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Research Article

Trends in Patient Satisfaction of Services at Imam Al-Hujjah Hospital, Holy Karbala, Iraq: A Longitudinal Comparative Study

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Abstract

Background: Patient satisfaction is a key indicator of healthcare quality, particularly in patient-centered care models. Regular monitoring supports service improvement. This study compared patient satisfaction with services.

Methods: A longitudinal comparative study was conducted using standardized electronic post-discharge questionnaires. A total of 3,274 patients participated in the study in 2020 and 3,221 patients in 2024. Satisfaction was measured in 12 clinical and non-clinical service areas using a five-point Likert scale. Statistical analyses included chi-square tests, odds ratios, Cohen's h for effect size, and thematic analysis of open-ended responses.

Results: Eleven of 12 domains showed statistically significant improvement ($p = 0.001$). Overall satisfaction increased from 68.6% in 2020 to 78.4% in 2024, a 9.8% rise. The largest gains were noted in radiology (+15.2%), pharmacy (+14.2%), laboratories (+13.0%), nursing (+11.3%), and medical services (+10.8%). Dissatisfaction (bottom-box responses) declined by an average of 3.6%. Clinical and administrative services showed moderate effect sizes (Cohen's h: 0.25–0.36; ORs (Odds Ratios): 1.96–2.42). Cleaning services maintained high satisfaction (93% in 2024), while food (+5.2%) and entry/account services (+3.7%) showed minimal improvement. Qualitative feedback indicated persistent concerns regarding food variety, appointment delays, and communication gaps.

Conclusions: Patient satisfaction improved substantially between the two specific years, 2020 and 2024, particularly in clinical services. Persistent gaps in some non-clinical areas highlight the need for targeted quality improvement. Longitudinal monitoring provides valuable insights to advance patient-centered care in resource-constrained settings.

Keywords: Patient satisfaction; Healthcare quality; Private hospitals; Iraq

Introduction

Healthcare systems are increasingly shifting toward patient-centered care, where patient satisfaction serves as a key indicator of service quality. In this context, patients are viewed not simply as recipients of care, but as active consumers who make informed decisions for themselves and their families. Consequently, assessing satisfaction has become crucial for evaluating both clinical and non-clinical services, guiding quality improvement, and improving health outcomes [1–4]. Patient satisfaction reflects the extent to which healthcare services meet patients' expectations and elicit positive experiences [5–6]. Key elements include effective communication, provider competence, and overall service quality throughout the care journey [7]. Satisfied patients are more likely to return for care, recommend the hospital, and enhance its reputation; furthermore, meeting patient expectations can boost staff morale and motivation [8–9]. Satisfaction is typically assessed on two levels. Transactional satisfaction assesses individual care experiences, often through online surveys using Likert scales and open-ended questions [10–11]. Overall satisfaction reflects cumulative impressions over time and is measured using standardized metrics such as the Patient Satisfaction Score (PSS) or average satisfaction rates, enabling benchmarking and continuous quality improvement [12].

Imam Al-Hujjah Charitable Private Hospital, a 140-bed healthcare facility located in Karbala, Iraq, was established in 2017 and operates under evidence-based policies aligned with the WHO

standards. The hospital routinely assesses patient satisfaction through a structured electronic feedback system. This post-consultation survey tool provides actionable data to support service enhancement initiatives. Online surveys are preferred for their objectivity, which minimizes the social desirability bias commonly associated with in-person interviews.

This retrospective study aims to evaluate and compare patient satisfaction in 2020 and 2024 at Imam Al-Hujjah Hospital, focusing on 12 service domains, both clinical and non-clinical aspects, based on patients' experiences with some or all of these services. It includes an analysis of quantitative and qualitative satisfaction scores to identify patterns, understand patient expectations, and highlight service gaps. This comprehensive approach provides valuable insights for hospital administrators and healthcare providers, guiding targeted interventions to improve patient-centered care and ensure continuity.

Materials and Methods

Study Design

This retrospective study used a longitudinal comparative design to assess changes in patient satisfaction at a single secondary care charitable private Imam Al-Hujjah hospital located in Holy Karbala, Iraq. The hospital provides both inpatient and outpatient services to a diverse population in the region. The primary objective was to assess the key strengths and weaknesses across twelve different service areas, clinical and non-clinical, as perceived by patients, and to compare the average level of overall satisfaction levels over time. It was purely observational in nature, and no interventions were implemented during the study period.

