Patient satisfaction with ambulatory care services delivery and respect for patient rights: findings from 2022 national survey in Rwanda

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Abstract

Background This study evaluated the factors influencing patient satisfaction with hospital services and respect for patient rights in outpatient consultation in Rwanda, aiming to provide insights into improving the overall quality of care.

Methods This was cross-sectional study design. We recruited participants from all (30) districts in Rwanda using stratified sampling. A structured questionnaire assessed satisfaction across seven hospital areas, including cashier, waiting, triage, doctor consultation, laboratory, pharmacy, and respect for patient rights. We used descriptive statistics, Chi-square, and Multivariate Regression analyses.

Results The study showed that most participants expressed satisfaction with hospital services and respect for their rights: doctor consultations (93.8%), triage (92.0%), dispensing pharmacy (88.2%), laboratory services (87.2%), waiting area (85.3%), patient rights (74.3%), cashier services (73.3%). At bivariate analysis, we observed that satisfaction in waiting areas was associated with location ($p = 0.036$), provinces ($p < 0.001$), and hospital rank ($p < 0.001$), while satisfaction in triage was associated with age categories ($p < 0.001$) and visits ($p = 0.02$). The association of satisfaction in cashier services with age categories ($p < 0.001$), visits ($p = 0.032$), and hospital rank ($p = 0.005$) was also significant, as well as satisfaction in dispensing pharmacy and provinces ($p < 0.001$), location ($p = 0.002$), and visits ($p = 0.008$). Multiple logistic regression indicated higher satisfaction in waiting areas among patients from Northern (OR = 3.81, 95%CI = 1.85–5.64), Western (OR = 1.95, 95%CI = 1.48–3.60), and Southern provinces (OR = 1.93, 95%CI = 1.17–2.85), while urban patients (OR = 0.65, 95%CI = 0.47–0.91) and those from high-rank hospitals had lower satisfaction (OR = 0.59, 95%CI = 0.43–0.82). High-rank hospital patients were more satisfied with triage (OR = 1.86, 95% CI = 1.14–3.13) while returning patients were less satisfied (OR = 0.51, 95%CI = 0.33–0.90). Lower satisfaction in dispensing pharmacy was observed among the City of Kigali (OR = 0.11, 95%CI = 0.05–0.24), Northern province (OR = 0.43, 95%CI = 0.23–0.80), and returning patients (OR = 0.51, 95%CI = 0.33–0.76). Urban (OR = 2.5, 95%CI = 1.32–5.16) and

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high-rank hospital patients (OR = 1.96, 95%CI = 1.08–3.77) reported higher laboratory satisfaction. However, cashier services had lower satisfaction among Kigali (OR = 0.37, 95%CI = 0.21–0.64), Northern (OR = 0.44, 95%CI = 0.29–0.65), and Western province patients(OR = 0.63, 95%CI = 0.43–0.91), returning patients (OR = 0.73, 95%CI = 0.55–0.96), and those from high-rank hospitals(OR = 0.70, 95%CI = 0.54–0.92).

Conclusion Our study has revealed disparities in satisfaction with ambulatory care services delivery by provinces, hospital rank and visit status. We recommend hospital to take initiatives aiming at streamlining payments, optimizing waiting area services, and enhancing coordination, staff training, regional equity, and patient-centered policies for continuous service improvement.

Keywords Patient satisfaction, Ambulatory care, Quality of services

Introduction

Patient satisfaction reflects patients' appreciation of the treatment they receive at health facilities, and it is a key measure used to assess service quality in healthcare facilities [1, 2]. Surveys for patient satisfaction offer deep insights into how healthcare is effective and highlight factors that impact clinical outcomes, patient retention, and treatment adherence. Healthcare providers' proficiency, communication skills, and the behavior of hospital staff, as well as accessibility, facilities, and infrastructure, are factors related to healthcare providers that influence patient satisfaction [3], while socio-demographics, disease stage, and perceptions of trust and involvement in healthcare decisions constitute factors specific to patients themselves [4–7]. Today's patients, being more informed and with higher expectations, require service delivery that meets these standards [8]. Positive patient experiences correlate with improved health outcomes, as satisfied patients are more likely to comply with treatment, continue care, and trust their healthcare providers [9]. In contrast, dissatisfaction can lead to poor compliance and even negative word-of-mouth, discouraging others from seeking care [10]. Studies reveal that perceived low quality at primary care centers often deters people in Africa from utilizing these facilities [11, 12].

In the U.S., it is estimated that if the patient is dissatisfied and never returns, the potential loss exceeding $200,000 in revenue can occur over a practice's lifetime. However, the patient drives loyalty if satisfied, and positive satisfaction influences others. For instance, satisfied patients tell an average of four others about their experience. In contrast, dissatisfied patients might share their negative experience with up to ten people or more if the issue is severe [13, 14]. Patient satisfaction correlates strongly with doctor and nurse interactions, as evidenced by studies in Bangladesh, and with specific service issues like waiting times and drug availability, as seen in Ethiopia [14–16].

