

Supplementary Information

Supplemental to:

Self-measurement of blood pressure at home using a cuff device for change in blood pressure levels: systematic review and meta-analysis

Supplementary Table 1. Search terms used for PubMed (MEDLINE)

#	Terms	Number
1	(randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR clinical trials as topic[mesh:noexp] OR randomly[tiab] OR trial[ti] NOT (animals[mh] NOT humans [mh]))	1,429,532
2	"Interactive Health Communication Applications"[Title/Abstract]	22
3	"self measurement"[Title/Abstract]	713
4	"self monitoring"[Title/Abstract]	9,288
5	"self-recording"[Title/Abstract]	225
6	"self-performed"[Title/Abstract]	269
7	"home measurement"[Title/Abstract]	133
8	"home intervention"[Title/Abstract]	353
9	"home monitoring"[Title/Abstract]	2,328
10	"remote monitoring"[Title/Abstract]	4,213
11	"telecommunicat*"[Title/Abstract]	5,681
12	"teleconferenc*"[Title/Abstract]	1,574
13	"teleconsult*"[Title/Abstract]	2,424
14	"telemonitor*"[Title/Abstract]	2,628
15	"telehome*"[Title/Abstract]	166
16	"telecare"[Title/Abstract]	1,003
17	"telehealth*"[Title/Abstract]	14,254
18	"telemed*"[Title/Abstract]	25,450
19	"telemetr*"[Title/Abstract]	10,664
20	"Drug Therapy, Computer-Assisted"[Mesh]	1,691
21	"Therapy, Computer-Assisted"[Mesh]	45,700
22	"Internet"[Mesh]	97,614
23	"Computers"[Mesh]	86,495
24	"Home Care Services, Hospital-Based"[Mesh]	1,978
25	"Home Care Services"[Mesh]	50,875
26	"Remote Consultation"[Mesh]	5,815
27	"Telemetry"[Mesh]	15,174
28	"Monitoring, Ambulatory"[Mesh]	31,611
29	"Telecommunications"[Mesh]	124,473
30	"Telemedicine"[Mesh]	44,900
31	#2 OR #3 OR #4 OR #5 OR #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 #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30	442,783
32	"Blood Pressure"[Mesh]	309,257
33	"Hypertension"[Mesh]	317,477
34	"Blood Pressure"[Title/Abstract]	345,998
35	"hypertens*"[Title/Abstract]	514,619
36	"Blood Pressure Monitoring, Ambulatory"[Mesh]	11,726
37	"Blood Pressure Monitors"[Mesh]	2,407
38	#32 OR #33 OR #34 OR #35 OR #36 OR #37	895,072
39	("2000/01/01"[Date - Publication] : "2023/07/31"[Date - Publication])	22,450,029
40	#1 and #31 and #38 and #39	3,495

Supplementary Table 2. Search terms used for Cochran database

#	Terms	Number
1	(randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR clinical trials as topic[mesh:noexp] OR randomly[tiab] OR trial[ti] NOT (animals[mh] NOT humans [mh]))	1,304,649
2	"Interactive Health Communication Applications"[Title/Abstract]	5
3	"self measurement"[Title/Abstract]	169
4	"self monitoring"[Title/Abstract]	4,131
5	"self-recording"[Title/Abstract]	51
6	"self-performed"[Title/Abstract]	95
7	"home measurement"[Title/Abstract]	33
8	"home intervention"[Title/Abstract]	329
9	"home monitoring"[Title/Abstract]	577
10	"remote monitoring"[Title/Abstract]	943
11	"telecommunicat*"[Title/Abstract]	0
12	"teleconferenc*"[Title/Abstract]	0
13	"teleconsult*"[Title/Abstract]	8
14	"telemonitor*"[Title/Abstract]	17
15	"telehome*"[Title/Abstract]	15
16	"telecare"[Title/Abstract]	223
17	"telehealth*"[Title/Abstract]	2,340
18	"telemed*"[Title/Abstract]	15
19	"telemetr*"[Title/Abstract]	0
20	"Drug Therapy, Computer-Assisted"[Mesh]	167
21	"Therapy, Computer-Assisted"[Mesh]	2,776
22	"Internet"[Mesh]	6,200
23	"Computers"[Mesh]	2,647
24	"Home Care Services, Hospital-Based"[Mesh]	268
25	"Home Care Services"[Mesh]	2,836
26	"Remote Consultation"[Mesh]	441
27	"Telemetry"[Mesh]	377
28	"Monitoring, Ambulatory"[Mesh]	3,680
29	"Telecommunications"[Mesh]	10,844
30	"Telemedicine"[Mesh]	4,268
31	#2 OR #3 OR #4 OR #5 OR #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 #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30	32,395
32	"Blood Pressure"[Mesh]	33,918
33	"Hypertension"[Mesh]	26,563
34	"Blood Pressure"[Title/Abstract]	92,175
35	"hypertens*"[Title/Abstract]	27
36	"Blood Pressure Monitoring, Ambulatory"[Mesh]	1,788
37	"Blood Pressure Monitors"[Mesh]	167
38	#32 OR #33 OR #34 OR #35 OR #36 OR #37	112,371
39	("2000/01/01"[Date - Publication] : "3000"[Date - Publication])	3,277
40	#1 and #31 and #38 and #39	2,953

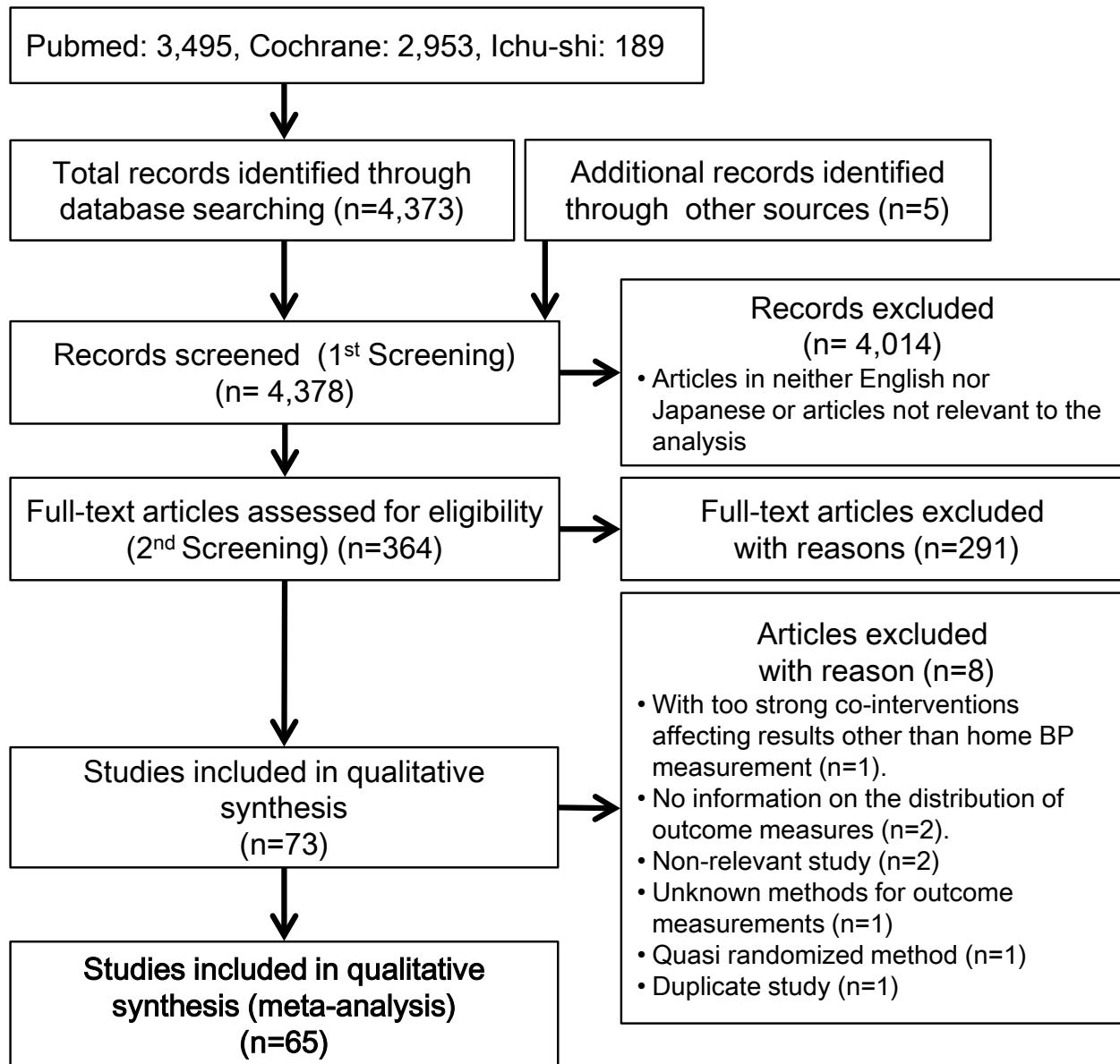
Supplementary Table 3. Search terms used for Ichu-shi (in Japanese)

