

**MID-TERM EVALUATION OF MOBILE HEALTH UNITS (MHUS) FOR DELIVERY
OF HEALTH SERVICES IN SELECTED GRAM PANCHAYATS OF JAIPUR
DISTRICT**

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by

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Under the Supervision and Guidance of

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DHARA SANSTHAN

Society For Development Health Hygiene And Rural Action

Date: 30th June 2025

INTERNSHIP COMPLETION CERTIFICATE

This is to certify that Mr. Roshan Kumar successfully completed an internship as an Intern at Dhara Sansthan, Jaipur.

During the three-month tenure, from March 2025 to June 2025, Mr. Roshan Kumar was actively involved in our ongoing programs and policy research initiatives, gaining valuable experiential learning in social development and program implementation.

We wish Mr. Roshan Kumar all the best in his future endeavors.

Regards,

Mahesh Panpalia
Chief Executive
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CERTIFICATE



This is to certify that dissertation titled “**Mid-Term Evaluation of Mobile Health Units (MHUs) for Delivery of Health Services in Selected Gram Panchayats of Jaipur District**” is a record of the research work undertaken by Roshan Kumar in partial fulfilment of the requirements for the award of the degree of MBA (Development Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled **“Mid-Term Evaluation of Mobile Health Units (MHUs) for Delivery of Health Services in Selected Gram Panchayats of Jaipur District”** is the Bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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ABSTRACT

Title: Mid-Term Evaluation of Mobile Health Units (MHUs) for Delivery of Health Services in Selected Gram Panchayats of Jaipur District

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Keywords: Mobile Health Units (MHUs), National Rural Health Mission (NRHM), Health Access, Primary Healthcare, PRIs, Rural Rajasthan, Gram Panchayats, Community Participation

Background:

The National Rural Health Mission (NRHM) introduced Mobile Health Units (MHUs) to improve last-mile health service delivery, especially in geographically and socio-economically marginalized regions. In Rajasthan's Jaipur district, MHUs are operated in collaboration with Dhara Sansthan to reach underserved Gram Panchayats. However, limited empirical evaluation exists on their mid-term performance and impact.

Objective:

The study aimed to evaluate the accessibility, quality, and effectiveness of MHU services; assess the role of Panchayati Raj Institutions (PRIs) and Village Health and Sanitation Committees (VHSCs) in service facilitation; identify operational barriers; and recommend strategic improvements to optimize rural healthcare delivery.

Methodology:

A descriptive and explorative research design was adopted. The study was conducted in six Gram Panchayats of Jaipur district. A mixed-methods approach was used:

- **Quantitative:** Structured questionnaires were administered to 210 randomly selected MHU beneficiaries.
- **Qualitative:** Data were analysed using Microsoft Excel for frequency distributions, ANOVA, t-tests, and regression analysis, supported by thematic narrative analysis.

Results/Findings:

The study found high levels of satisfaction among beneficiaries, with women rating services more positively. MHUs significantly improved access to antenatal care, diagnostics, and basic consultations. However, challenges included irregular scheduling, staff shortages, limited coordination with static health infrastructure, and weak PRI engagement. A strong correlation was observed between satisfaction levels and perceived service quality. Involvement of VHSCs and PRIs was inconsistent, limiting local ownership.

Conclusions:

MHUs are effective in delivering essential health services in underserved areas, but operational inefficiencies constrain their full potential. Strengthening PRI participation, ensuring regular scheduling through GPS-enabled tracking, improving staffing, and integrating digital tools for monitoring are essential. These findings support policy improvements to enhance MHU sustainability under NHM frameworks and promote equitable rural healthcare.

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1.INTRODUCTION

1. 1 Background and Rationale

Over the past two decades, India has undertaken several structural and strategic reforms aimed at strengthening its public health system, particularly in rural and marginalized regions. The National Rural Health Mission (NRHM), launched in 2005 and later subsumed under the National Health Mission (NHM), represents one of the most ambitious health initiatives undertaken to address healthcare inequities. It was designed to ensure accessible, affordable, and quality health care services to the rural population, especially the vulnerable sections. Within this framework, Mobile Health Units (MHUs) have been introduced as a flexible, on-the-ground strategy to reach remote populations with essential health services. MHUs aim to bypass the barriers of distance, infrastructure, and medical workforce shortages by bringing services directly to the doorstep of underserved communities.

1.2 Healthcare Gaps in Rural Rajasthan

Rajasthan, with its vast geographical expanse and socio-economic diversity, presents a unique set of challenges for health service delivery. Despite progress in several health indicators, rural areas in districts such as Jaipur continue to grapple with persistent gaps. These include acute shortages of medical professionals, poorly equipped health centres, limited transportation, and irregular access to diagnostic and preventive services. In particular, Gram Panchayats, being the lowest units of rural governance, often lack the institutional capacity and resources to address health needs effectively. The burden of maternal and child health issues, communicable diseases, and chronic illnesses remains high, and many communities still rely on informal or private providers for basic health care. These circumstances necessitate targeted interventions like MHUs to supplement the existing health infrastructure and improve outreach.

1.3 Role of Mobile Health Units

Mobile Health Units have emerged as a viable mechanism to address the "last-mile" challenge in health service delivery. Operating as well-equipped vans with medical personnel and diagnostic tools, MHUs are designed to offer a range of services including outpatient consultations, immunization, antenatal and postnatal care, health screenings, referral services, and health education. Their mobility allows them to serve scattered and isolated populations

who otherwise have limited or no access to formal health facilities. In the context of Jaipur's rural Gram Panchayats, MHUs play a pivotal role in enhancing health awareness, promoting timely treatment, and reducing the burden on overburdened static health facilities. They also support public health campaigns, epidemic response, and continuity of care during emergencies. The operational success of MHUs, however, depends heavily on adequate funding, community participation, inter-departmental coordination, and alignment with local health governance.

1.4 Objectives of the Mid-Term Evaluation

This mid-term evaluation seeks to critically assess the performance of Mobile Health Units operating in selected Gram Panchayats of Jaipur district. The evaluation aims to measure their effectiveness in terms of service coverage, benefits, frequency of visits, coordination with local health workers like ASHAs and ANMs, and integration with the broader public health system. Furthermore, it explores how well MHUs align with the objectives of NRHM/NHM and the extent to which they have succeeded in reaching vulnerable groups such as women, children, elderly, and those with chronic conditions. Another key objective is to examine the institutional support provided by Panchayati Raj Institutions (PRIs) and their involvement in planning, monitoring, and facilitating the functioning of MHUs at the local level. The findings are intended to identify implementation bottlenecks, suggest improvements, and inform future health planning.

1.5 Scope and Relevance

The relevance of this evaluation lies in its potential to guide policy makers, program managers, and public health stakeholders in optimizing mobile healthcare strategies in rural India. By focusing on Jaipur district—a representative mix of rural and peri-urban communities—the study provides insights that can be scaled or adapted to other districts facing similar challenges. It sheds light on how MHUs can complement static health infrastructure and strengthen the last-mile delivery of services. Moreover, by involving PRIs and other grassroots institutions in the evaluation process, the study underscores the importance of community ownership and accountability in sustaining health interventions. This mid-term evaluation is thus both a diagnostic tool and a strategic guide for enhancing the impact and sustainability of MHUs in rural Rajasthan and beyond.

2. REVIEW LITERATURE

Sharma, Patel & Sen (2024) conducted a comprehensive review of Gram Panchayat–level health delivery models in Jaipur District, focusing on the integration and performance of Mobile Health Units (MHUs). Their analysis revealed that MHUs significantly contributed to improved immunization rates and increased antenatal care (ANC) utilization, especially in areas underserved by static health infrastructure. However, the review also identified critical challenges in service predictability and accountability due to irregular visit timings and lack of tracking mechanisms. To address these, the authors recommend implementing GPS-enabled tracking and fixed visit schedules to ensure transparency, enhance community trust, and strengthen planning. These measures were framed within a broader push for digitally enabled, Panchayat-led governance models that emphasize decentralized service delivery through coordinated efforts among health workers, local bodies, and telemedicine platforms.

Ranjan & Verma (2023) conducted a mixed-methods study involving surveys of 200 individuals and interviews with Accredited Social Health Activists (ASHAs) and Panchayati Raj Institution (PRI) members across rural areas in Rajasthan and Bihar. Their findings showed that Mobile Health Units (MHUs) played a crucial role in reducing out-of-pocket healthcare expenditures, particularly by eliminating the need for long, costly travel to Community Health Centres (CHCs) and Primary Health Centres (PHCs). MHUs provided free diagnostic services and essential medicines while leveraging ASHA-led community mobilization to increase awareness and attendance. Interview narratives highlighted specific cases where families, previously spending ₹300–500 per medical visit, could now access timely care at zero cost. These results underscore not only the economic relief provided by MHUs but also their broader contribution to improving healthcare equity in resource-constrained settings.

Dr. Ranjeeta Dwivedi (2022) conducted an extensive literature review using official health statistics, policy documents, and government evaluation reports to assess the role of decentralized governance in health delivery across Uttar Pradesh. She underscored the pivotal role of Panchayati Raj Institutions (PRIs), particularly through Village Health, Sanitation, and Nutrition Committees (VHSNCs, formerly VHSCs), in supporting frontline services like Mobile Health Unit (MHU) visits and immunization drives. Her analysis revealed that many VHSNCs remain underutilized due to limited capacity, weak financial oversight, and inadequate community participation. As a solution, she recommended structured capacity-

building programs, mechanisms for regular community engagement, and robust fund-tracking practices to enhance committee performance. Strengthening these grassroots institutions, she argued, would empower Gram Panchayats to coordinate more effectively with health systems and ensure better delivery of maternal and child healthcare services.

Bajpai, Sachs & Dholakia (2020) carried out field-based assessments in the districts of Jaipur, Dausa, and Udaipur to evaluate the on-ground performance of Mobile Health Units (MHUs), with findings published through SAGE. Their study revealed that MHUs played a significant role in increasing institutional deliveries by improving accessibility to skilled birth attendants, especially in areas with limited fixed-facility coverage. However, they also identified several operational challenges, including inadequate infrastructure—such as the absence of portable delivery kits—and service strain caused by high patient volumes that exceeded the capacity of existing staff and resources. Through detailed field observations, the authors stressed that the success of MHUs depends not only on mobility and outreach but also on proportional investments in trained personnel, logistical support, and robust supply-chain mechanisms. They advocated integrated planning to ensure that the expansion of mobile services is matched by the infrastructure and staffing needed to deliver quality care.

Udai Bhan Singh (2021) conducted 13 field visits across remote regions of Uttarakhand, combining observational research with interviews of Mobile Medical Unit (MMU) health teams. His findings highlighted the critical role MMUs played in ensuring timely maternal and child health transport, as well as providing emergency referrals in areas where traditional health infrastructure was sparse or inaccessible. However, the study also pointed to persistent logistical challenges, such as unpaved or damaged roads, frequent monsoon-related service disruptions, and shortages of drivers or support staff, which often delayed emergency response. Singh emphasized the importance of region-specific logistical planning—such as alternative routes, weather-resilient scheduling, and standby staffing—to maintain the reliability of MMUs in mountainous terrain.

Singh, U. B. (2016) analyzed NRHM program data using NFHS, DLHS, and PRC reports to evaluate the role of Mobile Medical Units (MMUs) in Uttarakhand. His findings highlighted that MMUs were crucial for reaching remote populations with limited access to static health facilities. However, the study identified consistent shortages of essential staff like lab technicians and drivers, which impaired the efficiency of service delivery. Coordination gaps

between MMUs and Primary Health Centres further weakened follow-up care and continuity of treatment in these underserved regions.

Poornima & Vijayalakshmi (2011) conducted a comprehensive comparative literature review across India to assess the impact of community participation in rural health initiatives. They concluded that effective involvement of Panchayati Raj Institutions (PRIs) significantly enhances transparency, community monitoring, and accountability in the implementation of health programs. The review emphasized that when PRIs are actively engaged, they help mobilize communities, track local health outcomes, and ensure better alignment between service delivery and local needs. This grassroots involvement was found to be especially important for sustaining Mobile Health Unit (MHU) operations and ensuring their responsiveness to community priorities.

