

Supplemental Online Content

Zhou H, Wang X, Yang Y, et al. Effect of a multicomponent intervention delivered on a web-based platform on hypertension control: a cluster randomized clinical trial. *JAMA Netw Open*. 2022;5(12):e2245439. doi:10.1001/jamanetworkopen.2022.45439

eTable 1. Baseline Characteristics for All Participants Enrolled in the Study

eTable 2. Comparison of Follow-up and Lost to Follow-up Patients

eTable 3. Changes From Baseline for BP Control Rate, BP Levels and Lifestyle Factors

eTable 4. Hypertension Control at Baseline and Follow-up

eTable 5. Newly Initiated Antihypertensive Medication

eTable 6. Adverse Events in the Study

eTable 7. Sensitivity Analysis for Primary and Secondary Outcomes After Imputing the Missing Data in the Study

eFigure 1. CONSORT Flow Diagram

eFigure 2. Overview of the Web-Based Platform

eFigure 3. Subgroup Analysis for Change in Blood Pressure at 12 Months

eFigure 4. Mean Change in Lifestyle Factors Over Time

This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Baseline Characteristics for All Participants Enrolled in the Study

	Total (4,709)	Control (1,570)	Intervention (3,139)	P value
Age, mean(SD), y	61.5(9.4)	61.2(9.7)	61.5(9.4)	.52
Sex, male, No.(%)	2,136(45.4)	747(47.6)	1,389(44.2)	.03
smoking, No.(%)	716(15.2)	226(14.4)	490(15.6)	.28
drinking, No.(%)	841(17.9)	279(17.8)	562(17.9)	.91
BMI group, No.(%)				.24
normal	1,316(28.0)	409(26.1)	907(28.9)	
overweight	2,052(43.6)	699(44.5)	1,353(43.1)	
obesity	1,260(26.8)	434(27.6)	826(26.3)	
SBP, mean(SD), mmHg	148.6(18.5)	147.5(17.7)	148.6(18.5)	.12
DBP, mean(SD), mmHg	85.0(11.4)	85.8(11.5)	85.0(11.4)	.002
BP control, No.(%)	1430(30.4)	358(22.8)	753(24.0)	.37
CVD family history				.79
no	2,891(61.4)	968(61.7)	1,923(61.3)	
yes	1,818(38.6)	602(38.3)	1,216(38.7)	
Antihypertensive medication	3,007(63.9)	991(63.1)	2,016(64.2)	.41
Region, No.(%)				.24
west	1,331(28.3)	450(28.7)	881(28.1)	
central	1,140(24.2)	399(25.4)	741(23.6)	
east	2,238(47.5)	721(45.9)	1517(48.3)	

Abbreviations: BMI, Body Mass Index; SBP, systolic Blood Pressure; CVD, cardiovascular disease; SD, standard deviations.

eTable 2. Comparison of Follow-up and Lost to Follow-up Patients			
	Follow-up (4,198)	Lost of follow-up (511)	P value
Age group, No.(%)			.13
<65	2,457(58.5)	317(62.0)	
≥65	1,741(41.5)	194(38.0)	
Sex, No.(%)			.15
Male	1,889(45.0)	247(48.3)	
Female	2,309(55.0)	264(51.7)	
BMI mean(SD), Kg/m ²	26.0(3.5)	26.1(3.3)	.66
BP mean(SD), mm Hg			
SBP	148.4(18.4)	146.9(17.3)	.13
DBP	85.2(11.4)	85.8(11.9)	.18
BP control, No.(%)	978(23.3)	133(26.0)	.17
Antihypertensive medication, No. (%)	2,684(63.9)	323(63.2)	.64
Abbreviations: BMI, body mass index; BP, blood pressure; SBP, systolic blood pressure; DBP, diastolic blood pressure; SD, standard deviations; CVD, cardiovascular disease.			

