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Knowledge and Attitude of Hypertensive Patients to Control Hypertension at Hayatabad Medical Complex, Peshawar

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ABSTRACT

Hypertension is a major public health concern globally, including in Pakistan, contributing significantly to cardiovascular morbidity and mortality. Despite its prevalence, knowledge and attitudes toward hypertension management remain inadequately explored in Pakistan. **Objectives:** To assess the knowledge, attitudes, and practices of hypertensive patients toward hypertension control at Hayatabad Medical Complex (HMC), Peshawar. **Methods:** A descriptive cross-sectional study was conducted from July 2023 to July 2024, involving 584 hypertensive patients aged 40-75 years. Data were collected using a structured, physician-administered questionnaire, which assessed patients' knowledge of hypertension, attitudes toward lifestyle modifications, and medication adherence. Descriptive statistics summarized the demographic characteristics, while chi-square tests were used to explore associations between knowledge and adherence behaviours. **Results:** Of the participants, 34.8% demonstrated good knowledge of hypertension, and 69.8% recognized it as a cardiovascular risk. Medication adherence was high, with 72.5% of patients consistently following their prescribed regimen. Regular blood pressure monitoring was performed by 59.7% of participants, though 31.5% had not monitored their BP for over a month. A significant association was found between knowledge levels and adherence to medication ($p<0.05$). **Conclusions:** It was concluded that the study reveals substantial gaps in knowledge about hypertension among patients, despite good medication adherence rates. Targeted educational interventions are needed to improve understanding of hypertension and its management, especially in resource-limited settings.

INTRODUCTION

Hypertension, a leading global public health concern, has been linked to significant morbidity and mortality due to cardiovascular diseases. The global prevalence of hypertension has been increasing, particularly in low- and middle-income countries, where resources for diagnosis and management are often limited [1, 2]. In Pakistan, hypertension is a major risk factor contributing to complications such as myocardial infarction, stroke, and renal disease [3, 4]. A study conducted at various hospitals across the country indicated that knowledge and attitude towards hypertension control among patients remain suboptimal [5, 6]. Controlling hypertension effectively depends heavily on patients' knowledge, attitude, and practices (KAP) towards the disease. Studies have revealed that when patients are aware of the consequences of untreated hypertension and actively participate in its management, their compliance with treatment increases, leading to better outcomes [7, 8]. On the other hand, numerous studies pinpointed the flaws in the levels of patient education as a vast part of the population may not be aware of the critical lifestyle modifications and medication courses they might need to make to control their case of hypertension [9, 10]. In Pakistan, the management of hypertension frequently encounters significant challenges since the relevant patient education is hindered by the lack of sufficient healthcare resources

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and cultural considerations [11]. Several studies in the region have investigated knowledge and awareness in hypertensive patients, showing that there is a lack of understanding among affected patients about how hypertension is associated with lifestyle factors, such as diet and physical activity. In urban settings, where the burden of hypertension is rising, the control of the disease is often suboptimal due to factors such as limited patient education, low adherence to treatment, and barriers to accessing quality healthcare services [12, 13]. The knowledge of hypertension management was reported in Ethiopia only to be as 51.7% and lifestyle modification adherence was found to be low among hypertensive patients [7, 14]. This is a familiar theme in studies that underscore the need for patient education around medication adherence and lifestyle changes to mitigate complications of hypertension [15]. Several different educational strategies have been tested across a variety of healthcare settings to enhance patients' knowledge and attitudes about the management of hypertension. A clinical trial in Iran found that targeted educational interventions significantly improved patients' knowledge, attitudes, and practices, leading to better blood pressure control [16]. Similarly, a study from Zimbabwe highlighted that awareness programs focusing on the risks of untreated hypertension could lead to better management outcomes, especially in rural communities [11]. Pakistan has seen similar trends, with studies indicating that hypertensive patients who receive structured health education, particularly those in urban settings, show higher compliance with medication and lifestyle changes [17, 18]. However, there remains a considerable gap between knowledge and practice, which points to the need for continuous, community-driven educational initiatives that focus not only on hypertension but also on the broader spectrum of cardiovascular disease prevention [19, 20].

