Community-based strategies to improve health-related outcomes in people living with hypertension in Low Middle-Income Countries: A systematic review and meta-analysis

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We systematically assessed community-level interventions for improving hypertension control in low—and middle-income countries. After screening 7125 articles, 18 studies were included in the analysis. The findings suggest that community-based strategies can effectively address hypertension in these countries without compromising the quality of care.

Introduction

- Non-Communicable Diseases (NCDs):
 - Kills 41 million people each year
 - 60% of disability-adjusted life years (DALYs)
 - 70% of deaths and more than 80% of years lived with disability (YLD)
 - The estimated annual incremental cost is \$131 billion per year
- Hypertension (HTN):
 - Affects 1Billion people globally.
 - Prevalence in LMIC is about 22% (≥25 years)
 - 43.6% of the cases are aware of having this condition
 - 36.9% receive appropriate treatment
 - 9.9% are controlled
 - DALYs associated with HTN increased from 95.9 million to
 143.0 million (Forouzanfar et al., 2017)

OBJECTIVE

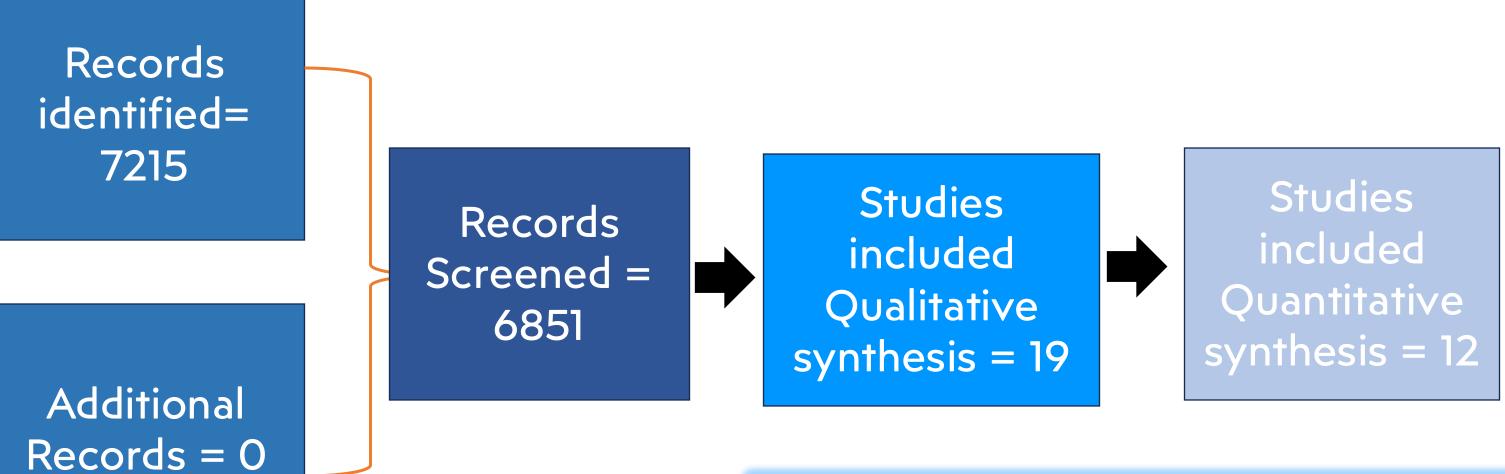
This systematic review and meta-analysis evaluated community-level interventions to improve hypertension control among patients living in LMICs.

Methods



- Nine databases were searched (July 22, 2023) for randomized controlled trials (RCTs) and cluster randomized control trials (cRCTs).
- Studies were included based on explicit focused on blood pressure control.
- Quality assessment was done using the Revised Cochrane Risk of Bias tool for randomized trials (ROBS 2).
- Results were presented following the provisions in the PRISMA checklist.
- Fixed-effect meta-analysis were conducted for studies that reported continuous outcome measures.

Results



- We analysed 8 RCTs and 11 cRCTs.
- The summary effect of blood pressure control from the meta-analysis was significant: risk ratio = 1.48 (95% Cl = 1.40 1.57, n=12).
- For the RCTs, risk ratio was 1.68 (95% CI = 1.40 2.01, n=5).
- For the RCTs, risk ratio=1.46 (95% CI = 1.32 1.61, n=7).
- Also, studies that reported individual data for the multicomponent interventions, the risk ratio was 1.27 (95% CI = 1.04 – 1.54, n=3).

