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## Perceptions of Healthcare Infrastructure Quality in Manipur: A Comparative Study of Facility Availability, Sanitation Standards, and Accessibility of Specialist Services

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### ABSTRACT

This study examines public perceptions of healthcare infrastructure quality in Manipur, with particular emphasis on the availability of healthcare facilities, the condition of physical infrastructure, the adequacy of medical equipment, sanitation standards, accessibility to specialist doctors, and preventive healthcare services. A descriptive survey design was adopted, and data were collected from 500 respondents in Imphal, Manipur, using a structured questionnaire and purposive sampling. Statistical tools such as frequencies and percentages, paired-samples t-tests, and descriptive analysis were used to analyse the data. The findings reveal that although 80.6% of respondents considered the availability of healthcare facilities to be good, major deficiencies persist in operational quality. About 78.2% rated physical infrastructure as only fair, while 80% reported inadequate medical equipment. Cleanliness and sanitation standards were perceived negatively, particularly in government healthcare facilities, where 90% rated sanitation as poor. Accessibility to specialist doctors was identified as a critical concern, with 96.4% reporting a lack of access to specialised healthcare services. Preventive healthcare services were also viewed

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inadequately by 79% of respondents. The study highlights that mere physical expansion of healthcare institutions is insufficient without functional readiness, proper sanitation, modern equipment, and the availability of specialists. The findings imply an urgent need for policy interventions focused on infrastructure modernisation, sanitation management, specialist recruitment, and strengthening preventive healthcare services to improve public trust and healthcare outcomes in Manipur.

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## 1. INTRODUCTION

Healthcare infrastructure forms the backbone of an effective healthcare delivery system because it determines the accessibility, quality, and efficiency of medical services available to the population. It includes healthcare facilities, medical equipment, sanitation standards, specialist services, and human resources, all of which collectively influence public health outcomes. In developing countries, particularly in rural and geographically challenging regions, inadequate healthcare infrastructure remains a major obstacle to achieving quality healthcare services and universal health coverage. The World Health Organisation recognises healthcare infrastructure as one of the most important pillars of a functional health system because deficiencies in infrastructure directly affect treatment quality, patient satisfaction, and healthcare utilisation (WHO, 2021). In India, despite considerable growth in the healthcare sector, large regional disparities persist in the distribution and quality of healthcare services, especially in north-eastern states such as Manipur (National Health Profile, 2023).

Manipur presents a unique healthcare context due to its geographical isolation, hilly terrain, socio-economic inequalities, and administrative challenges. Although the Indian government has introduced several initiatives, such as the National Rural Health Mission (NRHM) and the National Health Mission (NHM), to strengthen healthcare services and infrastructure, healthcare in Manipur continues to face severe challenges (MoHFW, 2022). The state's healthcare system is structured into a three-tier network comprising Sub-Centres (SCs), Primary Health Centres (PHCs), and Community Health Centres (CHCs). However, many of these facilities suffer from inadequate infrastructure, insufficient electricity, limited diagnostic equipment, a shortage of trained personnel, and poor maintenance standards (Saikia, 2014). Such deficiencies limit the operational effectiveness of healthcare institutions and reduce public confidence in healthcare services.



Perceptions of healthcare infrastructure play an important role in shaping healthcare-seeking behaviour. Individuals often evaluate the quality of healthcare services based not only on clinical outcomes but also on visible indicators such as cleanliness, availability of equipment, accessibility of doctors, and the condition of hospital buildings (Donabedian, 2005). Research suggests that poor perceptions of infrastructure quality discourage people from using public healthcare facilities and increase dependence on private healthcare providers, even when such services impose financial burdens on households (Basu et al., 2012). In Manipur, healthcare accessibility is further complicated by the uneven distribution of facilities, with a significant concentration of healthcare institutions in urban areas while rural populations remain underserved (Tsering, 2025).

One of the major dimensions of healthcare infrastructure quality is the availability and adequacy of medical equipment. Functional diagnostic tools, laboratory facilities, and modern medical technologies are essential for timely diagnosis and effective treatment. However, studies conducted in Manipur indicate that many PHCs and CHCs lack essential diagnostic equipment such as X-ray machines, laboratory facilities, and emergency care resources (Joseph & Anal, 2017). This inadequacy often forces patients to travel to urban centres such as Imphal or seek treatment in private hospitals, thereby increasing the economic burden on low-income households. Chokshi et al. (2016) observed that shortages of medical equipment in Indian healthcare institutions contribute significantly to delayed referrals, poor treatment outcomes, and patient dissatisfaction.

