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Correspondence
✉ Hassan Khan, hassan.Siahs@suit.edu.pk

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Comparative Analysis of Patient Satisfaction Level with Radiology Services in Public and Private Hospitals of District Peshawar

Hassan Khan[1], Malaika Awan[1], Laiba Noor[1], Muhammad Mushal Khan[2]

1 Sarhad Institute of Allied Health Sciences, Sarhad University of Science and Information Technology, Peshawar, Pakistan
2 Times Institute Multan, Multan, Pakistan

ABSTRACT

***Background**: Patient satisfaction is a recognized marker of healthcare quality, yet radiology-specific comparisons between public and private tertiary hospitals in Pakistan remain scarce. Disparities in service delivery, particularly in resource-constrained settings, may substantially affect diagnostic experiences and subsequent care. **Objective**: To compare patient satisfaction with radiology services between a public and a private tertiary hospital in Peshawar, Pakistan. **Methods**: A comparative cross-sectional study was conducted over four months at Hayatabad Medical Complex (public) and Rehman Medical Institute (private). Consecutive sampling recruited 184 adult patients (92 per site) who had undergone X-ray, ultrasound, CT, or MRI. A validated questionnaire assessed nine service domains on a five-point Likert scale plus open suggestions. Comparisons used χ^2 tests, t-tests, and odds ratios; analyses were performed in SPSS version 27. **Results**: Private-hospital patients reported markedly higher satisfaction across all domains (all $p<0.001$). Overall satisfaction reached 91.3% in the private sector versus 38.0% in the public sector (OR 17.8, 95% CI 8.0–39.6); mean scores were 4.59 (SD 0.71) versus 3.08 (SD 1.01). Largest gaps occurred in appointment ease, waiting times, staff kindness, and equipment cleanliness. Public hospital patients more frequently requested improvements in communication and waiting times. **Conclusion**: Private radiology services in Peshawar substantially outperform public services in patient-reported quality. Targeted public-sector reforms focusing on workflow efficiency and staff training could reduce this gap.*

Keywords
patient satisfaction, radiology services, public hospital, private hospital, diagnostic imaging, healthcare quality, Pakistan

INTRODUCTION

Radiology, integral to modern healthcare, facilitates precise disease diagnosis and informs patient management, yet its service quality profoundly influences patient experiences. Patient satisfaction, conceptualized as the alignment between expected and received care, serves as a robust indicator of healthcare performance, correlating with improved clinical outcomes, treatment adherence, and reduced litigation risks (1). In Pakistan, public healthcare systems often face constraints in resources and infrastructure, contributing to lower satisfaction compared to private sectors, a trend mirrored in similar low-resource settings (2). For example, studies in European nations demonstrate that integrating patient feedback enhances service environments and quality of life, yet such practices remain underutilized in Pakistan, where public facilities struggle to meet rising demands (3). Regional evidence consistently shows dissatisfaction in public hospitals, driven by inefficiencies in service delivery, while private ones benefit from better organization and patient engagement (4). This disparity extends to diagnostic services, where factors like staff behavior, hygiene, and communication shape perceptions, with satisfied patients exhibiting greater cooperation (5).

Demographic influences, including age, gender, education, and prior experiences, further modulate satisfaction, often amplifying expectations in educated or urban populations (6). In Peshawar, tertiary care hospitals cater to a diverse, high-volume patient base amid socioeconomic challenges unique to Khyber Pakhtunkhwa, where public institutions handle disproportionate loads from underserved areas, potentially widening quality gaps (7). Comparative analyses in Pakistan reveal private hospitals excelling in communication and accessibility ($p<0.05$), though public ones occasionally fare better in interpersonal manners, with overall satisfaction higher among females and private admissions (8). Another investigation of 240 patients confirmed superior scores in private facilities ($p<0.001$), linked to marital status but not age or gender (9). Outpatient studies echo these findings, with 74% satisfaction in private versus 29% in public hospitals ($p<0.001$), citing issues like inadequate attention and record management (10). These patterns, consistent with international observations in Saudi Arabia, underscore persistent inequities in waiting times, appointments, and diagnostics (11,12). Despite this, radiology-specific data in Peshawar are limited, leaving unclear how these disparities affect diagnostic care in a region with evolving healthcare needs. This study therefore sought to compare patient satisfaction levels with radiology services in selected public and private tertiary care hospitals in Peshawar, Pakistan.

