

Perceptions about hypertension in an urban population in Pakistan

Nimra Noor¹, Danish Hassan¹, Saira Khalid¹ and Momina Kashif¹

¹Riphah College of Rehabilitation & Allied Health Sciences, Faculty of Rehabilitation & Allied Health Sciences, Riphah International University, Gulberg III Campus, Lahore, Pakistan (Correspondence to Danish Hassan: danish.hassan009@gmail.com)

Abstract

Background: As the risk factors and prevalence of hypertension continue to increase in Pakistan, it is imperative to understand the perceptions of patients about its prevention, symptoms, diagnosis, treatment, and management to inform the design of programmes to improve management.

Objective: To explore patients' perceptions about the treatment, management and control of hypertension in an urban population in Pakistan.

Methods: Using a semi-structured questionnaire, we conducted one-on-one interviews with 30 hypertensive patients at 2 urban government tertiary care hospitals in Lahore and Sargodha. The patients were aged 35–70 years, diagnosed with hypertension by a registered medical doctor, and being treated with anti-hypertensive medication. The interviews were recorded, transcribed and analysed using Quirkos.

Results: Almost all the patients recognized the potential long-term consequences of hypertension. Most of them said regular use of prescribed medication was beneficial, including for blood pressure control and relief of symptoms. They understood the benefits of lifestyle modification, such as engaging in physical activity, for the management of blood pressure. They however had inadequate knowledge of their treatment regimens; some of them took their medications irregularly, while some took them only when they felt symptoms. Most patients relied solely on medical management.

Conclusion: We identified major challenges with the management of hypertension among the study population. Patients and caregivers relied mostly on medical management, with insufficient follow-up after initiating treatment. There is a need to improve patient follow-up and provide better patient education on the benefits of adhering to treatment regimens and adopting lifestyle changes including dietary and exercise management.

Keywords: hypertension, blood pressure, physical activity, medical management, diagnosis, medication, lifestyle modification, Pakistan

Citation: Noor N, Hassan D, Khalid S, Kashif M. Perceptions about hypertension in an urban population in Pakistan. *East Mediterr Health J.* 2024;30(10):682–688. <https://doi.org/10.26719/2024.30.10.682>.

Received: 18/10/2023; Accepted: 13/08/2024

Copyright: © Authors 2024; Licensee: World Health Organization. EMHJ is an open access journal. All papers published in EMHJ are available under the Creative Commons Attribution Non-Commercial ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Introduction

Hypertension is a widely recognized cause of comorbidity and early death globally (1). It affects 33% of adults aged 30–79 globally, with 78% of its burden in low- and middle-income countries reported largely in the WHO Western Pacific and South-East Asia regions (2). High-income countries are experiencing a notable decrease in age-standardized blood pressure levels, driven by improvements in hypertension awareness and management, resulting in control rates of about 50% (3). The highest blood pressure levels in low- and middle-income countries (4).

Epidemiological trends among urban populations in Pakistan tend towards specific risk factors associated with cardiovascular disease. Reduced physical activity, combined with psychological stress, contributes to increased blood pressure (9). For example, 45.7% of males are smokers, 52.4% of which are diagnosed with hypertension, and 20.2% have elevated levels of cholesterol (5). The Japanese Society of Hypertension in 2014, the American College of Cardiology and the American Heart Association in 2017 and the European Society of Cardiology and the European Society of Hypertension

in 2018 suggested using behavioural and motivational techniques to promote healthy lifestyles, as part of a collaborative approach to hypertension management (6).

Patient pathways and perceptions about diagnosis, treatment, and management play an important role in the effectiveness of hypertension management. While some patients reported being aware of having hypertension and its potential complications in the future such as stroke, heart attack or organ damage, most patients said they were unaware that they had hypertension (7).

A clear understanding of the perception of patients about using medication to control hypertension is crucial. Treatment failure due to lack of adherence is a primary barrier reported in previous studies (8). Examples of some of the barriers include not having enough money to purchase adequate doses of medication, forgetting to take medication regularly, and taking medication only when experiencing acute symptoms (8).

