

Doctors make blood pressure higher than nurses: systematic review and meta-analysis

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Introduction

- The "White Coat Effect" is the rise in blood pressure associated with a clinic or surgery visit. It is common (up to 75% of hypertensives) and may affect any hypertensive patient.

- Nurse-led hypertension clinics demonstrate lower outcome blood pressures compared to doctor-led or usual care. Some studies in our previous review lacked blinding by reporting blood pressures measured by the doctors or nurses themselves.¹

- Blood pressures measured by doctors appear to elicit a larger white coat effect than those measured by nurses.²

- **Therefore improved outcomes in nurse-led hypertension care could reflect a differential white coat effect. We undertook this systematic review, in preparation for our review of hypertension care,³ to quantify the magnitude of any difference in white coat effect between doctors and nurses.**

Methods

- Text word searches of Medline, Embase, CINAHL and CENTRAL for "White coat". Hand searching of included studies, hypertension journal collections, conference abstracts and personal archives.

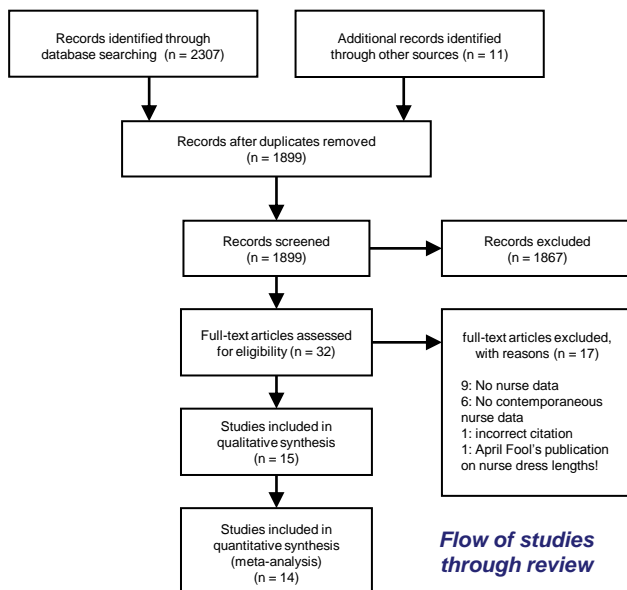
- Inclusion criterion: studies reporting blood pressures measured in adults by doctors and nurses during the same clinic visit.

- **Primary outcome measures were differences in mean systolic and diastolic blood pressures measured by nurses and doctors.**

- For sensitivity analysis studies were classed as 'high risk of bias' if they failed to demonstrate more than one of the following criteria:

- i. randomisation of measurement order
- ii. blinding of doctors and nurses to each others' measurements
- iii. blinding of measurements by use of an automated or random-zero sphygmomanometer

- We extracted nurse and doctor blood pressures measurements adjusted for within-person correlations. Given substantial statistical heterogeneity, we pooled differences across studies with random effects meta-analysis.



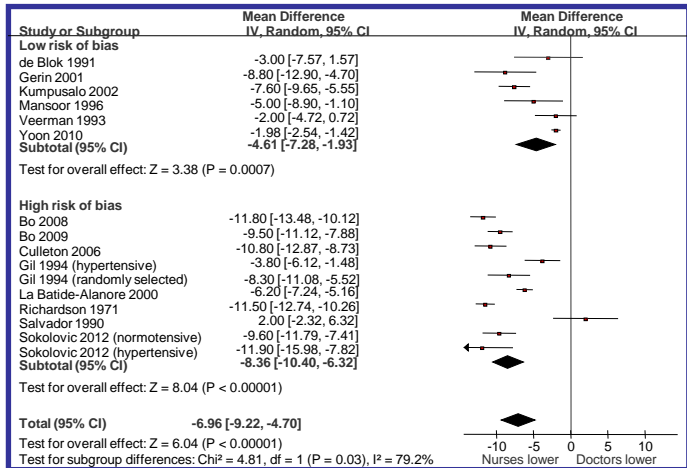
References:

- (1) Clark CE, Smith LFP, Taylor RS, Campbell JL. Nurse led interventions to improve control of blood pressure in people with hypertension: systematic review and meta-analysis. *BMJ* 2010; 341(aug23, 1):c3995.
- (2) Mancini G, Parati G, Pomidossi G, Grassi G, Casadei R, Zanchetti A. Alerting reaction and rise in blood pressure during measurement by physician and nurse. *Hypertension* 1987; 9(2):209-215.
- (3) Clark CE, Smith LFP, Glynn L, Taylor RS, Campbell JL. Allied health professional-led interventions for improving control of blood pressure in patients with hypertension [Protocol]. *Cochrane Database of Systematic Reviews* John Wiley & Sons Ltd Chichester, 2011.

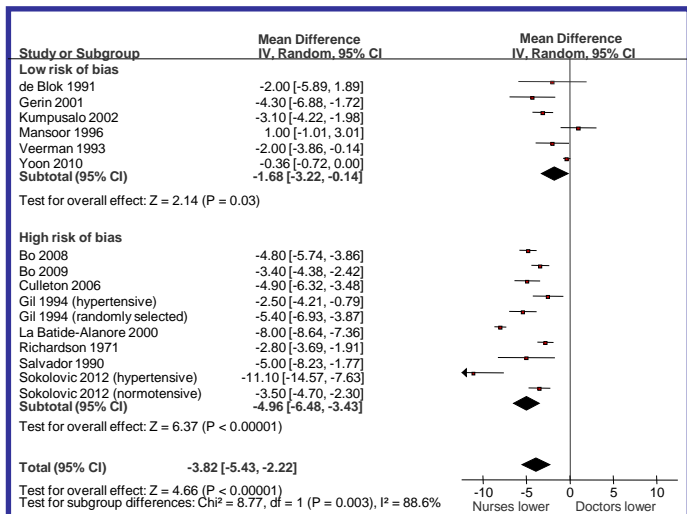
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Results

1899 unique citations were screened, 32 full texts were identified for review, and 14 contributed to the meta-analyses presented (see flow chart). Six of these were classified as being at low risk of bias. Forest plots for the primary outcome measures are presented:



Differences in systolic blood pressure measurements



Differences in diastolic blood pressure measurements

Conclusions

- **On average, blood pressure is 7.0/3.8mmHg lower when measured by nurses than by doctors.**

- **For studies at low risk of bias: systolic blood pressure is 4.6mmHg lower diastolic blood pressure is 1.7mmHg lower**

- **Differences of this magnitude can confound studies comparing doctor and nurse-led care.**

- **Outcome blinding is essential to minimise bias in future studies**

- **Blood pressure measurements by doctors may need cautious interpretation in clinical decision making due to a potentially greater white coat effect**