INSIGHTS-JOURNAL OF
LIFE AND SOCIAL SCIENCES

INSIGHTS-JLSS
Insights-Journal of Life and Social Sciences

# MEDICINE COMPLIANCE AND BARRIERS TOWARDS THE HYPERTENSION MANAGEMENT IN PAKISTAN

*Original Article*

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Conflict of Interest: None

Grant Support & Financial Support: None

Acknowledment: The authors sincerely acknowledge the support of all participants and the healthcare staff of Civil Hospital Thatta for their valuable contributions to this study.

## ABSTRACT

**Background:** Hypertension poses a significant public health challenge in Pakistan, contributing substantially to morbidity and mortality. Medication compliance in hypertension management is a critical concern, often hindered by factors such as forgetfulness, financial constraints, and limited awareness. Although this issue is widely documented, there is a lack of data on medication compliance and barriers in the remote areas of Southern Sindh, where healthcare access and awareness are often limited.

**Objective:** To explore medication compliance and identify barriers to hypertension management in Southern Sindh, Pakistan.

**Methods:** A cross-sectional study was conducted among 260 hypertensive patients attending the outpatient department of a tertiary care hospital in Thatta, a district in Southern Sindh. Participants were selected using simple random sampling. Inclusion criteria included patients aged 20 years and above with a confirmed diagnosis of hypertension. Data were collected using a validated questionnaire following informed consent. Ethical approval was obtained from the relevant review board. The collected data were analyzed using SPSS version 25, with descriptive statistics used to summarize findings.

**Results:** The study found that 63.8% of participants cited forgetfulness as the primary barrier to medication adherence. Financial constraints affected 16.9%, while 8.1% reported medication side effects as a barrier. Adherence levels varied, with 30.8% reporting no difficulty, 17.7% finding adherence slightly difficult, and 20.4% moderately difficult. A further 19.2% and 11.9% found adherence very difficult and extremely difficult, respectively. Demographically, 63.1% were male, and 43.8% had completed matriculation education.

**Conclusion:** Medication compliance in hypertension management remains a significant challenge in Southern Sindh, primarily due to forgetfulness and financial barriers. Addressing these issues through improved patient education, affordable medication access, and enhanced healthcare support systems is vital for better hypertension management in this underserved region.

**Keywords:** Barriers, Compliance, Determinants, Hypertension, Medication Adherence, Risk Factors, Sindh.

## INTRODUCTION

Hypertension, often termed the "silent killer," is a pervasive global health challenge due to its asymptomatic nature and association with severe cardiovascular complications. It is a major contributor to approximately 50% of strokes and ischemic heart diseases, positioning it as the leading cause of mortality worldwide (5). Defined as persistently elevated blood pressure above 140/90 mmHg, hypertension affects a substantial proportion of the population, with its prevalence increasing significantly when thresholds are lowered to 130/80 mmHg, as per the 2017 American College of Cardiology and American Heart Association guidelines (3). This silent condition is particularly alarming in low- and middle-income countries, where nearly two-thirds of the population is affected, resulting in over seven million deaths annually (7). Pakistan, a lower-middle-income country, is no exception, with one in four adults living with hypertension, contributing to approximately 200,000 deaths per year. Cardiovascular diseases, driven by hypertension, account for 59% of all deaths in the country (8). The burden of hypertension in Pakistan is compounded by various factors, including limited healthcare funding, inadequate infrastructure, and poor access to affordable treatment options (13). With direct and indirect healthcare costs for hypertension management estimated at PKR 19,789.88 (US$ 201.21) and PKR 11,990.90 (US$ 121.92), respectively, the economic strain on households is immense (9). Such financial constraints contribute significantly to treatment non-adherence, as patients struggle to afford antihypertensive medications and regular follow-ups (10). Additionally, cultural beliefs and misconceptions about the disease often lead to non-compliance, as individuals may opt for alternative remedies or discontinue medications when symptoms are not evident. This behavior, coupled with the lack of awareness about the critical importance of consistent medication use, exacerbates the risk of uncontrolled hypertension and its complications (11).

In rural and underserved areas of Pakistan, such as the southern districts of Sindh, the challenges of hypertension management are even more pronounced. These regions face barriers including a scarcity of trained healthcare professionals, limited access to medical facilities, and inadequate availability of blood pressure-control medicines and devices (14). Furthermore, patient non-adherence and clinical inertia remain significant obstacles, resulting in poor health outcomes and escalating healthcare costs (15). Despite the known benefits of effective hypertension control in reducing morbidity and mortality, there is limited data on medication compliance and barriers to treatment, particularly in these remote regions. The objective of this study was to explore the extent of medicine compliance and to identify barriers to hypertension management in the southern districts of Sindh, Pakistan. By addressing these gaps, this research aims to provide insights that can inform targeted interventions to improve hypertension management and reduce its associated burden in underserved communities.

