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IMPACT OF PHARMACIST-LED COUNSELLING ON BLOOD PRESSURE CONTROL IN HYPERTENSIVE OUTPATIENTS

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Abstract

Hypertension remains the leading modifiable risk factor for cardiovascular disease, yet blood pressure is controlled in only a minority of treated outpatients in many countries. This narrative review, which reports no new data, examines the published evidence on pharmacist-led counselling as a way of improving control. It describes the components of counselling, including adherence support, lifestyle advice, home monitoring and collaboration with physicians, and summarises trials and meta-analyses. Pharmacist interventions are generally associated with clinically meaningful reductions in systolic pressure, especially when counselling is combined with feedback to prescribers or medicine adjustment. Heterogeneous interventions, short follow-up and limited data from low-resource settings reduce confidence in the size and durability of the benefit.

1. INTRODUCTION

A raised blood pressure rarely announces itself. Most people with hypertension feel well, which is one reason why so many stop taking their tablets or never take them as prescribed. Epidemiological analyses covering hundreds of thousands of adults showed that the risk of vascular death rises steadily with usual blood pressure, starting from levels well below those once regarded as normal [1]. Worldwide, the number of adults with hypertension has increased over recent decades, with the largest rises in low- and middle-income countries [2, 3]. Large trials and meta-analyses confirm that lowering pressure reduces stroke, heart failure and coronary events [4, 5], so the question is not whether treatment works but how to deliver it reliably to those who need it.

Control rates give a sobering answer. In India, a systematic review and meta-analysis found that awareness, treatment and control of hypertension were all low, with only a modest fraction of those on treatment reaching target [6]. Similar gaps exist elsewhere. Reasons include late diagnosis, therapeutic inertia, cost, side effects, forgotten doses and short consultations in which counselling is squeezed out. Guidelines from Europe, the United States and the International Society of Hypertension all recommend a combination of lifestyle measures and drug therapy, regular follow-up and attention to adherence [7, 8, 9]. Delivering this package requires more contact time than most physicians can offer, and that is where pharmacists have been proposed as partners.

Pharmacists are well placed for the task. They see patients regularly when medicines are refilled, they are trained in pharmacology and adverse effects, and in many countries they are among the most accessible health professionals. The concept of pharmaceutical care, developed from the early 1990s and later set out in consensus definitions, defined the pharmacist's responsibility as achieving definite outcomes that improve the patient's quality of life, with hypertension an obvious example [10]. Counselling in this context means structured, patient-centred communication that explains the purpose of treatment, teaches correct use, solves practical problems and encourages healthy behaviour. This review asks whether such counselling, delivered by pharmacists to hypertensive outpatients, improves blood pressure control, and what features of the intervention seem to matter.

Health-system factors add to the clinical ones. In many countries, a patient with hypertension sees a physician for a few minutes every month or every few months, and the remaining weeks are spent managing tablets alone. Pharmacies are visited more often than clinics, with refill cycles of one month or less, and no appointment is needed. Where the physician workforce is thin, which is the case across much of South Asia and sub-Saharan Africa, the pharmacist may be the only health professional the patient meets regularly [3, 6]. Making use of those repeated contacts for structured counselling costs little compared with expanding the physician workforce, which is the practical argument that has driven much of the research reviewed here.

The review is narrative and reports no new data. It draws on randomised trials, systematic reviews and guidelines published up to 2023. Because the title refers to outpatients, studies of hospital inpatients and emergency presentations are excluded, though some literature on team-based care is used where pharmacists formed part of the team. The sections that follow outline the clinical and public-health context, the components of counselling, the evidence of effect, issues in measurement and trial design, and the implications for practice and future research. Where a numerical effect is quoted, it is given as an approximate range from the cited source, and readers should consult the original reports before relying on any single value [11, 12, 13].

