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Patient Satisfaction and Associated Factors in Ultrasound Services at a Tertiary Care Hospital in Bharatpur, Chitwan, Nepal

Keshab Paudel [1], **Surya Prakash Sapkota** [1], **Samikshya Paudel** [2], **Mukesh Mallik** [3]

[1]Department of Radiology, [2]Medical Officer, Bharatpur Hospital, Bharatpur, Chitwan, Nepal, [3]Department of Radiology, West Hertfordshire Teaching Hospitals NHS Trust, Watford, United Kingdom.

ABSTRACT

Background

In low-middle income countries like Nepal, where expensive imaging modalities such as CT or MRI are limited, ultrasound plays a crucial role in maternal health, emergency care, abdominal imaging, and guided therapeutic procedures. This study performed to find the patients' satisfaction in ultrasound services in a tertiary hospital in central Nepal.

Methods

A mixed method study was conducted over 1000 patients. Data was collected usign structured questionnaire in five dimensions: promptness of service, waiting area ambience, communication, cost of the test, and service in general. The qualitative section explored what patients liked most, what challenges they faced, and what they suggested for improvements. Descriptive analysis, univariate and multivariate logistic regression were done to find the association. Thematic analysis was done for the qualitative sections of the questionnaire.

Results

The percentage of satisfied patients (49.7%) (with 95% CI as 46.56% to 52.85%). There was no association of patient satisfaction with education, sex, and residence. The odds of getting satisfied was 1.5 times higher for the people aged more than 60 years compared to those below 18 years of age. Patients were happy with the low cost. But they faced challenges with the staff behaviour and suggested improvements in doctors' counselling, staff behaviour, waiting area cleanliness, privacy, and separate arrangements for emergency and ill patients.

Conclusions

Satisfaction level of the patient is not associated with the education of the patient or with the sex. Staff should have good behaviour.

Keywords: Patient satisfaction; Radiology; Bharatpur; Nepal; Ultrasound.

Correspondence: Dr. Keshab Paudel, Department of Radiology, Bharatpur Hospital, Bharatpur, Chitwan, Nepal. Email: kpaudel250@gmail.com, Phone: +977-9855060568 **Article received**: 2025-10-16 **Article accepted**: 2026-01-14 **Article published**: 2026-03-31.

INTRODUCTION

Because of its affordability, safety, and its capability to evaluate a wide range of clinical conditions, ultrasonography (USG) is one of the most widely used imaging modalities globally.[1] In low-middle-income countries (LMIC) like Nepal where expensive imaging modalities such as CT-scan or MRI is limited, ultrasound plays a crucial role in maternal health, emergency care, abdominal imaging, and guided procedures.[2] For a patient-centred care model, it is essential to meet the patient's needs, expectations, and their preferences.[3] As per the WHO, patients' experience and perception of diagnostic care quality have become one of the essential indicators of health system performance with patient-centeredness, prompt services, dignity, and communication being core quality domains.[4,5] Previous surveys and observational studies have reported the association of positive patient perception with improved service utilization and also that patients' experience and satisfaction level provided information about the quality of existing service and opportunity to improve further.[6-8]

Hospitals in Nepal have been facing operational challenges like long waiting times and limited human workforce and have had a negative influence on USG services.[9] Nevertheless, there is no systematic research on patients' experience and perception related to ultrasonography. Thus, the aim of the study was to find patients' level of satisfaction, and their experience-based perception following USG service. Results of this study would support hospital administrators, imaging departments, and policy makers in strengthening ultrasonography service. The findings of this study can also be used in nationwide government-funded tertiary care hospitals in Nepal because they have similar management protocol and infrastructure.

METHODS

This mixed method study was conducted at the Department of Radiology of Bharatpur Hospital, Bharatpur, Chitwan, Nepal from June to September, 2025. Bharatpur Hospital is a 300-bed tertiary care hospital and referral centre for districts around Chitwan. Being a government-funded hospital, it has similar infrastructure like many other government hospitals in Nepal and reflects the services provided elsewhere at the same level of government hospitals. The population of this study was all the patients who came for ultrasonography in Bharatpur Hospital. Ethical approval was taken from institutional review committee of Bharatpur Hospital (Ref. No. 081/82-060). A pretested structured standard questionnaire modified for the study setting was used for the data collection.[10,11] To make the questionnaire easily understandable, it was designed in colloquial language (mixed Nepali and English). The questionnaire consisted of 20 questions in four sections. Section 1 had 6 questions for baseline characters with demographic information, section 2 included 9 questions about patients' experience with ultrasound services, section 3 had two questions of overall satisfaction and recommendation of service to others, and finally section 4 contained three open ended questions about suggestions for improvement. Section 4 was a qualitative component of the data collection tool. The quantitative components of the questionnaire explored patients' experience in five dimensions viz, promptness of the service, surrounding area and ambience of the waiting room and ultrasonography room, communication and patient approach, cost of the test, and service in general.