#	検索式	文献数
1	(ランダム化比較試験/TH or ランダム化比較試験/TA or RCT/TA or 準ランダム化比較試験/TH)	77,351
2	自己測定/TA	1,866
3	自己監視/TA	28
4	自己記録/TA	106
5	自己実施/TA	5
6	自宅測定/TA	7
7	自宅介入/TA	1
8	自宅監視/TA	0
9	リモート/TA or 遠隔/AL	60,445
10	"テレ*"/TA	0
11	"コンピュータ支援薬物療法"/TH	82
12	"コンピュータ支援治療"/TH	10,713
13	"インターネット"/TH	26,850
14	"コンピュータ"/TH	20,149
15	"病院基盤在宅介護支援サービス"/TH	837
16	"在宅介護支援サービス"/TH	56,336
17	"遠隔診療"/TH	7,068
18	"テレメトリー"/TH	2,760
19	"自由行動下血圧測定"/TH	2,608
20	"遠隔通信"/TH	33,958
21	"遠隔医療"/TH	12,820
22	"血圧"/TH	46,336
23	"高血圧"/TH	130,278
24	"血圧"/TA	201,588
25	"高血圧"/TA	134,263
26	"家庭血圧測定"/TH	330
27	"血圧計"/TH	2,075
28	(PDAT=2000/01/01:2023/07/31)	15,837,978
29	#2 or #3 or #4 or #5 or #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 #20 or #21	185,119
30	#22 or #23 or #24 or #25 or #26 or #27	251,805
31	#1 and #28 and #29 and #30	189

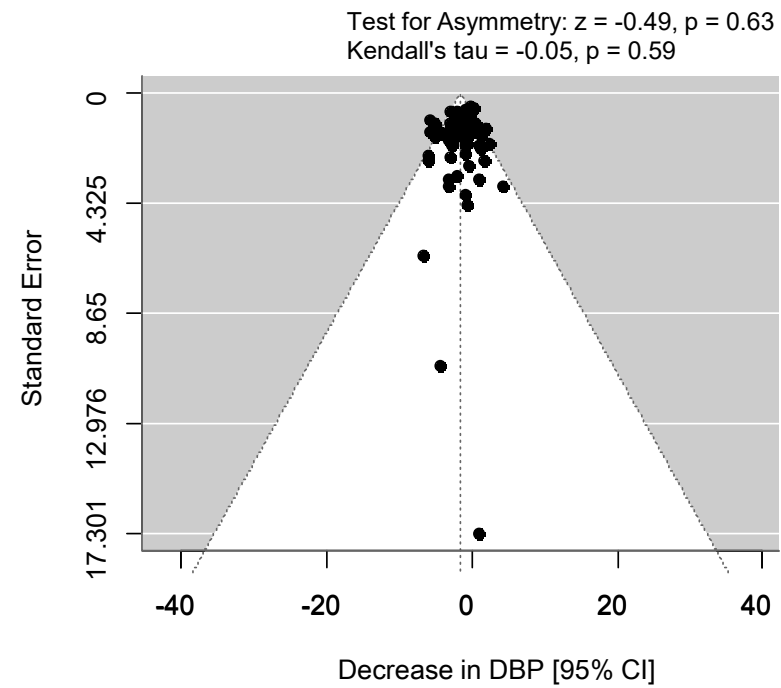
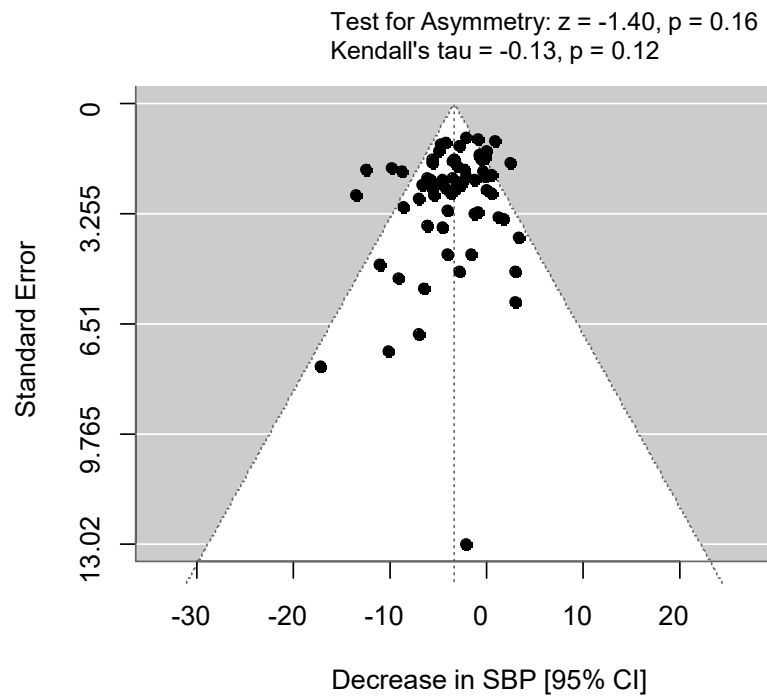
Supplementary Table 4. Risk of Bias and Indirectness