Data Collection

Data were collected through an electronic questionnaire conducted in Arabic, the participants' native language, shortly after hospital discharge. The instrument was adapted from validated patient tools, including the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), and culturally tailored to suit the local healthcare context. A total of 3,274 responses were collected in 2020 and 3,221 in 2024 using a consecutive non-probability sampling approach, whereby all patients who met the eligibility criteria and presented during the designated study period were enrolled in chronological order. This approach, although lacking randomization, is widely used in observational research to maximize case ascertainment within a pre-specified time period. Because not all participants experienced every hospital service domain, the analysis for each domain was restricted to those who rated that specific service. Percentages were calculated based on the number of valid responses per item. Demographic data were not reported because the standard questionnaire, developed and implemented by the hospital administration, did not include items to capture such information.

Instrument design

The survey instrument was designed to measure patient satisfaction across 12 service domains over the (2020 and 2024) period, including inquiry and information services, entry-related, and account services. hospitality services and comfort, administrative and organizational services, hospital hygiene and cleanliness, diagnostic laboratory services, imaging and radiological services, medication availability and pharmacy interactions, nursing care and communication, physician care and clinical expertise, food quality, variety, and delivery, safety and security procedures. Each domain was designed to capture patients' perceptions and experiences, providing a comprehensive assessment of service quality.

Response Measurement

Responses were recorded using a 5-point Likert scale: poor, below average, average, very good, and excellent**.** For analytical purposes, the top-box (high satisfaction) includes "very good" and "excellent"; the bottom-box (low satisfaction) includes "below average" and "poor", and neutral represents "average" (indicating that the service was acceptable but did not exceed expectations)**.** Qualitative responses from open-ended items were analyzed thematically to capture patient-identified drivers of satisfaction and dissatisfaction.

Measurement Metrics

Patient Satisfaction Score (PSS) is expressed as a percentage, with higher values indicating greater satisfaction. It was computed for each domain using the following formula:

$$PSS = \frac{\text{Top} - \text{box response}}{\text{Total responses}} * 100$$

Average Overall Satisfaction Score: calculated using the following formula:

$$\text{Average Overall Satisfaction Score} = \frac{\text{Patient Satisfaction Score of all services}}{\text{Number of services}}$$

Cohen's h quantifies the effect size between satisfaction rates in 2020 and 2024. It is ideal for binary outcomes (satisfied against poorly satisfied) and

demonstrates the practical significance of differences, beyond mere statistical significance. The formula h:

$$Cohen's\ h = 2X[\arcsin\sqrt{p1} - \arcsin\sqrt{p2}]$$

P_1 = Proportion in the first group, P_2 = Proportion in the second group, X = Multiplication, Arcsin = Inverse sine function Odds Ratio (OR) compares the odds of patient satisfaction in 2024 to the odds in 2020. Formula:

$$\text{Odds Ratio} = \frac{\text{Odds of satisfaction in 2024}}{\text{Odds of satisfaction in 2020}} = \frac{\text{Top} - \text{box (2024)} \,/\, \text{Low} - \text{bottom (2024)}}{\text{Top} - \text{box (2020)} \,/\, \text{Low} - \text{bottom (2020)}}$$

Ethical Considerations

Verbal ethical approval for conducting the study was obtained at the beginning of 2025 from the Development and Relief Foundation, the institutional governing body overseeing Imam Al-Hujjah Hospital. This approval was subsequently documented in writing under document No. 113 issued on 30 August 2025. All participants were informed of the purpose of the study, assured of confidentiality, and agreed to participate voluntarily. The study adhered to ethical standards for human research.

Statistical Analysis

Data were analyzed using SPSS (version 21; IBM Corp., Armonk, NY, USA). Descriptive statistics summarized satisfaction patterns, while inferential statistics assessed significance across time points. Chi-square (χ^2) tests determined the significance of change across categorical variables across the two years. Odds Ratios (ORs) measured the likelihood of satisfaction in 2024 relative to 2020. Cohen's h quantified the effect size for the difference in proportions between the two years.

