	-0.53 (-3.45 to 2.40)	3.27 (-2.49 to 9.03)	-3.72 (-8.65 to 1.19)	-0.55 (-4.55 to 3.45)	0.84 (-7.16 to 1.54)	0.84 (-6.83 to 8.48)	-2.13 (-8.77 to 4.49)	-2.24 (-10.70 to 6.25)
	5.74 (4.18 to 7.30)	Salt restriction	-1.81 (-5.48 to 1.86)	0.78 (-3.51 to 5.06)	0.51 (-3.05 to 4.03)	-0.81 (-5.40 to 3.76)	-1.54 (-5.76 to 2.68)	3.26 (-1.18 to 7.69)	5.75 (-1.05 to 12.54)	-2.95 (-6.78 to 0.84)	2.24 (-0.92 to 5.38)	1.28 (-2.03 to 3.73)	5.08 (-0.42 to 3.01)	1.27 (-0.18 to 10.34)	-1.91 (-6.23 to 2.39)	1.27 (-1.95 to 4.47)	-1.00 (-4.63 to 2.65)	2.65 (-4.65 to 9.91)	-0.32 (-6.52 to 5.85)	-0.43 (-8.55 to 7.71)
	7.78 (3.53 to 11.91)	Diet	0.23 (-5.15 to 5.52)	2.82 (-3.01 to 8.55)	2.55 (-2.78 to 7.74)	1.23 (-4.81 to 7.18)	0.50 (-5.21 to 6.32)	5.30 (-0.65 to 11.17)	7.79 (-0.09 to 15.56)	-0.91 (-6.43 to 4.47)	2.04 (-2.48 to 6.45)	-4.97 (-11.82 to 1.88)	-0.96 (-4.14 to 2.26)	2.84 (-3.06 to 8.77)	-4.15 (-9.24 to 0.93)	-0.98 (-5.18 to 3.24)	-3.24 (-7.75 to 1.31)	0.41 (-7.37 to 8.16)	-2.57 (-9.30 to 4.16)	-2.67 (-11.23 to 5.91)
	-7.01 (-17.34 to 3.33)	Diet + exercise	-14.56 (-25.42 to -3.69)	-11.97 (-23.04 to -0.90)	-12.24 (-23.06 to -1.42)	-13.56 (-24.75 to -2.41)	-14.29 (-25.33 to -3.19)	-9.49 (-20.62 to 1.64)	-7.00 (-19.22 to 5.27)	-15.70 (-26.81 to -4.81)	-12.75 (-23.19 to -2.30)	-14.79 (-25.90 to -3.58)	4.02 (-2.30 to 10.34)	7.81 (-0.25 to 15.85)	0.82 (-6.66 to 8.28)	1.74 (-2.89 to 10.87)	5.38 (-5.38 to 8.85)	2.41 (-4.15 to 14.92)	2.30 (-6.27 to 11.08)	2.30 (-2.88 to 7.46)
	5.11 (4.45 to 7.82)	Aerobic exercise	-1.44 (-5.14 to 2.30)	1.15 (-3.16 to 5.51)	0.87 (-2.71 to 4.47)	-0.44 (-5.45 to 3.33)	-1.17 (-5.45 to 3.33)	3.63 (-0.83 to 8.13)	6.12 (-0.68 to 12.97)	-2.58 (-6.44 to 1.30)	0.37 (-1.91 to 2.69)	-1.67 (-6.11 to 2.93)	13.12 (2.66 to 23.59)	3.79 (-1.51 to 9.08)	-3.19 (-7.37 to 0.93)	-0.02 (-3.30 to 3.24)	-2.28 (-5.98 to 1.40)	1.37 (-5.85 to 8.52)	-1.61 (-7.82 to 4.59)	-1.71 (-9.86 to 6.45)
	12.75 (6.54 to 18.98)	Tai Chi	5.20 (-1.85 to 12.27)	7.79 (0.41 to 15.19)	7.52 (0.51 to 14.50)	6.21 (-1.37 to 13.76)	5.47 (-1.80 to 13.00)	10.27 (2.81 to 17.76)	12.76 (3.69 to 21.85)	4.06 (-3.08 to 11.20)	7.01 (0.60 to 13.44)	4.98 (-2.47 to 12.56)	19.76 (7.64 to 31.77)	6.65 (0.16 to 13.06)	-5.99 (-13.60 to -0.40)	-3.81 (-9.77 to 2.13)	-6.08 (-12.25 to 0.13)	-2.43 (-11.27 to 6.36)	-5.40 (-13.37 to 2.56)	-5.51 (-15.05 to 4.06)
