

Patients' Beliefs Regarding the Causes of Hypertension and Treatment Adherence as Predisposing Factors for Complications and Uncontrolled Blood Pressure

Nidhal Awad Obaid Alibraheemi

Family Medicine Specialist, C.A.B.S. (Family Medicine), Ministry of Health- Karbala Health Directorate, Iraq

Mohanad Qasim Mahfoodh Abdullah

Family Medicine Specialist, C.A.B.S. (Family Medicine), Ministry of Health- Karbala Health Directorate, Iraq

Sarah Sabah Hasan Alshami

Family Medicine Specialist, C.A.B.S. (Family Medicine), Ministry of Health- Karbala Health Directorate, Iraq

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Abstract: Background: Hypertension is a highly prevalent non-communicable disease and a leading risk factor for cardiovascular morbidity and mortality. Despite effective treatments, blood pressure control remains suboptimal globally, partly due to patient beliefs and poor adherence, which contribute to the development of complications. Misconceptions about the causes and management of hypertension are particularly common in low- and middle-income countries.

Aim of the study: To identify patients' misconceptions about hypertension which may increase the risk of complications.

Patients and Methods: A prospective cross-sectional study was conducted at Karbala Health Directorate primary health care centers, over a ten-month period. Two hundred adult patients with hypertension attending the primary health center were included. Data were collected using a structured questionnaire addressing sociodemographic characteristics, clinical history, beliefs about hypertension, and adherence to therapy assessed by the Modified Morisky Medication Adherence Scale. Blood pressure control and the presence of complications were recorded. Statistical analysis was performed to explore associations between patient beliefs, adherence, blood pressure control, and complications.

Results: The mean age of participants was 54.3 years, with 52% male and 48% female. Misconceptions were widespread, with 60 % of patients believing stress was the main cause of hypertension, 45 % attributing it to blood viscosity, and 38 % to dietary fat intake. Only 40 % of patients achieved controlled blood pressure. High adherence to therapy was observed in 28 % of patients, medium adherence in 34 %, and low adherence in 38 %. More than half of the participants (56 %) experienced hypertension-related complications, most commonly kidney problems (22 %), heart attacks (18 %), and heart failure (16 %). Patients with low adherence were significantly more likely to have uncontrolled blood pressure and complications compared with those with high adherence ($p < 0.05$).

Conclusions: Patient misconceptions about hypertension were common and significantly influenced adherence to treatment, blood pressure control, and the occurrence of complications. Consistent adherence to therapy was protective, highlighting the importance of patient education and culturally sensitive interventions to improve hypertension outcomes.

Recommendations: Educational programs targeting patient beliefs, culturally adapted health messages, support for adherence, and training for healthcare providers should be prioritized. Community engagement and further

research in larger populations are essential to confirm these findings and evaluate the impact of interventions.

Keywords: Hypertension, Patient beliefs, Medication adherence, Blood pressure control.

Introduction: Hypertension is one of the most prevalent non-communicable diseases worldwide and remains a leading modifiable risk factor for cardiovascular morbidity and mortality. Hypertension is defined as a sustained systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg, based on multiple readings in a clinical setting, in accordance with international guidelines such as those from the European Society of Cardiology (ESC) and the American College of Cardiology (ACC)/American Heart Association (AHA). (1)

Globally, an estimated 1.28 billion adults aged 30–79 years are living with hypertension, with approximately two-thirds residing in low- and middle-income countries (LMICs). Alarming, nearly 46% of hypertensive adults are unaware of their condition, and among those diagnosed, a substantial proportion remain untreated or inadequately controlled. (2)

According to the World Health Organization only about 1 in 5 hypertensive individuals have their blood pressure adequately controlled, underscoring major public health and clinical care gaps. (3)

Regionally, in the Middle East and North Africa (MENA) hypertension has emerged as a growing public health challenge due to demographic transitions, urbanization, increasing rates of obesity, sedentary lifestyles, and high salt consumption. (4)

