Supplemental Digital Content

Table S1. Items assessed in the adaptation of the QUADAS-2 tool

Participant selection	- Representativeness of the source population; - Adequacy of the sample selection process; - Relevance of inclusion criteria.
BP measurements	- Standardized measurement protocol according to current guidelines (including type of device, body and arm position, size and placement of the cuff, rest before the first measurement). We considered that good measurement practices were globally respected when measurements were conducted in an adequate body position, after a rest period of 5 minutes, with an appropriately sized cuff; - Allocation of the order of cuff placement, considered unbiased if randomly generated; - Blinding of BP readers, considered effective when the observer did not know what was being measured, or if different observers took unblinded measures for each cuff placement without knowing the measurement results with other cuff placements.
Flow	- Inter-measurement delay between different cuff placements, deemed appropriate if the measurements were conducted during the same encounter and without any intercurrent event; - Measurements conducted in the same conditions for all subjects; - Number of participants included in the analysis; description and explanation given for any exclusion; - Type and handling of missing data.
Statistical methods	- Intended sample size calculated with appropriate hypotheses (considered suitable if able to detect a difference greater than 5 mmHg for systolic BP); - Power (deemed appropriate if a 95% CI of the difference was provided and less than 10 mmHg wide); - Statistical decision tests, such as p-values using paired statistics (considered relevant if plainly stated or if mean BP difference given with a 95% CI or a standard deviation); - Relevant analyses of agreement (intraclass correlation coefficient or Bland-Altman plot for quantitative measurements [25]; Cohen's kappa coefficient for binary classification).

Table S2. Setting and selection criteria

Study	Country	Subjects (centers)	Study design	Source population	Exclusion criteria
Ahmed 2006	Pakistan	200 (1)	Intraindividual comparison, successive measurements	Unrestricted outpatients	Seriously ill; restless; age under 14; no consent
Eder 2008	Germany	203 (1)	Intraindividual comparison, successive measurements	Cardiovascular rehabilitation center, inpatients	Arrhythmia; meal, strenuous physical activity, nicotine, caffeine, or alcohol immediately before measurements
Ertug 2017	Turkey	162 (1)	Intraindividual comparison, successive measurements	Healthy female volunteers	Diagnosis of hypertension; BMI ≥ 30 kg/m^2; caffeine or tobacco use within 30 minutes; full bladder
Holleman 1993	USA	36 (2)	Intraindividual comparison, simultaneous measurements	Smoking cessation program	Unspecified
Kahan 2003	Israel	201 (2)	Intraindividual comparison, successive measurements	Family practice patients and nursing home residents	Unspecified
Ki 2013	Korea	141 (1)	Intraindividual comparison, successive measurements	Unspecified	Bradycardia; history of arrhythmia cardiac failure; ischemic heart disease; short sleeve top; nicotine or caffeine before measurements
Liebl 2004	Germany	201 (1)	Intraindividual comparison, successive measurements	Outpatients (70%); inpatients (30%)	Obese arm size; arrythmia
Ma 2008	Canada	376 (1)	Randomized trial with a control group, successive measurements	Patients from a family medicine clinic	Age > 85 years; patients unable to use right arm; sleeve ending above elbow
Ozone 2016	Japan	186 (3)	Intraindividual comparison, successive measurements	Outpatients	BP not measurable; arrhythmia; no informed consent

Ozone 2018	Japan	147 (3)	Intraindividual comparison, successive measurements	Long-term care users	BP not measurable; arrhythmia; unable to seat
Pinar 2009	Turkey	258 (1)	Intraindividual comparison, successive measurements	Hypertensive outpatients	Unable to use right arm; sleeve ending above elbow, sleeve very thick; nicotine, caffeine before measurements
Thien 2015	The Netherlands	133 (1)	Intraindividual comparison, successive measurements	Outpatients	Unspecified
Woloszyn 2019 patients	Poland	50 (1)	Intraindividual comparison, successive measurements	In-patients	None
Woloszyn 2019 volunteers	Poland	101 (1)	Intraindividual comparison, successive measurements	Volunteers	None