First author	Year	Risk of bias										Indirectness				
		Selection bias		Performance bias	Detection bias	Attrition bias	Other bias				Summary	Population,	intervention,	comparator	outcomes	Summary
		Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Intention-to-treat analysis	Incomplete outcome data	Selective outcome reporting	Early termination	Others						
Vetter	2000	-1	-1	-1	0	-2	-2	-1	-1	-1	-2	-1	-1	-1	0	-1
Mehos	2000	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	0	-1	0	0	-1
Rogers	2001	0	0	-1	0	-1	0	-1	0	-1	0	-1	0	-1	0	-1
Broege	2001	-1	-1	-1	0	-1	-1	-1	-1	0	-1	-1	-2	-2	0	-2
Rudd	2004	0	-1	-1	0	-1	-1	-1	0	-1	0	-1	0	0	0	-1
Halme	2005	-1	-1	-1	0	-1	0	-1	0	0	-1	0	0	-1	0	-1
Zillich	2005	-2	-1	-1	-1	-1	0	-1	0	0	-2	-1	-1	0	0	-1
Marquez-Contreras	2006	0	0	-1	-1	-1	0	-1	0	0	-1	0	0	0	0	0
Verberk	2007	0	0	-1	0	0	0	0	0	0	-1	0	-1	-1	0	-1
Kauric-Klein	2007	0	0	-1	0	0	0	-1	0	0	-1	0	-1	-1	0	-2
Artinian	2007	0	0	-1	0	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
Tobe	2008	-2	-1	-1	-1	-2	-2	-1	0	0	-2	0	-1	-1	0	-1
Madsen	2008	0	0	-1	-1	0	0	-1	0	0	-1	0	-1	0	0	-1
Green	2008	0	-1	-1	0	0	0	-1	0	0	-1	0	0	0	0	0
Parati	2009	-1	-1	-1	-1	-1	-2	-1	0	0	-2	0	-1	0	0	-1
da Silva	2009	-1	-1	-1	-1	-2	-2	-1	0	0	-2	-2	-1	-1	0	-2
Dejesus	2009	-1	-1	-1	-1	0	-1	-1	-2	0	-2	-1	0	0	0	-1
Bosworth	2009	-1	-1	-1	0	0	0	-1	0	0	-1	0	0	0	0	0
Rinfret	2009	-1	-1	-1	-1	0	-1	0	0	0	-1	0	-1	0	0	-1
Godwin	2010	-2	0	-1	-1	-1	-1	-1	-1	0	-2	0	-1	0	0	-1
McManus	2010	0	0	-1	-1	-1	-1	0	-1	0	-1	0	-1	0	0	-1
Varis	2010	0	0	-1	-1	-1	-1	-1	-1	0	-1	-2	0	-1	0	-2
Bosworth	2011	-1	-1	-1	0	-1	0	0	0	0	-1	0	-1	0	0	-1
Magid	2011	0	-1	-1	0	-1	0	0	0	0	-1	0	-1	0	0	-1
Hebert	2012	0	0	-1	0	-1	0	-1	0	-1	-1	-1	0	0	0	-1
Fuchs	2012	0	0	-1	-1	-1	0	0	0	0	-1	0	-1	-1	0	-1
Piette	2012	0	0	-1	-1	-1	0	-1	0	0	-1	0	-1	0	0	-1
Williams	2012	0	0	-1	-1	-1	0	-1	0	0	-1	-2	-1	0	0	-2
Kerry	2013	0	0	-1	0	-1	0	-1	0	-1	-1	-2	0	-2	0	-2
Magid	2013	0	0	-1	0	-1	0	-1	0	0	-1	0	0	0	0	0
McKinstry	2013	0	0	-1	0	-1	0	-1	0	0	-1	0	-1	0	0	-1
Margolis	2013	-2	-1	-1	-1	-1	0	0	0	0	-2	0	-1	-1	0	-1
Ogedegbe	2014	-2	-1	-1	-1	-1	0	-1	0	0	-2	0	-1	0	0	-1
Stewart	2014	-2	-1	-1	-1	-1	0	0	0	0	-2	0	-1	0	0	-1
McManus	2014	0	-1	-1	-1	-1	0	-1	0	0	-1	-2	-1	-2	0	-2
Hosseiniinasab	2014	-2	0	-1	0	-1	0	0	0	0	-2	0	0	0	0	0
Kim	2014	-2	-1	-1	-1	-1	0	-1	0	0	-2	-1	-1	0	0	-1
Yi	2015	0	0	-1	-1	-1	-1	0	0	0	-1	0	-1	0	-1	-1
Hanley	2015	-1	-1	-1	-1	-2	0	0	0	0	-2	-2	-1	0	0	-2
Aekplakorn	2016	-2	0	-1	0	-1	0	-1	0	0	-2	0	0	-1	0	-1
Kim	2016	-1	-1	-1	-1	-1	-1	0	-1	0	-1	0	-2	0	0	-2
Tzourio	2017	-2	-2	-1	0	-1	0	0	-1	-1	-2	-1	0	0	0	-1
Klarskov	2018	0	0	-1	0	0	-1	-1	0	0	-1	0	0	0	0	0
Martinez	2018	0	0	-1	0	0	-1	-1	0	0	-1	-2	0	0	0	-2
McManus	2018	0	0	-1	0	0	0	0	0	0	-1	0	0	0	0	0
Pan	2018	0	0	-1	0	0	0	-1	0	0	-1	0	0	0	0	-1
Skolarus	2018	0	0	-1	0	-2	-1	0	0	0	-2	0	0	0	0	0
Cuffee	2019	0	0	-1	0	-1	0	0	0	0	-1	0	-1	-1	0	-1
Gu	2020	0	-1	-1	0	0	0	0	0	0	-1	-2	0	0	0	-2
Ojji	2020	-1	-1	-1	0	0	0	-1	-2	0	-2	0	-1	-1	0	-1
Zha	2020	-1	-1	-1	0	-2	0	0	-2	0	-2	0	0	0	0	0
Ionov	2021	0	0	-1	0	-1	-1	-1	0	0	-1	0	-1	0	0	-1
McManus	2021	0	-1	-1	-1	-1	-1	0	0	0	-1	0	-1	0	0	-1
Zhang	2021	-1	-1	-1	0	0	0	0	0	0	-1	0	-1	-1	0	-1
Akl	2021	0	0	-1	-1	-2	0	0	-2	-1	-2	0	0	0	-2	-2
Margolis	2022	-2	-2	-1	0	0	0	-1	0	0	-2	0	-2	-1	0	-2
Okoro	2022	0	0	-1	0	0	0	-1	0	-1	-1	-2	-2	0	-2	-2
Muijsers	2022	0	0	-1	-1	-1	-1	0	0	0	-1	-2	0	0	0	-2
Calderón-Anyosa	2023	-1	-1	-1	0	-1	0	0	0	0	-1	0	-1	0	0	-1
Doogue	2023	0	0	-1	0	-1	0	-1	-2	0	-2	-2	0	0	0	-2
Hoppe	2023	0	0	-1	0	0	-1	0	0	-1	-1	-1	-1	-1	0	-1
Leupold	2023	-2	0	-1	0	-1	-2	0	0	0	-2	0	-2	0	0	-2
Martinez-Ibáñez	2023	0	0	-1	0	0	-1	-1	-1	0	-1	0	-1	-1	0	-1
Nejamis	2023	0	0	-1	0	0	0	-1	0	0	-1	0	0	0	0	0
Ramos-Zavala	2023	0	-2	-1	0	-1	-1	-1	0	0	-2	0	-1	0	0	-1

The Cochrane Risk of Bias Tool was used to evaluate the studies.

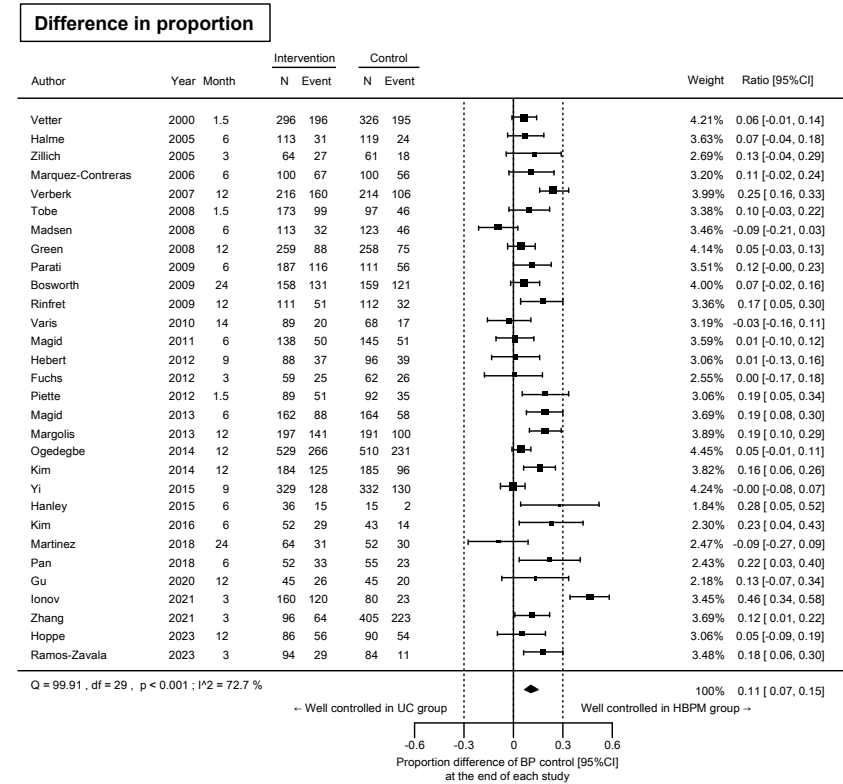
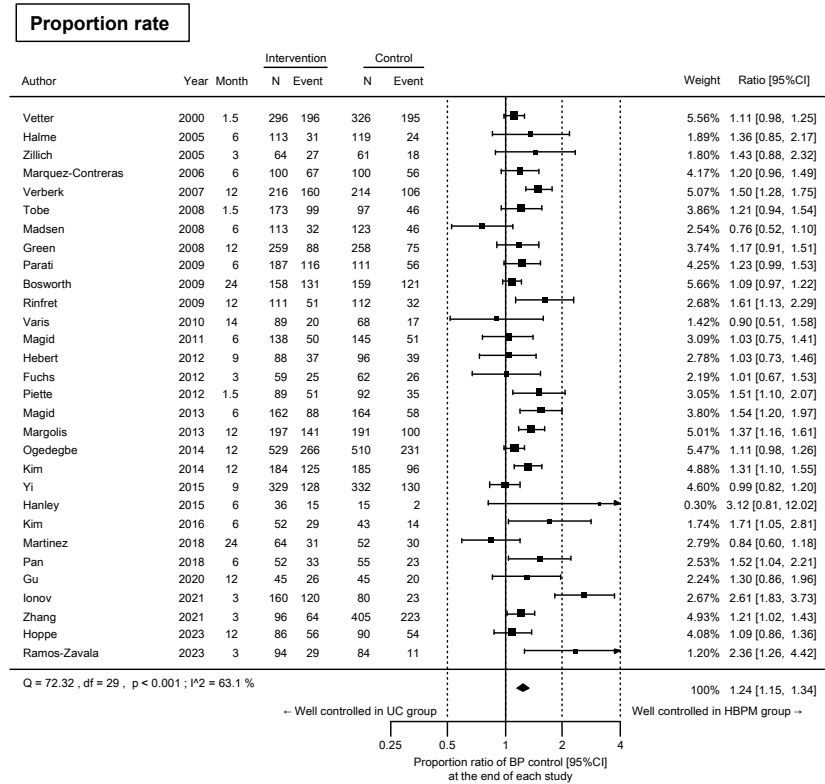


Supplementary Figure 1. Selection of studies for inclusion in the review.



