MIND-BODY THERAPIES FOR HYPERTENSION

Systematic Review and Meta-Analysis

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Background - Hypertension

- Most common reason for physician office visits in the United States.
- Age-adjusted prevalence: 32% blacks; 23% whites (50 million in the US).
- Top attributable risk factor for death worldwide.
- 34% of hypertensives under control.
- Increasing evidence of psychosocial risk factors including time urgency/impatience hostility, work stress, chronic anger, SES , and depression.

CAM for HTN - Epidemiology

- 42% of the public has used CAM.
  - Out-of pocket expenses
- Mind-Body medicine is one of five major branches of CAM.
  - "Behavioral techniques are employed to augment the mind's capacity to affect bodily function and symptoms, utilizing varied modalities such as meditation, prayer, mental healing, and therapies that use creative outlets such as art, music, or dance."
- 30 million users of relaxation techniques including meditation and yoga, and 10 million users of yoga therapies in 2002.
- ~3 million (8%) have tried MBT for HTN
  - Of these, 25% found MBT "very helpful.".

Objectives

- Aims to assess the efficacy of the most prevalent MBT versus placebo or active control in the treatment of hypertension.
- Outcome measures are change in SBP and DBP (pre- and post-intervention period).

Operational Definitions

- **Most** prevalent MBTs (>3.5% of general population) are meditation, yoga, and guided imagery techniques.
- **Yoga** is "the joining of the lower human nature to the higher" Yoga techniques comprise a series of body positions and movements developed in order to help relax the body and calm the mind. It involves breath control, physical exercises, and meditation.
- **Meditation: "**intentional self-regulation of attention," a systematic mental focus on particular aspects of inner or outer experience. It involves engaging in an activity that directs the mind to single point of focus, using breathing techniques, or imagery in order to feel a state of calmness.
- **Guided imagery**: Using the capacities of visualization and imagination, individuals evoke images, usually either sensory or affective. These images are typically visualized with the goal of evoking a psychophysiological state of relaxation or with some specific outcome in mind.

Inclusion Criteria

- **Studies:** RCTs (or quasi-randomized) comparing MBT alone or in combination with conventional treatment to conventional treatment alone or no intervention / waiting list control.
- **Subjects:** Hypertensive adult men and non-pregnant women
- **Outcomes: SBP** and **DBP** assessed at baseline and following intervention;
- **Search strategy:** Cochrane Complementary Medicine Field Registry, The Cochrane Central Register of Controlled Trials (CENTRAL; 2005), Medline (1966-present), EMBASE (1966-present), PsycInfo (1875-present), and CINAHL (1960-present).
- **Keywords:** hypertension, blood pressure, mind-body, meditation, yoga, imagery, and guided imagery (English)

Quality

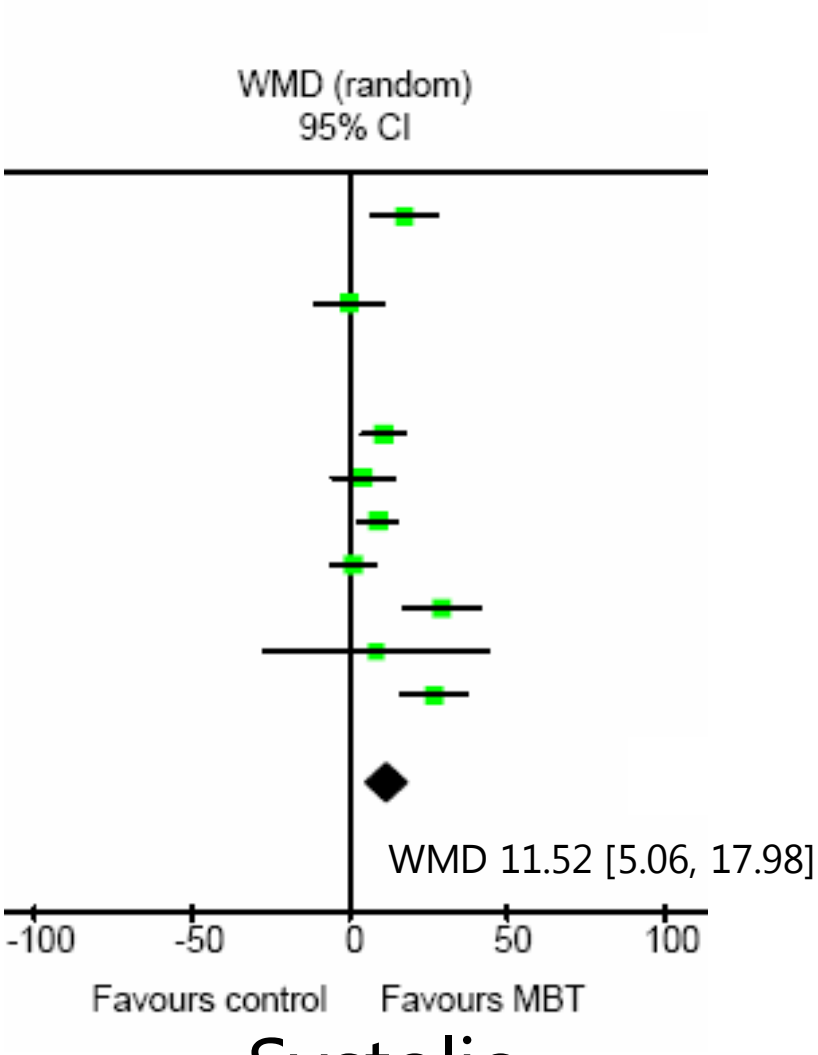
- 1) Was method of allocation sequence adequate
- 2) Information re: dropouts/withdrawals
- 3) Were outcomes assessor blinded? (if possible)
- 4) Were co-interventions documented?
- 5) Were treatment and placebo groups balanced in terms of number of treatments received and time spent in therapy?