Table S3. Participant characteristics

Study	Ethnicity	Mean age (years)	Sex (% males)	Hypertension	Diabetes	Mean BMI (kg/m²)	Mean BP (SD)		Mean arm circumference (cm)
							SBP (mmHg)	DBP (mmHg)	
Ahmed 2006	Unspecified	32.3	39%	Unspecified	Unspecified	Unspecified	112.9 (15.1)	74.1 (9.9)	26.0
Eder 2008	Unspecified	52.1	84%	100% (treated)	Unspecified	29.8	112.5[1]	78.8[1]	Unspecified
							127.1[2]	81.7[2]	Unspecified
Ertug 2017	100% white	20.7	0%	0%	Unspecified	22.1	Unspecified		Unspecified
Holleman 1993	72% white	43.8	58%	Unspecified	Unspecified	Unspecified	130 (27.7)	75 (13.7)	Unspecified
Kahan 2003	Unspecified	46	34%	17% (treated)	Unspecified	26	123.6 (19)	73.2 (10)	Unspecified
Ki 2013	Unspecified	53.7	83%	42%	20%	Unspecified	128.4 (10.8)	80.8 (6)	Unspecified
Liebl 2004	99% white	45.5	50%	23% (treated)	Unspecified	23.4	126.9[1]	80.2[1]	Unspecified
							127.7[2]	79.4[2]	Unspecified
Ma 2008	78% white	61.5	61%	41% (treated)	12% (treated)	26.5	138.5 (19.6)	78 (10.2)	Unspecified
Ozone 2016	Unspecified	74.6	38%	66% (treated)	8% (treated)	22.9	128.9 (19.1)	67.4 (10.8)	Unspecified
Ozone 2018	Unspecified	87.2	24%	49% (history)	Unspecified	21.3	128.8 (20)	69.3 (13.2)	22.9
Pinar 2009	Unspecified	61.7	47%	100%	41%	27.8	137.3 (19.1)	80.5 (11.9)	Unspecified
Thien 2015	Unspecified	56.3	49%	64% (treated)	Unspecified	27.1	132.8 (15)	78.3 (10.4)	29.9
Woloszyn 2019 p	Unspecified	60	48%	50% (SBP ≥ 140 mmHg)	Unspecified	Unspecified	139.5 (34.4)	80.9	Unspecified
Woloszyn 2019 v	Unspecified	37.3	34%	24% (SBP ≥ 140 mmHg)	Unspecified	Unspecified	130.3	79.5	Unspecified

[1] Oscillometric measurement
[2] Auscultatory measurement

Table S4. Statistical methods reported in individual studies

Study	Pre-specified hypotheses	Appropriate power	Mean BP difference with 95% CI or SD	P-values using paired statistics	Analysis of agreement
Ahmed 2006	Yes	Yes	Yes	Yes	Not done
Eder 2008	Yes	Yes	Yes	Yes	Bland-Altman plot
Ertug 2017	No	No	Yes	Yes	Not done
Holleman 1993	No	Yes	Yes	Yes	Not done
Kahan 2003	Yes	Yes	Yes	Yes	Bland-Altman plot
Ki 2013	No	Yes	No	Yes	Not done
Liebl 2004	Yes	Yes	Yes	Yes	Bland-Altman plot
Ma 2008	Yes	Yes	Yes	Yes	Bland-Altman plot
Ozone 2016	No	Yes	No	Yes	Bland-Altman plot
Ozone 2018	No	No	Yes	Yes	Not done
Pinar 2009	No	No	No	No	Not done
Thien 2015	No	Yes	Yes	Yes	Bland-Altman plot
Woloszyn 2019	No	Yes	Yes	Yes	Not done

Table S5. Meta-regression analyses between selected characteristics and mean SBP difference

Variable	**Number of studies**	**Regression coefficient** [95% CI, p-value]
Percentage of hypertensive subjects	9	-0.01 [-0.05 to -0.03, p = 0.58]
Mean SBP	11	-0.004 [-0.138 to 0.140, p = 0.95]
Mean BMI	8	-0.45 [-0.74 to -0.16, p = 0.009]
Percentage of female subjects	11	-0.04 [-0.08 to 0.01, p = 0.07]

Tables S6. Within-subject variability of SBP measured on a bare arm and on a sleeve or on different sleeves

	Bare arm – bare arm SBP difference		Sleeve – bare arm SBP difference		
Study	**Sleeve thickness**	**SD**	**Sleeve thickness**	**SD**	**p-value***
Ma 2008	Not applicable	9.2	4.3 mm	9.3	0.88

	Thinest sleeve – bare arm SBP diffence		Thickest sleeve – bare arm SBP diffence		
Study	**Sleeve thickness**	**SD**	**Sleeve thickness**	**SD**	**p-value***
Eder 2008	< 2 mm	7.4	2 mm	7.3	0.80
Holleman 1993	Unspecified	11.0	Unspecified	10.9	0.93
Ozone 2018	< 0.5 mm	11.3	< 1.5 mm	14.2	0.006
Thien 2015	Unspecified	6.0	Unspecified	5.9	0.85
Woloszyn 2019 p	8 mm	6.5	17 mm	23.4	< 0.001
Woloszyn 2019 v	8 mm	6.6	17 mm	8.0	0.06

