

Association Between Minimum Service Standards and Patient Satisfaction in Outpatient Departments of Nepal's Government Hospitals

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ABSTRACT

Background: Nepal's Minimum Service Standards (MSS) tool assesses structural readiness of government hospitals but its relationship to patient satisfaction is unknown. We evaluated how well MSS scores correspond to outpatient satisfaction and patient reported gaps in the quality of services.

Methods: A cross-sectional mixed-methods study utilized 839 patient satisfaction surveys conducted from July 2021 to May 2024 across 57 government hospitals, then linked responses to retrospective hospital-level MSS scores. Overall satisfaction was modeled with an ordinal mixed-effects logistic regression with hospital-level random intercepts. For qualitative insights, six hospitals were purposely sampled for six focus group discussions with OPD staff and six interviews with hospital leaders. Transcripts underwent thematic content analysis, and quantitative and qualitative findings were triangulated.

Results: Each 1% rise in OPD MSS score increased satisfaction odds by 3% (OR 1.03, 95 % CI 1.02–1.05; $p < 0.001$), with variable effects below a 50 % MSS threshold. Key gaps in privacy, human resources, and patient counseling were identified across hospitals, regardless of their MSS score, highlighting areas where the MSS tool does not fully correlate to patient experience. Less frequently reported problems (privacy, staff behaviour, and counselling) had the greatest effect on patient satisfaction, whereas more frequently cited problems (cleanliness, waiting times, cost, and medicine availability) had smaller effects. Qualitative findings revealed that hospitals with higher MSS scores had better management systems, stronger leadership, and improved team support, contributing to a more conducive working environment.

Conclusions: The MSS tool effectively reflects readiness in tangible aspects like cleanliness and equipment but fails to reflect gaps in privacy, human resources, and medicine availability. Addressing these misalignments is crucial to ensure that the MSS tool effectively addresses quality of care.

Keywords: MSS, OPD, patient satisfaction, quality, readiness.

INTRODUCTION

Patient-centered care is fundamental to quality Universal Health Care and impacts care-seeking behavior, adherence to treatment, and trust in health systems.¹ In Nepal, nearly 80% of population lives in rural areas, often dependent on government health services.²⁻⁴ In 2015, only 11% of health facilities met the World Health Organization's quality standards, and 13% had all seven essential equipment for service delivery.⁵

Nepal's Ministry of Health and Population (MoHP),

in partnership with Nick Simons Institute (NSI), implemented the Minimum Service Standards (MSS) since 2014, a standardized tool to assess hospital readiness.⁶ However, MSS does not capture measures of service quality, specifically patient satisfaction, a key component of high-performing health systems.^{1,6}

Thus, we aimed to understand the relationship between structural readiness and patient satisfaction within outpatient departments (OPDs) at hospitals in Nepal with the expectation to inform actionable insights improving MSS, patient satisfaction and quality of care together.

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METHODS

A mixed-methods study design was employed to assess outpatient service readiness and patient satisfaction in Nepal's government hospitals. Quantitative and qualitative data were collected and triangulated in parallel to explore relationships between hospital characteristics, service quality, and patient-reported experiences. See the Conceptual Framework in Figure S1.

Retrospective MSS data from 86 Primary and Secondary A hospitals were collected from the fiscal year 2020/21. The Patient Satisfaction Tool from the Demographic and Health Surveys (DHS) Program, Nepal Health Facility Survey was used to complete 839 surveys across 57 of 86 (66%) Primary and Secondary A government hospitals from July 2021 to May 2024.⁷ Descriptive analyses and random effects outlier checks were performed in R. Ten items (0 = no problem; 1 = minor; 2 = major) were collapsed into nine domains (wait time, cleanliness, counselling, medicine availability, hours/days of operation, privacy, cost), merging two collinear items. Ethical approval was obtained from NHRC/2192/2022

District population density (2021 census), provincial HDI (2019 report), geographic region (Himalayan/Hill/Terai), governance (provincial vs. local), hospital level (Primary vs. Secondary A), patient age, sex, and closest facility status was included as covariates; both total and OPD-specific MSS scores served as predictors.