Abad-Franch et al. (2011) conducted a global comparative study of health delivery models in Latin America, focusing on vector-borne disease control programs. Their analysis demonstrated that strong community participation was a key determinant of success in initiatives targeting diseases like Chagas and malaria. The study emphasized that local ownership, trust, and involvement in planning and implementation improved both health outcomes and sustainability. While the geographic and health system contexts differ, the findings underscore the relevance of community-driven approaches for Mobile Health Unit (MHU) effectiveness in rural India as well.

Atkinson et al. (2011) conducted a literature review examining the role of mobile health units and community leadership in managing endemic diseases across low- and middle-income countries. They found that integrating mobile outreach services with the efforts of trained and trusted local leaders led to improved disease surveillance, early diagnosis, and treatment adherence—particularly for malaria and neglected tropical diseases. The review highlighted that mobile services were most effective when aligned with culturally sensitive communication and supported by local networks. These findings offer valuable parallels for implementing Mobile Health Unit (MHU) strategies in India, where similar community-based integration can enhance health service delivery in underserved areas.

Marston et al. (2013) carried out a global review of community-based health interventions to understand what drives their success and sustainability. They found that open, inclusive community dialogue—facilitated through mechanisms like village meetings, local health

committees, and Panchayati Raj Institution (PRI) forums—played a central role in building trust and encouraging participation in health programs. Such dialogue not only raised awareness but also ensured that services were culturally relevant and responsive to the specific needs of each community. Their findings strongly support the integration of participatory approaches in the deployment of Mobile Health Units (MHUs) to maximize their reach and impact in rural settings.

Mahanta et al. (2024) surveyed 418 adults with hypertension in Himachal Pradesh and Uttarakhand using structured/semi-structured questionnaires, KIIs, and FGDs. The study found 95% awareness of stress as a risk factor and high trust in BP monitoring via MMUs. Remarkably, over half had limited formal education, yet responded positively to MMU engagement; women showed significantly greater awareness of alcohol as a risk factor (64%, $p<0.033$) and uniformly supported regular BP monitoring ($p<0.004$). Respondents expressed high satisfaction with MMU services, citing easy access to diagnostics, medication adherence, and referral facilitation .

Seth et al. (2025) evaluated MHVs in Delhi NCR slums via mixed methods (routine data and FGDs)—totaling over 41,000 visits. Their findings showed MHVs offered quality primary pediatric and maternal care, health education, and child immunization messaging. With approximately 10% of cases referred for higher-level treatment and uniformly positive satisfaction feedback, the MHVs demonstrated a crucial role in urban primary healthcare.

Pal et al. (2008) conducted a rapid assessment in three districts of Jharkhand using in-depth interviews and semi-structured tools to evaluate the functioning of Mobile Medical Units (MMUs). They found that MMUs provided crucial diagnostic services like X-rays, ultrasounds, and lab tests, along with medicines, and were accessed by over 90% of users who had no prior knowledge of their visit schedules. The study highlighted key logistical challenges such as irregular visit timings, lack of public notification, poor road access, and technical issues like equipment instability. Despite these barriers, the MMUs were well-received by communities and played a vital role in extending healthcare access to remote areas.

Prinja et al. (2020) carried out a micro-costing study of 12 Mobile Medical Units (MMUs) in Andhra Pradesh to assess the cost of delivering primary healthcare services. They used an activity-based costing method to capture both capital costs (like vehicle depreciation) and recurrent costs such as fuel, salaries, and medical supplies. The study also included staff time-

use data and calculated the average cost per patient visit with sensitivity analyses. These findings offer valuable guidance for evaluating the financial sustainability and scalability of MMU programs in similar rural settings.

Khanna & Narula (2017) conducted a systematic review of Mobile Medical Unit (MMU) programs across India to evaluate their effectiveness in expanding healthcare access. Their analysis confirmed that MMUs have played a significant role in improving outreach, especially in underserved and remote areas lacking fixed health facilities. However, they noted that the success of these units is closely tied to the quality of infrastructure, consistent availability of trained healthcare personnel, and meaningful community engagement. The study underscored the importance of coordinated efforts among government agencies, local governance bodies, and civil society organizations to ensure the sustained impact and operational efficiency of MMUs.

AP Govt (2025 report) analyzed Maharashtra's operational data across 87 active MMUs. They recorded an impressive 650,000 OPD consultations, 166,000 laboratory tests, and 182,000 diabetes screenings—quantifying MMU coverage depth and reach.

Andhra Pradesh survey (2021) deployed structured questionnaires among 148 PHC respondents in Bundi, Kota, and other Rajasthan districts. More than 90% confirmed that MMUs delivered OPD, ANC/PNC, and immunization services through PHCs—but noted persistent gaps in emergency, surgical, and maternal complication handling.

The CRHP (Comprehensive Rural Health Project) model, implemented over various years in rural Maharashtra, established a system of weekly mobile health team visits to remote villages. These teams provided essential services such as antenatal care (ANC), immunizations, and health education, often in coordination with trained village health workers. Outcome analyses and case reports from the model demonstrated a substantial reduction in maternal and child mortality, attributed to early identification of risk cases, timely referrals, and consistent community engagement. The success of the CRHP approach highlights the value of integrated mobile outreach combined with local capacity-building in achieving sustainable rural health outcomes.

The Deen Dayal Mobile Health Clinic model, as described in the 2025 documentation, represents one of Madhya Pradesh's earliest and most sustained efforts in mobile healthcare

delivery. Initiated in 2006, this GPS-enabled van model is staffed by a multidisciplinary team including a doctor, nurse, lab technician, and pharmacist, ensuring comprehensive service delivery at the doorstep of underserved populations. The integration of real-time GPS tracking not only enhances route planning and monitoring but also strengthens transparency and accountability in service provision. Over the years, the model has proven effective in improving outreach, especially in tribal and hard-to-reach areas, by offering diagnostics, consultations, and essential medicines on a predictable and reliable schedule.

E Health Point (2025) carried out a service model analysis of a private Mobile Medical Unit (MMU) initiative aimed at transforming rural healthcare delivery in India. The model integrated advanced technologies such as telemedicine consultations, electronic medical records (EMR), and point-of-care diagnostic testing, allowing real-time data access and patient tracking. In addition, it incorporated disease surveillance tools to monitor community health trends and respond proactively to emerging issues. By merging digital health solutions with mobile outreach, the initiative demonstrated a scalable and modern approach to bridging rural healthcare gaps with efficiency and accountability.

The Hans Foundation (2023–24) conducted a cross-sectional survey involving 418 participants in the hilly regions of Himachal Pradesh and Uttarakhand to evaluate the effectiveness of Mobile Medical Units (MMUs) in managing non-communicable diseases, particularly hypertension. Their findings mirrored those of Mahanta et al. (2024), showing marked improvements in awareness, treatment adherence, and follow-up care for hypertension patients. The study highlighted the adaptability and success of MMUs in geographically challenging terrains, where fixed health infrastructure often falls short. It also emphasized the strong potential for replicating such mobile health models in other regions with similar topographical and health system constraints.

Mahapatra et al. (2024) conducted an in-depth review of clinic data from Mobile Medical Units (MMUs) operating in tribal regions of West Bengal. Their analysis revealed that prevalent morbidity patterns—particularly anemia, acute respiratory infections, malaria, and skin diseases—were instrumental in shaping the composition of medical teams, drug kits, and diagnostic tools onboard the MMUs. By tailoring service packages to the specific health needs and cultural practices of tribal communities, the initiative improved both the relevance and effectiveness of healthcare delivery. The study highlighted the importance of data-driven

customization in enhancing the impact of MMUs in marginalized and medically underserved populations.

Akhtar & Ramkumar (2023) conducted a comprehensive review of Mobile Medical Units (MMUs) in Madhya Pradesh, assessing their performance, operational challenges, and alignment with population health needs. They emphasized the critical need for cost-efficient service models that go beyond one-size-fits-all approaches, advocating instead for customization based on local disease profiles, geographic barriers, and community expectations. The authors proposed flexible staffing models—such as rotating specialists or multipurpose health workers—and stronger integration with community mobilization efforts to enhance reach and effectiveness. Their findings support the development of demand-responsive MMUs that can adapt to changing health priorities while maintaining financial and operational sustainability.

Linkspring's Odisha boat clinic (2023) evaluated a novel boat-based MMU model in Assam. Their findings showed that delivering family planning services via riverboats significantly boosted service uptake in remote riverine communities—showcasing adaptability to unique geographic settings.

NHM Maharashtra (2025) administrative data on 103 sanctioned MMUs across the state revealed deployment of multidisciplinary teams—including doctors, nurses, lab techs, and pharmacists—reflecting a strong policy push toward state-level MMU scale-up and comprehensive care delivery.

2.1 Mobile Health Units under the National Rural Health Mission (NRHM)

The National Rural Health Mission (NRHM), launched in 2005, aimed to strengthen rural public health systems in India. A central innovation under NRHM was the deployment of Mobile Health Units (MHUs) — vehicles equipped with basic medical equipment and staffed by medical professionals — to ensure delivery of essential healthcare services in remote and underserved areas. According to Bajpai, Sachs, and Dholakia (2010) in their mid-term field evaluation across Rajasthan, Madhya Pradesh, and Uttar Pradesh, the MHUs played a vital role in bridging access gaps for populations living in hard-to-reach geographies like tribal belts and hilly terrain.

The authors found that while MHUs were designed to supplement static facilities like Primary Health Centres (PHCs) and Community Health Centres (CHCs), their performance was often constrained due to severe shortages of medical personnel, especially female doctors and specialists. In districts of Rajasthan, where villages are sparsely populated and distances to health facilities can exceed 10 kilometers, MHUs offered a critical lifeline for maternal and child health services, vaccinations, and outpatient care.

However, the study noted that MHUs were often underutilized due to limited operating days, inadequate planning of routes, and lack of coordination with the local health system. Furthermore, the issue of inadequate night coverage, poor transport allowances for staff, and weak logistical support (such as fuel and vehicle maintenance) undermined their effectiveness.

2.2 Role of Panchayati Raj Institutions (PRIs) in Rural Health Service Delivery

The importance of local governance and community participation in ensuring effective health service delivery is emphasized in the study by Dr. Ranjeeta Dwivedi (2022). She highlights that Panchayati Raj Institutions (PRIs), especially Gram Panchayats, play an essential role in facilitating the implementation and monitoring of MHUs at the village level. With powers conferred by the 73rd Constitutional Amendment, PRIs are mandated to oversee health, sanitation, and family welfare at the grassroots level.

The study points out that when PRIs are empowered and actively involved, they can mobilize beneficiaries, ensure community participation, and monitor the frequency and effectiveness of MHU visits. Dr. Dwivedi notes that Village Health and Sanitation Committees (VHSCs), a sub-component under NRHM, are key platforms where ASHAs, Anganwadi Workers (AWWs), and Panchayat representatives collaborate to improve local health outcomes.

In Gram Panchayats of districts like Jaipur, the synergy between MHUs and PRIs is crucial. While MHUs bring services physically closer to the people, it is the PRI's involvement that ensures community trust, better turnout during visits, and follow-up care. However, in many cases, weak coordination, inadequate training of PRI members, and political interference limit their impact.

2.3 Community Participation and Accountability in MHU Services

Effective functioning of MHUs requires strong community involvement and accountability mechanisms, which are often weak or inconsistent in rural settings. ASHAs and Village Health and Sanitation Committees (VHSCs) serve as the key conduits for mobilizing rural populations and ensuring that MHU services are aligned with local health needs.

However, the underutilization of untied funds, lack of regular training, and limited participation of marginalized groups in VHSCs are major hurdles. The committees often do not hold regular meetings or keep track of MHU schedules and services delivered. The evaluation highlights that the functionality of VHSCs is variable across Gram Panchayats, with better outcomes observed where ASHAs and PRI members receive capacity-building support.

A common finding is that MHUs perform better when their visits are predictable, well-publicized, and linked to local health awareness campaigns. For instance, when an MHU visit is scheduled during a VHSC meeting or immunization drive, there is significantly higher attendance and community engagement.

2.4 Operational Gaps and Infrastructure Challenges

Despite the promise of MHUs as a vehicle for health equity, their potential is often undermined by systemic and operational challenges. As described in *mhu.pdf*, most MHUs suffer from poor staffing patterns, lack of equipment maintenance, irregular scheduling, and poor integration with district health plans.