eTable 3. Changes from baseline for BP control rate, BP levels and Lifestyle factors					
	Group	Months			
		3	6	9	12
BP control rate (%,95%CI)	intervention	20.9(18.7-23.2)	27.3(25.1-29.4)	30.6(28.3-32.8)	24.6(22.3-26.9)
	control	-	-	-	7.7(3.9-11.4)
SBP (mm, 95%CI)	intervention	-10.7(-11.5 to -9.9)	-13.6(-14.4 to -12.8)	-14.1(-14.9 to -13.3)	-12.0(-12.8 to -11.1)
	control	-	-	-	-1.9(-3.3 to -0.5)
DBP (mm, 95%CI)	intervention	-2.8(-3.3 to -2.3)	-4.4(-4.9 to -3.9)	-4.8(-5.3 to -4.3)	-4.0(-4.6 to -3.5)
	control	-	-	-	-2.2(-3.1 to -1.4)
regular exercise (%,95%CI)	intervention	12.2(9.8-14.7)	13.5(11.1-15.9)	15.4(13.0-17.8)	14.4(11.9-16.9)
	control	-	-	-	14.1(9.8-18.5)
Smoking (%,95%CI)	intervention	0.6(-1.2-2.4)	-1.8(-3.6 to -0.1)	-2.6(-4.3 to -0.9)	-1.2(-3.0 to 0.6)
	control	-	-	-	0.4(-2.7 to 3.6)
Drinking (%,95%CI)	intervention	0.7(-1.2 - 2.7)	-0.2(-2.1 - 1.6)	-2.2(-4.1 to -0.4)	-2.1(-4.0 to -0.2)
	control	-	-	-	2.1(-1.3 to 5.5)
Obesity (%,95%CI)	intervention	-4.8(-7.1 to -2.6)	-7.6(-9.8 to -5.3)	-8.0(-10.3 to -5.8)	-5.3(-7.7 to -3.0)
	control	-	-	-	-4.4(-8.2 to -0.5)

Abbreviations: BP, blood pressure

eTable 4. Hypertension Control at Baseline and Follow-up					
Baseline	12 months	Control Group (1,133)	Intervention Group (2,985)	Intervention Effect	<i>P</i> value
uncontrolled	uncontrolled	679(59.9)	1425(47.7)	-	
uncontrolled	controlled	199(17.6)	879(29.5)	1.17(1.13-1.21)	<.001
controlled	uncontrolled	112(9.9)	145(4.9)	-	
controlled	controlled	143(12.6)	536(18.0)	-	
Data were presented as NO.(%).					

eTable 5. Newly Initiated Antihypertensive Medication				
	Total (425)	Control (88)	Intervention (337)	P value
Number of antihypertensive medication*, No.(%)				.15
1	317(74.6)	68(77.3)	249(73.9)	
2	94(22.1)	20(22.7)	74(22.0)	
>2	14(3.3)	0	14(4.2)	
Drug Type for Monotherapy, No.(%)				.04
ACEI	71(22.4)	15(22.1)	56(22.5)	
ARB	68(21.5)	11(16.2)	57(22.9)	
CCB	144(45.4)	31(45.6)	113(45.4)	
β-blockers	4(1.3)	3(4.4)	1(0.4)	
Diuretics	21(6.6)	5(7.4)	16(6.4)	
other	9(2.8)	3(4.4)	6(2.4)	
Abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor antagonist; CCB, calcium channel blocker; Other, traditional Chinese medicine.				
* "1" for one drug of monotherapy; "2" for two drugs free combinations or single-pill combination consisted of two active ingredients; ">2" for >2 drugs free combinations or single-pill combination consisted of >2 active ingredients.				