The primary outcome was overall satisfaction (5-point Likert: 1 = very dissatisfied; 3 = neutral; 5 = very satisfied) was modeled with cumulative-link mixed models (clmm, R 'ordinal') including a random intercept for hospital to account for clustering of patients within facilities. Candidate predictors were selected a priori from patient experience domains and hospital-level characteristics considered conceptually relevant to outpatient satisfaction. We first fit a base model including MSS OPD score and patient-reported experience variables, then added hospital- and patient-level covariates individually in a purposeful stepwise manner. A step-wise model was used as a pragmatic, data-informed approach given the study context, not as a replacement for theory. Variables were retained when their inclusion improved model fit based primarily on likelihood-ratio tests and supported by changes in AIC/BIC; variables that did not improve fit were not retained in the final model. We assessed model assumptions using approximate tests of proportional odds, inspection of random effects, multicollinearity diagnostics, and

checks of predictor functional form. Subgroup analyses and alternative model forms (GLMM, GAM, cumulative link without random effects) assessed robustness. Key findings remained robust across models.

Six hospitals were purposely sampled to span low (<50%), medium (51-70%) and high ($\geq 71\%$) MSS performance. At each site, a semi-structured interview with the Medical Superintendent (Me. Su) ($n = 6$) and one focus group discussion composed of 8-12 OPD staff (i.e. consultants, medical officers, paramedics) were conducted using an iteratively refined topic guide. Participants diversity was maintained so that reflection from a variety of participants could be represented. Different levels of hospitals from all three geography (himalayan, hill and terai) were purposely selected to ensure maximum representation in the study. Saturation was decided when no new ideas /experience were obtained from the participants while further probing during discussion and in the interview sessions. These sessions lasted 45-90 minutes which were audio-recorded, transcribed and translated into English. Transcripts were inductively coded for emergent themes and tagged by MSS category for comparative analysis. Finally, themes were triangulated with quantitative findings to identify areas of convergence and divergence.

Ethical approval from the Nepal Health Research Council (Ref. 2192) and the MoHP was received prior to the start of the study. See supplemental materials. Written informed consent was taken from all the participants of the study.

RESULTS

A total of 839 patient satisfaction surveys were collected across 57 government hospitals. Participants under 18 years and surveys with missing data were excluded, resulting in 771 usable surveys from 56 government hospitals. See Table 1. Clustering at the hospital level was supported. Of the 771 surveys, 75.1% of respondents reported satisfaction (Likert ≥ 4), with 12.6% neutral responses (Likert=3) and 12.3% dissatisfied (≤ 2), split evenly between "very" (5.5 %) and "somewhat" (6.7%) dissatisfied.

We fitted a cumulative-link mixed model for overall satisfaction to account between-hospital variations, which removed geography, hospital level, and hospital governance from analysis. After stepwise selection, the nine problem-domains and OPD MSS score remained. See Table 2. Threshold parameters (1|2, 2|3, etc.) had very large ORs with wide CIs, reflecting the difficulty

of precisely locating cutpoints between adjacent categories as extreme responses were less frequent. These values are not used for interpretation, thus, we focused on the predictor odds ratios, which remain stable and significant. The increasing odds ratios with highly significant p-values with increasing thresholds provides strong evidence that as patient satisfaction improves, the likelihood of being more satisfied increases further.

Regardless of reported problems, OPD MSS score demonstrated a significant positive relationship on overall patient satisfaction. A single percentage increase in MSS score raised the odds of higher satisfaction by 3% (OR = 1.03; 95% C.I. 1.01 - 1.05; $p < 0.001$). Cumulatively, a 10 % increase corresponds to 1.35-fold higher odds, and a 20% increase nearly doubles the odds of satisfaction. The relationship between OPD MSS score and overall patient satisfaction appears linear with a correlation of 0.91 with greater variability before 50% (Supplemental Figure S2).