This study aims to assess the knowledge and attitudes of hypertensive patients at HMC, Peshawar. The findings will inform targeted educational interventions to enhance patient understanding of hypertension management. By identifying the common misconceptions and barriers to compliance, this study seeks to contribute to improving hypertension outcomes in a low-resource setting.

METHODS

A descriptive cross-sectional study was conducted at Hayatabad Medical Complex (HMC), Peshawar, from June 2023 to July 2024, for hypertensive patients aged 40-75 years. The sampling technique used was convenience sampling, where patients attending the Outpatient Department were approached for participation in the study. Data were collected using a structured, physician-administered questionnaire, which assessed patients' knowledge of hypertension, attitudes toward lifestyle modifications, and medication adherence. The sample size for this study was calculated using an assumed 50% prevalence of hypertension knowledge among patients, with a margin of error of 4% and a confidence level of 95%. Based on these assumptions and similar research, such as the study by Mekonnen et al., [7], the total sample size was determined to be 584 participants. The study included male and female patients aged 40-75 years who had been diagnosed with hypertension for at least three months before the beginning of the study. This age range was selected because hypertension commonly develops after the age of 40, and its prevalence increases with age, particularly in individuals aged 40-75. The patients have no major cardiovascular comorbidities, such as definite or probable heart failure, history of myocardial infarction, definite or history of diagnosed coronary artery disease, stroke, or peripheral arterial disease. The exclusion criteria in this study were pregnancy and diagnosis of psychiatric disorders that could affect the assessment of reliable data and compliance with therapy. The data were collected using a structured, physician-administered questionnaire in the Outpatient Department setting. The questionnaire used in this study was developed specifically for this research based on established hypertension knowledge, attitude, and practice scales used in prior studies. To ensure reliability, the questionnaire was pre-tested on a sample of 30 hypertensive patients. The Cronbach's alpha for the final version of the questionnaire was 0.82, which indicates good internal consistency. An interview schedule designed to assess the levels of knowledge and attitudes was presented in English but was translated verbally to the local language by the physician to ensure understanding by participants. The questionnaire included items related to basic demographic information, knowledge of hypertension, lifestyle modifications, medication adherence, and follow-up practices. It assessed attitudes toward hypertension management, including the importance of regular blood pressure monitoring, compliance with prescribed medication, and lifestyle modifications. The study specifically examined patients' understanding of hypertension, its stages, target blood pressure levels, associated risks, and the role of lifestyle factors such as physical activity, smoking, diet, salt intake, and body weight in controlling blood pressure. Data were entered into SPSS (Version 25.0) for statistical analysis. Descriptive statistics, including frequencies and percentages, summarized the demographic characteristics, knowledge levels, and attitudes of participants. A Chi-Square test was applied to assess associations between knowledge and attitude variables (such as knowledge of hypertension, awareness of lifestyle changes, and perception of hypertension as a

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cardiovascular risk factor) and demographic characteristics (such as age, gender, and duration of hypertension). Additionally, the Chi-Square test was also used to explore the relationships between knowledge of hypertension and adherence to antihypertensive medication and between the perception of hypertension as a cardiovascular risk factor and frequency of blood pressure monitoring. The study protocol was reviewed and approved by the Ethical and Research Committee of HMC, Peshawar (Reference No: 2207). All patients were informed of the study's objectives, assured that their participation was voluntary, and provided written informed consent before completing the questionnaire. Confidentiality of patient information was maintained, and all data were anonymized during analysis. This study did not involve any animal subjects.

RESULTS

A total of 584 hypertensive patients participated in this study, with 51.9% being female and 48.1% male. The average age of participants was 57.6 years (SD ± 10.61), with the majority falling within the age group of 50-59, followed by 40-49 and 60-69. These demographic details are shown in Table 1.

