

Original Research Article

Demographic influences on service quality perceptions in rural public healthcare: a pilot cross-sectional study from Mizoram, Northeast India

Ishanika Chawngzikpuii*, K. Lalromawia

Department of Management, Mizoram University, Aizawl, Mizoram, India

Received: 29 April 2026

Revised: 16 July 2026

Accepted: 22 July 2026

*Correspondence:

Ishanika Chawngzikpuii,

E-mail: winniezikpuii07@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Patient satisfaction in rural public healthcare is shaped by service quality dimensions and patient demographic characteristics. Evidence from rural northeast India remains sparse. This pilot study examined how SERVPERF-based service quality dimensions predict patient satisfaction and whether demographic variables moderate dimension scores in rural Mizoram.

Methods: A cross-sectional survey was conducted with 400 patients from 14 public healthcare facilities (Primary Health Centres and District Hospitals) across seven districts of rural Mizoram between October 2023 and May 2024. A 22-item SERVPERF instrument measuring tangibles, reliability, responsiveness, assurance, and empathy was administered face-to-face. Multiple regression analysis examined service quality dimension predictors of satisfaction; Kruskal-Wallis tests and one-way ANOVA with Tukey's post-hoc analysis examined demographic variation in dimension scores.

Results: The instrument demonstrated strong reliability ($\alpha=0.851$; $KMO=0.841$). Multiple regression explained 41.8% of variance in patient satisfaction ($R^2=0.418$, $F(5, 394)=56.60$, $p<0.001$), with reliability ($\beta=0.864$) and Assurance ($\beta=0.634$) as strongest predictors. Age was the only demographic variable to show significant differences across all five SERVPERF dimensions ($p<0.01$), with patients aged 60 years and above reporting consistently higher satisfaction. Gender, education, employment, visit frequency, and purpose showed no significant differences.

Conclusions: Service reliability and staff assurance are the primary determinants of patient satisfaction in rural Mizoram's public healthcare facilities. Age-specific expectations represent the dominant demographic moderator. These pilot findings informed subsequent larger-scale instrument development for the main study.

Keywords: Demographic factors, Healthcare service quality, Mizoram, Patient satisfaction, Rural healthcare, SERVPERF

INTRODUCTION

Patient satisfaction has emerged as a central metric in healthcare quality assessment, capturing patient experiences and perceptions of care delivery beyond purely clinical outcomes.^{1,2} In the Indian healthcare context, studies consistently report gaps between urban and rural service quality, with rural public facilities facing systemic challenges including staffing shortages, infrastructure deficits, and medicine unavailability.^{3,4}

Patient-perceived service quality in these settings is shaped not only by objective resource inputs but by the expectations patients bring to the encounter- expectations that vary systematically with demographic characteristics such as age, education, and employment status.^{5,6}

Despite growing recognition of rural healthcare quality as a policy priority, evidence from Northeast India remains almost entirely absent from the published literature. Mizoram- a predominantly tribal state with high rural

healthcare utilization and a largely informal economic base- represents a distinctive and underexplored context for service quality research. Understanding how patients in this setting evaluate care quality, and how demographic factors moderate these evaluations, carries direct implications for the National Health Mission's rural quality improvement agenda.⁷

The present study is a cross-sectional pilot investigation conducted as part of a broader programme of healthcare service quality research in rural Mizoram. Employing the SERVPERF model- a performance-only adaptation of SERVQUAL that eliminates the expectation-perception gap measurement and has demonstrated superior validity and reliability in healthcare contexts- the study pursued two objectives: (1) to identify which SERVPERF service quality dimensions most strongly predict patient satisfaction in rural Mizoram public healthcare facilities; and (2) to examine whether demographic variables (age, gender, education, employment status, visit frequency, and visit purpose) significantly moderate service quality dimension scores.^{8,9}

Notably, a prior publication from this programme of research (Chawngzikpuii and Lalromawia, 2024) examined service quality in PHCs only using binary logistic regression on a subset of 200 patients from the same geographic area.¹⁰ The present study extends this work by doubling the sample size to 400 patients, including both PHCs and district hospitals, and shifting the analytical focus from predictors of high vs low overall quality to the dimensional predictors of patient satisfaction and the specific role of demographic moderators- questions unanswered by the earlier study.

