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UTILIZING PERFORMANCE METRICS TO ASSESS HEALTHCARE QUALITY

Abdulaziz Abdurhman Almugren, Zabin Taraheeb Almutairi, Samar Ali Hassan Alamri, AMANI MOHAMMAD ABDULKARIM ALKHATEEB, Ebtsam Ibrahim Fallatah, Alanoud Musaid Aleidan, Hanif Mossad Algarni, Faheed Mothib Thawab Almotairi, MAJED NAFEA ALHARBI, Ali Ibrahim Al Othman, Geza Abdulah Al alwey Al harbi, ABDULLAH Mohammad Alkhtani, Aldulbah Nujud Ali M, Ahmad Rayan Alfuraydi, Bader Abdulaziz Alazmi, Ismail Ibrahim Alsaif, Tahani Nader Almuzaini, Nasser Ibrahim Aleidi, Suliman Ali Alhussain

Corresponding Author: Abdulaziz Abdurhman Almugren

Abstract

Background: In recent years, the healthcare system has experienced swift transformation. However, a recent Quality and Patient Safety Report indicated a deterioration in patient safety and quality culture among healthcare personnel. This underscores the need of evaluating treatment quality and patient safety from the viewpoints of both patients and healthcare providers.

Objectives: This study aimed to identify (2) the demographic parameters correlated with overall quality of care and patient safety, as well as (1) the perspectives of patients and healthcare professionals about patient safety and overall quality of care standards at two tertiary hospitals.

Methods: The research design employed was cross-sectional. Information regarding two subjects overall quality of care and patient safety—was collected utilizing the Healthcare Professional Core Competency Instrument and the Revised Humane Caring Scale. From late 2018 to early 2019, questionnaires were sent to patients (n = 600) and healthcare professionals (n = 246) across three departments in two tertiary hospitals: medical, surgical, and obstetrics and gynecology. Binary logistic regression and descriptive statistics were employed to analyze the data.

Results: A total of 367 patients and 140 medical professionals completed the surveys, yielding response rates of 61.2% and 56.9%, respectively. Healthcare professionals assigned superior ratings for patient safety (M = 4.39; SD = 0.675) and quality of care (M = 4.36; SD = 0.720) compared to patients (M = 4.23; SD = 0.706) and the general public (M = 4.22; SD = 0.709). The study identified a correlation between hospital attributes and overall healthcare quality (OR = 0.095; 95% CI = 0.016-0.551; p = 0.009), as well as patient safety (OR = 0.153; 95% CI = 0.027-0.854; p = 0.032) among healthcare personnel. A correlation was identified between the admission/work area and the participants' opinions of care quality (patients: OR = 0.257; professionals: OR = 0.093; 95% CI = 0.009-0.959; p = 0.046).

Conclusions: Patients and healthcare professionals assessed the quality of care and patient safety as excellent, with only small discrepancies, indicating high patient satisfaction and proficient healthcare providers. These perspectives can offer valuable and supplementary insights toward enhancing the overall standards of healthcare delivery systems.

Keywords: perspective of the patient, perspective of the healthcare provider, Care quality, patient safety, quantitative analysis

Background

The primary aims of the world's leading healthcare systems are the quality of care and patient safety. Regulators and policymakers in the healthcare sector maintain a significant emphasis on these objectives [4]. The Ministry of Health (MOH) established the Department of Quality and

Patient Safety in regional hospitals in 2007 to execute a quality assurance plan. To promote an inclusive and integrated healthcare system, the Patient Safety Friendly Hospital Initiative (PSFHI) was introduced in 2015. These programs have markedly enhanced healthcare outcomes by reducing infant and maternal death rates by 72% and 55%, respectively, from 1990 to 2013.

A recent Report of Quality and Patient Safety (RQPS) indicated a deterioration in patient safety and quality of care culture among healthcare professionals (HCPs), despite the World Health Organization (WHO) rating the healthcare system among the top ten globally in 2012. The paper advocated for a comprehensive assessment of patient safety and treatment quality, considering the perspectives of both patients and healthcare professionals as service providers. The research asserts that healthcare professionals often oversee service and delivery expenses while focusing on long-term, sustainable solutions [10]. Healthcare professionals' core competences and broader technical proficiency sometimes significantly influence the overall assessment of treatment quality and patient safety [3, 11–13].