2. CLINICAL CONTEXT AND TARGETS

Blood pressure targets have shifted over time. Early guidelines set a threshold of 140/90 mmHg for most adults, with lower goals for people with diabetes or kidney disease [14]. More recent guidelines adopted lower targets for many patients, particularly after trials such as SPRINT showed that intensive systolic control reduced cardiovascular events in high-risk adults without diabetes, albeit at the cost of more adverse events such as hypotension and electrolyte disturbance [4]. European and American documents differ in the exact thresholds, though they agree on the principle that treatment should be individualised and that out-of-office measurement is helpful [7, 8]. For counsellors, the practical consequence is that goals must be agreed with the prescriber and explained clearly to the patient.

Accurate measurement underlies everything. Office readings vary with posture, cuff size, recent caffeine, talking and the anxiety many people feel in a clinic. Recommendations for measurement stress a quiet room, a rested patient, a properly sized cuff at heart level, and the average of several readings [15].

Pharmacists who take blood pressure in the pharmacy or at home visits must follow these steps or the numbers will mislead. Home and ambulatory measurement predict outcomes better than casual office readings and can expose white-coat and masked hypertension, a distinction that affects both diagnosis and the decision to intensify drugs [7, 8]. Counselling programmes that include proper measurement technique therefore add to their value.

Why do treated patients remain above target? Studies of resistant and uncontrolled hypertension repeatedly find that nonadherence accounts for a considerable share of cases once pseudo-resistance is excluded. Adherence to long-term therapy in chronic disease averages around half in developed countries, a figure widely quoted from a World Health Organization report and discussed in later reviews, and it is probably lower in poorer settings [16]. A review of adherence in hypertension described a prevalence of nonadherence that is high, driven by factors such as complex regimens, side effects, cost, poor understanding and depression, and associated with worse outcomes [17]. Measuring and managing adherence in resistant hypertension has been described as a distinct clinical task, with electronic monitoring and drug level assays used in specialist centres [18].

Terms need to be used carefully. Adherence describes the extent to which a person's behaviour in taking medication matches agreed recommendations, and it includes starting treatment, taking doses as directed, and continuing for the intended duration. Persistence refers to the time from start to discontinuation. The distinction matters because a patient who takes most doses but stops after a year and one who takes half the doses throughout will show different patterns on refill records [16, 19]. Counselling can target each stage. Early on, it explains why treatment is needed despite the absence of symptoms. Later, it helps patients cope with side effects, schedule changes and costs, so that they continue beyond the first months.

Cost is a practical barrier that counselling can partly address. Medicines for hypertension are inexpensive in many countries, but the cumulative cost of drugs, tests and visits is large for households paying out of pocket, and patients may skip doses to make tablets last. Pharmacists can suggest generic substitution, fixed-dose combinations that reduce the number of items bought, and sensible refill timing, steps that fit within the dispensing role [6, 17]. Such measures do not change the pharmacology of the treatment, yet they remove a common reason for poor control and show that attention to the patient's circumstances is a core part of effective counselling.

3. COMPONENTS OF PHARMACIST-LED COUNSELLING

Counselling is not a single act but a bundle. Most trial protocols include a baseline assessment of the patient's knowledge, beliefs and medication-taking, followed by education about hypertension, its complications and the purpose of each drug. Pharmacists then review the regimen for interactions, duplication, side effects and unnecessary complexity. They agree on a plan with the patient, offer written materials, and arrange follow-up by visit or telephone. The hypertension team literature describes these activities as the core pharmacist contribution and notes that the intensity and duration of contact vary greatly between programmes [20]. Interventions are best described in enough detail for replication, as reporting guidance for interventions recommends [21].

Adherence support is the central element. Techniques include simplifying regimens by moving to once-daily or fixed-dose combinations, linking tablets to daily routines, pill organisers, reminders, refill synchronisation and problem-solving about side effects and cost. Reviews of adherence interventions across chronic diseases show that effects are generally modest and that the most effective strategies are complex and combine several approaches [22, 23]. A review focused on hypertension found that interventions improved adherence and, in many cases, blood pressure, though the gains varied with the type of intervention [24]. Patient-reported scales such as the Morisky instrument, developed in the 1980s, are often used to measure adherence in counselling studies, with all the limits of self-report [25].

