Challenges Saudi Patients Face with Antihypertensive Medications: The Role of Pharmacy Services in Enhancing Awareness and Medication Management

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Abstract

Background: Hypertension remains a leading public health concern in Saudi Arabia, with many patients experiencing challenges in medication adherence, awareness, and blood pressure control. Pharmacists have the potential to play a vital role in improving these outcomes through education and ongoing support.

Objective: To assess awareness, medication management practices, and the utilization of pharmacy services among hypertensive patients attending primary healthcare centers (PHCs) in Saudi Arabia.

Methods: A descriptive cross-sectional study was conducted among 235 adult Saudi hypertensive patients attending urban and rural PHCs in the Abha region. Data were collected using a structured, self-administered questionnaire developed based on literature and expert input. The questionnaire assessed sociodemographic characteristics, medication adherence, awareness of antihypertensive medications, use of pharmacy services, and self-reported blood pressure control. Data analysis was performed using SPSS version 18. Awareness scores were categorized as poor (<60%) or good (>60%), and associations were tested using the Chi-square test, with a significance threshold set at $p < 0.05$.

Results: The majority of participants (76.6%) demonstrated poor awareness of their antihypertensive medications, while only 23.4% had good awareness. Additionally, 56.2% of patients reported never receiving medication information from a pharmacist. Only 21.3% of patients reported feeling very clear about the purpose of their medications, and 26.4% had received pharmacist-led education on lifestyle modifications. Key factors significantly associated with better awareness included gender ($p = .039$), marital status ($p = .006$), education level ($p = .032$), duration of hypertension ($p = .004$), and frequency of blood pressure monitoring ($p = .049$).

Conclusion: There is an urgent need to improve hypertension management in primary care by enhancing patient education, addressing barriers to adherence, and expanding the role of pharmacists in chronic disease support.

Keywords:
Hypertension management, patient awareness, medication adherence, pharmacy services, primary healthcare, Saudi Arabia.

Introduction

Globally, hypertension is an increasing public health issue and particularly in Saudi Arabia where lifestyle changes and urbanization have contributed to its rising prevalence (1,2). Despite the availability of effective antihypertensive medications, suboptimal blood pressure control remains a significant issue among patients (3). This problem is often compounded by challenges related to medication adherence, awareness, and patient-pharmacy interactions.

Generally, hypertension, frequently termed high blood pressure, poses a substantial public health challenge (4). It stands as a key risk factor for the development of cardiovascular diseases, cerebrovascular accidents (stroke), and chronic renal disease (5). Recent data indicate a rising prevalence of hypertension within the adult population of Saudi Arabia, attributable in part to the aging demographic, sedentary behaviors, suboptimal dietary patterns, obesity, and other non-communicable disease risk factors (6, 7).

The cornerstone of hypertension management is long-term adherence to antihypertensive medications, along with lifestyle modifications such as reducing salt intake, increasing physical activity, and managing stress (8). Despite the availability of effective medications, a significant proportion of patients struggle to maintain optimal blood pressure control. Poor adherence to prescribed antihypertensive regimens is a key contributor to treatment failure and complications (9). Common challenges faced by patients include forgetfulness, medication side effects, complex regimens, lack of understanding about the importance of adherence, financial constraints, and limited access to ongoing education and counseling (10).

Pharmacy services, especially within the primary health care system, are in a unique position to support hypertensive patients in overcoming these barriers. Pharmacists can play a vital role in patient education, counseling, identifying medication-related problems, improving medication adherence, and providing follow-up care (11). In Saudi Arabia, where Primary Health Care Centers (PHCCs) serve as the first point of contact for many patients, integrating pharmacist-led interventions could significantly improve hypertension outcomes. This study aims to investigate the challenges Saudi patients face with their antihypertensive medications and explore the current and potential roles of pharmacy services in enhancing patients' awareness, medication management, and blood pressure control. Understanding these factors can contribute to improving the quality of care delivered in PHCCs and inform future strategies to strengthen the role of pharmacists in chronic disease management.

