

# COMMUNITY AWARENESS, PREVENTIVE PRACTICES, AND BARRIERS TOWARD INFECTIOUS DISEASE CONTROL IN URBAN POPULATIONS OF PAKISTAN

*Original Article*

Huda Muneer<sup>1\*</sup>, Muhammad Umer Ijaz<sup>2</sup>, Komal Abdul Aziz<sup>3</sup>, Ubaid Muhammad<sup>4</sup>, Sheharbano Haider<sup>5</sup>, Khadeeja Abubakar<sup>6</sup>, Farmanullah<sup>7</sup>

<sup>1</sup>General Dentist, Mir Gul Khan Naseer Teaching Hospital, Nushki, Pakistan.

<sup>2</sup>MBBS, MCPS (t), MPH, Graduate Student, Adelphi University, New York, United States.

<sup>3</sup>Principal, Karachi Institute of Nursing and Allied Health Sciences, Karachi, Pakistan.

<sup>4</sup>Medical Officer, Zam Zam Diagnostic Center, Shahmansoor, Swabi, Pakistan.

<sup>5</sup>Dentist (House Officer), Altamash Institute of Dental Medicine, Karachi, Pakistan.

<sup>6</sup>MS Biotechnology, Lahore College for Women University, Lahore, Pakistan.

<sup>7</sup>MBBS, CHPE, Demonstrator, Department of Physiology, NUST School of Health Sciences, NUST University, Islamabad, Pakistan.

**Corresponding Author:** Huda Muneer, General Dentist, Mir Gul Khan Naseer Teaching Hospital, Nushki, Pakistan, [hudamunir29@gmail.com](mailto:hudamunir29@gmail.com)

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## ABSTRACT

**Background:** Infectious diseases remain a persistent public health challenge in urban areas of Pakistan, where rapid population growth, overcrowding, and limited infrastructure amplify risks. Despite awareness campaigns, gaps in preventive practices and barriers to disease control continue to undermine health outcomes. Understanding these dynamics is essential to guide effective interventions in vulnerable communities.

**Objective:** To describe public awareness levels, preventive health behaviors, and barriers influencing infectious disease control in urban communities of South Punjab.

**Methods:** A descriptive study was conducted over four months, enrolling 420 adult residents from selected urban neighborhoods through multistage sampling. Data were collected via a structured, pretested questionnaire addressing awareness of major infectious diseases, adoption of preventive practices, and perceived barriers. Descriptive statistics summarized findings, while chi-square and independent t-tests compared outcomes across socio-demographic groups, given normally distributed data.

**Results:** The mean participant age was  $34.8 \pm 11.2$  years, with a balanced gender distribution. Awareness was highest for hepatitis (72.1%) and tuberculosis (68.4%) but lower for dengue (59.3%), influenza (54.2%), and emerging infections (41.8%). Preventive practices were suboptimal, with 61.9% reporting regular handwashing, 57.3% safe water use, 48.6% vaccination uptake, 44.1% mask use, and 52.8% early healthcare-seeking. Barriers included economic constraints (62.4%), structural inadequacies (58.7%), cultural influences (44.9%), and misinformation (39.2%).

**Conclusion:** Urban populations in South Punjab exhibited moderate awareness of infectious diseases, but preventive behaviors were inconsistent and hindered by significant economic, structural, and social barriers. Interventions that combine knowledge dissemination with improved access to resources and culturally sensitive strategies are necessary to strengthen infectious disease control in urban environments.

**Keywords:** Barriers AND Communicable Diseases, Community Awareness, Disease Prevention AND Control, Health Behavior, Infectious Diseases, Pakistan, Preventive Health Services, Urban Population.