Results

Table 1 shows a clear and consistent improvement in service quality across nearly all domains. Top-box satisfaction was included; overall improvement equaled +117.9% across 12 service domains, with a mean improvement of 9.8%. The largest increases were seen in radiological (+15.2%), pharmacy (+14.2%), laboratory (+13%), and hospitality services (+13.2%) (Figure 1). The (+) symbol denotes an increase or improvement in the services, whereas the (–) symbol indicates a decrease or dissatisfaction.

Neutral (average) satisfaction generally declined across most service domains, indicating a shift away from impassivity toward top-box" ratings, signaling meaningful service enhancements beyond marginal gains. Overall, neutral ratings declined in 11 of 12 domains, with more drops in hospitality (−12.9%), radiological (−10.6%), laboratory (−8.9%), and administrative services (−8.2%). Only food services showed an increase in ratings (+4.6%). Low-box satisfaction, conversely, the overall reduction in ratings reached −42.9%, with a mean decrease of 3.58%. Notable declines occurred in food (−9.8%), pharmacy (−5.7%), nursing (−4.7%), and radiological services (−4.6%). (Table 1 and Figure 2).

Cohen's h, where P1 = proportion in group 1 (satisfaction rate in 2024), P2 = proportion in group 2 (satisfaction rate in 2020), and arcsin is the inverse sine function (in radians). The difference is multiplied by 2 to scale the effect size. 0.2 = small effect, 0.5 = medium effect. Highlight domains with Cohen's h ≥ 0.3 as strong effects (radiology, laboratory, and pharmacy) (Table 2 and Figure 3).

Odds ratio of 1.2–1.5 showed a small but statistically meaningful improvement (entry-related, hospitality, and cleaning services) (red). 1.5–2.0, Moderate–to–strong effect, significant improvement in satisfaction (safety and security procedures, inquiry & information services, administrative services, and food) (blue). < 2.0, very strong effect (nursing, medical, laboratory, radiological, and pharmacy services) (green) (Table 3).

Average overall patient satisfaction

Average overall patient satisfaction with healthcare services is a metric that reflects patients' evaluations of their experience in healthcare facilities. It encompasses the quality of medical care, service efficiency, comfort levels, and communication with healthcare providers. This measure reveals how well patient expectations and their physical and psychological needs are met during treatment. The average overall satisfaction score increased from 68.6% in 2020 to 78.4 % in 2024, representing a 9.8% improvement (Table 1). The analysis revealed that seven service categories-nursing, medical laboratory, radiology, pharmacy, hospitality, and administrative services-demonstrated the highest improvement, with satisfaction scores increasing from 10.1% to 15.2% when comparing the two discrete years 2020 and 2024. Additionally, four service categories-information, safety, food, and cleaning services-showed moderate improvement, with satisfaction levels rising by 5.2% to 9.7% over the same period. Conversely, entry-related and account services exhibited the least improvement with only a marginal increase in satisfaction (Table 3).

Table 1: Comparative analysis of top-box (high satisfaction), neutral (average), and low-box (low satisfaction) patient satisfaction scores between 2020 (n = 3,274) and 2024 (n = 3,221) across all 12 service domains.