Side effects are among the commonest reasons for stopping antihypertensive drugs, and counselling can anticipate them. Patients started on an angiotensin-converting enzyme inhibitor may develop a dry cough and think it unrelated to the tablet. Those given a calcium channel blocker may notice ankle swelling, and thiazide-type diuretics can cause frequent urination, cramps or changes in electrolytes. Guidelines list these effects and the preferred alternatives [7, 8]. A pharmacist who explains in advance what is common and harmless and what needs a call to the clinic reduces needless discontinuation. Equally, the pharmacist can recognise symptoms that signal a real problem, such as facial swelling or marked dizziness on standing, and arrange urgent review [20].

The manner of communication matters as much as the content. Motivational interviewing, a client-centred style that helps people explore their own reasons for change, is widely taught to health professionals and has been applied in pharmacy counselling for adherence and lifestyle change [26]. It stresses open questions, reflective listening and respect for the patient's autonomy, and avoids confrontation. A pharmacist who says simply, you must take your tablets, is likely to meet silence. One who asks what the patient finds difficult about the treatment gets a more useful reply. Few trials report the style of counselling used or the training of the pharmacists, so it is not possible to say how much of the effect depends on communication skills [21, 22].

Lifestyle advice features in almost all programmes. The DASH dietary pattern, rich in fruit, vegetables and low-fat dairy, lowered blood pressure in a controlled feeding trial, and its effect was enhanced by lower sodium intake in a follow-up study [27, 28]. A Cochrane review of longer-term modest salt reduction found a lowering of blood pressure in both hypertensive and normotensive people [29]. A review of lifestyle trials reported benefits from weight loss, exercise and reduced alcohol intake, and the effects were comparable in size to those of a single drug in some cases [30]. Pharmacists can reinforce these messages at every visit and translate them into practical choices, such as using less salt in local dishes, which is more persuasive than general advice.

Device quality and technique decide whether home readings can be trusted. Many consumer monitors have never been validated, wrist devices are sensitive to arm position, and cuffs that are too small give falsely high values. Pharmacists can check the device against a reference reading, advise on the correct cuff size and show the patient how to sit, rest and measure twice daily for a week before a review. Systematic reviews suggest that self-monitoring may improve both adherence and the adoption of healthy behaviours, and that its value on blood pressure depends on being coupled with counselling [31, 32]. Pharmacy-based loan or sale of validated devices therefore fits naturally with the counselling role.

4. EVIDENCE FROM TRIALS AND REVIEWS

The main findings are collected in table 1 and counted by type of evidence in fig. 1. The overall direction is consistent: patients who receive pharmacist-led interventions tend to have lower systolic and diastolic pressures than those given usual care, and more of them reach target. The size of the effect varies with the model. The table lists meta-analyses, randomised trials and related reviews, and it gives only a qualitative summary of each, because the numerical results differ in population, comparator and follow-up. Readers needing exact values should consult the cited reports [11, 12, 13, 33, 34, 35].

A meta-analysis of randomised trials of pharmacist interventions concluded that these interventions were associated with significant reductions in systolic and diastolic pressure and with a higher proportion of patients achieving control, compared with usual care, with considerable heterogeneity between studies [11]. A separate review confined to community pharmacies reached a similar conclusion for interventions delivered in that setting, though the number of studies was smaller [12]. Earlier reviews pooling pharmacist interventions to enhance control and adherence had also reported improvements in blood pressure and in adherence outcomes [13]. The convergence of

these independent analyses, using somewhat different inclusion criteria, strengthens the central finding even if the exact magnitude remains uncertain.