## INTRODUCTION

Urban centers in Pakistan represent some of the most dynamic environments in South Asia, where rapid population growth, migration, and industrialization converge with persistent public health challenges (1). Infectious diseases continue to pose significant risks within these densely populated areas, exacerbated by limited infrastructure, inadequate sanitation, and socio-economic disparities. While advances in healthcare delivery and disease surveillance have improved overall outcomes in recent decades, the burden of communicable illnesses such as tuberculosis, dengue, hepatitis, influenza, and emerging viral infections remains disproportionately high in urban populations (2). Understanding how people perceive these threats, the preventive actions they adopt, and the barriers that hinder effective control is critical for shaping targeted interventions that resonate with community realities. The concept of community awareness is central to effective infectious disease control (3). Awareness encompasses not only general knowledge about the nature of diseases and their modes of transmission, but also an understanding of the importance of timely preventive measures such as vaccination, hand hygiene, use of protective equipment, and safe water consumption. In Pakistan, awareness campaigns have historically been launched in response to outbreaks, often through media coverage, religious leaders, or governmental initiatives. However, the level of awareness among urban populations is uneven, influenced by factors such as literacy, access to health information, cultural perceptions, and trust in healthcare systems. For example, while individuals may recognize the threat of certain high-profile illnesses like COVID-19, misconceptions about vaccines or preventive behaviors persist, undermining disease control efforts (4).

Preventive practices are equally shaped by awareness and accessibility. In densely packed urban neighborhoods, residents may face daily exposure to unsanitary conditions, contaminated water sources, and crowded transport systems (5). Even when individuals are aware of the importance of protective behaviors, adherence may falter due to economic limitations, lack of clean facilities, or the demands of daily survival in resource-limited settings. Practices such as regular handwashing, waste disposal, or seeking timely medical advice often compete with financial constraints and social pressures (6). Moreover, preventive health behaviors are not uniform; they are mediated by gender roles, occupational risks, and generational attitudes. For instance, younger populations in cities may be more inclined toward adopting hygiene-related habits promoted on digital platforms, while older groups may rely more heavily on traditional remedies or community norms (7). Barriers to infectious disease control in Pakistan's urban areas are multifaceted and interdependent. Structural challenges include overcrowding, inadequate public health infrastructure, and irregular access to affordable healthcare. These realities are compounded by systemic barriers such as weak policy enforcement, insufficient investment in public health education, and limited trust in healthcare providers. Social stigma surrounding certain diseases further discourages individuals from seeking diagnosis or treatment, especially for conditions like tuberculosis or hepatitis. In addition, misinformation, particularly through social media, has emerged as a modern barrier, often amplifying myths that discourage vaccination or promote ineffective treatments. These factors collectively create an environment where disease transmission remains difficult to curb, even when preventive measures are theoretically available (8).

The interplay between awareness, practice, and barriers highlights a critical gap in research: there is limited comprehensive data that examines these dimensions collectively within urban Pakistani populations (9). Existing studies often focus on a single disease or on rural health dynamics, leaving urban communities underexplored despite their heightened vulnerability to outbreaks due to density and mobility (10). Addressing this gap is not merely an academic exercise but a practical necessity, as policies designed without accurate insights into urban realities risk being ineffective or misaligned with community needs. A descriptive study that maps current levels of awareness, preventive practices, and perceived barriers can offer actionable knowledge to health authorities, non-governmental organizations, and policymakers, guiding the design of more culturally sensitive and socially acceptable interventions (11). This study therefore seeks to describe the state of community awareness, assess preventive health behaviors, and identify barriers influencing infectious disease control in urban populations of Pakistan. By capturing these interconnected dimensions, the research aims to provide a grounded understanding of how urban communities perceive and respond to infectious threats, and where gaps in knowledge, practice, or accessibility may hinder progress (12). The ultimate objective is to generate insights that can inform targeted health education programs, strengthen preventive strategies, and reduce the persistent burden of infectious diseases in Pakistan's rapidly expanding urban environments.