	N layer(s) – bare arm SBP difference**		N+1 layers – bare arm SBP difference**		
Study	**Sleeve thickness**	**SD**	**Sleeve thickness**	**SD**	**p-value***
Holleman 1993	Unspecified	11.0	Unspecified	10.9	0.93
Ozone 2018	< 0.5 mm	11.3	< 1.5 mm	14.2	0.006
Woloszyn 2019 p	8 mm	6.5	17 mm	23.4	< 0.001
Woloszyn 2019 v	8 mm	6.6	17 mm	8.0	0.06

SBP: systolic blood pressure; SD: standard deviation

* F-test (homogeneity of variances test)

** One vs two layers in Holleman 1993 and Ozone 2018; two vs three layers in Woloszyn 2019 p and Woloszyn 2019 v

Table S7. PRISMA checklist

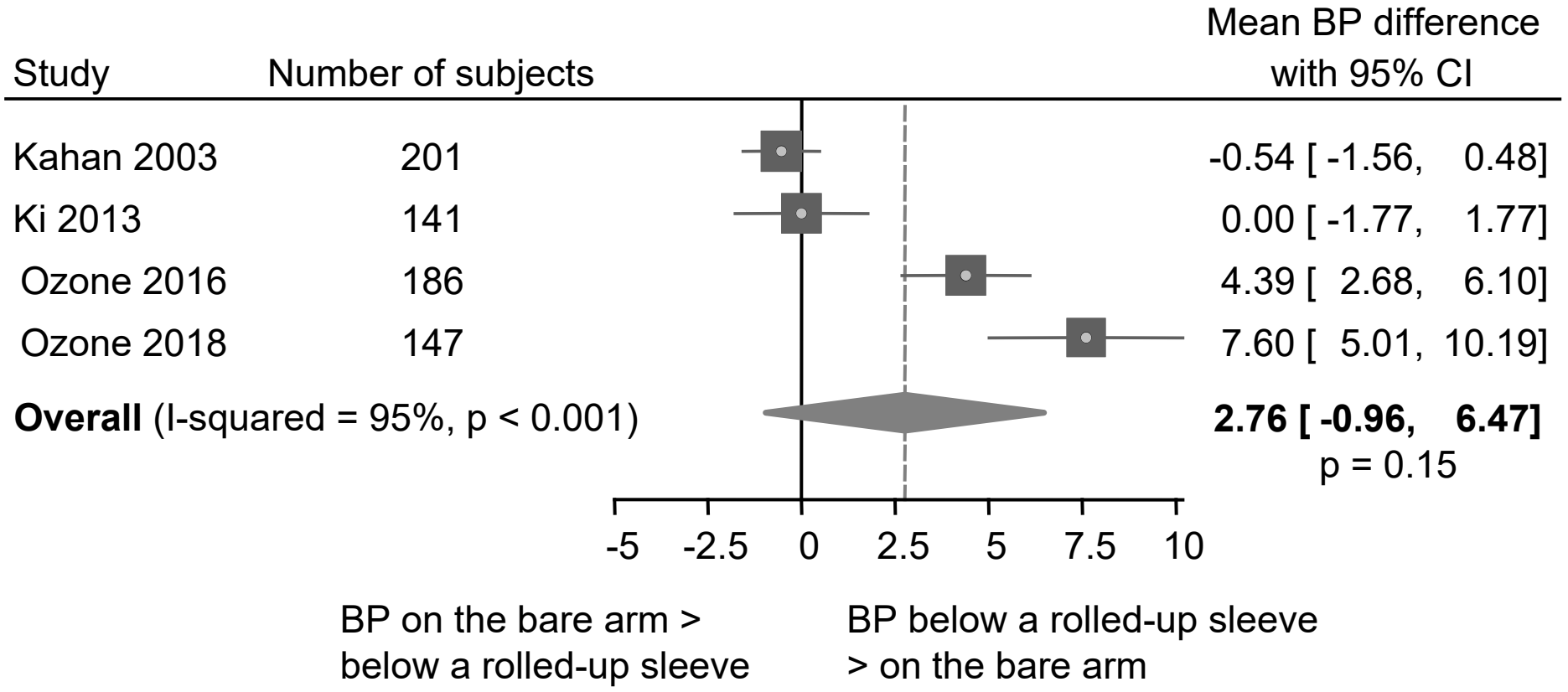
Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	3
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3-4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	3-4
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	4

