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EVALUATING THE QUALITY OF PRIMARY HEALTH CARE SERVICES AT BASIC HEALTH UNITS IN MUZAFFARGARH

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Abstract

This study investigates patient perceptions of service quality in rural Basic Health Units (BHUs) in Muzaffargarh, Punjab, with a particular focus on both process and structural dimensions of care. The objective was to assess key factors influencing patient satisfaction and trust in primary healthcare services. A quantitative, cross-sectional survey design was employed, collecting data from 426 patients through structured questionnaires across selected BHUs in two tehsils. The target population included OPD patients who were selected using systematic random sampling. The questionnaire focused on variables such as staff behavior, waiting time, communication, accessibility, and facility conditions. Findings indicated that while infrastructural improvements were generally acknowledged, significant dissatisfaction persisted with provider conduct, long waiting times, and poor communication. These process-related deficiencies had a more pronounced impact on patients' trust and perceptions than structural factors alone. The study concludes that improving service quality in rural primary healthcare requires moving beyond infrastructure upgrades to include staff training, performance incentives, and active patient engagement. These findings have implications for policy reforms, especially in marginalized areas where strengthening patient trust is vital for better health outcomes.

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CHAPTER 1: INTRODUCTION

Primary healthcare serves as the foundation of a country's health system, especially in rural and underserved regions like Muzaffargarh, Pakistan.

Background of the Study

Primary healthcare (PHC) is widely acknowledged as the foundation of an effective and equitable health system, particularly in rural and resource-constrained settings. The World Health Organization (WHO, 2022) emphasizes that strengthening PHC is vital to achieving Universal Health Coverage (UHC) and Sustainable Development Goal 3: Good Health and Well-being. PHC focuses on delivering accessible, acceptable, and affordable care at the community level—where the burden of disease is often highest and access to specialists is limited.

In Pakistan, Basic Health Units (BHUs) serve as the backbone of public sector PHC, offering services such as outpatient consultations, maternal and child healthcare, immunization, and family planning. Each BHU is typically designed to serve 10,000–15,000 people in rural communities (NIPS & ICF, 2019). However, despite significant investment in infrastructure, the functional capacity of many BHUs remains suboptimal due to chronic issues such as inadequate staffing, unavailability of medicines, lack of equipment, and poor facility maintenance (Ahmed & Javed, 2020; Khan et al., 2022).

Muzaffargarh, a predominantly rural district in Southern Punjab, exemplifies these challenges. Characterized by high poverty rates, limited transportation access, and low literacy levels, the district's population faces substantial barriers to quality healthcare. BHUs in Muzaffargarh have repeatedly been criticized for inconsistent service availability, poor staff conduct, long waiting times, and low patient satisfaction (Punjab Health Department, 2023). These conditions undermine the very purpose of PHC, leading patients to seek care from unregulated or private providers, even at higher costs.

Recognizing these concerns, this study adopts a comprehensive and patient-centered approach to evaluate service quality at BHUs in Muzaffargarh. Guided by the Donabedian model of healthcare quality — focusing on structure, process, and outcome — the research investigates key dimensions including infrastructure and resources, staff-patient interaction, accessibility, waiting time, and patient satisfaction. Data are collected using a structured questionnaire based on internationally validated tools, ensuring systematic measurement of perceived service quality across the selected facilities.

Service Delivery Challenges in Basic Health Units (BHUs)

Despite the extensive infrastructure of BHUs across Pakistan, their performance and utilization remain inconsistent and often inadequate. Research and monitoring reports have consistently highlighted a variety of service delivery issues within BHUs. These include frequent absenteeism of medical officers, unavailability of essential medicines, poor hygiene conditions, inadequate diagnostic services, and staff behavior that undermines patient trust (Ahmed & Javed, 2020; Khan et al., 2022).

In rural areas such as Muzaffargarh, these challenges are further exacerbated by geographical barriers, low literacy levels, and limited transport infrastructure, which restrict access to care. Consequently, even when BHUs are physically available, patients often turn to private providers or quacks, citing dissatisfaction with public health services. The resulting underutilization of BHUs leads to inefficient resource use and defeats the purpose of community-level healthcare.

These observations underscore the urgent need to systematically evaluate the perceived quality of services at BHUs, particularly from the patients' perspective, which is often overlooked in administrative audits and health statistics.

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Dimensions of Primary Healthcare Quality

This study is grounded in the Donabedian model of healthcare quality, which evaluates service delivery based on three core dimensions: structure, process, and outcome (Donabedian, 1988). These dimensions not only guide the theoretical framework of the research but are also directly aligned with the study objectives and embedded within the structured questionnaire developed for data collection. This alignment ensures a robust, multidimensional understanding of how primary healthcare services are experienced by patients in Basic Health Units (BHUs) of Muzaffargarh.

The first dimension, structural quality, refers to the tangible and organizational elements that support healthcare provision. These include the physical infrastructure of health facilities, the availability of skilled medical staff, essential diagnostic equipment, sanitation, and uninterrupted stocks of medicines. Structural aspects are critical because they determine the readiness of a facility to deliver healthcare. In the context of BHUs, structural quality encompasses elements such as whether sanitary conditions are up to the mark, drinking water is available, all essential equipment is in working condition, medicines are available for both chronic and common illnesses, and whether services like a labor room or ambulance are present. According to Ahmed and Javed (2020), many BHUs across rural Punjab are plagued with inadequacies in these very areas, which compromise the effectiveness of care and discourage utilization. Similarly, Hafeez et al. (2011) emphasize that the availability of qualified doctors, functioning diagnostic tools, and a clean environment significantly shape patients' willingness to seek treatment at government facilities. This study captures structural quality through specific questionnaire items that reflect these realities, allowing respondents to evaluate whether the physical environment of the BHU met their expectations and basic healthcare needs.

Process quality, the second dimension, refers to how healthcare is actually delivered and includes interpersonal communication, coordination of care, timeliness of services, and the conduct of medical and support staff. In rural health settings, especially in underprivileged districts like Muzaffargarh, the process of care is often marred by delays, lack of empathy, and procedural inefficiencies. According to Andaleeb (2001), the behavior of healthcare providers and the manner in which services are delivered can often matter as much as the technical quality of care. In this study, process quality is examined through variables such as whether doctors behaved politely during the patient's visit, whether the staff was cooperative, and whether waiting times to see a doctor or obtain lab tests were reasonable. Additionally, it assesses whether the services were well-managed, including delivery-related services and emergency care through ambulance availability. Patients' experiences in these areas serve as a reflection of the internal functioning and responsiveness of the healthcare system. As Siddiqui et al. (2023) note, delays in care, unresponsiveness of staff, or neglect of emergency needs are among the primary reasons why rural patients often shift from public to private providers despite financial constraints. The questionnaire items chosen to evaluate process quality thus play a vital role in determining whether patients perceive the service delivery as respectful, timely, and adequately managed.

The third dimension, outcome quality, focuses on the effects of healthcare services on patient health, satisfaction, and future health-seeking behaviors. This includes both objective indicators, such as recovery and improvement in health status, and subjective indicators, such as trust in healthcare providers and willingness to revisit or recommend the facility. In this study, outcome quality is measured through patient feedback on several key indicators. Respondents were asked whether they or a family member recovered after treatment at the BHU, which

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reflects the perceived clinical effectiveness of the services provided. They were also asked whether they would recommend the BHU to others, an important marker of trust and satisfaction. Other items explored whether patients were satisfied with the behavior of the BHU staff, whether they believed quality medicines were being provided, and whether they would revisit the BHU in the future if needed. These indicators collectively form the dependent variable of the study, i.e., perceived service quality, and are essential for understanding whether patients associate their care experience with positive health outcomes and reliable service delivery. According to Rocha et al. (2019), such patient-centered outcome measures offer valuable insights that purely administrative data often fail to capture, particularly in rural settings where health services are underutilized.

The use of these three dimensions—structure, process, and outcome—not only provides a comprehensive evaluation of primary healthcare services but also ensures the study is methodologically sound and aligned with global service quality models. The questionnaire was designed in light of Donabedian's conceptual model and incorporates standardized variables derived from tools such as the SERVQUAL model (Parasuraman et al., 1985). While Donabedian's model offers a functional framework for categorizing healthcare quality, the SERVQUAL dimensions—empathy, assurance, reliability, responsiveness, and tangibles—support the design of questionnaire items that reflect real-life patient interactions and expectations. These conceptual anchors ensure that the study remains theoretically robust and internationally comparable.

Moreover, this approach is consistent with national health policy guidelines and World Health Organization recommendations, which stress the importance of integrating patient feedback into service evaluation mechanisms (WHO, 2020). In a country like Pakistan, where public trust in primary care institutions is fragile, especially in rural areas, capturing patient perspectives on structural, procedural, and outcome-related aspects is essential for guiding reforms. As highlighted in a recent report by the Punjab Health Department (2023), efforts to improve rural health infrastructure must be supported by real-time, patient-centered evidence to design effective and sustainable interventions.

In sum, this study's operationalization of the Donabedian model into clearly defined and questionnaire-based variables makes it possible to identify which specific components of service delivery are most influential in shaping patient satisfaction and usage patterns. By applying a variable-based design, this research moves beyond general observations and enables targeted analysis that can inform policy-level improvements. The focus on structural readiness, service delivery practices, and patient-reported outcomes offers a holistic view of primary healthcare quality and generates actionable insights for improving BHUs in Muzaffargarh and beyond.

Problem Statement

Although Basic Health Units (BHUs) serve as the cornerstone of primary healthcare delivery in rural Pakistan, their effectiveness in meeting the healthcare needs of local communities remains critically insufficient. In the Muzaffargarh district, persistent structural challenges—such as the unavailability of essential medicines, poor infrastructure, inadequate diagnostic services, and a shortage of trained healthcare personnel—are widely reported. Additionally, many patients face long waiting times and encounter unprofessional behavior from staff, leading to a decline in public trust and underutilization of services (Punjab Health Department, 2023; UNICEF, 2023).

Despite the crucial role BHUs play in delivering primary healthcare, there is a notable lack of comprehensive and systematic evaluation of their service quality. Existing assessments predominantly focus on input-level indicators, such as inventory audits and staff attendance

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records, which fail to reflect actual patient experiences. This narrow evaluation approach overlooks the critical insights that could be gained by understanding how patients perceive the care they receive—particularly in socioeconomically disadvantaged areas like Muzaffargarh.

To address this gap, the present study employs a structured questionnaire grounded in the Donabedian model, which examines three key dimensions: structural readiness, service delivery processes, and treatment outcomes. By capturing feedback directly from patients, the study aims to provide a more accurate and holistic assessment of the quality of care at BHUs. The findings are expected to guide evidence-based interventions, support localized policy reforms, and improve planning and delivery of primary healthcare services at the grassroots level. This rigorous evaluation will help identify the existing challenges and barriers, thereby enabling the development of targeted strategies to enhance healthcare delivery and patient satisfaction in rural communities.

Aims and Objectives

Aims

This study aims to evaluate the overall quality of primary healthcare services provided at Basic Health Units (BHUs) in Muzaffargarh district, Pakistan, by examining the structural, process, and outcome dimensions of service delivery based on patient experiences.

Objectives

To assess the structural quality of BHUs in terms of infrastructure, availability of essential equipment, and adequacy of medical resources.

To evaluate the process quality of primary healthcare services, including adherence to clinical protocols, continuity of care, and effectiveness of patient–provider communication.