eTable 6. Adverse Events in the Study		
Adverse Event [No. (%)]	Intervention (2,985)	Control (1,133)
CVD Event		
AMI	NA	2(0.2)
CABG	4(0.1)	2(0.2)
Stroke	12(0.4)	3(0.3)
Death	13(0.4)	6(0.5)
Adverse Effect		
Cough	9(0.3)	NA
Stomach discomfort	3(0.1)	1(0.1)
Edema	3(0.1)	NA
Dizziness	1(0)	1(0.1)
Other	10(0.3)	2(0.2)
Abbreviations: AMI, acute myocardial infraction; CABG, coronary artery bypass graft; CVD, cardiovascular disease; NA, no data available.		

eTable 7. Sensitivity Analysis for Primary and Secondary Outcomes After Imputing the Missing Data in the Study

	Control			Intervention			Intervention effect(OR (95%CI)) ^a	P value
	baseline	12 Month	Change from baseline	baseline	12 Month	Change from baseline		
Mean SBP (SD), mm Hg	147.5(18.0)	145.5(18.0)	-2.0(-3.4 to -0.6) ^b	148.7(18.5)	137.0(13.5)	-11.8(-12.6 to -10.9) ^b	-9.7(-11.4 to -8.1)	<.001
Mean DBP (SD), mm Hg	85.5(11.3)	83.3(11.1)	-2.2(-3.1 to -1.4) ^b	85.0(11.5)	81.1(8.9)	-3.9(-4.4 to -3.4) ^b	-1.7(-2.7 to -0.7)	.001
BP control (%)	22.6	30.2	7.6(3.8-11.3) ^b	23.3	47.3	24.0(21.7-26.3) ^b	1.18(1.13-1.23)	<.001
BP classification (%)								
Stage 1 hypertension	42.7	42.1	-0.6(-4.5-3.3)	39.0	27.4	-11.6(-14.0 to -9.2) ^b	0.90(0.86-0.94)	<.001
Stage 2 hypertension	22.6	16.3	-6.4(-9.3 to -3.4) ^b	23.3	6.6	-16.7(-18.5 to -14.9) ^b	0.90(0.87-0.93)	<.001
Stage 3 hypertension	6.0	5.8	-0.2(-1.9-1.5)	7.1	1.1	-6.0(-7.0 to -4.9) ^b	0.94(0.93-0.96)	<.001
Lifestyle factors (%)								
Current smoking	14.2	14.9	0.7(-2.2-3.6)	15.7	14.6	-1.1(-2.9-0.7)	0.98(0.95-1.02)	.30
Current drinking	17.0	18.7	1.7(-1.4-4.8)	18.0	16.2	-1.8(-3.7-0.1)	0.96(0.93-1.00)	.05
Overweight/Obesity	73.4	70.1	-3.3(-7.1-0.5)	70.8	67.3	-3.5(-5.8 to -1.2) ^b	1.00(0.95-1.04)	.92
Regular exercise	42.5	56.3	13.8(9.8-17.9) ^b	45.2	59.8	14.7(12.2-17.1) ^b	1.01(0.96-1.06)	.73

Abbreviations: SBP, systolic blood pressure; DBP, diastolic blood pressure; OR, odds ratio. Data were presented as mean(SD) for continuous outcomes; proportion for dichotomous outcomes.