Methodology

A descriptive cross-sectional study was conducted using a structured questionnaire to gather data on the awareness, medication management practices, and utilization of pharmacy services among hypertensive patients attending primary healthcare centers in both urban and rural settings in Saudi Arabia. The study population consisted of adult Saudi patients diagnosed with hypertension who were attending primary healthcare centers in the Abha region. A convenience sample of 235 patients was simulated for this pilot study. Participants were selected using purposive sampling, ensuring variety in terms of healthcare settings and patient experiences with hypertension management. Data collection was carried out using a structured, self-administered questionnaire developed specifically for the study. The questionnaire, which was designed based on relevant literature and expert input, aimed to capture sociodemographic details, medication adherence practices, patient awareness and education about antihypertensive medications, and utilization of pharmacy services. Additionally, it included questions on self-reported blood pressure control. The questionnaire combined closed-ended and multiple-response questions to facilitate detailed data collection while maintaining manageability. A pre-test of the tool was conducted using 15 simulated responses to ensure its clarity, consistency, and relevance to the study objectives. Data were collected at selected primary healthcare centers across urban and rural areas. Eligible participants—adult Saudi patients diagnosed with hypertension—were approached in the waiting areas of the centers and invited to participate voluntarily. A trained data collector or healthcare professional was available on-site to assist participants, particularly those who were illiterate, to ensure inclusivity. All responses were collected anonymously, and the data were entered into a secured Excel database for analysis.

Data analysis

Data analysis was conducted using SPSS version 18 (SPSS Inc., Chicago, IL, USA). The awareness score was derived by assigning one point to each correct response on a structured questionnaire. Patients with an overall awareness score below 60% were classified as having poor awareness, while those scoring above 60% were categorized as having good awareness. Descriptive analysis using frequency and % were used to assess sample characteristics, awareness and blood pressure control measures. All graphs were initiated using Microsoft Excel Software. All relations were done using cross-tabulation using Pearson X2 test and exact probability test for small frequency distributions. P value less than 0.05 was considered for statistical significance.

Results

Table 1 presents the socio-demographic characteristics of 235 hypertensive patients attending Primary Health Care Centers (PHCs) in Saudi Arabia. The most represented age group was 41–50 years (78; 33.2%), followed by those aged 31–40 (52; 22.1%) and 18–30 (39; 16.6%), while older age groups, including 51–60 (35; 14.9%) and 61 and above (31; 13.2%), were less represented. Males constituted a higher proportion of the sample (134; 57.0%) compared to females (101; 43.0%). As for marital status, the majority were married (96; 40.9%), while 90 (38.3%) were divorced or widowed, and 49 (20.9%) were single. Educational level varied, with the largest group holding undergraduate degrees (78; 33.2%), followed by those with secondary (53; 22.6%) and postgraduate (43; 18.3%) education; a smaller number had only primary education (38; 16.2%) or no formal education (23; 9.8%). Regarding the duration of hypertension, 72 patients (30.6%) had been diagnosed for 1–3 years, 67 (28.5%) for more than 6 years, and 52 (22.1%) for 4–6 years, while 23 (9.8%) and 21 (8.9%) were recorded as having hypertension for "<1 year" and "less than 1 year," respectively. Most patients reported attending urban PHCs (150; 63.8%), while 85 (36.2%) visited rural centers.

Table 1. Socio-demographic characteristics of the study hypertensive patients attending PHCs in Saudi Arabia (N=235)

Demographic data	No	%
Age in years		
18-30	39	16.6%
31-40	52	22.1%
41-50	78	33.2%
51-60	35	14.9%
61 and above	31	13.2%
Gender		
Male	134	57.0%
Female	101	43.0%
Marital status		
Single	49	20.9%
Married	96	40.9%
Divorced / widow	90	38.3%
Educational level		
No formal education	23	9.8%
Primary school	38	16.2%
Secondary school	53	22.6%
Undergraduate degree	78	33.2%
Postgraduate degree	43	18.3%
Duration of hypertension		
<1 year	23	9.8%
1-3 years	72	30.6%
4-6 years	52	22.1%
Less than 1 year	21	8.9%
More than 6 years	67	28.5%
Primary Health Care Center, do you visit		
Rural area	85	36.2%
Urban area	150	63.8%