This study was conducted among the 1000 patients. Random sampling was used to collect the data from the patients. Two independent enumerators outside of the institution were used for data collection. A printed version of the questionnaire was used for data collection. For the qualitative parts patients were asked to answer the questions in their own words about 'what they liked most about ultrasonographic service', 'what challenges did they face during visits' and 'what improvements they would suggest for better services". Five 5-point Likert scale offered by *Zyzanski et al.,*[12] were used to measure the patient experience. We used a likert score method with a range of five responses from

strongly disagree (1) to strongly agree (5) because evidence suggested that this method consistently produced more reliable scores.[13] To get the mean score, responses from patients for all the questions were summed up and was divided by the total number of involved questions. Ten questions with a 5-point Likert was used for calculating the mean score. Then mean score was categorized in to two groups as 'satisfied' (score>mean score) and 'not satisfied' (score ≤ mean score) to get the percentage of people who were satisfied and not satisfied. Quantitative data was entered in Microsoft Excel and analysed using STATA 15.1. Data were analysed using descriptive and inferential statistical tolls. In the descriptive Statistics for categorical variables frequency and percentage were calculated where as for continuous variables mean and standard deviation was calclulated. In the infernial statitics to find the association betewen level of satisfaction with other independent variables both univariate and multivariate logistic regression were. p-value <0.05 was considred as Statistically significnat. Qualitative information were analysed using the thematic form.

RESULTS

Baseline characteristics suggest that the maximum number of patients were of more than 60 years of age, followed by 20.6% of patients with age between 31 years to 45 years. The sex of the participants was almost balanced, with males being approximately 10% more than females. People living in urban regions (57%) who came for ultrasound were more than those living in rural regions. The majority of patients (35%) had a Bachelor's qualification while 18.6% of patients were not educated. More than 50% of the patients who underwent USG got an appointment on the same day, while 8.5% had to wait for 3 days for the appointment. Report of the USG was immediately provided to more than 93% of the patients, and the remaining were provided within an hour (Table 1).

For the promptness of the service, less than 25% of the people were unsatisfied or extremely unsatisfied with the appointment delay, while 58% were satisfied with the result time and almost 30% were extremely satisfied. 47.9% and 46.9% had an average feeling about the cleanliness and waiting area experience, while 8.5% were extremely satisfied. The communication paradigm suggested that 42.4% of the people were unsatisfied with the support staff and 30% were extremely unsatisfied. About the procedure explanation by the doctor, only 7.5% were extremely satisfied. Concerns of the patient were addressed at an unsatisfactory and extremely unsatisfactory level for 23.8% and 17.5% patients. Regarding the cost of the service, the majority scored average or towards the satisfactory side on the scale, although about 25% of the people gave scores below average on the scale (Table 2).

In the study 49.7% patients were satisfied with 95% CI as 46.56% to 52.85% (Table 3).

Compared to the representative of patients below the age of 18 years, patients of more than 60 years of age had 50% higher chances of getting satisfied as shown by both crude odds ratio (COR=1.5, CI=1.03-2.18, P-value=0.03) and adjusted odds

Table 1. Baseline characteristics (n=1000).

Variables	Categories	Frequecny (%)
Age (years)	<18	172 (17.2)
	18 - 30	196 (19.6)
	31 - 45	206 (20.6)
	46 - 60	104 (10.4)
	>60	322 (32.2)
Sex	Male	552 (55.2)
	Female	448 (44.8)
Residence	Urban	575 (57.5)
	Rural	425 (42.5)
Education	None	186 (18.6)
	Primary	81 (8.1)
	Secondary	286 (28.6)
	Bachelor	358 (35.8)
	Master	89 (8.9)
Waiting time to get an appointment	Same day	533 (53.3)
	One day	197 (19.7)
	Two- days	110 (11)
	Three-days	85 (8.5)
	>3 days	75 (7.5)
Time to get result of USG	Immediately	935 (93.5)
	Within one hour	65 (6.5)

Table 2. Likert scale response of the patients about the experience (n=1000).