Table 1: Demographics and Knowledge Distribution (n=584)

Variables	Category	Frequency (%)
Gender	Male	281 (48%)
	Female	303 (52%)
Age Group	40-49 Years	150 (26%)
	50-59 Years	188 (32%)
	60-69 Years	160 (27%)
	70-75 Years	86 (15%)

In terms of knowledge about hypertension, 34.76% of patients (203 out of 584) reported understanding their condition, while the remaining 65.24% (381 out of 584) were either unsure or did not know about hypertension. Among those who were informed about optimal blood pressure (BP) levels, 64.90% (379 out of 584) knew, while 35.10% (205 out of 584) were not aware. Additionally, 35.44% (207 out of 584) of participants were informed about associated cardiovascular risks, while 64.56% (377 out of 584) were not. These findings are summarized in Table 2.

Table 2: Knowledge and Awareness of Hypertension Among Participants (n=584)

Variables	Category	Frequency (%)
Knowledge of Hypertension	Yes	203 (34.76%)
	No/Unsure	381 (65.24%)
Optimal BP Informed	Yes	379 (64.90%)
	No/Unsure	205 (35.10%)
Informed About Risks	Yes	207 (35.44%)
	No/Unsure	377 (64.56%)

The majority of participants, 69%, recognized hypertension as a significant risk factor for cardiovascular disease (CVD), while 17.1% were uncertain about this risk. Regarding the management of hypertension, 29% of patients believed that it could be managed without antihypertensive medications, while the majority acknowledged the importance of these drugs. These findings are summarized in Table 3.

Table 3: Patient Attitudes Toward Hypertension Management (n=584)

Variables	Yes Frequency (%)	No Frequency (%)	Uncertain Frequency (%)
Hypertension is a Risk for CVD	408 (69.9%)	76 (13.0%)	100 (17.1%)
Can Manage BP without Drugs	172 (29.4%)	204 (34.9%)	208 (35.7%)
Importance of Antihypertensives	424 (72.5%)	160 (27.5%)	0 (0%)

Regarding lifestyle modifications, 58.3% (340 patients) of patients were aware of the importance of making changes to their lifestyle, although only 49.1% (287 patients) had successfully quit smoking. The necessity for multiple drugs to control hypertension was recognized by 58.4% (341 patients) of patients. These findings are summarized in Table 4.

Table 4: Lifestyle Modifications Among Participants (n=584)

Lifestyle Modification	Frequency (%)
Regular Physical Activity	340 (58%)
Successfully Quit Smoking	287 (49.1%)
Recognizes Need for Multiple Drugs	341 (58.4%)
Smokes Cigarettes	152 (26%)
Follows Diet Control	356 (61%)
Reduces Salt Intake	316 (54%)
Monitors Body Weight	240 (41%)

Medication adherence was relatively high, with 72.6% (424 cases) of patients reporting consistent use of antihypertensive medications. However, 5.0% (29 cases) missed doses at least once a month, while 22.4% (131 cases) reported missing doses at other frequencies. This information is illustrated in Figure 1.

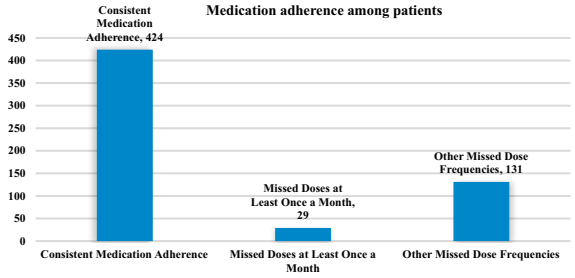

Figure 1: Medication Adherence Among Patients

Around 59.7% (348 patients) of participants regularly monitored their blood pressure. Among them, 21% (122 patients) monitored their blood pressure within the last

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month, 20% (116 patients) did so within the last week, and 19% (110 patients) monitored their blood pressure between 1 month and 1 year. However, 40.3% (236 patients) did not monitor their blood pressure, as shown in Figure 2.