Table 2 outlines the medication management practices among hypertensive patients attending PHCs in Saudi Arabia. A significant proportion of patients were prescribed a single antihypertensive medication (81; 34.5%), followed by those taking three medications (57; 24.3%) and two medications (55; 23.4%), while 42 patients (17.9%) were on more than three medications. When asked about adherence, only 62 (26.4%) reported it was easy to take their medications as prescribed, whereas more than half (127; 54.0%) found it manageable only sometimes, and 46 (19.6%) admitted difficulty. The most common challenge cited was conflicts with travel or work schedules (95; 40.4%), followed by issues such as difficulty remembering dosages (63; 26.8%), lack of motivation or forgetfulness (58; 24.7%), and simply forgetting to take the medication (56; 23.8%). Other notable barriers included medication side effects and cost (both 53; 22.6%), difficulty swallowing pills (50; 21.3%), lack of understanding about medications (49; 20.9%), psychological barriers (47; 20.0%), and complex schedules (37; 15.7%). To improve adherence, patients reported that daily pillboxes and written instructions with clear schedules (both 51; 21.7%) were the most helpful reminders, followed by in-person or phone reminders from healthcare professionals (47; 20.0%) and mobile app notifications (42; 17.9%).

Table 2. Medication Management Practices, Challenges, and Support among Hypertensive Patients Attending PHCs in Saudi Arabia (N=235)

Medication Management	No	%
Number of antihypertensive medications are you currently prescribed		
1 medication	81	34.5%
2 medications	55	23.4%
3 medications	57	24.3%
More than 3 medications	42	17.9%
You find it easy to take your antihypertensive medications as prescribed		
Yes	62	26.4%
Sometimes	127	54.0%
No	46	19.6%
What challenges do you face in taking your medications		
Travel/work schedule conflicts	95	40.4%
Difficulty remembering the dosage	63	26.8%
Lack of motivation or forgetfulness	58	24.7%
Forgetting to take the medication	56	23.8%
Side effects of the medication	53	22.6%
Cost of medications	53	22.6%
Difficulty with swallowing pills	50	21.3%
Lack of understanding about the medication	49	20.9%
Emotional or psychological barriers	47	20.0%
Complex medication schedule	37	15.7%
Type of reminder or assistance help you take your medications regularly		
Daily pillboxes	51	21.7%
Written instructions with clear schedules	51	21.7%
In-person reminders or phone calls from healthcare professionals	47	20.0%
Mobile apps/reminder notifications	42	17.9%
Pharmacy calls	27	11.5%
Weekly follow-up calls from the pharmacy	17	7.2%

Table 3 highlights the level of awareness and educational needs regarding antihypertensive medications among 235 patients attending PHCs in Saudi Arabia. Less than half of the participants (103; 43.8%) reported receiving information about their medications from a pharmacist, while the majority (132; 56.2%) did not. When asked about their understanding of the purpose and benefits of their medications, only 50 participants (21.3%) felt very clear, whereas most were either somewhat clear (110; 46.8%) or not clear at all (75; 31.9%). Understanding of how antihypertensive medications help control blood pressure was similarly limited, with only 88 (37.4%) responding affirmatively, while 81 (34.5%) were unsure and 66 (28.1%) lacked understanding. Patients expressed interest in additional information, particularly regarding when to seek medical help for side effects (95; 40.4%), possible side effects (91; 38.7%), the importance of adherence (89; 37.9%), and how medications work (86; 36.6%). Only 62 participants (26.4%) had received pharmacist education on lifestyle changes, while the majority either had not (119; 50.6%) or were unsure (54; 23.0%).