	1.74 (-3.56 to 6.98)	Resistance training	-5.81 (-12.05 to 0.39)	-3.22 (-9.84 to 3.36)	-3.49 (-9.69 to 2.61)	-4.80 (-11.64 to 1.96)	-5.54 (-12.08 to 1.14)	-0.74 (-7.48 to 5.93)	1.75 (-6.71 to 10.20)	-6.95 (-13.30 to 0.67)	-6.04 (-9.51 to 1.47)	-4.37 (-12.74 to 0.71)	-4.37 (-2.85 to 20.31)	-11.02 (-19.21 to -2.88)	3.17 (-1.92 to 8.29)	0.91 (-4.47 to 6.33)	4.56 (-3.72 to 12.79)	1.59 (-5.77 to 8.94)	1.48 (-7.55 to 10.56)	
	5.65 (1.47 to 9.87)	Isometric training	-1.90 (-7.23 to 3.49)	0.69 (-5.06 to 6.50)	0.41 (-4.83 to 5.69)	-0.90 (-6.85 to 5.11)	-1.63 (-7.37 to 4.31)	3.17 (-2.70 to 9.11)	5.66 (-2.13 to 13.52)	-3.04 (-8.46 to 2.44)	-0.09 (-4.54 to 4.41)	-2.13 (-8.00 to 3.89)	12.66 (1.51 to 23.81)	-0.46 (-4.97 to 4.06)	-7.11 (-14.56 to 0.45)	-2.26 (-2.79 to 10.70)	1.39 (-6.85 to 2.32)	1.39 (-6.45 to 9.16)	-1.59 (-8.37 to 5.20)	-1.69 (-10.28 to 6.92)
	3.06 (-1.26 to 7.39)	Lifestyle	-4.49 (-9.94 to 0.96)	-1.90 (-7.78 to 3.98)	-2.17 (-7.54 to 3.16)	-3.49 (-9.60 to 2.59)	-4.22 (-10.02 to 1.78)	0.58 (-5.44 to 6.56)	3.07 (-4.82 to 10.97)	-5.63 (-11.18 to -0.11)	-2.68 (-7.28 to 1.92)	-4.72 (-10.70 to 1.35)	10.07 (-1.15 to 21.23)	-3.05 (-7.73 to 1.55)	-9.69 (-17.27 to -2.13)	1.32 (-5.47 to 8.15)	-2.59 (-8.66 to 3.39)	3.65 (-4.34 to 11.59)	0.67 (-6.33 to 7.66)	0.57 (-8.19 to 9.37)
	10.92 (2.79 to 19.10)	Aerobic + DASH	3.37 (-5.41 to 12.20)	5.96 (-3.10 to 15.06)	2.23 (-3.05 to 14.45)	4.37 (-4.87 to 13.59)	3.64 (-5.39 to 12.85)	8.44 (-0.70 to 17.61)	10.93 (0.42 to 21.42)	2.23 (-6.64 to 11.11)	5.18 (-3.10 to 13.51)	3.14 (-5.99 to 12.32)	17.93 (4.74 to 31.06)	4.81 (-3.31 to 12.96)	-1.84 (-12.08 to 8.44)	5.27 (-0.45 to 18.83)	7.86 (-3.91 to 14.41)	5.27 (-1.36 to 17.11)	-2.97 (-12.40 to 6.46)	-3.08 (-13.91 to 7.75)
	3.79 (-3.57 to 11.15)	Salt restriction + DASH	-3.76 (-11.85 to 4.30)	-1.17 (-9.53 to 7.19)	-1.44 (-9.48 to 6.56)	-2.76 (-11.32 to 5.74)	-3.49 (-11.79 to 4.97)	1.31 (-7.14 to 9.75)	3.80 (-6.05 to 13.66)	-4.90 (-13.08 to 3.22)	-1.95 (-9.47 to 5.57)	-3.99 (-12.39 to 4.49)	10.80 (-1.91 to 23.47)	-2.32 (-9.90 to 5.20)	-1.86 (-18.56 to 0.64)	0.73 (-6.97 to 11.11)	0.73 (-10.36 to 6.56)	0.73 (-7.80 to 9.25)	-0.11 (-18.08 to 3.82)	-0.11 (-10.19 to 10.01)
	-5.70 (-18.02 to 6.68)	Salt restriction + diet + exercise	-13.24 (-26.02 to -0.43)	-10.66 (-23.66 to 2.32)	-10.93 (-23.65 to 1.84)	-12.25 (-25.29 to 0.81)	-12.98 (-25.91 to 0.08)	-8.18 (-21.17 to 4.89)	-5.69 (-19.69 to 8.34)	-14.39 (-27.19 to -1.55)	-11.44 (-23.87 to 1.02)	1.31 (-26.50 to -0.37)	-11.81 (-5.45 to 8.08)	-18.45 (-32.25 to -4.57)	-7.44 (-20.85 to 6.05)	-11.35 (-24.38 to 1.68)	-8.76 (-21.81 to 4.35)	-16.62 (-31.41 to -1.81)	-9.49 (-23.90 to 4.92)	-9.49 (-23.90 to 4.92)