When the cashier system is well organized, patients experience a smooth journey through various stages of care. Patient perceptions of service quality are reduced by long queues or delays at cashiers in health facilities [17].

Hospitals can enhance patient satisfaction by ensuring efficient processing, clear communication, and courteous service. The cashier's role goes beyond simply handling payments by building trust and positively impacting the perception of healthcare quality. Patient satisfaction is critical in evaluating healthcare quality, yet challenges persist in Rwandan hospitals, such as long waiting times, inadequate communication, limited resources, and gaps in patient-provider relationships. These issues can lead to poor treatment adherence, reduced patient trust, and lower healthcare-seeking behavior [18]. Although Rwanda has made significant strides in improving healthcare access, no study at a large scale has documented patient satisfaction across different health facilities. This study is essential for Rwanda and other countries with similar contexts to identify broader service gaps and areas for improvement, aiming to enhance patient satisfaction, promote trust in the healthcare system, and guide strategies for delivering more patient-centered, high-quality care.

Methods

Study design

The study, which was cross-sectional in design, was conducted across 30 hospitals in Rwanda from August 22 to 30, 2022.

Study setting

Rwanda has public health facilities organized in a pyramid structure comprising 508 health centers, 36 districts, four provincial, and eight referral hospitals. Health posts are other entities working at the cell level and operating under public-private partnership models; Rwanda has 1,160 health posts (HPs). At the community level, each village is served by 3 to 4 Community Health Workers, totaling 58,445 countrywide (Fig. 1). Hospitals provide primary, secondary, and tertiary healthcare services. Primary care includes outpatient consultations, maternal-child health, vaccinations, and basic diagnostics. Secondary care covers emergency services, inpatient care, surgeries, and specialized consultations. Referral hospitals offer advanced diagnostics, intensive care, organ
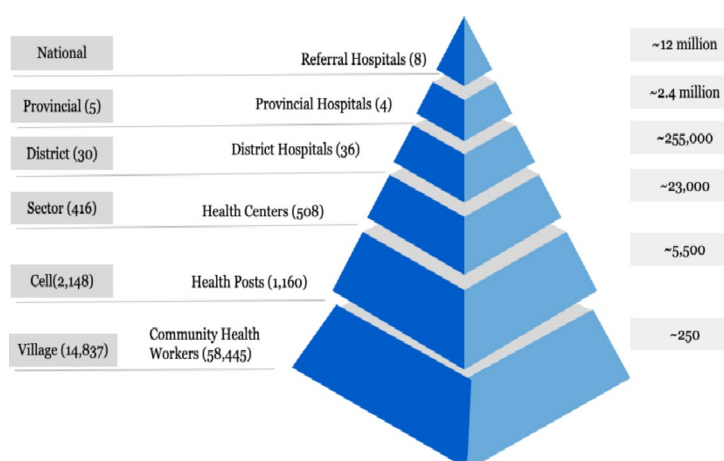
Fig. 1 Pyramid of public health facilities in Rwanda as 2022

Table 1 Sample calculation for the study

A	Number of strata (Provinces)		5
B	p		0.50
	z		2.17
	e		0.03
	Effective Sample size		**1308**
C	m (target number of interviews per cluster)		**16**
	ICC (Intra-cluster correlation)		0.1
	DEFF (design effect)		1.50
1	Total completed cases needed:		**1920**
2	Number of clusters needed per stratum		30

transplants, oncology, and specialized surgeries. This study sampled three referrals, two provincial and 25 district hospitals, purposively included in the patient satisfaction survey based on district representativeness.

Sampling method

This study employed a multistage sampling approach, stratified hospitals by category (district, provincial, and referral) and geographic region (Eastern, Western, Southern, Northern, and Kigali City). Overall, thirty hospitals were selected (Table 1). In the subsequent stage, individual patients were purposively chosen within each selected hospital, utilizing hospital visit records from the data collection period. We determined a sample size of 1920 participants composed of ambulatory care and inpatients, but we included only 1260 patients who consulted at the outpatient department in the analysis. The exclusion of inpatients in the analysis was based on different healthcare experiences and service expectations. This was done to ensure a homogeneous sample and meaningful comparisons.

Study population

The target population for this study consisted of patients who received ambulatory care services at public hospitals across Rwanda and who provided consent for the survey at the hospital exit stage after receiving the last health service and used one of the six-hospital services: cashier, waiting, triage, doctor consultation, laboratory, pharmacy. We also included respect for patients' rights as cross-cutting to all services. For children aged from 0 to 18 years and patients with mental disorders or unable to respond, the parents/caregiver provided the information on their behalf. The study excluded admitted patients and those who did not provide consent. Figure 2 illustrates the sequential movement of patients through key hospital service points, from entry to exit. It covers essential steps such as waiting area, triage, cashier services, doctor consultation, laboratory tests, pharmacy dispensing, and respect for patient rights.