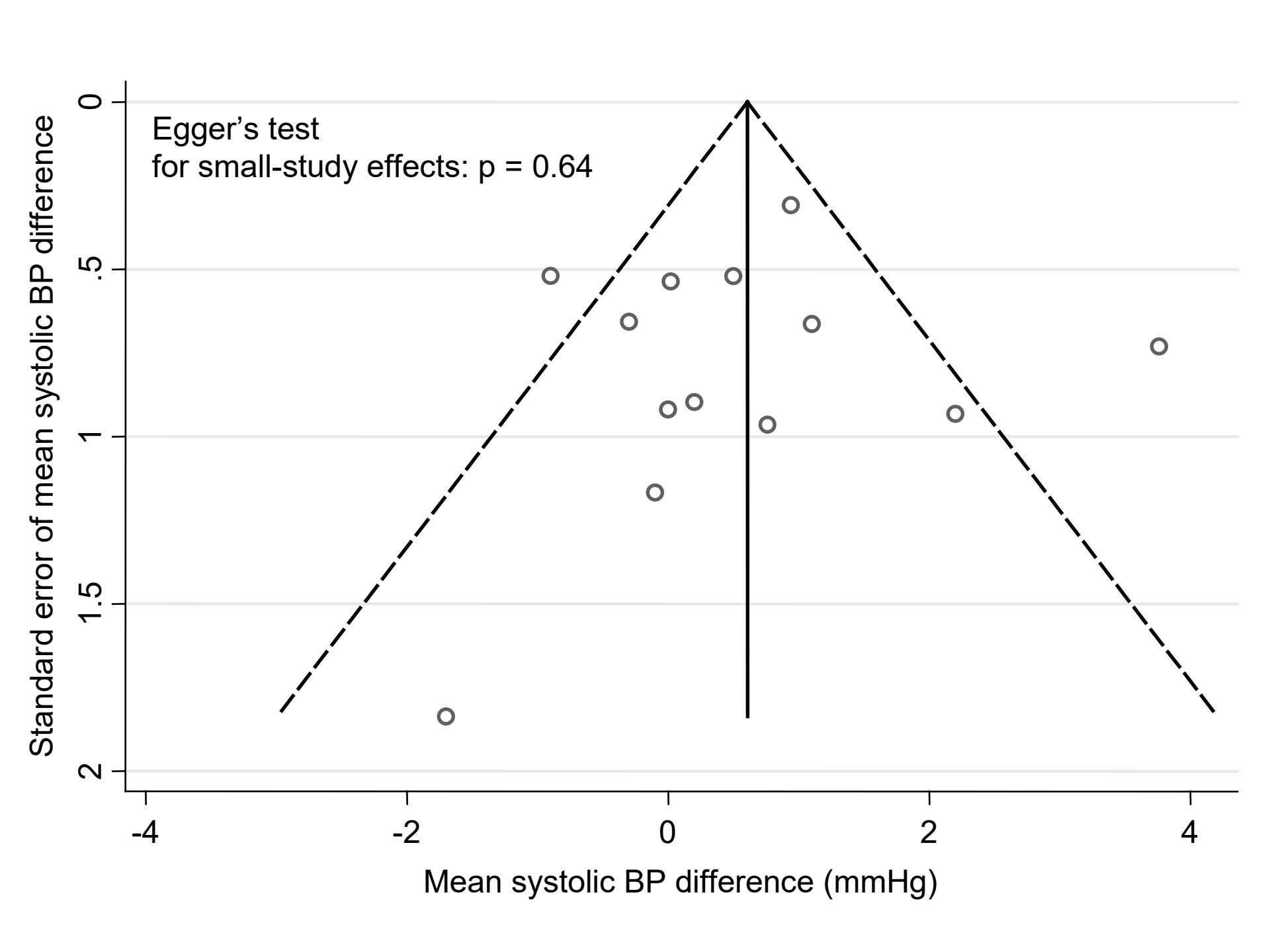
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4-5, Table S1
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	5
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5