METHODS

Study design and setting

A cross-sectional survey was conducted across rural Mizoram between October 2023 and May 2024. The study encompassed 14 public healthcare facilities- primary health centres (PHCs) and district hospitals- spanning seven of Mizoram's eleven districts, selected to ensure geographic representation across the state.

Participants and sampling

A total of 400 adult patients were enrolled using consecutive sampling at each participating facility. Prior institutional approval was obtained from the Health Department and all participating facility administrations. Written informed consent was obtained from all participants.

Inclusion criteria

The study included (i) patients aged 18 years and above; (ii) patients attending the selected primary health centres or district hospitals for outpatient (OPD) or inpatient

(IPD) services during the study period; (iii) patients able to communicate in Mizo or English; and (iv) patients who provided written informed consent.

Exclusion criteria

The study excluded (i) patients below 18 years of age; (ii) patients who were critically ill, medically unstable, or otherwise unable to respond to the questionnaire; (iii) patients with cognitive impairment precluding reliable self-report; and (iv) patients who declined to participate. Accompanying attendants and facility staff were not eligible for enrolment.

Instrument

The SERVPERF instrument was adapted for the rural Mizoram public healthcare context, comprising 22 items across five dimensions: tangibles (4 items), reliability (5 items), responsiveness (4 items), assurance (4 items), and empathy (5 items).⁸ A five-point Likert scale (1 = strongly disagree to 5 = strongly agree) was used. The instrument was forward and back-translated into Mizo by bilingual healthcare professionals. Overall patient satisfaction was measured using four additional items assessing global satisfaction. Demographic variables collected included age was analysed in four groups (18-32, 33-46, 47-60, ≥61), age group (four categories), gender, education level, employment status, visit frequency, and visit purpose.

Statistical analysis

All analyses were conducted in SPSS version 25. Instrument reliability was assessed using Cronbach's alpha and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Pearson correlation coefficients examined inter-dimensional relationships. Multiple linear regression (enter method) examined the predictive effect of SERVPERF dimensions on overall patient satisfaction. Kruskal-Wallis tests assessed non-parametric differences in dimension scores across demographic groups, with one-way ANOVA and Tukey's HSD post-hoc analysis applied where assumptions were met. Statistical significance was set at $p < 0.05$.

Ethical approval

Ethical clearance was obtained from the authors' institutional ethics committee prior to data collection. All participants provided informed consent and participation was voluntary.

RESULTS

Sample profile

The 400 respondents comprised 64.0% female and 36.0% male patients. The largest age group was 33-46 years (40.5%), followed by 47-60 years (28.5%), 18-32 years

(22.5%), and 61 years and above (8.5%). Secondary education was the most common qualification (41.5%), followed by higher secondary (29.0%), graduate and above (17.5%), and primary or below (12.0%). Occupationally, 50.5% were self-employed, 39.0%

unemployed, and 10.5% formally employed. District hospital patients comprised 65.5% of the sample; 34.5% attended PHCs. The most common visit frequency was quarterly (41.0%), and 66.5% attended for OPD check-ups.

Table 1: Mean scores and standard deviations of SERVPERF items (n=400).

Characteristics	Mean	Standard deviation
Tangibles	3.68	0.259
Physical facilities at the PHC/DH is visually appealing	3.88	0.612
Staff of PHC/DH is neat in appearance	4.03	0.328
Medical team follows proper dress code	3.88	0.501
The PHC/DH has modern looking equipment	2.94	0.948
Reliability	3.98	0.023
PHC/DH provides its service at the time it promises to do so	3.98	0.254
Procedures and treatment are performed timely	3.96	0.291
PHC/DH provides error free/accurate records	3.99	0.311
PHC/DH is sympathetic and assuring when patients have problems	3.97	0.298
PHC/DH is dependable; efforts are made to follow appropriate treatment methods	4.00	0.261
Responsiveness	3.87	0.121
The PHC/DH doctors give prompt or quick service	3.84	0.633
When patients have enquiries, the medical team sincerely responds	3.82	0.641
Staff inform patients about when and how the service will be performed	3.79	0.548
Staff of PHC/DH is polite and friendly	4.03	0.377
Assurance	3.96	0.060
The PHC/DH safely performs necessary treatment and procedures	3.96	0.343
Staff of PHC/DH have sufficient knowledge, skills and training	4.02	0.235
The PHC/DH does not misdiagnose the patients	3.95	0.361
Adequate training and support is given to PHC/DH staff	3.91	0.372
Empathy	3.93	0.090
The staff of PHC/DH understand patient's needs	4.00	0.272
The medical team is empathetic and gives individualized attention	3.96	0.376
The operating hours of PHC/DH are convenient for patients	3.94	0.401
The PHC/DH is fair and just in its conduct	3.85	0.503
The PHC/DH has the best interest at heart when dealing with patients	3.89	0.507
Overall scale $\alpha=0.851$	3.88	—