Another critical component of healthcare infrastructure is sanitation and hygiene standards. Cleanliness in healthcare institutions is directly linked to patient safety, infection prevention, and patient satisfaction. Studies show that poor hospital sanitation increases the risk of hospital-acquired infections and reduces public trust in healthcare systems (Allegranzi & Pittet, 2009). In many government healthcare facilities in India, inadequate Water, Sanitation, and Hygiene (WASH) facilities persist. Bouzid et al. (2018) reported that poor toilet conditions, lack of running water, and unhygienic environments are major causes of dissatisfaction among patients in public healthcare facilities. In Manipur, perceptions of cleanliness differ between private and government hospitals, with private institutions generally receiving more favourable evaluations due to better maintenance and hygiene practices (Singh, 2012).

Access to specialist healthcare services is another major challenge affecting healthcare quality in Manipur. Specialist doctors are predominantly concentrated in urban areas, leaving rural and tribal populations with limited or no access to specialised medical care (Rao et al., 2016). This shortage affects



the management of chronic illnesses and non-communicable diseases (NCDs), which require specialised diagnosis and long-term care. Gupta et al. (2022) found that PHCs in Manipur were largely unprepared to manage NCDs because of the absence of trained personnel, essential medicines, and standard treatment guidelines. Such limitations significantly affect preventive healthcare services and contribute to poor health outcomes.

Preventive healthcare services are increasingly recognised as essential components of public health systems because they reduce disease burden, promote early detection, and minimise healthcare costs. However, preventive services in many Indian healthcare institutions remain underdeveloped due to inadequate infrastructure and staffing shortages (Kumar & Pal, 2018). In Manipur, the healthcare system continues to focus more on curative services than preventive care, limiting the effectiveness of public health interventions and awareness programmes.

The distinction between the public and private healthcare sectors is also significant for understanding the quality of healthcare infrastructure. Public healthcare institutions are often perceived as overcrowded, poorly maintained, and under-resourced, whereas private facilities are viewed as cleaner, more efficient, and better equipped (Basu et al., 2012). However, private healthcare services are often financially inaccessible for economically weaker sections of society. Consequently, many individuals continue to depend on public healthcare despite dissatisfaction with service quality and infrastructure conditions.

Overall, the quality of healthcare infrastructure in Manipur reflects a paradox: while healthcare facilities are present, operational readiness and service quality remain inadequate. Understanding public perceptions regarding facility availability, sanitation standards, medical equipment, and specialist accessibility is important because such perceptions influence healthcare utilisation, treatment adherence, and trust in healthcare institutions. Therefore, this study seeks to examine public perceptions of healthcare infrastructure quality in Manipur with particular focus on facility availability, cleanliness standards, accessibility of specialist services, and preventive healthcare delivery.

## **2. REVIEW OF RELATED LITERATURE**

Healthcare infrastructure quality has become a major concern in both developed and developing countries, as it significantly influences healthcare outcomes, patient satisfaction, and healthcare utilisation. The World Health Organisation (WHO, 2021) identifies healthcare infrastructure as one of the



central building blocks of health systems. It emphasises that effective healthcare delivery depends on adequate facilities, trained personnel, sanitation standards, and functional medical equipment.

Research conducted in developing countries consistently reveals serious infrastructure deficiencies that hinder healthcare delivery. Oyekale (2017), in a study on primary healthcare facilities in Nigeria, found that many health centres lacked functional medical equipment, essential drugs, and adequate staffing. Although physical structures were available, service readiness remained poor due to equipment nonfunctionality and inadequate maintenance systems. Similarly, Adufe et al. (2025) observed that patients often perceived government healthcare facilities as structurally better than private facilities but criticised them for poor service delivery, inadequate equipment, and shortages of essential healthcare resources.