- A : High quality - all criteria met
- B: Moderate quality - one or more criteria only partially met
- C: Low quality - two or more criteria not met

- Review Manager 4.2.8 used.
- Results of each intervention group were weighted by the sample size and reported as WMD
- I^2 [(Q – df)/Q x 100%] tests for heterogeneity.
- A random effects model is used for primary analysis.

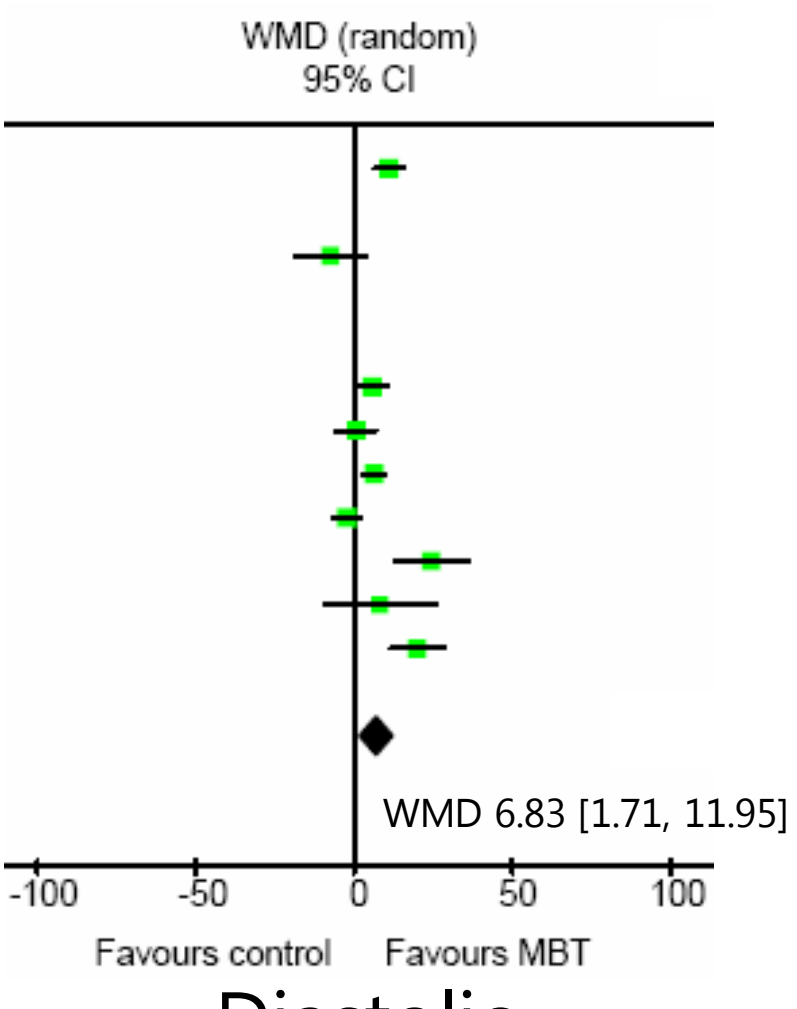
IMAGERY	Methods	Participants	Interventions
Crowther 1982 Q:Mod Alloc: B	8-week parallel unblinded RCT.	N=34, stable meds	Training followed by imagery practice (n=12) vs. stress management training + imagery (n=12) vs. weekly blood pressure checks (n=10). Daily practice times not specified.
Yung 2001 Q: Mod Alloc: B	8-week parallel unblinded RCT.	n=9, unmedicated Chinese	Individual training followed by daily 20-min practice of imagery (n=3) vs. PMR (n=3) vs. stretch release relaxation (n=3).
MEDITATION			
Castillo 2000 Q: High Alloc: A	6-9 month parallel unblinded RCT.	n=60, AA adults	TM 20 min bid (n=31) vs. health education with 20-min daily leisure (n=29).
Hafner 1982 Q: Low Alloc: B	8-week parallel unblinded RCT.	n=21, meds/no meds	Training followed by meditation practiced for 30-35 min twice daily (n=7) vs. meditation + biofeedback (n=7) vs. no treatment control (n=7).
Hager 1978 Q: Mod Alloc: B	4-week parallel unblinded RCT.	n=30, meds/no meds	Training + meditation 20 min bid, 5 d/wk (n=10) vs. biofeedback (n=7).
Patel 1985 Q: Low Alloc: B	8 week parallel unblinded RCT.	n=192, adults at high CVD risk	Training + meditation 15-20 min bid (n=86) vs. meditation + health education vs. health education control (n=75).
Schneider 1995 Q: High Alloc: B	3-mo parallel single-blinded RCT.	n=111; AA adults	Training + TM 20 min bid (n=36) vs. PMR vs. partial attention control (n=38).
Seer 1980 Q: Mod Alloc: B	5-week parallel unblinded RCT.	n=41, no meds.	TM practiced 15-20 min bid (n=14) vs. meditation without mantra (n=13) vs. no treatment control (n=14).
YOGA			
McCaffrey 2005 Q: Mod Alloc: B	8 week parallel unblinded RCT.	n=61, no meds	Training + yoga practiced 3x/week (n=27) vs. education control (n=27).
Murugesan 2000 Q: Low Alloc: B	11 week parallel unblinded RCT.	n=33, no meds.	Yoga 60 min bid, 6 days per week (n=11) vs. meds (n=11) vs. no treatment control (n=11).
van Montfrans 1990 Q: Mod Alloc: A	8 week parallel unblinded RCT.	n=35, no meds.	1 hour weekly training in muscle relaxation, yoga exercises, and stress management x 1 yr (n=18) vs. control relaxation (n=17).
Patel 1975 Q: High Alloc: B	12 week cross-over, unblinded RCT.	n=34, meds.	30 min yoga + biofeedback 2x/wk (n=17) vs. general relaxation control (n=17).