Table 2: Reliability statistics by dimension (n=400).

Variables	Number of items	Cronbach's alpha
Tangibles	4	0.803
Reliability	5	0.814
Responsiveness	4	0.801
Assurance	4	0.799
Empathy	5	0.821
Overall questionnaire	22	0.851

Service quality descriptives and reliability

Table 1 presents mean scores and standard deviations for all 22 SERVPERF items. Four of the five dimension means exceeded 3.80, with Tangibles the lowest at 3.68. Reliability (M=3.98) and assurance (M=3.96) recorded

the highest dimension means. Tangibles (M=3.68) recorded the lowest dimension mean, driven primarily by the modern equipment item (M=2.94). The overall scale demonstrated satisfactory reliability ($\alpha=0.851$, KMO=0.841) and all individual dimensions exceeded the $\alpha=0.70$ threshold (Table 2).

Correlation analysis

Table 3 presents Pearson correlation coefficients for the five SERVPERF dimensions. Significant positive correlations were observed between all dimension pairs ($p<0.01$). The strongest inter-dimensional correlations were between assurance and responsiveness ($r=0.791$) and between empathy and assurance ($r=0.788$), indicating that patients who perceive high competence and trustworthiness also perceive high responsiveness and empathetic care as interconnected quality attributes.

Table 3: Pearson correlation matrix of SERVPERF dimensions (n=400).

Dimension	Tangibles	Reliability	Responsiveness	Assurance	Empathy
Tangibles	1				
Reliability	0.541**	1			
Responsiveness	0.428**	0.624**	1		
Assurance	0.597**	0.774**	0.791**	1	
Empathy	0.699**	0.611**	0.567**	0.788**	1

**Significant at the $p < 0.01$ level (2-tailed).

Table 4: Multiple regression analysis- predictors of patient satisfaction (n=400).

Variables	Beta (β)	SE	t-value	P value	Decision
Intercept	1.072	0.523	2.050	0.041	-
Tangibles	-0.451*	0.216	-2.088	0.037	$H_0(6)$ Rejected
Reliability	0.864*	0.093	9.290	<0.001	$H_0(2)$ Rejected
Responsiveness	-0.951*	0.164	-5.799	<0.001	$H_0(3)$ Rejected
Assurance	0.634*	0.109	5.817	<0.001	$H_0(4)$ Rejected
Empathy	0.061	0.131	0.466	0.642	$H_0(5)$ Not rejected

$R^2=0.418$; Adjusted $R^2=0.411$; $F(5, 394)=56.60$ ($p < 0.001$). *Significant predictors.

Table 5: Kruskal-Wallis and ANOVA results- age versus SERVPERF dimensions (n=400).

Dimension	Kruskal-Wallis H	P value (K-W)	ANOVA F	P value (ANOVA)
Tangibles	15.82	0.001**	9.21	<0.001**
Reliability	18.94	<0.001**	11.03	<0.001**
Responsiveness	13.46	0.004**	7.58	<0.001**
Assurance	17.29	<0.001**	10.14	<0.001**
Empathy	14.71	0.002**	8.36	<0.001**

**Significant at 0.05 level.

Regression analysis

Multiple regression results are presented in Table 4. The model was statistically significant ($F(5, 394)=56.60$, $p < 0.001$) and explained 41.8% of the variance in patient satisfaction ($R^2=0.418$, Adjusted $R^2=0.411$), rejecting $H_0(1)$. Four of the five dimensions were significant predictors. Reliability emerged as the strongest positive predictor ($\beta=0.864$, $p < 0.001$), followed by assurance ($\beta=0.634$, $p < 0.001$) while empathy ($\beta=0.061$, $p=0.642$) was not a significant predictor. Responsiveness ($\beta=-0.951$) and tangibles ($\beta=-0.451$) showed negative coefficients in the multivariate context, reflecting their suppressor relationships with other dimensions when all five are entered simultaneously. $H_0(2)$, $H_0(3)$, $H_0(4)$ and $H_0(6)$ were rejected; $H_0(5)$ (empathy) was not rejected.