In the Indian context, interstate disparities in healthcare infrastructure are significant. Selvaraj and Karan (2012) reported that the northeastern states lag behind the national average in terms of healthcare facility quality, specialist availability, and the provision of medical equipment. Saikia (2014) further noted that rural healthcare infrastructure in North-East India suffers from inadequate electricity supply, poor transportation networks, healthcare worker absenteeism, and insufficient housing facilities for medical staff. In Manipur specifically, several Sub-Centres operate without electricity and many rural healthcare facilities function from rented or temporary buildings, thereby affecting service reliability (Saikia, 2014; Hohoi, 2015).

Physical infrastructure conditions strongly influence patient confidence and healthcare-seeking behaviour. Das et al. (2020) found that patients frequently judge healthcare quality based on visible infrastructure conditions, such as building maintenance, cleanliness, and equipment availability, because they are unable to directly evaluate technical medical competence. Poor infrastructure creates negative perceptions that discourage healthcare utilisation, especially in public healthcare institutions.

Medical equipment adequacy is another major determinant of healthcare quality. Chokshi et al. (2016) documented severe shortages of essential diagnostic equipment in Indian primary healthcare centres, especially in rural and northeastern regions. Inadequate equipment delays diagnosis, restricts treatment options, and increases referrals to urban hospitals. In Manipur, Joseph and Anal (2017) found that many PHCs lacked basic laboratory facilities and diagnostic technologies, compelling rural populations to seek expensive healthcare services in urban centres.



Sanitation and cleanliness have received increasing attention in healthcare research due to their direct relationship with infection prevention and patient safety. Allegranzi and Pittet (2009) found that healthcare-associated infections occur more frequently in institutions with poor sanitation infrastructure. Bouzid et al. (2018) found that patients in low- and middle-income countries often avoid public healthcare institutions due to poor WASH conditions, dirty toilets, and a lack of running water. In Bangladesh, Islam and Rahman (2024) identified hospital cleanliness as one of the weakest dimensions of healthcare quality, requiring urgent policy intervention.

Comparative studies between public and private healthcare institutions consistently show that private facilities are perceived more positively regarding cleanliness and patient care. Basu et al. (2012) reported that patients generally prefer private healthcare facilities because they are viewed as cleaner, better managed, and more responsive to patient needs. Similarly, Pandey and Adhikari (2024), in a study conducted at Kantipur Dental Hospital in Nepal, found that patients associated modern infrastructure and hygienic environments with higher service quality and greater satisfaction.

Accessibility of specialist doctors remains a major challenge in rural and underserved areas. Rao et al. (2016) documented severe shortages of specialist doctors across India, particularly in rural regions and northeastern states. This shortage limits access to advanced healthcare services and contributes to delayed diagnosis and treatment. In Manipur, Gupta et al. (2022) found that PHCs were inadequately prepared to manage non-communicable diseases because of the absence of specialists, treatment guidelines, and essential medicines.

Preventive healthcare services also face infrastructure-related challenges. Kumar and Pal (2018) observed that preventive healthcare programmes in Indian PHCs are often underdeveloped due to inadequate staffing, poor infrastructure, and a lack of awareness-raising programmes. Preventive care is essential for reducing the burden of chronic diseases, yet healthcare systems in many developing regions continue to focus primarily on curative treatment.

Overall, the reviewed literature demonstrates that the quality of healthcare infrastructure significantly affects patient satisfaction, healthcare accessibility, and health outcomes. Deficiencies in infrastructure, equipment, sanitation, and specialist availability are persistent challenges in developing countries, particularly in north-eastern states such as Manipur.



### 3. RATIONALE OF THE STUDY

Given the findings and existing gaps in healthcare services, the study examined public perceptions of the quality of healthcare infrastructure in Manipur. Although healthcare facilities have expanded in the state, concerns regarding inadequate medical equipment, poor sanitation, a shortage of specialist doctors, and weak preventive healthcare services continue to affect healthcare delivery and patient satisfaction. The study is important because public perception influences healthcare utilisation, trust in medical institutions, and treatment-seeking behaviour. Furthermore, limited research has comparatively examined the quality of infrastructure, sanitation standards, and specialist accessibility in both government and private healthcare facilities in Manipur. By identifying the strengths and weaknesses of the existing healthcare system, the study provides policymakers, healthcare administrators, and planners with valuable insights to improve infrastructure, service quality, and operational readiness. The findings may also contribute to strengthening public health policies and ensuring accessible, efficient, and quality healthcare services for the people of Manipur.