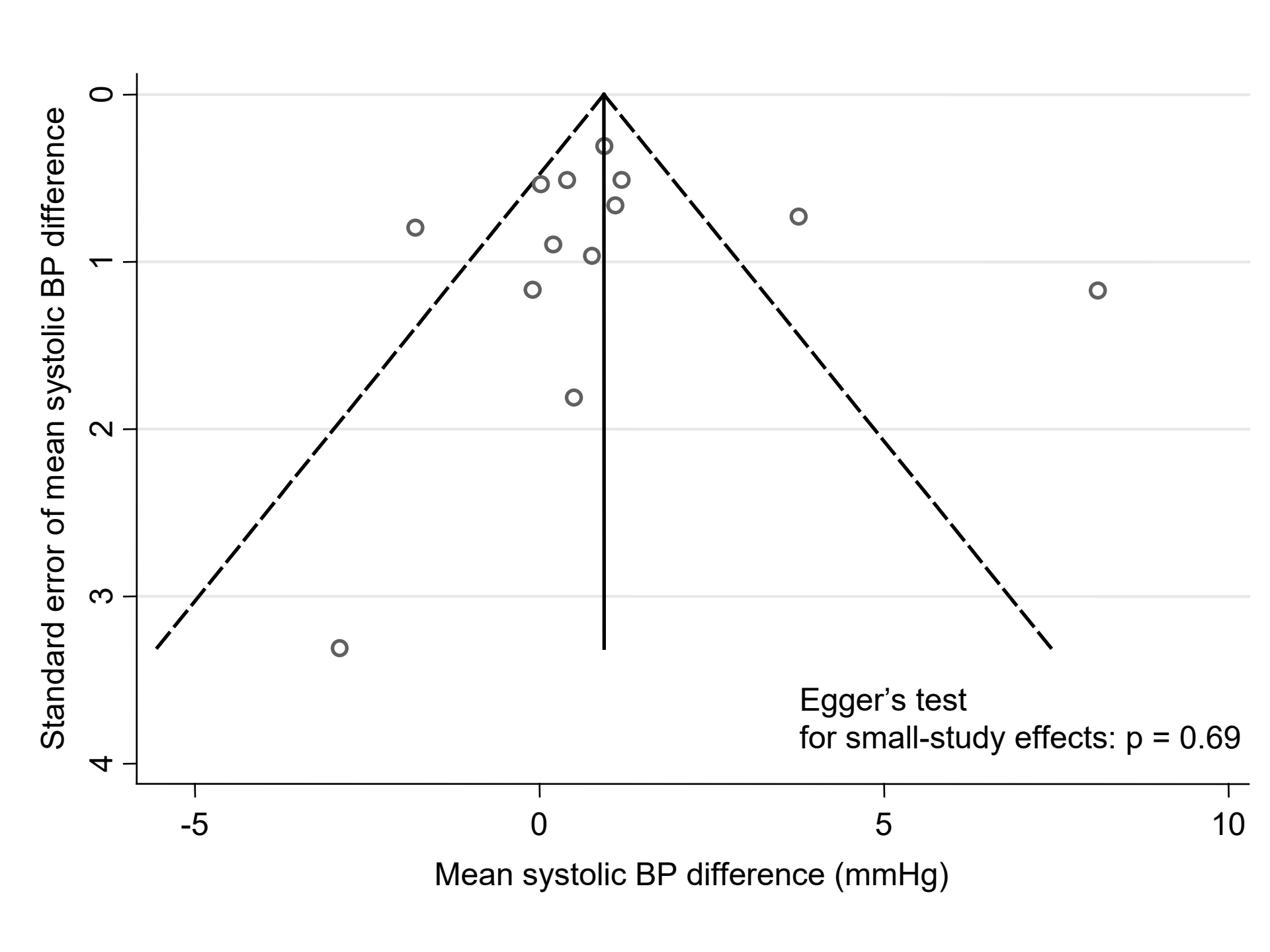
Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	5
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	5
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	5, Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5-6, Table S2, Table 1, Table S3
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	6, Table 2, Table S4
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	6, Table 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	6-7, Figure2, Figure 3, Figure S1
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	7, Figure S2, Figure S3
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	7, Figure S4, Figure