Demographic variation in service quality perceptions. Table 5 presents Kruskal-Wallis and ANOVA results for age as a moderator of SERVPERF dimension scores. Age was the only demographic variable to demonstrate statistically significant differences across all five dimensions ($p < 0.01$), partially rejecting $H_0(7)$. Gender, education, employment status, visit frequency, and visit purpose showed no statistically significant differences in dimension scores at the 0.05 level. Tukey's HSD post-hoc

analysis confirmed that patients aged 60 years and above reported significantly higher scores than all other age groups across every dimension (all pairwise comparisons $p < 0.05$), consistent with the expectation-adaptation hypothesis that older patients hold more modest service benchmarks shaped by extended exposure to public sector constraints.

DISCUSSION

The findings demonstrate that SERVPERF reliably captures healthcare service quality perceptions in rural Mizoram's public healthcare facilities, with strong internal consistency and sampling adequacy. The regression model's explanation of 41.3% of satisfaction variance confirms that service quality dimensions are meaningful predictors of patient satisfaction in this resource-constrained context, consistent with earlier SERVPERF applications in Indian and South Asian public healthcare settings.^{3,9}

Reliability emerged as the strongest predictor of patient satisfaction ($\beta=0.864$), reflecting that patients in rural Mizoram prioritize consistent, dependable service delivery above all other quality dimensions. This finding is consistent with Birhanu et al's work in rural Ethiopia,

where service consistency was the dominant satisfaction driver, and parallels the relational quality emphasis identified in primary care quality literature.¹¹ Assurance-encompassing staff competence, trustworthiness, and safety- was the second strongest predictor ($\beta=0.634$), underscoring that perceived clinical competence is central to how rural patients form overall satisfaction judgements.

The negative regression coefficients for responsiveness and tangibles in the multivariate model should not be interpreted as negative direct effects on satisfaction. Rather, they reflect suppressor dynamics arising from the strong intercorrelations between dimensions ($r=0.428$ to 0.791): in the context of all five dimensions entered simultaneously, responsiveness and tangibles contribute shared variance that is captured by the correlated reliability and assurance paths, resulting in sign reversals. The bivariate correlations between each dimension and satisfaction are all positive, confirming the expected direction of effects.

Age was the only demographic variable significantly moderating service quality perceptions across all five dimensions, with patients aged 60 and above consistently reporting higher satisfaction. This aligns with the expectation-adaptation mechanism proposed by Oliver and the extensive international evidence reviewed by Hall and Dornan confirming older patients' systematically more positive healthcare evaluations.^{5,12} The non-significance of gender, education, occupation, visit frequency, and visit purpose in this pilot sample may reflect the relatively homogeneous demographic composition of the sample- 64.0% female, 70.5% with secondary or higher secondary education, 89.5% self-employed or unemployed- which limits variance available to detect demographic effects on individual dimensions. The main study, with a larger and more analytically refined design, was better positioned to examine these relationships using structural equation modelling.

These findings have direct implications for healthcare management and National Health Mission programme design in rural Mizoram. The primacy of reliability suggests that quality improvement investment in consistent service protocols and timekeeper management will yield stronger returns than infrastructure upgrades for the modal PHC patient. The age effect implies that aggregate satisfaction scores overstate quality among older patients relative to younger and middle-aged patients, and that disaggregated reporting by age cohort is necessary for accurate facility benchmarking.¹³⁻²⁰

A primary limitation of this pilot study is its cross-sectional design, which precludes causal inference. The sample is confined to seven of Mizoram's eleven districts, limiting state-wide generalizability. The SERVPERF model, while well-validated, captures patient-perceived quality rather than objective service quality. Future research should examine longitudinal satisfaction

trajectories and validate expanded, context-specific quality frameworks developed from this pilot's findings.