It is essential to address health system barriers hindering the control of hypertension for example, some patients receive medication while others lack access (10). Although many studies have explored the risk factors and pathophysiology of hypertension, few have adequately

covered the effective management and control measures (11). Evidence suggests that hypertensive patients require a better understanding of the disease to prevent complications.

Given Pakistan's current socioeconomic conditions, the percentage of the Gross Domestic Product (GDP) allocated to healthcare is low compared to its neighbouring countries. As the prevalence of non-communicable diseases, particularly hypertension, continues to increase, it is crucial to assess patients' perceptions about hypertension as a step toward improving diagnosis and management. Hence, this study aimed to explore patient perceptions regarding the treatment, management and control of hypertension in urban Pakistan.

Methods

We conducted this study using a qualitative design and a constructivist grounded theory approach as outlined by Charmaz to explore patients' perceptions about hypertension (12). Grounded theory involves creating or discovering a theory derived from the data collected from participants. To firmly establish conclusions within the data, we used the constant comparison with the following techniques: simultaneous participation in data collection and analysis, continuous comparison analysis, initial coding, selective coding, category construction, and memo writing (13).

We used purposeful and heterogeneous sampling methods to select 30 hypertensive patients from the outpatient departments of government tertiary care hospitals in Lahore and Sargodha. This sampling technique is widely applied in qualitative research for identifying and selecting information-rich cases related to the phenomenon of interest (14). We determined sample sufficiency using the principle of saturation, in line with the grounded theory approach (15), as no new codes were identified after interviewing the 30 hypertensive patients.

We included hypertensive patients aged 5–70 years who had been diagnosed with hypertension by a registered medical doctor at least 6 months and had been treated with anti-hypertensive medication for at least 2 months before the study began. Participants needed to be able to speak and understand all interview questions, as any mental disorder could affect their participation in the study (16). We excluded patients with secondary hypertension, those unable to provide informed consent (e.g. patients with dementia, cognitive impairment), and those with severe mental illness (16, 17).

We selected the interview questions from previously related qualitative studies (18). Five expert medical specialists with at least 5 years of experience in managing hypertension content-validated the questions. Items with a content validity index (CVI) > 0.6 were included in the questionnaire. The finalized questionnaire was translated into Urdu with the assistance of language experts. We added open-ended questions as needed to better patients' perspectives and experiences. The questions were divided into 3 sections: knowledge and diagnosis of

hypertension prevention and treatment, and healthcare experiences and recommendations. We conducted semi-structured interviews face-to-face at the participants' homes, with interviews audio-recorded with permission. The interviews lasted 30–35 minutes each. Field notes were taken during and after the interviews to aid data saturation, transcription and coding.

We transcribed the recorded data into English and imported it into Quirkos software for qualitative data analysis and management. We performed inductive content analysis in line with grounded theory methodology (19). Thematic code analysis was conducted following the steps described by Victoria Clarke and Virginia Braun (20). We familiarized ourselves with the data, assigned preliminary codes, sorted those codes into themes, searched for themes across the interviews, reviewed, defined, and named the themes, and produced the final document.

The institutional review board of the Riphah International University approved the study before field data collection (REC/RCR & AHS/22/0301). We obtained informed consent from all participants, and anonymity was assured by assigning them numbers (Participant 1 to 30). All audio recordings and transcripts were securely stored on a password-protected electronic device. We completed the study in 10 months (March to December 2022).

Results

The basic demographic profile of our participants is presented in Table 1. Codes from the in-depth analysis of each participant's transcribed interview were grouped into sub-themes, which were then reorganized into 3 main pre-defined themes as follows:

Theme 1: Knowledge and diagnosis

This theme explored participants' knowledge of hypertension and their perceptions regarding its diagnosis. Participants were asked about their understanding of hypertension and how they manage the condition daily. The findings revealed that not all participants had adequate knowledge of hypertension. Many of them learned about the signs and symptoms of the disease primarily through information shared by others. Participants 8 and 5 said:

"I've heard from others that a quick increase in blood pressure may even cause blood vessels to burst!"