From a pathophysiological perspective, hypertension is not only a chronic hemodynamic disorder but also a complex syndrome involving neurohormonal dysregulation, endothelial dysfunction, and target organ damage. If left uncontrolled, it significantly increases the risk for stroke, myocardial infarction, heart failure, chronic kidney disease, peripheral vascular disease, and vascular dementia. (5)

Evidence suggests that for every 20-mmHg increase in systolic blood pressure or 10-mmHg increase in diastolic blood pressure, the risk of cardiovascular events doubles in adults aged 40–70 years. (6)

Despite the availability of effective antihypertensive medications and well-established guidelines for management, hypertension control rates remain suboptimal in clinical practice. This discrepancy between evidence and outcomes points toward deeper systemic, behavioural, and psychosocial factors — such as patient beliefs, treatment adherence, access to care, and health literacy — which play a critical role in achieving blood pressure control. (7)

Effective management of hypertension is based on a combination of lifestyle modification and pharmacological therapy, guided by individual cardiovascular risk, comorbidities, and organ function. Clinical trials have consistently shown that lowering systolic and diastolic blood pressure by as little as 10/5 mmHg can reduce the risk of stroke by approximately 35–40%, myocardial infarction by 20–25%, and heart failure by over 50%. However, achieving and maintaining optimal blood pressure targets in real-world settings remains challenging, particularly due to suboptimal adherence to prescribed treatment. (8)

Both blood pressure levels and total cardiovascular risk guide treatment initiation and intensity. Lifestyle modification recommended universally as first-line therapy, but pharmacological treatment is indicated immediately in patients with stage 2 hypertension or in those with stage 1 hypertension and elevated cardiovascular risk. (9)

Simplifying regimens (e.g., fixed-dose combinations, once daily dosing), educating patients about the importance of continuous therapy, and addressing misconceptions can significantly improve long-term adherence and outcomes. (10)

Managing hypertension is not only about choosing the right drug combination but also about understanding the patient's perceptions, attitudes, and beliefs toward their disease and treatment. This psychosocial dimension of care is especially important in resource-limited or culturally diverse populations, such as those in Iraq, where hypertension-related complications are prevalent despite the availability of treatment. (11)

A major barrier to successful blood pressure control is non-adherence to therapy. Medication adherence refers to the degree to which a patient correctly follows medical instructions, particularly with respect to dosing schedule and drug persistence over time. Studies have shown that up to 50% of patients with chronic diseases, including hypertension, do not adhere to long-term therapy, leading to poor BP control, increased hospitalizations, and greater healthcare expenditures. (12)

The blood pressure control rates remain unsatisfactory in real world, often due to delayed diagnosis, therapeutic inertia, and inadequate follow-up or poor patient adherence. These persistent gaps highlight the need to explore patient-centred factors, including beliefs about hypertension and its treatment —

particularly in low-resource or high-risk populations.(13)

Aim of the study

To identify patients' misconceptions about hypertension which may increase the risk of complications.

2. Method

2.1. Study Design

Prospective cross-sectional study to investigate the relationship between patients' beliefs about the causes of hypertension, their adherence to treatment, and the impact on blood pressure control and hypertension-related complications.

2.2. Study Setting

The study was conducted at Karbala Health Directorate- primary health care centers over a period of 10 months between October 2024 and July 2025.

2.3. Study Population

The study population included 200 adult patients diagnosed with hypertension who attended the primary health care center during the study period.

2.3.1. Inclusion Criteria

1. Adults aged 18 years and older of both genders.
2. Patients with a diagnosis of hypertension at any stage, regardless of whether they were on medication.
3. Agreed to participate in the study.

2.3.2. Exclusion Criteria

1. Patients with secondary hypertension.
2. Patients aged less than 18 years.
3. Patients with severe comorbid conditions (e.g., advanced cancer or severe heart failure) that might confound results.
4. Pregnant women.