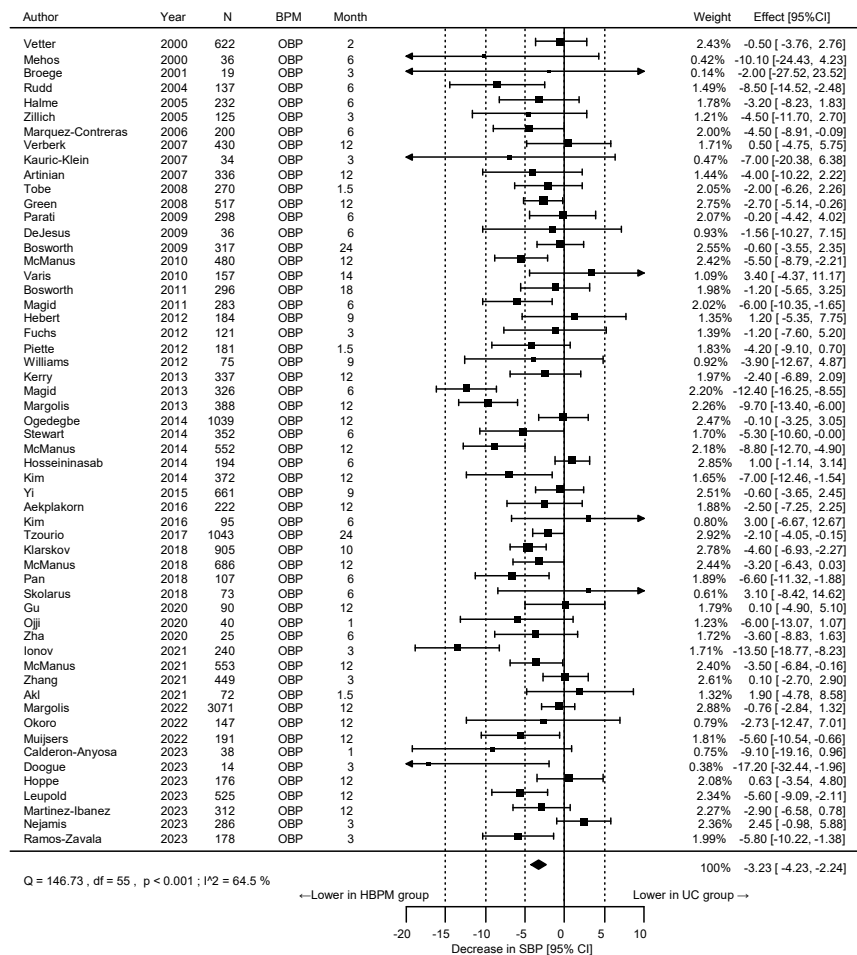
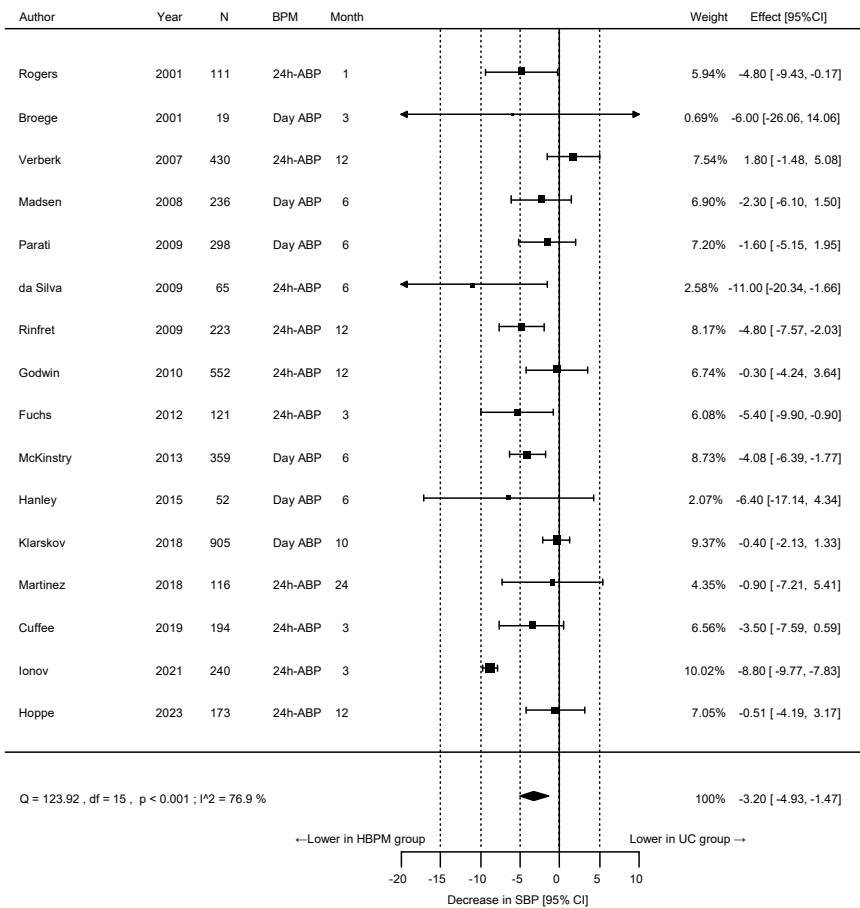
Supplementary Figure 2. Funnel Plot of the differences in systolic (SBP) and diastolic (DBP) blood pressure changes

“Test for Asymmetry” and “Kendall’s tau” indicate the results of Egger’s test and Begg’s test, respectively.