Conversely, patients prefer immediate relief. They often formulate their opinions based on the overall healthcare system, the nature of the practice, and the personal and professional credentials of the healthcare practitioners [13, 15, 16]. This elucidates why international entities such as the Council of Europe (CoE) [17], the World Health Organization (WHO) [3], and the United States Institute of Medicine (IOM) [18] emphasize the necessity of incorporating patients' viewpoints on quality care alongside those of providers to achieve an optimal equilibrium and provide further insight into areas requiring reform. This study is part of a broader investigation that seeks to (2) identify participant characteristics most associated with quality of care and patient safety, and (3) integrate the perspectives of patients and healthcare professionals (nurses and physicians) regarding quality of care and patient safety at two tertiary hospitals [19]. The findings of this study will provide valuable and supplementary insights for enhancing the standards of the entire healthcare delivery system.

Methods

Study context

This research was conducted in Riyadh, the capital of Saudi Arabia, a high-income Arab country with a population of 24.6 million residents. Since 1970, it has seen rapid economic and social transformation, elevating living conditions. As of 2019, the Ministry of Health (MOH) operated 1,254 private clinics, 269 public health centers, clinics, and dispensaries, 50 hospitals, and 5,049 beds. The total number of physicians was 6,419, while the total number of nurses was 14,491. In 2019, the nurse-to-doctor ratio was 2:1, resulting in 21 doctors and 44 nurses per 10,000 individuals in the country. The public and private sectors of the healthcare system collaborate to offer universal coverage for both residents and non-residents. Government-owned and operated facilities deliver the majority of healthcare, providing 83.1% of hospitals, 92.5% of hospital beds, 62.2% of all outpatient services, and 94.5% of all inpatient services, which constitutes approximately 81.1% of total health expenditure (THE) [21].

Design

The study employed a cross-sectional design for its execution. The study adhered to the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) criteria [22].

Sample and setting

This study included adult patients and all healthcare professionals (nurses and doctors) from three departments—medical, surgical, and obstetrics and gynecology (OBG)—at two tertiary hospitals (A and B). Data was collected throughout the month spanning the end of 2018 and the beginning of 2019. In the case of hospitals "A" and "B," with an effect size of d = 0.5, alpha = 0.05, and a total sample size of N = 6155 (comprising 4094 from hospital "A" and 2061 from hospital "B"), power analysis indicated that a minimum of 313 respondents was necessary [21]. Patient data was collected from a convenience sample of 600 adult patients admitted to hospitals A and B, comprising 400 and 200 individuals, respectively. The authors recruited a greater number of participants than the minimum required sample size and enhanced follow-up and reminders to mitigate potential bias from convenience sampling.
Healthcare professionals were selected via proportional stratified sampling from a cohort of 246 personnel across two hospitals, comprising 139 nurses and 107 physicians. The comprehensive study results were utilized to determine the sample size for healthcare professionals.

Study instruments

This study utilized two elements—general quality of care and patient safety—from the healthcare professional core competence instrument (HPCCI) and the revised humane caring scale (RHCS), respectively, for patients and healthcare professionals, to gather data [23–25]. The two measures described were created by the authors and tested as part of a broader study utilizing convenience sampling of patients (n = 30) and healthcare professionals (HCPs) (n = 56) at a tertiary hospital. The research encompassed both the RHCS and HPCCI devices in their entirety. The HPCCI has 11 subscales with 81 items, constructed utilizing legitimate and reliable instruments, with authorization from the inventors of these tools. In this study, specialists translated the RHCS, comprising seven subscales with a total of 46 items, from English to Arabic and then back to English. The pilot did not influence the tool's specifications. A 5-point Likert scale was employed to assess the two items on the questionnaires administered to patients and healthcare professionals (1 = Failing, 2 = Poor, 3 = Acceptable, 4 = Very Good, and 5 = Excellent). A score of 1 was perceived to signify inadequate care quality and patient safety perceptions, whilst a score of 5 was regarded as indicative of exceptional levels.

Data collection

The principal investigator collaborated extensively with the research assistants from the two designated hospitals, delineating the study objectives and the methodology for data collection. Throughout the month, the research assistants disseminated several fact sheets and questions to the patient and healthcare professional target populations. Each unit received a collection of secured boxes for the storage of completed questionnaires. In both universities, research assistants provided verbal reminders to the target groups throughout the study duration. The study was non-restrictive, allowing participants to exit at their discretion.