To measure the outcome quality of healthcare services at BHUs, focusing on patient satisfaction, perceived health improvements, and cost-effectiveness of care.

Research Questions

In line with the study objectives, the following research questions are formulated to evaluate the structural, process, and outcome quality of primary healthcare services at BHUs in Muzaffargarh:

What is the structural quality of Basic Health Units (BHUs) in Muzaffargarh in terms of infrastructure, availability of essential equipment, and adequacy of medical resources?

What is the process quality of healthcare services at BHUs, particularly regarding adherence to clinical protocols, continuity of care, and the effectiveness of patient–provider communication?

What is the outcome quality of healthcare services at BHUs, based on patient satisfaction, perceived health improvements, and cost-effectiveness of care?

Significance of the Study

Basic Health Units (BHUs) form the backbone of primary healthcare delivery in rural Pakistan. Despite their importance, they often face critical challenges such as inadequate infrastructure, shortage of trained staff, limited availability of medicines, and poor communication between patients and providers (Ministry of National Health Services, Regulations and Coordination, 2021). These issues are particularly evident in socioeconomically disadvantaged districts like Muzaffargarh, where access to quality healthcare is vital yet limited.

While most assessments of BHUs rely on administrative records or facility audits, these do not reflect the real-world experiences of patients (World Health Organization, 2018). This study addresses that gap by directly incorporating patient feedback, using the Donabedian model to evaluate the structural, process, and outcome dimensions of service quality (Donabedian, 1988). It offers a patient-centered approach to

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understanding how healthcare is delivered and perceived at the community level.

The findings of this study will be significant in informing local and provincial health authorities about the strengths and weaknesses of BHU performance in Muzaffargarh. The evidence generated can support better policy decisions, targeted improvements in service delivery, and more efficient resource allocation (Creswell & Creswell, 2018). Moreover, this research contributes to broader efforts in improving primary healthcare systems in rural Pakistan by highlighting the value of patient perspectives in healthcare quality evaluation.

Research Gap and Rationale of the Study

In Pakistan, Basic Health Units (BHUs) are designed to serve as the primary point of care for rural populations, offering essential health services close to communities. However, numerous studies and government reports have highlighted persistent issues in BHUs, such as poor infrastructure, irregular medicine supply, limited diagnostic services, and insufficient staffing (Ministry of National Health Services, Regulations and Coordination, 2021; UNICEF, 2023). Despite these well-documented challenges, existing evaluations largely rely on administrative data, stock audits, or staffing records, which fail to reflect the lived experiences of patients and the actual quality of care delivered.

There is a noticeable lack of comprehensive, patient-centered research that systematically assesses the quality of services using standardized evaluation models such as the Donabedian framework. Specifically, little evidence exists from underserved districts like Muzaffargarh, where the burden of disease is high, and the quality of service delivery at BHUs has significant implications for community health outcomes. Most available studies tend to focus on urban areas or higher-level facilities, leaving a gap in understanding the performance and effectiveness of rural primary care systems from the perspective of service users.

This study aims to fill that gap by applying a structured, patient-focused assessment tool based on the Donabedian model, evaluating structural readiness, service delivery processes, and outcomes at BHUs in Muzaffargarh. The rationale for selecting Alipur and Jatoi tehsils lies in their high patient flow, which offers a practical context to capture real user experiences. By integrating patient feedback into the evaluation process, this study not only contributes to academic literature but also provides actionable insights for policymakers and healthcare planners seeking to strengthen primary healthcare delivery in rural Pakistan.

Delimitations of the Study

The delimitations of this study outline the specific boundaries set by the researcher to maintain focus and feasibility. These include:

Geographic Scope: The study is limited to Basic Health Units (BHUs) in **Alipur** and **Jatoi** tehsils of Muzaffargarh district only.

Type of Facility: Only public sector BHUs are included; other facilities like RHCs, Dispensaries, and private clinics are excluded.

Respondent Focus: The study includes patients only; views of doctors, staff, or policymakers are not considered.

Framework Used: The assessment is restricted to structural, process, and outcome quality based on the Donabedian model.

Operational Definitions

The following key terms are defined as they are used within the context of this study:

Primary Health Care (PHC)

PHC refers to essential health care made universally accessible to individuals and families in the community through full participation and at a cost the community can afford (World Health Organization [WHO], 1978).

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Basic Health Unit (BHU)
A BHU is a public sector facility that provides primary healthcare services in rural areas of Pakistan, typically covering a population of 10,000 to 15,000. It is staffed with a medical officer and basic support staff, offering outpatient services, maternal and child health care, and preventive services (Government of Pakistan, 2021).

Healthcare Quality
Quality of care is defined as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Institute of Medicine, 2001).

Patient Satisfaction
Patient satisfaction is the degree to which patients perceive that their expectations of healthcare services have been met. It is a key outcome indicator of service quality (Batbaatar et al., 2017).

Structural Quality
Refers to the physical and organizational infrastructure of a health facility, including equipment, human resources, and availability of essential supplies (Donabedian, 1988).

Process Quality
Refers to the actual delivery of healthcare, such as diagnostic accuracy, adherence to treatment protocols, communication, and interpersonal behavior (WHO, 2018).

Outcome Quality
Represents the effects of healthcare on the health status of patients, including recovery, functional improvement, and satisfaction (Donabedian, 1988).CHAPTER 2: LITERATURE REVIEW
This chapter reviews relevant literature to understand the concept of healthcare quality, its measurement, and its application to Basic Health Units (BHUs) in Pakistan, particularly in rural contexts
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Quality in Healthcare
Quality in healthcare is a multidimensional concept that encompasses the extent to which health services provided to individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Donabedian, 1988). The idea of quality extends beyond clinical effectiveness to include aspects such as safety, equity, responsiveness, and patient-centeredness. In many healthcare settings, especially within low- and middle-income countries, defining and measuring quality becomes even more critical due to the persistent challenges of limited infrastructure, under-resourced facilities, and unequal access to care (World Health Organization [WHO], 2006).
Donabedian (1988), one of the pioneers in the field of healthcare quality assessment, introduced a widely adopted model that classifies quality into three major categories: structure, process, and outcome. Structural quality refers to the physical and organizational aspects of healthcare facilities such as infrastructure, equipment, and staffing levels. Process quality relates to how care is delivered, including interactions between patients and providers, adherence to clinical guidelines, and timeliness of services. Outcome quality, on the other hand, measures the impact of healthcare services on the health status of patients and populations, including mortality rates, recovery levels, and patient satisfaction.
In the context of Pakistan's primary healthcare system, these dimensions provide a useful lens to assess service delivery at Basic Health Units (BHUs). As the first point of contact for many rural populations, BHUs play a vital role in delivering accessible and affordable care. However, issues such as inadequate staffing, lack of medical supplies, and poor communication often hinder their effectiveness (Nishtar et al., 2013). To evaluate the quality of healthcare

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comprehensively, it is essential to consider all three dimensions structural, process, and outcome — as patients' experiences are shaped by the integration of these elements (Alhassan et al., 2015).

Moreover, modern definitions of quality emphasize patient-centered care, a critical component that has gained traction in recent years. Mosadeghrad (2013) defined quality healthcare as "consistently delighting the patient by providing efficacious, effective, and efficient healthcare services according to the latest clinical guidelines and standards, which meet the patient's needs and satisfy providers." This definition highlights the importance of aligning clinical excellence with patients' expectations and satisfaction levels.

As healthcare delivery becomes more complex, especially in under-resourced settings like Muzaffargarh, assessing quality through a comprehensive and patient-focused approach becomes crucial. In this light, understanding how patients perceive healthcare quality and whether the services meet their expectations offers important insights for improving primary care delivery and for achieving health equity at the grassroots level.

Patient Perception of Quality Healthcare

Patient perception plays a pivotal role in evaluating the quality of healthcare services, especially in primary care settings such as Basic Health Units (BHUs). Unlike traditional biomedical indicators that rely solely on clinical outcomes, patient perception reflects the experiential and subjective dimension of care, offering insights into how healthcare services are received and valued by the users themselves (Atinga et al., 2011). This perspective is crucial because it helps healthcare providers and policymakers align services more closely with patient expectations, leading to improved satisfaction and better health outcomes.

Perceived quality is influenced by multiple factors, including staff behavior, facility cleanliness, waiting time, communication, accessibility, and availability of medicines and equipment. These experiential dimensions often determine whether a patient returns for follow-up care or recommends the facility to others (Andaleeb, 2001). In rural settings, where formal accountability mechanisms are often weak, the patient's perception becomes one of the few reliable indicators for service monitoring and improvement (World Bank, 2004).

Research from various developing countries, including Pakistan, underscores that poor communication, lack of respect, and inattentiveness from medical staff are among the top complaints expressed by patients using primary healthcare services (Batbaatar et al., 2017). These non-clinical aspects, though seemingly minor, significantly influence whether patients trust and continue to use health services. According to a study conducted by Ahmed et al. (2018), interpersonal behavior of the medical staff was one of the strongest predictors of patient satisfaction in public health facilities in Punjab.

Furthermore, cultural and social factors shape how patients perceive and interact with the healthcare system. In patriarchal societies, for example, female patients may feel uncomfortable or disrespected when examined by male doctors or when privacy is not ensured. Similarly, perceptions of negligence can emerge when patients see no clear communication about diagnosis, treatment, or follow-up procedures (Shaikh & Hatcher, 2005). These nuanced factors contribute to a broader understanding of how "quality" is experienced and judged by the service users.

Importantly, understanding patient perception also helps in identifying service delivery gaps and mismatches between provider intentions and patient needs. For instance, a doctor may prioritize clinical accuracy, whereas a patient may place higher importance on empathy and attentiveness. Bridging this gap requires active listening, culturally sensitive practices, and

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sustained efforts to improve communication between providers and users (Larson et al., 2019). Therefore, incorporating patient perspectives into quality assessment frameworks is not merely an ethical imperative but also a strategic necessity for improving primary healthcare. Especially in the context of Pakistan's BHUs, understanding patient perceptions enables a bottom-up approach to health system reform — one that values the voices of those most affected by healthcare disparities.

Frameworks for Assessing Quality in Primary Healthcare

Assessing the quality of healthcare, particularly in primary care settings, demands a structured framework to ensure that both service delivery and patient experience are evaluated comprehensively. Over the years, various theoretical models have been developed to define and measure healthcare quality, each offering a unique lens for understanding what constitutes "good" healthcare.

One of the most widely used models is Donabedian's Framework, which classifies quality assessment into three dimensions: structure, process, and outcomes (Donabedian, 1988). Structural components refer to the physical and organizational infrastructure — such as staff availability, facility condition, and equipment. Process elements focus on how care is delivered — including diagnosis accuracy, communication, and timeliness. Outcome measures consider the effects of care on patient health and satisfaction. This framework is especially relevant in evaluating BHUs in Pakistan, where both structural deficiencies and process inefficiencies often coexist.

The World Health Organization (WHO) has also emphasized quality in healthcare through its people-centered care framework, stressing accessibility, safety, equity, and continuity as core elements (WHO, 2006). This approach aligns with the Sustainable Development Goals (SDGs), particularly SDG 3, which calls for universal health coverage and access to quality essential healthcare services. It provides a policy-oriented structure for national healthcare systems, including Pakistan, to benchmark progress and identify gaps in service delivery.