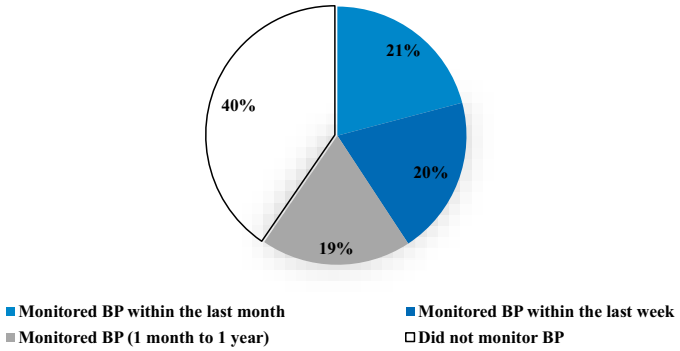

Figure 1: Frequency of Blood Pressure Monitoring

The study revealed that 58% of participants engaged in regular physical activity, such as walking, jogging, or other forms of exercise, while 42% did not incorporate any consistent physical activity into their routine. Regarding smoking habits, 26% of participants were current smokers, 15% were former smokers, and 59% had never smoked. In terms of diet control, 61% of participants reported following a specific diet, such as a low-salt or low-fat diet, to help manage their hypertension, whereas 39% did not adopt any particular dietary modifications for blood pressure control. Concerning salt intake, 54% of participants actively reduced their salt consumption to manage their blood pressure, while the remaining 46% did not consciously limit their salt intake. Finally, 41% of participants monitored their body weight as part of their hypertension management, while 59% did not follow any specific weight control strategies. These findings are summarized in Table 5.

Table 5: Lifestyle Modifications Among Participants (n=584)

Lifestyle Modification	Yes Frequency (%)	No Frequency (%)
Regular Physical Activity	340 (58.3%)	244 (41.7%)
Smokes Cigarettes	152 (26%)	432 (74%)
Follows Diet Control	356 (61%)	228 (39%)
Reduces Salt Intake	316 (54%)	268 (46%)
Monitors Body Weight	240 (41%)	344 (59%)

The analysis revealed that among the 392 patients who did not recognize hypertension as a cardiovascular risk factor, 131 patients (33.4%) regularly monitored their blood pressure, while the remaining 261 patients (66.6%) did not monitor their blood pressure. In contrast, of the 192 patients who recognized hypertension as a cardiovascular risk factor, 64 patients (33.3%) regularly monitored their blood pressure, and 128 patients (66.7%) did not. These findings indicate that recognition of hypertension as a cardiovascular risk factor was not strongly associated with an increased likelihood of monitoring blood pressure. The majority of patients in both groups, regardless of risk factor recognition, did not engage in regular blood pressure monitoring, as shown in Table 6.

Table 6: Relationship Between Risk Factor Recognition and Blood Pressure Monitoring (n=584)

Risk Factor Recognition	Monitoring (Count %)	Non-Monitoring (Count %)	Total (Count)
Not Recognized	131 (33.4%)	261 (66.6%)	392
Recognized	64 (33.33%)	128 (66.7%)	192
Significance value: <0.01			

Patients' knowledge of hypertension showed a more balanced association with medication adherence. Among the 203 patients categorized as having better knowledge of hypertension, 104 patients (51.2%) adhered to their prescribed antihypertensive medications, while 99 patients (48.8%) did not adhere. Conversely, of the 381 patients with poor knowledge of hypertension, 191 patients (50.1%) adhered to their prescribed medications, and 190 patients (49.9%) did not. These results indicate that patients with better knowledge of hypertension were slightly more likely to adhere to their medication regimen compared to those with poor knowledge; however, the difference in adherence rates was minimal, with adherence observed in approximately half of the patients in both groups, as shown in Table 7.

Table 7: Relationship Between Knowledge Group and Medication Adherence (n=584)

Knowledge Group	Adherence (Count %)	Non-Adherence (Count %)	Total (Count)
Better Knowledge	104 (51.2%)	99 (48.8%)	203
Poor Knowledge	191 (50.1%)	190 (49.9%)	381
Significance value: <0.01			