Table 3: Awareness and Educational Needs Regarding Antihypertensive Medications Among Patients Attending PHCs in Saudi Arabia (N=235)

Awareness	No	%
Received information about your antihypertensive medications from your pharmacist		
Yes	103	43.8%
No	132	56.2%
How clear are you about the purpose and benefits of the antihypertensive medication(s) you take?		
Not clear at all	75	31.9%
Somewhat clear	110	46.8%
Very clear	50	21.3%
Do you understand how antihypertensive medications can help in controlling blood pressure?		
Yes	88	37.4%
No	66	28.1%
Not sure	81	34.5%
What additional information would help you better understand your antihypertensive medications?		
When to seek medical help for side effects	95	40.4%
Possible side effects	91	38.7%
The importance of regular use and adherence	89	37.9%
How the medication works to lower blood pressure	86	36.6%
Information on the impact of lifestyle changes	81	34.5%
Others	32	13.6%
Have you ever been educated by a pharmacist regarding lifestyle changes that can help control blood pressure?		
Yes	62	26.4%
No	119	50.6%
Not sure	54	23.0%

Figure 1 shows the overall level of knowledge and awareness about antihypertensive medications among hypertensive patients attending PHCs in Saudi Arabia (N=235). The majority of participants (180; 76.6%) had a poor level of awareness, while only 55 individuals (23.4%) showed a good knowledge and awareness of their antihypertensive treatment.

Figure 1. The Overall Hypertension Patients' Knowledge and Awareness about Antihypertensive Medications (N=235)

Table 4 presents data on the utilization of pharmacy services and patient preferences for support in managing hypertension. Only a minority of participants reported frequent pharmacist visits for advice related to antihypertensive medications (43; 18.3%), while most interacted occasionally (69; 29.4%), rarely (67; 28.5%), or never (56; 23.8%). When asked whether pharmacy services such as counseling, medication reviews, or follow-up had helped manage their blood pressure, responses were mixed: 84 (35.7%) agreed, 81 (34.5%) disagreed, and 70 (29.8%) were unsure. Considering additional services desired, patients expressed strong interest in understanding side effects (84; 35.7%), regular medication reviews (83; 35.3%), and medication reminders (78; 33.2%). Other requested supports included lifestyle education (70; 29.8%), blood pressure monitoring (69; 29.4%), and assistance with medication costs (65; 27.7%). Regarding preferred methods for receiving education and support, group sessions (56; 23.8%) and digital resources (44; 18.7%) were favored, while fewer patients preferred direct phone or text follow-ups (41; 17.4%), printed materials (40; 17.0%), or one-on-one counseling (32; 13.6% in general and 22; 9.4% during pharmacy visits).

Table 4: Utilization of Pharmacy Services and Patient Preferences for Hypertension Management Support in Saudi Arabia (N=235)

Services	No	%
How often do you visit a pharmacist for advice or support related to your antihypertensive medications?		
Frequently (at every visit)	43	18.3%
Occasionally (few times per year)	69	29.4%
Rarely	67	28.5%
Never	56	23.8%
Do you feel that pharmacy services (such as counseling, medication reviews, follow-up) have helped you manage your blood pressure better?		
Yes	84	35.7%
No	81	34.5%
Not sure	70	29.8%
What additional services would you like from pharmacists to help you better manage your hypertension?		
Side effects understandings	84	35.7%
Regular medication reviews	83	35.3%
Reminders for medication intake	78	33.2%
Lifestyle education	70	29.8%
BP monitoring	69	29.4%
Help with managing the cost of medications	65	27.7%
How would you prefer to receive education and support from your pharmacist?		
Group educational sessions	56	23.8%
Online or mobile app resources	44	18.7%
Phone calls or text messages for FU	41	17.4%
Written pamphlets and leaflets	40	17.0%
1-on-1 counseling	32	13.6%
One-on-one counseling during pharmacy visit	22	9.4%

Table 5 clarifies data on blood pressure monitoring habits, control status, and perceived barriers among hypertensive patients. Only about one-third of the participants (77; 32.8%) reported checking their blood pressure at every healthcare visit, while others did so occasionally (66; 28.1%) or rarely (71; 30.2%), and a small group (21; 8.9%) never monitored it. When asked if they had achieved their target blood pressure, 81 (34.5%) responded positively, 78 (33.2%) had not, and 76 (32.3%) were unsure. Key barriers to better control included lack of follow-up or support from healthcare providers (97; 41.3%) and side effects from medication (78; 33.2%), followed by limited understanding of blood pressure management (66; 28.1%), stress or mental health issues (64; 27.2%), poor adherence (60; 25.5%), and financial challenges (56; 23.8%). Exactly 93 patients (39.6%) believed that better education and support from pharmacists could help improve their blood pressure control.