Data analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were utilized for data analysis. The metric employed to assess the overall quality of care and patient safety was the statistical mean. The minimum attainable score was a mean of 1, while the most attainable score was a mean of 5. A mean score of 4 or above was deemed "excellent" on this scale. This number, derived from literature and magnet hospital assessment tools, signifies best practices, with a score of 4 denoting adherence to magnet standards [26]. The associations between the dependent variables (overall quality of treatment and patient safety) and the independent variables were analyzed for both patients and healthcare professionals using binary logistic regression analysis

(demographic characteristics). 'Excellent or very good' was assigned a value of 1, while 'acceptable, poor, and failing' were assigned a value of 0. The variables for care quality and patient safety were divided into two categories. This research calculated the P value (P), odds ratio (OR), and 95% confidence interval (CI) of the OR to elucidate the relationship between the predictors and the outcomes. Both multivariate and univariate analyses were conducted. The data were analyzed utilizing the Statistical Package for the Social Sciences (SPSS version 27.0).

Results

Participants' demographic characteristics

The overall patient response rate was 61.2% (367 of 600 targets), comprising 149 patients from hospital B and 218 patients from hospital A (59.4% and 40.6%, respectively). Out of 246 targets, 140 healthcare professionals (HCPs), representing 56.9%, answered, comprising 65 professionals (46.4%) from hospital A and 75 (53.6%) from hospital B. Table 1. Fewer than 30% of the patients and more than 50% of the personnel were in their 30s and 40s, respectively. Females constituted 58.5 percent of patients and 75.5 percent of professionals, respectively. Ninety-three percent of patients were citizens, however the staff's response rate was somewhat higher by 3.6% compared to foreign nationals.

Table 1 Participants' demographic characteristics

Patients				Healthcare Professionals			
		n	%			n	%
Hospital	A	218	59.4	Hospital	A	65	46.4
	B	149	40.6		B	75	53.6
				Profession	Nurse	84	60.0
					Physician	56	40.0
Age in (years)	< 30	119	35.6	Age in (years)	< 30	28	24.6
	30–40	94	28.1		30–40	59	51.8
	> 40	121	36.2		> 40	27	23.7
Gender	Female	210	58.5	Gender	Female	105	75.5
	Male	149	41.5		Male	34	24.5
Ethnicity	i	332	93.0	Ethnicity	i	72	51.8
	Non-i	25	7.0		Non-i	67	48.2
Living	Alone	39	11.3	Position	Clinician	84	78.5
	With family	305	88.7		Management	4	3.7
Education	Post-secondary school education	140	40.0		Both	19	17.8
	Basic level of education	210	60.0	Work experience	< 8 years	41	34.2
Occupational status	Un-employed	154	43.9		8–15 years	44	36.7

	Employed	159	45.3		> 15 year	35	29.2
	Retiree	38	10.8	Education	Diploma/resident	60/13	71.4/27.1
					Bachelor/specialist	23/34	27.4/70.8
					Master/adjunct	1/0	1.2/0
					Ph.D./docent	0/1	0/2.1
Admission area	Medical	117	34.7	Work area	Medical	34	25.0
	Surgical	156	46.3		Surgical	71	52.2
	Obstetrics and gynaecology	64	19.0		Obstetrics and gynaecology	31	22.8
Hospital admission	Planned	132	37.7				
	Emergency	218	62.3				
Reason of admission	Examination	47	13.3				
	Treatment	306	86.7				
Stay duration	<=5 Days	192	67.6				
	> 5 Days	92	32.4				

Sixty percent of the patients possessed a high school education, and around eighty-nine percent resided with their families. 44% were unemployed, resulting in around 45% being employed. Most health care professionals (HCPs) 78.5% were engaged in bedside treatment, while those with multiple roles clinical and managerial ranked second. Respondents from each healthcare professional working group exhibited some common qualities. Approximately two-thirds possessed between eight and fifteen years of experience. A majority of nurses (71.4%) and doctors (70.8%) have diplomas as part of their educational qualifications or credentials. Approximately 46.3% of patients and 52.2% of healthcare professionals were situated in the surgical department, followed by the medical department. A significant proportion of patients (87%), or around two-thirds (62.3%), were hospitalized as emergencies and opted for treatment rather than an assessment. 67.6% of patients, equivalent to two-thirds, were hospitalized for less than five days. Participants' perspectives on the quality of care and patient safety the participants' viewpoints on patient safety and quality of care criteria are encapsulated in Table 2. Patient safety ($M = 4.22$; $SD = 0.709$; HCPs: $M = 4.39$; $SD = 0.675$) and patient quality of treatment ($M = 4.23$; $SD = 0.706$; HCPs: $M = 4.36$; $SD = 0.720$) were both rated quite high overall. Nonetheless, there were notable disparities in the participants' perspectives on patient safety ($p = 0.013$).