Another important model is the SERVQUAL framework, originally developed for the service industry but increasingly adapted for healthcare settings. This model assesses quality across five dimensions: tangibles (physical facilities and appearance), reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1988). Its strength lies in measuring the gap between patient expectations and perceptions, thus offering a dynamic understanding of patient satisfaction. In BHUs, SERVQUAL has been employed to study how facility cleanliness, staff attitude, and response times shape patient judgments of care quality.

The Primary Health Care Performance Initiative (PHCPI) provides a global framework focusing on five key areas: governance and leadership, inputs, service delivery, outputs, and outcomes. It promotes data-driven decision-making and local system improvements by integrating patient feedback into performance metrics (PHCPI, 2018). This model is especially applicable to low-resource settings like rural Pakistan, where system-level accountability and real-time data are often lacking.

Lastly, the Health Systems Framework by WHO outlines six building blocks of a health system: service delivery, health workforce, health information systems, access to essential medicines, financing, and leadership/governance (WHO, 2007). This comprehensive model links quality improvement with system-wide reforms and can guide national strategies in strengthening BHUs and similar facilities.

By using such frameworks, policymakers and researchers can not only assess current service quality but also design targeted interventions that address specific weaknesses. In Pakistan's context, where BHUs often suffer from chronic underfunding, staff shortages, and weak

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monitoring, structured quality assessment frameworks offer a roadmap for scalable and sustainable improvement.

Challenges to Quality Service Delivery at BHUs in Pakistan

Basic Health Units (BHUs) form the cornerstone of Pakistan's primary healthcare system, especially in rural and underserved areas. Despite their strategic importance, a multitude of interrelated challenges continue to hinder the quality and effectiveness of services provided through these centers. These challenges span infrastructure, workforce, governance, and socio-cultural dimensions, all of which undermine the system's ability to meet the healthcare needs of the population.

One of the most prominent barriers is the inadequacy of infrastructure and physical facilities. Many BHUs in Pakistan lack basic amenities such as electricity, clean drinking water, sanitation, and proper buildings (Shaikh & Hatcher, 2005). This discourages both staff and patients, impacting patient safety and comfort. A WHO facility assessment report revealed that more than 30% of rural health centers in Pakistan operate in dilapidated conditions with no reliable source of power, which affects laboratory services and the storage of medicines requiring refrigeration.

A related issue is the shortage and irregular presence of qualified medical personnel, including doctors, nurses, and paramedics. Despite official postings, absenteeism among medical staff is widespread in rural areas due to lack of incentives, poor monitoring, and difficult working conditions (World Bank, 2014). This not only causes delays and neglect in patient care but also leads to a loss of trust in the health system. Studies have consistently shown that patients are more likely to bypass BHUs and seek care at secondary or tertiary hospitals, leading to overcrowding and inefficiency at higher levels of the system.

Unavailability of essential medicines and diagnostic equipment further reduces the utility of BHUs. Patients are often prescribed medication that is not available on-site, forcing them to buy from private pharmacies, which may be far away or unaffordable (Nishtar, 2010). Additionally, the lack of functional laboratory equipment and diagnostic tools compromises the accuracy and efficiency of care. Without adequate diagnostics, healthcare providers rely on symptomatic treatment, which can lead to misdiagnosis and ineffective care.

Governance and administrative inefficiencies play a central role in exacerbating these issues. Weak supervision, absence of performance audits, corruption, and political interference in appointments hinder effective management of BHUs. Moreover, decentralization efforts under various health sector reforms have not been uniformly implemented across provinces, leading to fragmentation and inconsistency in health service delivery (Khan et al., 2018). Budget allocations for primary care are often insufficient and mismanaged, with little community involvement or transparency in how funds are used.

Another critical challenge is poor patient-provider communication and cultural barriers. In many areas, healthcare providers do not speak the local language fluently or fail to understand cultural sensitivities, especially in maternal and reproductive health. This disconnect results in poor compliance with treatment plans and low levels of patient satisfaction. In patriarchal rural communities, female patients often feel uncomfortable discussing health concerns with male providers, and there is minimal provision for female medical staff in several BHUs.

Lastly, transport and geographic accessibility issues limit patients' ability to visit BHUs, especially in remote or flood-prone areas. Many people have to travel long distances, often on foot or by unreliable transport, to access primary healthcare. This leads to delays in seeking care and higher rates of preventable complications.

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In summary, the quality of service delivery at BHUs in Pakistan is constrained by systemic, structural, and sociocultural factors. Any meaningful reform or intervention must holistically address these challenges through policy innovation, capacity building, and local community engagement to ensure that BHUs fulfill their foundational role in the country's healthcare system.

Challenges to Quality Service Delivery at BHUs in Pakistan

Basic Health Units (BHUs) are critical for delivering primary healthcare to rural populations in Pakistan. However, several structural and systemic barriers continue to impede the quality of services they offer.

A 2024 WHO Eastern Mediterranean Regional Office (EMRO) assessment across multiple BHUs in Punjab, including Muzaffargarh, documented severe infrastructural deficiencies. These included non-functional clinical equipment, lack of essential diagnostic tools like ultrasound machines, and sanitation issues. In 14% of the facilities surveyed, medical instruments were either missing or outdated, directly affecting maternal and child health service delivery (Tahir et al., 2024).

Another evaluation conducted in Rawalpindi District in 2024 revealed that only seven out of one hundred BHUs met the basic quality assurance benchmarks established by the Punjab Healthcare Commission. These gaps were found in areas such as equipment maintenance, medicine availability, staffing levels, and infection control protocols (Mirza, 2024). The findings pointed toward systemic negligence and a lack of sustainable investment in rural health infrastructure.

The shortage of skilled medical staff remains a significant issue. According to national workforce data published in 2025, Pakistan has a doctor-to-patient ratio of approximately 1:1300, far below the WHO recommended standard of 1:1000 (Kamal, 2025). Doctors and trained personnel often avoid postings in rural areas due to poor working conditions, limited professional growth, and safety concerns, thereby contributing to the persistent human resource crisis at BHUs.

In terms of logistics, a widespread problem is the stock-out of essential medicines. Anti-venom, anti-rabies vaccines, and life-saving antibiotics were found missing in 32% of surveyed BHUs in Punjab as per a 2024 healthcare facility audit. Additionally, laboratory support was absent in over half of the facilities, undermining the basic diagnostic capabilities needed for proper treatment protocols (Tahir et al., 2024).

Studies from Khyber Pakhtunkhwa and Sindh confirm these challenges are not localized but systemic. Khurshid et al. (2021) highlighted high patient wait times, inefficient referral mechanisms, poor medical waste management, and lack of preventive education programs. Similarly, a 2023 assessment of PHC centers in Peshawar revealed inconsistent family planning services, the absence of emergency transport, and under-equipped laboratories, even though overall operational functionality was considered acceptable (Shah et al., 2023).

Cultural and social barriers further exacerbate the situation. A 2025 qualitative research study on maternal health access in Punjab revealed that women, especially in conservative rural settings, are reluctant to visit male health providers and often face discourteous behavior from staff. The study also documented a lack of privacy and poor doctor–patient communication as key reasons for service dissatisfaction and low revisit intention (Khan et al., 2025).

Moreover, recent quantitative data analyses from urban PHC settings have shown a positive correlation between service quality and patient satisfaction, including likelihood of revisits. While these findings are promising, there remains a dearth of equivalent research in rural BHU contexts, which limits the formulation of evidence-based improvement strategies (Heliyon, 2024).

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Collectively, these studies underline the multifaceted nature of challenges in BHUs—ranging from infrastructure and workforce shortages to sociocultural barriers and systemic inefficiencies. Without addressing these issues through coordinated policy reforms, the quality of primary healthcare in rural Pakistan will remain suboptimal and inequitable.

Gaps in the Existing Literature

While a wide range of studies has been conducted globally and nationally on primary healthcare services, particularly in developing countries, significant gaps remain in the existing literature—especially in the context of rural Pakistan. These gaps present opportunities for focused research that can contribute meaningfully to healthcare policy and service delivery models.

One of the critical shortcomings observed in previous literature is the limited attention given to the patients' perspectives. Most evaluations of Basic Health Units (BHUs) have relied heavily on provider reports, administrative data, or macro-level indicators such as service utilization or disease prevalence (Ahmad et al., 2022; Hafeez et al., 2019). While such data is valuable, it often neglects the subjective experience of care—factors such as dignity, empathy, respect, and communication—that significantly influence patients' perceptions of quality (Mosadeghrad, 2013; WHO, 2021).

Another notable gap lies in the lack of regional specificity. Much of the literature treats rural Pakistan as a homogenous unit, overlooking variations in healthcare delivery across districts, provinces, and even within tehsils. Muzaffargarh, for instance, is rarely the focal point of in-depth primary healthcare research despite its unique demographic challenges, poverty levels, and geographic isolation (Nishtar et al., 2019). This lack of localized studies leads to generalized conclusions that may not effectively inform targeted interventions.

Additionally, while several studies explore healthcare availability—such as the presence of staff or stock-outs of medicine—they often fail to assess accessibility and acceptability, including transportation, cultural barriers, language, and gender dynamics. These elements are critical in rural areas where conservative traditions, long travel distances, and gendered norms heavily shape healthcare utilization (Ameh et al., 2017).

Further, there is a methodological gap in the form of absence of mixed-methods or patient-centric frameworks. Very few studies apply validated service quality models such as SERVQUAL or Donabedian's Structure-Process-Outcome (SPO) framework when evaluating BHU performance. This hinders comparability across regions and limits the depth of insight into patient satisfaction and perceived healthcare quality (Donabedian, 1988; Parasuraman et al., 1985).

Finally, recent developments in healthcare governance, such as the devolution of health services to provincial governments, have not been sufficiently studied in the context of their impact on BHUs. The operational changes and administrative challenges post-18th Amendment are under-researched, especially with regard to how they affect frontline healthcare delivery in rural districts like Muzaffargarh (Khan & Khan, 2021).

In summary, these research gaps—particularly regarding patient perception, localized assessment, service acceptability, and use of analytical frameworks—highlight the need for the current study. Addressing these issues can provide actionable insights for improving the quality and reach of BHU services in Pakistan.

Need for Patient-Centered Evaluation of BHUs

The prevailing focus in healthcare assessments often leans heavily toward provider-centric metrics such as staff availability, drug stock, or infrastructure development. While these are undeniably important, they fail to reflect how patients perceive and interact with healthcare

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services. Patient satisfaction, communication, dignity, and trust—all crucial to sustained healthcare utilization—are inadequately studied in the context of Pakistan's rural BHUs (Ahmed et al., 2023). This limitation contributes to an incomplete understanding of service quality.

Studies conducted by Malik et al. (2022) highlight that when patients' experiences are ignored, even technically sound services may go underutilized due to issues like rude behavior of staff, long waiting times, or lack of gender sensitivity. Similarly, evidence suggests that improved communication between healthcare providers and patients enhances treatment compliance and overall satisfaction, which are strong indicators of service effectiveness (Farooq & Zafar, 2023).

In the rural health system of Muzaffargarh, where cultural norms, literacy levels, and poverty influence health-seeking behavior, capturing the voices of patients is not just valuable—it is essential. Without this lens, efforts to improve service delivery risk being misdirected. Therefore, there is a pressing need for a structured, patient-centered evaluation that investigates not only physical and technical elements but also the social and behavioral dynamics within BHUs.