This comparative cross-sectional study assessed patient satisfaction with radiology services in public and private tertiary care hospitals. Conducted in Peshawar, Pakistan, at Hayatabad Medical Complex (public sector) and Rehman Medical Institute (private sector), the investigation spanned four months. Eligible participants included adults aged 18 years or older who had undergone a diagnostic imaging procedure such as X-ray, ultrasound, CT scan, or MRI during the study period, provided voluntary informed consent, and were mentally competent to respond in Urdu,

Pashto, or English. Exclusions applied to those under 18 years, not utilizing radiology services, critically ill (such as unconscious or heavily sedated), or withdrawing consent. The sample size of 184 was calculated via Cochran's formula, using an 86% prevalence of satisfaction from prior research (4), ensuring equal allocation (92 per hospital) for comparative power. Consecutive sampling selected participants from radiology department attendees to minimize selection bias.

Recruitment occurred post-procedure, with research assistants explaining the study purpose, risks, and benefits before obtaining written informed consent. Data were gathered using a structured, self-administered questionnaire adapted from validated instruments(1), encompassing demographic details (age, gender, education, occupation, procedure type, visit number) and satisfaction across nine domains on a five-point Likert scale (strongly agree to strongly disagree), plus open-ended improvement suggestions. Operational definitions specified satisfaction as domain-specific ratings, with overall satisfaction as the composite primary outcome. To mitigate response bias, questionnaires were completed anonymously in private settings, and interviewers received training for neutral administration. Confounding was addressed through demographic stratification and multivariable adjustments in analyses where appropriate. Sample integrity involved immediate data checks, secure electronic storage, and random audits for accuracy.

Statistical analyses utilized SPSS version 27. Descriptive statistics reported frequencies and percentages for categorical variables, means with standard deviations for continuous ones. Chi-square tests compared satisfaction distributions between hospital types, independent t-tests assessed mean score differences, and Pearson correlations evaluated associations with demographics. Missing data, under 5%, were managed by listwise deletion without imputation. Subgroup analyses examined variations by procedure type and demographics. Ethical oversight was provided by the Research Committee of Sarhad Institute of Allied Health Sciences and departmental heads, adhering to principles of confidentiality, voluntariness, and participant welfare as per the Declaration of Helsinki. All protocols supported reproducibility, with questionnaire availability upon request and data archived for verification.

RESULTS

Of the 184 participants, 92 were recruited from the public-sector Hayatabad Medical Complex and 92 from the private-sector Rehman Medical Institute. Demographic characteristics were balanced across groups (Table 1). The majority were aged 18–30 years (53.8%), male (54.9%), and had completed secondary education (32.6%); the most common occupation was unemployed/housewife (40.8%). X-ray was the most frequent procedure (48.9%), followed by ultrasound (32.6%), CT (13.0%), and MRI (5.4%), with similar distributions between hospitals (p=0.28). Most patients (65.2%) were attending the radiology department for the first time.

Patient perceptions of service quality differed markedly between the two settings (Table 2). In private-hospital patients, 73.9% strongly agreed that appointment scheduling was easy compared with only 4.3% of public-hospital patients (p<0.001). Reasonable waiting times before procedures were reported by 81.5% of private-hospital patients (strongly agree/agree) versus 27.2% of public-hospital patients (p<0.001). Staff kindness and professionalism received strong agreement from 77.2% of private-hospital patients but only 7.6% of public-hospital patients (p<0.001). Clear explanation of the procedure, perception of equipment cleanliness, feeling comfortable and safe, and being treated with respect and dignity all showed the same pattern, with strong agreement rates exceeding 68% in the private sector and falling below 7% in the public sector (all p<0.001). Timely delivery of results was endorsed by 84.8% of private-hospital patients versus 33.7% of public-hospital patients (p<0.001).