Although medicine availability, cost, and wait time were the most frequently cited problems, negative experiences with privacy during examination and patient-reported staff behavior, meaning patient's interactions with any hospital staff, had the greatest significant impact on satisfaction. Patients who reported a major problem with privacy during their examination had 27 times greater odds of lower overall satisfaction ratings, although CIs were wide and results should be interpreted with caution and causality should not be assumed (OR = 26.87; 95% C.I. 10.81 - 66.81; $p < 0.001$). Similarly, if patients had a major problem with staff behavior, they had 19 times greater odds of reporting a lower overall satisfaction (OR = 19.01; 95% C.I. 7.56 - 47.84; $p < 0.001$). Further related to interpersonal interactions, patients reporting an issue discussing their problem with a healthcare provider had 11 times greater odds of lower overall satisfaction (OR = 11.68; 95% C.I. 3.58 - 38.12; $p < 0.001$).

Patients reporting problems with medicine availability had 10 times greater odds of reporting a lower overall satisfaction (OR = 6.99; 95% C.I. 2.62 - 18.65; $p < 0.001$). Considering medicine availability was reported by 78.2% of patients, addressing this will likely result in drastic improved satisfaction.

Of all patients surveyed, 25.3% (n=195) were not visiting their closest hospital. When provided with a multiple choice for why they chose not to visit the closest hospital, the most common reason cited was the lack of medicine at their closest health facility (34.4%), as

shown in Supplemental Table 1. This was followed by "other" (23.6%) and a referral (21.5%). Surprisingly, dislike of the personnel was never cited as the reason for the patient traveling to a farther health facility despite staff behavior having the greatest impact on overall patient satisfaction.

Participants noted that hospitals were providing services despite poor, outdated infrastructure to a high patient volume. This was reported as a problem across hospitals, regardless of MSS score.

"There is not enough space. The patient's privacy is also not maintained. When the OPD opens, all the patients come inside at once." - Service Provider, Primary Hospital

"Comparatively, we have better infrastructure for the OPD than before.... However, with an increased number of patients and consultants, ... then this infrastructure is not enough to meet our plan." - Medical Superintendent, high-scoring Secondary A Hospital

A participant from a Primary hospital scoring 100% in OPD MSS was not satisfied with the structure and stated, *"It's not sufficient. It's not enough. Currently, we are running several OPD [clinics] in this space."*

Providers reported that patient privacy was compromised across hospitals. No staff were satisfied with the maintenance of privacy at the hospitals, citing poor infrastructure, human resources, furniture, and queue management.

"Basic infrastructure is required for ensuring privacy like a screen, personnel for crowd controlling, etc. We don't have that." - Service provider, low-scoring Secondary A Hospital

"Two doctors provide services in one room. Even the room is not very big. There is very little distance, about 3 to 4 feet between the doctors." - Service provider, high-scoring Primary Hospital

Responses regarding equipment and instrument availability diverged between low- and high-scoring hospitals. Most participants from the high-scoring facilities expressed that basic equipment and instruments were available at their working station as per the hospitals.

"Yes, we do have basic equipment. ... we have all the basic instruments that are needed in this level of hospital." - Service provider, Secondary A Hospital

"Basic equipment like BP cuff, stethoscope, saturation probe etc. are available." - Service provider, high-scoring Primary Hospital

In contrast, healthcare workers at lower-scoring hospitals reported working in compromised environments without functional equipment and instruments. Similarly, hospitals reported problems including misplaced items and replacing broken or lost equipment.

"We don't have thermometers for taking vitals. ... I got [a pulse oximeter] 10 days after requesting it. But ... they gave me a non-functional one." - Service provider, Secondary A Hospital

"A single sphygmomanometer is used by multiple providers ... Moreover, equipment is not functioning ... and is broken.... Instruments are lost frequently from the OPD." - Service provider, Primary Hospital

Most hospitals, regardless of MSS scores, continue to experience problems with insufficient human resources. In some hospitals, a few consultant doctors were employed but in their absence specialist services were interrupted. And while some hospitals reported enough staff, lack of effort from all staff was cited as a problem.

"As far as I know there is no doctor patient ratio maintained throughout the country and we have the same condition. However, we manage to see all the patients within the working hours." - Service provider, Secondary A Hospital

"...we have one consultant for each OPD, if they take leave, the service is interrupted" - Consultant of a high-scoring Secondary A Hospital

Providers reported that low-scoring hospitals had a higher referral rate. In contrast, high-scoring hospitals reported a lower referral rate.