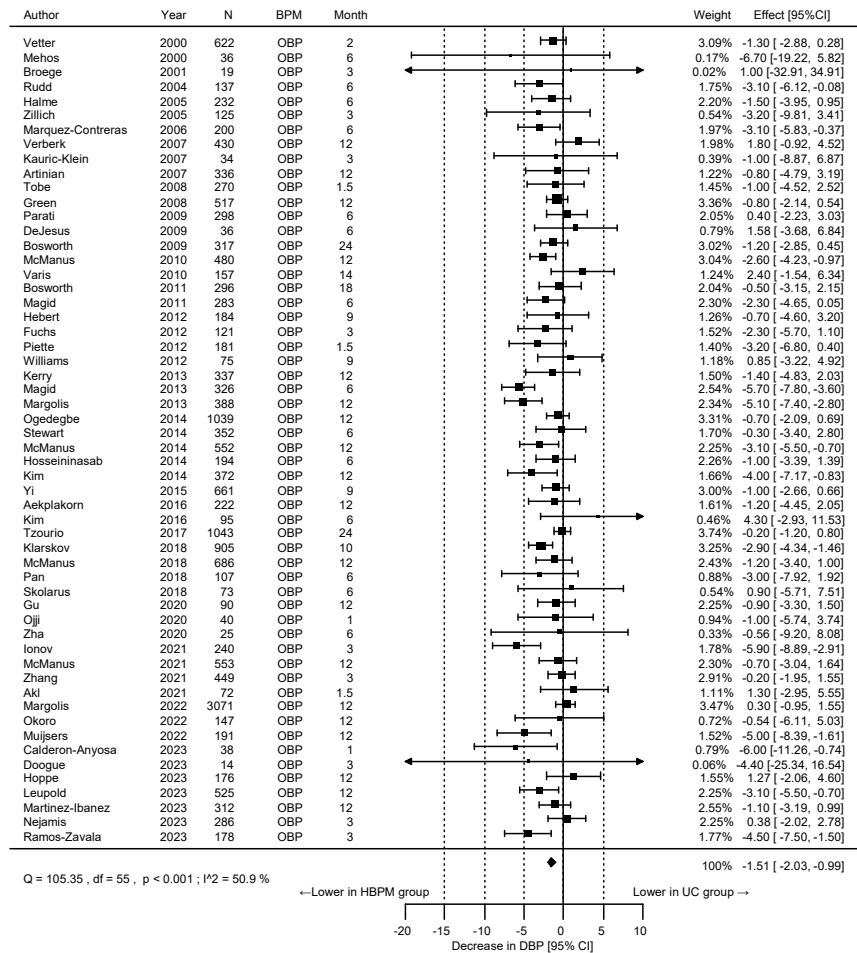
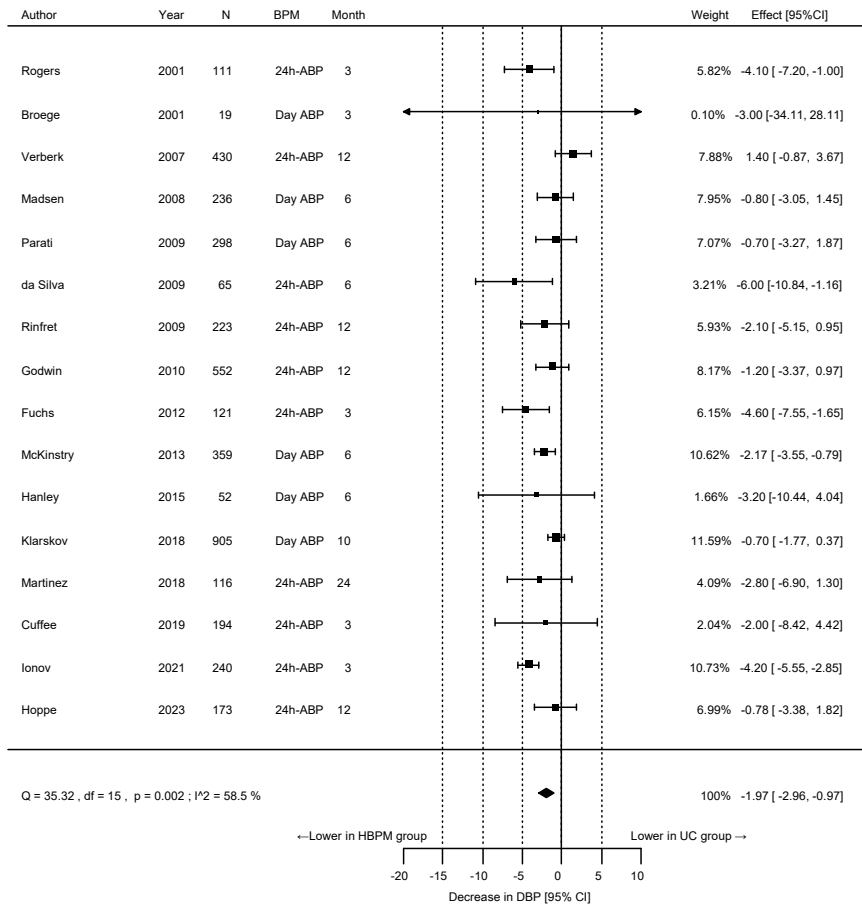


Supplementary Figure 3. Difference in BP control at follow-up between groups

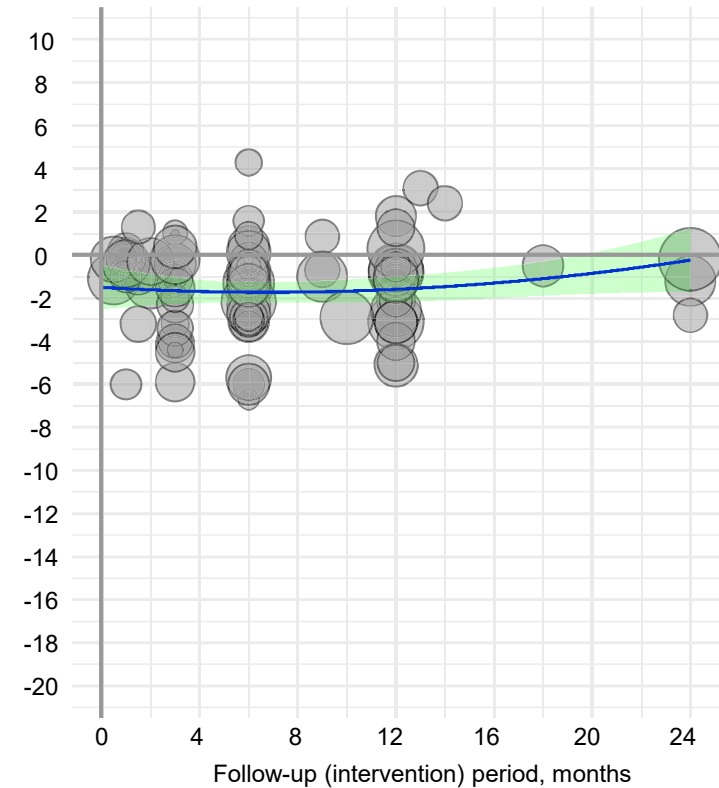
CI, confidence interval; BP, blood pressure; HBPM, home blood pressure measurement; UC, usual care

Outcome measure: Office BP (OBP)**Outcome measure: Ambulatory BP (ABP)****Supplementary Figure 4. The results for SBP change stratified by the type of outcome BP measurements**

CI, confidence interval; BPM, blood pressure measurement method to obtain the outcome value; OBP, office blood pressure; ABP, ambulatory blood pressure; HBPM, home blood pressure measurement; UC, usual care

Outcome measure: Office BP (OBP)**Outcome measure: Ambulatory BP (ABP)****Supplementary Figure 5. The results for DBP change stratified by the type of outcome BP measurements**

Abbreviations are the same as in Supplementary Figure 4.

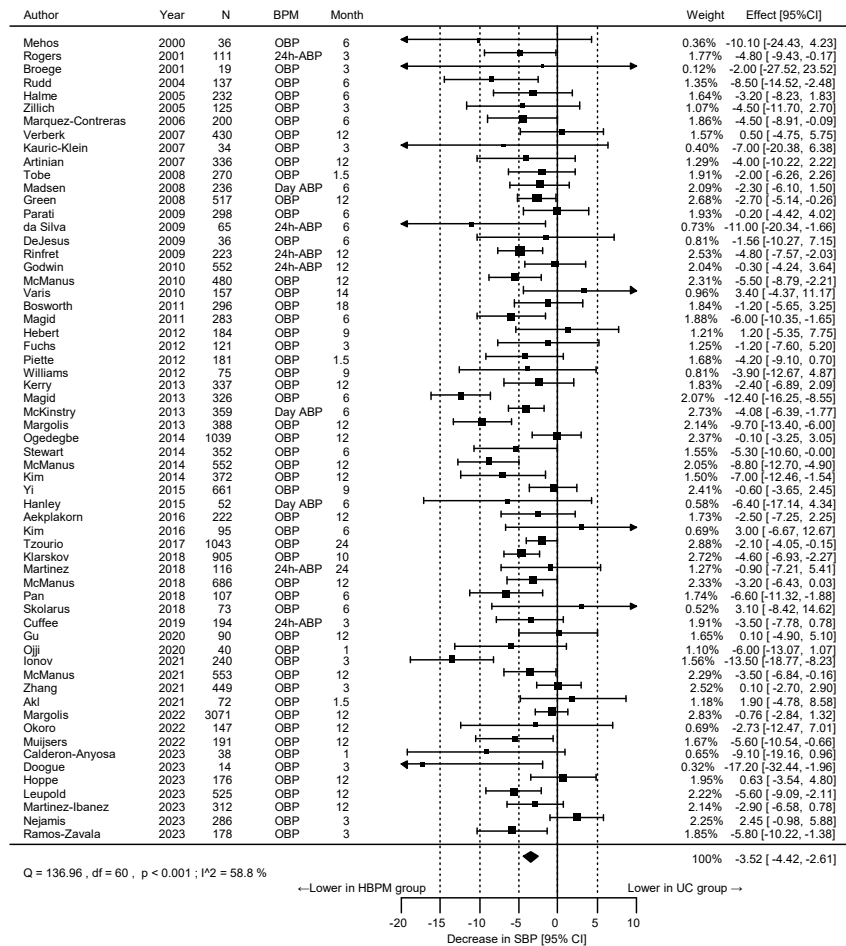


Supplementary Figure 6. The meta-regression analysis for the association between the follow-up period and the BP-lowering effect of HBPM