Theoretical Framework

To assess the quality of primary healthcare (PHC) services from the patient's perspective, it is essential to rely on a sound theoretical foundation. One of the most influential models in healthcare quality assessment is Donabedian's Model, introduced by Avedis Donabedian (1988). This model categorizes healthcare quality into three interrelated dimensions: structure, process, and outcome. The structure refers to the physical and organizational attributes of healthcare settings, such as infrastructure, human resources, and equipment. The process encompasses the methods of healthcare delivery, including the interactions between patients and providers, diagnosis accuracy, communication, and timeliness. Finally, the outcome focuses on the results of care, such as changes in health status, patient satisfaction, and perceived effectiveness of treatment.

In the context of evaluating Basic Health Units (BHUs) in rural Pakistan, Donabedian's framework offers a comprehensive and applicable approach. For example, a BHU may have sufficient physical resources and qualified staff (structure), but if patients encounter poor communication, unempathetic behavior, or procedural inefficiencies (process), then their satisfaction and compliance (outcome) are likely to decline. Thus, a holistic understanding of quality assessment requires simultaneous evaluation of all three domains. This model allows researchers and policymakers to pinpoint where quality lapses occur and which aspects require the most urgent attention.

The model has been widely applied in various low- and middle-income countries (LMICs) to study service quality in primary care settings. For instance, Nasir, Abbas, and Akram (2022) applied Donabedian's framework to maternal health services in Punjab and concluded that while the structural elements were moderately adequate, deficiencies in the process—particularly provider behavior—diminished patient satisfaction. Similarly, Khokhar and Abbas (2023) demonstrated that patients' satisfaction with rural PHC services in Sindh was more closely linked with process quality, such as respect and empathy, than with infrastructure alone. These studies reinforce the relevance of Donabedian's model in evaluating not just what services are provided, but how they are delivered and experienced by patients.

By grounding the current study in this theoretical framework, the analysis is better positioned to identify and interpret gaps in the quality of care in BHUs from the perspective of patients. Donabedian's model also enhances the study's credibility by aligning it with internationally recognized standards for evaluating healthcare services.

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Hypotheses Development and Conceptual Framework

The literature review highlighted that the quality of healthcare is influenced by various factors, which are broadly categorized into three domains: structure, process, and outcome of care delivery (Donabedian, 1988; Akhtar et al., 2023; Khan et al., 2022). These three components provide a logical foundation for formulating hypotheses and constructing the conceptual model of this study.

Structure refers to the physical and organizational infrastructure of the Basic Health Units (BHUs), such as the availability of sanitary conditions, medical equipment, essential medicines, and qualified staff. Numerous studies have suggested that well-structured healthcare facilities are more likely to deliver quality services and positively influence patient satisfaction (WHO, 2022; Mahmood et al., 2021). In light of this, the following hypothesis is formulated:

H1: There is a significant positive relationship between the structural quality of BHUs and patient satisfaction with primary healthcare services.

Process indicators reflect the interactions between healthcare providers and patients, such as the behavior of doctors, cooperation of staff, waiting times, and proper management of services. According to past research, the quality of processes within healthcare settings substantially affects how patients perceive and evaluate healthcare delivery (Ahmed & Saeed, 2020; Qureshi et al., 2022). Hence, this leads to the second hypothesis:

H2: There is a significant positive relationship between the process quality of BHUs and patient satisfaction with primary healthcare services.

Outcome refers to the final result of healthcare service delivery from the perspective of the patient, including satisfaction, recovery, and willingness to revisit or recommend the BHU. As supported by several empirical findings, favorable patient outcomes are often the consequence of adequate structure and process elements (Alam et al., 2023; Saeed et al., 2022). Therefore, the following hypothesis is suggested:

H3: There is a significant positive relationship between healthcare outcomes and patient satisfaction with primary healthcare services.

Given that each component of the Donabedian model contributes uniquely to overall service delivery, this study posits an integrated view that:

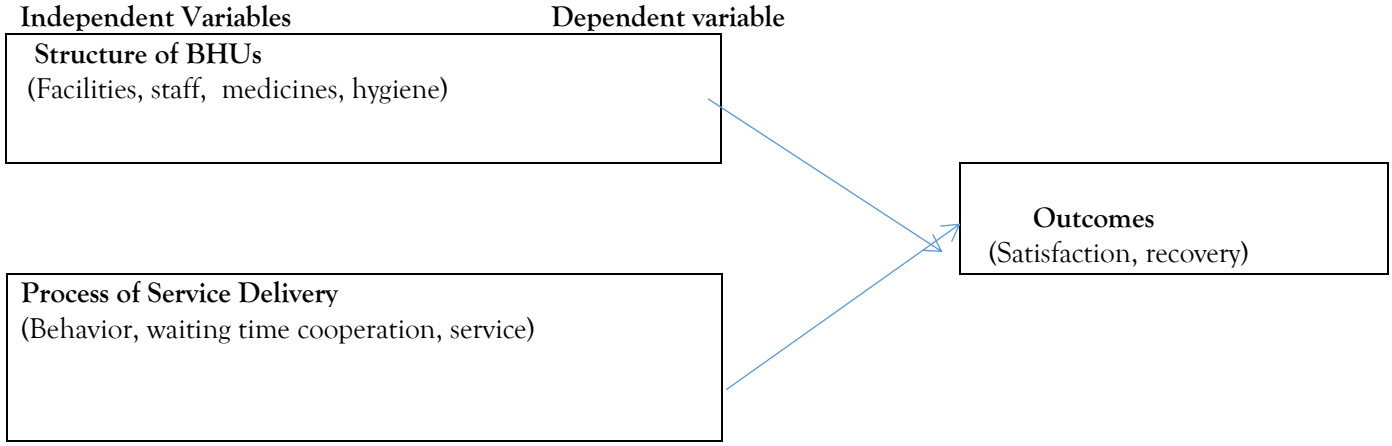
H4: Structure and process jointly mediate the relationship between service inputs and healthcare outcomes in BHUs.

Conceptual Framework of the Study

Below is a conceptual representation that illustrates the relationships between the main variables based on the Donabedian model and supported by the derived hypotheses.

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Structure and Process directly influence Outcomes, which in turn influence Patient Satisfaction. This framework integrates the hypothesized relationships and guides the empirical analysis.

CHAPTER 3: RESEARCH METHODOLOGY

Introduction

This chapter outlines the research design, population and sample, data collection tools, procedures, and analytical methods employed to assess the quality of primary healthcare services in selected BHUs of Muzaffargarh. It also addresses ethical considerations and limitations of the study.

Research Design

This study employs a descriptive cross-sectional design using a quantitative approach to collect data from patients attending Basic Health Units (BHUs). A cross-sectional design allows for the collection of data at one point in time, which is particularly useful in evaluating service delivery and patient satisfaction (Levin, 2006). The quantitative method facilitates objective measurement and statistical analysis of variables related to structure, process, and outcomes of healthcare services.

Study Area and Population

The study was conducted in Basic Health Units (BHUs) located in Alipur and Jatoi tehsils of Muzaffargarh District, Pakistan. These two tehsils were selected based on their high patient load, geographic diversity, and accessibility. BHUs represent the first level of contact in the healthcare system for rural communities and are vital in understanding the real-time effectiveness of primary healthcare (Pakistan Bureau of Statistics, 2022).

The target population included patients aged 18 and above who had received any medical service from the selected BHUs within the past week. Only those patients who were mentally and physically able to respond to the questionnaire were considered.

Sampling Technique and Sample Size

A multi-stage sampling technique was applied. First, a list of BHUs from Alipur and Jatoi was obtained. Using simple random sampling, 6 BHUs (3 from each tehsil) were selected. In the second stage, patients were selected using systematic random sampling from the outpatient department (OPD) register.

The sample size was calculated using the Yamane formula (1967):

A sample of 400 respondents is selected for the survey at the selected BHUs. For data collection, each BHU will be visited for two days from July to September 2023. The sample of the respondent is calculated through the Yamane formula 1967: $n = N/(1+N(e)2)$

Where,

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n = Sample size
N = Total number of respondents
e = Level of precision (5% = 0.05)

Instrument for Data Collection

Data were collected using a structured questionnaire developed in alignment with Donabedian's model of healthcare quality, which divides service evaluation into three interrelated components: structure, process, and outcome (Donabedian, 1988). The questionnaire was designed to reflect the specific conditions of Basic Health Units (BHUs) in Muzaffargarh and included both closed-ended and a few open-ended items to allow for elaboration. A 5-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree" was employed to measure patient perceptions regarding various aspects of care.

The structure component focused on the physical and organizational attributes of the BHUs. It included items on the availability and functionality of infrastructure, the presence of essential medical staff, the adequacy of medicine supply, and overall hygiene and cleanliness within the facility. These indicators were adapted from prior studies conducted in similar resource-limited healthcare settings (Ameh et al., 2012; Zaidi et al., 2019). The process of service delivery was measured by assessing the interaction between patients and healthcare staff. Items evaluated the behavior of staff (courtesy, attentiveness), cooperation, communication skills, provision of information about medical procedures, and waiting time before being attended to. This section was informed by the findings of Basharat and Shaikh (2017) and further refined to capture nuanced experiences at BHUs.

The outcome variables aimed to capture the consequences of service utilization. These included patient satisfaction with care received, perceived recovery or treatment effectiveness, and their willingness to recommend the BHU to others or revisit in the future. Such outcome measures align with Mosadeghrad's (2013) conceptualization of quality assessment in public healthcare. In addition, the questionnaire included sections on utilization patterns, asking respondents how frequently they visited BHUs for specific services such as treatment of common illnesses, chronic diseases, acute respiratory infections (ARI), child immunizations, antenatal and postnatal care, family planning, laboratory tests, and delivery services.

Furthermore, socio-demographic variables such as age, gender, education level, marital status, language spoken, type of family (nuclear or joint), economic status, employment status, and the specific BHU visited were also included to explore any potential associations with the perceived quality and usage of services. These demographic indicators help contextualize variations in responses and provide insight into the differential healthcare experiences across population subgroups.

Validity and Reliability

Content validity was ensured by having the tool reviewed by three public health experts. A pilot study was conducted on 30 patients from a nearby BHU not included in the final sample. The reliability of the instrument was confirmed using Cronbach's Alpha, with values exceeding 0.7 for each domain, indicating acceptable internal consistency (Tavakol & Dennick, 2011).

Data Collection Procedure

Data was collected over a period of 4 weeks. Researcher approached patients after their consultation and administered the questionnaire face-to-face, ensuring anonymity and confidentiality. Each interview took approximately 15–20 minutes.

Informed consent was obtained, and participation was entirely voluntary. COVID-19 safety protocols (mask-wearing, hand sanitizing) were strictly followed.

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Ethical Considerations

This study was approved by the Ethical Review Committee of University. Respondents were informed about the purpose of the study, and their confidentiality and right to withdraw were assured. Data were securely stored and only used for academic purposes.

Limitations of the Study

Although the study captures valuable insights from the patient's perspective, several limitations exist:

The findings are limited to two tehsils and may not generalize to all BHUs in Punjab.

Self-reported data may be subject to recall or social desirability bias.