Analysis – Mind-Body Therapies



Systolic

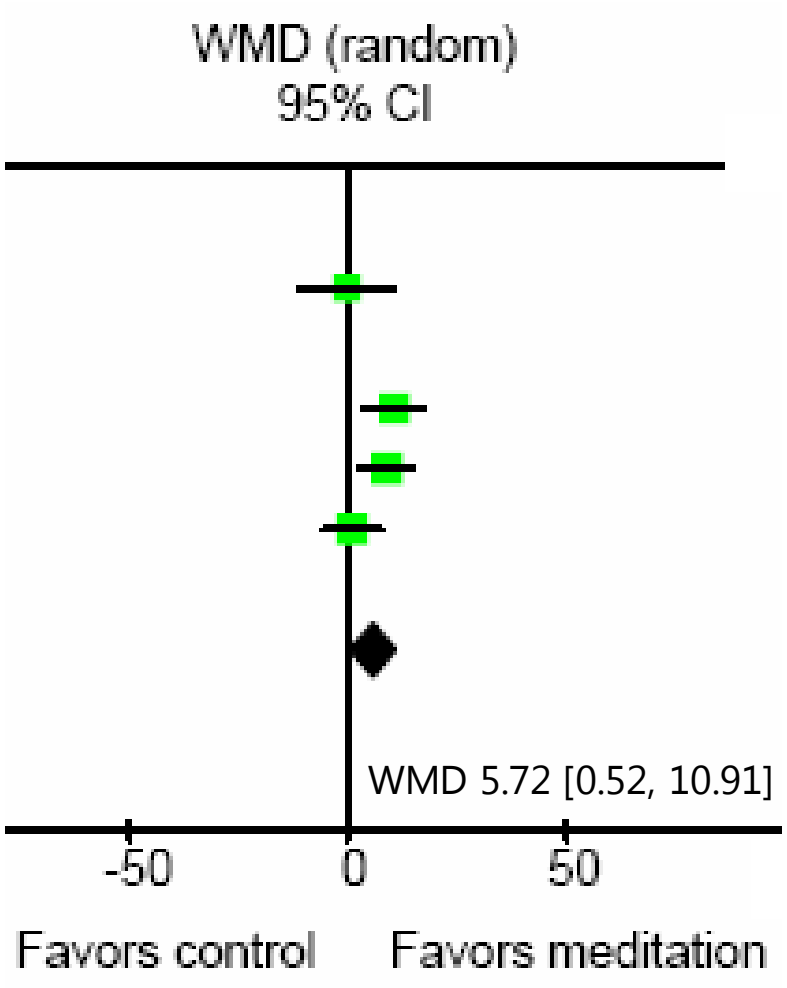
Total (95% CI) 272
Test for heterogeneity: Chi² = 33.48, df = 8 (P < 0.0001), I² = 76.1%
Test for overall effect: Z = 3.49 (P = 0.0005)



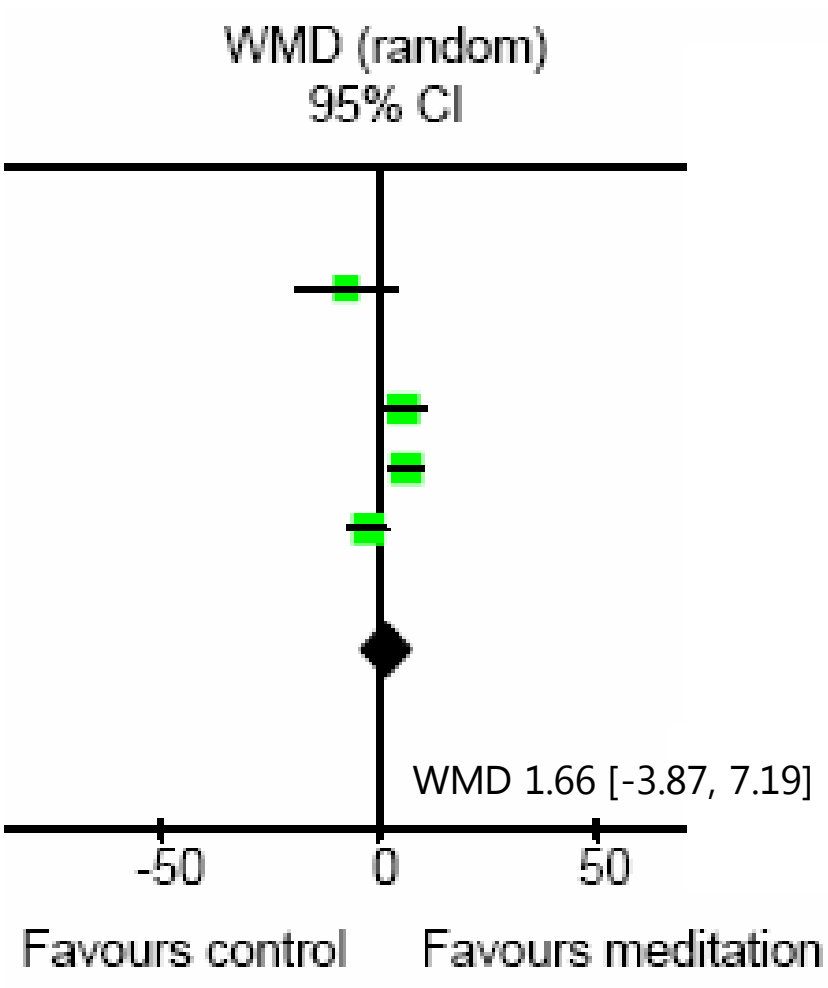
Diastolic

Total (95% CI) 272 255
Test for heterogeneity: Chi² = 48.37, df = 8 (P < 0.00001), I² = 83.5%
Test for overall effect: Z = 2.61 (P = 0.009)