Comparisons should be read from left to right. The mean change in systolic blood pressure or diastolic blood pressure is located at the intersection of the column-defining intervention and the row-defining intervention, and be reported in weighted mean difference (WMD) and 95% credible intervals (CrIs). The effective BP-lowering estimates that were supported by the combination evidence of direct and indirect comparisons were

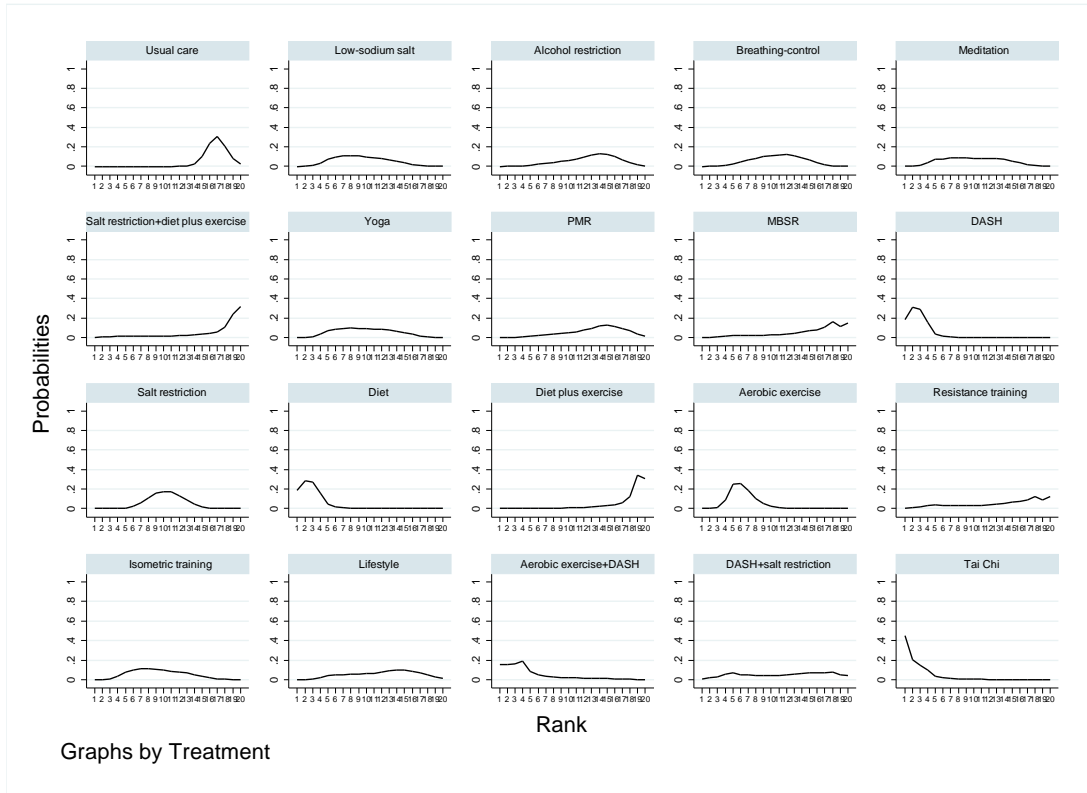
bolded and underlined, and the effective BP-lowering estimates that were supported only by indirect evidence were underlined.