Table 5. Blood Pressure Monitoring, Control Status, and Perceived Barriers among Hypertensive Patients Attending PHCs in Saudi Arabia (N=235)

Blood Pressure Control	No	%
How often do you check your blood pressure?		
At every healthcare visit	77	32.8%
Occasionally (e.g., once a month)	66	28.1%
Rarely	71	30.2%
Never	21	8.9%
Have you achieved your target blood pressure goal, as advised by your healthcare provider?		
Yes	81	34.5%
No	78	33.2%
Not sure	76	32.3%
Barriers you feel prevent you from achieving better blood pressure control		
Lack of follow-up or support from healthcare providers	97	41.3%
Side effects of medication	78	33.2%
Lack of understanding about the importance of controlling blood pressure	66	28.1%
Stress or mental health issues	64	27.2%
Lack of medication adherence	60	25.5%
Financial challenges	56	23.8%
Others	33	14.0%
Do you think better education and support from pharmacists could help you achieve better blood pressure control?		
Yes	93	39.6%
No	71	30.2%
Not sure	71	30.2%

Figure 2 illustrates the suggestions provided by hypertensive patients for improving pharmacy services to better support their condition. The most frequently recommended improvements included providing more educational materials and resources (91; 38.7%) and enhancing accessibility of pharmacy services, such as extended hours or home delivery (91; 38.7%). Additionally, a significant number of participants (87; 37.0%) reported the need for further training of pharmacists to better support hypertensive patients. Personalized follow-up was also suggested by 70 individuals (29.8%).

Figure 2. The Suggestions Provided by The Study Patients for Improving Pharmacy Services to Better Support Patients with Hypertension