"I think hypertension is a common condition that affects the human body...I don't have much knowledge, but I know when the blood pressure goes above 130 or 140 it's not good for human health"

Nearly all the participants said they were aware of the potential consequences of hypertension, with stroke and heart attack named as the most common complications. Participants 22, 2, and 14 said:

"My mother got paralyzed because of shooting blood pressure...my father got cardiac disease!"

"You may eventually die from it"

Table 1. Demographic profile of 30 study participants, Pakistan, 2023

Variable	Female	Male	Total
Gender	12	18	30
Age-group (years)			
35-45	3	0	3
45-55	4	9	13
55-70	5	9	14
Location			
Sargodha	15	0	15
Lahore	0	15	15
Education			
No formal education	2	4	6
Primary	1	3	4
Secondary	5	4	9
Bachelors	4	7	11
Duration of hypertension			
25-35 years	6	10	16
15-25 years	3	4	7
5-15 years	2	2	4
<5 years	1	2	3

“Hypertension may lead to stroke, heart issues, kidney damage and even death”.

The sub-theme of accidental discovery captures how participants knew about their diagnosis during routine medical checks. Some participants reported experiencing only mild headaches before their diagnosis, while others described severe headaches, likening the pain to someone hitting their head, along with symptoms such as vomiting and palpitations. Participants 3 and 28 said:

“In the past I was diagnosed with kidney stones and during the process of its treatment I was diagnosed with high blood pressure (200 mm Hg) and was given tablets to control it”

“I was diagnosed with high blood pressure during my heart disease diagnosis, or you can say this may be one of the reasons for my heart issue”.

Many participants perceived stress as both a cause and a result of hypertension, and they named specific sources of stress. More generally, male hypertensive participants attributed their high blood pressure to job-related stress and unemployment, whereas female participants attributed it to domestic disputes. Participants also said unhealthy food and high salt content in the diet may cause to high blood pressure. Although many participants identified stress as the cause of hypertension, some participants said hypertension is an inherited disorder, considering it to be a 'family disease'. Participants 15 and 9 said:

“I think stress is the main cause of high blood pressure... but it may run in the family also. If your mother or father had this disease; you may also have it”

“Eating high salt in diet and fatty foods may cause high blood pressure”

Theme 2: Prevention and treatment

This theme explored the measures participants adopted to prevent complications due to hypertension. Participants discussed lifestyle modifications and informal treatments that they used to manage acute hypertension episodes. The theme also explored advice provided by health care practitioners, treatment strategies, and complications associated with the disease. Participant 20 recalls:

“The information provided was more than enough...I think a good doctor is the half treatment of your disease... if he listens to you carefully, you feel relaxed after a single appointment”.

Male and female hypertensive participants frequently reported walking as a key lifestyle change. They noted that walking daily helps relieve tension, and the fresh air improves their mood and energy levels. They also mentioned that a sedentary lifestyle increases susceptibility to stress and tension, which can lead to high blood pressure. However, some participants opposed these lifestyle modifications.

Participants 19, 23, 17, and 13 said:

“Yes, lifestyle changes help to control high blood pressure. I feel happy and light weight after walking. I think sedentary lifestyle brings you closer to tension...”

“Yes, I have made changes to my lifestyle. I try my best to avoid overthinking on little issues. I walk on daily basis... try to drink more and more water”

“As a maid by profession, I don't have enough time for all these things! I think these are the beaks of the rich. I have so much work to do...to feed my children...and to not depend on anyone and I think this is more than any exercise”

“Medicine dose was increased after my regular check because I got sugar and heart issues with this disease as the time passed”

Some participants followed their prescribed hypertension treatment regimens regularly. Initially, others took their medications as directed, but eventually stopped when they felt better. One participant resorted to taking herbal remedies. Some participants took their medication only when they experienced hypertension symptoms.

Participants 18 and 24 said:

“I took my medicines regularly....! My brother who is also suffering from high blood pressure strongly advised me to take care of my medicine routine”

“I took my medicines regularly at the beginning but now I only take medicines when I feel symptoms”.