## METHODS

A descriptive cross-sectional study design was employed to assess the sociocultural determinants of hypertension management among patients in Thatta, a rural district of Sindh, Pakistan. The study was conducted in the outpatient department (OPD) of Civil Hospital Thatta, a public healthcare facility catering to a significant population, including hypertensive patients. Thatta is characterized by traditional cultural practices and limited access to healthcare services, making it an appropriate setting for this investigation. A total of 260 hypertensive patients were included in the study, with the sample size determined using a standard formula for cross-sectional studies at a 95% confidence interval. Simple random sampling was utilized to ensure that every hypertensive patient visiting the OPD had an equal probability of being selected, reducing selection bias and enhancing the generalizability of the findings. Participants were selected based on specific inclusion criteria, including individuals aged 20 years and above, both male and female, those with co-morbidities, and individuals with a family history of hypertension. Exclusion criteria were not explicitly mentioned in the original text but could include those unwilling to participate or unable to provide informed consent. Ethical approval for the study was obtained from the Ethical Review Board (approval reference number to be added if available), ensuring adherence to ethical research standards. Informed consent was obtained from all participants after explaining the purpose of the study and the nature of data collection. Participants were assured of the confidentiality and anonymity of their responses, and data were strictly used for research purposes only.

Data collection was carried out using a pre-tested questionnaire, adapted from previously validated studies. The questionnaire encompassed demographic information, clinical history, and sociocultural factors influencing hypertension management. The tool was designed to ensure comprehensiveness and reliability. No details about the mode of administration of the questionnaire (e.g., face-to-face interviews or self-completion) were provided in the original text, which could be clarified for greater methodological transparency. Statistical analyses were not explicitly mentioned in the original description, but it is presumed that appropriate statistical tests were conducted to analyze the data in alignment with the study objectives. The study adhered to all ethical principles, ensuring participant rights and the integrity of the research process. However, the absence of details on data analysis methods, exclusion criteria, and the administration of the questionnaire limits the completeness of the methodology and could be addressed in future reporting.

## RESULTS

The study included 260 hypertensive patients, with findings organized around their demographic characteristics, levels of difficulty in medication adherence, and barriers to compliance. The majority of participants (31.2%) were aged between 36 and 45 years, followed by 23.1% aged 46 to 55 years. Participants aged 26 to 35 years comprised 15.0%, while 18.0% were aged 56 years and above. A smaller proportion (12.7%) was aged 20 to 25 years. Male participants (63.1%) outnumbered females (36.9%), reflecting potential gender-related variations in hypertension prevalence or healthcare-seeking behavior in the study population. Education levels revealed that most participants had completed matriculation (43.8%), with 30.8% having an intermediate education. Graduates accounted for 21.9%, while only 2.3% had postgraduate qualifications. A negligible proportion (1.2%) reported no formal education. Occupation-wise, 29.6% of participants were self-employed, 21.5% were unemployed, 17.3% were students, and 11.2% were employed in formal settings. Additionally, 20.4% belonged to the "other" category, encompassing informal or part-time workers. These findings highlight the socioeconomic and educational diversity of the population, which may influence adherence to hypertension management.

**Table: Demographic Characteristics of Participants**

| Characteristics | Frequency (%age) |
|---|---|
| Age Group | |
| 20-25 | 33 (12.7%) |
| 26-35 | 39 (15.0%) |
| 36-45 | 81 (31.2%) |
| 46-55 | 60 (23.1%) |
| 56 and above | 47 (18.0%) |
| Gender | |
| Male | 164 (63.1%) |
| Female | 96 (36.9%) |
| Education Level | |
| Postgraduate | 6 (2.3%) |
| Graduate | 57 (21.9%) |
| Intermediate | 80 (30.8%) |
| Matriculation | 114 (43.8%) |
| No formal education | 3 (1.2%) |
| Occupation | |
| Employed | 29 (11.2%) |
| Unemployed | 56 (21.5%) |
| Self-employed | 77 (29.6%) |
| Student | 45 (17.3%) |
| Other | 53 (20.4%) |