2.4. Data Collection

Data were collected prospectively using a questionnaire developed by the researcher. (Appendix) The questionnaire covered:

- **Sociodemographic information:** (age, sex, marital status, education, employment, residence).
- **Clinical and treatment history:** (duration of hypertension, comorbidities, medications, adherence to dietary advice, home BP monitoring).
- **Beliefs regarding causes of hypertension:** (stress, diet, genetics, lifestyle, spiritual or supernatural causes, and other patient-reported factors).
- **Attitudes and perceptions:** about

hypertension and treatment, using belief-based statements rated on a Likert scale. Each response is coded numerically:

- o Strongly agree = 5
- o Agree = 4
- o Neutral = 3
- o Disagree = 2
- o Strongly disagree = 1

a higher score = stronger belief in the statement.

- **Medication adherence:** assessed with a Modified Morisky Medication Adherence Scale (MMAS-8).

The MMAS-8 consists of 8 items: 7 yes/no questions and 1 Likert-type question.

- **For items 1–7:**

- o Yes = 1 point (non-adherent)
- o No = 0 points (adherent)

- **For item 8 (five-point Likert):**

- o Never = 0
- o Rarely = 0.25
- o Sometimes = 0.5
- o Often = 0.75
- o Always = 1

Total score range: 0 to 8

Interpretation:

- o High adherence: score = 0
- o Medium adherence: score = 1–2
- o Low adherence: score ≥ 3

- **Outcomes:** including blood pressure control (measured values, frequency of monitoring, patient perception of control) and presence of hypertension-related complications (stroke, heart attack, heart failure, kidney problems, eye disease).

2.5. Outcome Measures

The outcome measures included:

1. **Treatment adherence:** assessed by MMAS-8.
2. **Blood pressure control:** defined according to the most recent BP reading and self-reported monitoring.
3. identification of patient beliefs that may influence treatment adherence and hypertension control.
4. **Hypertension-related complications:** as reported by patients and confirmed by medical records when available.

2.6. Statistical Analysis

Data analysis was done using IBM® Statistical Package for Social Sciences (SPSS) version 27 for Microsoft® Windows 11, results were presented in simple measures of frequency, %age, mean, range and standard deviation and illustrated as tablets and figures.

An independent t test was used to evaluate the association between numerical variables. Categorical data presented by frequencies and %ages. Chi square test was used to assess the association between categorical variables, while fisher exact test was used when the expected frequency was less than 5. A level of p- value less than 0.05 was considered statistically significant.

2.7. Ethical Considerations

- Verbal consent was obtained from each

participant before enrolment.

- All patient data were kept confidential.

3. Results

The study included 200 patients with hypertension; the sample had a mean age of 54.3 ± 12.1 years. (47.5%) of the participants were aged 40–59 years, 37.5% were ≥ 60 years, and 15% were 18–39 years. Males were 57.5% of the sample, while females were 42.5%. Most participants were married (75%), (11%) were single, widowed (9%), or divorced (5%).

Regarding education, 31.5% had secondary education, 27.5% had primary education, 20% were university graduates, and 21% were illiterate. Employment status showed that 48.5% were unemployed, 26.5% employed, and 25% retired. As shown in table 3.1.

Table 3.1.: Sociodemographic characteristics of the sample (n = 200)

Variable	Frequency	%age (%)
Age (years)		
18–39	30	15
40–59	95	47.5
≥ 60	75	37.5
Mean $\pm$ SD	54.3 ± 12.1	—
Gender		
Male	115	57.5
Female	85	42.5
Marital status		
Single	22	11
Married	150	75
Widowed	18	9
Divorced	10	5
Education level		
Illiterate	42	21
Primary	55	27.5
Secondary	63	31.5
University	40	20
Job		
Employed	53	26.5
Unemployed	97	48.5
Retired	50	25