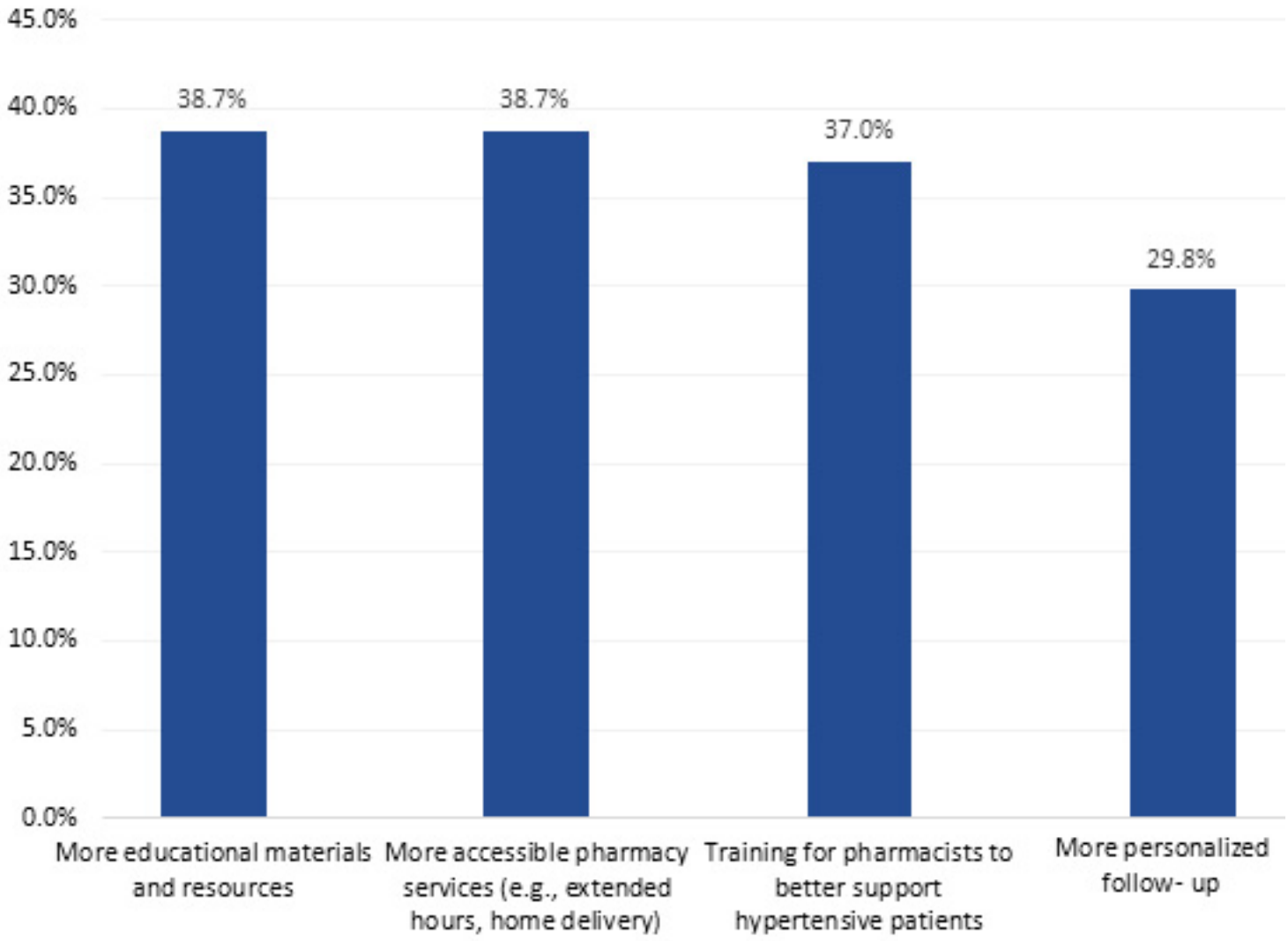

Table 6 highlights the factors significantly associated with patients' overall awareness of antihypertensive medications. Gender was a significant factor (p = .039), with a higher proportion of males (28.4%) having good awareness compared to females (16.8%). Marital status also showed a significant association (p = .006), where married patients had the highest level of good awareness (31.3%), followed by single individuals (28.6%), while divorced or widowed participants had the lowest (12.2%). Educational level was another key factor (p = .032), with those holding an undergraduate degree showing the highest awareness (33.3%), compared to only 9.3% among those with postgraduate degrees and 17.0% among secondary school graduates. Duration of hypertension was significantly related to awareness (p = .004), as patients with shorter durations of hypertension (e.g., <1 year: 34.8%; 1–3 years: 34.7%) had better awareness than those with longer durations (e.g., more than 6 years: 20.9%; 4–6 years: 15.4%).

Table 6. Factors Associated with Overall Awareness Level About Antihypertensive Medications Among Hypertensive Patients (N=235)

Factors		Overall awareness level				p-value
		Poor		Good		
		No	%	No	%	
Age in years	18-30	32	82.1%	7	17.9%	.260
	31-40	35	67.3%	17	32.7%	
	41-50	58	74.4%	20	25.6%	
	51-60	30	85.7%	5	14.3%	
	61 and above	25	80.6%	6	19.4%	
Gender	Male	96	71.6%	38	28.4%	.039*
	Female	84	83.2%	17	16.8%	
Marital status	Single	35	71.4%	14	28.6%	.006*
	Married	66	68.8%	30	31.3%	
	Divorced / widow	79	87.8%	11	12.2%	
Educational level	No formal education	17	73.9%	6	26.1%	.032*
	Primary school	28	73.7%	10	26.3%	
	Secondary school	44	83.0%	9	17.0%	
	Undergraduate degree	52	66.7%	26	33.3%	
	Postgraduate degree	39	90.7%	4	9.3%	
Duration of hypertension	<1 year	15	65.2%	8	34.8%	.004*^
	1-3 years	47	65.3%	25	34.7%	
	4-6 years	44	84.6%	8	15.4%	
	Less than 1 year	21	100.0%	0	0.0%	
	More than 6 years	53	79.1%	14	20.9%	
Primary Health Care Center do you visit	Rural area	69	81.2%	16	18.8%	.212
	Urban area	111	74.0%	39	26.0%	
Number of antihypertensive medications are you currently prescribed	1 medication	57	70.4%	24	29.6%	.232
	2 medications	47	85.5%	8	14.5%	
	3 medications	43	75.4%	14	24.6%	
	More than 3 medications	33	78.6%	9	21.4%	
You find it easy to take your antihypertensive medications as prescribed	Yes	50	80.6%	12	19.4%	.395
	Sometimes	98	77.2%	29	22.8%	
	No	32	69.6%	14	30.4%	
Type of reminder or assistance help you take your medications regularly	Daily pillboxes	37	72.5%	14	27.5%	.969^
	In-person reminders or phone calls from healthcare professionals	36	76.6%	11	23.4%	
	Mobile apps/reminder notifications	33	78.6%	9	21.4%	
	Pharmacy calls	22	81.5%	5	18.5%	
	Weekly follow-up calls from the pharmacy	13	76.5%	4	23.5%	
	Written instructions with clear schedules	39	76.5%	12	23.5%	