Data collection

Thirty surveyors working in pairs at the hospital level collected data under the supervision of five supervisors at the provincial level and three research coordinators at the national level. Surveyors were quality improvement officers in different hospitals. Data collectors received training on the validated Google Form questionnaires. We assigned surveyors to hospitals that differed from the hospitals where they worked. Informed consent was obtained from all participants before data collection. Participation was voluntary, and participants were assured confidentiality and anonymity of their responses. Surveyors conducted face-to-face interviews with patients, using tablets to record real-time responses. This method minimized the risk of missing data and ensured that patients with low literacy levels could still participate.

For the survey instruments and tools, we used a questionnaire with questions to elicit patients' perspectives on a range of key hospital ambulatory care services (Supplementary material 1). To ensure data quality, principal investigators (PIs) were responsible for organizing,
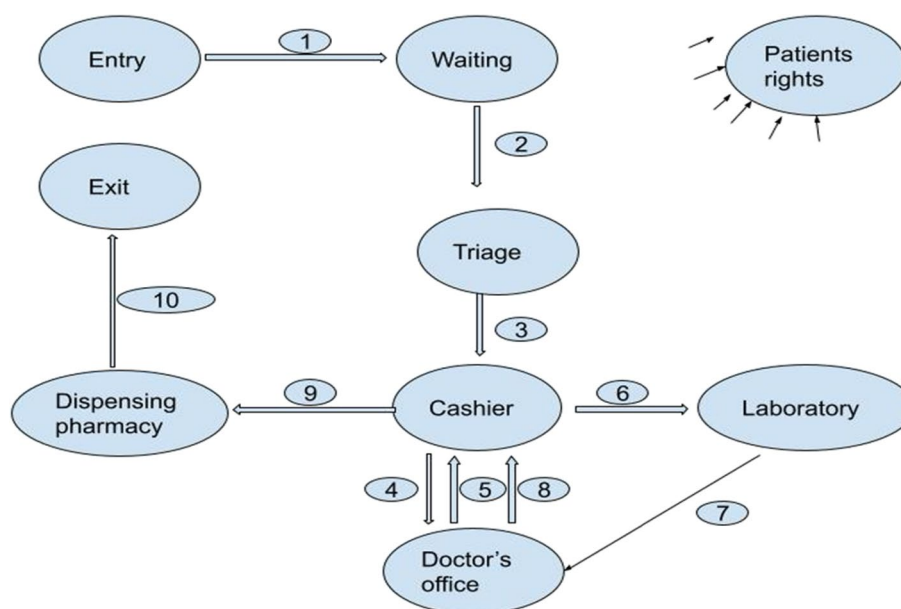
Fig. 2 Patient flow, patients' rights were cross-cutting across different services

supervising, and receiving completed questionnaires from surveyors during the data collection period. The PIs coordinated the data collection process for quality control purposes and independently verified if the surveyors collected data appropriately. Surveyors were responsible for safely keeping hard copy survey tools when connection did not permit online Google sheets. At the same time, electronically entered data was safely protected using individualized Google sheet passwords. Before full-scale data collection, a pilot test was conducted with 30 patients at one hospital not included in the final sample. This helped to assess the survey instrument's clarity, reliability, and validity. Based on the feedback from the pilot test, research coordinators made minor revisions to the wording of some questions to improve comprehension.

Data analysis

Using Microsoft Excel, we checked missing values and duplicate entries and computed descriptive statistics to summarize the sample's demographic characteristics using frequencies and percentages. We also used a Chi-Square test of independence to test associations between demographic characteristics and satisfaction of patients for each domain service and respect for patient rights. Patient satisfaction was measured using responses to multiple survey questions. For each survey question, responses indicating satisfaction ('Yes') were coded as 1 and dissatisfaction ('No') as 0. A total satisfaction score was calculated using a summative scoring method for each hospital service and respect for patient rights. Patients with a total satisfaction score exceeding 64% of the maximum possible score were classified as satisfied (1) in the final analysis. At the same time, those

scoring $\leq 64\%$ were categorized as Unsatisfied (0)" [19]. This 64% threshold aligns with prior research indicating that patients reporting satisfaction with most items are meaningfully distinct from those with lower scores [20–24]. Using this binary satisfaction classification, multivariate logistic regression was performed to identify factors associated with patient satisfaction with each service and patient rights. The model adjusted for age, gender, and other relevant variables to estimate the odds of being satisfied across different hospital service domains. The statistical significance was considered $p < 0.05$. We used R 4.3.3 in statistical analysis.

Ethical considerations

The study adhered to Rwanda's Ministry of Health institutional review board (IRB) guidelines under reference NHRC/2022/PROT/038. Consent was obtained from all participants, emphasizing voluntary participation and confidentiality. Data were anonymized, and the patients were informed of their right to withdraw at any point. Special considerations were made for vulnerable groups, including elderly patients and those with disabilities, to ensure inclusive participation. Surveyors were trained in ethical data collection practices, especially when handling sensitive information.