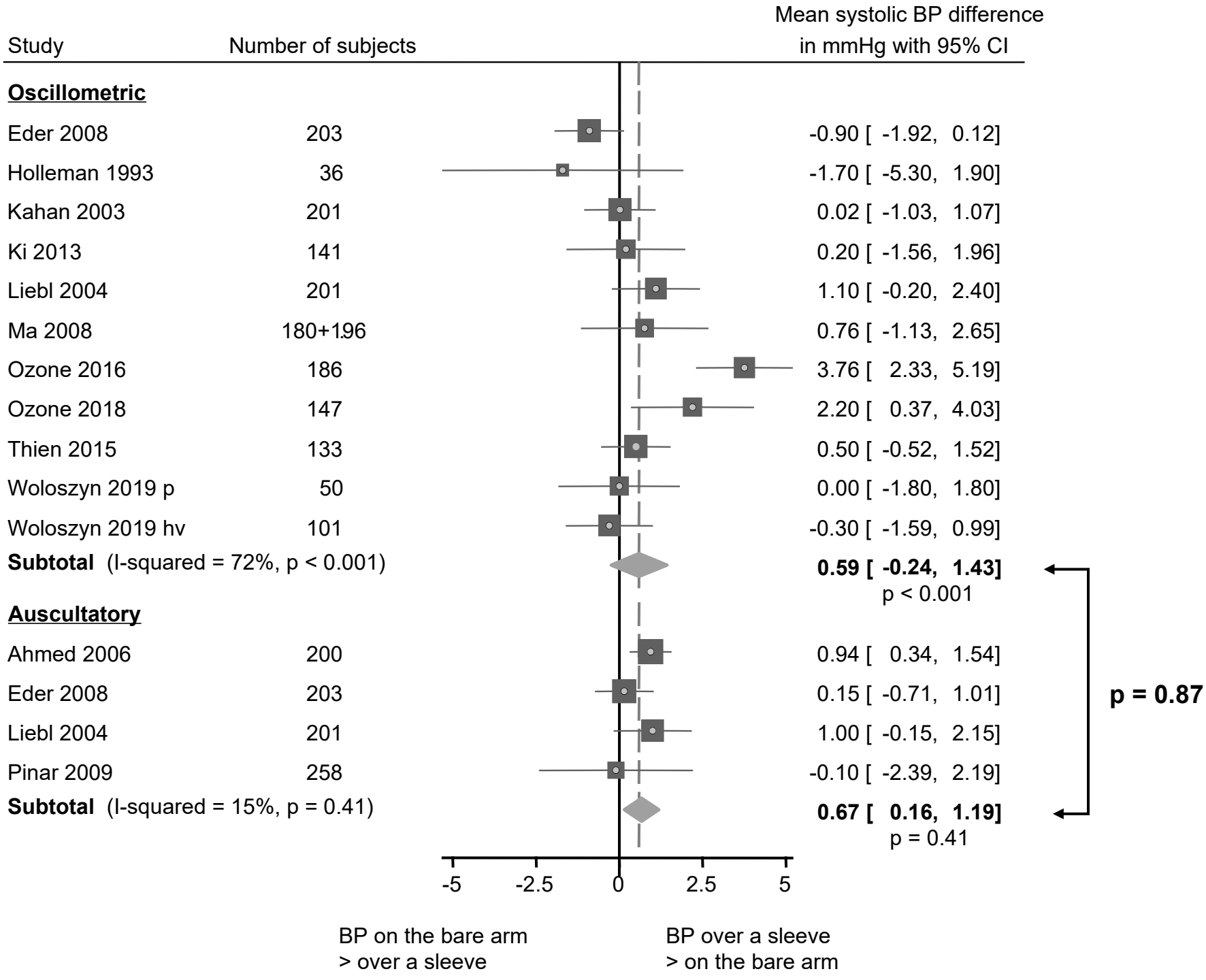
			S5, Table S5, Table S6
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7-8
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	8
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	8-10
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Title page