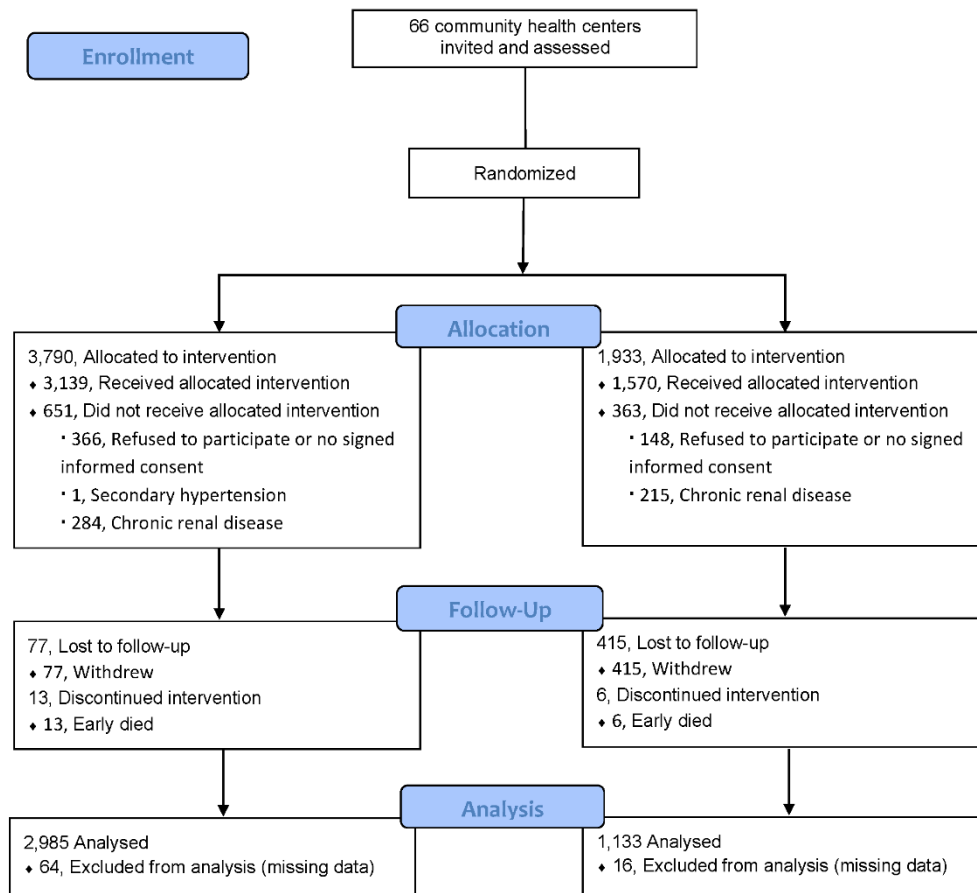
^a Data were presented as mean(95%CI) for continuous outcomes, and OR(95%CI) for dichotomous outcomes.

^b P<0.05.