In Jaipur and similar districts, MHUs are sometimes used as ad hoc solutions rather than being integrated into long-term health planning and monitoring frameworks. There is limited use of digital tools to track MHU visits, record patient data, or plan based on disease burden. Moreover, infrastructure issues like unpaved roads, long distances, and unreliable power supply affect the reach and efficiency of MHUs.

The review also points to a lack of robust monitoring and evaluation frameworks. Often, there is no clear data on service utilization, quality of care delivered, or patient outcomes associated with MHUs. Without such evidence, policy refinements and funding justifications become difficult.

2.5 Problem Statement

Despite multiple initiatives under the National Rural Health Mission (NRHM) and the operationalization of Mobile Health Units (MHUs), significant gaps persist in the delivery of primary health services in rural areas, particularly in the Gram Panchayats of Jaipur District. The literature and field evaluations indicate that MHUs have played a pivotal role in extending healthcare access to underserved populations. However, critical challenges remain, including inadequate human resources, poor infrastructural support, irregular service delivery, and limited community participation. The study by Bajpai, Sachs, and Dholakia (2010) highlights a systemic strain on manpower and infrastructure, with most healthcare centers under-equipped to handle increasing patient loads. A shortage of doctors, insufficient ANMs, and poorly located facilities reduce the impact of health initiatives, including MHUs. Concurrently, there is a disconnect between NRHM administrative bodies and the traditional health governance system, further hampering effective implementation and accountability mechanisms. Complementing this, findings from Dr. Ranjeeta Dwivedi's research emphasize that while Panchayati Raj Institutions (PRIs) have been constitutionally empowered to influence public health delivery, their role remains underutilized. Weak engagement of PRIs in the functioning and monitoring of MHUs has undermined the goal of decentralized, community-led health governance. Given these persisting bottlenecks, a mid-term evaluation of MHUs in selected Gram Panchayats of Jaipur District is necessary to assess their effectiveness, identify systemic challenges, and recommend actionable strategies for improved health service delivery, stakeholder coordination, and community accountability.

3. RATIONALE

3.1 Persistent Health Inequities in Rural India

Despite sustained efforts under the National Rural Health Mission (NRHM) and later the National Health Mission (NHM), significant disparities in health service delivery remain between urban and rural India. The situation is particularly acute in rural and tribal areas of Rajasthan, including the Gram Panchayats of Jaipur district, where poor infrastructure, low health awareness, and long distances to health facilities continue to act as barriers to universal health coverage. According to Bajpai, Sachs, and Dholakia (2010), these areas exhibit severe shortages in human resources and infrastructure, hampering effective implementation of maternal and child health interventions and institutional care.

3.2 MHUs as a Strategic Intervention under NRHM

To overcome structural limitations, the NRHM introduced Mobile Health Units (MHUs) to provide preventive, promotive, and basic curative services in hard-to-reach areas. MHUs, by design, are meant to function as mobile extensions of PHCs and CHCs, ensuring that underserved populations receive essential care such as ANC/PNC check-ups, immunization, minor ailments treatment, and health education. However, the effectiveness of these units remains largely undocumented at the Gram Panchayat level, especially in regions like Jaipur where geographical, administrative, and social challenges converge.

3.3 Role of Panchayati Raj Institutions in Health Governance

The Panchayati Raj Institutions (PRIs), empowered by the 73rd Constitutional Amendment, are central to decentralized planning and delivery of public services, including health. As per Dr. Ranjeeta Dwivedi (2022), PRIs have the potential to act as facilitators for MHUs by organizing community mobilization, managing untied health funds, and supporting local health staff like ASHAs and ANMs. However, the literature also indicates that in many cases, PRIs lack training, institutional clarity, or support to fulfill this role effectively.

3.4 Lack of Mid-Term Evaluations and Gram Panchayat-Level Evidence

While several national and state-level evaluations of NRHM and NHM have been conducted, there exists a research gap in terms of mid-term, micro-level assessments—particularly those that examine MHU performance through the lens of Gram Panchayat functioning and community involvement. Successful health interventions are often characterized by active VHSCs, engaged PRIs, and accountable health personnel. Evaluating the interplay of these elements in Jaipur district is crucial for evidence-based planning and resource allocation.

3.5 Need for Contextual Insights to Improve Program Implementation

Operational bottlenecks—such as irregular MHU visits, vehicle maintenance issues, staff absenteeism, and underutilization of untied funds—are frequently reported across rural Rajasthan. However, there is limited data on how these issues manifest at the Panchayat level and what local solutions may exist. This study aims to fill that void by offering context-specific insights into MHU effectiveness in selected Gram Panchayats of Jaipur, which can inform district-level policy reforms and strengthen health outcomes.

4. RESEARCH QUESTIONS

1. Are the Mobile Health Units (MHUs) able to satisfy the basic healthcare needs of the rural communities located in the selected GPs of the Jaipur district?
2. How are the roles and responsibilities divided between Dhara Sansthan and the Mobile Health Units (MHUs), and how does this collaboration influence community health outcomes?
3. Which service delivery challenges do MHUs experience in their work and what important parts should be improved to increase access, coverage and efficiency?

5. OBJECTIVE

5.1 Assessing Accessibility and Coverage of MHUs

The study aims to evaluate how effectively Mobile Health Units (MHUs) are reaching the rural population in selected Gram Panchayats of Jaipur district. This includes analyzing the frequency of visits, the geographical areas covered, and the range of services provided. Special attention will be given to key healthcare interventions like antenatal care, immunization, health check-ups, and referrals. The objective is to identify any disparities in access to these services, particularly in underserved or remote areas.

5.2 Examining the Role of PRIs and Community Structures

An important objective is to explore the involvement of Panchayati Raj Institutions (PRIs) and community-based structures like Village Health and Sanitation Committees (VHSCs) in the planning, implementation, and monitoring of MHU operations. This includes assessing the effectiveness of community mobilization efforts, the support provided by local governance bodies, and the role of ASHAs and AWWs in facilitating healthcare delivery. The study seeks to understand how local governance and community engagement contribute to the success of MHU services.

5.3. Identifying Operational and Systemic Challenges

The study intends to document the logistical, administrative, and infrastructural challenges that MHUs face in delivering services. These may include staffing shortages, irregular maintenance of vehicles, insufficient medical supplies, and gaps in the utilization of untied funds and Rogi

Kalyan Samiti (RKS) resources. The objective is to uncover bottlenecks that hinder the efficiency and sustainability of MHUs, providing a clear picture of the systemic issues that require attention.

5.4 Measuring the Impact on Health-Seeking Behavior

Another objective is to assess the impact of MHUs on the health-seeking behavior of rural communities. This includes evaluating whether MHUs have contributed to improved institutional delivery rates, increased immunization coverage, enhanced maternal and child healthcare, and reduced out-of-pocket expenses for medical needs. The study seeks to understand the extent to which MHUs have influenced health outcomes and addressed healthcare gaps in the region.

5.5 Proposing Strategies for Strengthening MHU Services

Based on the findings, the study aims to recommend strategies to improve the efficiency, reach, and sustainability of MHUs. This may involve suggestions for better route planning, enhancing the involvement of PRIs and VHSCs, leveraging technology for monitoring and reporting, and increasing awareness among rural populations about the availability of MHU services. The goal is to ensure that MHUs effectively bridge the healthcare delivery gap in rural areas and contribute to long-term health improvements.

6. METHODOLOGY

6.1 Study Design

This mid-term evaluation employs a descriptive and explorative study design to understand the outreach, effectiveness, and challenges associated with Mobile Health Units (MHUs) operating in the Gram Panchayats of Jaipur district. A blended methodology approach is adopted, incorporating both quantitative and qualitative data collection techniques. The descriptive component enables profiling of health service patterns, while the exploratory design helps uncover operational challenges, community perspectives, and institutional bottlenecks that influence the delivery and acceptability of MHU services.

6.2. Study Area

The study is conducted in selected villages under six Gram Panchayats (GPs) of Jaipur district, Rajasthan, where MHUs have been implemented by Dhara Sansthan, an NGO working in coordination with the public health department. These areas have been chosen due to the consistent operation of MHUs, geographical diversity, and community representation. The selected GPs reflect varied demographic and socio-economic profiles, allowing the study to capture a wide spectrum of experiences with the MHUs.

6.3. Sampling Strategy

A total of 210 beneficiaries will be selected from the chosen study villages. The sample size has been determined in consultation with Dhara Sansthan based on their operational records from January 2022 to December 2023, which show an average monthly footfall of 35–40 unique beneficiaries per GP. This ensures both feasibility and representativeness.

The sampling approach follows the Proportionate to Population Size (PPS) technique to ensure equitable distribution across the selected villages. From a list of MHU beneficiaries procured from Dhara Sansthan, respondents will be selected using simple random sampling to avoid selection bias.

In addition to beneficiary surveys, key stakeholders such as officials from Dhara Sansthan, grassroots health officials, ASHA workers, and MHU staff will be purposively selected for in-depth interviews to gather expert and implementation-level insights on MHU operations and challenges.

6.4. Data Collection Methods

- i. The study will rely on both primary and secondary data sources.
- ii. Secondary Data Review- Annual records and service logs maintained by the MHUs will be analyzed to determine trends in health service utilization by disease type, -frequency of visits, and outreach coverage.

Quantitative Data Collection: A structured semi-structured questionnaire will be administered to 210 beneficiaries to capture data on:

- i. Frequency and nature of services availed.
- ii. Perceptions of service quality.
- iii. Accessibility and timeliness.
- iv. Satisfaction with the MHU team.
- v. Perceived health outcomes post-intervention.

Qualitative Data Collection: In-depth understanding will be gathered through:

- i. content analysis and narrative analysis

6.5. Data Analysis

- i. The analysis will follow a mixed-methods approach:
- ii. Quantitative data will be compiled and analyzed using Microsoft Excel, focusing on frequency distribution, percentages, and comparisons across the selected Gram Panchayats.
- iii. The results will be presented in both tabular and graphical formats wherever applicable, accompanied by qualitative excerpts for thematic support.

6.6. Timeline Planning

The study will be carried out in three structured phases:

Phase 1: Preparation and Design

❖ Chapters Covered:

- i. Chapter 1: Introduction
- ii. Chapter 2: Review of Literature
- iii. Chapter 3: Research Methodology

❖ **Key Activities:**

- i. Finalizing the research topic and proposal.
- ii. Conducting a comprehensive literature review.
- iii. Designing tools for data collection.

Phase 2: Fieldwork and Documentation

❖ **Chapters Developed:**

- i. Chapter 4: Profile of Study Areas and Dhara Sansthan
- ii. Chapter 5: Data Collection and Preliminary Observations

Phase 3: Analysis, Writing, and Final Submission

i. **Chapters Completed:**

- ii. Chapter 6: Analysis and Discussion
- iii. Chapter 7: Conclusion and Recommendations
- iv. Annexures and Bibliography

❖ **Key Activities:**

- i. Analyzing quantitative and qualitative data using appropriate tools.
- ii. Synthesizing findings with research objectives and literature review.
- iii. Drafting and revising the final report.
- iv. Final submission of the completed dissertation with all necessary documentation.

7. CASE STUDY

7.1 Background

The National Rural Health Mission (NRHM), launched in 2005, introduced Mobile Health Units (MHUs) as a strategic solution to address the healthcare needs of rural and remote populations. MHUs aim to enhance last-mile healthcare access by delivering essential services such as outpatient consultations, maternal and child healthcare, and preventive services directly to underserved communities. In Rajasthan, particularly in the Gram Panchayats of Jaipur District, MHUs operate in areas where permanent healthcare facilities like PHCs and CHCs are either inadequate or geographically inaccessible. These mobile services were designed to complement the fixed health infrastructure and reduce the burden on overstretched rural hospitals. However, despite the strategic design of this intervention, ground-level realities highlight persistent bottlenecks in service coverage, quality, and local community participation—raising the need for a mid-term evaluation to assess their actual performance and sustainability.

7.2 Objectives of the Case Study

This case study seeks to evaluate the performance of MHUs deployed in selected Gram Panchayats of Jaipur District. The key objectives are to assess the extent and quality of health services provided by MHUs, identify the operational and systemic challenges affecting their functionality, and examine the level of engagement of local governance structures, particularly Panchayati Raj Institutions (PRIs) and Village Health and Sanitation Committees (VHSCs). The study also aims to derive practical recommendations for strengthening the efficiency and responsiveness of MHUs in addressing rural health needs. By focusing on both service delivery and governance dynamics, the study attempts to contribute to policy-level insights and mid-course corrections in the implementation of mobile healthcare strategies.