Table 2 Participants' perspectives on quality of care and patient safety

Participants	Overall quality of care							Overall patient safety						
	N	M	SD	SE	P	95% CI		N	M	SD	SE	P	95% CI	
Patients	348	4.23	0.706	0.038	0.068	4.16	4.30	351	4.229	0.70	0.038	0.013	4.15	4.29
HCPs	140	4.36	0.720	0.061		4.24	4.48	140	4.395	0.67	0.057		4.28	4.50
Total	488	4.26	0.712	0.032		4.20	4.33	491	4.274	0.70	0.032		4.21	4.33

N Number of participants, *M* Mean, *SD* Standard deviation, *SE* Standard error, *P P* value, *CI* Confidence interval

The relationship among patient safety, overall healthcare quality, and demographic variables. A binary logistic regression analysis was conducted to assess the influence of hospital, age, gender, ethnicity, and admission/work area on patient safety and overall quality of care. The selected variables were chosen for their comparability and availability in both instruments (RHCS and HPCCI). Patients at hospital A exhibited lower satisfaction with the quality of care compared to those at hospital B, as indicated in Table 3 (OR 0.622; 95% CI 0.271-1.424; p = 0.261), however the difference lacked statistical significance. Healthcare professionals at Hospital A exhibited a 90% reduction in satisfaction about care quality (OR 0.095; 95% CI 0.016-0.551; p = 0.009) compared to their counterparts at Hospital B. Men generally assessed the quality of care more favorably than women, although this disparity was not statistically significant (OR 1.920; 95% CI 0.972-3.792; p = 0.060). The findings indicated that both patients and healthcare professionals expressed lower satisfaction with the standard of service in the medical department compared to the OBG department (p = 0.036 and p = 0.046, respectively). Table 4 presents the results of a binary logistic regression study to determine whether patient and healthcare provider demographics might elucidate the overall findings.

Table 3 Binary logistic regression analysis of the quality of care

	Patients				Healthcare professionals			
	OR[a]	CI[b] of OR		P[c]	OR[a]	CI[b] of OR		P[c]
Hospital								
A	0.622	0.271	1.424	0.261	0.095	0.016	0.551	0.009
B	1	Ref.			1	Ref.		
Age in (years)								
< 30	0.860	0.408	1.813	0.692	0.131	0.010	1.707	0.121
30–40	1.901	0.755	4.791	0.173	0.148	0.014	1.606	0.116
> 40	1	Ref.		0.223	1	Ref.		0.269
Gender								
Male	1.920	0.972	3.792	0.060	1.496	0.255	8.790	0.656
Female	1	Ref.			1	Ref.		
Ethnicity								
	0.571	0.166	1.967	0.375	1.941	0.420	8.962	0.396
	1	Ref.			1	Ref.		
Admission/Work area								
Medical	0.257	0.072	0.916	0.036	0.093	0.009	0.959	0.046
Surgical	0.376	0.115	1.227	0.105	0.103	0.011	0.999	0.050
Obstetrics and gynaecology	1	Ref.		0.110	1	Ref.		0.119
Classification percentage correct	83.3%				84.5%			
2 Log likelihood	241.401[a]				72.160[a]			
Cox & Snell R Square	.076				.185			
Nagelkerke R Square	.128				.321			
Hosmer and Lemeshow	0.528				0.338			

[a]Odds ratio
[b]95% confidence interval of odds ratio
[c]P value (level of significance)

Patient safety standards are considered to be exceptionally high. The patients' perceptions of patient safety standards at the two hospitals were not statistically significant; however, satisfaction levels were lower at hospital A compared to hospital B (OR 0.659; 95% CI 0.298-1.457; p = 0.303). Moreover, healthcare professionals at Hospital A exhibited 85% lower satisfaction about patient safety standards compared to their counterparts at Hospital B (OR 0.153; 95% CI 0.027-0.854; p = 0.032). Men generally achieved markedly superior scores compared to women for patient safety criteria (OR 1.856; 95% CI 0.955-3.606; p = 0.068). The findings indicated that patients expressed lower satisfaction about safety in the medical department compared to the OBG department (p = 0.066).

Discussion

The study aimed to ascertain the perceptions of patients and healthcare professionals regarding the overall standards of care and patient safety at two tertiary hospitals, and subsequently to investigate the relationship between demographic parameters and these standards of care and patient safety. The study's principal findings indicated that patient safety and care quality received favorable ratings, reflecting competent healthcare personnel and a high degree of patient satisfaction.

Patients assessed the overall quality of care and patient safety as good, with scores of 4.22 and 4.23, respectively, according to the findings of the previous survey. This indicates that patients recognized and valued the contributions of healthcare professionals to healthcare. This enhances their pleasure and confidence in the healthcare system, potentially increasing their willingness to explore new treatments and procedures. This may expedite patient recovery and enhance the total value of each medical resource and intervention [27].