"Most of the patients come to the OPD to get referred. You can hardly find a person who believes in this hospital. The hospital environment should [take care of] half of the patient's illness,..." - Service provider, low-scoring Secondary A Hospital

"Before there used to be more referrals, when OPD client total number was around 100 then around 30 used to be referred but ... now, I think 2-3 referrals per day." - Service provider high scoring Secondary A Hospital

Most hospitals faced similar obstacles maintaining cleanliness and waste management due to high patient flow, a lack of human resources, and poor management. Contrary to the current health care waste management guidelines, most reported disposing of waste by burning or burying. However, high-scoring hospitals generally had better cleanliness and waste management.

"Color coded dustbins are not available in OPD, final disposal is done by burning or burying." - Service

provider, mid-scoring Primary Hospital

"Our OPD is clean. Normally, we have seen that government hospitals are not clean. But our hospital is clean. Our two helpers - one male and one female, clean the OPD twice a day." - Service provider, high-scoring Primary Hospital

Respondents cited poor record-keeping practices, with insufficient human resources, high patient load, and lack of queuing as reasons for poor documentation. Respondents agreed that using an electronic medical record system would improve recording and reporting.

"OPD records are important but with the current situation [with] one clinician is seeing 50-60 OPD patients per day, it is very difficult to maintain the record by the same person, but it can be done if we can allocate a paramedic for recording purposes only." Medical Superintendent, Secondary A Hospital

"About 30 patients enter the OPD at once. At that time, are we supposed to do the recording or check the patients? ... It's not possible to do the recording." Service provider, Primary Hospital

The MSS tool has become widely used in government hospitals with both providers and management reporting that MSS is linked to provision of high-quality health services.

"Before I used to criticize that MSS deals with quantitative things and [it was] no use... but when I started to become involved with MSS, I realized that with increased MSS scores, the quality of health service is also higher." - Medical Superintendent, high scoring MSS Secondary A hospital.

"All the hospitals must score at least 95%. We mustn't be satisfied with 80 or 90%. ... But, what if the referred hospital's MSS score is only 35%? So, more budget is needed to make all the hospitals according to MSS." - Medical Superintendent, Primary Hospital

Triangulation of quantitative and qualitative results highlighted how well MSS tool captures elements of hospital readiness, such as cleanliness or availability of equipment and supplies. However not all areas were accurately reflected. The quantitative findings revealed that each percentage increase in MSS score is significantly associated with three percentage increase in patient satisfaction while the KII's frequently noting that the increase in MSS score enabled higher quality of service. Privacy issues, identified as the strongest predictor of poor satisfaction, were prevalent across hospitals regardless of MSS scores, indicating a gap in

the tool's ability to accurately measure this crucial aspect of patient experience (See Table 3 triangulation matrix). Similarly, human resource challenges, such as insufficient staff, poor doctor-patient ratios, and staff behavior, were reported consistently across hospitals meeting high MSS scores, suggesting that MSS may not adequately assess staffing quality and performance.

Table 1. Demographics of OPD Patient Satisfaction Survey Respondents (n=771) and Hospital Characteristics (n=56). Mean Satisfaction is out of 5 points, with 5 being most satisfied, and 1 being least satisfied. Note that Primary and Secondary A hospitals have slightly different assessment tools based on expected services.