Table 1: Published evidence on pharmacist-led interventions for blood pressure control in hypertension

Evidence source	Main reported finding	Ref.
Meta-analysis of randomised trials pharmacist interventions	Lower systolic and diastolic pressure and more patients at target	[11]
Meta-analysis community pharmacies	Similar benefit for interventions delivered in community pharmacies	[12]
Review and meta-analysis control and adherence	Improved pressure and adherence with pharmacist input	[13]
Meta-analysis of team-based care	Larger effect when a pharmacist or nurse could alter therapy	[33]
Community guide review team-based care	Improved control, especially with pharmacist or nurse on team	[36]
Cluster trial physician and pharmacist collaboration	Greater fall in systolic pressure than usual care	[37]
Randomised trial pharmacist prescribing in community	Clearly greater fall in systolic pressure after follow-up	[35]
Cluster trial telemonitoring with pharmacist management	Better control during the intervention year, with the gap narrowing afterwards	[34]
Systematic review adherence in hypertension	Interventions improved adherence and often blood pressure	[24]
Meta-analysis self-monitoring with support	Lower blood pressure when monitoring was combined with support	[31]

Team-based care analyses add detail. A meta-analysis of team-based interventions found larger effects when the team included a pharmacist or nurse who was permitted to alter therapy, compared with teams in which the extra professional only provided education and reminders [33]. A cluster randomised trial of physician and pharmacist collaboration in medical offices found that pharmacist recommendations, made to physicians after assessment, were associated with a greater fall in systolic pressure compared with usual care [37]. These findings imply that counselling is stronger when it is connected to the ability to change treatment, whether through a collaborative practice agreement, a protocol or direct prescribing authority [20, 36].

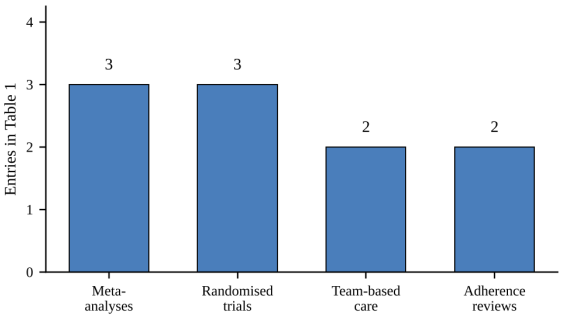


Fig. 1: Number of entries in table 1 by type of evidence

Randomised trials in community pharmacies provide direct evidence. In a Canadian trial of pharmacist prescribing, patients who received assessment, education, prescribing and follow-up by a pharmacist had a clearly greater fall in systolic pressure after a few months than those receiving usual care [35]. A cluster randomised trial that combined home blood pressure telemonitoring with pharmacist case management likewise reported better control than usual care during the year of the intervention, although the difference narrowed after the intervention ended [34]. These trials were conducted in health systems that permit expanded pharmacist roles, so their generalisability to settings with different regulation requires caution [34, 35].

What of settings where pharmacists cannot prescribe? Evidence from outpatient counselling programmes that rely on education, adherence support and communication with the physician suggests smaller but still useful benefits [11, 13]. The size of effect appears related to the number of contacts and to whether blood pressure was measured and fed back. Programmes with several visits over months do better than those with a single counselling session, a pattern also seen in reviews of adherence interventions generally [22, 23]. This matters for countries such as India, where pharmacists cannot adjust prescriptions, because it indicates that structured counselling with follow-up can still contribute, particularly given the low rates of control reported [6].

Subgroups with higher risk have been studied separately. People with diabetes or chronic kidney disease have lower targets and more complex regimens, and several of the collaborative care trials included many such participants [37]. The large SPRINT trial recruited adults at increased cardiovascular risk and showed what intensive control can achieve under protocolised conditions, which sets a benchmark for what a pharmacist-supported programme aims to approach in routine care [4]. Older patients benefit from simplification and attention to falls and postural hypotension, though few pharmacy trials report age-specific results. The evidence in specific groups is therefore suggestive, and tailoring counselling by risk profile remains a matter of clinical judgement.

Outcomes other than blood pressure are less often measured. Some trials report improvements in adherence scores, patient knowledge, satisfaction and quality of life, but few follow patients long enough to show effects on stroke, myocardial infarction or death. This is understandable, since such trials would be large and costly, but it means that the clinical benefit is inferred from blood pressure change using the known relationship between pressure and events [1, 5]. A fall of a few millimetres of mercury in systolic pressure across a population is meaningful, as meta-analyses of drug trials show a proportionate reduction in events for each 10 mmHg lowering [5]. It is nonetheless an inference, and it should be presented as such.