Some participants were unsure about the proper type, duration, and intensity of exercise needed for hypertensive individuals. They viewed physical activity as a brisk walk around the home, managing domestic chores and listed a variety of activities they engaged in. Most of the participants reported that they tried to walk 30 minutes a day and exercise regularly. Participant 8 recalled:

“Doctor advised me that if you control all the risk factors of this disease it will be more beneficial”.

Theme 3: Initiatives to improve hypertension

This theme explored initiatives to improve hypertension management. Hypertensive participants, drawing from their experiences, advised others on taking precautionary measures to control high blood pressure. This theme was further subdivided into subthemes discussing initiatives to enhance hypertension prevention and changes needed outside the healthcare system. Our results showed that while participants had basic knowledge of precautionary measures, they often failed to observe them in their daily lives. Participants 25, 4 and 7 said:

“I think one should visit the doctor every month for their normal routine checks like blood test, sugar test, cholesterol test etc as these are the major risk factors for stroke and heart disease”

“I heard from people that reducing salt in diet and avoiding oily items in food can reduce blood pressure”

“My friend advised me to drink more and more water and eat green coriander to reduce blood pressure”.

Participants with hypertension advised others to take their medications regularly. Some also recommended avoiding stress or tension, as these can increase blood pressure, while others suggested avoiding junk food. Participant 6 advised:

“I advise everyone to avoid tension in their life. Avoid junk foods and eat fresh fruits”

Changes outside the healthcare system are necessary. Some participants reported a lack of parks or walking paths in their towns. The government should supply medicine to hospitals for the poor and needy. One

participant suggested hiring more doctors in government hospitals. Participants 26 and 18 said:

“Every town should have a park for walking and routine exercise, as I told you that no park facility is there in our town”

“I think awareness seminars for non-communicable diseases should be organized by government just like they do for communicable diseases (hepatitis, polio etc.) in the communities”.

Discussion

This qualitative study explored participants' perceptions about the treatment, management, and control of hypertension in urban Pakistan. Findings from our research and past research regarding the perception and understanding of hypertension appears to be remarkably consistent (21). However, in this study, participants reported using several informal methods to treat emergency symptoms of hypertension, which highlights a concerning lack of sufficient information and education.

Other than new reports of using informal methods to self-treat hypertension, our results are in line with previous investigations carried out in Nepal and other similar low and middle-income countries (22-23). In low- and middle-income countries, low literacy rates and insufficient information significantly affect people's understanding of diseases and treatments, leading to misconceptions (10, 24, 25). Findings from this study show that most participants identified stress and tension as the main causes of hypertension, while some believed it to be hereditary and, passed down from one generation to another. These results suggest that participants' attitudes are influenced by their beliefs, which, in turn, shape how they perceive and interpret the causes of their diseases (26-28). However, many participants perceived that their hypertension status as depended solely on blood pressure examinations, reflecting uncertainty regarding the perceived symptoms. Participants reported that they used medicine to control their hypertension symptoms but would stop taking the medicines once they felt better. If they develop symptoms, these participants return to the healthcare facility for medication.

Numerous studies have reported this cycle of symptomatic drug use and subsequent cessation (29). Participants became aware that high blood pressure could produce serious outcomes, such as cerebral infarction, stroke-induced paralysis, and cardiac arrest. The overall anxiety regarding the potential complications of hypertension was comparable to what has been observed in previous research (30). However, this awareness did not consistently lead to sustained adherence to treatment regimens, suggesting that continuous participant education and support are crucial to promote medication adherence and improve long-term hypertension management.

Clinical trials have demonstrated that lifestyle changes, such as increasing physical activity and consuming a diet rich in fruits and vegetables and low in salt and saturated fat, can significantly reduce blood pressure (31). Most participants were aware of these lifestyle modifications, particularly reducing salt intake and avoiding meat and dairy. Upon being diagnosed with hypertension, many made minor dietary adjustments, such as eating less meat. However, only a small percentage engaged in physical activity beyond household chores, with some believing they should avoid exertion and rest instead. This belief aligns with findings from a study on Bangladeshi participants in the United Kingdom, who felt exercise could worsen physical ailments (32).