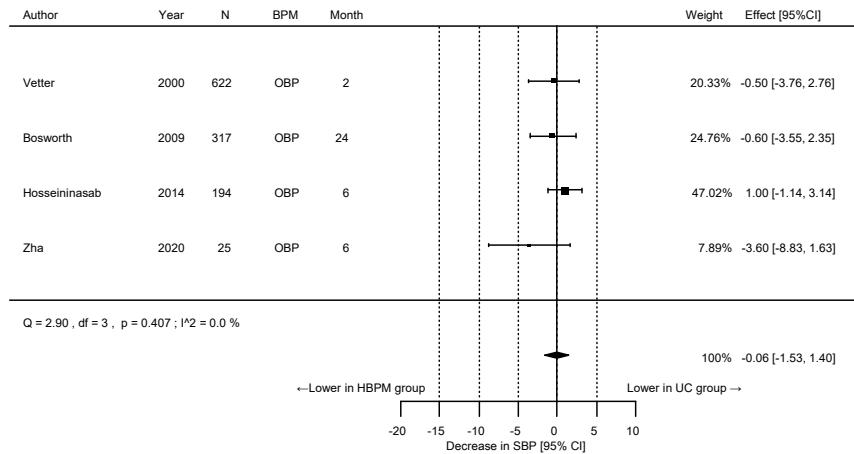
Likelihood ratio tests between a model that only included the follow-up period as a linear equation and a model that further included a quadratic equation showed that the latter was better ($p=0.018$ for SBP and $p=0.038$ for DBP). The size of each bubble represents the inverse of the standard error for the corresponding study.

Abbreviations are the same as in **Supplementary Figure 4**.

Intervention by an upper-arm device



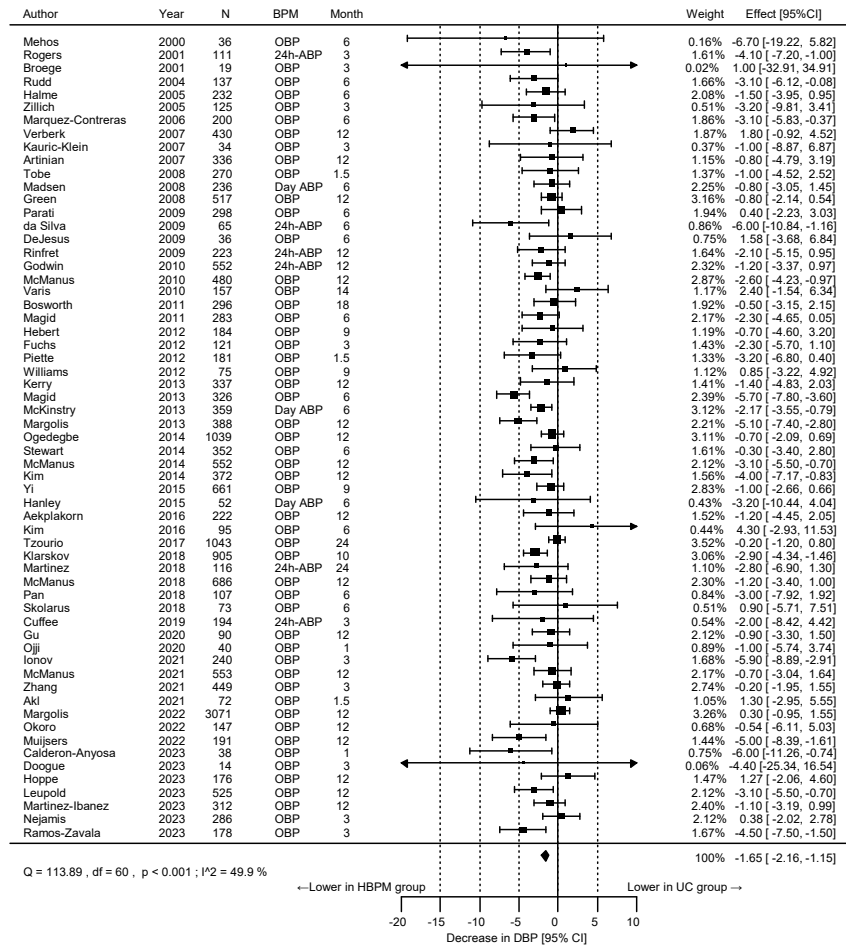
Intervention by a wrist-type device



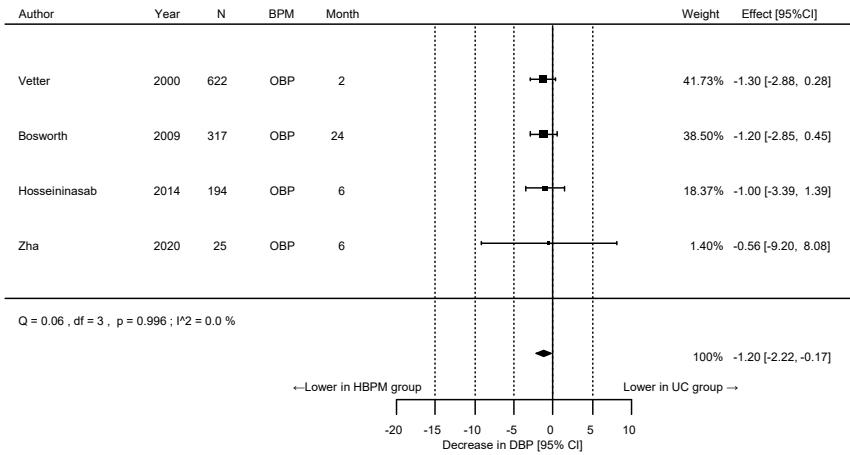
Supplementary Figure 7. The results for SBP change stratified by the device type for the intervention

Abbreviations are the same as in Supplementary Figure 4.

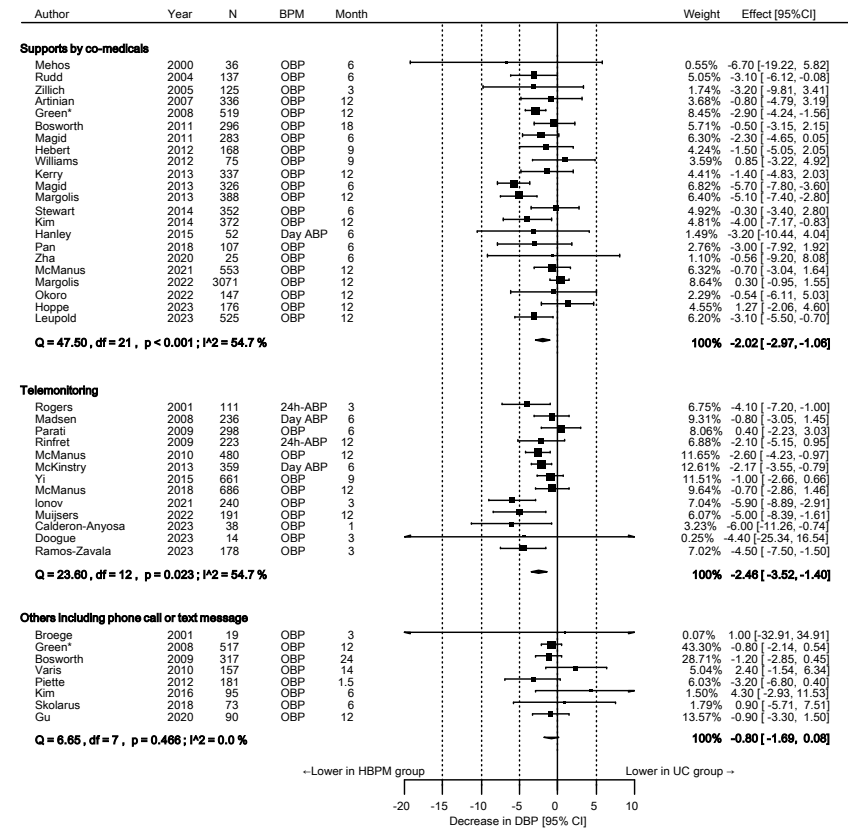
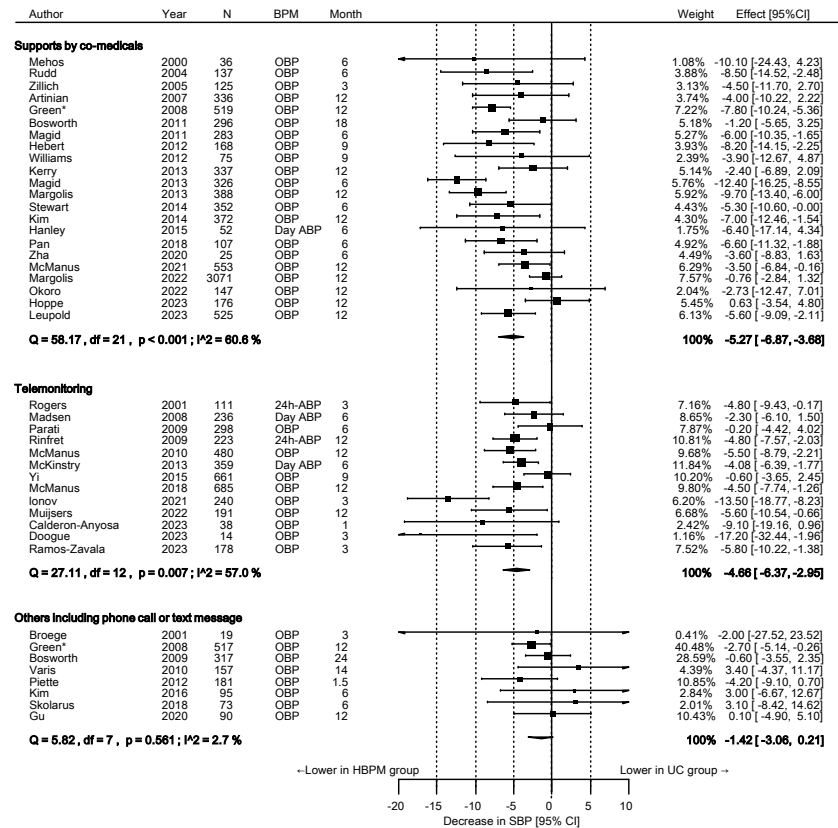
Intervention by an upper-arm device