## METHODS

The study was designed as a descriptive investigation conducted over a period of four months in urban communities of South Punjab. The purpose was to systematically capture the levels of public awareness, preventive health behaviors, and perceived barriers related to

infectious disease control in these settings. The descriptive design was chosen to provide an accurate representation of the population without introducing interventions or experimental manipulation, ensuring that the findings reflect the community's existing practices and perceptions. The study population comprised adult residents of selected urban localities within South Punjab. A sample size was determined using an anticipated awareness prevalence of 50% to allow maximum variability, a 95% confidence interval, and a 5% margin of error. Based on these parameters, a minimum of 384 participants was calculated, and to account for potential non-response, the final sample size was increased to 420 individuals. Participants were selected through multistage sampling: in the first stage, urban neighborhoods were randomly chosen, followed by systematic sampling of households within each selected area. One eligible respondent per household was invited to participate, selected by the Kish grid method to avoid bias toward any household member.

Inclusion criteria required participants to be permanent residents of the urban locality for at least one year and aged 18 years or older. Individuals who were visiting temporarily, those with severe illness preventing communication, and healthcare professionals were excluded to ensure the study reflected the general public rather than specialized knowledge groups. This approach provided a balanced view of community-level understanding and practices rather than perspectives influenced by professional expertise. Data were collected using a structured questionnaire developed after reviewing literature and adapting items to the local context. The instrument was divided into three sections. The first section assessed awareness levels regarding common infectious diseases such as tuberculosis, hepatitis, dengue, influenza, and emerging viral infections, focusing on knowledge of causes, modes of transmission, and preventive measures. The second section captured preventive practices, including vaccination status, hand hygiene, sanitation habits, and healthcare-seeking behaviors. The third section addressed barriers to control, ranging from socio-economic challenges and cultural beliefs to systemic issues such as access to healthcare facilities and trust in public health campaigns. The questionnaire was pretested on a small group from a non-study area to ensure clarity, relevance, and cultural appropriateness, and necessary modifications were made prior to data collection.

Trained data collectors administered the questionnaire through face-to-face interviews conducted in the local language to ensure comprehension and minimize literacy-related exclusion. The responses were coded and entered into a statistical software package for analysis. Descriptive statistics, including means and standard deviations for continuous variables and frequencies with percentages for categorical variables, were generated to describe the population characteristics. To compare awareness and preventive practices across socio-demographic groups such as age, gender, and education, chi-square tests and independent t-tests were applied, given that the data followed a normal distribution. Barriers were analyzed descriptively and categorized into themes for clearer interpretation. The outcome measurements were clearly defined: awareness was measured as the proportion of participants correctly identifying causes and preventive measures; preventive practice scores were derived from reported adherence to hygiene and vaccination behaviors; and barriers were documented as reported challenges grouped into structural, economic, and cultural categories. Through this structured yet flexible approach, the study ensured a comprehensive understanding of how urban populations in South Punjab perceive and respond to infectious disease threats, while providing sufficient detail to allow replication by future researchers.

## RESULTS

A total of 420 participants were included in the study, with a mean age of 34.8 years (SD  $\pm 11.2$ ). The gender distribution was nearly equal, with 51.0% males and 49.0% females. Educational attainment varied, with 11.4% reporting no formal education, 21.9% primary, 37.1% secondary, and 29.5% higher education. Employment status showed that 55.2% were employed, while 44.8% were unemployed. These demographic details are presented in Table 1.

Awareness levels about infectious diseases demonstrated considerable variability across conditions. Knowledge regarding hepatitis was the highest, with 72.1% of participants identifying its major modes of transmission and preventive strategies, followed by tuberculosis at 68.4%. Awareness of dengue stood at 59.3%, while influenza was recognized correctly by 54.2% of respondents. Awareness of emerging viral diseases, including novel outbreaks, was lowest, with only 41.8% reporting accurate knowledge. These findings are summarized in Table 2 and illustrated in Figure 1.