Only patients attending OPDs were considered, excluding insights from staff or management

CHAPTER 4: DATA ANALYSIS

This chapter consist of analysis of data collected from respondents attending BHUs in Muzaffargarh. It explores the important patterns and relationships between variables to assess and interpret the quality of health care servicesl

Reliability

Table Error! No text of specified style in document.**.1:** Reliability Statistics

Cronbach's Alpha	N of Items
0.842	30

The Cronbach's Alpha value is 0.842 for the 30 items included in the scale. This indicates a high level of internal consistency, meaning that the items in the questionnaire are reliably measuring the same underlying concept. A value above 0.8 is generally considered good, so this scale is suitable for further analysis.

Demographics

Table Error! No text of specified style in document.**.2:** Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	252	59.2	59.2	59.2
	female	174	40.8	40.8	100.0
	Total	426	100.0	100.0	

Out of a total of 426 respondents, 252 were male, making up 59.2 percent of the sample, while 174 were female, accounting for 40.8 percent. This shows that male participants were in the majority, indicating a gender imbalance in the study. The unequal representation could be due to cultural or social factors affecting participation. This difference should be considered when analyzing gender-influenced findings.

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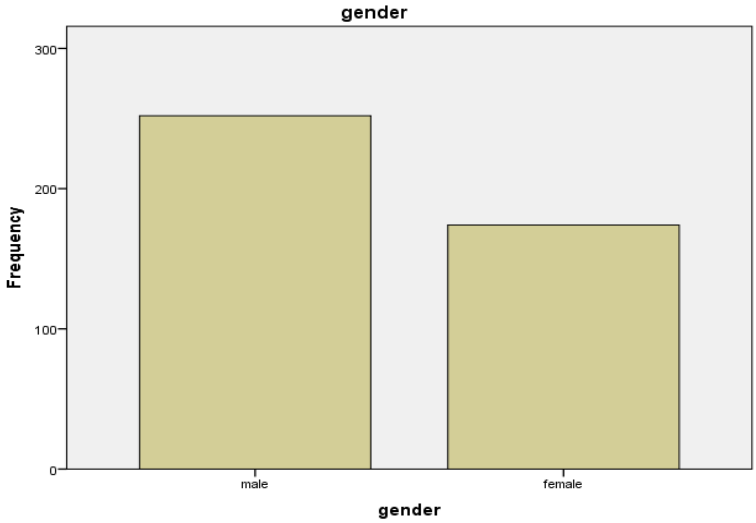


Figure 1: Gender

Table Error! No text of specified style in document.**.3: Tehsil**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alipur	305	71.6	71.6	71.6
	Jatoi	121	28.4	28.4	100.0
	Total	426	100.0	100.0	

In terms of tehsil-wise distribution, 305 respondents (71.6 percent) were from Alipur, while 121 respondents (28.4 percent) were from Jatoi. This indicates a higher representation from Alipur in the sample. The imbalance might be due to factors such as population size or ease of access. As a result, the findings may reflect Alipur's conditions more than those of Jatoi.

Table Error! No text of specified style in document.**.4: Education level**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Illiterate	25	5.9	5.9	5.9
	Primary	30	7.0	7.0	12.9
	Middle	40	9.4	9.4	22.3
	Matric	37	8.7	8.7	31.0
	Intermediate	97	22.8	22.8	53.8
	Bachelor	147	34.5	34.5	88.3
	Master	48	11.3	11.3	99.5
	missing	2	.5	.5	100.0
	Total	426	100.0	100.0	

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Among the 426 respondents, the largest group held a bachelor's degree (34.5%), followed by those with intermediate education (22.8%) and a master's degree (11.3%). A smaller portion had completed matric (8.7%), middle (9.4%), or primary education (7.0%), while 5.9% were illiterate. Only 0.5% of responses were missing. This shows that the sample was largely composed of individuals with at least secondary-level education.

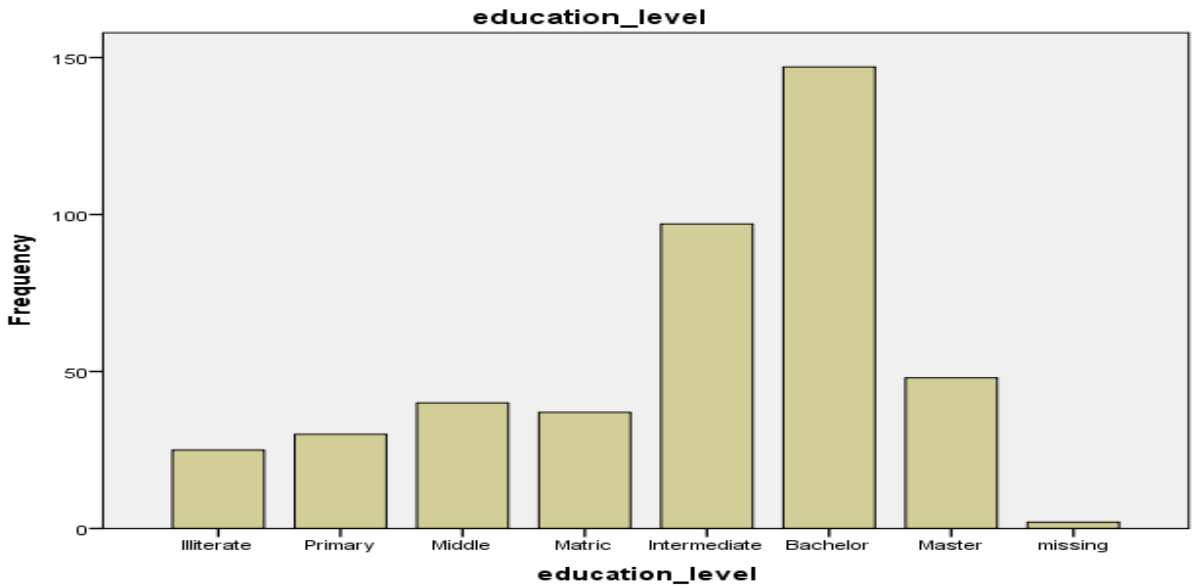


Figure 2: Education Level

Table Error! No text of specified style in document.**.5:** Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	146	34.3	34.3	34.3
	married	250	58.7	58.7	93.0
	Divorced	28	6.6	6.6	99.5
	missing	2	.5	.5	100.0
	Total	426	100.0	100.0	

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In the analysis of marital status among the 426 respondents, the majority were married, accounting for 58.7 percent of the sample. Single individuals made up 34.3 percent, while a smaller group of 6.6 percent were divorced. Only 0.5 percent of the data was missing. This distribution shows that most participants were married, which may influence certain perspectives or responses in the study.

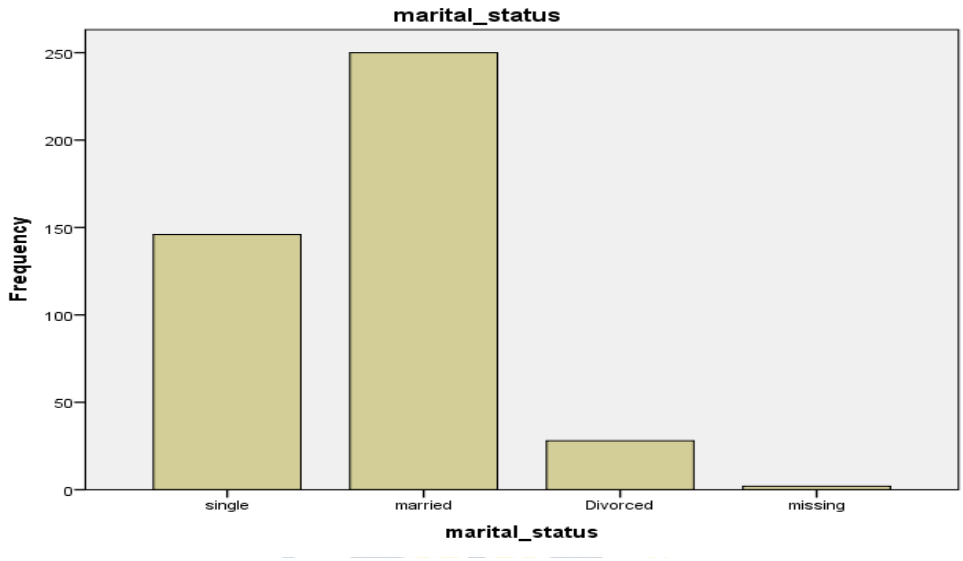


Figure 3: Marital Status

Table Error! No text of specified style in document.**.6: Family type**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nuclear	256	60.1	60.1	60.1
	Extended	160	37.6	37.6	97.7
	missing	10	2.3	2.3	100.0
	Total	426	100.0	100.0	

The data on family type shows that a majority of respondents, 60.1 percent, belonged to nuclear families, while 37.6 percent were part of extended families. Only 2.3 percent of responses were missing. This suggests that nuclear family structures are more common among the participants in this study.

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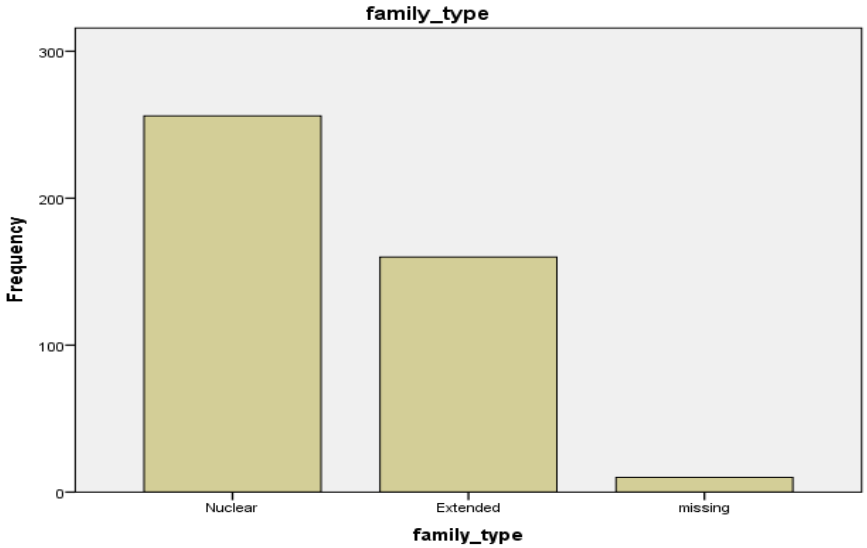


Figure 4: Family Type

Table Error! No text of specified style in document.**.7: Occupation**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unemployed	53	12.4	12.4	12.4
	Agriculture	67	15.7	15.7	28.2
	Wage laborer	55	12.9	12.9	41.1
	Personal Business	126	29.6	29.6	70.7
	Government job	93	21.8	21.8	92.5
	Private job	32	7.5	7.5	100.0
	Total	426	100.0	100.0	

The occupational data of the 426 respondents shows that the largest proportion, 29.6 percent, were engaged in personal businesses. This was followed by 21.8 percent working in government jobs and 15.7 percent involved in agriculture. Wage laborers made up 12.9 percent, while 12.4 percent were unemployed. A smaller segment, 7.5 percent, was employed in private sector jobs. This distribution highlights that self-employment and government jobs were the most common sources of livelihood among the participants.