Safety should not be overlooked when pharmacists take part in titration. Intensive treatment brings more hypotension, syncope, electrolyte disturbance and acute kidney injury, as the large intensive-control trial showed [4]. In the pharmacist prescribing trial, protocols required assessment of renal function and electrolytes and referral of complex cases, and the intervention was delivered in a system with access to laboratory data [35]. These safeguards are essential if pharmacist-led titration is introduced elsewhere. In the absence of laboratory results or physician back-up, counselling and recommendation to the prescriber are safer than independent dose changes. The balance of benefit and harm depends on the surrounding system as much as on the pharmacist's knowledge.

5. TRIAL DESIGN AND INTERPRETATION

Several design issues limit interpretation. Pharmacist interventions are complex, with multiple interacting components, and guidance on developing and evaluating complex interventions urges researchers to define the components, test feasibility, and plan process evaluation alongside outcome assessment [38]. Many pharmacy trials lack such preparation, which makes it hard to know why an intervention succeeded or failed. Blinding of patients and pharmacists is impossible, so outcome assessors should be blinded and blood pressure should be measured in a standard way. A standard tool for judging risk of bias in randomised trials is available, and unclear allocation concealment and incomplete outcome data are the typical concerns in trials of complex interventions [39].

Choice of outcome and measurement method influences the result. Trials that use office readings taken by the pharmacist can be affected by observer expectation, whereas home or ambulatory averages are less vulnerable but cost more [7, 15]. Clinic readings by independent staff blinded to allocation, or automated devices that print results, reduce bias. Some trials define success as reaching a target and others as an average change, and the former is sensitive to the threshold chosen. Reporting both the mean difference and the proportion at target, with confidence intervals, is more informative. A handful of trials also measure diastolic pressure and heart rate, but systolic pressure is the better predictor of events in most adults and should be the primary outcome [1, 5].

Heterogeneity is a second problem. A pooled estimate from trials with different populations, comparators and intervention intensity is an average of unlike things. The reviews cited above report high statistical heterogeneity, and subgroup analysis suggests that effects are larger in patients with higher baseline pressure, in interventions that

include physician feedback, and in those with more frequent contact [11, 12, 33]. A patient with a baseline pressure only slightly above target has less room for improvement than one whose pressure is far above it, so differences in baseline alone can produce apparent differences between studies. Meta-regression on baseline values is therefore informative, though the number of trials limits what can be tested.

Regression to the mean and the Hawthorne effect also deserve attention. Patients are often recruited because a reading was high, and the next reading is likely to be lower even without intervention. Usual care groups in randomised trials control for this, but uncontrolled before-and-after studies, which make up a large part of the pharmacy literature, do not. The attention given to patients in a study can itself improve behaviour. For these reasons, claims based on uncontrolled designs should be viewed as hypotheses. Randomised comparison with a concurrent control group, measured with the same method at each visit, remains the standard, as the better reviews do [33, 36].

Follow-up duration is a further weakness. Many trials last three to twelve months. Improvements in adherence and pressure achieved in that time may fade when intensive contact ends, as is known from the adherence literature, where effects often wane once support is withdrawn [22, 23]. Reviews of adherence interventions have noted that few studies assess long-term maintenance, and that the strongest evidence of benefit comes from interventions that continue over time [23]. For hypertension, a lifelong condition, a counselling programme must be sustainable within normal pharmacy workload and funding, otherwise any gains seen in a research setting will not translate to routine practice [20, 24].

6. PRACTICE IMPLICATIONS AND FUTURE DIRECTIONS

For practising pharmacists, the evidence supports a clear routine. Measure blood pressure correctly at each visit or train patients to do so at home. Assess adherence with a neutral, non-judgemental question and, where possible, a validated tool. Look for side effects and interactions that might explain missed doses. Agree on one or two specific behaviour goals, such as taking tablets at breakfast or halving added salt. Record the readings and share them with the prescriber when they exceed target, with a concrete suggestion for action [15, 20, 31]. These steps need little equipment and can be built into the dispensing workflow, and they apply whether or not the pharmacist has prescribing powers.