CONCLUSION

This pilot study confirms the reliability and validity of the SERVPERF instrument for measuring healthcare service quality in rural Mizoram's public facilities and identifies reliability and assurance as the dominant predictors of patient satisfaction. Age is the primary demographic moderator, with older patients consistently evaluating care more favourably across all service quality dimensions. These pilot findings contributed directly to instrument refinement and study design for the subsequent main investigation and offer actionable evidence for healthcare administrators seeking to prioritise quality improvement resources in resource-constrained rural public healthcare settings.

ACKNOWLEDGEMENTS

The authors thank the patients who participated in this study and the staff of the participating healthcare facilities across Mizoram for their cooperation during data collection.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Chow A, Mayer EK, Darzi AW, Athanasiou T. Patient-reported outcome measures: the importance of patient satisfaction in surgery. *Surgery*. 2009;146(3):435-43.
2. Tucker JL, Adams SR. Incorporating patients' assessments of satisfaction and quality: an integrative model of patients' evaluations of their care. *Manag Serv Qual*. 2001;11(4):272-87.
3. Pramanik A. Patients' perception of service quality of health care services in India: a comparative study on urban and rural hospitals. *J Health Manag*. 2016;18(2):205-17.
4. Sangode PB. Service quality in rural health care: an exploration of expectation versus veracity. *J Pharm Res Int*. 2021;33(34A):169-77.
5. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Soc Sci Med*. 1990;30(7):811-8.
6. Batbaatar E, Dorjdagva J, Luvsannyam A, Savino MM, Amenta P. Determinants of patient satisfaction: a systematic review. *Perspect Public Health*. 2017;137(2):89-101.
7. Kumar V, Kumar D. Issues, challenges, and opportunities in accessing primary health services in tribal-rural setting in India: a decadal view. *Int J Community Med Public Health*. 2023;10(1):515-24.

8. Cronin JJ, Taylor SA. Measuring service quality: a reexamination and extension. *J Mark*. 1992;56(3):55-68.
9. Jain SK, Gupta G. Measuring service quality: SERVQUAL versus SERVPERF scales. *Vikalpa*. 2004;29(2):25-38.
10. Chawngzikpuii I, Lalromawia K. Rural Indian health-care: assessing patient satisfaction using the SERVPERF model. *Bangladesh J Multidiscip Sci Res*. 2024;9(5):19-28.
11. Birhanu Z, Assefa T, Woldie M, Morankar S. Determinants of satisfaction with health care provider interactions at health centres in central Ethiopia: a cross-sectional study. *BMC Health Serv Res*. 2010;10:78.
12. Oliver RL. A cognitive model of the antecedents and consequences of satisfaction decisions. *J Mark Res*. 1980;17(4):460-9.
13. Parasuraman A, Zeithaml VA, Berry LL. SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *J Retailing*. 1988;64(1):12-40.
14. Young GJ, Meterko M, Desai KR. Patient satisfaction with hospital care: effects of demographic and institutional characteristics. *Med Care*. 2000;38(3):325-34.
15. Rahmqvist M. Patient satisfaction in relation to age, health status and other background factors: a model for comparisons of care units. *Int J Qual Health Care*. 2001;13(5):385-90.
16. Jaipaul CK, Rosenthal GE. Are older patients more satisfied with hospital care than younger patients? *J Gen Intern Med*. 2003;18(1):23-30.
17. Kondasani RK, Panda RK. Customer perceived service quality, satisfaction and loyalty in Indian private healthcare. *Int J Health Care Qual Assur*. 2015;28(5):452-67.
18. Zolnierok KB, Dimatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. *Med Care*. 2009;47(8):826-34.
19. Naunheim MR, Xu L, Zhou G, Agarwala AV. Patient satisfaction with otolaryngology care: stratification by race, age, gender, income, and language. *Otolaryngol Head Neck Surg*. 2022;166(6):1055-61.
20. Chumbler NR, Otani K, Desai SP, Herrmann PA, Kurz RS. Hospitalized older adults' patient satisfaction. *SAGE Open*. 2016;6(1):1-9.

Cite this article as: Chawngzikpuii I, Lalromawia K. Demographic influences on service quality perceptions in rural public healthcare: a pilot cross-sectional study from Mizoram, Northeast India. *Int J Community Med Public Health* 2026;13:4319-24.