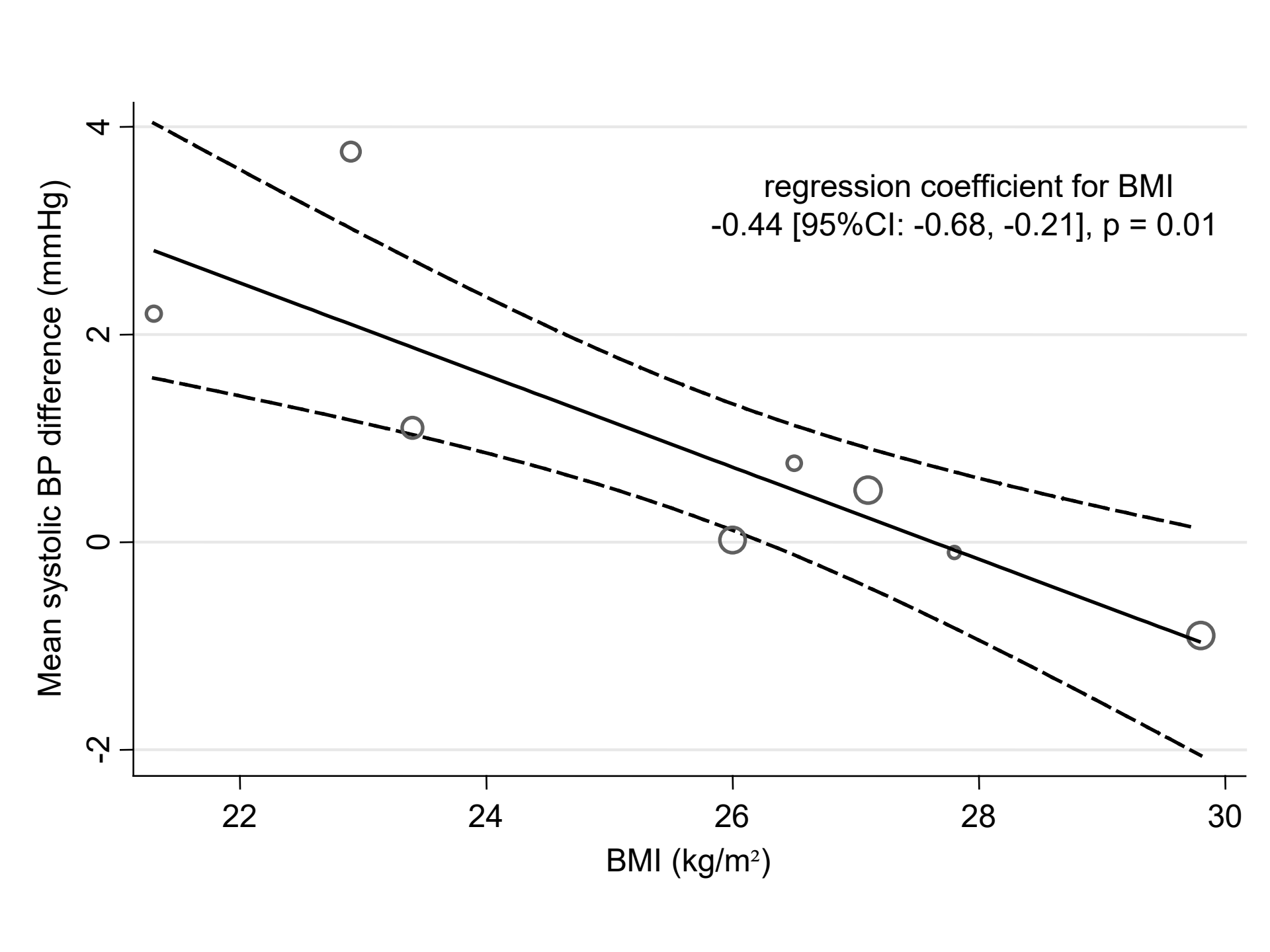
From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