For Hypertension duration, 47.5% were having the condition for more than 5 years, 40% for 1–5 years, and 12.5% for less than 1 year. Associated comorbidities were present in 60% of patients, with diabetes in 25%, heart disease in 17.5%, kidney disease in 10%, and a

history of stroke in 7.5%; 40% had no comorbidities. Regarding antihypertensive therapy, half of the patients were on 2–3 medications, 35% on a single drug, and 15% on ≥ 4 drugs, with a mean daily pill count of 2.4 ± 1.3 . Low-salt diet adherence was reported by

44% of participants, while 56% did not follow a diet. occasional by 37.5%, and never by 35%. As in table 3.2. Home blood pressure monitoring was regular by 27.5%,

Table 3.2.: Clinical and treatment history (n = 200)

Variable	Frequency	%age (%)
Duration of hypertension		
<1 year	25	12.5
1–5 years	80	40
>5 years	95	47.5
Comorbidities*		
Diabetes	50	25
Kidney disease	20	10
Heart disease	35	17.5
Stroke history	15	7.5
None	80	40
No. of HTN medications		
1	70	35
2–3	100	50
≥4	30	15
Mean daily pill count	2.4 ± 1.3	—
Low-salt diet adherence		
Yes	88	44
No	112	56
Home BP monitoring		
Regularly	55	27.5
Occasionally	75	37.5
Never	70	35

*a patient may have one or more associated comorbidities.

A considerable proportion of patients attributed stress (62.5% agreeing or strongly agreeing) as a cause of hypertension. Around 40% believed that if they felt calm, they did not need medication. Misconceptions were also noted: 40% thought hypertension is only

dangerous if symptomatic, 52.5% believed treatment could be stopped once BP improves, and 35% considered herbal remedies a replacement for medications. 52.5% believed blood pressure was related to blood viscosity, and 57.5% linked it to dietary fat intake and lipid profile. As shown in table 3.3.

Table 3.3.: Patients' beliefs regarding causes of hypertension (Likert-scale)

Statement	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
Stress is the main reason I have high BP	55 (27.5)	70 (35.0)	30 (15.0)	25 (12.5)	20 (10.0)
If I feel calm, I don't need medication	35 (17.5)	45 (22.5)	20 (10.0)	60 (30.0)	40 (20.0)
Hypertension is only dangerous if it causes symptoms	30 (15.0)	50 (25.0)	25 (12.5)	55 (27.5)	40 (20.0)

Once my BP improves, I can stop treatment	45 (22.5)	60 (30.0)	20 (10.0)	50 (25.0)	25 (12.5)
Herbal remedies can replace medications	25 (12.5)	45 (22.5)	25 (12.5)	70 (35.0)	35 (17.5)
High BP is a temporary problem	30 (15.0)	45 (22.5)	25 (12.5)	60 (30.0)	40 (20.0)
BP is related to blood viscosity	50 (25.0)	55 (27.5)	30 (15.0)	35 (17.5)	30 (15.0)
BP is related to dietary fat intake or blood lipid profile	55 (27.5)	60 (30.0)	25 (12.5)	35 (17.5)	25 (12.5)

Low adherence was observed in 40% of patients, medium adherence in 37.5%, and high adherence in

22.5%, indicating that the majority had suboptimal adherence to antihypertensive therapy. As shown in table 3.4.

Table 3.4.: Medication adherence by MMAS-8

Adherence Category	Frequency	%age (%)
High adherence (score = 0)	45	22.5
Medium adherence (score 1–2)	75	37.5
Low adherence (score ≥ 3)	80	40

Only 40% of patients had controlled blood pressure, while 60% were uncontrolled. Blood pressure monitoring frequency was low: 17.5% monitored weekly, 27.5% monthly, 32.5% occasionally, and 22.5% never.