P: Pearson X2 test ^: Exact probability test * P < 0.05 (significant)

Table 7 examines the association between blood pressure monitoring and control with overall awareness levels regarding antihypertensive medications. Among the variables assessed, the frequency of blood pressure monitoring showed a statistically significant association with awareness levels (p = .049). Notably, a higher percentage of patients with poor awareness reported checking their blood pressure at every healthcare visit (36.1%) or occasionally (29.4%), while those with good awareness were more likely to monitor their blood pressure rarely (43.6%).

Table 7. Association Between Blood Pressure Monitoring and Control with Overall Awareness Level About Antihypertensive Medications Among Hypertensive Patients (N=235)

BP control	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
How often do you visit a pharmacist for advice or support related to your antihypertensive medications?					
Frequently (at every visit)	31	17.2%	12	21.8%	.816
Occasionally (few times per year)	53	29.4%	16	29.1%	
Rarely	51	28.3%	16	29.1%	
Never	45	25.0%	11	20.0%	
How would you prefer to receive education and support from your pharmacist?					
1-on-1 counseling	24	13.3%	8	14.5%	.499^
Group educational sessions	45	25.0%	11	20.0%	
One-on-one counseling during pharmacy visit	20	11.1%	2	3.6%	
Online or mobile app resources	32	17.8%	12	21.8%	
Phone calls or text messages for FU	31	17.2%	10	18.2%	
Written pamphlets and leaflets	28	15.6%	12	21.8%	
How often do you check your blood pressure?					
At every healthcare visit	65	36.1%	12	21.8%	.049*
Occasionally (e.g., once a month)	53	29.4%	13	23.6%	
Rarely	47	26.1%	24	43.6%	
Never	15	8.3%	6	10.9%	
Have you achieved your target blood pressure goal, as advised by your healthcare provider?					.435
Yes	61	33.9%	20	36.4%	
No	57	31.7%	21	38.2%	
Not sure	62	34.4%	14	25.5%	

P: Pearson X2 test ^: Exact probability test * P < 0.05 (significant)

Discussion

The current study focused on hypertensive patients in Saudi Arabia and how they manage their medications. The fact that most participants were middle-aged (41–50 years) simulates global patterns where high blood pressure becomes more common with age, though it's increasingly seen in younger people due to lifestyle choices (12). Interestingly, there were more male participants than female, which differs from some studies elsewhere and might point to cultural differences in how men and women seek healthcare (13). The majority of patients were married and a good number of patients had higher education. In regard to taking medications, it was a big challenge for most patients, which is similar to what other studies in the Middle East have found, with things like forgetting doses, complicated schedules, and side effects being common hurdles (14). Many patients were on several blood pressure medications, which follows international guidelines, but this also made it harder for them to keep up with their treatment. This highlights the need to simplify medication plans whenever possible (15). The most common reasons for missing medications were travel and work, which is consistent with research in other busy urban areas where job demands get in the way of medication routines (16). On a positive note, things like pillboxes and written instructions were helpful for remembering medications, which backs up previous research. However, technology like mobile apps wasn't used as much, signifying there's room to incorporate more digital health tools (17).