Category	Variable		
<i>Panel A. Respondent Demographics (N =771)</i>		N (%)	Mean Satisfaction (5) ± s.d.
Sex	Female	433 (56.2)	4.03 ± 1.16
	Male	338 (43.8)	4.01 ± 1.16
Age Categories (years)	18 - 24	118 (15.3)	3.87 ± 1.25
	25 - 34	200 (25.9)	4.09 ± 1.12
	35 - 44	142 (18.4)	4.03 ± 1.16
	45 - 54	77 (9.99)	4.06 ± 1.13
	55 - 64	88 (11.4)	3.93 ± 1.07
	65 +	146 (18.9)	4.05 ± 1.21
Hospital Level	Primary	416 (54.0)	4.03 ± 1.16
	Secondary A	355 (46.0)	4.01 ± 1.16
Geographical Region	Himalayan	151 (19.6)	4.16 ± 1.09
	Hills	272 (35.3)	4.07 ± 1.15
	Terai	348 (45.1)	3.88 ± 1.2
Province	Koshi	78 (10.1)	4.4 ± 1.01
	Gandaki	54 (7.0)	3.76 ± 1.23
	Bagmati	84 (10.9)	3.6 ± 1.30
	Madhesh	153 (19.8)	4.67 ± 0.53
	Lumbini	167 (21.7)	3.71 ± 1.29
	Karnali	129 (16.7)	4.03 ± 1.01
	Sudurpaschim	106 (13.7)	4.34 ± 0.99
<i>Panel B. Hospital Characteristics (n=56)</i>		n (%)	Mean MSS score (%) ± s.d.
Hospital Level	Primary	30 (53.6)	73.6 ± 15.1
	Secondary A	26 (46.4)	75.9 ± 17.5
Geographical Region	Himalayan	11(19.6)	73.9 ± 10.8
	Hills	20(35.7)	81.6 ± 13.4
	Terai	25 (44.6)	69.6 ± 18.4
Province	Koshi	6 (10.7)	84.3 ± 5.1
	Gandaki	4 (7.14)	80.5 ± 15.1
	Bagmati	6 (10.7)	80.0 ± 16.5
	Madhesh	11 (19.6)	64.2 ± 17.3
	Lumbini	12 (21.4)	73.6 ± 20.1
	Karnali	9 (16.1)	72.2 ± 11.1
	Sudurpaschim	8 (14.3)	79.5 ± 14.1

Table 2. Ordinal Mixed Model Output (n=771). Predictor variables reported as ORs for interpretation. Threshold variables reported as logit estimates. * = p<0.05; ** = p<0.01, *** = p<0.001.

Variable	OR (95% C.I.)	<i>p-value</i>	
<i>Thresholds (Reported as logit estimates ± s.e.)</i>			
1 2	8.452 ± 2.726	0.002	**
2 3	10.686 ± 2.739	<0.001	***
3 4	13.686 ± 2.764	<0.001	***
4 5	19.867 ± 2.934	<0.001	***
<i>Predictor Variables (Reported as ORs)</i>			
MSS OPD Score (%)	1.03 (1.01 - 1.05)	<0.001	***
Problem with wait time	3.38 (1.49 - 7.70)	0.004	**
Problem with cleanliness	5.78 (2.29 - 14.56)	<0.001	***
Problem with provider counselling and information	11.68 (3.58 - 38.12)	<0.001	***
Problem with staff behaviour	19.01 (7.56 - 47.84)	<0.001	***
Problem with medicine availability	6.99 (2.62 - 18.65)	<0.001	***
Problem with days of operation	1.60 (0.20 - 12.63)	0.660	
Problem with hours of operation	1.56 (0.25 - 9.58)	0.629	
Problem with privacy	26.87 (10.81 - 66.81)	<0.001	***
Problem with cost	5.89 (2.30 - 15.09)	<0.001	***
HDI (%)	1.10 (1.00 - 1.20)	0.044	*

Table 3. Triangulation Matrix of Quantitative and Qualitative Findings by Theme.

Item	Quantitative Findings	Qualitative Findings	Convergence/ Divergence
Minimum Service Standards	Increasing MSS scores significantly increased the odds of higher patient satisfaction (OR = 1.03; p<0.001). Greater variability in satisfaction observed below 50% MSS score; stronger linear effect above that threshold.	Providers acknowledged MSS readiness improves service quality but emphasized equitable adoption and funding gaps. MSS scores aligned with staff experiences of equipment and supply functionality and availability, cleanliness, and management.	Convergence: MSS scores reflect patient satisfaction. Highest satisfaction almost exclusively at higher scoring MSS hospitals. Further, non-linear relationship suggests a threshold effect where improvements only translate to satisfaction after baseline conditions are met. Reinforces the need to raise low-performing facilities above this threshold. Divergence: Significant predictors of poor satisfaction (privacy issues, human resources, and counselling) were found across high and low scoring MSS hospitals.
Infrastructure	Infrastructure issues (e.g., space, privacy) significantly impact patient satisfaction.	Service providers reported insufficient space, poor lighting, ventilation issues, and outdated infrastructure.	Convergence: Poor infrastructure reduces patient satisfaction and compromises privacy regardless of MSS score.
Privacy	Problems with patient privacy was the greatest predictor of poor patient satisfaction (OR = 26.867; p<0.001).	Providers highlighted lack of private spaces, crowding, and shared rooms compromising confidentiality across all hospital levels low- and high- scoring MSS hospitals.	Convergence: Both data types show privacy as a critical issue negatively affecting satisfaction regardless of MSS score.