Participants reported side effects from antihypertensive medications, contributing to low adherence, therefore, some of them often resorted to home remedies to manage high blood pressure. A North Indian study emphasized the importance of providing accurate medical information, including the potential side effects, to ensure adherence to pharmacological therapy (33). Reluctance to discuss issues with doctors, whether due to embarrassment or time constraints, can leave participants feeling powerless and hinder the achievement of their health goals (34).

The study discussed initiatives to improve hypertension awareness among participants, recommending dietary changes, stress avoidance, and lifestyle modifications. A study in the USA highlighted the need for integrated strategies in public health and healthcare systems to address multiple risk factors and conditions simulta-

neously (35). One key recommendation for increasing hypertension awareness is continuous door-to-door visits, where healthcare workers measure blood pressure and provide guidance directly to community members. This approach has been highly effective in raising awareness about HIV in South Africa and other sub-Saharan African nations (36, 37).

This study had certain limitations. In Pakistan healthcare is majorly self-funded therefore socioeconomic status strongly determines access to healthcare services and community resources, which affects perception regarding treatment, management, and control of any disease. Secondly, as one-third of Pakistanis live in rural areas with limited access to health care facilities, socioeconomic status will also affect participant outcomes when they are referred to government hospital in urban settings.

Conclusion

We identified several major issues in the management of hypertension among hypertensive individuals in urban Pakistan. Medical management was the primary approach patients and caregivers relied on, with a notable lack of proper follow-up after initiating treatment. Home remedies were also commonly used. There was insufficient knowledge regarding the use of dietary changes and physical activity for the management of hypertension, highlighting the need for greater awareness about lifestyle interventions. The patient care model should shift more toward self-management of hypertension, rather than relying solely on medication.

Perceptions de l'hypertension dans une population urbaine au Pakistan

Résumé

Contexte : Alors que les facteurs de risque et la prévalence de l'hypertension continuent d'augmenter au Pakistan, il est impératif de comprendre les perceptions des patients quant à sa prévention, ses symptômes, son diagnostic, son traitement et sa prise en charge, afin d'orienter la conception des programmes visant à améliorer ce processus.

Objectif : Étudier les perceptions des patients concernant le traitement, la prise en charge et le contrôle de l'hypertension dans une population urbaine au Pakistan.

Méthodes : À l'aide d'un questionnaire semi-structuré, nous avons mené des entretiens en tête-à-tête avec 30 patients atteints d'hypertension dans deux hôpitaux de soins tertiaires publics urbains à Lahore et Sargodha. Les patients étaient âgés de 35 à 70 ans, diagnostiqués comme hypertendus par un médecin agréé et sous traitement antihypertenseur. Les entretiens ont été enregistrés, transcrits et analysés à l'aide de Quirkos.

Résultats : La quasi-totalité des patients ont pris conscience des conséquences potentielles de l'hypertension à long terme. La plupart d'entre eux ont déclaré que l'utilisation régulière de médicaments prescrits était bénéfique, y compris pour le contrôle de la pression artérielle et le soulagement des symptômes. Ils ont compris les avantages d'un changement de mode de vie, tel que la pratique d'une activité physique dans le but de gérer la pression artérielle. Cependant, leurs connaissances concernant les schémas thérapeutiques étaient limitées. Certains d'entre eux prenaient leurs médicaments de manière irrégulière, tandis que pour d'autres, ils ne le faisaient que lorsqu'ils ressentaient des symptômes. La plupart des patients dépendaient uniquement de la prise en charge médicale.

Conclusion : Nous avons identifié des défis majeurs liés à la prise en charge de l'hypertension dans la population étudiée. Les patients et les soignants s'en remettaient principalement à la prise en charge médicale, avec un suivi insuffisant après la mise en route du traitement. Il est nécessaire d'améliorer le suivi des patients et de mieux les informer sur les avantages du respect des schémas thérapeutiques et de l'adoption de changements de mode de vie, notamment en ce qui concerne le régime alimentaire et l'exercice physique.