Analysis – Meditation



Systolic

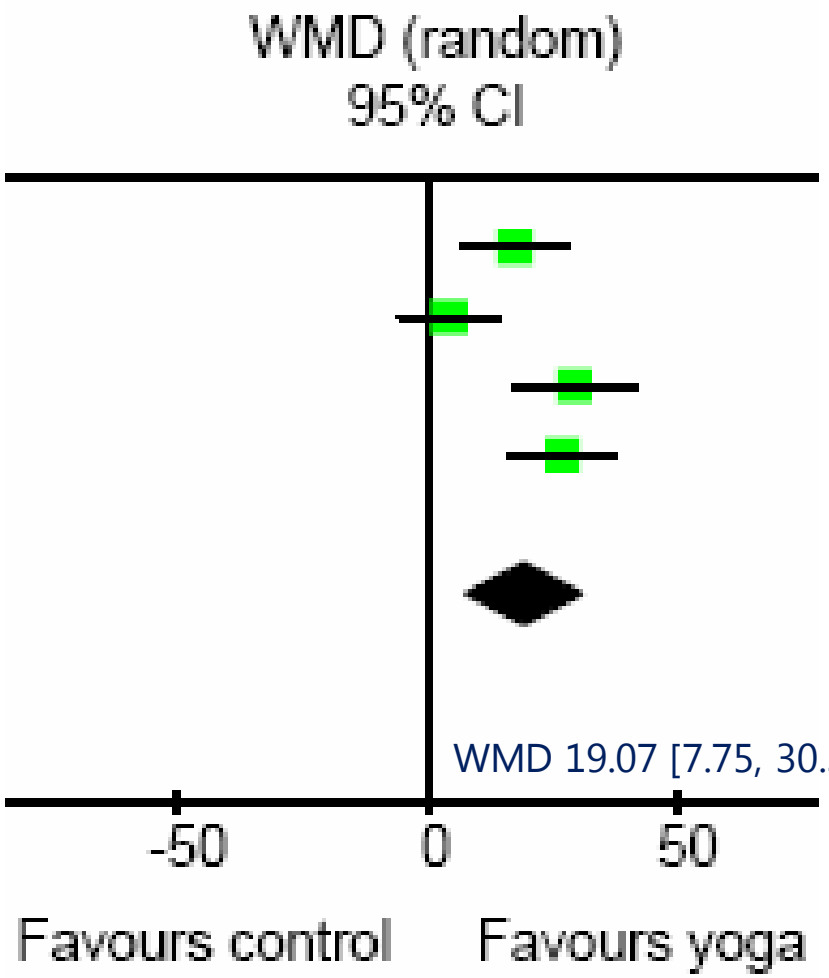


Diastolic

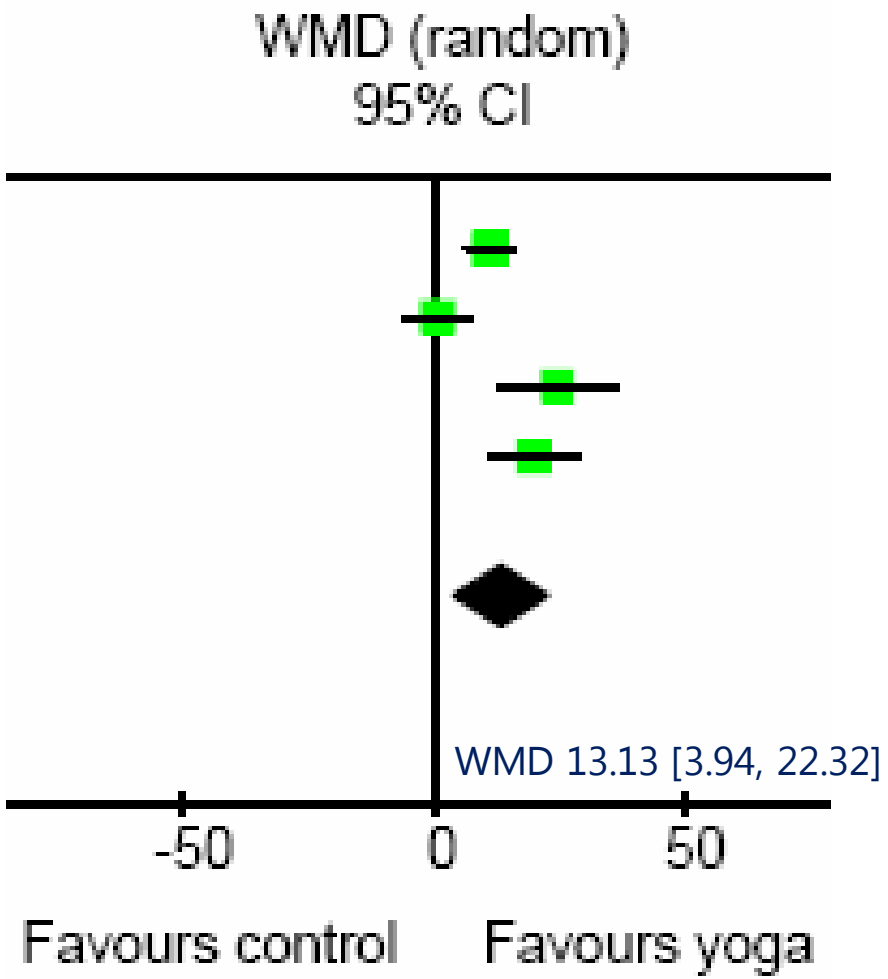
Total (95% CI) 184 170
Test for heterogeneity: Chi² = 6.07, df = 3 (P = 0.11), I² = 50.6%
Test for overall effect: Z = 2.16 (P = 0.03)

Total (95% CI) 184 170
Test for heterogeneity: Chi² = 14.51, df = 3 (P = 0.002), I² = 79.3%
Test for overall effect: Z = 0.59 (P = 0.56)