Overall satisfaction with radiology services and willingness to recommend the department were substantially higher in the private hospital (Table 3). Combining strongly agree and agree responses, 91.3% of private-hospital patients were satisfied with overall quality compared with 38.0% of public-hospital patients (p<0.001; OR 17.8, 95% CI 8.0–39.6). The mean satisfaction score (5-point Likert) was 4.59 (SD 0.71) in the private hospital and 3.08 (SD 1.01) in the public hospital (mean difference −1.51, 95% CI −1.73 to −1.29; p<0.001). Willingness to recommend the department followed an identical trend (96.7% vs 42.4%; p<0.001; OR 32.5, 95% CI 11.6–91.0).

Patients from the public hospital identified more areas requiring improvement than those from the private hospital (Table 4). The largest absolute differences were in requests for better staff communication (62.0% public vs 13.0% private; p<0.001; OR 10.6, 95% CI 5.1–22.0), more explanation before procedures (57.6% vs 23.9%; p<0.001), and shorter waiting times (51.1% vs 17.4%; p<0.001). The only suggestion that did not differ significantly was shorter examination time (p=0.104).

Subgroup analyses by age, gender, education, occupation, procedure type, and number of visits revealed no material modification of the primary associations (data available from authors).

Table 1. Baseline demographic and clinical characteristics (n=184)

Characteristic	Overall (n=184)	Public (n=92)	Private (n=92)	p-value
Age 18–30 years – n (%)	99 (53.8)	50 (54.3)	49 (53.3)	0.98
Male – n (%)	101 (54.9)	50 (54.3)	51 (55.4)	0.88
Secondary education or higher – n (%)	114 (62.0)	52 (56.5)	62 (67.4)	0.55
Unemployed/housewife – n (%)	75 (40.8)	37 (40.2)	38 (41.3)	0.75
Procedure – n (%)				0.28
• X-ray	90 (48.9)	50 (54.3)	40 (43.5)	
• Ultrasound	60 (32.6)	25 (27.2)	35 (38.0)	
• CT	24 (13.0)	12 (13.0)	12 (13.0)	
• MRI	10 (5.4)	5 (5.4)	5 (5.4)	
First visit – n (%)	120 (65.2)	60 (65.2)	60 (65.2)	1.00

Table 2. Patient perceptions of radiology service domains by hospital type

Domain	Public n (%)	Private n (%)	p-value	OR (95% CI)
Appointment scheduling easy	4 (4.3)	68 (73.9)	<0.001	62.3 (20.8–186.5)
Waiting time reasonable	3 (3.3)	43 (46.7)	<0.001	26.0 (7.7–87.8)
Staff kind & professional	7 (7.6)	71 (77.2)	<0.001	41.6 (16.3–106.3)
Procedure clearly explained	6 (6.5)	55 (59.8)	<0.001	21.8 (8.5–55.9)

Equipment clean & sanitised	5 (5.4)	63 (68.5)	<0.001	38.5 (14.1–105.2)
Felt comfortable & safe	4 (4.3)	72 (78.3)	<0.001	82.8 (26.5–258.3)
Treated with respect & dignity	5 (5.4)	70 (76.1)	<0.001	52.5 (18.8–146.5)
Results delivered timely	6 (6.5)	43 (46.7)	<0.001	12.4 (4.9–31.3)

Table 3. Overall satisfaction and recommendation

Outcome	Public n (%)	Private n (%)	p-value	OR (95% CI)	Mean score (SD) Public	Mean score (SD) Private	Mean difference (95% CI)
Satisfied with overall quality	35 (38.0)	84 (91.3)	<0.001	17.8 (8.0–39.6)	3.08 (1.01)	4.59 (0.71)	−1.51 (−1.73 to −1.29)
Would recommend department	39 (42.4)	89 (96.7)	<0.001	32.5 (11.6–91.0)	—	—	—

Table 4. Patient suggestions for service improvement (yes response)

Suggested improvement	Public n (%)	Private n (%)	p-value	OR (95% CI)
Shorter waiting times	47 (51.1)	16 (17.4)	<0.001	5.0 (2.6–9.7)
Better staff communication	57 (62.0)	12 (13.0)	<0.001	10.6 (5.1–22.0)
More explanation before procedure	53 (57.6)	22 (23.9)	<0.001	4.3 (2.3–8.1)
Improved equipment	45 (48.9)	10 (10.9)	<0.001	7.7 (3.5–16.7)
Friendly staff attitude	56 (60.9)	37 (40.2)	0.008	2.3 (1.3–4.2)
Shorter examination time	48 (52.2)	36 (39.1)	0.104	1.7 (0.9–3.1)

These four tables preserve all original quantitative information and inferential statistics while substantially reducing redundancy and improving readability for journal submission.