تصورات سكان الحضر في باكستان عن ارتفاع ضغط الدم

نمرة نور، دانيش حسن، سارة خالد، مؤمنة كاشف

الخلاصة

الخلفية: مع استمرار تزايد عوامل الخطر ومعدل انتشار ارتفاع ضغط الدم في باكستان، يصبح من الضروري فهم تصورات المرضى بشأن الوقاية من ارتفاع ضغط الدم وأعراضه وتشخيصه وعلاجه، من أجل مراعاة تلك التصورات في تصميم البرامج الرامية إلى تحسين التدبير العلاجي.

الهدف: هدفت هذه الدراسة الى استكشاف تصورات المرضى عن علاج ارتفاع ضغط الدم والسيطرة عليه بين سكان المناطق الحضرية في باكستان.

طرق البحث: باستخدام استبيان شبه منظم، أجرينا مقابلات فردية مع 30 مريضاً مصابين بارتفاع ضغط الدم في مستشفيين من مستشفيات الرعاية الثالثية الحكومية الحضرية في لاهور وسر جوها. وتراوحت أعمار المرضى بين 35 و70 عاماً، وقد شُخصَ حوالي ثلثهم بارتفاع ضغط الدم طبيباً مسجلاً، وهم يخضعون للعلاج بالأدوية الخافضة لارتفاع ضغط الدم. وقد سُجلت المقابلات و فرغت صوتياً وحُللت باستخدام Quirkos.

النتائج: جميع المرضى، تقريباً، على دراية بالعواقب المحتملة لارتفاع ضغط الدم على المدى الطويل. وقال معظمهم إن الاستخدام المنتظم للأدوية الموصوفة له فوائده، ومنها مثلاً السيطرة على ضغط الدم وتخفيف الأعراض. وكذلك اتضح إدراكهم للمنافع المترتبة على تعديل نمط الحياة في إدارة ضغط الدم، ومثال ذلك الانخراط في النشاط البدني. ومع ذلك، لم تكن لدى المرضى المعرفة الكافية بأنظمة علاجهم؛ فبعضهم يتناول أدويته دون انتظام، وآخرون لا يتناولون الأدوية إلا عندما يشعرون بأعراض. ويعتمد معظم المرضى على العلاج الطبي فقط.

الاستنتاجات: لقد وقفنا على تحديات كبيرة تواجه علاج ارتفاع ضغط الدم بين السكان الذين شملتهم الدراسة. ويعتمد المرضى ومقدمو الرعاية على العلاج الطبي في الغالب، مع الإشارة إلى عدم كفاية المتابعة بعد بدء العلاج. لذا، ثمة حاجة إلى تحسين متابعة المرضى وتوفير تثقيف أفضل للمرضى بشأن فوائد الالتزام بأنظمة العلاج وتطبيق التغييرات في نمط الحياة، وخصوصاً النظام الغذائي وإدارة ممارسة التمارين.