7.3 Methodology

A mixed-method approach was adopted to conduct this mid-term evaluation. The study relied on both qualitative and quantitative data drawn from NRHM records, government reports, field observations, and scholarly evaluations. Key references included findings from Bajpai et al. (2010) on systemic constraints in NRHM implementation, and Dr. Ranjeeta Dwivedi's (2022)

work on PRI involvement in rural health services. Data collection involved field visits to 8–10 purposively selected Gram Panchayats within Jaipur District where MHUs have been operational for at least a year. Semi-structured interviews were conducted with MHU personnel, local ASHAs, ANMs, PRI representatives, and beneficiaries to understand user experiences and implementation challenges. The combination of document review and field insights provided a comprehensive perspective on the MHU model’s functioning.

8. RESULT

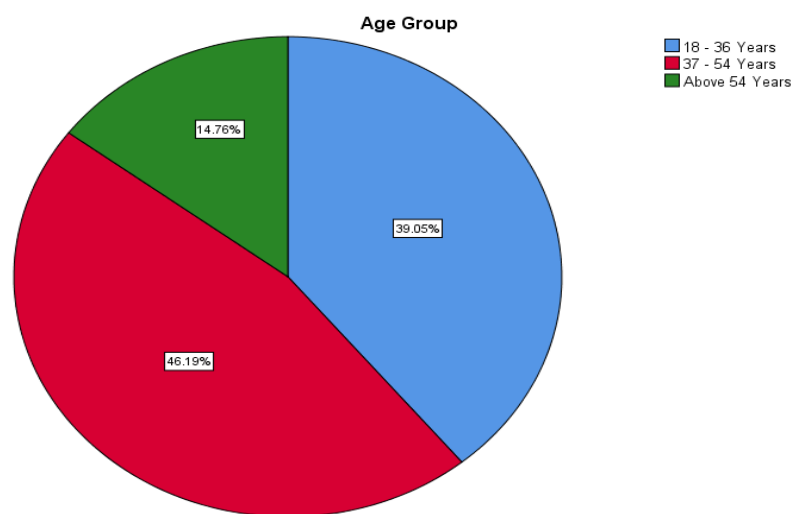
MHUs were found to deliver basic primary care services including general outpatient consultations, immunizations, antenatal check-ups, and health awareness. Despite this outreach, several operational inefficiencies were noted. In line with Bajpai et al. (2010), issues such as irregular scheduling, unpredictable routes, and lack of GPS tracking mechanisms emerged as significant barriers to service predictability. Additionally, the infrastructure supporting MHU deployment was limited, with no fixed points for service delivery in most Gram Panchayats. Human resource shortages, including an absence of doctors and trained paramedics, further restricted the service scope. Community participation, as observed in the field and echoed in Dwivedi’s (2022) analysis, was minimal. VHSCs were either inactive or functioned without meaningful engagement from PRI members, leading to limited awareness and accountability in MHU operations. While some improvement was seen in maternal and child health indicators in regularly served areas, the overall impact remained constrained by poor coordination, limited service range, and weak governance.

Table 1. Age Distribution of Study Participants

Age Group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 36 Years	82	39.0	39.0	39.0
	37 - 54 Years	97	46.2	46.2	85.2
	Above 54 Years	31	14.8	14.8	100.0
	Total	210	100.0	100.0	

Table 1 reveals that the majority of participants fall within the 37–54 years age group, accounting for 46.2% of the total sample. Individuals aged 18–36 years represent 39.0% of respondents, while those above 54 years make up the smallest group at 14.8%. This indicates that middle-aged adults form the core demographic of the study population, with younger and older individuals being less represented.

Figure-1 Graphical Representation of Respondents by Age Group



The pie chart illustrates the age distribution of the study's 210 participants. The largest proportion belongs to the 37–54 years category, comprising 46.19% of respondents. This is followed by the 18–36 years group, which makes up 39.05% of the sample. The smallest segment, accounting for 14.76%, consists of participants aged above 54 years. The data suggests that the majority of respondents are middle-aged, indicating their stronger presence or engagement in the context of the study.

Table 2. Occupational Distribution of Respondents

Occupation of respondent					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Anganwadi worker	1	.5	.5	.5
	Asha worker	2	1.0	1.0	1.4
	Contractor	1	.5	.5	1.9
	Driver	4	1.9	1.9	3.8
	Farmer	94	44.8	44.8	48.6
	House Wife	69	32.9	32.9	81.4
	Job	4	1.9	1.9	83.3
	Labour Work	10	4.8	4.8	88.1
	Mechanic	2	1.0	1.0	89.0
	shop	4	1.9	1.9	91.0
	Shop	12	5.7	5.7	96.7
	Student	3	1.4	1.4	98.1
	Tailor	4	1.9	1.9	100.0
	Total	210	100.0	100.0	

Table 2 indicates that a significant proportion of the respondents are engaged in farming, comprising 44.8% of the total sample. This is followed by housewives, who make up 32.9% of the respondents. Other occupations such as labor work (4.8%), shopkeeping (combined 7.6% for both “Shop” and “shop”), and tailoring (1.9%) also appear, but in much smaller numbers. Professions like drivers, job holders, mechanics, students, and health workers (Anganwadi and ASHA) each contribute only a minimal share to the overall distribution. This suggests that the sample is predominantly rural, with farming and household responsibilities being the primary occupations.

Figure-2 Graphical Representation of Respondents' Occupations

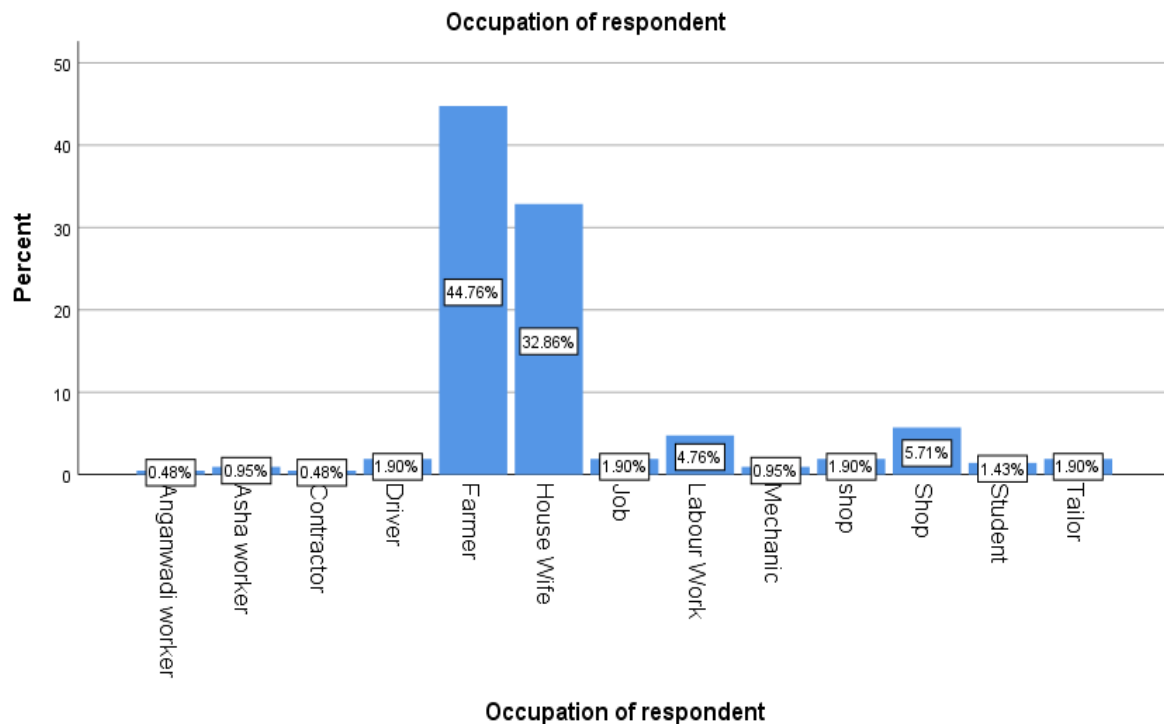


Figure-2 clearly shows that farming is the most common occupation among respondents, with 44.76% identifying as farmers. This is followed by housewives, who make up 32.86% of the total sample. Other occupations such as shopkeeping (5.71%), labor work (4.76%), and various low-frequency jobs including tailoring, driving, and formal employment are also represented but in much smaller percentages. The presence of Anganwadi and ASHA workers, along with students and mechanics, highlights a small mix of service and skilled labor sectors. Overall, the data suggests a predominantly rural and agrarian population with limited occupational diversity.

Table 3. Gender Distribution of Respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	106	50.5	50.5	50.5
	Female	104	49.5	49.5	100.0
	Total	210	100.0	100.0	

Table 3 shows that the gender distribution among the 210 respondents is nearly equal, with males slightly outnumbering females. Males constitute 50.5% of the total participants, while females make up 49.5%. This balanced representation ensures that the study captures perspectives from both genders almost equally, enhancing the inclusivity and reliability of the findings.

Figure-3 Graphical Representation of Gender Distribution

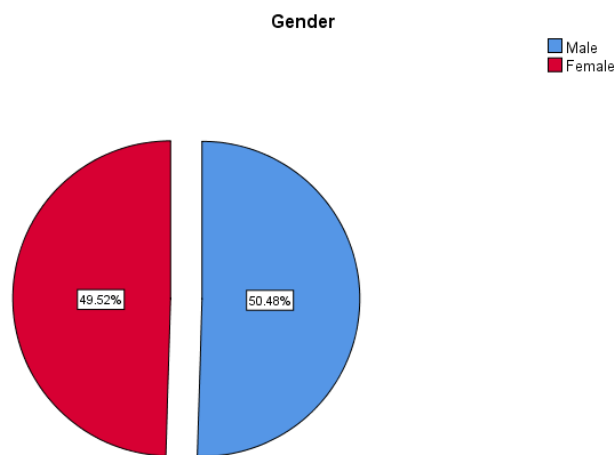


Figure-3 demonstrates an almost equal distribution of gender among the respondents. Males constitute 50.48% of the sample, while females represent 49.52%. This near parity ensures balanced gender representation in the study, which can contribute to more equitable and inclusive insights drawn from the data.

Table 4. Marital Status Distribution of Respondents

Marital status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	57	27.1	27.1	27.1
	Single	42	20.0	20.0	47.1
	Widow	44	21.0	21.0	68.1
	Widower	41	19.5	19.5	87.6
	Separated/Divorcee	26	12.4	12.4	100.0
	Total	210	100.0	100.0	

Table 4 shows a diverse distribution among respondents. A total of 27.1% are married, while 20% are single. Notably, a significant portion of the participants are widowed—21.0% are widows and 19.5% are widowers—indicating a large representation of individuals who have lost their spouses. Additionally, 12.4% of the respondents are separated or divorced. This varied distribution suggests that the study sample includes a wide range of marital experiences, which may influence the perspectives and responses observed in the research.

Figure-4 Graphical Representation of Marital Status

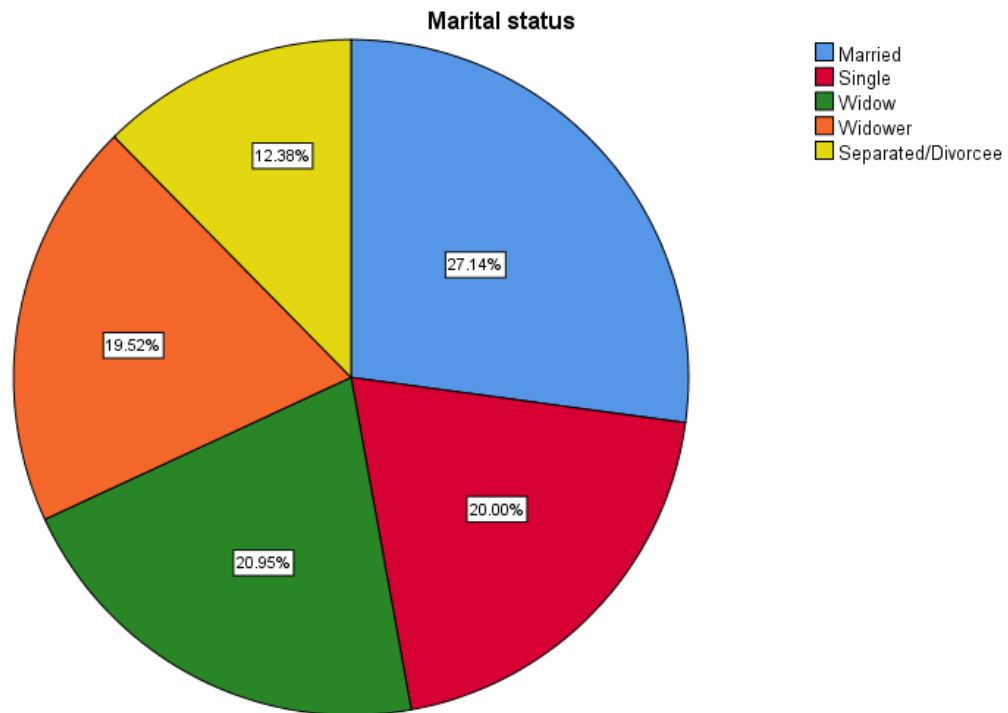


Figure 4 displays a varied marital status among respondents. The majority are married (27.14%), followed by widows (20.95%) and singles (20.00%). Widowers account for 19.52%, and 12.38% are separated or divorced. This diversity suggests that the study includes individuals from different life situations, with a notable portion having experienced the loss of a spouse or marital separation. Such variation could provide a broad range of perspectives relevant to the research context.