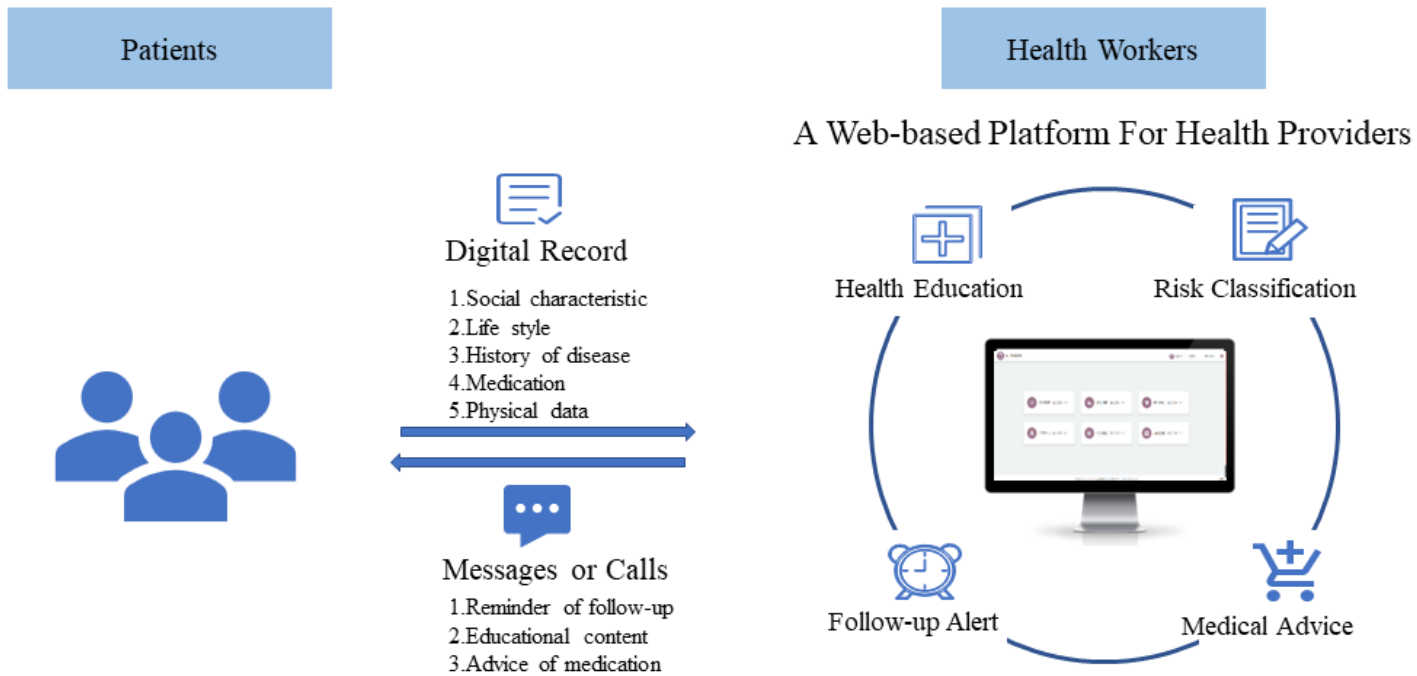
eFigure 1 CONSORT Flow Diagram



CONSORT 2010 Flow Diagram

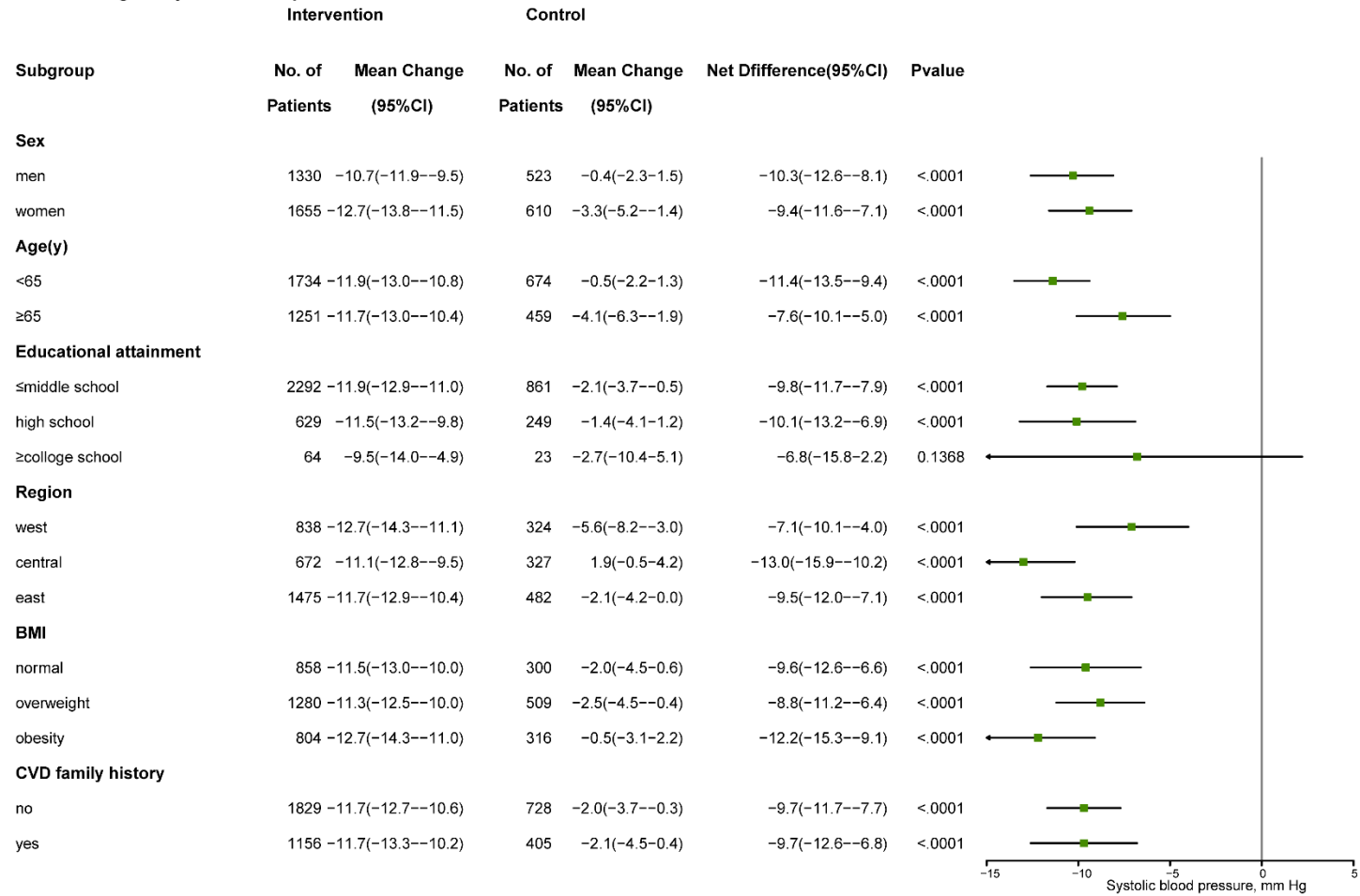