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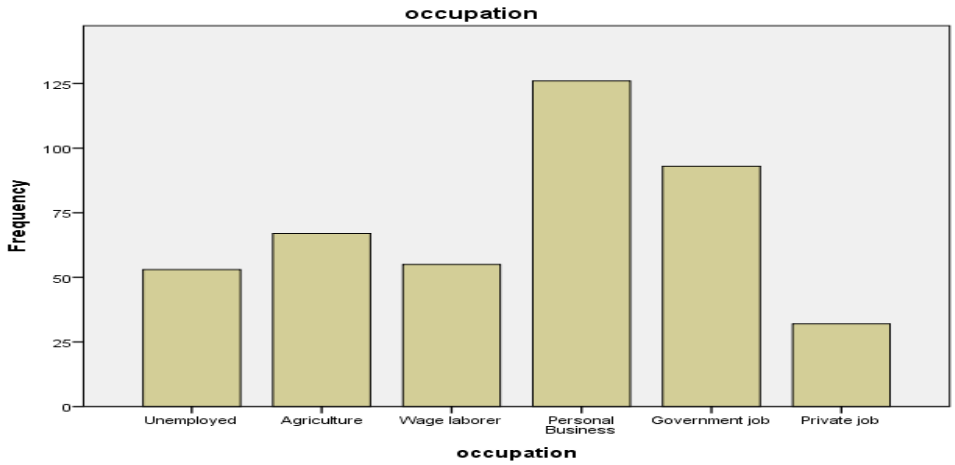


Figure 5: Occupation

Table Error! No text of specified style in document.**8: Economic status**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	48	11.3	11.3	11.3
	Fair	98	23.0	23.0	34.3
	good	271	63.6	63.6	97.9
	99	9	2.1	2.1	100.0
	Total	426	100.0	100.0	

The analysis of economic status among the 426 respondents indicates that a majority, 63.6 percent, considered their economic condition to be good. Another 23 percent described it as fair, while 11.3 percent identified themselves as poor. A small group of 2.1 percent fell into an unspecified or possibly miscoded category labeled "99." Overall, the data suggests that most participants viewed their economic situation positively.

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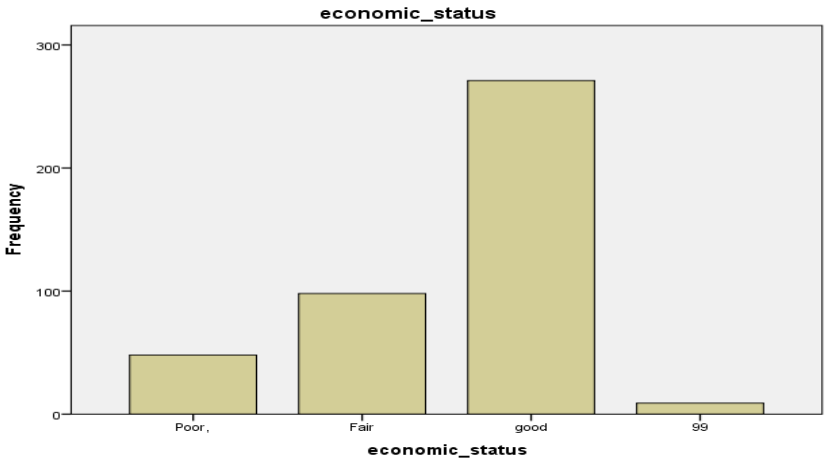


Figure 6: Economic Status

Table Error! No text of specified style in document.**.9: Age Group**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	142	33.3	33.6	33.6
	2.00	171	40.1	40.4	74.0
	3.00	80	18.8	18.9	92.9
	4.00	30	7.0	7.1	100.0
	Total	423	99.3	100.0	
Missing	System	3	.7		
Total		426	100.0		

The age distribution of the 426 respondents shows that the largest proportion, 40.4 percent, fell into the second age group (2.00), followed by 33.6 percent in the first age group (1.00). The third group (3.00) accounted for 18.9 percent, while only 7.1 percent belonged to the fourth age group (4.00). Data was missing for 0.7 percent of the respondents. This indicates that the majority of participants were relatively younger, with over 70 percent falling within the first two age categories.

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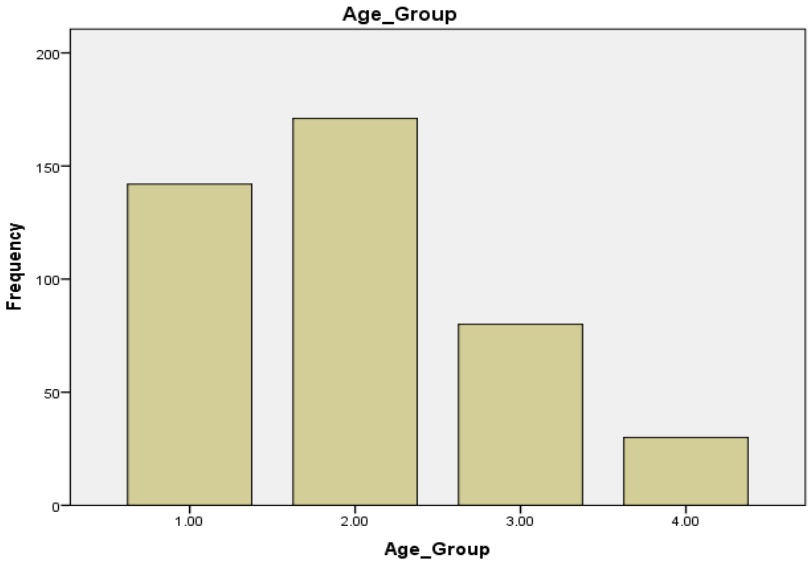


Figure 7: Age Group

Frequency Tables for Utilization of BHUs Services

Table Error! No text of specified style in document.**.10: Visit of BHU during Illness**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	416	97.4	98.3	98.3
	no	7	1.6	1.7	100.0
	Total	423	99.1	100.0	
Missing	System	4	.9		
Total		427	100.0		

The data reveals that a significant majority of respondents, 98.3 percent, reported visiting a Basic Health Unit (BHU) when ill, while only 1.7 percent did not. This indicates a high level of reliance on BHUs for treatment during illness. A small portion of responses (0.9 percent) was missing. The results suggest that BHUs play a vital role in providing primary healthcare services to the local population during times of illness.

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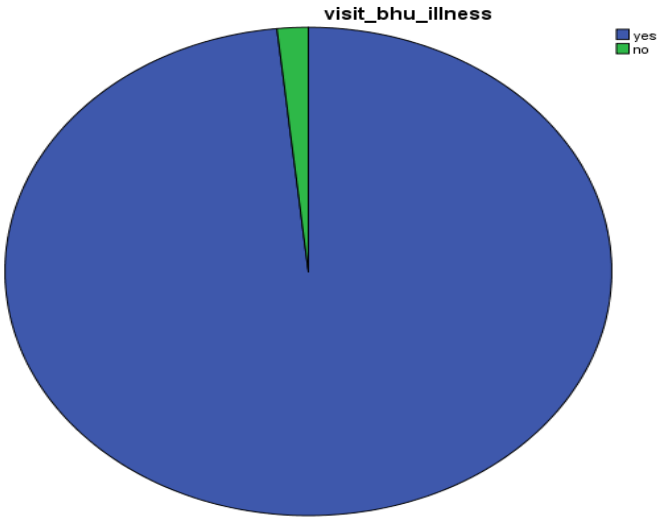


Figure 8: Visit of BHU during Illness

Table Error! No text of specified style in document.**.11: Visit BHU in 1 month**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One time	22	5.2	5.2	5.2
	More than one time	404	94.6	94.8	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data shows that 94.8 percent of respondents visited a Basic Health Unit (BHU) more than once in the last month, while only 5.2 percent visited one time. This indicates frequent utilization of BHU services within a short period. Just 0.2 percent of responses were missing, suggesting nearly complete participation in this question.

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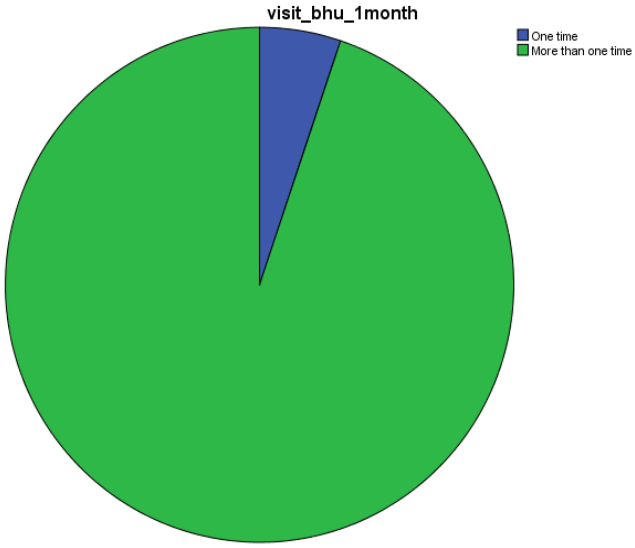


Figure 9: Visit BHU in 1 month

Table Error! No text of specified style in document.**.12:** Visit BHU in 2 months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One-time	20	4.7	4.7	4.7
	Two-times	86	20.1	20.2	24.9
	Three-times	182	42.6	42.7	67.6
	More than three-times	138	32.3	32.4	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data on visits to BHUs in the last two months shows that 42.7 percent of respondents visited three times, while 32.4 percent visited more than three times. Additionally, 20.2 percent visited twice, and only 4.7 percent visited once. This reflects a high frequency of BHU usage over a two-month period. Just 0.2 percent of responses were missing, indicating a strong response rate for this question.

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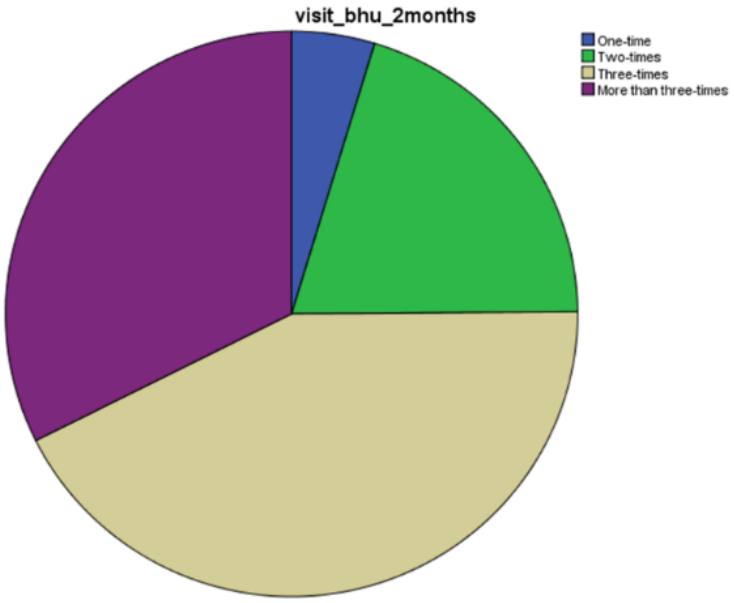


Figure 10: Visit BHU in 2 months

Table Error! No text of specified style in document.**13: Visit BHU in 3 months**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One-time	21	4.9	4.9	4.9
	Two-times	83	19.4	19.5	24.4
	Three-times	162	37.9	38.0	62.4
	More than three-times	160	37.5	37.6	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data regarding visits to BHUs in the last three months shows that 38.0 percent of respondents visited three times, while 37.6 percent visited more than three times. Additionally, 19.5 percent visited twice, and only 4.9 percent visited once. This indicates consistent and frequent use of BHU services over a three-month period. Only 0.2 percent of responses were missing.