Intervention by a wrist-type device



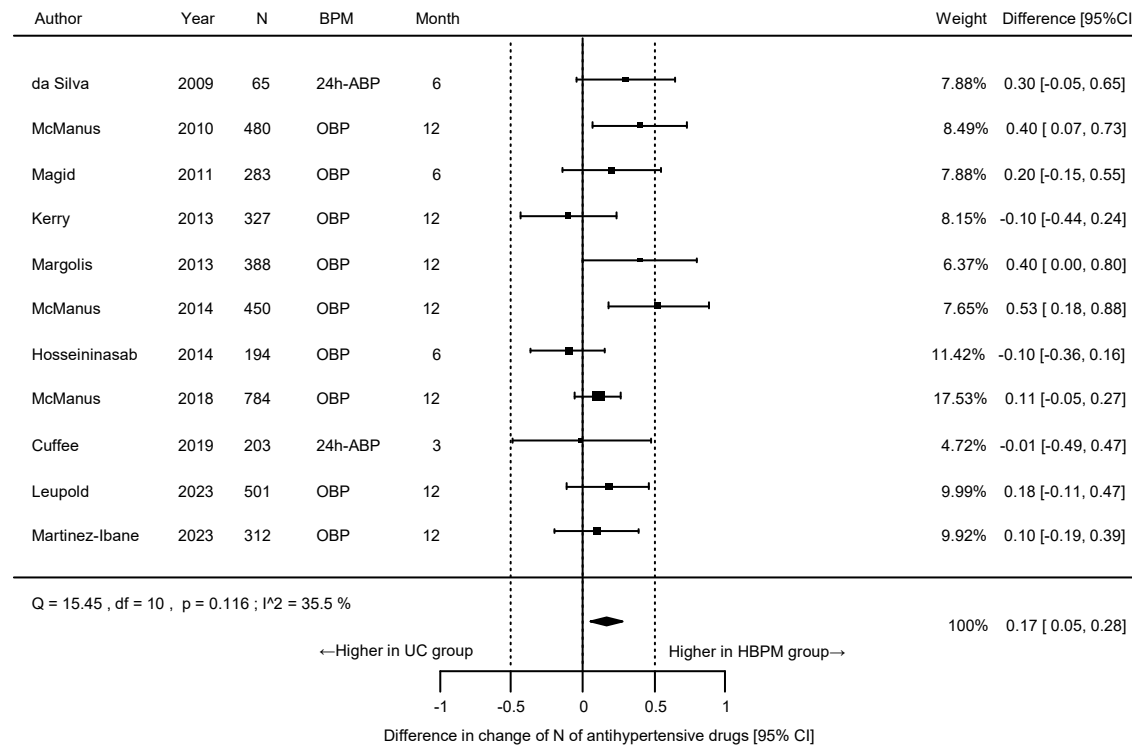
Supplementary Figure 8. The results for DBP change stratified by the device type for the intervention
Abbreviations are the same as in Supplementary Figure 4.



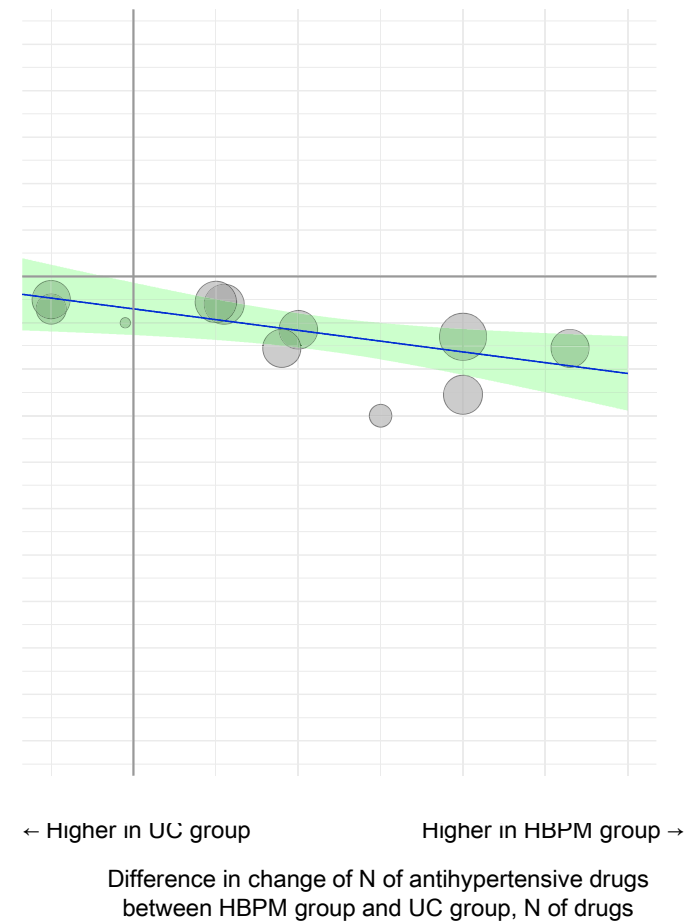
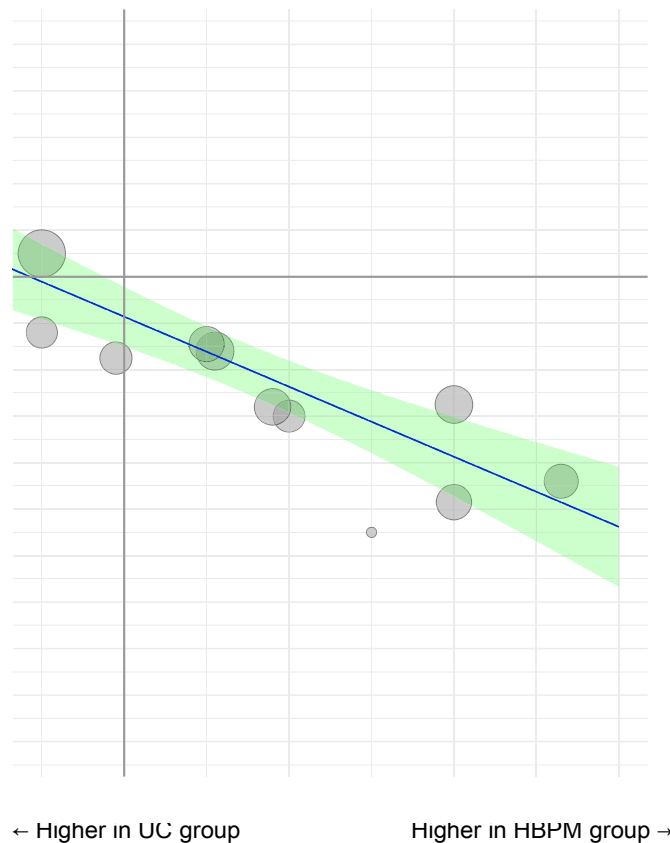
Supplementary Figure 9. The results stratified by the type of co-intervention

Abbreviations are the same as in Supplementary Figure 4.