Communication with prescribers decides whether counselling leads to treatment change. A short, structured note that gives the patient's readings, the adherence picture, any side effects and a specific suggestion is far more useful than a generic remark that the pressure is high. Collaborative trials used such notes and found that physician response was a key link between pharmacist assessment and the fall in pressure [20, 37]. Documentation should be brief and standardised so that it can be completed within the time available. Electronic referral forms, shared dashboards and standard abbreviations all help, and pharmacies that adopt them tend to find that physicians become more willing to act on the information provided [13, 36].

Preparation of pharmacists is the last piece. Clinical knowledge of hypertension guidelines, skills in measurement, familiarity with motivational techniques and understanding of local referral pathways are not always part of a basic pharmacy degree. Short certified courses and supervised practice have been used in trials, and the programmes that reported success typically invested in training before launch [20, 26]. Continuing education should be aligned with current guidance, which has changed repeatedly in the last two decades [7, 8, 9, 14]. Regulators and professional bodies can support this by defining competencies, offering accreditation and recognising counselling as a professional service, which also helps employers justify the staff time required.

System-level changes would multiply the effect. Collaborative agreements between pharmacists and physicians, shared records, protocols for dose titration, and payment for cognitive services convert good intentions

into sustained programmes. Team-based care has been recommended on the basis of its consistent effect on control, and the evidence suggests that pharmacists are a cost-efficient member of such teams [33, 36]. In countries where pharmacists cannot adjust therapy, a practical starting point is a formal referral and feedback loop, in which the pharmacist reports readings and adherence problems to the physician in a standard format. Even this modest structure addresses the therapeutic inertia noted earlier and gives physicians information they otherwise lack [13, 37].

Research priorities follow from the limits described above. Larger pragmatic trials in low- and middle-income settings, using clear descriptions of the intervention and standard blood pressure measurement, are needed [21, 38]. Studies should report adherence by objective as well as self-reported measures, follow patients for at least a year, and record costs. Comparisons of different intensities of counselling, and of in-person with telephone or digital delivery, would show how best to use limited time. Cluster designs that randomise pharmacies instead of patients can avoid contamination between groups. Finally, outcome trials or linked-record studies capturing cardiovascular events would test whether the blood pressure gains seen in the literature translate into fewer strokes and heart attacks [5, 39].

7. CONCLUSION

The literature indicates that pharmacist-led counselling, delivered to hypertensive outpatients with proper blood pressure measurement, adherence support, lifestyle advice and communication with the prescriber, lowers blood pressure and improves the proportion reaching target compared with usual care [11, 12, 13]. The effect is larger when pharmacists can recommend or make changes to therapy or work in a team, and smaller when counselling stands alone [33, 35, 36, 37]. Mechanisms include better adherence, fewer unnoticed side effects, reinforcement of lifestyle change and relief of therapeutic inertia [17, 24, 27, 28].

Confidence is limited by heterogeneous interventions, short follow-up, unblinded designs, reliance on self-reported adherence and scarce data from low-resource settings [6, 38, 39]. Practice should adopt the simple elements that have a sound basis, namely correct measurement, adherence assessment, goal setting, home monitoring and feedback to prescribers, while health systems should enable collaborative models and fund them [15, 20, 31]. Future trials should describe interventions fully, use objective adherence measures, extend follow-up and record cardiovascular events, so that the real value of pharmacist counselling in hypertension can be judged [18, 21].

8. ABBREVIATIONS

BP-Blood pressure, DASH-Dietary Approaches to Stop Hypertension, ESC-European Society of Cardiology, ESH-European Society of Hypertension, JNC-Joint National Committee, MI-Motivational interviewing, SBP-Systolic blood pressure, SPRINT-Systolic Blood Pressure Intervention Trial

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Nil

10. AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

11. CONFLICT OF INTERESTS

Declared none

12. REFERENCES

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