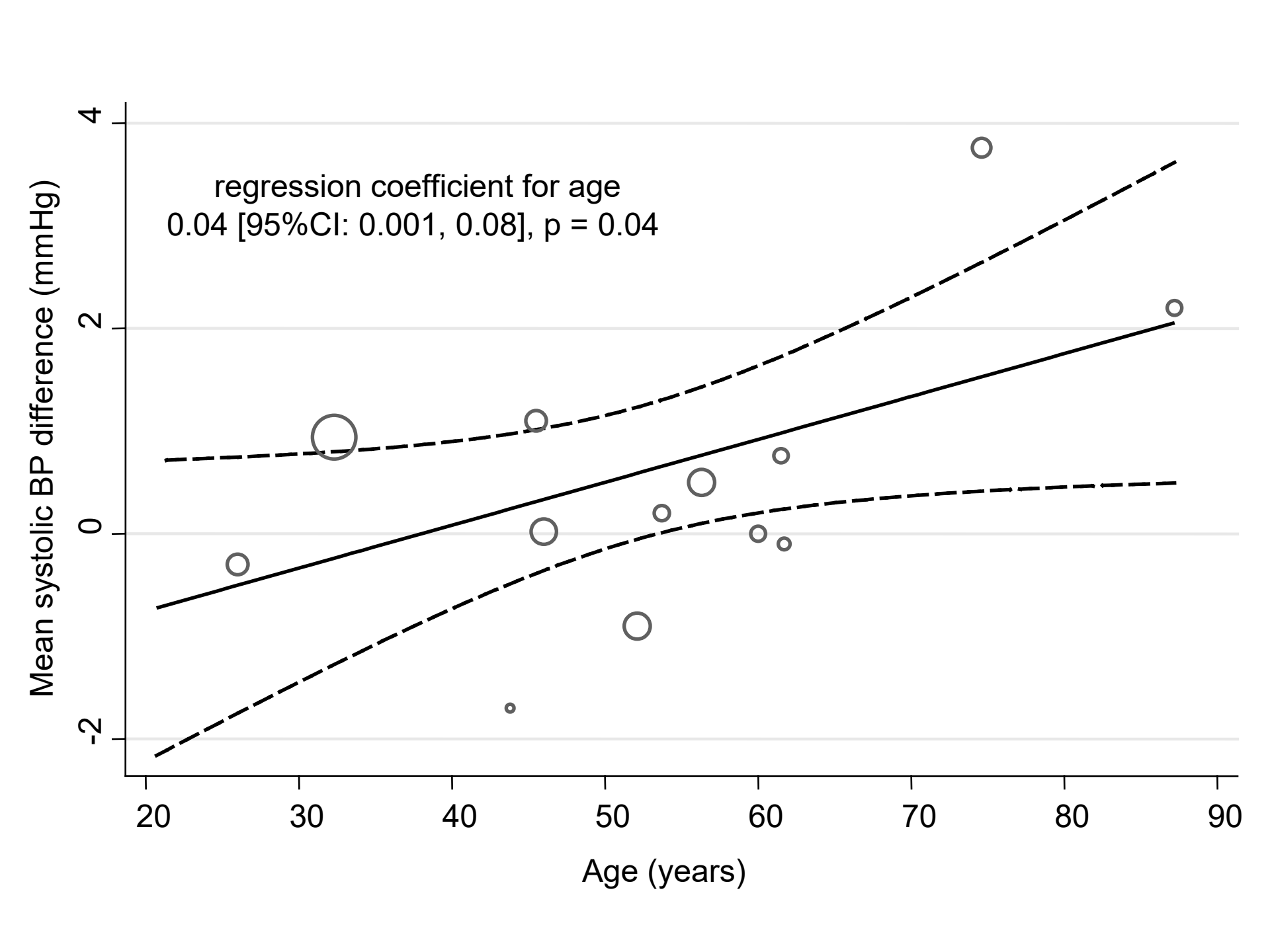

Study
Number of subjects
Mean BP difference with 95% CI
Kahan 2003
201
-0.54 [-1.56, 0.48]
Ki 2013
141
0.00 [-1.77, 1.77]
Ozone 2016
186
4.39 [2.68, 6.10]
Ozone 2018
147
7.60 [5.01, 10.19]
Overall (I-squared = 95%, p < 0.001)
2.76 [-0.96, 6.47]
p = 0.15
-5
-2.5
0
2.5
5
7.5
10
BP on the bare arm > below a rolled-up sleeve
BP below a rolled-up sleeve > on the bare arm


Egger's test
for small-study effects: p = 0.64
Standard error of mean systolic BP difference
0
.5
1
1.5
2
-4
-2
0
2
4
Mean systolic BP difference (mmHg)


Standard error of mean systolic BP difference
0
1
2
3
4
-5
0
5
10
Mean systolic BP difference (mmHg)
Egger's test
for small-study effects: p = 0.69


Study
Number of subjects
Mean systolic BP difference in mmHg with 95% CI
Oscillometric
Eder 2008 203 -0.90 [-1.92, 0.12]
Holleman 1993 36 -1.70 [-5.30, 1.90]
Kahan 2003 201 0.02 [-1.03, 1.07]
Ki 2013 141 0.20 [-1.56, 1.96]
Liebl 2004 201 1.10 [-0.20, 2.40]
Ma 2008 180+196 0.76 [-1.13, 2.65]
Ozone 2016 186 3.76 [2.33, 5.19]
Ozone 2018 147 2.20 [0.37, 4.03]
Thien 2015 133 0.50 [-0.52, 1.52]
Woloszyn 2019 p 50 0.00 [-1.80, 1.80]
Woloszyn 2019 hv 101 -0.30 [-1.59, 0.99]
Subtotal (I-squared = 72%, p < 0.001)
0.59 [-0.24, 1.43]
p < 0.001
Auscultatory
Ahmed 2006 200 0.94 [0.34, 1.54]
Eder 2008 203 0.15 [-0.71, 1.01]
Liebl 2004 201 1.00 [-0.15, 2.15]
Pinar 2009 258 -0.10 [-2.39, 2.19]
Subtotal (I-squared = 15%, p = 0.41)
0.67 [0.16, 1.19]
p = 0.41
p = 0.87
-5
-2.5
0
2.5
5
BP on the bare arm > over a sleeve
BP over a sleeve > on the bare arm


regression coefficient for BMI
-0.44 [95%CI: -0.68, -0.21], p = 0.01
Mean systolic BP difference (mmHg)
4
2
0
-2
22
24
26
28
30
BMI (kg/m²)


regression coefficient for age
0.04 [95%CI: 0.001, 0.08], p = 0.04
Mean systolic BP difference (mmHg)
4
2
0
-2
20
30
40
50
60
70
80
90
Age (years)