Results
Socio-demographic characteristics

One thousand two hundred sixty participants participated in the study, with most adults (73.7%, $n = 929$). Females represented a substantial portion of the patient population, constituting 65.3% ($n = 823$). The distribution of participants was pretty balanced across provinces

except the City of Kigali, which was the least represented province with 7.5% of participants ($n = 120$). Most participants were from rural hospitals ($n = 882$, 70%), and most were returning patients ($n = 805$, 63.9%). District hospitals provided two-thirds of the participants ($n = 851$, 67.5%) (Table 2).

Most participants indicated satisfaction in the services provided across different hospital services. Specifically, 85.3% ($n = 1,067$) were satisfied by waiting area. 92.0% ($n = 1.068$) were satisfied by triage, while 93.8% ($n = 1,173$) were satisfied by services provided during consultation by medical doctors. For cashier services, 73.3% ($n = 918$) of participants reported a positive experience, while 74.3% ($n = 478$) were satisfied with respect to their rights while seeking care. 88.2% ($n = 1,036$) were satisfied with the services provided by the dispensing pharmacy, while 87.2% of participants appreciated the laboratory services (Tables 3 and 4).

Bivariate analysis showed that satisfaction in waiting areas was associated with location (rural vs. urban) ($p = 0.036$), provinces ($p < 0.001$), and hospital rank ($p < 0.001$), while satisfaction in triage was associated with age categories ($p < 0.001$) and visits ($p = 0.02$). Furthermore, we observed the association of satisfaction in cashier services with age categories ($p < 0.001$), visits ($p = 0.032$), and hospital rank ($p = 0.005$). Satisfaction in dispensing pharmacy was also associated with provinces ($p < 0.001$), location ($p = 0.002$), and visits ($p = 0.008$).

Table 2 Demographic characteristics of participants

Characteristics	Participants, *n*	%
Total Participants	1260	100
Age Categories		
Young	331	26.3
Adult	929	73.7
Gender		
Female	823	65.3
Male	437	34.7
Provinces		
Eastern	300	23.8
Western	282	22.4
Southern	335	26.6
Northern	223	17.7
City of Kigali	120	9.5
Location		
Rural	882	70
Urban	378	30
Visits status		
New patients	455	36.1
Returning patients	805	63.9
Hospital Rank		
High-rank hospitals	409	32.5
District Hospitals	851	67.5

Young = Aged below 30 years according to Rwandan Policy, Adult = Above 30 years, High-rank hospitals = referral, teaching and provincial hospitals

Concerning satisfaction in laboratory services, we observed that it is associated with provinces ($p < 0.001$), location ($p = 0.019$), and hospital rank ($p = 0.047$). Lastly, no association was observed between the demographic characteristics of the participants and the doctor's consultation and respect for patients' rights ($p > 0.005$) (Tables 3 and 4).

Factors associated with satisfaction in ambulatory services and respect of patient rights

The study assessed the association between patient characteristics—such as age categories, provinces, location, gender, visit status, and hospital rank, and their satisfaction across ambulatory services and respect for patient rights. They include waiting areas, triage processes, doctor consultations, respect for patients' rights, cashier services, pharmacy dispensing, and laboratory services (Tables 5 and 6).

In simple logistic regression analyses, the unadjusted model indicated that patients from Northern (OR = 3.15, 95% CI = 1.85–5.64), Western (OR = 2.29, 95% CI = 1.48–3.60) and Southern Provinces(OR = 1.82, 95%CI = 1.17–2.85) were likely to be satisfied by waiting areas while urban patients (OR = 0.70, 95%CI = 0.50–0.97), patients from the high-rank hospital (OR = 0.56, 95%CI = 0.41–0.77) had lower odds of being satisfied by waiting areas. Returning patients (OR = 1.65, 95%CI = 1.02–2.76) had higher odds of being satisfied by services provided at triage compared to new patients, while those from high-rank hospitals (OR = 0.55, 95%CI = 0.33–0.88) had lower odds compared to those from District Hospitals. We also observed that returning patients have 1.88 times the odds of being satisfied with a Doctor's consultation than new patients (OR = 1.88, 95%CI = 1.10–3.42). For satisfaction in dispensing pharmacy, patients from City of Kigali (OR = 0.15, 95%CI = 0.08–0.28), Northern (OR = 0.4, 95% CI = 0.21–0.72), Western Provinces (OR = 0.53, 95%CI = 0.29–0.94) and returning patients (OR = 0.57, 95% CI = 0.38–0.85) were associated with lower odds of being satisfied with dispensing pharmacy. Urban patients had 2.54 times the odds of being satisfied by laboratory services (OR = 2.54, 95% CI = 1.35–5.23), whereas returning patients had 1.93 times the odds of being satisfied. On cashier services, patients from City of Kigali (OR = 0.33, 95%CI = 0.21–0.52), Northern (OR = 0.41, 95% CI = 0.28–0.61), Western Provinces (OR = 0.61, 95%CI = 0.42–0.89), returning patients (OR = 0.74, 95% CI = 0.57–0.97) and from high-rank hospitals (OR = 0.68, 95%CI = 0.53–0.89) had lower odds compared to those from Eastern Province, new patients and those from District Hospitals respectively. No statistically significant odds ratios were observed between being satisfied in a Doctor's consultation and respect for patients' rights with the demographic characteristics of participants.