Complications were present in 52.5% of participants, with kidney problems being the most common (15%), followed by heart attack (12.5%), heart failure (10%), and stroke (7.5%), and eye problems (7.5%). As shown in table 3.5.

Table 3.5.: Blood pressure control and complications (n = 200)

Variable	Frequency	%age (%)
BP Control		
Controlled	80	40
Uncontrolled	120	60
Frequency of BP monitoring		
Weekly	35	17.5
Monthly	55	27.5
Occasionally	65	32.5
Never	45	22.5
Complications		
Stroke	15	7.5
Heart attack	25	12.5
Heart failure	20	10
Kidney problems	30	15
Eye problems	15	7.5
None	95	47.5

Beliefs significantly influenced blood pressure control. Patients with uncontrolled BP were more likely to agree

with statements reflecting misconceptions, such as “If I feel calm, I don’t need medication” ($p = 0.032$), “Hypertension is only dangerous if it causes symptoms”

($p = 0.016$), “Once BP improves, I can stop treatment” ($p = 0.002$), and “Herbal remedies can replace medications” ($p = 0.003$). Beliefs linking BP to blood

viscosity and dietary fat intake and blood lipid profile were highly associated with uncontrolled BP ($p < 0.001$ for both). As shown in table 3.6.

Table 3.6.: Association between patients’ beliefs and blood pressure control

Belief Statement	Total Mean $\pm$ SD	Controlled BP (n=80)	Uncontrolled BP (n=120)	p-value
Stress is the main cause of hypertension	3.5 $\pm$ 1.1	3.9 $\pm$ 1.7	3.7 $\pm$ 1.1	0.127
If I feel calm, I don’t need medication	2.8 $\pm$ 1.2	2.1 $\pm$ 0.9	3.3 $\pm$ 1.1	0.032*
Hypertension is only dangerous if it causes symptoms	2.8 $\pm$ 1.2	2.3 $\pm$ 1.1	3.6 $\pm$ 1.1	0.016*
Once BP improves, I can stop treatment	2.9 $\pm$ 1.3	2.2 $\pm$ 0.9	3.8 $\pm$ 1.2	0.002*
Herbal remedies can replace medications	2.6 $\pm$ 1.2	2.0 $\pm$ 1.5	3.7 $\pm$ 1.1	0.003*
High BP is temporary	2.8 $\pm$ 1.2	2.3 $\pm$ 1.2	3.4 $\pm$ 1.1	0.001*
BP is related to blood viscosity	3.2 $\pm$ 1.1	2.0 $\pm$ 0.9	4.1 $\pm$ 1.4	<0.001*
BP is related to dietary fat intake or lipid profile	3.3 $\pm$ 1.0	2.1 $\pm$ 0.8	4.3 $\pm$ 1.2	<0.001*

Lower adherence was strongly associated with the presence of hypertension related complications. Among patients with low adherence, 51.3% experienced complications, compared to 37.3% with

medium adherence and 24.4% with high adherence. 75.6% of patients with high adherence had no complications compared to only 48.7% in patients with low adherence ($p = 0.001$). As shown in table 3.7.

Table 3.7.: Association between adherence and complications

Adherence Category	Complications Present (n=105)	No Complications (n=95)	p-value
High adherence	11 (24.4%)	34 (75.6%)	0.001*
Medium adherence	28 (37.3%)	47 (62.7%)	

Low adherence	41 (51.3%)	39 (48.7%)	
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4. Discussion

In the current study of 200 hypertensive patients, the mean age was 54.3 years, with nearly half (47.5%) between 40–59 years and 37.5% aged ≥60 years. This reflects the well-documented trend that hypertension prevalence rises with age due to vascular stiffness and reduced endothelial function. Blacher et al. who showed a progressive increase in hypertension prevalence after the fourth decade of life have reported similar findings. (14)