eFigure 2 Overview of the Web-based platform



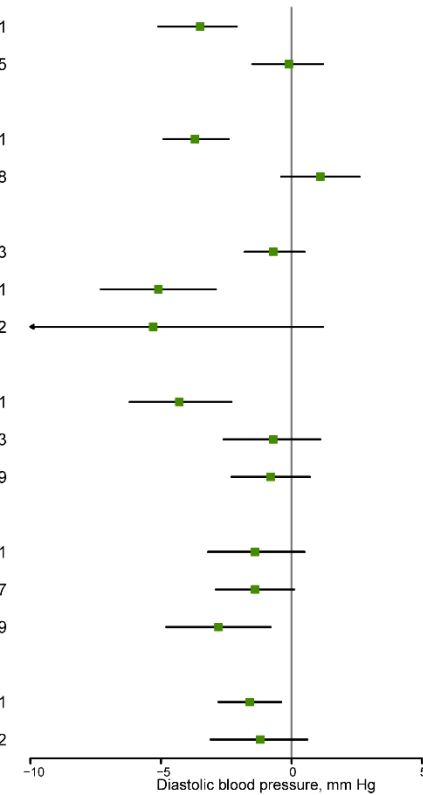
eFigure 3 Subgroup Analysis for Change in Blood Pressure at 12 Months