Performance Category	Domain	2020		2024		Change
		Total Responders	Number (%)	Total Responders	Number (%)	
Top-box (excellent & very good) (PSS)	Safety Procedures	2688	2101 (78.2%)	3007	2556 (85%)	+ 6.8 %
	Information services	2670	1826 (68.4%)	2979	2326 (78.1%)	+ 9.7%
	Entry-related Services	2587	1827 (70.6%)	2892	2151 (74.3%)	+ 3.7 %
	Nursing Services	2515	1714 (68.2%)	2785	2215 (79.5 %)	+ 11.3%
	Medical Services	2701	1893 (70%)	2757	2227 (80.8%)	+ 10.8 %
	Laboratory Services	2565	1856 (72.4%)	2575	2199 (85.4%)	+ 13%
	Radiological Services	1989	1349 (67.7%)	1910	1584 (% 82.9)	+ 15.2 %
	Pharmacy Services	2315	1503 (64.9%)	2449	1937 (79.1%)	+ 14.2%
	Hospitality Services	1292	784 (60.9%)	1597	1183 (% 74.1)	+ 13.2 %
	Administrative	2099	1419 (67.6%)	2254	1751 (77.7%)	+ 10.1 %
	Food Services	1432	671 (46.9%)	1726	899 (52.1%)	+ 5.2%
	Cleaning Services	2726	2379 (87.3%)	2652	2440 (92%)	+ 4.7 %
	Average Overall Satisfaction		(68.6%)		(78.4%)	+ 9.8%
Neutral (Average)	Safety Procedures	2688	437 (16.3%)	3007	340 (11.3%)	- 5%
	Information services	2670	577 (21.6%)	2979	480 (16.1%)	- 5.5%
	Entry-related Services	2587	536 (20.7%)	2892	541 (18.7%)	- 2%
	Nursing Services	2515	534 (21.2%)	2785	407 (14.6%)	- 6.6%
	Medical Services	2701	581 (21.5%)	2757	397 (14.4%)	- 7.1%
	Laboratory Services	2565	501 (19.5%)	2575	274 (10.6%)	- 8.9%
	Radiological Services	1989	446 (22.4%)	1910	225 (11.8%)	- 10.6%
	Pharmacy Services	2315	563 (24.3%)	2449	388 (15.8%)	- 8.5%
	Hospitality Services*	1292	384 (29.7%)	1597	268 (16.8%)	- 12.9%
	Administrative	2099	509 (24.2%)	2254	360 (16%)	- 8.2%
	Food Services	1432	391 (27.3%)	1726	550 (31.9%)	+ 4.6%
	Cleaning Services	2726	273 (10%)	2652	147 (5.5%)	- 4.5%
	Average					- 6.3%
Low-Bottom (Below Average & poor)	Safety Procedures	2688	150 (5.6%)	3007	111 (3.7%)	- 1.9%
	Information services	2670	267 (10%)	2979	173 (5.8%)	- 4.2%
	Entry-related Services	2587	224 (8.7%)	2892	200 (6.9%)	- 1.8%
	Nursing Services	2515	267 (10.6%)	2785	163 (5.9%)	- 4.7%
	Medical Services	2701	227 (8.4%)	2757	133 (4.8%)	- 3.6%
	Laboratory Services	2565	208 (8.1%)	2575	102 (4%)	- 4.1%
	Radiological Services	1989	197 (9.9%)	1910	101 (5.3%)	- 4.6%
	Pharmacy Services	2315	249 (10.8%)	2449	124 (5.1%)	- 5.7%
	Hospitality Services	1292	124 (9.6%)	1597	146 (9.1%)	- 0.5%
	Administrative	2099	171 (8.1%)	2254	143 (6.3%)	- 1.8%
	Food Services	1432	370 (25.8%)	1726	277 (16%)	- 9.8%
	Cleaning Services	2726	74 (2.7%)	2652	65 (2.5%)	- 0.2%
	Average					- 3.5%

Hospitality Services and comfort, typically include linen changes, ventilation, drinking water, and other amenities that contribute to patient satisfaction and well-being.