Male predominance in the current (57.5%) aligns with a previous study by Khaleefah et al. during the second round of Non-Communicable Diseases Risk Factors STEPS survey Iraq 2016. where men were more frequently affected, possibly due to higher rates of smoking, stress-related occupations, and earlier onset of cardiovascular risk factors compared to women. (15)

However, large-scale global data, such as that by Song et al. suggest that gender differences in prevalence narrow with advancing age. and that the rate of blood pressure control is comparable in men and women receiving antihypertensive therapy. (16)

Most participants were married (75%), and a considerable proportion (21%) were illiterate, while only 20% had university education. Lower educational attainment has been consistently linked to poor hypertension awareness, adherence, and control. A study by Soliman et al. in Egypt on 2869 participants 18–59 years found that illiteracy was a predictor of poor treatment adherence, consistent with our results. Nearly half of the participants were unemployed (48.5%), which may reflect both socioeconomic vulnerability and its impact on health literacy and access to regular medical follow-up. (17)

Regarding clinical history, almost half (47.5%) of the patients had hypertension for more than 5 years, increasing their risk of cumulative vascular damage. Comorbidities were common, with diabetes (25%), heart disease (17.5%), and kidney disease (10%) being the most prevalent. This clustering of cardiometabolic comorbidities is consistent with international data, as shown by Lee et al. who underlines the burden of multimorbidity in hypertensive populations and explore the intricate relationship between the treatment burden of multimorbidity and adherence to self-care among hypertensive patients with multiple chronic conditions. (18)

Medication use patterns revealed that half the patients were on two or three antihypertensive agents, with a mean daily pill count of 2.4. Polypharmacy in hypertension management is common, as most patients require combination therapy for adequate control, which has been reported in studies such as Diaconu et al. who found that adherence becomes more challenging with increasing pill burden and suggested combination antihypertensive medications for better adherence. (19)

Dietary and self-monitoring behaviors were suboptimal in our population: only 44% adhered to a low-salt diet, and 35% never monitored their blood pressure at home. Alhaddad et al. in Saudi Arabia, emphasizing the limited lifestyle modification adoption in Middle Eastern hypertensive patients, reported similar figures. (20)

Regarding the prevalence of misbeliefs about hypertension. More than half of the patients believed stress was the main cause of hypertension (62.5%), and a significant proportion thought that calmness alone could negate the need for medication (40%). Moreover, 52.5% believed treatment could be stopped once BP improved, and over one-third considered herbal remedies an alternative to prescribed therapy.

Such misconceptions are well documented in low- and middle-income countries, where traditional health beliefs strongly influence adherence. A review of 95 studies that included 34,102 hypertensive patients from 27 countries by Aminde et al. found that the overall prevalence of nonadherence to blood pressure-lowering medication was 43.9%. The most common determinants of adherence were socioeconomic and patient-related factors. Better adherence was associated with active patient involvement in disease management, accurate understanding of hypertension, and sufficient treatment knowledge. In contrast, poor adherence was linked to high pill burden, treatment cost, side effects, and the presence of comorbidities. In their study 2 in 5 hypertensive patients do not adhere to their prescribed therapy and 40% believe that hypertension is only dangerous when it causes symptoms. (21)

Goodhart et al. study in the United Kingdom also concluded that poor adherence is largely due to the absence of distressing symptoms that would motivate compliance, as well as the lack of immediate relief or tangible benefits that might reinforce continued adherence. (22)

Similarly, the association of blood pressure with “blood viscosity” (52.5%) and dietary fat intake (57.5%) highlights culturally rooted beliefs, which have been observed in many populations as well. These misconceptions strongly correlated with uncontrolled BP in our analysis, confirming that health beliefs play a critical role in treatment outcomes and differ among societies.