Table 3 Bivariate analysis of patients satisfactions across different services in outpatient consultation

Demographic characteristics	Waiting			Triage			Doctor's consultation			Cashier		
	Satisfied (n,%)	Dissatisfied (n,%)	p-value	Satisfied (n,%)	Dissatisfied (n,%)	p-value	Satisfied (n,%)	Dissatisfied (n,%)	p-value	Satisfied (n,%)	Dissatisfied (n,%)	p-value
Total	1067(85.3)	184(14.7)		1068(92.0)	93(8.0)		1173(93.8)	77(6.2)		918(73.3)	335(26.7)	
Age categories			0.168			0.263			1			1
Young	287(22.9)	40(3.2)		281(24.2)	19(1.6)		309(24.7)	20(1.6)		676(54.0)	247(19.7)	
Adult	780(62.4)	144(11.5)		787(67.8)	74(6.4)		864(69.1)	57(4.6)		242(19.3)	88(7.0)	
Provinces			<0.001			<0.001			0.741			<0.001
City of Kigali	90(7.2)	29(2.3)		93(8.0)	20(1.7)		111(8.9)	9(0.7)		68(5.4)	51(4.1)	
Northern	205(16.4)	18(1.4)		201(17.3)	7(0.6)		210(16.8)	13(1.0)		138(11.0)	83(6.6)	
Eastern	231(18.5)	64(5.1)		232(20.0)	17(1.5)		273(21.8)	21(1.7)		238(19.0)	59(4.7)	
Western	243(19.4)	37(3.0)		255(22.0)	16(1.4)		265(21.2)	13(1.0)		236(18.8)	46(3.7)	
Southern	298(23.8)	36(2.9)		287(24.7)	33(2.8)		314(25.1)	21(1.7)		238(19.0)	96(7.7)	
Location			0.036			1			1			0.143
Rural	758(60.6)	116(9.3)		744(64.1)	65(5.6)		821(65.7)	54(4.3)		655(52.3)	224(17.9)	
Urban	309(24.7)	68(5.4)		324(27.9)	28(2.4)		352(28.2)	23(1.8)		263(21.0)	111(8.9)	
Gender			0.111			0.137			0.15			0.979
Female	706(56.4)	110(8.8)		697(60.0)	53(4.6)		773(61.8)	44(3.5)		600(47.9)	218(17.4)	
Male	361(28.9)	74(5.9)		371(32.0)	40(3.4)		400(32.0)	33(2.6)		318(25.4)	117(9.3)	
Visits			0.193			0.02			0.872			0.032
New	393(31.4)	58(4.6)		400(34.5)	23(2.0)		423(33.8)	29(2.3)		347(27.7)	104(8.3)	
Returning	674(53.9)	126(10.1)		668(57.5)	70(6.0)		750(60.0)	48(3.8)		571(45.5)	232(18.4)	
Hospital Rank			<0.001			0.06			0.035			0.005
High Rank Hospital	739(59.1)	103(8.2)		361(31.1)	22(1.9)		388(31.0)	61(4.9)		278(22.2)	130(10.4)	
District Hospital	328(26.2)	81(6.5)		707(60.9)	71(6.1)		785(62.8)	16(1.3)		640(51.1)	205(16.4)	

Statistical significance was considered at p<0.05

Table 4 Bivariate analysis of patients satisfactions across different services in outpatient consultation