Analysis – Yoga



Systolic

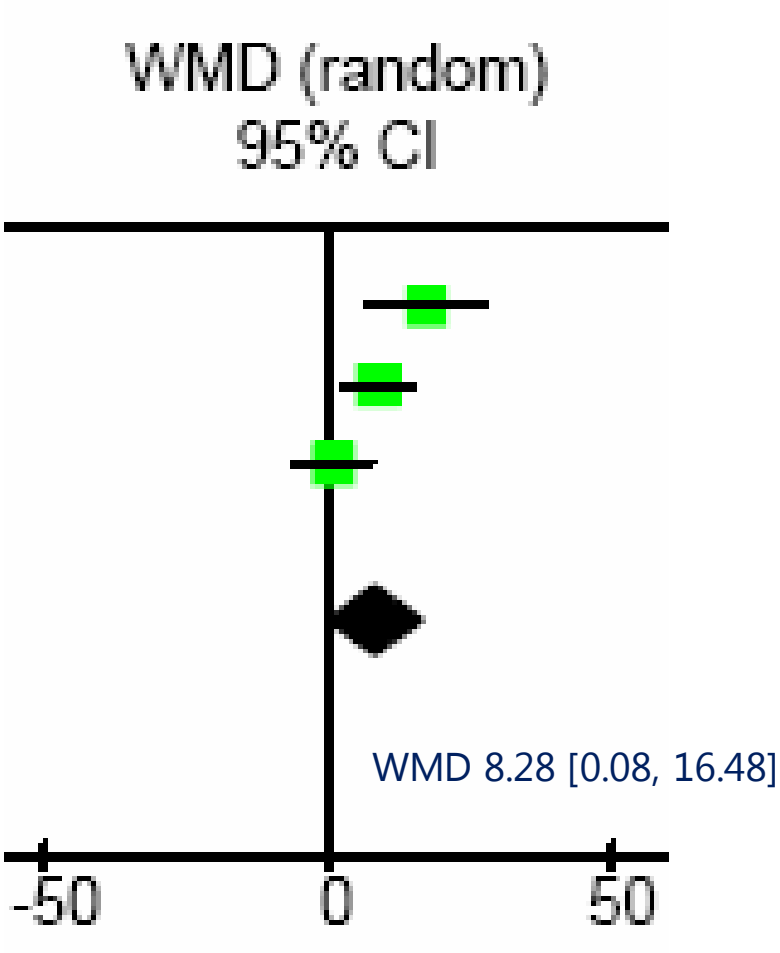


Diastolic

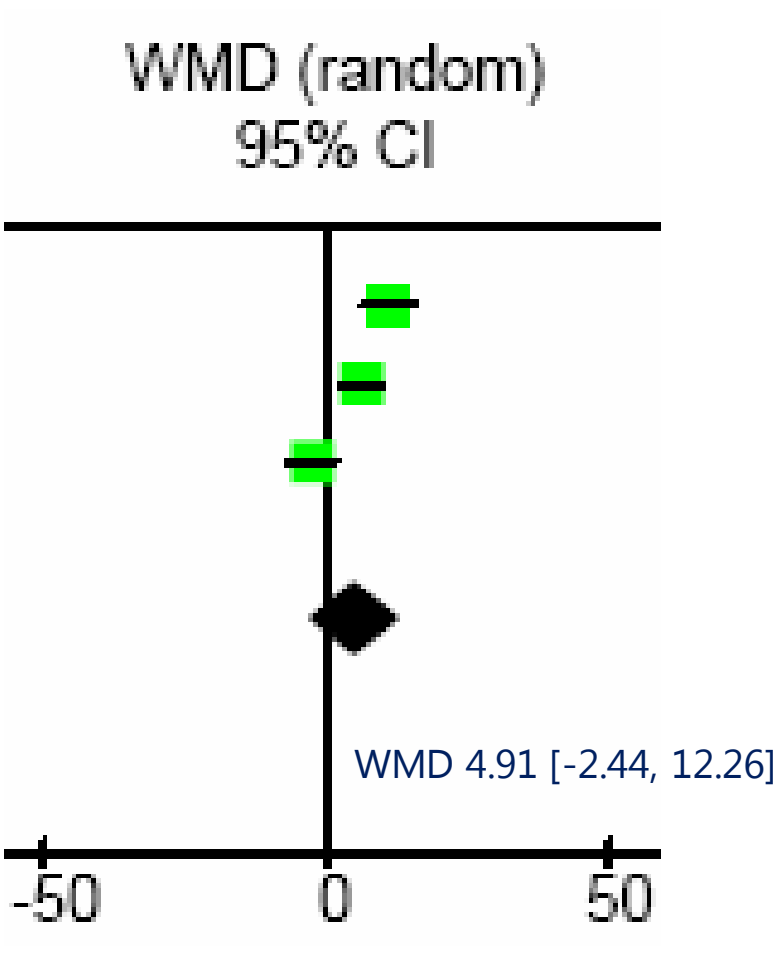
Total (95% CI) 73 72
Test for heterogeneity: Chi² = 13.65, df = 3 (P = 0.003), I² = 78.0%
Test for overall effect: Z = 3.30 (P = 0.0010)

Total (95% CI) 73 72
Test for heterogeneity: Chi² = 19.16, df = 3 (P = 0.0003), I² = 84.3%
Test for overall effect: Z = 2.80 (P = 0.005)

Analysis – High Quality Studies Only



Systolic



Diastolic

Total (95% CI) 84
Test for heterogeneity: Chi² = 7.16, df = 2 (P = 0.03), I² = 72.1%
Test for overall effect: Z = 1.98 (P = 0.05)

Total (95% CI) 84
Test for heterogeneity: Chi² = 18.89, df = 2 (P < 0.0001), I² = 89.4%
Test for overall effect: Z = 1.31 (P = 0.19)

Discussion

- In the most efficacious MBTs, absolute reductions in blood pressure are comparable to pharmacologic monotherapy in both effect size and temporality (ALLHAT).

- BP reductions to the degree found in yoga interventions are associated with reductions in vascular death rates as well as decreased overall cardiac risk (JNC 7/ Framingham).

Discussion

- Analysis of high quality studies demonstrated weaker BP reduction; DBP reduction was nonsignificant.
- Trial quality was generally moderate-low with high heterogeneity.
  - Duration and type of intervention differed widely, even within MBT category
  - Meditation trials were less heterogeneious but may suffer from higher bias
- Given statistically weak, though generally positive effects, without apparent adverse effects:
  - BP reductions compare favorably with what can be achieved using any of the most popular BP medications.
  - Additional research is needed to assess long-term effects on cardiac outcomes

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