A study by Messerli et al. on 1,365 hypertensive patients found that Nearly 40% of participants were unable to define hypertension, and many who could were in denial of having the condition. About 24% did not know the causes of hypertension, with psychosocial stress being the most frequently cited. Some respondents even believed that regular sexual activity could worsen blood pressure. Additionally, 8% of patients expressed no concern about the consequences of poor adherence to medication, while 10% were worried about the financial costs of treatment. Notably, 65% believed they could discontinue medication once their blood pressure was controlled. (23)

Otemah et al. study in Ghana Also found that patients' choices to pursue alternative treatments for hypertension are largely driven by misconceptions and beliefs shaped by information from unregulated media sources and peers. (24)

The current study results show that medication adherence was suboptimal: only 22.5% of patients demonstrated high adherence, while 40% had low adherence. The WHO estimates that adherence to long-term therapy for chronic diseases averages only 50%, which is consistent with our findings. (25)

Blood pressure control was achieved in just 40% of patients, while 60% remained uncontrolled, despite medical therapy. This control rate is similar to global averages reported by the Prospective Urban Rural Epidemiology (PURE) study on 125 287 participants from 18 countries in North America, South America, Europe, Africa, and Asia where only about one-third of treated patients reached target BP. (26)

Complications were frequent (52.5%), with kidney problems (15%), heart attack (12.5%), and heart failure (10%) being most common. These complications highlight the long-term impact of poor BP control. Fihaya et al. reported comparable complication patterns in a study where cerebrovascular accidents, renal impairment and cardiovascular disease were leading outcomes of uncontrolled hypertension. (27)

The associations between beliefs, adherence, and outcomes were significant. Misconceptions such as “calmness negates medication” ($p = 0.032$), “hypertension is dangerous only if symptomatic” ($p =$

0.016), and “herbal remedies can replace drugs” ($p = 0.003$) were all significantly linked to uncontrolled BP. Particularly strong associations were found with the belief that BP is related to blood viscosity and dietary fat intake (both $p < 0.001$). These results emphasize how culturally rooted beliefs directly translate into poorer adherence and inadequate BP control. Moreover, patients with low adherence were significantly more likely to develop complications (57.1%) compared with high-adherence patients (9.5%) ($p = 0.001$), confirming the protective effect of consistent therapy.

Misconceptions contribute to poor adherence, leading to uncontrolled blood pressure and higher complication rates and patient education should be a cornerstone of hypertension management. (28)

The current study results agree with most of these studies discussed previously.

5. Conclusion

This study demonstrated that misconceptions about hypertension were widespread among patients, with many attributing the condition to stress, blood viscosity, or dietary fat intake, and believing that treatment could be discontinued once blood pressure improved. These beliefs were strongly associated with poor medication adherence, uncontrolled blood pressure, and higher rates of complications. Only 40% of patients achieved controlled BP, and more than half experienced hypertension-related complications. Importantly, adherence emerged as a critical protective factor, with high adherence significantly reducing the risk of complications. Overall, the findings highlight the central role of patient beliefs and adherence in determining hypertension outcomes.

6. Recommendations

1. Patient education programs should be used in primary care centers and hospital settings to correct common misconceptions about hypertension.
2. Health education campaigns should address culturally rooted beliefs (such as blood viscosity and stress) using locally tailored language and examples.
3. Support adherence by strategies such as medication counseling, pill boxes, reminder systems, and family involvement.
4. Physicians and nurses should be trained to identify and address patient misconceptions during consultations making health education part of routine care.
5. Public health campaigns through mass media, mosques, and community gatherings could help

disseminate accurate information about hypertension.

6. Conduct further studies to confirm these associations and to evaluate the impact of educational interventions on long-term outcomes.

7. Study Limitations

1. The sample size was drawn from a single medical center, which may limit the generalizability of the findings to the wider hypertensive population in Iraq.
2. The cross-sectional design and lack of follow up cannot establish causal relationships between beliefs, adherence, outcome and improvements after interventions.
3. Adherence was assessed using self-reported tools (MMAS-8) which contains subjective measures.
4. Some unmeasured factors, such as income level, or access to healthcare services, could not be fully evaluated.

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