### 4. OBJECTIVES OF THE STUDY

The following specific objectives guided this study:

1. To study the perceptions of respondents regarding the availability of healthcare facilities, physical infrastructure, and adequacy of medical equipment.
2. To examine the perceptions of respondents on cleanliness standards in private and government healthcare facilities.
3. To assess the perceptions of accessibility of specialist doctors, preventive healthcare services, and the overall perception of infrastructure quality.

### 5. METHODOLOGY

This study used a descriptive survey to assess perceptions of healthcare infrastructure and service quality among residents of Imphal, Manipur, who utilise local healthcare services. A purposive sampling method was adopted to select 500 respondents with relevant healthcare experience, with the permission and consent from the individual respondents. The sample consisted of 254 males (50.8%) and 246 females (49.2%), representing different age and income groups. Data were collected with respondents' consent using a structured questionnaire that covered socio-economic characteristics, accessibility barriers, physical infrastructure, medical equipment, hygiene, and operational effectiveness in both government and private healthcare facilities. The study enabled a comparative evaluation of service

standards across the two sectors. Statistical tools, including frequencies, percentages, means, and standard deviations, were used for descriptive analysis. Chi-square tests examined relationships between demographic factors and perceptions of infrastructure, while paired samples t-tests compared cleanliness perceptions between private and government facilities. Pearson correlation analysis identified associations among key variables at a 0.05 significance level.

## 6. ANALYSIS AND FINDINGS

### 6.1 Objective 1: Perceptions of Availability of Healthcare Facilities, Physical Infrastructure, and Adequacy of Medical Equipment

**Table 1: Perception of Healthcare Facility Availability**

Availability of healthcare facilities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	57	11.4	11.4	11.4
	Fair	40	8.0	8.0	19.4
	Good	403	80.6	80.6	100.0
	Total	500	100.0	100.0	

**Table 1** shows respondents' perceptions of healthcare facility availability in Imphal, Manipur. A majority of respondents (80.6%, 403) rated the availability of healthcare facilities as "good," indicating that healthcare centres are generally accessible and well distributed. However, 8.0% (40) rated availability as "fair," while 11.4% (57) perceived it as "poor." These findings suggest that although the expansion of healthcare infrastructure has improved physical access to health services, a notable proportion of the population still experiences accessibility or distribution challenges. The results further imply that while healthcare facilities are present, their effectiveness also depends on the quality of infrastructure, equipment, and service delivery standards.

**Table 2: Perception of Physical Infrastructure**

Physical infrastructures					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	109	21.8	21.8	21.8
	Fair	391	78.2	78.2	100.0
	Total	500	100.0	100.0	

**Table 2** indicates that most respondents perceived the physical infrastructure of healthcare facilities as only moderately satisfactory. A majority, 78.2% (391 respondents), rated the infrastructure as “fair,” while 21.8% (109 respondents) considered it “poor.” Importantly, no respondent rated the infrastructure as “good,” highlighting the absence of highly satisfactory healthcare facilities. The predominance of the “fair” category suggests that although healthcare institutions are operational, they face shortcomings such as inadequate maintenance, outdated equipment, and insufficient supporting infrastructure. These findings imply that while healthcare facilities are available to the public, their physical conditions and overall standards remain inadequate for delivering efficient and high-quality healthcare services.

**Table 3: Perception of Equipment Adequacy**

Adequacy of available equipment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	400	80.0	80.0	80.0
	Yes	100	20.0	20.0	100.0
	Total	500	100.0	100.0	

**Table 3** reveals the most critical structural deficiency identified in the study: a profound lack of medical equipment. An overwhelming 80.0% of respondents stated that available equipment is inadequate, compared to only 20.0% who found it sufficient. This finding points to a massive functional barrier within the health system. Without adequate diagnostic tools, such as X-ray machines or functional laboratories, the physical buildings identified in **Table 1** cannot provide comprehensive care. This equipment deficit often compels patients to seek expensive treatments at urban private centres or outside the region, thereby increasing the socioeconomic burden on people with low incomes. The data emphasise that the "operational functionality" of Manipur's healthcare system is severely hampered, with 4 out of every 5 citizens perceiving the tools of the trade as insufficient for their medical needs.