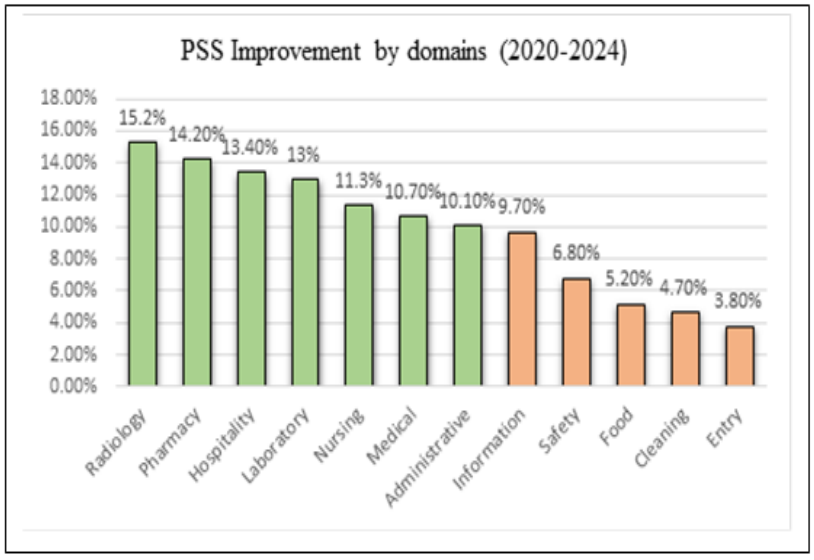

Figure 1: Trends in overall and domain-specific patient satisfaction scores in 2020 against 2024, showing notable improvements in radiology, pharmacy, laboratory, nursing, and medical services.

Discussion

Quality is the keystone of organizational excellence and long-term sustainability, especially in the healthcare sector, where patient satisfaction is a key indicator of service quality and system performance [6]. Positive patient satisfaction improves reputation, patient retention, and referrals. However, the link between quality and satisfaction is not strictly linear [13-14]. Satisfaction is subjective, influenced by expectations, cultural standards, and individual biases, with patients often unable to fully judge clinical efficiency and skills [14-15]. In addition, healthcare providers must balance meeting patient expectations and ensuring the best outcomes [15-16]. In the United States, approximately 70% of patients are willing to pay more for high-quality care [17].

In Iraq, however, the absence of a comprehensive insurance system means financial considerations heavily influence patients' perceptions of quality, especially in private institutions [18-19].

Significant gains were observed in radiology, pharmacy, laboratory, nursing, and medical services. These improvements showed moderate to strong results and are likely attributable to patient-centered care practices, enhanced communication protocols, technological upgrades, and structured staff training. Medical and nursing care are essential to comprehensive service delivery [20-21].

Despite overall improvements, qualitative feedback revealed persistent dissatisfaction, particularly with nursing, citing delayed response, limited empathy, and technical challenges in procedures such as neonatal cannulation. These issues, consistent with previous studies, highlight the need for ongoing evaluation and targeted nursing development [22-24]. Similarly, frequent delays in physicians' appointment adherence were reported and remain a recognized source of patient dissatisfaction [25].

Table 2: Chi-square test results and Cohen's h effect sizes for satisfaction changes between 2020 and 2024.

Service	Chi-square (χ^2)	p-value	Cohen's h
Safety and Security Procedures	55.13	0.001	0.177
Inquiry & Information Services	78.59	0.001	0.220
Entry-related & Account Services	12.16	0.002	0.084
Nursing Services	110.2	0.0001	0.260
Medical Services	109.46	0.0001	0.250
Laboratory Services	146.30	0.0001	0.323
Radiological Services	131.18	0.0001	0.358
Pharmacy Services	131.56	0.0001	0.318
Hospitality Services	79.04	0.0001	0.287
Administrative Services	63.16	0.0001	0.227
Food Services	71.28	0.004	0.105
Cleaning Services	42.39	0.01	0.156

All p-values are less than 0.05, indicating statistically significant differences.