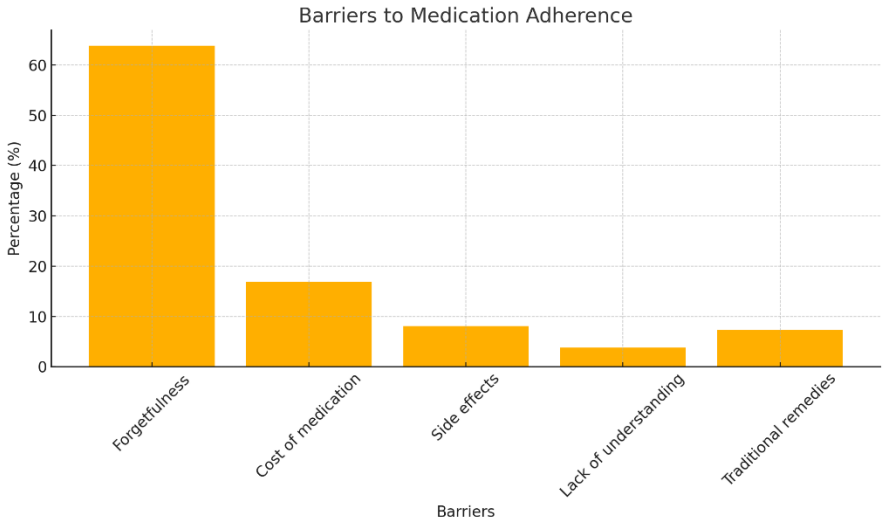
Regarding medication adherence, 30.8% of participants reported no difficulty in following their prescribed regimen. However, varying degrees of challenges were observed among others, with 17.7% finding it slightly difficult, 20.4% moderately difficult, 19.2% very difficult, and 11.9% extremely difficult. This indicates that while a significant portion manages their medication effectively, barriers to adherence remain prevalent among a substantial number of patients. The study also identified key barriers to medication adherence. Forgetfulness was the most frequently cited issue, reported by 63.8% of participants, signifying the need for strategies to improve patient memory and routine adherence. Financial constraints emerged as the second most significant barrier, with 16.9% indicating that the cost of medication impeded regular usage. Adverse side effects affected 8.1% of participants, deterring them from continuing prescribed

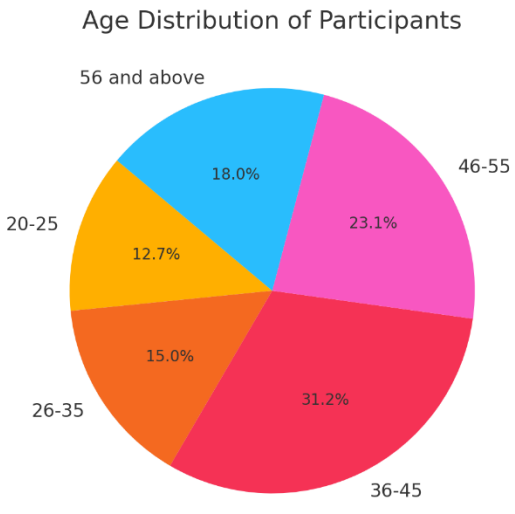
 

treatment. Lack of understanding about the importance of medication was noted in 3.8% of cases, underscoring the necessity of patient education. Additionally, 7.3% of participants resorted to traditional remedies, reflecting cultural influences on medication adherence.

**Table: Difficulty Levels and Barriers to Medication Adherence**

| Category | Frequency (%age) |
|---|---|
| Level of Difficulty | |
| Not at all difficult | 80 (30.8%) |
| Slightly difficult | 46 (17.7%) |
| Moderately difficult | 53 (20.4%) |
| Very difficult | 50 (19.2%) |
| Extremely difficult | 31 (11.9%) |
| Barriers to Compliance | |
| Forgetfulness | 166 (63.8%) |
| Cost of medication | 44 (16.9%) |
| Side effects | 21 (8.1%) |
| Lack of understanding about medication | 10 (3.8%) |
| Traditional remedies | 19 (7.3%) |




## DISCUSSION

The findings of this study provide valuable insights into the multifactorial challenges associated with hypertension management in rural Pakistan. The significant rate of medication non-compliance due to forgetfulness reflects a critical gap in patient empowerment and self-management strategies. This aligns with previous literature from low-resource settings, which underscores the importance of tailored health education programs to improve medication adherence. Community-based interventions, such as follow-ups and reminders provided by trained health workers, have demonstrated effectiveness in addressing this issue and could be integrated into local healthcare systems to foster better compliance (18, 19). Financial constraints, reported by 16.9% of participants, emphasize the socioeconomic challenges in accessing essential medications. This is consistent with studies from other low- and middle-income countries where limited healthcare funding exacerbates treatment gaps. Systemic interventions, including the integration of hypertension management into national health initiatives and the development of social safety nets, could mitigate these barriers. Partnerships with pharmaceutical

companies to lower the cost of antihypertensive drugs and enhance the availability of affordable generics are critical for addressing financial barriers and improving accessibility (20, 21, 22).