Table 5. Educational Status of Respondents

Educational status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Illiterate	96	45.7	45.7	45.7
	Primary	82	39.0	39.0	84.8
	Elementary	22	10.5	10.5	95.2
	Graduation	9	4.3	4.3	99.5
	Post Graduation	1	.5	.5	100.0
	Total	210	100.0	100.0	

Table 5 reveals that a large portion, 45.7%, are illiterate. This is followed by 39.0% who have completed primary education, and 10.5% with elementary education. Only a small fraction of the participants have pursued higher education, with 4.3% being graduates and just 0.5% holding a postgraduate degree. The data highlights a predominantly low educational background among the respondents, suggesting that literacy and access to education may be limited in the population studied.

Figure_5 Graphical Representation of Educational Status

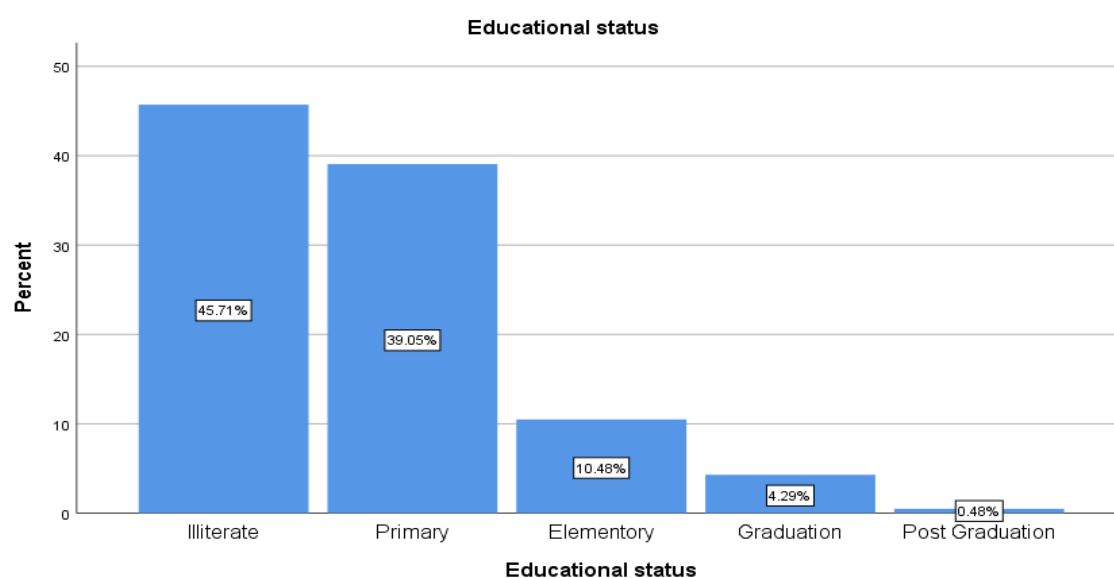


Figure 5 highlights a predominantly low level of education among the respondents. Nearly half (45.71%) are illiterate, and 39.05% have only primary education. A smaller segment (10.48%) has completed elementary schooling. Higher education is rare in this sample, with only 4.29% having graduated and a mere 0.48% attaining postgraduate qualifications. These findings indicate a limited educational background in the population, suggesting potential barriers to accessing or completing higher levels of education.

Table 6. Card Holding Status of Respondents

Card holding status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	APL	139	66.2	66.2	66.2
	BPL	71	33.8	33.8	100.0
	Total	210	100.0	100.0	

Table 6 shows that 66.2% possess an Above Poverty Line (APL) card, while 33.8% hold a Below Poverty Line (BPL) card. This indicates that a majority of the participants belong to relatively better-off households. However, a significant one-third of the population falls under the economically weaker BPL category, highlighting the need to consider economic disparities while analyzing access to resources, welfare schemes, and support services within the study area.

Figure-6 Card Holding Status of Respondents

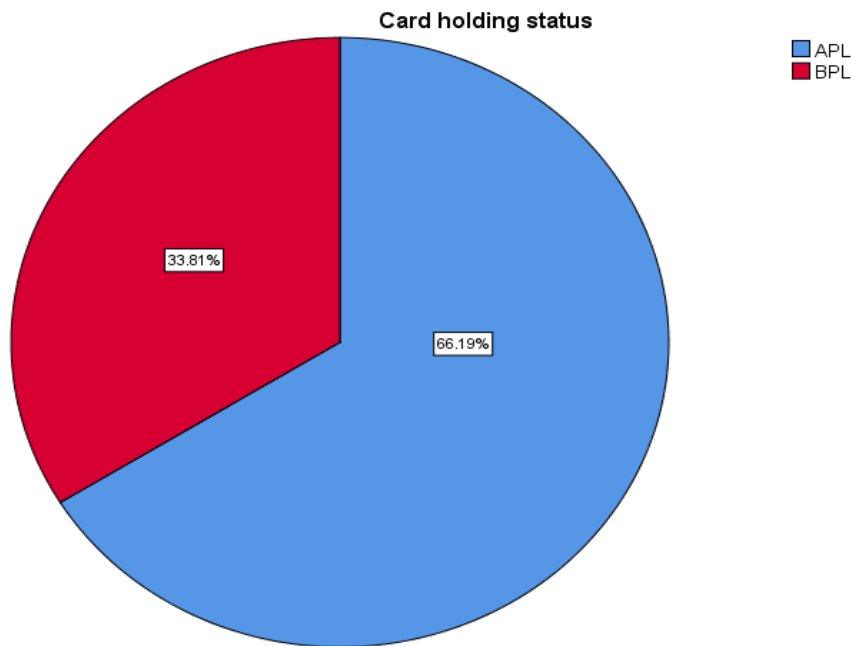


Figure 6 displays the distribution of respondents based on their ration card status. A majority, 66.19%, belong to the Above Poverty Line (APL) category, while 33.81% hold Below Poverty Line (BPL) cards. This indicates that two-thirds of the population are relatively better off economically, whereas one-third still fall under the economically weaker BPL category. The data provides important socioeconomic context that may influence access to welfare schemes and basic services.

Table 7. Types of Treatments Taken for Reported Diseases

Treatment taken for the disease.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ACIDITY	3	1.4	1.4	1.4
	Allergy	1	.5	.5	1.9
	ANC	4	1.9	1.9	3.8
	ARTHRITIS	3	1.4	1.4	5.2
	ASTHMA	2	1.0	1.0	6.2
	BACKACHE	2	1.0	1.0	7.1
	BODY PAIN	24	11.4	11.4	18.6

body pain and leg pain	1	.5	.5	19.0
body pain-leg pain	2	1.0	1.0	20.0
Boils	1	.5	.5	20.5
BP	17	8.1	8.1	28.6
BRONCHITIS	5	2.4	2.4	31.0
COLD	15	7.1	7.1	38.1
COUGH	22	10.5	10.5	48.6
cough-body pain-fever	2	1.0	1.0	49.5
DERMATITIS	14	6.7	6.7	56.2
Diabetes	2	1.0	1.0	57.1
ENT	2	1.0	1.0	58.1
FEVER	8	3.8	3.8	61.9
GASTRITIS	5	2.4	2.4	64.3
Headache	2	1.0	1.0	65.2
heart problem	1	.5	.5	65.7
HYPERTENSION	4	1.9	1.9	67.6
INJURY	3	1.4	1.4	69.0
ITCHING	16	7.6	7.6	76.7
Joint pain	3	1.4	1.4	78.1
leg pain	6	2.9	2.9	81.0
MOUTH ULCER	2	1.0	1.0	81.9
PAIN ABDOMEN	7	3.3	3.3	85.2
PELVIC PAIN	1	.5	.5	85.7
PILES	2	1.0	1.0	86.7
PNC	7	3.3	3.3	90.0
SUGAR	5	2.4	2.4	92.4
TOOTHACHE	1	.5	.5	92.9
URI	14	6.7	6.7	99.5
Weakness	1	.5	.5	100.0
Total	210	100.0	100.0	

Table 7 reveals a wide range of health issues for which respondents sought treatment. The most commonly reported condition was body pain, affecting 11.4% of the participants, followed closely by cough (10.5%), BP (8.1%), itching (7.6%), cold (7.1%), dermatitis (6.7%), and URI (6.7%). Other ailments included fever (3.8%), pain abdomen (3.3%), and PNC (postnatal care) (3.3%). A variety of less common conditions such as gastritis, bronchitis, sugar, leg pain, and hypertension were also noted. Rarely reported issues like allergy, toothache, heart problems, and pelvic pain made up a very small portion of responses (0.5%–1.9%). This distribution suggests that non-communicable conditions (such as pain-related ailments and chronic issues like BP and diabetes) and minor infections (like cough, cold, and URI) are prevalent in the population, indicating a need for both preventive healthcare and basic medical facilities.

Figure-7 Graphical Representation of Diseases for Which Treatment Was Sought

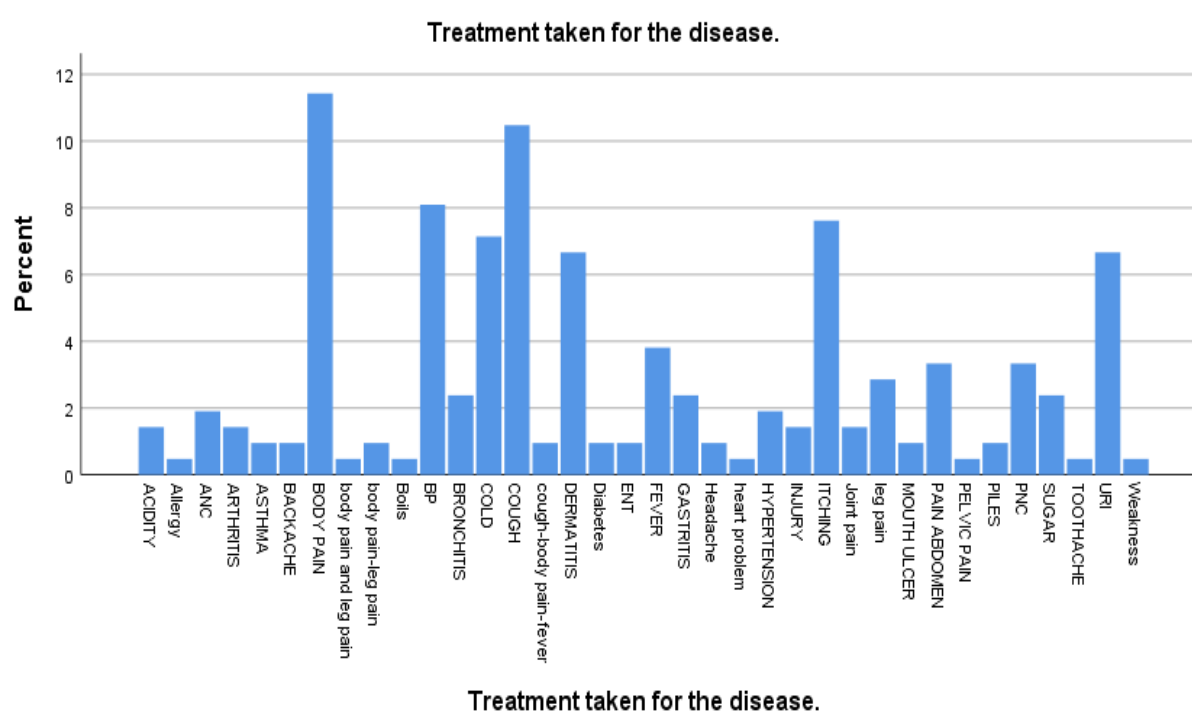


Figure 7 illustrates the variety of health issues for which respondents sought treatment. Body pain was the most frequently reported condition, accounting for 11.4% of cases, followed by cough (10.5%), BP (8.1%), itching (7.6%), cold (7.1%), and URI (6.7%). Dermatitis (6.7%) and fever (3.8%) were also among the more common complaints. A wide range of other

conditions like gastritis, leg pain, pain abdomen, diabetes, bronchitis, hypertension, and PNC appear with lower but notable frequencies. Meanwhile, some conditions such as acidity, asthma, arthritis, headache, toothache, and pelvic pain were reported by very few respondents (below 2%). This wide spread of ailments, especially related to chronic pain, minor infections, and skin problems, highlights the need for accessible primary healthcare services, especially those addressing non-communicable diseases and routine infections.