## 6.2 Objective 2: Perceptions of Sanitation and Cleanliness in Private and Government Facilities

**Table 4: Perception of Sanitation and Cleanliness in Private Facilities**

Cleanliness (Private facility)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	360	72.0	72.0	72.0



	Fair	51	10.2	10.2	82.2
	Good	88	17.6	17.6	99.8
	Excellent	1	.2	.2	100.0
	Total	500	100.0	100.0	

**Table 4** reveals that sanitation and cleanliness in private healthcare facilities are viewed negatively by most respondents. A majority, 72.0% (360 respondents), rated cleanliness as “poor,” while 10.2% considered it “fair,” 17.6% rated it “good,” and only 0.2% viewed it as “excellent.” These findings indicate inadequate sanitation and maintenance practices in private healthcare institutions. Poor hygiene standards can increase the risk of hospital-acquired infections, compromise patient safety, and weaken public trust in healthcare services. Despite patients paying higher costs in private facilities, the results suggest that cleanliness and sanitation standards often fail to meet public expectations.

**Table 5: Perception of Sanitation and Cleanliness in Government Facilities**

Govt. facility cleanliness					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	450	90.0	90.0	90.0
	Fair	34	6.8	6.8	96.8
	Good	16	3.2	3.2	100.0
	Total	500	100.0	100.0	

**Table 5** shows that cleanliness standards in government healthcare facilities are perceived very negatively. A vast majority, 90.0% (450 respondents), rated cleanliness as “poor,” while 6.8% considered it “fair” and only 3.2% rated it “good.” These findings indicate serious deficiencies in hygiene, sanitation, and maintenance within public healthcare institutions. Poor sanitation conditions can increase infection risks, compromise patient safety, and reduce public trust in government healthcare services. The results also suggest inadequate availability of basic amenities and weak sanitation management, making public healthcare facilities appear unsafe and unsanitary to a large section of the population.

**Table 6: Comparison of Perception of Respondents on Sanitation and Cleanliness between Private and Government Facilities**

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Cleanliness (Private facility)	1.46	500	0.783	0.035



	Cleanliness (Govt. facility)	1.13	500	0.423	0.019
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**Table 6** presents a comparison of respondents’ perceptions of cleanliness in private and government healthcare facilities using paired-samples statistics. The mean score for private healthcare facilities is 1.46, while government facilities recorded a lower mean score of 1.13. Since lower mean values indicate poorer cleanliness, government healthcare institutions are perceived as less clean compared to private facilities. The higher standard deviation for private facilities (0.783) suggests greater variation in respondents’ opinions, whereas the lower deviation for government facilities (0.423) indicates more consistent negative perceptions. Overall, the findings highlight poor sanitation and inadequate maintenance in government healthcare facilities.

**Table 7: Paired Sample t -Test Results**

Paired Sample Statistics						
		Mean Difference	Std. Deviation	t	df	Sig. (2-tailed)
Pair	Private - Government Sanitation and Cleanliness	0.328	0.739	9.930	499	0.000

**Table 7** compares perceptions of sanitation and cleanliness between private and government healthcare facilities. The mean score for private facility sanitation and cleanliness (1.46) was higher than that of government facilities (1.13), indicating that private institutions are generally perceived as cleaner. The paired-samples t-test showed a statistically significant difference between the two sectors ( $t = 9.930$ ,  $p = 0.000$ ), confirming that the variation is not due to chance. Additionally, the correlation coefficient ( $r = 0.373$ ,  $p = 0.000$ ) revealed a moderate positive relationship between perceptions of both sectors. Although sanitation and cleanliness challenges exist in both, government facilities were viewed far more negatively, reinforcing public preference for private healthcare services.