Table 3. Triangulation Matrix of Quantitative and Qualitative Findings by Theme.

Item	Quantitative Findings	Qualitative Findings	Convergence/ Divergence
Equipment & Supplies	MSS assesses equipment and instrument availability and functionality. Higher MSS scores positively correlate with satisfaction. Lack of medicine availability was a significant and frequent predictor of poor patient satisfaction (OR = 6.99; $p < 0.001$)	Providers in low-scoring hospitals noted broken or shared equipment with poor management, while high-scoring hospitals reported better access.	Convergence: Equipment availability strongly aligns with MSS scores and impacts satisfaction. Divergence: Staff emphasized general equipment issues, but less about medicine availability.
Human Resources	MSS scores staffing numbers and ratios. Higher MSS scores positively correlate with satisfaction. Poor staff behavior significantly increased the odds of reduced patient satisfaction (OR = 19.01; $p < 0.001$).	Providers reported lack of sufficient clinicians, poor doctor-patient ratios, and staff who do not fulfill duties across all MSS scoring hospitals.	Convergence: Human resource gaps impact service quality and patient satisfaction. Divergence: Human resource issues were found across all regardless of MSS score.
Cleanliness	Problems with cleanliness increased the odds of lower satisfaction (OR = 5.78; $p < 0.001$).	High scoring MSS hospitals adhered better to cleanliness guidelines; others faced waste disposal and maintenance issues.	Convergence: Poor sanitation in hospitals with lower MSS scores aligns with poor patient satisfaction.
Management	Wait time was the second most frequently reported problem by patients, and increased the odds of poor satisfaction (OR = 3.38; $p = 0.004$).	Leadership and management in high MSS hospitals created positive working environments and facilitated equipment availability. Poor management was suggested to contribute to poor record keeping and thus longer wait times.	Convergence: Effective management improves efficiency, satisfaction and MSS scores.
Bypassing Closest Hospital	25.3% of patients were not going to their closest facility. The most common reason was medicine unavailability (34.4%).	Staff did not acknowledge patients bypassing due to supply or trust issues.	Divergence: Patients are altering care-seeking behavior due to medicine availability, while providers did not mention this. Highlights gap in provider awareness of patient priorities.
Counseling & Communication	Major issues with counseling increased odds of poor satisfaction 12-fold (OR = 11.68; $p < 0.001$).	Providers acknowledged some challenges in communication, but felt constrained by time, patient volume, or staff capacity.	Convergence: Both data sources agree that counseling is critical but under-delivered. However, it is not captured explicitly in MSS scoring, limiting the tool's sensitivity to interpersonal care.
Leadership & Team Cohesion	Not formally measured in the quantitative tool but associated with higher MSS scores and patient satisfaction in qualitative synthesis.	Strong leadership and team cohesion enabled better adherence to MSS and problem-solving, especially in high-scoring hospitals.	Convergence: Leadership and teamwork are critical enablers of MSS performance and patient satisfaction, though not directly scored. Suggests opportunity to integrate these domains into future MSS revisions.