A. Mean change in systolic blood pressure



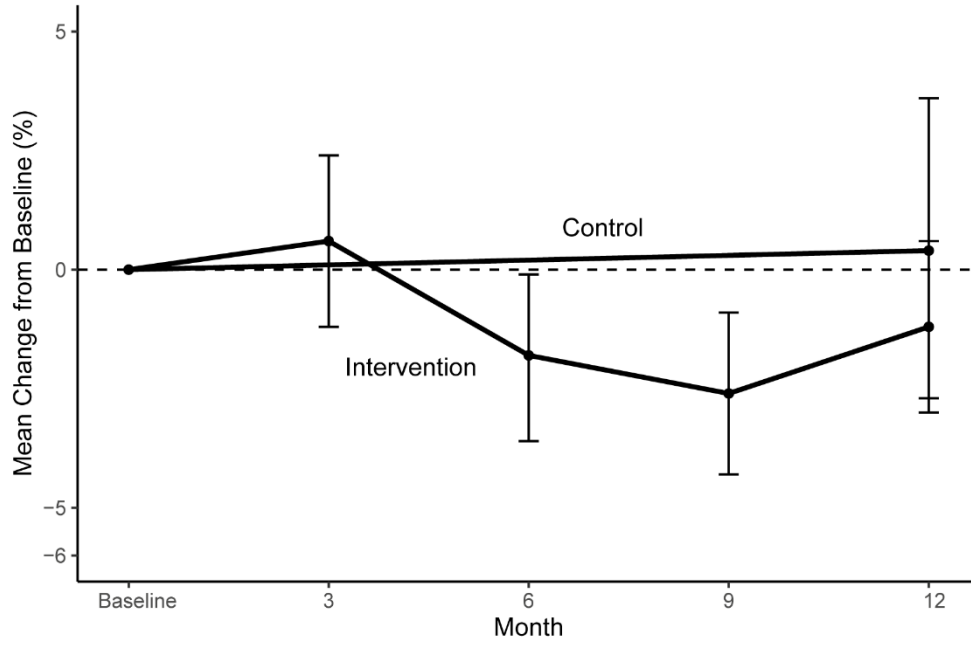
B. Mean change in diastolic blood pressure

Subgroup	Intervention		Control		Net Difference(95%CI)	Pvalue
	No. of Patients	Mean Change (95%CI)	No. of Patients	Mean Change (95%CI)		
Sex						
men	1330	-5.1(-5.9--4.3)	523	-1.5(-2.7--0.2)	-3.6(-5.1--2.1)	<.0001
women	1655	-3.0(-3.7--2.3)	610	-2.9(-4.1--1.7)	-0.1(-1.5--1.2)	0.8395
Age(y)						
<65	1734	-5.0(-5.7--4.4)	674	-1.4(-2.5--0.3)	-3.7(-4.9--2.4)	<.0001
≥65	1251	-2.4(-3.2--1.6)	459	-3.5(-4.8--2.2)	1.1(-0.4--2.6)	0.148
Educational attainment						
≤middle school	2292	-3.5(-4.1--2.9)	861	-2.9(-3.9--1.9)	-0.7(-1.8--0.5)	0.2633
high school	629	-5.2(-6.4--4.1)	249	-0.2(-2.0--1.7)	-5.1(-7.3--2.9)	<.0001
≥colloge school	64	-6.3(-9.6--3.1)	23	-1.1(-6.7--4.5)	-5.3(-11.8--1.2)	0.1112
Region						
west	838	-4.2(-5.2--3.1)	324	0.1(-1.6--1.8)	-4.3(-6.2--2.3)	<.0001
central	672	-4.3(-5.4--3.3)	327	-3.6(-5.2--2.1)	-0.7(-2.6--1.1)	0.4483
east	1475	-3.7(-4.4--2.9)	482	-2.9(-4.2--1.6)	-0.8(-2.3--0.7)	0.3119
BMI						
normal	858	-3.5(-4.4--2.6)	300	-2.2(-3.7--0.6)	-1.4(-3.2--0.5)	0.1461
overweight	1280	-3.7(-4.5--2.9)	509	-2.2(-3.5--1.0)	-1.4(-2.9--0.1)	0.0617
obesity	804	-4.6(-5.6--3.5)	316	-1.8(-3.5--0.1)	-2.8(-4.8--0.8)	0.0069
CVD family history						
no	1829	-3.5(-4.2--2.9)	728	-2.0(-3.0--0.9)	-1.6(-2.8--0.4)	0.0111
yes	1156	-4.0(-5.0--3.1)	405	-2.8(-4.4--1.2)	-1.2(-3.1--0.6)	0.192