Healthcare professionals also provided outstanding ratings for patient safety and care quality, scoring 4.39 and 4.36, respectively. This may reflect healthcare professionals' self-perceptions as

qualified specialists who implement the quality assurance plan and utilize the Patient Safety Friendly Hospital Initiative (PSFHI) [4, 6].

Healthcare professionals assessed both the quality of care and patient safety marginally higher than patients did. This outcome aligns with the findings of Miranda et al. [28], who identified that healthcare workers exhibited enhanced confidence in their competencies. These factors may foster this optimism: Initially, patients may refrain from expressing their issues regarding the care they receive owing to linguistic and cultural obstacles; subsequently, healthcare professionals may perceive their care as high-quality. Zhao et al. [30] corroborated this conclusion, indicating that nurses perceived their care as holistic, whereas patients believed that high-quality care compromised their privacy and disrupted their sleep.

	Patients				Healthcare professionals			
	OR[a]	CI[b] of OR		P[c]	OR[a]	CI[b] of OR		P[c]
Hospital								
A	0.659	0.298	1.457	0.303	0.153	0.027	0.854	0.032
B	1	Ref.			1	Ref.		
Age in (years)|								
<30	0.967	0.463	2.022	0.929	0.273	0.022	3.348	0.310
30–40	1.623	0.683	3.859	0.273	0.399	0.038	4.226	0.445
>40	1	Ref.		0.445	1	Ref.		0.589
Gender								
Male	1.856	0.955	3.606	0.068	1.184	0.197	7.117	0.853
Female	1	Ref.			1	Ref.		
Ethnicity								
	0.560	0.163	1.929	0.358	0.876	0.171	4.481	0.873
	1	Ref.			1	Ref.		
Admission/work area								
Medical	0.331	0.101	1.077	0.066	0.289	0.027	3.083	0.304
Surgical	0.435	0.147	1.288	0.133	0.167	0.018	1.579	0.118
Obstetrics and gynaecology	1	Ref.		0.185	1	Ref.		0.275
Classification percentage correct	82.3%				88.2%			
-2 Log likelihood	254.335*				66.644*			
Cox & Snell R Square	.065				.114			
Nagelkerke R Square	.107				.220			
Hosmer and Lemeshow	1.000				0.249			

[a]Odds ratio
[b]95% confidence interval of odds ratio
[c]p value (level of significance)

The binary logistic regression analysis of this study indicated a correlation among hospital, age, gender, ethnicity, and admission/work area characteristics with overall patient safety and quality of treatment. Healthcare professionals at hospital B evaluated the overall grade of treatment and patient safety higher than their counterparts at hospital A. The specialization of hospital A in medical and chronic cases requiring extended hospitalizations may contribute to its increased burden.

This study's results revealed a substantial disparity in the overall standard of care administered to patients and healthcare professionals in the medical sector. This result aligns with Abuosi's research [31], which revealed that patients and nurses held divergent perspectives of quality care based on their definitions and interpretations.

This study provides significant new insights into the perceptions of patients and healthcare professionals about patient safety and healthcare quality. This information may assist current and future programs of the MOH aligned with the Sultanate's Health Vision 2050 [41].

Strengths and limitations

The favorable outcomes may be attributed to the prolonged implementation of quality assurance and patient safety procedures by healthcare organizations. This should particularly motivate governments who have yet to adopt these strategies. This study, however, has certain limitations. The emphasis was primarily on two factors: overall quality of treatment and patient safety, together with their correlation to demographic characteristics. The study's generalizability may be limited due to data collection being restricted to three departments across two hospitals. The response rate for both target groups may have been elevated, while it was deemed acceptable [32, 33]. Third, given the extensive nature of quality of care and patient safety concepts, together with the multitude of variables that might influence them, reliance solely on self-assessment approaches is inadequate. Consequently, interviews and focus groups with patients and healthcare professionals would provide researchers with enhanced insights into this topic.

Conclusions

This study analyzed the perceptions of patients and healthcare workers on the standard of treatment and patient safety. Both patients and healthcare professionals assessed the level of care and patient safety as exceptional when compared to magnet hospital standards. Patients express satisfaction with the healthcare delivery system and recognize the value of the medical services provided to them. This may also indicate that healthcare professionals utilize appropriate quality assurance methods and possess a diverse array of essential competencies.
The overall quality of treatment and patient safety were affected by elements within the hospital and the admission/work environment. These perspectives can be utilized to enhance the alignment of healthcare delivery models with the health Vision 2030.

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