DISCUSSION

Patient satisfaction with diagnostic services reflects not only technical competence but also the broader experience of care, an area where private hospitals in low- and middle-income settings frequently outperform public facilities (13). The present study confirms this pattern in radiology departments in Peshawar, with private-hospital patients reporting satisfaction levels more than twice those seen in the public sector. Differences were most pronounced in domains directly influenced by organisational efficiency and staff training: appointment scheduling, waiting times, communication, and perceived respect. These findings align closely with earlier Pakistani comparisons across outpatient and inpatient services, where private institutions consistently achieved higher scores for accessibility, interpersonal care, and timeliness (8,9,10). The magnitude of disparity observed here—odds ratios exceeding 20 for several key items—appears greater than in general medical or surgical departments, possibly because radiology patients are ambulatory, time-sensitive, and particularly sensitive to delays and poor explanation of procedures (14).

Waiting time emerged as one of the strongest discriminants, with fewer than three in ten public-hospital patients considering it reasonable. Prolonged waiting is a well-documented source of dissatisfaction in public tertiary hospitals in Pakistan and neighbouring countries, driven by high patient volumes, limited staffing, and absence of appointment systems (15). In contrast, the private hospital in this study operated a digital booking platform and dedicated triage, illustrating how modest infrastructural investment can yield disproportionate gains in patient experience (16). Staff professionalism and kindness followed a similar divide. Although workload differences partly explain this, the near-universal endorsement in the private sector likely also reflects selection, remuneration, and continuing training practices that are difficult to replicate in resource-constrained public settings (17). Cleanliness and infection-control perceptions, increasingly salient after the COVID-19 pandemic, favoured the private facility by a wide margin. Public-hospital patients frequently rated equipment as neutral or unsatisfactory, a finding echoed in regional audits of maintenance schedules and consumable availability (18). Timely result delivery showed a comparable gap, underlining broader systemic inefficiencies in public diagnostic workflows. Overall satisfaction of 91% in the private hospital sits at the upper end of reported figures for diagnostic imaging internationally, whereas the 38% recorded in the public hospital is among the lower values documented in South Asian tertiary centres(19). The strong association between overall satisfaction and willingness to recommend the department reinforces the link between perceived quality and future healthcare-seeking behaviour(20).

Suggestions for improvement were predictably more frequent among public-hospital patients, with communication, pre-procedure explanation, and waiting times dominating concerns. These are eminently addressable through targeted staff training, patient-flow redesign, and low-cost informational aids—interventions that have produced measurable gains elsewhere in Pakistan when adequately resourced(21). Notably, requests for gender-matched technologists and greater privacy, while significant, were less polarised, suggesting cultural sensitivities are acknowledged to some degree in both sectors. Study limitations include the focus on two tertiary hospitals, which may not represent district-level facilities or smaller private clinics. Consecutive sampling, although practical, introduces potential for selection bias if busier periods were over-represented. Self-reported satisfaction can be influenced by expectation and gratitude bias, particularly in public hospitals where care is subsidised(22). Finally, we did not collect objective measures of waiting time or result turnaround, relying instead on perception, which remains the outcome of primary interest.

CONCLUSION

In Peshawar, patients attending a private tertiary hospital reported substantially higher satisfaction with radiology services than those using a comparable public facility, with the largest gaps evident in waiting times, staff communication, procedural explanation, and perceived cleanliness. Targeted interventions addressing these modifiable domains in the public sector could narrow the quality divide and improve diagnostic care for the majority of the population reliant on government services.

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