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification;

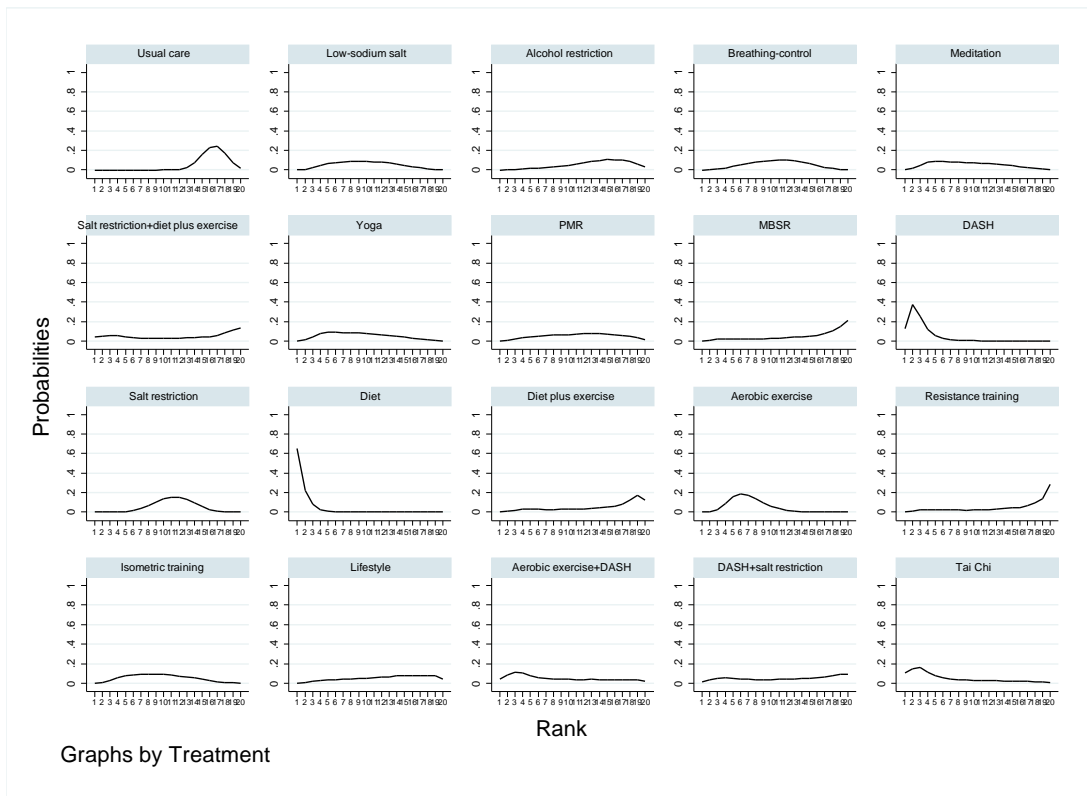
Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.



(A)



(B)



**Figure S6. The Surface Under the Cumulative Ranking (SUCRA) Probabilities Plots in Patients with Hypertension. A, Mean Systolic Blood Pressure Change. B, Mean Diastolic Blood Pressure Change.**

This visually depicts the uncertainty in the ranking distribution of interventions. Ranking positions from 1 (best) to 20 (worst) for all intervention.

DASH indicates Dietary Approach to Stop Hypertension; Diet indicates low-calorie diet; Lifestyle indicates comprehensive lifestyle Modification; Low-sodium salt indicates low-sodium and high-potassium salt; MBSR indicates mindfulness-based stress reduction; PMR indicates progressive muscle relaxation.