### 6.3 Objective 3: Perceptions of Accessibility of Specialist Doctors, Preventive Healthcare Services, and Overall Infrastructure Quality

**Table 8: Accessibility of Specialist Doctors**

Accessibility of specialists				
	Frequency	Percent	Valid Percent	Cumulative Percent



Valid	No	482	96.4	96.4	96.4
	Yes	18	3.6	3.6	100.0
	Total	500	100.0	100.0	

**Table 8** highlights a severe shortage of specialist healthcare services in Manipur. An overwhelming 96.4% (482 respondents) reported having no access to specialist doctors, while only 3.6% (18 respondents) reported having access. These findings reveal unequal distribution and limited availability of specialised medical professionals, particularly outside urban areas. The shortage of specialists can lead to delayed diagnosis, inadequate treatment, and increased reliance on costly private healthcare services or on travel to urban centres for advanced care. Overall, the results suggest that although healthcare facilities may exist, the absence of specialist expertise significantly weakens the effectiveness and quality of healthcare delivery.

**Table 9: Perception of Preventive Healthcare Services**

Preventive healthcare services					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	395	79.0	79.0	79.0
	Fair	71	14.2	14.2	93.2
	Good	32	6.4	6.4	99.6
	Excellent	2	0.4	0.4	100.0
	Total	500	100.0	100.0	

**Table 9** shows that most respondents perceive preventive healthcare services as inadequate. A majority, 79.0% (395 respondents), rated preventive services as “poor,” while 14.2% considered them “fair,” 6.4% rated them “good,” and only 0.4% viewed them as “excellent.” These findings indicate limited emphasis on preventive healthcare, including health education, early disease detection, and community outreach programmes. Weak preventive services may contribute to higher rates of chronic and communicable diseases due to insufficient awareness and intervention. Overall, the results suggest that the healthcare system focuses more on treating illnesses than promoting long-term community health and disease prevention.

**Table 10: Overall Perception of Infrastructure Quality**

Overall Perception on Infrastructure Quality Frequencies		
	Responses	Per cent of Cases

		<b>N</b>	<b>Percent</b>	
Overall perception of infrastructure quality	Poor	1489	56.9%	297.8%
	Fair	587	22.4%	117.4%
	Good	539	20.6%	107.8%
	Excellent	3	0.1%	0.6%
Total		2618	100.0%	523.6%
a. Group				

**Table 10** presents respondents' overall perceptions of healthcare infrastructure quality. The findings reveal that 56.9% of responses rated healthcare infrastructure as "poor," 22.4% as "fair," 20.6% as "good," and only 0.1% as "excellent." These results indicate widespread dissatisfaction with healthcare services and infrastructure. Negative perceptions are mainly linked to inadequate medical equipment, poor sanitation, a shortage of specialist doctors, and weak service quality. Although healthcare facilities are physically available, respondents expressed concerns regarding their operational effectiveness and quality standards. Overall, the findings highlight a systemic need to improve healthcare infrastructure, staffing, sanitation, and service delivery to restore public confidence.

## 7. DISCUSSION

The study's findings reveal significant gaps between the availability of healthcare facilities and the actual quality of the healthcare infrastructure in Manipur. Although 80.6% of respondents perceived the availability of healthcare facilities as "good," the quality and operational effectiveness of these facilities were rated poorly in several dimensions. This indicates that physical presence alone does not guarantee satisfactory healthcare delivery. Similar observations were made by Oyekale (2017), who noted that healthcare centres in developing regions may be physically present but often fail to function effectively due to inadequate equipment, staffing shortages, and poor maintenance systems. Likewise, Saikia (2014) reported that healthcare facilities in North-East India suffer from inadequate infrastructure and unreliable services despite the expansion of healthcare networks.

The study further shows that physical infrastructure remains inadequate, with 78.2% of respondents rating it as "fair" and 21.8% as "poor." Notably, no respondent rated the infrastructure as "good," suggesting widespread dissatisfaction with the condition and maintenance of healthcare institutions. These findings support the observations of Das et al. (2020), who argued that patients judge healthcare quality largely through visible infrastructure such as buildings, equipment, and maintenance



standards. Poor physical infrastructure reduces public confidence and discourages healthcare utilisation, especially in public healthcare facilities.

One of the most serious concerns identified in the study is the inadequacy of medical equipment. About 80% of respondents reported that healthcare facilities lacked adequate equipment. This finding strongly aligns with Chokshi et al. (2016) and Joseph and Anal (2017), who documented shortages of diagnostic tools, laboratory facilities, and emergency equipment in Indian primary healthcare centres, particularly in rural and north-eastern regions. Inadequate equipment delays diagnosis and treatment, forcing patients to seek healthcare services in urban private hospitals, thereby increasing the financial burden on households.