*The trial by Green et al. had three arms.

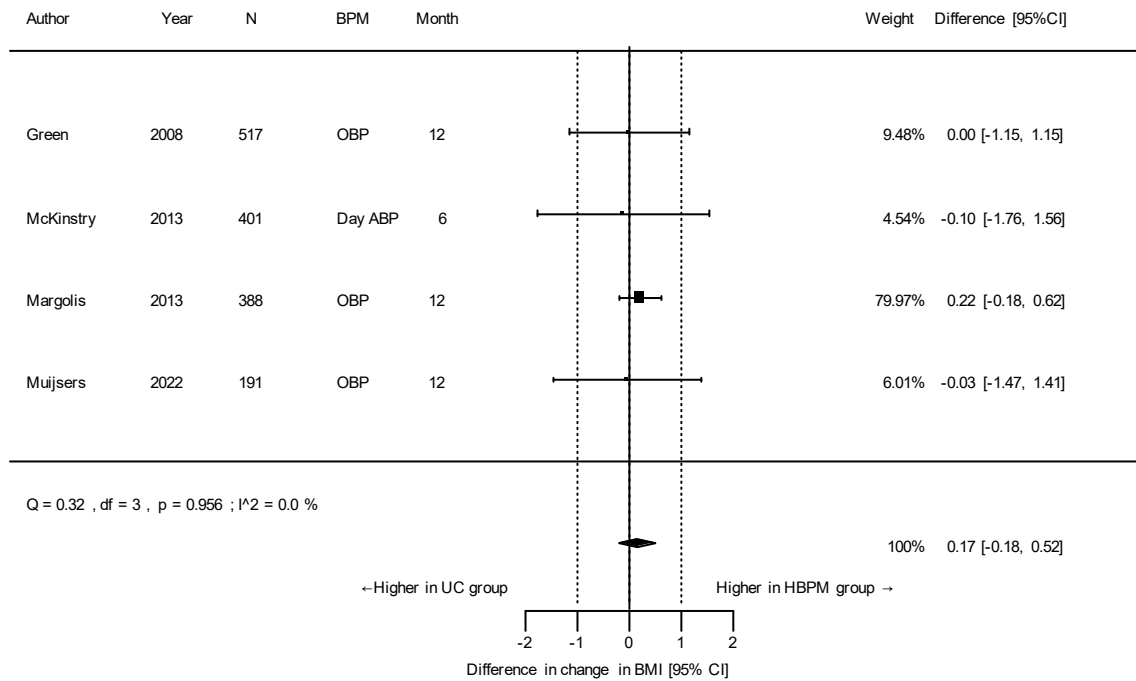


Supplementary Figure 10. Difference in antihypertensive drug change at the end of intervention between groups
Abbreviations are the same as in **Supplementary Figure 4**.



Supplementary Figure 11. The meta-regression analysis for the association between the difference in the change of the number of antihypertensive medications and the BP-lowering effect of HBPM

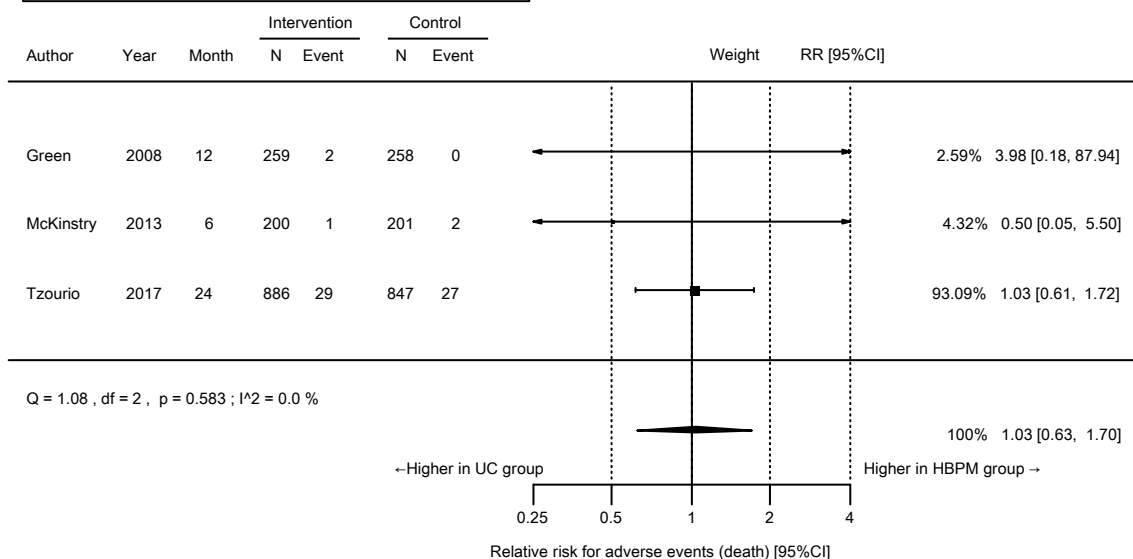
Abbreviations are the same as in **Supplementary Figure 4**. The size of each bubble represents the inverse of the standard error for the corresponding study.



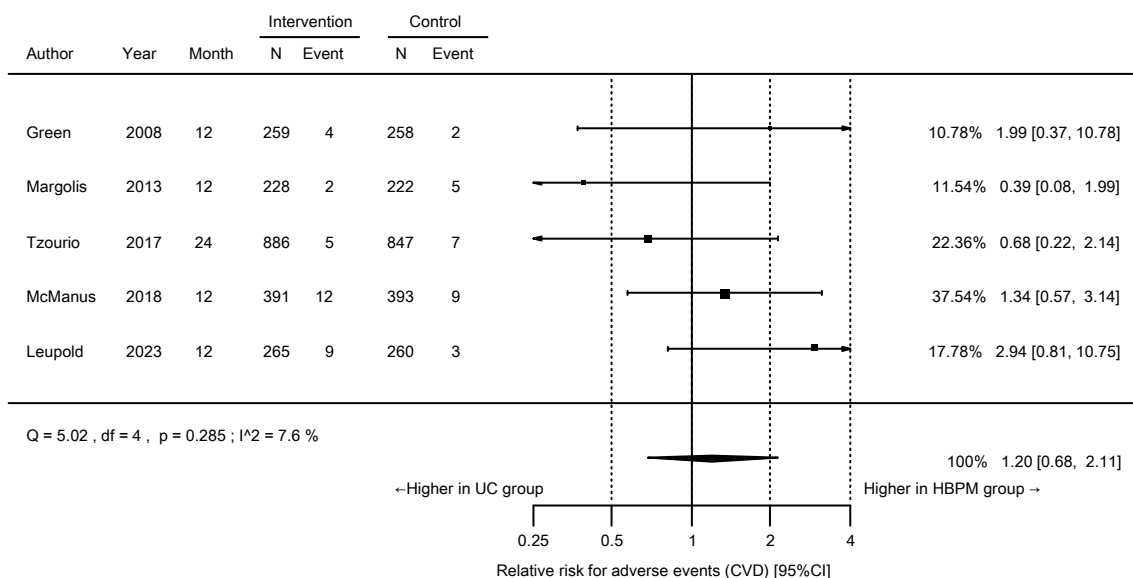
Supplementary Figure 12. The difference in BMI change between groups

BMI, body mass index. Other abbreviations are the same as those in **Supplementary Figure 4**.

Outcome : Death as an adverse event



Outcome : Cardiovascular disease as an adverse event



Supplementary Figure 13. Incidence proportion ratios of HBPM vs UC as a reference for severe adverse events

CVD, cardiovascular disease; RR, relative risk. Other abbreviations are the same as those in

Supplementary Figure 4.