Demographic characteristics	Rights respected?			Dispensing pharmacy			Laboratory		
	Satisfied (*n*,%)	Dissatis-fied (*n*,%)	*p*-value	Satisfied (*n*,%)	Dissatis-fied (*n*,%)	*p*-value	Satisfied (*n*,%)	Dissatis-fied (*n*,%)	*p*-value
Total	478(74.3)	165(25.7)		1036(88.2)	139(11.8)		376(87.2)	70(12.8)	
Age categories			0.49			0.423			0.518
Young	134(20.8)	41(6.4)		254(21.6)	39(3.3)		123(22.5)	15(2.7)	
Adult	344(53.5)	124(19.3)		782(66.6)	100(8.5)		353(64.7)	55(10.1)	
Provinces			0.961			< 0.001			< 0.001
City of Kigali	39(6.1)	16(2.5)		74(6.3)	34(2.9)		52(9.5)	6(1.1)	
Northern	69(10.7)	23(3.6)		177(15.1)	31(2.6)		74(13.6)	9(1.7)	
Eastern	144(22.4)	52(8.1)		260(22.1)	18(1.5)		83(15.2)	15(1.7)	
Western	97(15.1)	31(4.8)		242(20.6)	19(1.6)		88(16.1)	9(1.7)	
Southern	129(20.1)	43(6.7)		283(24.1)	37(3.2)		179(32.8)	31(5.7)	
Location			0.319			0.002			0.019
Rural	368(57.2)	120(18.7)		745(63.4)	90(7.7)		323(59.2)	59(10.8)	
Urban	110(17.1)	45(7.0)		291(24.8)	49(4.2)		153(28.0)	11(2.0)	
Gender			0.222			0.16			0.797
Female	314(48.8)	99(15.4)		674(57.4)	86(7.3)		306(56)	45(8.2)	
Male	164(25.5)	66(10.3)		362(30.8)	53(4.5)		170(31.1)	25(4.6)	
Visits			0.407			0.008			0.646
New	155(24.1)	60(9.3)		383(32.6)	35(3.0)		173(31.7)	28(5.1)	
Returning	323(50.2)	105(16.3)		653(55.6)	8.9)		303(55.5)	42(7.7)	
Hospital Rank			0.096			0.263			0.047
High Rank Hospital	169(26.3)	71(11.0)		327(27.8)	51(4.3)		155(28.4)	14(2.6)	
District Hospital	309(48.1)	94(14.6)		709(60.3)	88(7.5)		321(58.8)	56(10.2)	

Statistical significance was considered at *p*<0.05

In multiple logistic regression analyses, the final models indicated that patients from Northern (OR = 3.81, 95%CI = 1.85–5.64), Western (OR = 1.95, 95%CI = 1.48–3.60), and Southern provinces (OR = 1.93, 95%CI = 1.17–2.85) were more likely satisfied with services provided at the waiting area. However, we observed that urban patients (OR = 0.65, 95%CI = 0.47–0.91) and patients from high-rank hospitals (OR = 0.59, 95%CI = 0.43–0.82) were associated with lower odds of being satisfied with services in waiting areas than new patients. On triage, patients from high-rank hospitals (OR = 1.86, 95% CI = 1.14–3.13) had 1.86 times the odds of being satisfied with services at the triage area than those from district hospitals, while returning patients had lower odds (OR = 0.51, 95%CI = 0.33–0.90) compared to new patients. The final model for dispensing pharmacy (satisfied/dissatisfied) showed that patients from City of Kigali (OR = 0.11, 95%CI = 0.05–0.24), Northern (OR = 0.43, 95%CI = 0.23–0.80), returning patients (OR = 0.51, 95%CI = 0.33–0.76) had lower odds compared to Eastern province and new patients respectively. However, the association between patients from Western Province and dispensing pharmacy (satisfied/dissatisfied) (OR = 0.58, 95%CI = 0.31–1.03) was not statistically significant as observed in the unadjusted model. Higher odds of being satisfied by the laboratory were observed between urban patients (OR = 2.5, 95%CI = 1.32–5.16) compared to rural

patients, patients from high-rank hospitals (OR = 1.96, 95%CI = 1.08–3.77) compared to those from district hospitals. Lastly, patients from the City of Kigali (OR = 0.37, 95%CI = 0.21–0.64), Northern (OR = 0.44, 95%CI = 0.29–0.65), Western Province (OR = 0.63, 95%CI = 0.43–0.91), returning patients (OR = 0.73, 95%CI = 0.55–0.96) and patients from high-rank hospitals (OR = 0.70, 95%CI = 0.54–0.92) were associated with lower odds of being satisfied in cashier services compared to those from Eastern provinces, District hospitals and new patients respectively. No adjusted models were conducted for doctor's consultation (satisfied/dissatisfied) and respect for patient rights (satisfied/dissatisfied).

Discussion

This study showed gender differences in the use of ambulatory care services. Several studies have observed similar gender differences and their influences on healthcare-seeking behavior. He et al., in their studies on gender differences in psychiatric outpatients before and during the COVID-19 pandemic in Chinese hospitals, found that male-to-female was 1:1.69. Similarly, Redondo-Sendino A. et al. found the same trend with more women visiting a medical practitioner [25, 26]. Our findings showed overall satisfaction was above 70% across all seven service domains. The highest satisfaction was observed in medical consultations, triage, dispensing pharmacy, laboratory

Table 5 Association between patients characteristics and outpatient hospital services