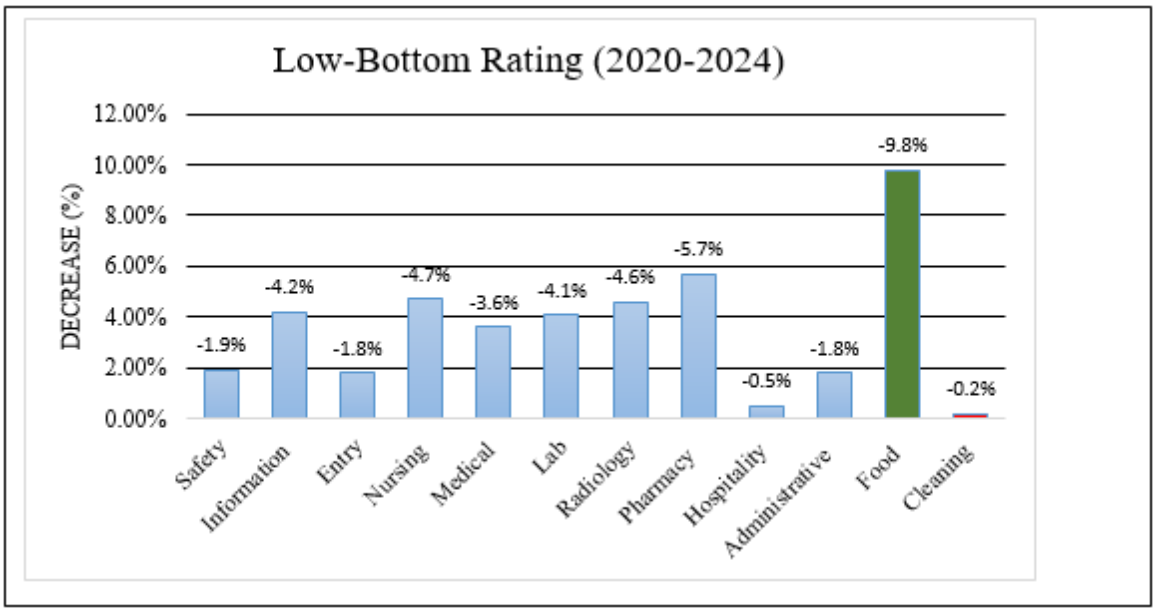

Figure 2: Percentage decrease in low-bottom rating for hospital service domains (e.g., Safety, Nursing, Lab, etc.) (2020 to 2024)

Table 3: Odds ratios comparing top-box against bottom-box satisfaction responses between 2020 and 2024 by service domain, highlighting the magnitude of improvement.

Domain	2020		2024		Odds Ratio (OR)	Significance
	Top-box	Low-bottom	Top-box	Low-bottom		
Safety	2101	150	2556	111	1.644	moderate
Information	1826	267	2326	173	1.966	moderate
Entry-related	1827	224	2151	200	1.319	small
Nursing	1714	267	2215	163	2.117	strong
Medical	1893	227	2227	133	2.008	strong
Laboratory	1856	208	2199	102	2.416	strong
Radiological	1349	197	1584	101	2.290	strong
Pharmacy	1503	249	1937	124	2.288	strong
Hospitality	784	124	1183	146	1.282	small
Administrative	1419	171	1751	143	1.476	moderate
Food Services	671	370	899	277	1.790	moderate
Cleaning	2379	74	2440	65	1.168	small

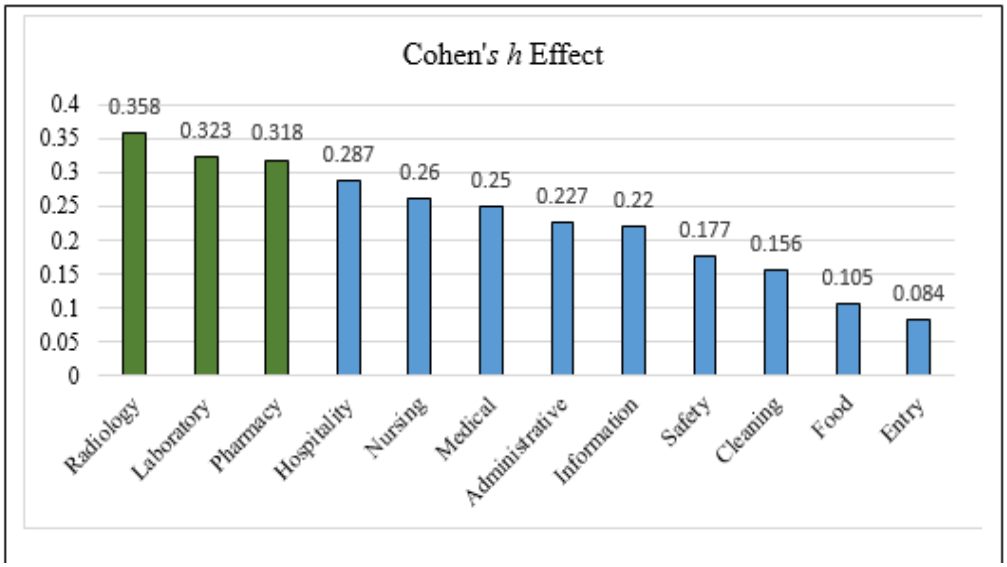

Figure 3: Effect size (Cohen's h) visualization for patient satisfaction changes between 2020 and 2024, emphasizing domains with moderate-to-strong improvements.