	Experim		Cont			Risk rat		Risk ı	
Study or Subgroup	Events	Total	Events	Total	Weight	IV, Fixed, 9	5% CI	IV, Fixed	, 95% CI
1.1.1 Studies reporting Blood Pressur	e Control								
Gamage et al., 2020	320	459	624	1012	12.8%	1.13 [1.05	, 1.22]		-
He et al., 2017	517	709	340	648	10.4%	1.39 [1.28	, 1.51]		
Hickey et al., 2022	96	100	66	99	3.7%	1.44 [1.25	, 1.66]		
Jafar et al., 2009	244	778	70	266	1.5%	1.19 [0.95	, 1.49]	1 4	.
Jafar et al., 2020	645	1211	509	1164	10.9%	1.22 [1.12	, 1.32]		
Khanal et al., 2021	17	57	23	58	0.3%	0.75 [0.45	, 1.25]	•	
Khetan et al., 2019	225	618	85	376	1.7%	1.61 [1.30	, 1.99]		
Lu et al., 2015	174	231	50	116	1.6%	1.75 [1.40	, 2.18]		
Nguyen et al., 2018	37	78	37	79	0.7%	1.01 [0.73	, 1.41]		<u> </u>
Pan et al., 2018	34	52	23	55	0.6%	1.56 [1.08	, 2.26]		
Qi, Qiu and Zhang, 2016	121	533	127	499	1.6%	0.89 [0.72	, 1.11]		<u> </u>
Vedanthan et al., 2019	190	751	100	355	1.8%	0.90 [0.73	, 1.10]		
Subtotal (95%CI)		5577		4727	47.6%	1.24 [1.19	, 1.29]		•
Total events:	2620		2054						•
Heterogeneity: $Chi^2 = 56.40$, $df = 11$ (P < 0.00) Test for overall effect: $Z = 10.48$ (P < 0.00)	,	= 80%							
1.1.2 Randomized Controlled Trial									
Hickey et al., 2022	96	100	66	99	3 7%	1.44 [1.25	1 661	i	_
Khetan et al., 2019	225	618		376		1.61 [1.30	_	·	
Lu et al., 2015	174	231		116		1.75 [1.40	_		
Pan et al., 2018	34	52		55		1.56 [1.48	_	•	
Qi, Qiu and Zhang, 2016	121	533		499		0.89 [0.72	-		
Subtotal (95% CI)	121	1 534		1145		1.40 [1.28	_		_
Total events:	650	1004	351	1145	J. 1 /0	1.40 [1.20	, 1.54]		
Heterogeneity: Chi² = 22.55, df = 4 (P = 0 Test for overall effect: Z = 7.20 (P < 0.000	•								
	01)								
Test for overall effect: Z = 7.20 (P < 0.000	01)	459	624	1012	12.8%	1.13 [1.05	, 1.22]		
Test for overall effect: Z = 7.20 (P < 0.000	01) Trial			1012 648		1.13 [1.05 1.39 [1.28	_	•	
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020	01) Trial 320	459	340		10.4%	-	, 1.51]	i	
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017	01) Trial 320 517	459 709	340 70	648	10.4% 1.5%	1.39 [1.28 1.19 [0.95	, 1.51] , 1.49]	i 	- - -
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017 Jafar et al., 2009	Trial 320 517 244	459 709 778	340 70 509	648 266	10.4% 1.5% 10.9%	1.39 [1.28 1.19 [0.95	, 1.51] , 1.49] , 1.32]	i 	- - -
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017 Jafar et al., 2020 Jafar et al., 2020	Trial 320 517 244 645	459 709 778 1211	340 70 509 23	648 266 1164	10.4% 1.5% 10.9% 0.3%	1.39 [1.28 1.19 [0.95 1.22 [1.12	, 1.51] , 1.49] , 1.32] , 1.25]	-	
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017 Jafar et al., 2009 Jafar et al., 2020 Khanal et al., 2021	Trial 320 517 244 645 17	459 709 778 1211 57	340 70 509 23 37	648 266 1164 58	10.4% 1.5% 10.9% 0.3% 0.7%	1.39 [1.28 1.19 [0.95 1.22 [1.12 0.75 [0.45	, 1.51] , 1.49] , 1.32] , 1.25] , 1.41]	-	
Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017 Jafar et al., 2009 Jafar et al., 2020 Khanal et al., 2021 Nguyen et al., 2018	Trial 320 517 244 645 17	459 709 778 1211 57 78	340 70 509 23 37 100	648 266 1164 58 79	10.4% 1.5% 10.9% 0.3% 0.7% 1.8%	1.39 [1.28 1.19 [0.95 1.22 [1.12 0.75 [0.45 1.01 [0.73	, 1.51] , 1.49] , 1.32] , 1.25] , 1.41] , 1.10]		
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Test for overall effect: Z = 7.20 (P < 0.000 1.1.3 Cluster Randomized Controlled Gamage et al., 2020 He et al., 2017 Jafar et al., 2009 Jafar et al., 2020 Khanal et al., 2021 Nguyen et al., 2018 Vedanthan et al., 2019 Subtotal (95% Cl) Total events: Heterogeneity: Chi² = 25.38, df = 6 (P = 0) Test for overall effect: Z = 8.15 (P < 0.000) 1.1.4 Studies that reported data for th Jafar et al., 2009 (GP Training) Jafar et al., 2009 (HHE and GP Training) Jafar et al., 2009 (HHE) Lu et al., (2015) Interactive Workshop Lu et al., (2015) Regular lecture Vedanthan et al., (2019) Paper-based Vedanthan et al., (2019) Smart phone Subtotal (95% Cl) Total events: Heterogeneity: Chi² = 24.41, df = 6 (P = 0)	Trial 320 517 244 645 17 37 190 1970 .0003); l² = 101) e multicon 93 94 57 101 73 106 84 608 .0004); l² = 1	459 709 778 1211 57 78 751 4043 76% nponen 256 256 255 117 114 395 356 1749	340 70 509 23 37 100 1703 t interven 24 24 24 25 25 50 50	648 266 1164 58 79 355 3582 tion 89 89 89 58 177 178 738	10.4% 1.5% 10.9% 0.3% 0.7% 1.8% 38.5% 0.5% 0.5% 0.5% 0.5% 0.9% 4.9%	1.39 [1.28 1.19 [0.95 1.22 [1.12 0.75 [0.45 1.01 [0.73 0.90 [0.73 1.20 [1.15 1.35 [0.92 1.36 [0.93 0.83 [0.55 2.00 [1.48 1.49 [1.07 0.95 [0.71 0.84 [0.62	, 1.51] , 1.49] , 1.32] , 1.25] , 1.41] , 1.10] , 1.26] , 1.25] , 2.72] , 2.06] , 1.26] , 1.37]		