Preventive health behaviors showed moderate adherence across domains. Handwashing at least five times daily was reported by 61.9% of participants, while 57.3% indicated consistent use of safe drinking water. Vaccination uptake was comparatively lower, reported by 48.6% of the sample. Mask use in crowded areas was adopted by 44.1%, and 52.8% reported seeking early medical care when experiencing infectious disease symptoms. These outcomes are detailed in Table 3 and visually represented in Figure 2.

Barriers to effective infectious disease control were reported across multiple dimensions. Economic limitations were most frequently cited (62.4%), followed by structural issues such as overcrowding and limited sanitation infrastructure (58.7%). Cultural beliefs, stigma, and reliance on traditional practices were acknowledged by 44.9% of respondents, while misinformation, particularly through informal media, was noted by 39.2%. The distribution of barriers is outlined in Table 4.

The overall results demonstrated that while awareness of major infectious diseases such as tuberculosis and hepatitis was relatively high, preventive practices remained inconsistent and barriers were widespread, reflecting both structural and social constraints within urban communities of South Punjab.

**Table 1: Demographic Characteristics of Participants**

Variable	Categories
Age (years)	Mean ± SD: 34.8 ± 11.2
Gender	Male: 214 (51.0%), Female: 206 (49.0%)
Education Level	No formal: 48 (11.4%), Primary: 92 (21.9%), Secondary: 156 (37.1%), Higher: 124 (29.5%)
Employment Status	Employed: 232 (55.2%), Unemployed: 188 (44.8%)

**Table 2: Awareness of Infectious Diseases**

Infectious Disease	Correctly Identified (%)
Tuberculosis	68.4
Hepatitis	72.1
Dengue	59.3
Influenza	54.2
Emerging Viruses	41.8

**Table 3: Preventive Practices**

Practice	Adherence (%)
Handwashing (≥5 times/day)	61.9
Use of safe drinking water	57.3
Vaccination uptake	48.6
Mask use in crowded areas	44.1
Seeking medical care early	52.8

**Table 4: Reported Barriers to Infectious Disease Control**

Barrier Category	Reported by Participants (%)
Economic	62.4
Structural	58.7
Cultural/Beliefs	44.9
Misinformation	39.2

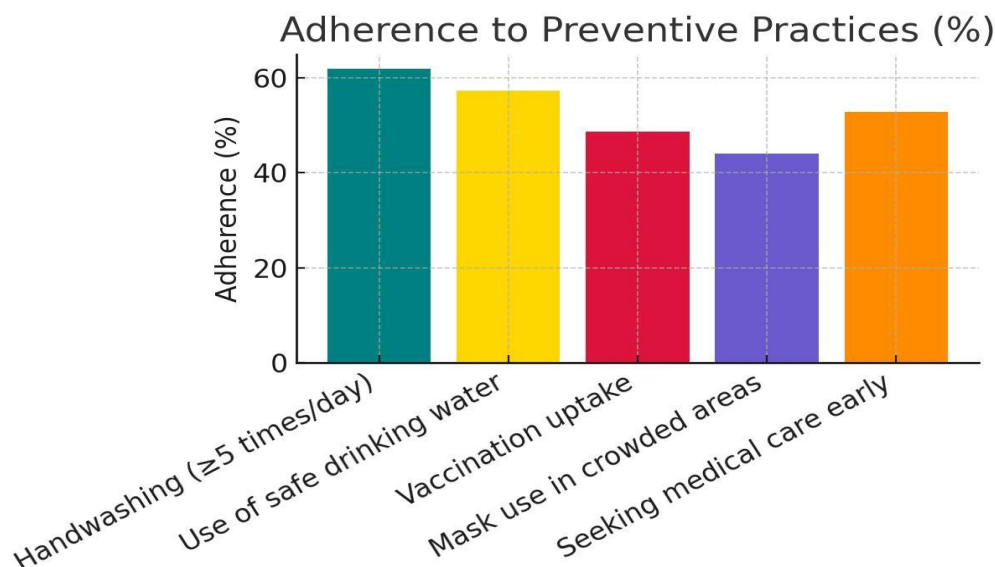


Figure 1 Adherence to Preventive Practice (%)