Survey dimensions	Questions	Extremely unsatisfied n (%)	Unsatisfied n (%)	Average n (%)	Satisfied n (%)	Extremely satisfied n (%)
Promptness of service	Appointment delay	100 (10%)	139 (13.90%)	213 (21.30)	439 (43.90)	109 (10.90)
	Result time speed	13 (1.30)	27 (2.70)	85 (8.50)	580 (58.00)	295 (29.50)
Surrounding area and ambience	Cleanliness	43 (4.30)	67 (6.70)	479 (47.90)	310 (31.00)	101 (10.10)
	Waiting area experience	54 (5.40)	232 (23.20)	469 (46.90)	160 (16.00)	85 (8.50)
Communication and patient approach	Supporting staff behave	294 (29.40)	424 (42.40)	125 (12.50)	99 (9.90)	58 (5.80)
	Procedure explanation	180 (18.00)	228 (22.80)	317 (31.70)	200 (20.00)	75 (7.50)
	Concerns addressed	175 (17.50)	238 (23.80)	305 (30.50)	202 (20.20)	80 (8.00)
Worth for money	Cost of the procedure	42 (4.2)	211 (21.10)	392 (39.20)	249 (24.90)	106 (10.60)
General services	Overall satisfaction level	160 (16)	213 (21.30)	347 (34.70)	211 (21.10)	69 (6.90)
	Quality of service compared to others	84 (8.40)	186 (18.60)	455 (45.50)	211 (21.10)	64 (6.40)

Table 3. Level of satisfaction and recommendation for others (n=1000).

Overall satisfaction	n(%)	95% CI	
		Lower	Upper
Satisfied	497 (49.7)	46.56	52.85
Unsatisfied	503 (50.3)	47.15	53.44
Recommend to the others for USG services			
Very unlikely	64 (6.4)	4.96	8.1
Unlikely	205 (20.5)	18.04	23.14
Neutral	59 (5.9)	4.52	7.55

ratio (AOR=1.56, CI=1.06-2.29, P-value=0.021). As per univariate logistic regression, the association of appointment delay with patient satisfaction has shown that odds of getting satisfied continuously decreased with increasing number of appointment delay days compared to those who had USG on same day [COR=0.62 for one day> COR=0.59 for 2 days > COR=0.34 for 3days > 0.37 for more than 3 days appointment delay] with P-value significant in all the cases (Table 4).

The components (Figure. 1, 2 and 3 below) showed the six themes from answers to the question 'What did you liked most about ultrasonic service in

Table 4. Association of predicting variables with patient's satisfaction (n=1000).

Variables	Categories	Overall satisfaction		Univariate logistic reg.		Multivariate logistic reg.	
		Unsatisfied (n=503) n(%)	Satisfied (n=497) n(%)	COR (95% CI)	P- value	AOR (95% CI)	P-value
Age (years)	<18	98	74 (43.02%)			Ref	
		-56.98%					
	18 - 30	103 (52.55%)	93 (47.45%)	1.2 (0.79 - 1.81)	0.395	1.301(0.85-1.98)	0.221
	31 - 45	96 (46.60%)	110 (53.40%)	1.52 (1.01 - 2.28)	0.045	1.49 (0.98-2.25)	0.059
	46 - 60	55 (52.88%)	49 (47.12%)	1.18 (0.72 -1.92)	0.508	1.95 (0.72-1.96)	0.484
	> 60	151 (46.89%)	171 (53.11%)	1.5 (1.03 - 2.18)	0.033*	1.56 (1.06-2.29)	0.021*
Sex	Male	284 (51.45%)	268 (48.55%)			Ref	
	Female	219 (48.88%)	229 (51.12)	1.108 (0.86 - 1.42)	0.42	1.09 (0.84-1.41)	0.492
Residence	Urban	288 (50.09%)	287 (49.91%)	Ref		Ref	
	Rural	215 (50.59%)	210 (49.41%)	0.98 (0.76 - 0.26)	0.875	0.941(0.73-0.21)	0.643
Education	None	91 (48.92%)	95 (51.08%)	Ref		Ref	
	Primary	41 (50.62%)	40 (49.38%)	0.934 (0.55 -0.57)	0.799	0.948 (0.55-.61)	0.845
	Secondary	139 (48.60%)	147 (51.40%)	1.013 (0.70 - 1.46)	0.945	0.989 (0.68-.44)	0.958
	Bachelor	186 (51.96%)	172 (48.04%)	0.886 (0.62 - 1.26)	0.502	0.927 (0.64-.33)	0.685
	Master	46 (51.69%)	43 (48.31%)	0.896 (0.54 - 1.48)	0.668	0.939 (0.55-.58)	0.815