Radiology satisfaction was shaped by clear procedural explanations, effective communication, privacy respect, timely reporting, and facility readiness [26]. Pharmacy improvements reflected better medication availability, shorter waiting times, and the introduction of confidential consultations and safety measures [27–29]. Yet, patient concerns about medication pricing, despite regulatory oversight, may stem from misconceptions about Iraq's open pharmaceutical market. Laboratory services also improved through ISO accreditation and enhanced protocols, though pre-analytical delays and processing times remain challenges [30].

Notable progresses were also seen in non-clinical areas such as hospitality, administration, information services, and safety procedures. These advancements likely reflect streamlined workflows and staff training. However, satisfaction in non-clinical domains remains comparatively lower, warranting continued focus. Patients emphasized the importance of responsive staff, clear communication, and a comfortable environment [31]. Some dissatisfaction was linked to institutional policies, such as restrictions on room refrigerators and limits on visitation and the attendants, which, while intended for infection control resource management, were perceived as inconvenient or lacking empathy. Although quality measures are important, they alone do not determine institutional excellence. Outcomes are also shaped by hospital size, resources, staff expertise, and institutional culture [32]. Effective safety systems, including surgical checklists, medication verification, fall prevention, and infection control, are crucial for fostering patient trust, overall satisfaction, and hospital reputation [33-34].

Despite overall improvements in patient satisfaction between 2020 and 2024, certain service domains, including food, entry, and accounts services, showed only modest gains or minor ongoing

concerns, aligning with global trends [35–37]. Cleaning services, which were already highly rated in 2020, showed further improvement in 2024, reflecting sustained excellence in hygiene and infection control-key factors for patient safety and institutional reputation [38-39]. Overall satisfaction improved by 9.8%, with notable increases in top-box responses and a corresponding reduction in bottom-box dissatisfaction. Previous studies suggest that larger hospitals and those with insurance coverage generally achieve higher satisfaction scores [40–42]. In Iraq, patients often prefer private hospitals over the public healthcare sector [43-45], and the lack of health insurance, along with the financial burden of private care, continues to strongly influence overall experiences and expectations.

Imam Al-Hujjah Hospital, a mid-sized facility in a non-insurance-based healthcare system, achieved a 9.8% increase in overall satisfaction, rising from 68.6% in 2020 to 78.4% in 2024. Most comparable Iraqi studies have focused on general or oncology centers, with only three closely related: a study from Erbil reporting similar trends [46], an assessment of trust in private facilities in Ramadi [44], and a comparison of satisfaction between public and private hospitals in Erbil [47]. International benchmarks classify satisfaction levels of 70–80% as good, 80–90% as excellent, and above 90% as exceptional [48]. Based on this scale, Imam Al-Hujjah Hospital's performance places it in the strong category, reflecting sustained efforts to enhance quality within a challenging healthcare context.

Study limitations

This study's reliance on a single center limits the generalizability of its findings. The lack of detailed demographic data restricts subgroup analyses. Variation in patient exposure across different service domains may have influenced responses.

Conclusions

This longitudinal comparative study showed an increase in overall patient satisfaction at Imam Al-Hujjah Hospital over four years, driven by significant improvements in clinical services such as radiology, pharmacy, laboratory, nursing, and medical care. These gains highlight the hospital's commitment to patient-centered care within a resource-limited, non-insurance-based setting and underscore the value of continuous monitoring and structured electronic feedback systems.

Non-clinical areas, particularly food services and admission processes, remain opportunities for improvement. Sustaining progress will require integrating clinical excellence with enhanced patient experience, operational efficiency, and comfort. Future assessments should incorporate demographic data, disease classification, and discharge status to better align services with evolving patient needs.

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Author Contributions

Conceptualization, M.A.S. and H.D.H.; Methodology, M.A.S., H.M.A. and H.M.A.; Formal Analysis, H.D.H., H.M.A. and H.M.A.; Investigation, H.M.A. and H.M.A.; Resources, M.A.S. and H.D.H.; Supervision, M.A.S. and H.D.H.; Writing Original Draft, M.A.S.; Writing – Review & Editing, all authors.

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