Table 8. Descriptive Statistics of Services Provided by MHV and Level of Satisfaction Across Age Groups

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Services provided by MHV	18 - 36 Years	82	33.7317	1.67073	.18450	33.3646	34.0988	30.00	36.00
	37 - 54 Years	97	33.3711	1.95959	.19897	32.9762	33.7661	27.00	36.00
	Above 54 Years	31	33.7097	1.93552	.34763	32.9997	34.4196	30.00	36.00
	Total	210	33.5619	1.84792	.12752	33.3105	33.8133	27.00	36.00
The level of satisfaction of villagers/patients	18 - 36 Years	82	30.1220	1.86845	.20634	29.7114	30.5325	23.00	32.00
	37 - 54 Years	97	30.5567	1.68306	.17089	30.2175	30.8959	24.00	32.00
	Above 54 Years	31	30.5161	1.71018	.30716	29.8888	31.1434	26.00	32.00
	Total	210	30.3810	1.76560	.12184	30.1408	30.6211	23.00	32.00

Table 8 reveals a high level of satisfaction among villagers across all age groups regarding both the services provided by the Mobile Health Vehicle (MHV) and their overall healthcare experience. The mean score for MHV services is consistently high, with the 18–36 years age group reporting the highest average (33.73), closely followed by those above 54 years (33.71) and the 37–54 years group (33.37), out of a maximum score of 36. Similarly, the level of satisfaction with healthcare services is notably high across all age categories, with an overall mean of 30.38 out of 32. The 37–54 years group reported the highest satisfaction (30.56), while the 18–36 years group had a slightly lower mean (30.12). The low standard deviations indicate that the responses were consistent within each group. Overall, the findings suggest that the services delivered by MHV are well-received and have effectively met the healthcare needs of the community, regardless of age.

Table 9. ANOVA Analysis of MHV Services and Patient Satisfaction Across Age Groups

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Services provided by MHV	Between Groups	6.571	2	3.286	.962	.384
	Within Groups	707.124	207	3.416		
	Total	713.695	209			
The level of satisfaction of villagers/patients	Between Groups	9.063	2	4.532	1.460	.235
	Within Groups	642.461	207	3.104		
	Total	651.524	209			

Table 9 indicate that there are no statistically significant differences in the perception of services provided by the Mobile Health Vehicle (MHV) or in the level of satisfaction among different age groups. For the services provided by MHV, the p-value is 0.384, which is greater than the significance level of 0.05. This means that the differences in mean scores across age groups are not statistically significant. Similarly, for the level of satisfaction of villagers/patients, the p-value is 0.235, also above 0.05, confirming that the satisfaction levels do not differ significantly among the age groups.

Table 10. Group Statistics Based on Gender for MHV Services and Satisfaction Levels

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Services provided by MHV	Male	106	33.1132	1.83262	.17800
	Female	104	34.0192	1.75699	.17229
The level of satisfaction of villagers/patients	Male	106	30.3868	1.80777	.17559
	Female	104	30.3750	1.73030	.16967

Table 10 indicate slight gender-based differences in the perception of Mobile Health Vehicle (MHV) services and overall satisfaction. Females reported a higher mean score (34.02) for services provided by MHV compared to males (33.11), suggesting that women may perceive or benefit from the services slightly more positively. However, in terms of the level of satisfaction, the difference is negligible, with males reporting a mean of 30.39 and females 30.38. The standard deviations are low across both genders, indicating consistency in responses.

Table 11. Independent Samples t-Test Based on Gender for MHV Services and Satisfaction

Independent Samples Test					
		Services provided by MHV		The level of satisfaction of villagers/patients	
		Equal variances assumed	Equal variances not assumed	Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	2.189		1.046	
	Sig.	.140		.308	
t-test for Equality of Means	t	-3.656	-3.657	.048	.048
	df	208	207.890	208	207.874
	Sig. (2-tailed)	.000	.000	.962	.962
	Mean Difference	-.90602	-.90602	.01179	.01179
	Std. Error Difference	.24782	.24772	.24427	.24417
	95% Confidence Interval of the Difference	Lower	-1.39459	-1.39439	-.46977
		Upper	-.41746	-.41765	.49336

Table 11 shows a significant gender difference in the perception of services provided by the Mobile Health Vehicle (MHV), with females rating the services notably higher than males ($p = 0.000$). However, when it comes to the overall level of satisfaction, there is no statistically significant difference between males and females ($p = 0.962$), indicating that despite slight variations in how services are perceived, both genders report nearly equal levels of satisfaction with the healthcare received.

Table 12. Cross-tabulation of Age Group and Type of Family

Crosstab					
Count					
		Type of family			Total
		Joint	Extended	Nuclear	
Age Group	18 - 36 Years	0	8	74	82
	37 - 54 Years	10	81	6	97
	Above 54 Years	30	1	0	31
Total		40	90	80	210

Table 12 reveals a strong relationship between age group and type of family structure. Among respondents aged 18–36 years, the majority (74 out of 82) live in nuclear families, with none in joint families, suggesting a preference for or transition to nuclear living arrangements in younger generations. In contrast, the 37–54 years age group is predominantly part of extended families (81 out of 97), indicating they may play central roles in multigenerational households. Meanwhile, respondents above 54 years are mostly found in joint families (30 out of 31), reflecting traditional living patterns among older adults. This distribution highlights a generational shift from joint to nuclear family systems over time.

Table 13. Chi-Square Test of Association Between Age Group and Type of Family

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	283.826 ^a	4	.000
Likelihood Ratio	270.280	4	.000
Linear-by-Linear Association	164.318	1	.000
N of Valid Cases	210		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.90.			

The Chi-Square test reveals a highly significant association between age group and type of family, with a Pearson Chi-Square value of 283.826 and a p-value of 0.000. This indicates that the distribution of family types varies significantly across different age groups. The result is further supported by the Likelihood Ratio (270.280) and Linear-by-Linear Association (164.318), both also significant at the 0.000 level. The fact that no cells have expected counts less than 5 ensures the validity of the test. These findings confirm a strong relationship between age and family structure, reflecting generational shifts in household composition—from joint families in older age groups to nuclear families among younger individuals.

Table 14. Descriptive Statistics for MHV Services and Patient Satisfaction

Descriptive Statistics			
	Mean	Std. Deviation	N
Services provided by MHV	33.5619	1.84792	210
The level of satisfaction of villagers/patients	30.3810	1.76560	210

Table 14 indicates that respondents rated both the services provided by the Mobile Health Vehicle (MHV) and their level of satisfaction quite highly. The mean score for MHV services was 33.56 (out of 36), with a standard deviation of 1.85, suggesting consistently positive evaluations across participants. Similarly, the mean satisfaction level was 30.38 (out of 32), with a standard deviation of 1.77, indicating a high and consistent level of satisfaction with healthcare services received. Overall, the data reflects strong approval of MHV services and a generally satisfied community.

Table 15. Correlation Between MHV Services and Level of Satisfaction

Correlations			
		Services provided by MHV	The level of satisfaction of villagers/patients
Services provided by MHV	Pearson Correlation	1	.290**
	Sig. (2-tailed)		.000
	N	210	210
The level of satisfaction of villagers/patients	Pearson Correlation	.290**	1
	Sig. (2-tailed)	.000	
	N	210	210

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

Table 15 shows a positive and statistically significant relationship between the services provided by the Mobile Health Vehicle (MHV) and the level of satisfaction of villagers/patients, with a correlation coefficient of 0.290 and a p-value of 0.000. This indicates a moderate positive correlation, meaning that as the perceived quality of MHV services increases, the satisfaction levels of respondents also tend to rise. The significance at the 0.01 level (2-tailed) confirms that this relationship is unlikely to be due to chance, suggesting that quality service delivery plays a meaningful role in shaping patient satisfaction.

Table 16. Regression Analysis: Predicting MHV Services Based on Satisfaction Levels

Model		Sum of Squares	df		F	Sig.
1	Regression	60.202	1	60.202	19.162	.000 ^b
	Residual	653.494	208	3.142		
	Total	713.695	209			
a. Dependent Variable: Services provided by MHV						
b. Predictors: (Constant), The level of satisfaction of villagers/patients						

Table 16 indicates a statistically significant relationship between the level of satisfaction of villagers/patients and their perception of services provided by the Mobile Health Vehicle (MHV). The model yields an F-value of 19.162 with a p-value of 0.000, confirming that the regression is significant. The level of satisfaction explains a portion of the variation in the perception of MHV services, as shown by the regression sum of squares (60.202) out of a total of 713.695. Although the explanatory power is modest, the results demonstrate that satisfaction is a meaningful predictor of how MHV services are perceived in the community.

Table 17. Regression Coefficients: Impact of Satisfaction on Perception of MHV Services

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	24.327	2.113		11.511	.000
	The level of satisfaction of villagers/patients	.304	.069	.290	4.377	.000
a. Dependent Variable: Services provided by MHV						

Table 17 shows that the level of satisfaction of villagers/patients is a significant positive predictor of their perception of services provided by the Mobile Health Vehicle (MHV). The unstandardized coefficient (B) is 0.304, indicating that for every one-unit increase in satisfaction score, the MHV service score increases by 0.304 units. This relationship is statistically significant with a t-value of 4.377 and a p-value of 0.000. The standardized beta coefficient is 0.290, reinforcing a moderate positive effect. The constant term (intercept) is 24.327, representing the baseline perception of MHV services when satisfaction is zero. These findings confirm that higher satisfaction levels are associated with better evaluations of MHV services.