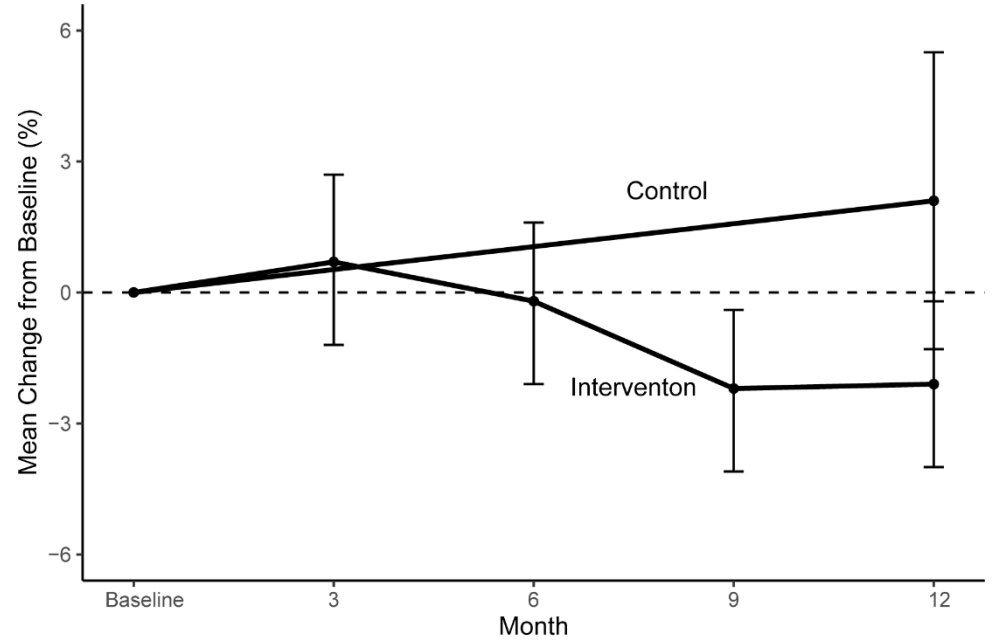


eFigure 4 Mean Change in Lifestyle Factors over Time

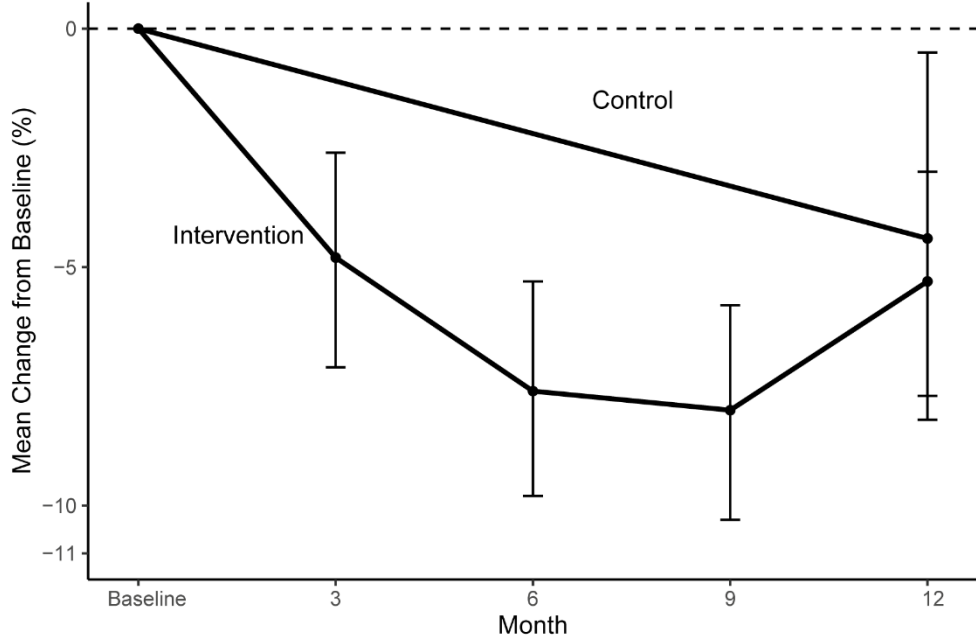
A Smoking



B Drinking



C Oversity/Obesity



D Regular exercise