Appointment delay	Same day	227 (42.59%)	306 (57.41%)	Ref		Ref	
	One day	107 (54.31%)	90 (45.69%)	0.624 (0.45 -0.87)	0.005*	0.619 (0.44-.86)	0.445
	Two days	61 (55.45%)	49 (44.55%)	0.596 (0.39 - 0.90)	0.014*	0.587(0.39-0.89)	0.387
	3 days	58 (68.24%)	27 (31.76%)	0.345 (0.21 - 0.56)	<0.001*	0.349 (0.21-.57)	0.213
	>3days	50 (66.67%)	25 (33.33%)	0.371 (0.22 - 0.62)	<0.001*	0.369 (0.22-.62)	0.22

*COR: crude odds ratio; AOR: adjusted odds ratio; *statistically significant (p-value <0.05)*

Bharatpur Hospital?'. We observed that 52.10% of respondents said they had nothing special to mention about what they liked. They wrote '*Nothing special*', '*Have nothing to say. Everything is okay. There are improvements as compared to the previous*'. Participants also liked the immediate results (22.70%) and low cost (10%) of the service.

'*Got ultrasound report immediately. This is really good*'.

'*Could do ultrasonography at a low price*'.

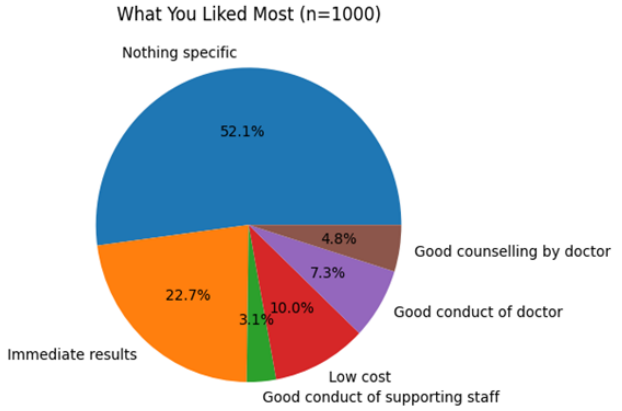

Figure 1. What the patients like most (n=1000).

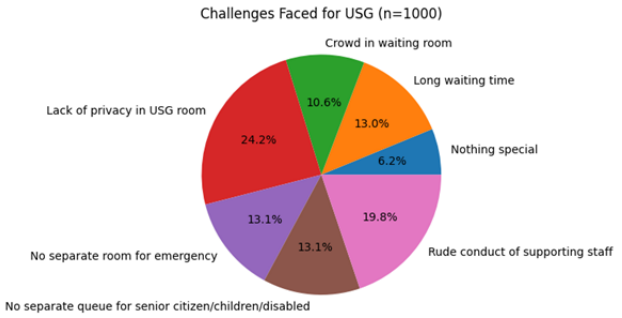

Figure 2. Challanges faced by patients (n=1000).

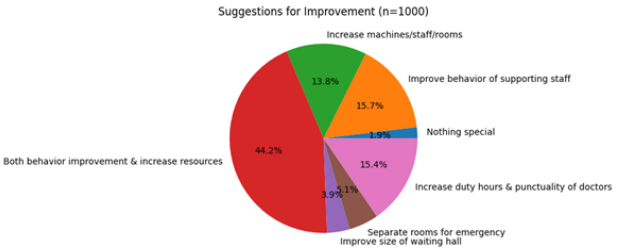

Figure 3. Suggestions given by patients (n=1000).

'*Feeling good to get the service of ultrasound at a low cost*'.

Some of the participants liked the staff's behaviour and their way of speaking. They wrote '*staff way of speaking is good*', '*staff is well behaved*'.

Participants also had different types of challenges and dissatisfaction. The most common cause (24.20%) of dissatisfaction was lack of privacy, followed by rude conduct of supporting staff (19.80%). Some other concerns were the long waiting time in the queue in the waiting room. Some were unhappy because there were no separate arrangements for emergency patients.

'*I felt like I was in a fish market. The patient was kept in a USG room like animals. No privacy was there*'.

'*The crowd in the waiting area made me feel suffocated* '.

'*Not having separate scan rooms for seriously ill patients was a worse feeling. Had to wait*", and '*long waiting time in the queue*'.

'*Had to wait long in the queue for the ultrasound. By the time we got our turn for the test, the patient got further sick. Like this, how can the patient be treated*?'

'*Even the senior citizen has to wait in the queue for the whole day. What kind of rule is this? I am surprised* '.