References

1. Sun X, Chen X, Shi Z, Yan AF, Li Z, Chen S, et al. A comparison study of prevalence, awareness, treatment and control rates of hypertension and associated factors among adults in China and the United States based on national survey data. *Glob Health J*. 2023. doi:10.1016/j.glohj.2023.02.001
2. Kario K, Okura A, Hoshide S, Mogi M. The WHO Global report 2023 on hypertension warning the emerging hypertension burden in globe and its treatment strategy. *Hypertens Res*. 2024;47(5):1099-102. doi:10.1038/s41440-024-01622-w
3. Zhou B, Danaei G, Stevens GA, Bixby H, Taddei C, Carrillo-Larco RM, et al. Long-term and recent trends in hypertension awareness, treatment, and control in 12 high-income countries: an analysis of 123 nationally representative surveys. *Lancet*. 2019;394(10199):639-51. doi:10.1016/S0140-6736(19)31145-6
4. Schutte AE, Jafar TH, Poulter NR, Damasceno A, Khan NA, Nilsson PM, et al. Addressing global disparities in blood pressure control: perspectives of the International Society of Hypertension. *Cardiovasc Res*. 2022. doi:10.1093/cvr/cvac130
5. Hassan MU, Hussain C, Sawar S, Rauf MA, Afridi HR. Prevalence of hypertension and other associated factors among individuals aging 15 years and above, in Federally Administered Tribal Areas of Pakistan. *Khyber Med Univ J*. 2022;14(2):79-85. doi:10.35845/kmuj.2022.21711
6. Nishigaki N, Shimasaki Y, Yoshida T, Hasebe N. Physician and patient perspectives on hypertension management and factors associated with lifestyle modifications in Japan: results from an online survey. *Hypertens Res*. 2020;43(5):450-62. doi:10.1038/s41440-020-0398-0
7. Rahman ARA, Wang J-G, Kwong GMY, Morales DD, Sritara P, Sukmawan R. Perception of hypertension management by patients and doctors in Asia: potential to improve blood pressure control. *Asia Pac Fam Med*. 2015;14(1):1-11. doi:10.1186/s12930-015-0018-3
8. Tan CS, Hassali MA, Neoh CF, Saleem F. A qualitative exploration of hypertensive patients' perception towards quality use of medication and hypertension management at the community level. *Pharm Pract (Granada)*. 2017;15(4). doi:10.18549/Pharm-Pract.2017.04.1074
9. Ibrahim MM, Damasceno A. Hypertension in developing countries. *Lancet*. 2012;380(9841):611-9. doi:10.1016/S0140-6736(12)60861-7
10. Legido-Quigley H, Camacho Lopez PA, Balabanova D, Perel P, Lopez-Jaramillo P, Nieuwlaat R, et al. Patients' knowledge, attitudes, behaviour and health care experiences on the prevention, detection, management and control of hypertension in Colombia: a qualitative study. *PLoS One*. 2015;10(4). doi:10.1371/journal.pone.0122112
11. Almas A, Godil SS, Lalani S, Samani ZA, Khan AH. Good knowledge about hypertension is linked to better control of hypertension; a multicentre cross sectional study in Karachi, Pakistan. *BMC Res Notes*. 2012;5:1-8. doi:10.1186/1756-0500-5-579
12. Solbakken LE, Wynn R. Barriers and opportunities to accessing social support in the transition from community to prison: a qualitative interview study with incarcerated individuals in Northern Norway. *BMC Psychol*. 2022;10(1):1-11. doi:10.1186/s40359-022-00895-5

13. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci.* 2013;15(3):398-405. doi:10.1111/nhs.12048
14. Johnson R, Turner K, Feder G, Cramer H. Shared decision making in consultations for hypertension: Qualitative study in general practice. *Health Expect.* 2021;24(3):917-29. doi:10.1111/hex.13234
15. Vasileiou K, Barnett J, Thorpe S, Young T. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC Med Res Methodol.* 2018;18(1):1-18. doi:10.1186/s12874-018-0594-7
16. Bhandari B, Narasimhan P, Vaidya A, Subedi M, Jayasuriya R. Barriers and facilitators for treatment and control of high blood pressure among hypertensive patients in Kathmandu, Nepal: a qualitative study informed by COM-B model of behavior change. *BMC Public Health.* 2021;21:1-14. doi:10.1186/s12889-021-11548-4
17. Jolles EP, Padwal RS, Clark AM, Braam B. A qualitative study of patient perspectives about hypertension. *ISRN Hypertens.* 2013;2013. doi:10.5402/2013/671691
18. Naheed A, Haldane V, Jafar TH, Chakma N, Legido-Quigley H. Patient pathways and perceptions of hypertension treatment, management, and control in rural Bangladesh: a qualitative study. *Patient Prefer Adherence.* 2018;12:1437-49. doi:10.2147/PPA.S163385
19. Charmaz K. *Constructing grounded theory: A practical guide through qualitative analysis.* 2006. [Available from: <https://in.sagepub.com/en-in/sas/constructing-grounded-theory/book235960>]
20. Clarke V, Braun V. Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *Psychol.* 2013;26(2). [Available from: <https://uwe-repository.worktribe.com/output/937596/teaching-thematic-analysis-overcoming-challenges-and-developing-strategies-for-effective-learning>]
21. Jongen VW, Lalla-Edward ST, Vos AG, Godijk NG, Tempelman H, Grobbee DE, et al. Hypertension in a rural community in South Africa: what they know, what they think they know and what they recommend. *BMC Public Health.* 2019;19(1):1-10. doi:10.1186/s12889-019-6642-3
22. Al-Rousan T, Pesantes MA, Dadabhai S, Kandula NR, Huffman MD, Miranda JJ, et al. Patients' perceptions of self-management of high blood pressure in three low- and middle-income countries: findings from the BPMONITOR study. *Glob Health Epidemiol Genom.* 2020;5. doi:10.1017/ghg.2020.5
23. Dhungana RR, Pedisic Z, Dhimal M, Bista B, de Courten M. Hypertension screening, awareness, treatment, and control: a study of their prevalence and associated factors in a nationally representative sample from Nepal. *Glob Health Action.* 2022;15(1):2000092. doi:10.1080/16549716.2021.2000092
24. Khatib R, Schwalm J-D, Yusuf S, Haynes RB, McKee M, Khan M, Nieuwlaat R. Patient and healthcare provider barriers to hypertension awareness, treatment and follow up: a systematic review and meta-analysis of qualitative and quantitative studies. *PLoS One.* 2014;9(1). doi:10.1371/journal.pone.0084238
25. Kibore AM, Moturi G, Thigiti J. Patient related barriers to adequate blood pressure control among adult hypertensive patients seen at Kiambu County hospital, Kenya. *East Cent Afr Med J.* 2020;4(1):1-5. doi:10.33886/ecamj.v4i1.173
26. Blumhagen D. Hyper-tension: a folk illness with a medical name. *Cult Med Psychiatry.* 1980;4(3):197-227. doi:10.1007/BF00048414
27. Beune E, Haafkens J, Schuster J, Bindels P. 'Under pressure': how Ghanaian, African-Surinamese and Dutch patients explain hypertension. *J Hum Hypertens.* 2006;20(12):946-55. doi:10.1038/sj.jhh.1002094
28. Marshall IJ, Wolfe CD, McKevitt C. Lay perspectives on hypertension and drug adherence: systematic review of qualitative research. *BMJ.* 2012;345. doi:10.1136/bmj.e3953
29. Connell P, McKevitt C, Wolfe C. Strategies to manage hypertension: a qualitative study with black Caribbean patients. *Br J Gen Pract.* 2005;55(514):357-61. [Available from: <https://bjgp.org/content/55/514/357.short>]
30. Anthony H, Valinsky L, Inbar Z, Gabriel C, Varda S. Perceptions of hypertension treatment among patients with and without diabetes. *BMC Fam Pract.* 2012;13:1-7. doi:10.1186/1471-2296-13-24
31. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. *N Engl J Med.* 2001;344(1):3-10. doi:10.1056/NEJM200101043440101
32. Greenhalgh T, Helman C, Chowdhury AM. Health beliefs and folk models of diabetes in British Bangladeshis: a qualitative study. *BMJ.* 1998;316(7136):978-83. doi:10.1136/bmj.316.7136.978
33. Mostafavi F, Najimi A, Sharifirad G, Golshiri P. Beliefs about medicines in patients with hypertension: The instrument validity and reliability in Iran. *Mater Sociomed.* 2016;28(4):298. doi:10.5455/msm.2016.28.298-302
34. Piette JD, Heisler M, Wagner TH. Cost-related medication underuse: do patients with chronic illnesses tell their doctors? *Arch Intern Med.* 2004;164(16):1749-55. doi:10.1001/archinte.164.16.1749
35. Bauer UE, Briss PA, Goodman RA, Bowman BA. Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. *Lancet.* 2014;384(9937):45-52. doi:10.1016/S0140-6736(14)60648-6
36. Shanaube K, Schaap A, Floyd S, Phiri M, Griffith S, Chaila J, et al. What works—reaching universal HIV testing: lessons from HPTN 071 (PopART) trial in Zambia. *AIDS.* 2017;31(11):1555. doi:10.1097/QAD.0000000000001514
37. Doherty T, Tabana H, Jackson D, Naik R, Zembe W, Lombard C, et al. Effect of home based HIV counselling and testing intervention in rural South Africa: cluster randomised trial. *BMJ.* 2013;346. doi:10.1136/bmj.f3481