Hospital Services	Waiting				Triage				Doctor's consultation			
Demographic characteristics	Unadjusted Model		Adjusted Model		Unadjusted Model		Adjusted Model		Unadjusted Model		Adjusted Model	
	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)
Age category												
Young (ref. Adult)	0.281	1.32(0.92-1.95)			0.3298	1.39(0.84-2.41)			0.019	1.02(0.61-1.76)		
Provinces												
City of Kigali (ref. Eastern)	-0.151	0.86 (0.52-1.43)			-1.077	0.34(0.17-0.68)			-0.053	0.95(0.43-2.24)		
Northern (ref. Eastern)	1.149	3.15(1.85-5.64)	1.339	3.81(1.85-5.64)	0.744	2.1(0.88-5.53)			0.217	1.24(0.61-2.6)		
Western (ref. Eastern)	0.83	2.29(1.48-3.60)	0.668	1.95(1.48-3.60)	-0.451	0.64(0.34-1.16)			0.14	1.15(0.61-2.16)		
Southern (ref. Eastern)	0.599	1.82(1.17-2.85)	0.66	1.93(1.17-2.85)	0.155	1.17(0.57-2.38)			0.45	1.57(0.78-3.28)		
Location												
Urban (ref. Rural)	-0.3633	0.70(0.50-0.97)	-0.431	0.65(0.47-0.91)	0.011	1.01(0.64-1.63)			0.006	1.01(0.62-1.70)		
Gender												
male (ref. female)	-0.274	0.76(0.55-1.05)			-0.349	0.71(0.46-1.09)			-0.371	0.69(0.43-1.11)		
Visits												
Returning (ref. new)	-0.236	0.79(0.56-1.01)			-0.6	0.55(0.33-0.88)	-0.657	0.51(0.33-0.90)	0.069	1.07(0.66-1.71)		
Hospital Rank												
High rank (ref. District Hospital)	-0.572	0.56(0.41-0.77)	-0.528	0.59(0.43-0.82)	0.5	1.65(1.02-2.76)	0.265	1.86(1.14-3.13)	0.634	1.88(1.10-3.42)	0.652	1.92(1.12-3.49)

β = Coefficient, OR = Odds ratio, CI = Confidence Interval

services, and waiting areas. However, patients were less satisfied regarding their rights and cashier services. According to Fig. 2, patients accessed cashier services at least three times, and patient rights were relevant across all service areas. This high frequency of interactions and the broad applicability of patient rights contributed to the lowest proportions of patients satisfied by cashier services and respect for their rights.

Our study has also revealed regional disparities in ambulatory care service delivery satisfaction. Patients from Northern, Western, and Southern provinces exhibited higher odds of satisfaction with services provided in the waiting areas than those from Eastern provinces. Hospitals in these provinces may have implemented quality improvement initiatives to improve services in waiting areas, set up comfortable seating arrangements, and effectively communicate challenges affecting the services in waiting areas [27]. Conversely, patients from the City of Kigali and Northern province had lower odds of satisfaction in dispensing pharmacy. Possible explanations may include long dispensing area queues and frequent stockouts of health commodities [28, 29]. Lower odds of satisfaction were also observed in cashier services by patients from the City of Kigali, Northern province, and Western provinces with long queues, challenges in the process of billing, or dissatisfaction with fee structures in these facilities is the possible reasons explaining this observation [18].

Urban patients were less likely to be satisfied with waiting area services. Conversely, they were more likely to be satisfied with laboratory services than rural patients. Studies showed that urban patients often have higher expectations in service delivery than rural patients and have negative perceptions of long waiting times and crowded hospital environments [30]. Health facilities in urban areas have better-equipped laboratories and more skilled laboratory personnel than rural hospitals, which can influence shorter turnaround times for test results [31].

Returning patients demonstrated lower odds of satisfaction at triage, dispensing pharmacy, and cashier services. This could be due to unmet expectations from previous visits, frustration with repeated assessments, delays in receiving definitive care, prolonged prescription processing times, or recurring medication shortages [32, 33]. The experiences of returning patients in payment processing may further contribute to lower odds of satisfaction.

Patients from high-rank (referral and Provincial) hospitals had higher odds of satisfaction with triage, doctor's consultations, and laboratory services. High-rank hospitals may have well-trained triage personnel, a better triage system, better-equipped triage areas, and more efficient patient flow systems [34, 35]. Additionally, high-rank hospitals have more medical specialists than district hospitals, which may influence patient satisfaction [35]. High-rank hospitals also have advanced diagnostic equipment and more efficient sample processing than district hospitals [36]. On the other hand, patients from high-rank hospitals had lower odds of satisfaction with services provided at waiting areas and cashier desks due to higher patient volumes, long queues, and inefficiencies in billing processes, which may affect the waiting experience and cashier services [17, 28, 29].

Limitations of the study
Despite the robust methodological approach, the study had some limitations. The cross-sectional design only captures patient experiences at a single point in time, limiting the ability to assess the changes in satisfaction over time or determine causal relationships between explanatory variables and outcome variables. The reliance on self-reported data may introduce response bias, where patients may overestimate or underestimate their satisfaction levels depending on recent experiences rather than an overall evaluation of services. However, the use of a summative approach may have minimized this bias. The study may also introduce selection bias, where patients who declined to participate may differ from those who accepted, possibly skewing the results. We also acknowledge that the study had a limited scope of variables where other potential factors, such as socioeconomic status, cultural factors, and provider-patient interactions, were not explored. The study did not control for the status of infrastructure, staffing, and management across hospitals, which may make a difference and influence the satisfaction of patients differently. Finally, while the sample was representative of public hospitals in Rwanda, the findings may not be generalizable to private healthcare facilities or inpatients who were excluded at the analysis stage.