DISCUSSION

This study represents a significant contribution to the understanding of hypertensive patients' knowledge and attitudes toward hypertension management at HMC in Peshawar, Pakistan. While there have been studies conducted in Pakistan on hypertension knowledge and attitudes, such as those by Naseem *et al.*, in Lahore and Sumaira *et al.*, in Rawalpindi, comprehensive assessments of both knowledge and attitudes of hypertensive patients in public healthcare settings have been relatively limited [21, 22]. These studies have focused on specific aspects of hypertension management, such as awareness of risk factors, treatment adherence, and lifestyle modifications. However, this study is one of the to comprehensively assess both knowledge and attitudes toward hypertension and its management among hypertensive patients in a public healthcare setting in Peshawar, which adds valuable insight into the challenges faced by patients in urban Pakistan. In various countries, especially in lower- and middle-income regions like Ethiopia and Zimbabwe,

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researchers have faced similar challenges with patient knowledge and the management of hypertension. For example, a study by Mekonnen *et al*. found that 51.7% of the participants in Ethiopia understood how to manage their hypertension. This is higher than what we observed in our study, where only 34.8% of the participants showed a comparable level of knowledge. Chimberengwa and Naidoo conducted a study in Zimbabwe, where they found that only 35.2% of participants had a good understanding of hypertension management, which is more in line with our results [11]. These findings underscore the critical role knowledge plays in managing hypertension and reflect similar patterns seen in other resource-limited settings around the world. There's been limited research in Pakistan on how hypertensive patients manage their condition and their level of knowledge about it. Unlike countries like Ethiopia and Zimbabwe, where this issue has been studied more thoroughly, Pakistan lacks a significant body of work in this area. This gap makes it harder to understand how people here deal with hypertension and highlights where education is most needed. While studies such as Khan *et al.*, have explored hypertension care in private healthcare, there's almost no research focusing on public hospitals like HMC [18]. Although research on hypertension management in Pakistan is limited, some studies have been conducted. Nadeem *et al.*, found that patient knowledge about hypertension and its management had a direct effect on blood pressure control in a semi-private hospital in Karachi [6]. The medication adherence rate of 72.5% observed in our study is in line with Nadeem's findings, where patients' awareness played a significant role in their adherence to antihypertensive medications. Hypertension as a public health issue is well-reported in Pakistan's medical literature, but gaps in patient education and attitude remain underexplored. Mahmood *et al.*, found that in primary and secondary care settings, only 40% of patients adhered to their antihypertensive medications, which is much lower than the 72.5% adherence rate observed in our study [20]. This difference could be due to the urban setting of Peshawar, where patients have better access to healthcare. However, it's important to investigate these regional differences more closely and explore how improving patient education could help raise adherence rates across different parts of Pakistan. Our study's results match what we're seeing worldwide: patients' knowledge and attitudes are really important for managing high blood pressure. We discovered that only about 35% of our participants understood their hypertension well, highlighting a significant gap that could make controlling blood pressure more difficult. Other research, like the 2020 study by Ramadaniati and colleagues, has shown that education programs led by pharmacists or nurses can greatly improve both patients' understanding and their adherence to medications [9]. We were encouraged to find that about 60% of our participants regularly monitor their blood pressure. However, there's still plenty of room to improve since many aren't checking it often enough to prevent potential complications. We need to boost educational efforts to highlight just how important regular BP checks are for managing hypertension effectively. Additionally, while the study used a cross-sectional design to assess knowledge and attitudes, a longitudinal approach would provide more insight into how patient education impacts long-term hypertension management. Future studies should consider exploring rural populations and implementing intervention programs that focus on improving patient knowledge and medication adherence over time. Given the substantial gaps in knowledge revealed in this study, structured community-based educational programs are recommended to enhance awareness and promote self-management of hypertension, especially in under-resourced areas of Pakistan.

CONCLUSIONS

It was concluded that this study highlights the significant gaps in knowledge about hypertension among patients at Hayatabad Medical Complex, Peshawar, despite high rates of medication adherence and awareness of hypertension as a cardiovascular risk. The findings underscore the need for targeted educational interventions to improve patient understanding of hypertension management and the importance of regular blood pressure monitoring. Enhancing patient education can lead to better self-management and overall health outcomes, particularly in resource-limited settings like Pakistan.

Authors Contribution

Conceptualization: SHAS, WB
Methodology: SHAS, WB
Formal analysis: SHAS, WB
Writing review and editing: SHAS, WB

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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