The reported difficulty with medication adherence due to side effects points to a deficiency in patient-provider communication. Effective counseling about potential side effects and their management is essential to ensure treatment continuity. Literature has demonstrated that clear, empathetic communication fosters better understanding and trust, encouraging patients to adhere to prescribed regimens despite minor adverse effects. Training healthcare professionals in effective communication techniques and providing patient-friendly educational materials could address this issue and reduce the risk of non-compliance (23, 24). The demographic distribution revealed a significant prevalence of hypertension among middle-aged and older adults, suggesting that targeted interventions for these age groups are necessary. Public health campaigns focusing on age-specific education about hypertension management and adherence to medications could significantly reduce disease burden. The gender imbalance observed in this study, with more male participants than females, further suggests the need for gender-sensitive strategies. Men in rural communities often have better healthcare access than women due to cultural norms, highlighting the need to address these disparities through inclusive community health initiatives (25, 26).

The low level of education among participants, with the majority having only matriculation or intermediate-level education, underscores the importance of literacy-sensitive interventions. Misunderstandings about the disease and its management are often rooted in inadequate health literacy. Educational programs should incorporate visual aids, simple language, and culturally relevant messaging to enhance patient understanding and engagement. This aligns with global recommendations advocating for health literacy improvements to address barriers to chronic disease management. The study's findings corroborate existing evidence that hypertension poses a significant public health challenge in low- and middle-income countries. Its contribution to cardiovascular mortality in Pakistan underscores the urgent need to integrate hypertension management into the national strategy for non-communicable diseases. This integration should include widespread screening programs, training of healthcare professionals in early diagnosis and management, and ensuring the availability of affordable blood pressure monitoring devices at the community level. Effective implementation of these strategies could significantly reduce the morbidity and mortality associated with uncontrolled hypertension (27).

The study is strengthened by its focus on a rural district with unique sociocultural dynamics, providing insights into a population often underrepresented in research. However, its cross-sectional design limits the ability to infer causality. The reliance on self-reported data introduces the potential for recall and reporting biases, while the focus on a single district restricts the generalizability of findings. Future research should consider larger, more diverse samples across multiple regions and incorporate longitudinal designs to better understand the dynamic factors influencing hypertension management. Additionally, future studies could explore the effectiveness of community-based interventions and policies in addressing the barriers identified in this research. This study underscores the multifaceted challenges in managing hypertension in rural Pakistan and highlights the urgent need for targeted interventions. Addressing financial constraints, improving health literacy, strengthening patient-provider communication, and tailoring strategies to demographic and cultural contexts are critical steps toward mitigating the burden of hypertension. By incorporating these strategies into public health initiatives, it is possible to enhance medication adherence, reduce complications, and improve health outcomes for hypertensive patients.

## CONCLUSION

The study highlights that medication compliance remains a critical challenge in the effective management of hypertension in rural Pakistan, driven by factors such as forgetfulness, financial barriers, side effects, and limited awareness of the importance of consistent treatment. These findings underscore the need for targeted interventions, including enhanced patient education, improved healthcare infrastructure, and policies that ensure affordable access to antihypertensive medications. By addressing these barriers, healthcare providers and policymakers can contribute to better hypertension management, reducing its associated risks and improving health outcomes in underserved communities. The research emphasizes the importance of tailored strategies that align with the sociocultural and economic realities of the population, offering valuable insights for future initiatives in similar settings.

| Author | Contribution |
|---|---|
| Dr Aisha Memon | Substantial Contribution to study design, analysis, acquisition of Data<br>Manuscript Writing<br>Has given Final Approval of the version to be published |
| Dr Muhammad Ilyas Siddiqui | Substantial Contribution to study design, acquisition and interpretation of Data<br>Critical Review and Manuscript Writing<br>Has given Final Approval of the version to be published |
| Dr Kanwal Naz Ariser | Substantial Contribution to acquisition and interpretation of Data<br>Has given Final Approval of the version to be published |

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|---|---|
| Dr Sajan Sarang | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Dr Abdul Razzaque Nohri | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Dr Erum Memon | Substantial Contribution to study design and Data Analysis<br>Has given Final Approval of the version to be published |

**Author Contribution**

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