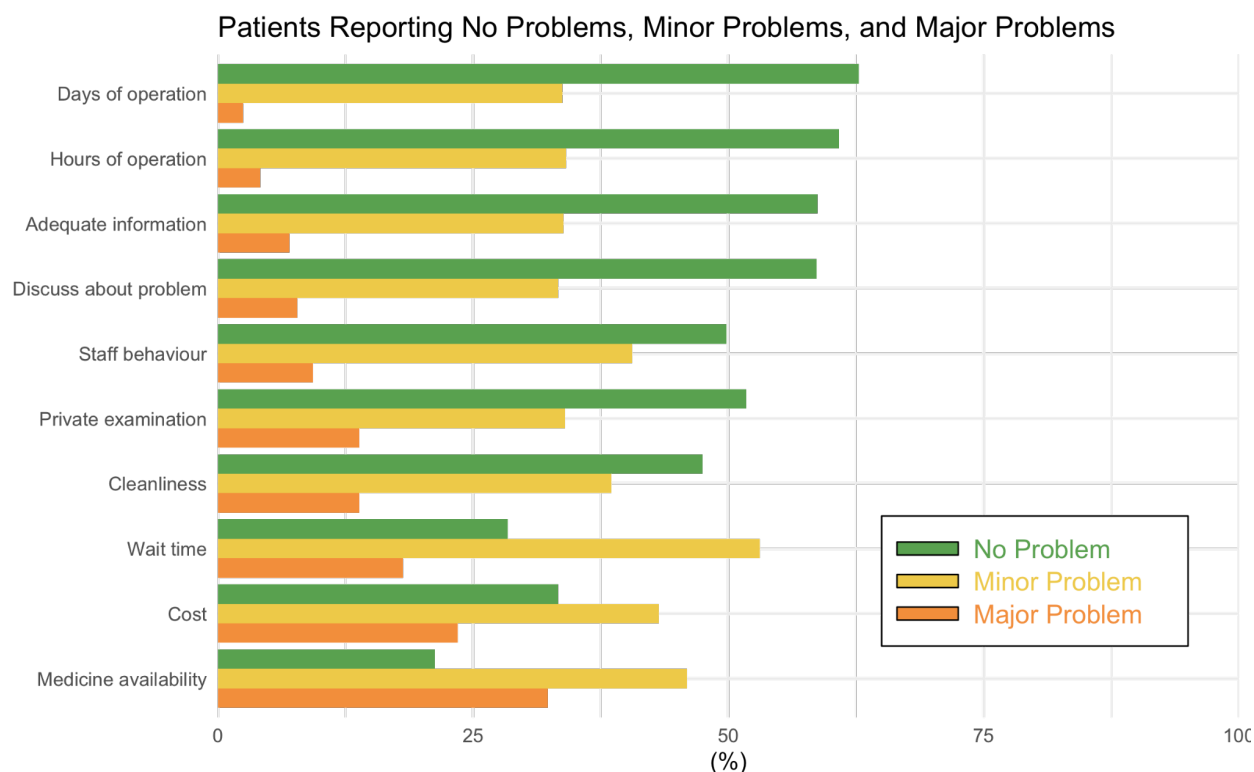


Figure 1. Patients Reporting No Problems, Minor Problems, and Major Problems (n=771) from their OPD visit.

DISCUSSION

Patient satisfaction is increasingly recognized as a critical indicator of healthcare quality, particularly in low-resource settings where service improvements must be strategic and impactful.¹ Nepal's healthcare system uses the Minimum Service Standards (MSS), to assess structural readiness of government health institutions, across various departments, including the OPD.⁶ This study explores how well MSS aligns with patient satisfaction and perception of service delivery, identifying gaps and areas of success.

The majority of patients were satisfied with the services they received in the OPD with 75.1% reporting satisfaction with services and 44.5% reporting high satisfaction. However, acquiescence bias may skew responses positively.⁸ Quantitatively, a 1 % rise in OPD MSS score increased the odds of higher satisfaction by 3 % (OR 1.03, $p < 0.001$), with a pronounced “threshold effect” below 50 % MSS where satisfaction varied widely. Above this level, improvements translated more consistently into better experiences suggesting that investments to elevate low-performing facilities past a minimal readiness threshold could yield gains in patient satisfaction. This was echoed in qualitative interviews,

where staff reported the positive effects of MSS on quality of care.