The findings on sanitation and cleanliness reveal extremely negative perceptions of both private and government healthcare facilities, with government institutions viewed more negatively. Around 90% of respondents rated the cleanliness of government facilities as “poor,” compared with 72% in private facilities. The paired-samples t-test also confirmed a statistically significant difference in perceptions of the cleanliness of private and government healthcare facilities ( $t = 9.930$ ,  $p = 0.000$ ). These findings are consistent with those of Bouzid et al. (2018), who found that poor sanitation and hygiene in healthcare institutions reduce patient satisfaction and discourage healthcare-seeking behaviour. Similarly, Basu et al. (2012) observed that private healthcare institutions are generally perceived as cleaner and more responsive than public hospitals.

Accessibility to specialist doctors emerged as another major challenge, with 96.4% of respondents reporting a lack of access to specialist healthcare services. This finding supports Rao et al. (2016), who highlighted severe shortages and unequal distribution of specialist doctors in rural and north-eastern India. Gupta et al. (2022) similarly found that healthcare facilities in Manipur were inadequately prepared to manage chronic diseases because of the absence of specialists and essential medical resources.

Preventive healthcare services were also perceived poorly, with 79% of respondents rating them as inadequate. This finding aligns with Kumar and Pal (2018), who argued that preventive healthcare in Indian PHCs remains underdeveloped due to poor infrastructure, staffing shortages, and limited awareness programmes. Overall, the study confirms that, despite the presence of healthcare facilities in Manipur, deficiencies in infrastructure, sanitation, equipment, specialist accessibility, and preventive care significantly undermine healthcare quality and public trust.



## 8. RECOMMENDATIONS

Based on the study findings, the following recommendations are proposed:

- **Upgrade Infrastructure and Technology:** Targeted investments are essential for modernising medical equipment and technological capabilities, alongside ensuring basic rural electrification for all health centres. Government healthcare authorities should prioritise improvements to physical infrastructure, particularly for government facilities that received the poorest ratings.
- **Address Specialist Shortages:** Policy interventions must prioritise recruiting and equitably distributing specialist doctors to remote and tribal districts to eliminate the current "gross unavailability" of specialised care. A multi-pronged approach, including incentives for specialist postings, telemedicine services, and expanded training programs, is essential.
- **Mandate Rigorous Hygiene Standards:** Government facilities must implement strict sanitation protocols, regular maintenance, and stronger accountability measures to bridge the perceived cleanliness gap with the private sector. Regular sanitation audits, training for cleaning staff, and adequate supplies of cleaning materials should be established.
- **Expand Preventive Services:** Increased funding should support public health awareness, early screening programs, and the training of primary healthcare workers to manage non-communicable diseases effectively. Integration of preventive services within the primary healthcare infrastructure could improve early detection and disease prevention.
- **Ensure Operational Readiness:** Future initiatives must shift focus from mere physical construction to ensuring facilities are fully functional, adequately staffed, and operationally ready. Community feedback mechanisms should be established to monitor perceptions of infrastructure quality.

## 9. CONCLUSION

The study concludes that healthcare infrastructure in Manipur remains inadequate despite the increasing availability of healthcare facilities. Although a majority of respondents acknowledged the presence of healthcare centres, the overall quality of infrastructure, medical equipment, sanitation, and specialist healthcare services was perceived negatively. The findings reveal serious deficiencies in operational readiness, particularly in government healthcare institutions, where poor sanitation, outdated equipment, and limited access to specialist doctors significantly affect healthcare quality and patient satisfaction. Preventive healthcare services were also found to be weak, indicating greater emphasis on



curative rather than preventive care. The study highlights that healthcare accessibility alone is insufficient without functional infrastructure and quality service delivery. Therefore, there is an urgent need for comprehensive policy interventions that focus on infrastructure modernisation, improved sanitation standards, adequate medical equipment, the recruitment of specialist doctors, and the strengthening of preventive healthcare programmes to enhance public trust, healthcare utilisation, and overall health outcomes in Manipur.

### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

### COMPETING INTEREST DISCLAIMER

The authors declare that they have no competing financial or non-financial interests, personal relationships, or affiliations that could have influenced the work reported in this paper.

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