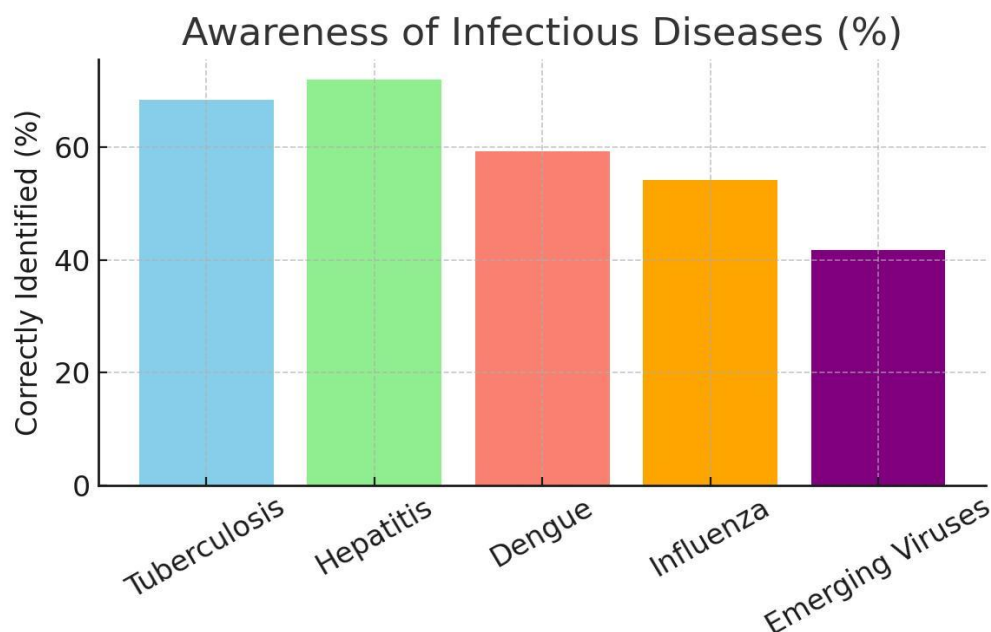


Figure 2 Awareness of Infectious Diseases (%)

## DISCUSSION

The findings of this study highlighted both encouraging and concerning aspects of infectious disease control within urban populations of South Punjab. Awareness regarding certain high-burden conditions, such as hepatitis and tuberculosis, appeared relatively strong, suggesting that longstanding public health campaigns and widespread recognition of these diseases have contributed to community knowledge (13). In contrast, limited understanding of emerging viral infections demonstrated an ongoing challenge, indicating that knowledge dissemination often lags behind rapidly evolving threats. This imbalance between awareness of traditional diseases and newer infections reflected a gap that can significantly affect community preparedness during outbreaks (14). Preventive practices were

reported at moderate levels, yet they did not match the awareness levels documented. Hand hygiene and safe water use were practiced by more than half of respondents, indicating some translation of awareness into behavior. However, critical practices such as vaccination and mask use in crowded areas showed considerably lower adherence. This pattern reinforced the notion that awareness alone does not necessarily guarantee compliance with preventive behaviors (15). The discrepancy between knowledge and practice highlighted behavioral, social, and structural determinants that go beyond individual awareness, underscoring the complexity of disease prevention in urban contexts. Barriers reported by the participants illuminated the systemic nature of these challenges. Economic constraints emerged as the most prominent barrier, reflecting the reality that preventive behaviors often require access to resources that many urban residents cannot afford. Similarly, structural issues, including inadequate sanitation facilities and overcrowded living conditions, were cited frequently, suggesting that environmental limitations can diminish the impact of individual-level practices. Cultural beliefs and reliance on traditional remedies also played a significant role, acting as deterrents to scientifically recommended measures. Furthermore, misinformation through informal communication channels weakened trust in preventive strategies and contributed to hesitancy, particularly toward vaccines. Collectively, these barriers demonstrated how infectious disease control is shaped by broader social determinants of health rather than knowledge alone (16).