When asked for the suggestions to improve the service then the behaviour of the staff and improve the waiting area were the common answer by the majority of them (44.2%). They wrote ' *Staff need to improve their words and language. Looking at their behaviour, felt like taking physical actions*',

'*Improve words and language, add more doctors, add more mchines and rooms*',

'*The waiting area should have been made bigger*'.

Some of the participants suggested separate arrangements for ill patients and wrote '*There should*

be separate service available for the seriously ill patients', '*should increase the number of doctors*', and '*Management should add up some new machines and manage new rooms*'. Participants also suggested punctuality of the doctors, answering '*the doctor should arrive on time*'.

DISCUSSION

We conducted this study to explore the satisfaction level of the patients in Bharatpur hospital who have received USG service. This study has shown that 49.7% of the patients were satisfied with the service they received. The percentage of satisfied patients was much lower compared to that reported by other studies. For example, a study conducted in Nigeria[14] reported 73.4%, while the studies in the Philippines[15] and Pakistan[16] reported that 71% and 71.2% of the patients were satisfied. The potential reasons for this difference are the study setting and sampling strategy. We conducted a study at a patient attending a USG service site where service utilisation and workload are very high, while other studies were conducted in large areas like CT scan and MRI where workload is comparatively very low. High workload on staff may lead to burnout and have a negative effect in their behaviour causing dissatisfaction among service recipients. Another reason is previous studies conducted their research with a lower sample size between 300 and 500, while we conducted research with a large sample size of 1000 patients with stratified sampling, balancing the number of male and female participants, representing the whole population, and may leave many patients unsatisfied. It means our result is a better reflection of patients receiving service.

We also analysed the association of satisfaction level with the education of the patient, age of the patient. We found no association of education with satisfaction level. This result aligns with a study conducted in Nigeria[17], which reported no association. On the contrary, there are studies which have reported a negative association of education with patient satisfaction. A study conducted in Hawassa University Teaching and referral hospital reported a negative association of education with satisfaction level where patients with higher secondary education were 95% less likely to be satisfied.[18] A study of Kuwait also reported that people attending primary school were 68.3% less likely to be satisfied.[19] The reason we got no association is that the government hospital is cheaper and pro-poor. Hence, patients coming for service are submissive and accept the challenges as a normal phenomenon. Regarding age, we found that patients of age more than 60 years were 50% more likely to be satisfied compared to the patient representative of patients aged less than 18 years, and other age groups did not show any significant association. Potentially because patients aged more than 60 years are retired and had enough time to wait, while other age groups were in a hurry of active work life.

We also found that 22.7% of the patients liked the immediate results of the USG and 10% liked the low cost. Our study showed 24% felt a lack of privacy and 20% felt rude conduct of staff. Our results show a very low level of satisfaction in these domains as compared to other studies conducted in Nigeria and Pakistan. The possible reason is, limited resources of the government, because of which management could not give enough importance to the ambience and to the privacy domain. Furthermore, hospital is pro-poor and management would have given priority in reducing the cost of treatment rather than managing waiting time and area. Maybe the staff were rude because of over burden of the patient.

CONCLUSIONS

Almost half of the patients were satisfied with the USG service. There was no association of education with satisfaction level. The conduct of the staff needs to be improved; the waiting needs to be made bigger. However, the majority of the patients would likely recommend the service to others.

Limitations

The strength of this study is the large sample size and robust mixed method. Inclusion of both quantitative

and qualitative sections in the study gives a better understanding of patients' perspectives. A small pretested questionnaire took hardly 10 minutes for the patients to fill. This gives better participation and less impatience of the participants, resulting in good quality of data. We also included parents of patients of age less than 18 years to make the sample truly representative of the variations of the population receiving the service. The limitation of this study is that it does not address accuracy of treatment or diagnosis outcome. This only presented patient experience about the service but not about the final outcome. Satisfied patient experience does not reflect better treatment and its
diagnostic accuracy.

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Availability of data and materials

All data analysed during this study will be made available upon reasonable request from the corresponding author.

Authors' contributions

Conceptualization: Dr. Keshab Paudel.

Data curation: Dr. Keshab Paudel, Surya Prakash Sapkota, Samikshya Paudel.

Formal analysis: Dr. Keshab Paudel, Mukesh Mallik.

Investigation: Dr. Keshab Paudel.

Methodology: Dr. Keshab Paudel.

Supervision: Dr. Keshab Paudel, Surya Prakash Sapkota, Samikshya Paudel.

Writing-original draft: Dr. Keshab Paudel.

Writing-review & editing: Dr. Keshab Paudel, Surya Prakash Sapkota, Samikshya Paudel.

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