Table 18. Descriptive Statistics of MHV Services and Satisfaction Across Family Types

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Services provided by MHV	Joint	40	33.3500	2.01977	.31935	32.7040	33.9960	30.00	36.00
	Extended	90	33.4778	1.93273	.20373	33.0730	33.8826	27.00	36.00
	Nuclear	80	33.7625	1.65540	.18508	33.3941	34.1309	30.00	36.00
	Total	210	33.5619	1.84792	.12752	33.3105	33.8133	27.00	36.00
The level of satisfaction of villagers/patients	Joint	40	30.6250	1.67466	.26479	30.0894	31.1606	26.00	32.00
	Extended	90	30.5778	1.68255	.17736	30.2254	30.9302	24.00	32.00
	Nuclear	80	30.0375	1.86537	.20855	29.6224	30.4526	23.00	32.00
	Total	210	30.3810	1.76560	.12184	30.1408	30.6211	23.00	32.00

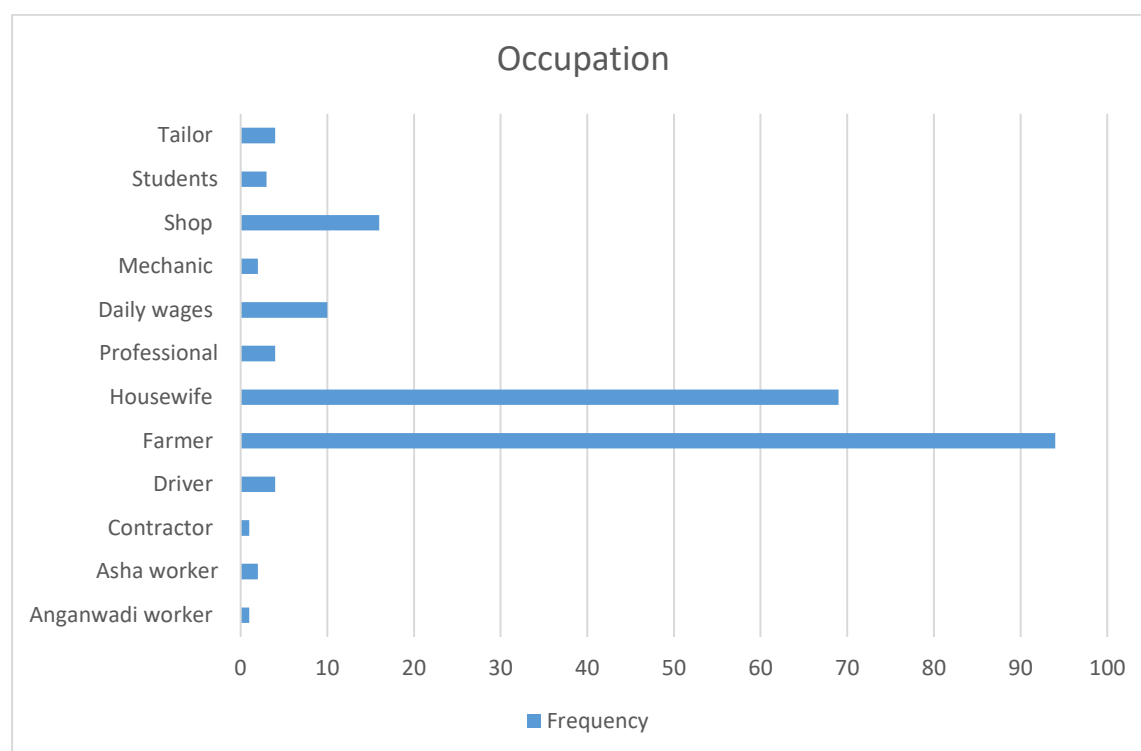
Table 18 shows slight differences in both the perception of Mobile Health Vehicle (MHV) services and the level of satisfaction among respondents. Individuals from nuclear families reported the highest mean score for MHV services (33.76), followed by those in extended (33.48) and joint families (33.35). In contrast, satisfaction levels were highest among joint family members (30.63), with extended families close behind (30.58), and the lowest satisfaction observed in nuclear families (30.04). Although these differences are relatively small, they suggest that family structure may have a modest influence on how healthcare services are perceived and experienced.

Table 19. ANOVA Results for MHV Services and Satisfaction Across Family Types

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Services provided by MHV	Between Groups	5.652	2	2.826	.826	.439
	Within Groups	708.043	207	3.420		
	Total	713.695	209			
The level of satisfaction of villagers/patients	Between Groups	15.306	2	7.653	2.490	.085
	Within Groups	636.218	207	3.074		
	Total	651.524	209			

Table 19 indicate that there are no statistically significant differences in how respondents from different family types perceive the services provided by the Mobile Health Vehicle (MHV) or report their level of satisfaction. For MHV services, the p-value is 0.439, and for satisfaction, it is 0.085, both above the 0.05 threshold for significance. Although satisfaction levels show a slightly closer margin, the difference still does not reach statistical significance. These results suggest that family structure does not have a significant impact on the perception of healthcare services or satisfaction levels among the respondents.

Figure-8 Occupational Distribution of Respondents

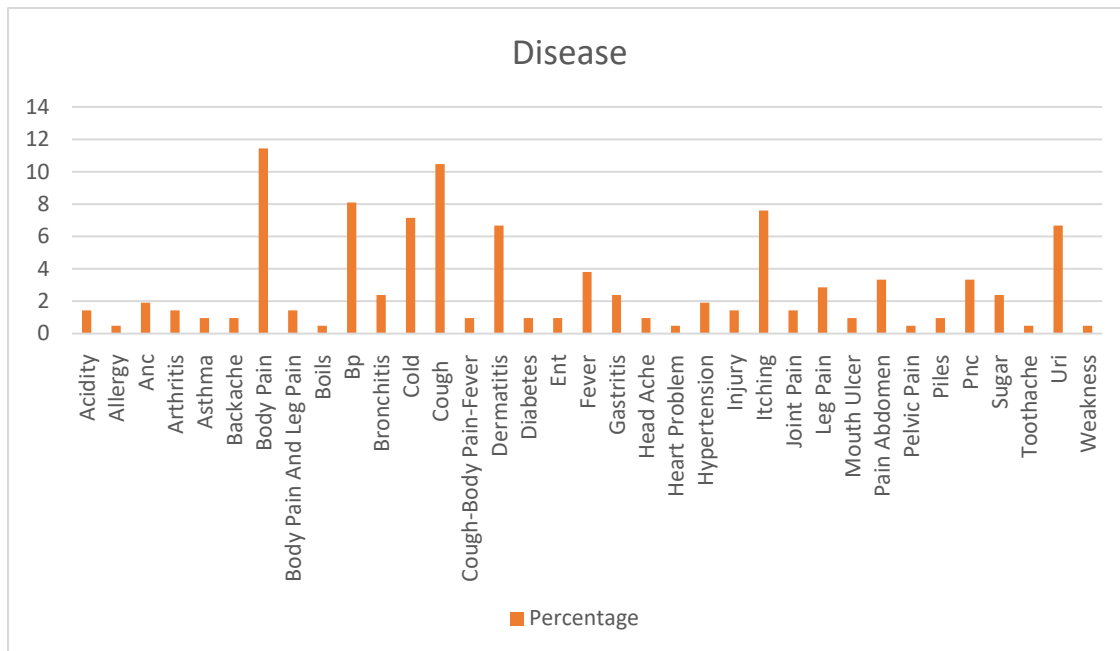


T1: Table for patients Occupations (e.g., Farmer: 94, 44.76%; Housewife: 69, 32.86%).

The diagram visualizes the top 5 occupations of MHU patients, with Farmer (94, 44.76%) and Housewife (69, 32.86%) dominating, reflecting the rural demographic. Shop (16, 7.63%), Daily wages (10, 4.76%), and Driver (4, 1.9%) follow, indicating diverse but less frequent occupations.

Figure 8 shows that farmers (94 individuals) and housewives (69 individuals) make up the majority of the respondents, accounting for more than three-fourths of the total sample. This reflects a rural or semi-rural demographic where agriculture is the primary occupation and traditional household roles are prevalent. Other occupations such as shop owners, daily wage workers, tailors, and professionals form a smaller portion of the population, while roles like anganwadi workers, ASHA workers, and contractors are minimally represented. This distribution is important for understanding the socioeconomic background of the surveyed population and tailoring healthcare outreach accordingly.

Figure-9 Distribution of Diseases for Which Treatment Was Sought

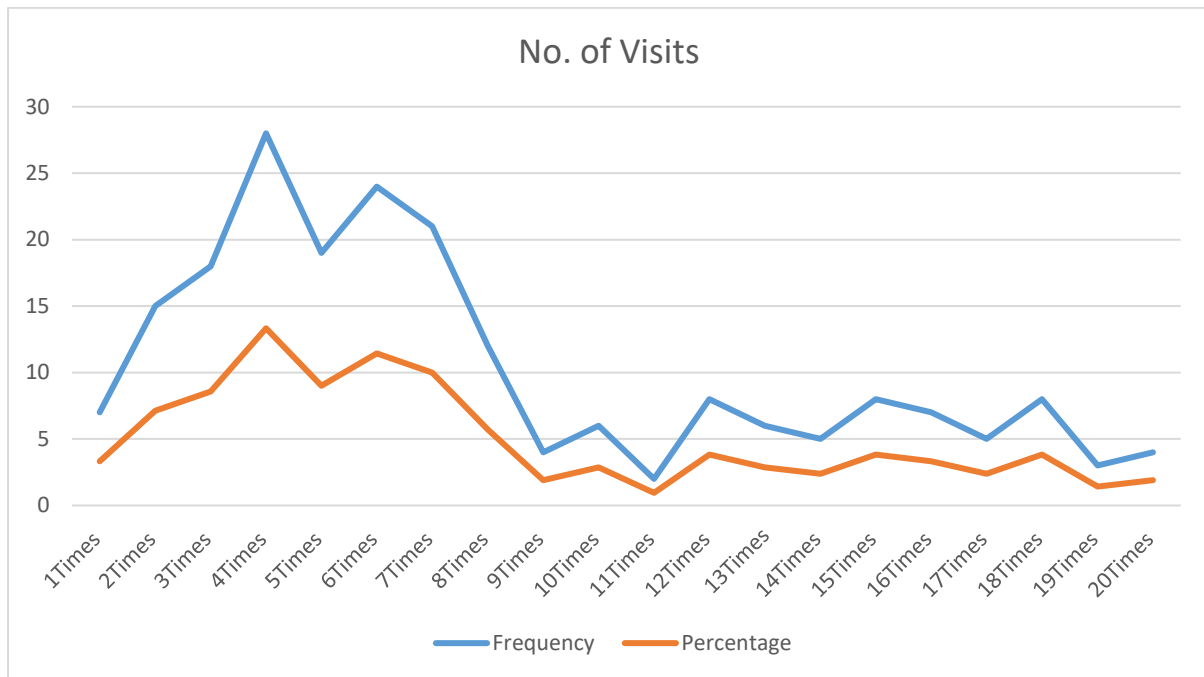


T2: Table for Top 5 Diseases (e.g., Body Pain: 24, 11.43%; Cough: 22, 10.48%).

The diagram shows the top 5 diseases treated by the MHU, with Body Pain (24, 11.43%) being the most prevalent, likely due to the physical demands of farming. Cough (22, 10.48%), BP (17, 8.1%), Itching (16, 7.61%), and Cold (15, 7.14%) highlight common health issues in the community.

Figure_9 highlights that body pain (11.4%), cough (10.5%), and blood pressure (BP) issues (8.1%) were among the most commonly reported health problems for which individuals sought treatment. Other frequently mentioned ailments include itching (7.6%), cold (7.1%), and dermatitis (6.7%), indicating a significant prevalence of general and skin-related health issues. Less frequently treated conditions include chronic illnesses like diabetes, hypertension, and heart problems, as well as minor issues like acidity, toothache, and allergies. These results suggest a community burdened more by general physical discomforts and common infections than by major chronic diseases.

Figure10 Number of Visits to Healthcare Services

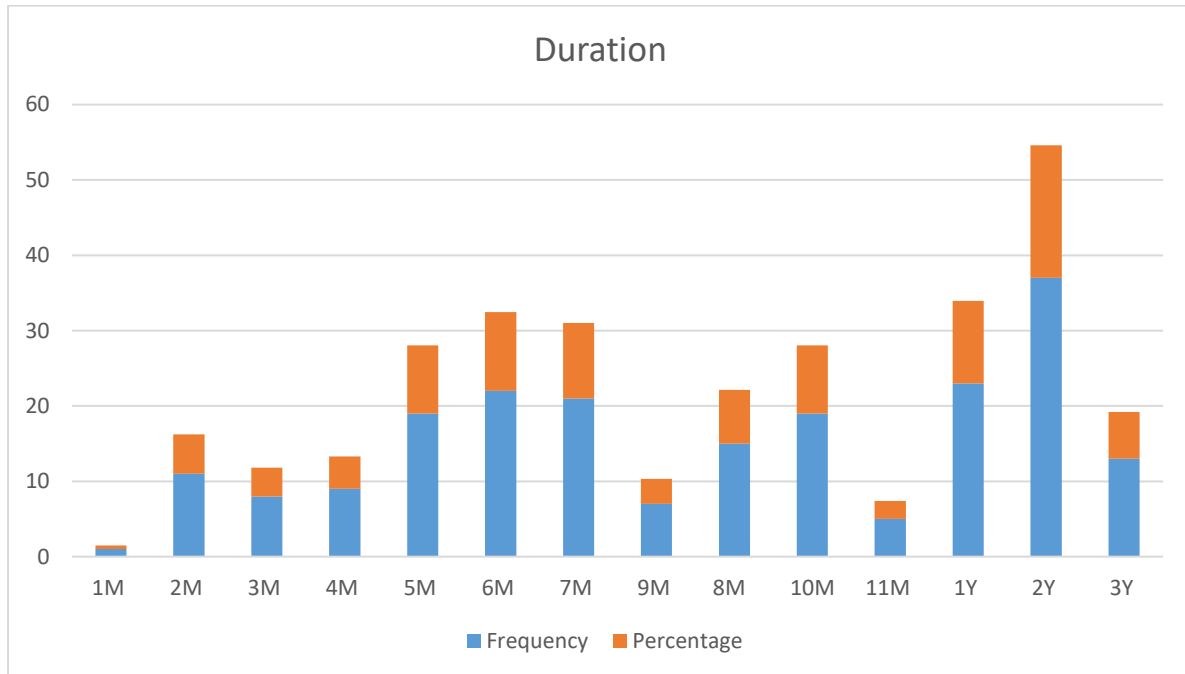


T3- Distribution of visit Frequencies to MHU

This diagram displays the top five frequencies of patient visits to the Mobile Health Unit (MHU). The most common visit frequency is 4 Times (28 patients, 13.33%), followed by 6 Times (24 patients, 11.43%). Other frequent visit counts include 7 Times (21 patients, 10%), 5 Times (19 patients, 9.01%), and 3 Times (18 patients, 8.57%). These figures indicate consistent engagement with MHU services among the community.