Despite MSS components to assess privacy, our findings suggest that MSS inadequately captures privacy. Currently, there is only one 3-point privacy indicator in peripheral hospitals' OPD (2.1.3) “*Patient privacy maintained with separate rooms, curtains hung, maintaining queuing of patients*”). Problems with privacy emerged as the single strongest predictor of dissatisfaction (OR = 26.9, $p < 0.001$), even after adjusting for MSS score. Qualitative interviews revealed crowded wards with little to no infrastructure to support patient confidentiality, compromising patient privacy and quality of care. As one healthcare provider states, “*Basic infrastructure is required for ensuring privacy like a screen, personnel for crowd controlling, etc. We don't have that.*” In Bangladesh, privacy during diagnostic tests was the “most satisfactory indicator”, and in Pakistan, both clinicians and caregivers described the importance of privacy when assessing patient satisfaction.^{9, 10} Our findings suggest that MSS should adapt and/or expand its privacy-related indicators to 1) better measure privacy and 2) to promote privacy as a greater component of MSS in an effort to prioritize patients' experience. However, more research is needed to see what indicators would best align with a patient's

perceived privacy and best practices.

The unavailability of medicine was the most frequently (78.2%) cited problem. Patients who reported problems accessing medicines had 7 times greater odds of reporting lower satisfaction (OR 6.99, $p < 0.001$). This was consistently supported in the literature, with studies demonstrating that inadequate availability of drugs was linked to lower satisfaction, or how the absence of supplies, including medicine, reduced adherence to treatment and increased dissatisfaction.¹¹⁻¹⁴ One staff member at a low-scoring hospital reported sending patients to private pharmacies to buy medicine. However, the topic was otherwise barely mentioned by staff. Addressing medicine availability by adding a specific indicator, thus encouraging medicine availability at the management level in response to MSS may improve patient satisfaction, service utilization, health outcomes, and trust in the government healthcare system.

While wait time (71.6%) and cleanliness (71.2%) were both commonly reported concerns, their impacts on overall satisfaction differed. Cleanliness had a stronger effect (OR = 5.78; $p < 0.001$) than wait time (OR = 3.38; $p < 0.001$), aligning with other studies that found poor environmental quality affects satisfaction but does not always deter service use.¹⁵ High-scoring MSS sites described dedicated cleaning teams and streamlined queues, demonstrating that managerial attention could address these gaps, which may suggest that MSS does adequately capture cleanliness.

In contrast, interpersonal behaviors exerted a more significant impact, similar to global studies (20). Patients reporting a problem with staff behavior had 19 times greater odds of reporting lower satisfaction (OR = 19.01; $p < 0.001$) and patients with a problem communicating with their provider had 11 times greater odds of reporting a lower satisfaction (OR = 11.68; $p < 0.001$). This aligns with another study which found that patient-provider communication and health education quality were strong predictors for satisfaction.¹⁶ Despite this, staff behavior was never cited as a reason for bypassing a closer health facility suggesting patients may either tolerate interpersonal issues or underreport them in satisfaction surveys.

These findings highlight an important gap in the MSS framework. While MSS comprehensively assesses structural readiness, it provides limited measurement of care processes, such as interpersonal communication, as have been called for by the Lancet Commission on High

Quality Health Systems.¹ MSS could be strengthened to include standardized assessment of communication, privacy, and shared patient-reported experience. Such revisions would utilize the existing MSS infrastructure to promote healthcare quality in alignment with patient-centered care priorities across Nepal, without the need for another system. However, more research is needed on best practices and how specific indicators align with patient satisfaction and improved patient outcomes in Nepal's context.

Limitations include acquiescence bias, cross-sectional design limiting causal inferences, and exclusion of private facilities. We also did not measure patient expectations or health literacy, which may modulate satisfaction. Further, confidence intervals were wide, suggesting caution when interpreting results. Further, this analysis explored sectional MSS scores against satisfaction, but was not able to analyze specific indicators, limiting the recommendations. Nevertheless, our geographically diverse sample and integration of MSS metrics with rich qualitative data provide robust, actionable insights into improving MSS's role in quality improvement in Nepal's government hospitals.

CONCLUSIONS

This study demonstrated that higher MSS scores are positively associated with patient satisfaction, indicating that the MSS tool effectively captures aspects of patient satisfaction, particularly for structural elements like cleanliness and equipment. However, significant gaps remain in the MSS tool's ability to capture critical interpersonal factors including privacy and counseling. Further, there was a mismatch in provider and patient concern for medicine availability. Revising the MSS tool to integrate process indicators for more accurately reflecting the realities and priorities of both patients and providers would allow for MSS to comprehensively evaluate and promote quality healthcare systems.

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CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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