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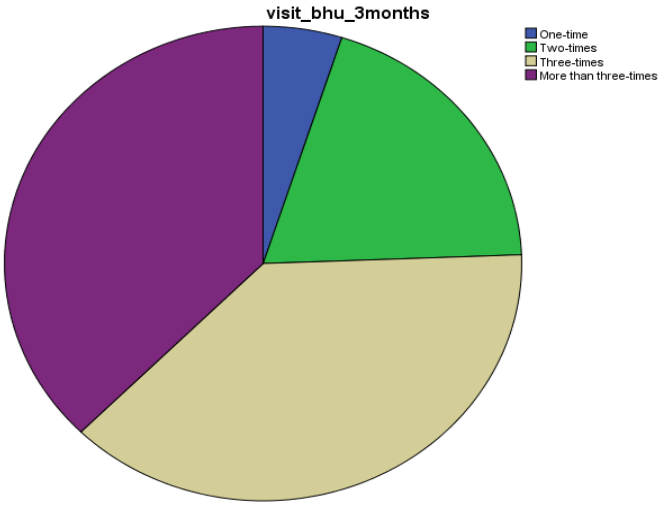


Figure 11: Visit BHU in 3 months

Table Error! No text of specified style in document.**.14: Visit ARI in 1 month**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	one time	28	6.6	6.6	6.8
	two timses	96	22.5	22.5	29.3
	three times	135	31.6	31.6	60.9
	More than three-times	167	39.1	39.1	100.0
	Total	427	100.0	100.0	

The data on visits to BHUs for Acute Respiratory Infections (ARI) in the last month shows that 39.1 percent of respondents visited more than three times, while 31.6 percent visited three times, and 22.5 percent visited twice. Only 6.6 percent visited once, and a negligible 0.2 percent had just a single entry. This indicates a high frequency of BHU visits for ARI treatment, reflecting both the prevalence of respiratory issues and reliance on BHU services for managing them.

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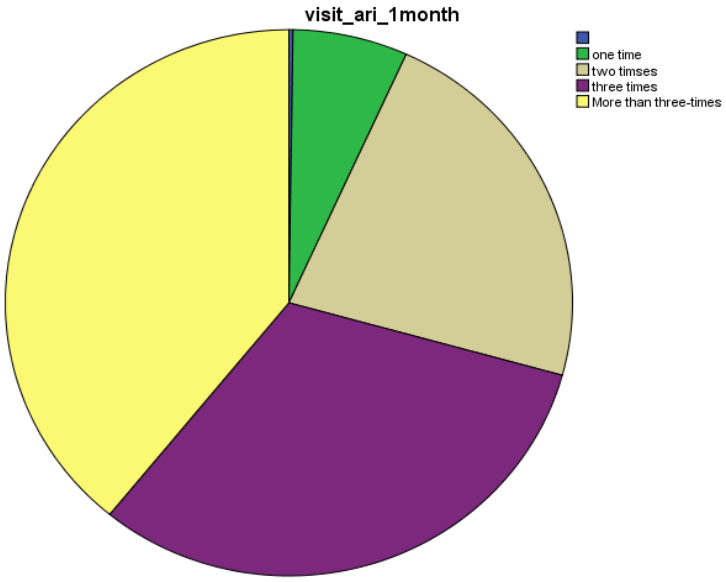


Figure 12: Visit ARI in 1 month

Table Error! No text of specified style in document.**15: Visit Childcare in 1 month**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One-time	23	5.4	5.4	5.4
	Two-times	99	23.2	23.2	28.6
	Three-times	145	34.0	34.0	62.7
	More than three-times	159	37.2	37.3	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data on visits to BHUs for child care and immunization in the last month shows that 37.3 percent of respondents visited more than three times, while 34.0 percent visited three times. Additionally, 23.2 percent visited twice, and 5.4 percent visited once. This indicates a high level of utilization of BHU services for child-related health needs. Only 0.2 percent of responses were missing.

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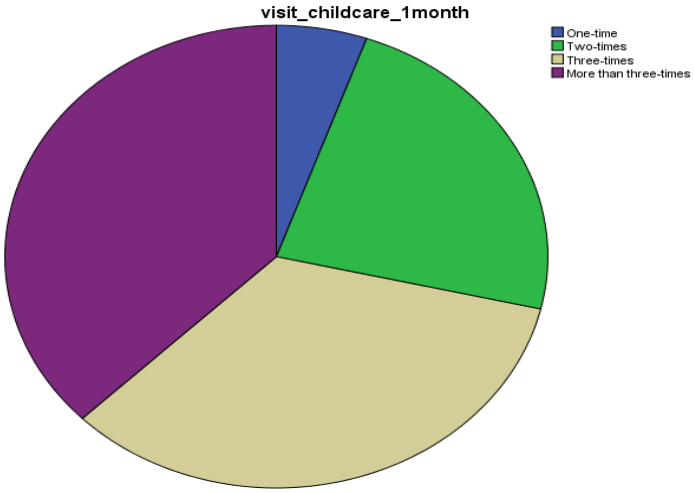


Figure 13: Visit Childcare in 1 month

Table Error! No text of specified style in document**..16:** Visit Antenatal in 1 month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No visit	49	11.5	11.5	11.5
	One-time	378	88.5	88.5	100.0
	Total	427	100.0	100.0	

The data on visits for antenatal and postnatal care in the last month shows that 88.5 percent of respondents visited a BHU at least once, while 11.5 percent reported no visit. This reflects a high level of engagement with BHU services for maternal healthcare. There were no missing responses for this question.

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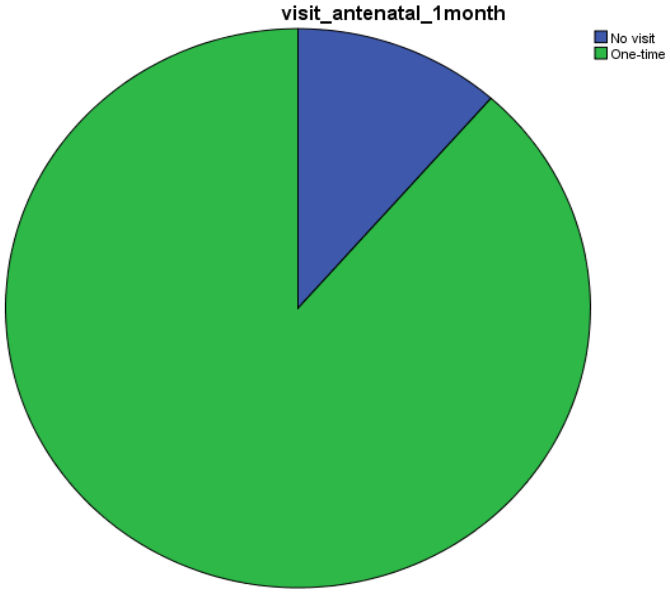


Figure 14: Visit Antenatal in 1 month

Table Error! No text of specified style in document.**17:** Visit for Chronic Diseases in 1 month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No visit	27	6.3	6.3	6.3
	One-time	94	22.0	22.1	28.4
	Two-times	148	34.7	34.7	63.1
	Three-times	132	30.9	31.0	94.1
	More than three-times	25	5.9	5.9	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data on visits to BHUs for chronic diseases in the last month shows that 34.7 percent of respondents visited twice, followed by 31.0 percent who visited three times. Additionally, 22.1 percent visited once, while 5.9 percent visited more than three times. Only 6.3 percent reported no visit. This indicates regular and repeated use of BHU services for managing chronic health conditions. Just 0.2 percent of responses were missing.

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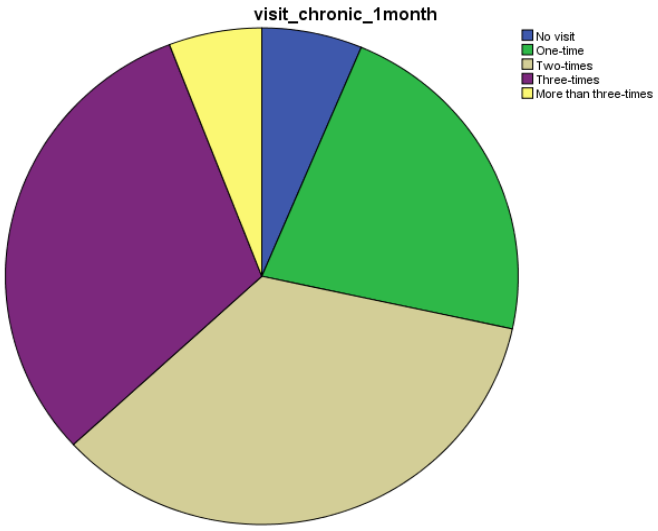


Figure 15: Visit for Chronic Diseases in 1 month

Table Error! No text of specified style in document.**18:** Lab test in 1 month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	no visit	38	8.9	8.9	9.1
	one time	71	16.6	16.6	25.8
	two times	166	38.9	38.9	64.6
	three times	127	29.7	29.7	94.4
	More than three-times	24	5.6	5.6	100.0
	Total	427	100.0	100.0	

The data on visits to BHUs for laboratory tests in the last month shows that 38.9 percent of respondents visited twice, and 29.7 percent visited three times. Additionally, 16.6 percent visited once, while 5.6 percent visited more than three times. A small portion, 8.9 percent, reported no visit, and one respondent provided an unclear entry. This indicates a high level of utilization of BHUs for diagnostic services.

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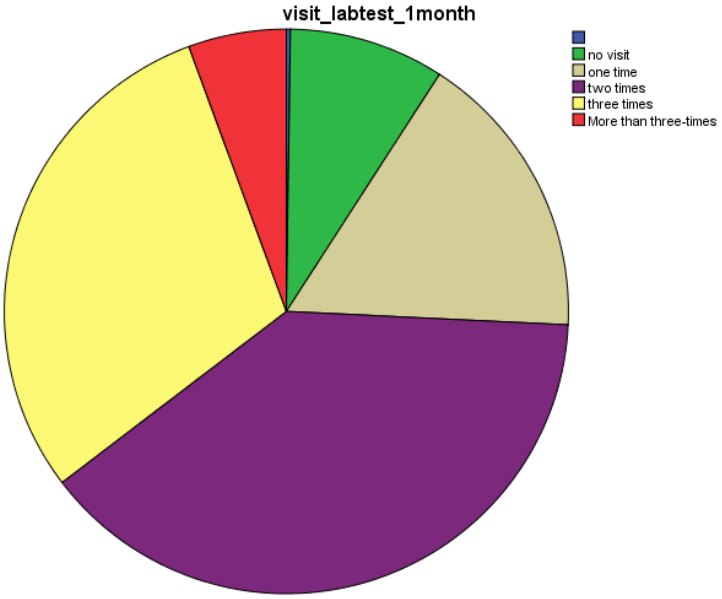


Figure 16: Lab test in 1 month

Table Error! No text of specified style in document.**19: Visit for Joint pain in 1 month**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No visit	33	7.7	7.7	7.7
	One-time	96	22.5	22.5	30.3
	Two-times	142	33.3	33.3	63.6
	Three-times	139	32.6	32.6	96.2
	More than three-times	16	3.7	3.8	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data on visits to BHUs for back or joint pain in the last month reveals that 33.3 percent of respondents visited twice, and 32.6 percent visited three times. Additionally, 22.5 percent had one visit, while only 3.8 percent reported more than three visits, and 7.7 percent had no visit. This indicates that musculoskeletal issues are a common reason for repeated BHU visits.