Conclusion
Overall, the findings from this study showed that satisfaction was high across all service domains, which is encouraging in the quest to build quality health care in Rwanda. It also highlights important regional and institutional differences in patient satisfaction across various hospital service areas. While high-rank hospitals offer the most appreciated triage and laboratory services, they struggle with satisfaction in waiting areas and cashier services. Urban patients report dissatisfaction in certain areas, potentially due to higher expectations and service demands. Addressing these disparities through targeted quality improvement initiatives can help enhance the patient experience and healthcare service delivery. Health facilities can enhance waiting area experiences by reducing wait times, optimizing seating, and enhancing

Table 6 Association between patients characteristics and outpatient hospital services

Hospital Services/ patient rights	Dispensing pharmacy				Patient rights				Laboratory				Cashier			
	Unadjusted Model		Adjusted Model		Unadjusted Model		Adjusted Model		Unadjusted Model		Adjusted Model		Unadjusted Model		Adjusted Model	
Demographic characteristics	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)
Age category																
Young (ref. Adult)	-0.183	0.83(0.56-1.25)			0.164	1.18(0.79-1.78)			0.245	1.28(0.71-2.42)			0.005	1.0(0.76-1.34)		
Provinces																
City of Kigali (ref. Eastern)	-1.893	0.15(0.08-0.28)	-2.216	0.11(0.05-0.24)	-0.128	0.88(0.46-1.74)			0.449	1.57(0.60-4.62)			-1.107	0.33(0.21-0.52)	-1.004	0.37(0.21-0.64)
Northern (ref. Eastern)	-0.928	0.4(0.21-0.72)	-0.836	0.43(0.23-0.80)	0.08	1.08(0.62-1.94)			0.396	1.49(0.62-3.72)			-0.886	0.41(0.28-0.61)	-0.831	0.44(0.29-0.65)
Western (ref. Eastern)	-0.636	0.53(0.29-0.94)	-0.549	0.58(0.31-1.03)	0.08	1.08(0.67-1.74)			0.043	1.04(0.52-2.00)			-0.487	0.61(0.42-0.89)	-0.469	0.63(0.43-0.91)
Southern (ref. Eastern)	-0.126	0.88(0.45-1.73)			0.122	1.13(0.68-1.90)			0.569	1.77(0.75-4.41)			0.241	1.27(0.83-1.95)		
Location																
Urban (ref. Rural)	-0.332	0.72(0.50-1.05)			-0.226	0.80(0.53-1.20)			0.932	2.54(1.35-5.23)	0.917	2.5(1.32-5.16)	-0.21	1.23(0.62-1.06)		
Gender																
male (ref. female)	-0.138	0.87(0.61-1.26)			-0.244	0.78(0.55-1.13)			2.72E-16	1(0.60-1.71)			-0.012	0.99(0.76-1.29)		
Visits																
Returning (ref. new)	-0.556	0.57(0.38-0.85)	-0.681	0.51(0.33-0.76)	0.175	1.19(0.82-1.72)			0.155	1.17(0.69-1.94)			-0.3	0.74(0.57-0.97)	-0.319	0.73(0.55-0.96)
Hospital Rank																
High rank (ref. District Hospital)	-0.228	0.80(0.55-1.16)			-0.323	0.72(0.50-1.04)			0.658	1.93(1.07-3.71)	0.673	1.96(1.08-3.77)	-0.378	0.68(0.53-0.89)	-0.35	0.7(0.54-0.92)

β = coefficient, OR = Odds ratio, CI = Confidence Interval

communication and patient-to-provider relationships, particularly in urban and high-rank hospitals. We recommend strengthening the triage efficiency through the revised triage assessment protocols. Addressing stockouts of health commodities and improving medication access, especially in urban areas and provinces with lower satisfaction odds, can enhance dispensing pharmacies' services. We recommend scaling up laboratory services in rural and district hospitals to bridge the satisfaction gap observed in rural and district hospitals. Lastly, key actions addressing the billing system challenges, such as improving cashier processes in high-rank hospitals, minimizing delays, and improving transparency, can lead to more appreciated cashier services.

Abbreviations

NHRC	National health research committee
PI	Principal investigator
IRB	Institutional review board
USAID	United States for international development
RIHSA	Rwanda integrated health systems activity

Supplementary Information

> Supplementary Material 1.

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Authors' contributions

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Data availability
The datasets generated during the current study are not publicly available but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
We obtained authorization to collect data for this study from the National Health Research Committee of the Ministry of Health (NHRC/2022/PROT/038). During data collection, participants provided informed consent and were informed of their right to stop participation without any consequences. Relevant guidelines and regulations of the Declaration of Helsinki were carried out using all methods.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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