Figure 10 indicates that most individuals visited healthcare services between 4 to 7 times, with the highest frequency observed at 5 visits. There is a sharp increase in both frequency and percentage from 1 to 5 visits, followed by a slight dip and stabilization from 6 to 8 visits. After 8 visits, the frequency gradually declines, with very few individuals visiting more than 10 times, suggesting a limited number of high-frequency users. This pattern reflects that the majority of the population accesses services moderately, possibly based on need or accessibility, while only a small segment shows consistent or chronic engagement.

Figure-11 Duration-wise Distribution of Frequency and Percentage

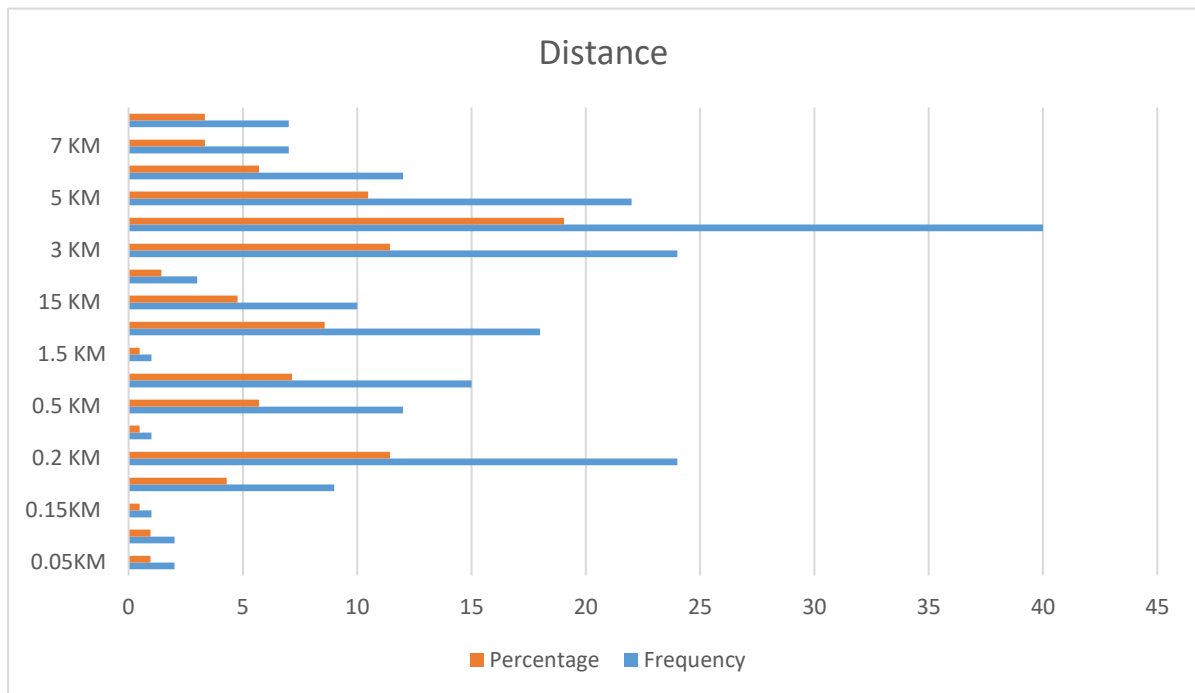


T4- Distribution of Top 5 Distances Travelled to Access MHU Services

This diagram illustrates the top five distances patients travel to reach MHU services. The most frequent distance is 4 KM (40 patients, 19.05%), followed by 3 KM and 0.2 KM (both 24 patients, 11.43%). Other common distances include 5 KM (22 patients, 10.48%) and 10 KM (18 patients, 8.57%). The data highlights varied accessibility, with a significant portion of patients traveling moderate distances.

Figure 11 illustrates how Frequency and Percentage vary across different durations ranging from 1 month (1M) to 3 years (3Y). The data reveals that the 2-year (2Y) duration has the highest overall value, driven largely by frequency, indicating a strong preference or accumulation at this interval. Mid-range durations like 5M to 7M also show consistently high values, while shorter durations such as 1M and 11M reflect minimal activity. Overall, there is a noticeable trend of increasing frequency and percentage as duration lengthens, with the most significant jumps occurring beyond the 1-year mark.

Figure_12 Distribution of Durations of health Conditions among MHU Patients



T5- Distribution of Durations of Health Conditions Among MHU Patients

This diagram shows the top five durations of health conditions reported by MHU patients. The most common duration is 2 Years (37 patients, 17.62%), followed by 1 Year (23 patients, 10.95%) and 6 Months (22 patients, 10.48%). Other prevalent durations are 7 Months (21 patients, 10%) and 10 Months (19 patients, 9.05%). These durations suggest a combination of chronic conditions and shorter-term health issues in the population.

Figure 12 presents the distribution of Frequency and Percentage across various distance intervals from 0.05 KM to 15 KM. The 3 KM mark stands out with the highest frequency, followed by 0.2 KM and 5 KM, indicating these distances are most common. In terms of percentage, 5 KM and 3 KM also show high values, suggesting both usage volume and proportional relevance. Shorter distances like 0.05 KM and 0.15 KM have minimal impact, while intermediate distances such as 0.5 KM and 1.5 KM show moderate frequency and percentage. Overall, the data suggests user activity or preference peaks notably around the 3 KM to 5 KM range.

QUESTIONNAIRE

Respondent Code:			
Study conducted by: Dhara Sansthan		Key Person: Nishy Biswa	
A. Identification Data			
1	Name of the Respondent:		
2	Complete Address:		
3	Mobile Number		
4	Date of Interview:		
Q. Code	QUESTIONS	RESPONSE	R. Code
1	Age	_____ yrs	
2	Gender	1. Male 2. Female	
3	Marital status	1. Married 2. Single 3. Widow 4. Widower 5. Separated/Divorcee	
4	Total number of family members		
5	Type of family	1. Joint 2. Extended 3. Nuclear	
6	Religion	1. Hindu 2. Christian 3. Muslim 4. Buddhist	
7	Caste	1. General 2. OBC 3. SC 4. ST/NT/DNT	
8	Educational status	1. Illiterate 2. Primary	

		3. Elementary 4. Graduation 5. Post-graduation 6. PhD	
9	Occupation of respondent		
10	Card holding status	1. APL 2. BPL	
11	Annual income of family (from all sources)	Rs	
12	Per-capita income of family	Rs	
13	Domicile of state		
14	Domicile of locality	1. Urban 2. Semi urban 3. Rural	
15	Number of visits to MHV		
16	Treatment taken for the disease.		
17	Nature of treatment		
18	Duration of treatment		

B.2 Services provided by MHV.

18	Statement	Totally agree (2)	Partially agree (1)	Disagree/ No response (0)	Code
18.1	The MHV visits my village twice a month.				
18.2	The MHV brings a doctor, nurse, and pharmacist on each of its visits.				
18.3	The MHV provides blood pressure checking service.				
18.4	The MHV possesses a diabetes testing machine.				
18.5	The MHV is equipped with a malaria testing machine.				
18.6	The MHV offers childcare services.				
18.7	The MHV staff provide comprehensive antenatal care.				
18.8	The MHV staff provide adequate postnatal care.				
18.9	The doctor is an experienced professional who attentively listens to the patients.				
18.10	The ANM is an experienced individual proficient in-patient care.				

18.11	The pharmacist is an experienced individual skilled in the distribution of medicines.				
18.12	The MHV spends enough time in my village.				
18.13	The MHV staff regularly conduct home visits.				
18.14	The MHV staff frequently organize awareness camps or programs in villages and nearby schools.				
18.15	MHV provides medicines free of charge.				
18.16	MHV is treating patients who are genuinely in need and facing serious health issues.				
18.17	The MHV staff frequently provides support to women and adolescent girls.				
18.18	The doctor, ANM, and coordinators serve as resource people for the awareness camps or programs.				
	Average of the services provided (according to the scores mentioned above)	2= High = 25 - 36 1 = Medium = 13-24 0 - Low = 0-12			

B.3 The level of satisfaction of villagers/patients.

19		Totally agree (2)	Partially agree (1)	Disagree/ No response (0)	
19.1	I am completely satisfied with the services provided by MHV.				
19.2	I am comfortable with doctor and the treatment procedure.				
20.3	The MHV staff is respecting my privacy.				
19.4	The MHV staff provides a safe environment to interact with the doctor.				
19.5	I am happy with, the way the doctor interacts.				
19.6	I am happy with the home visits done by the MHV staffs.				
19.7	I am completely satisfied with the services provided to the women and adolescent girls.				
19.8	I am happy with the health-related topics of awareness camps.				
19.9	I am happy with the way the ANM serves us.				

19.10	I am satisfied with the home visits process.				
19.11	I am happy with the time spent by the MHV in my village in every visit.				
19.12	I am satisfied with the medicines provided by the MHV.				
19.13	I am happy to see the awareness posters placed in my village.				
19.14	I am happy with the intervention of health care services in my village.				
19.15	My family and my relatives are satisfied with the services.				
19.16	I am happy with the behavior of the MHV staffs.				
	Average of the level of satisfaction (according to the scores mentioned above)	2= High = 22 -32 1= Medium = 11-21 0= Low =0-10			

FEEDBACK

Sl. No	Name	Feedback
1		
2		

9. CHALLENGES IDENTIFIED

Several systemic and operational challenges undermine the performance of MHUs in Jaipur's rural areas. Staff vacancies and high turnover, particularly among medical officers, led to service inconsistency. Logistical issues such as poorly maintained vehicles, fuel shortages, and difficult terrain further impeded timely service delivery. Most MHUs lacked logistical support for setting up temporary clinics, often providing care in makeshift settings without privacy or sanitation facilities. Furthermore, there was a glaring disconnect between MHU operations and the local governance structures meant to support them. PRI members were often unaware of MHU schedules or roles, and many VHSCs existed merely on paper. Poor communication and absence of localized IEC activities meant that many villagers were unaware of MHU services or their benefits.

10. CONCLUSION

The mid-term evaluation of MHUs in Jaipur District reveals that while these units have the potential to bridge significant gaps in rural healthcare delivery, their current impact is limited by structural and systemic barriers. Human resource shortages, inadequate logistics, weak PRI involvement, and low community awareness collectively hinder service effectiveness. To realize the full potential of MHUs, it is essential to integrate them more closely with local governance, ensure adequate resources, and institutionalize community participation mechanisms. Doing so will not only improve access to essential health services but also contribute toward building a more resilient and inclusive rural health system.

11. RECOMMENDATIONS

To enhance the effectiveness of MHUs in delivering rural health services, a multifaceted strategy is required. Strengthening PRI involvement is crucial; this includes regular training sessions for elected members and involving them in monthly planning and review meetings. Technological tools such as GPS tracking and SMS alerts can be used to inform villagers of visit schedules and ensure accountability. Human resource gaps need to be urgently addressed through incentive-based recruitment and dedicated cadre development. Logistical support should be bolstered with clear budgetary allocations for vehicle maintenance and operational expenses. Finally, community awareness must be improved through health education

campaigns led by ASHAs and local NGOs to ensure that the services provided by MHUs are utilized effectively and efficiently.