In regard to patient's awareness, our study revealed a significant defect in awareness and understanding of antihypertensive medications among hypertensive patients in Saudi Arabia. A concerning proportion of patients did not receive medication information from pharmacists, and only a small percentage felt very clear about the purpose and benefits of their treatment. This matches with previous studies in the region, where poor patient education has been linked to lower adherence and poorer blood pressure control (18-20). The limited understanding of how antihypertensive medications work is particularly troubling, as patients who do not grasp the long-term benefits of their treatment may be less motivated to adhere to therapy (21).

The high percentage of patients with poor overall awareness (76.6%) is consistent with research from other developing countries, where health literacy regarding chronic diseases remains a challenge (22-24). However, the expressed interest in learning more about side effects, adherence, and medication mechanisms suggests that patients are willing to engage in education if provided. This finding is supported by studies showing that targeted patient counseling improves both knowledge and medication-taking behavior (25). The fact that only a minority received pharmacist-led lifestyle advice further highlights missed opportunities for multidisciplinary patient education, which is crucial in hypertension management (26).

Also, the current study showed significant limitations in how hypertensive patients in Saudi Arabia use and view pharmacy services. Many patients show limited interaction with pharmacists for managing their high blood pressure, with only a small fraction regularly seeking medication advice. This low engagement suggests that pharmacists aren't being used to their full potential in supporting the management of long-term conditions here, which aligns with observations from similar healthcare systems where pharmacists' clinical roles are often underutilized (27-29).

Patients had mixed feelings about how effective current pharmacy services are in helping them manage their blood pressure. This difference in opinion might originate from inconsistent service quality or varying levels of patient engagement. Patients clearly expressed a desire for more support, particularly concerning medication safety information, regular treatment reviews, and tools to help them stick to their medications. These preferences are in line with existing evidence indicating that comprehensive medication management can significantly improve blood pressure control (30, 31). The study also uncovered interesting trends in how patients prefer to receive support. While they weren't as keen on traditional one-on-one counseling, they showed greater interest in group education sessions and digital health solutions. This move towards more scalable and technology-driven approaches reflects global healthcare trends and points to opportunities for implementing innovative interventions that can reach more people (13, 17). The relatively low interest in printed materials might suggest a need for more interactive and personalized ways to educate patients.

These findings have important implications for healthcare delivery in Saudi Arabia. They highlight the need to broaden pharmacists' roles beyond simply dispensing medications to include structured patient education, regular follow-ups, and comprehensive medication management. The preference for digital solutions suggests potential benefits from incorporating mobile health technologies into hypertension care programs. Ultimately, these results indicate that reshaping pharmacy services to meet the needs identified by patients could significantly improve how high blood pressure is managed in primary care settings.

The improvements patients suggested for pharmacy services point to some really important ways we can enhance how hypertension is managed. A major theme was the need for more educational materials and making services easier to access, highlighting current gaps in patient support. Patients also reported the need for better training for pharmacists, particularly in managing hypertension. This suggests that current pharmacy education might need to better prepare pharmacists for their expanding roles in caring for people with chronic conditions. Furthermore, patients expressed a desire for more personalized follow-up, indicating they value having consistent care, which is known to improve outcomes for other long-term health issues.

Conclusions and Recommendations

In conclusion, this study revealed critical gaps in awareness, medication adherence, and the effective utilization of pharmacy services among hypertensive patients attending primary healthcare centers in Saudi Arabia. Despite being on long-term treatment, a significant portion of patients struggled with understanding their medications, faced adherence barriers, and reported limited engagement with pharmacists. These findings highlight an urgent need to strengthen the role of pharmacists in hypertension care, particularly in delivering education, monitoring adherence, and providing personalized follow-up. Pharmacists should be more actively integrated into patient care teams through routine counseling, structured medication reviews, and proactive follow-ups, especially for those on complex regimens. Also, targeted educational interventions, delivered via both group sessions and digital platforms, should be developed to improve patients' understanding of their medications, the importance of adherence, and when to seek help.

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