Conclusion

Test for subgroup differences: Chi² = 8.66, df = 3 (P = 0.03), I^2 = 65.4%

- We highlight the need for community-based interventions to address the burden of hypertension in LMICs.
- It is however important to evaluate how these interventions can be implemented within existing healthcare systems.

References

- Egan BM, Kjeldsen SE, Grassi G, Esler M, Mancia G. The global burden of hypertension exceeds 1.4 billion people: should a systolic blood pressure target below 130 become the universal standard? J. Hypertens. 2019;37:1148–53.
 Cappuccio FP, Miller MA. Cardiovascular disease and hypertension in sub-Saharan Africa: burden, risk and
- interventions. Intern. Emerg. Med. 2016;11:299–305.
 3. Forouzanfar, M. H., Liu, P., Roth, G. A., Ng, M., Biryukov, S., Marczak, L., ... & Murray, C. J. (2017). Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. *Jama, 317*(2), 165-182.
 4. Li X, Li T, Chen J, Xie Y, An X, Lv Y, et al. A WeChat-based self-management intervention for community middle-aged and elderly adults with hypertension in Guangzhou, China: a cluster-randomized controlled trial. Int. J. Environ. Res.
- Public. Health 2019;16:4058.

 5. Gamage DG, Riddell MA, Joshi R, Thankappan KR, Chow CK, Oldenburg B, et al. Effectiveness of a scalable group-based education and monitoring program, delivered by health workers, to improve control of hypertension in rural India: A cluster randomised controlled trial. PLoS Med. 2020;17:e1002997.

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