The results aligned with the wider understanding that infectious disease control in densely populated urban settings requires a multipronged approach (17). Knowledge dissemination, while essential, cannot achieve lasting control unless coupled with structural improvements, economic support, and culturally sensitive interventions. The relatively higher levels of awareness regarding hepatitis and tuberculosis compared to influenza and emerging infections indicated that sustained campaigns and long-standing public health programs can achieve measurable results when consistently implemented (18). However, the persistence of barriers underscored the limitations of information-based interventions when broader socio-economic inequities remain unaddressed. The strengths of this study included its community-based design, which captured perspectives from a diverse urban population rather than restricting the scope to hospital-based samples (19). The use of multistage sampling improved representativeness and reduced bias, while the focus on both awareness and practice, along with perceived barriers, provided a comprehensive view of the factors influencing infectious disease control. The structured questionnaire allowed systematic data collection, and the use of standardized statistical analysis enhanced the reliability of findings. Nevertheless, the study carried important limitations. The descriptive nature of the design limited the ability to establish causal relationships between awareness, practices, and barriers. The reliance on self-reported behaviors introduced the possibility of social desirability bias, with participants potentially overstating their adherence to preventive practices. The study was confined to urban populations in South Punjab, which restricted generalizability to other regions of the country, particularly rural areas where social and structural determinants differ markedly. Additionally, the cross-sectional approach provided a snapshot in time, without capturing temporal changes in awareness or behavior that might arise from public health campaigns or outbreak events (20).

Despite these limitations, the study offered valuable insights with practical implications (21). The clear gap between awareness and adherence to preventive behaviors emphasized the need for interventions that not only inform but also facilitate practice (22). This could include the provision of affordable hygiene products, improved vaccination services, and community-driven efforts to counter misinformation. Structural barriers highlighted the importance of policy-level reforms aimed at improving sanitation, housing, and healthcare accessibility. Economic constraints pointed toward the necessity of integrating preventive health into broader poverty alleviation strategies. Future research could build upon these findings by employing longitudinal designs to observe how awareness, practices, and barriers evolve over time, particularly in response to public health interventions or during outbreaks. Comparative studies across urban and rural settings would further clarify regional differences, while qualitative investigations could provide deeper insights into the cultural and behavioral determinants that hinder preventive practices (23). Moreover, the role of digital platforms in spreading both accurate and misleading information warrants focused investigation, given their increasing influence on community health behaviors. In summary, the study demonstrated that while awareness of certain infectious diseases among urban communities of South Punjab was encouraging, preventive practices remained inconsistent, and barriers were deeply rooted in structural, economic, and cultural realities. Addressing these interconnected challenges requires coordinated strategies that extend beyond knowledge dissemination to encompass resource provision, infrastructure development, and culturally adapted interventions. Through such integrated approaches, the persistent burden of infectious diseases in urban populations can be reduced, paving the way for healthier and more resilient communities (24).



## CONCLUSION

This study concluded that while urban populations in South Punjab demonstrated moderate awareness of infectious diseases, preventive practices were inconsistently adopted and significant barriers persisted. Economic hardship, structural inadequacies, cultural beliefs, and misinformation collectively hindered effective disease control. The findings emphasize that knowledge alone is insufficient without accessible resources, supportive infrastructure, and culturally sensitive interventions. By addressing these interconnected challenges through comprehensive strategies, policymakers and health authorities can strengthen community resilience and reduce the burden of infectious diseases in urban environments.

## AUTHOR CONTRIBUTION

Author	Contribution
Huda Muneer*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Umer Ijaz	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Komal Abdul Aziz	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Ubaid Muhammad	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Sheharbano Haider	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Khadeeja Abubakar	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Farmanullah	Contributed to study concept and Data collection Has given Final Approval of the version to be published

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