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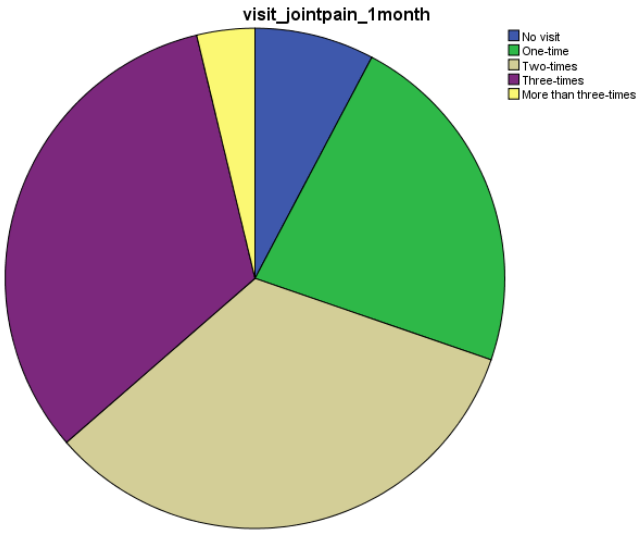


Figure 17: Visit for Joint pain in 1 month

Table Error! No text of specified style in document.**20: Visit for Family Planning in 1 month**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No visit	71	16.6	16.7	16.7
	One-time	355	83.1	83.3	100.0
	Total	426	99.8	100.0	
Missing	System	1	.2		
Total		427	100.0		

The data on family planning service visits in the last month shows that 83.3 percent of respondents visited a BHU once, while 16.7 percent made no visit. This high rate of single visits reflects a strong engagement with family planning services, suggesting consistent utilization within the community.

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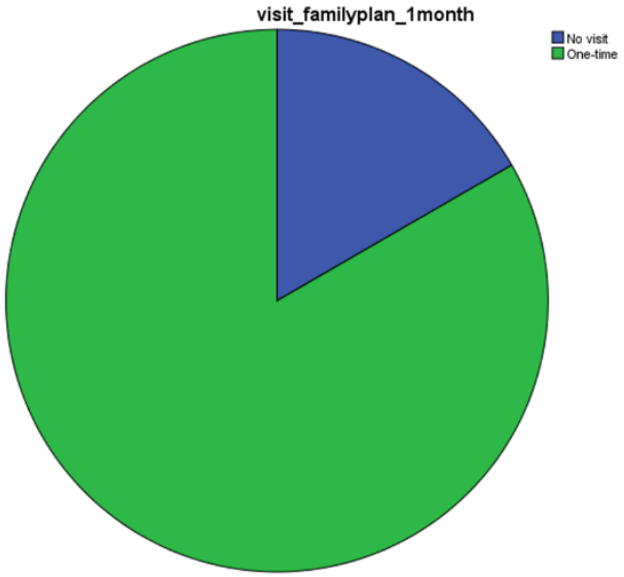


Figure 18: Visit for Family Planning in 1 month

Correlations

Table Error! No text of specified style in document.**.21:** Pearson Correlation Matrix (N=426)

	Structure	Process	Outcome
Structure	1	.585**	.575**
Process	.585**	1	.640**
Outcome	.575**	.640**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis reveals that Structure has a moderate positive relationship with Process ($r = 0.585$, $p < 0.01$), indicating that improvements in structural elements are associated with better processes. Similarly, Structure is moderately correlated with Outcome ($r = 0.575$, $p < 0.01$), suggesting that stronger structural support contributes to better health outcomes. The strongest relationship is found between Process and Outcome ($r = 0.640$, $p < 0.01$), showing that efficient processes are closely linked with improved results. All correlations are statistically significant at the 0.01 level, highlighting meaningful associations among the three components.

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Model Summary

Table Error! No text of specified style in document.**.22:** Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.686[a]	0.470	0.468	0.44341	0.470	187.657	2	423	0.000

a. Predictors: (Constant), Process_Score, Structure_Score

The model shows a moderate positive correlation (R = 0.685) between the predictors (structure and process) and the outcome variable. The R Square value of 0.470 means that 47% of the variance in the outcome is explained by the model. The model has good explanatory power.

ANOVA

Table Error! No text of specified style in document.**.23: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.790	2	36.895	187.657	.000[b]
	Residual	83.165	423	0.197		
	Total	156.955	425			

a**. Dependent Variable: Outcome_Score**

b. Predictors: (Constant), Process_Score, Structure_Score

The model is statistically significant ($p < 0.001$), indicating that structure and process together significantly predict the healthcare outcome. The high F-value confirms a good model fit.

Coefficients

Table Error! No text of specified style in document.**.24: Coefficients**[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.703	0.132		5.342	0.000		

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	Structure_Score	0.322	0.046	0.305	6.987	0.000	0.657	1.521
	Process_Score	0.481	0.046	0.461	10.561	0.000	0.657	1.521

a. Dependent Variable: Outcome_Score

The correlation analysis reveals that Structure has a moderate positive relationship with Process ($r = 0.585$, $p < 0.01$), indicating that improvements in structural elements are associated with better processes. Similarly, Structure is moderately correlated with Outcome ($r = 0.575$, $p < 0.01$), suggesting that stronger structural support contributes to better health outcomes. The strongest relationship is found between Process and Outcome ($r = 0.640$, $p < 0.01$), showing that efficient processes are closely linked with improved results. All correlations are statistically significant at the 0.01 level, highlighting meaningful associations among the three components.

Collinearity Diagnostics

The collinearity diagnostics show that there is no serious multicollinearity between Structure and Process. The condition index values are below 15, which means the variables are not too closely related to each other. So, both Structure and Process can be used in the model without any problem.

Hypothesis Testing Summary Table

Hypothesis	Statement	Supported?	Evidence
H1	There is a significant positive relationship between structure quality and patient satisfaction.	Supported	B = 0.263, p < .001
H2	There is a significant positive relationship between process quality and patient satisfaction.	Supported	B = 0.487, p < .001
H3	There is a significant positive relationship between healthcare outcomes and patient satisfaction.	Supported	High outcome scores related to structure and process predictors ($R^2 = 0.470$)
H4	Structure and process jointly influence the outcome of PHC services.	Supported	Model with both predictors is significant (F = 187.657, p < .001)

Based on the multiple linear regression results and collinearity diagnostics, all four hypotheses (H1 to H4) are supported. H1 is confirmed as structure quality significantly predicts patient satisfaction (B = 0.263, p < .001). H2 is also supported, with process quality having an even stronger positive effect (B = 0.487, p < .001). For H3, the model explains 47% of the variance in outcomes, indicating that higher structure and process scores are associated with better patient outcomes. Finally, H4 is supported, as the model including both structure and process scores is statistically significant (F = 187.657, p < .001), and the collinearity diagnostics confirm that both predictors can be reliably included in the same model. This aligns well with Donabedian's theoretical framework, which emphasizes that structure and process together shape the outcomes of healthcare service delivery.

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CHAPTER 5: CONCLUSION

Conclusion

This study evaluated the quality of primary healthcare services at Basic Health Units (BHUs) in Muzaffargarh using Donabedian's (1988) framework, which examines three key dimensions of care: structure, process, and outcome. The findings revealed that both the structural readiness of BHUs and the efficiency of service delivery processes significantly contribute to patient satisfaction and perceived care outcomes. The regression analysis confirmed that process-related factors—such as staff behavior, waiting time, and communication—had a stronger influence on patient satisfaction than structural elements like infrastructure or equipment availability. These results are consistent with earlier studies in Pakistan and other LMICs, which found that while physical resources are important, the way care is delivered has a greater impact on how patients perceive healthcare quality (Khokhar & Abbas, 2023; Nasir et al., 2022).

Despite BHUs being the primary contact point for rural populations, many face chronic issues such as limited diagnostic services, poor facility maintenance, and understaffing—especially in remote areas like Alipur and Jatoi. This study reinforces concerns raised by UNICEF (2023) and the Punjab Health Department (2023), which report widespread dissatisfaction with basic care services in under-resourced districts. By adopting a patient-centered evaluation approach, this research highlights the mismatch between input-based assessments (e.g., stock or staff audits) and actual patient experiences. Patients frequently reported dissatisfaction not only due to physical shortcomings but also due to lapses in provider empathy, responsiveness, and communication—factors that are often overlooked in administrative evaluations (Ahmed & Saeed, 2020).

This study provides valuable empirical insights indicating that improving process quality is essential for strengthening rural primary healthcare. While investments in infrastructure and resources remain necessary, policy efforts should also focus on enhancing staff competencies, establishing regular patient feedback systems, and introducing performance-based incentives to improve provider behavior. The findings support a shift from a resource-centered model to a more integrated approach that considers the delivery and perception of care. This is particularly important in socioeconomically disadvantaged areas like Muzaffargarh, where restoring patient trust in public health services is critical to increasing service utilization and achieving long-term health improvements (Saeed et al., 2022; Alam et al., 2023). However, these findings should be interpreted with caution due to the study's limited geographic focus and reliance on self-reported data.

CHAPTER 6: RECOMMENDATIONS

The findings indicate that both structure and process significantly influence patient outcomes in primary healthcare facilities. Based on the statistical evidence and model interpretation, the following recommendations are proposed:

Enhance Structural Components

Investment in the physical infrastructure of Basic Health Units (BHUs), such as equipment availability, facility cleanliness, and staffing levels, should be prioritized. Although the structural score had a smaller coefficient than the process score, it still significantly contributed to patient outcomes.

Strengthen Healthcare Processes

Since the process score showed a stronger influence on patient satisfaction and outcomes, immediate attention must be given to improving patient-provider interactions, treatment protocols, responsiveness,
and follow-up systems.

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Regular Monitoring and Evaluation
Introduce standard monitoring tools and regular evaluations to assess both structure and process indicators. This helps ensure accountability and continuous improvement in service delivery.

Capacity Building of Staff
Continuous training and professional development of healthcare staff should be emphasized to improve communication skills, patient handling, and adherence to protocols—key aspects of healthcare processes.

Policy Alignment and Resource Allocation
Policies should be updated to reflect the evidence that process improvements yield stronger impacts. Resources must be allocated accordingly, without neglecting structural development.

Community Engagement
Engage local communities in evaluating BHU services and incorporating feedback into management decisions. This helps improve the responsiveness of both structure and process dimensions.

Further Research
Future studies should explore the mediating role of patient satisfaction between structure/process and health outcomes. Longitudinal data would also help validate causal relationships.

Theoretical and Practical Implications
The findings reinforce Donabedian's framework, demonstrating that both structure and process significantly influence patient outcomes in primary healthcare (Donabedian, 1988). Theoretically, this supports the model's relevance in contemporary settings, highlighting that quality care is a product of measurable systems and service delivery mechanisms (Campbell et al., 2000).
Practically, the results suggest that improving facility infrastructure (structure) and enhancing provider-patient interactions (process) can lead to better patient satisfaction and health outcomes. Primary healthcare units should invest in staff training, availability of medical resources, and effective communication practices (Ameh et al., 2014). Policy reforms focusing on strengthening both structural and procedural components may substantially improve service utilization and outcomes, especially in rural or under-resourced settings (WHO, 2010).

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