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Direct Factors Influencing Patient Satisfaction with the Quality of Care in Kwango Health Centers in the Democratic Republic of the Congo

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ABSTRACT

Introduction
Patient satisfaction in health centers within the Kwango region remains concerning, characterized by high levels of dissatisfaction that structurally impede access to and optimal utilization of health services. This negative dynamic severely compromises the realization of Universal Health Coverage (UHC), which fundamentally depends on both the structural quality of care offered and the localized capability of individuals to benefit from it.

Purpose
This study aims to identify the direct factors that influence patient satisfaction with the quality of primary healthcare services in these centers, operationalized through Amartya Sen's capabilities approach framework.

Methods
This is a quantitative, cross-sectional analytical study conducted via structured, face-to-face interviews. Data were collected from a randomized sample of 384 patients using an evaluation questionnaire integrated into the KoboCollect mobile application framework on Android devices. Statistical data analysis was executed using bivariate cross-tabulations and multi-variable logistic regression models.

Results
Multivariate logistic regression analysis identified several critical factors significantly escalating patient dissatisfaction, including: prolonged waiting times (p = .017, OR = 1.486, 95% { CI } [1.073, 2.057]), unavailability of medical staff (p = .011, OR = 1.302, 95% { CI } [0.782, 2.168]), insufficient clinical collaboration with patients (p = .001, OR = 2.794, 95% { CI } [1.738, 4.491]), poor clinical pain relief management (p = .001, OR = 3.321, 95%{ CI } [1.711, 6.445]), inadequate provider personal protective hygiene/glove usage practices (p = .018, OR = 2.260, 95% { CI } [1.150, 4.440]), structural center un-cleanliness (p = .001, OR = 2.109), missing handwashing installations (p = .001, OR = 2.084, 95% { CI } [1.419, 3.059]), un-affordable care pricing (p = .001, OR = 2.452, 95% { CI } [1.661, 3.619]), and local drug stockouts (p = .008, OR = 1.194). Conversely, explicit respect for patient privacy (p = .031, OR = 0.958, 95% { CI } [0.645, 1.422]) and functional post-discharge home monitoring (p = .002, OR = 0.472, 95% { CI } [0.294, 0.758]) acted as highly significant protective indicators, substantially reducing the risk of overall patient dissatisfaction.

Conclusion
The study mapped the explicit enabling (protective) and non-enabling (risk) parameters of patient satisfaction within Kwango primary health centers. To systematically advance regional patient satisfaction, urgent, targeted institutional interventions must be designed to correct these core infrastructure and relational failures, keeping line with the socio-evaluative principles of the capability approach.

INTRODUCTION

Within health systems evaluative frameworks, promoting factors are alternatively operationalized as risk vectors when they systematically increase the structural likelihood of developing a localized systemic failure, whereas non-promoting factors function protectively to buffer operational outcomes. Patient satisfaction is intrinsically subjective, reflecting the perceived experiential utility of clinical treatment patterns and broader institutional services. It represents a deeply personal cognitive and affective appraisal of structural healthcare quality and interpersonal dignity during interactions within clinical settings. Consequently, satisfaction forms a key performance indicator of contemporary health services quality. Medical care cannot merely target objective physiological improvement; it must concurrently conform to human expectations, contextual needs, and explicit user feedback loops to maintain societal validity (Mokdadi & Chikh, 2022).

Global and regional empirical evaluations highlight divergent determinants of satisfaction. In Ho Chi Minh City, Vietnam, a post-discharge survey of 538 patients and families revealed that 50.2% experienced high levels of dissatisfaction explicitly tied to protracted clinical waiting times, poor behavioral posture from nursing staff, deficits in environmental hygiene, and localized infrastructural layout shortages, such as unsecured motorcycle parking fields. However, the technical quality of care offered by senior physicians sustained a localized satisfaction sub-index of 90.7% (Nguyen Thi et al., 2002). Conversely, a municipal health center survey in Geneva, Switzerland, reported an overall patient satisfaction rate of 95.0%, fueled by widespread staff availability, interpersonal cordiality, minimal delays in appointment scheduling, and rapid clinical responses during acute emergencies (Pierre, 2019).

In Sub-Saharan Africa, institutional performance challenges are more acute. A descriptive study evaluating 283 hospitalized patients at the Libreville University Hospital Center and the Omar Bongo Ondimba Army Training Hospital in Gabon revealed an overall patient dissatisfaction rate of 60.77%. This was tied to an absence of clear personnel identification badges (55.5%), a lack of clear patient onboarding information on service rules (63.6%), and institutional restrictions preventing patients from selecting a designated family guardian during admission (52.7%) (Souaka et al., 2025).

Similarly, Philippe et al. (2015) demonstrated that key factors linked to clinical dissatisfaction included poor patient assessment of the technical competencies of medical staff (OR = 5.86, 95%{ CI } [2.23, 15.38]), unsanitary environments (OR = 4.88, 95% { CI } [2.35, 10.10]), acute financial inability to cover cost out-of-pocket (OR = 2.37, 95% { CI } [1.35, 4.18]), and the lack of an accompanying familial guardian (OR = 3.47, 95% { CI } [1.35, 8.87]). Higher educational attainment (secondary level and above) conversely buffered expectations, showing a protective trend against extreme dissatisfaction (OR = 0.50, 95% { CI } [0.29, 0.84]) (Philippe et al., 2015). In Togo, Diallo et al. (2021a) reported distinct gendered dynamics in rheumatological consultations at CHR Kara, where female patients expressed high dissatisfaction with institutional wait-times and clinical privacy protections despite reporting high objective satisfaction with pain relief protocols.

Patient dissatisfaction in Sub-Saharan Africa is fueled by low clinical quality, weak communication, long waiting times, degraded health infrastructure, and high financial barriers. Shortages of staff and equipment, unhygienic wards, and ineffective pain control break down institutional trust, increasing the frequency of discharges against medical advice. Fundamentally, user dissatisfaction stems from a failure to meet individual human needs, including bodily and emotional integrity, security, belonging, utility, and relational respect (Weber, 2012). Provider-patient relationships require active communication, provider availability, active listening, clinical safety, and technical nursing competence (Diallo, 2021b). Medical professionals must respect the cultural, psychological, economic, and social environments of their patients (Daniel et al., 2025). Within the Democratic Republic of Congo, Mpembele (2020) found that while mothers in the N'djili health zone valued the technical skills and positive attitudes of maternal health providers, their overall satisfaction was undercut by weak hospital hygiene, perceived clinical negligence, and un-announced out-of-pocket expenses.

Relevance of the Study

This study forms part of a doctoral research project. It was preceded by an initial exploratory phase that mapped localized patient expectations and quantified baseline satisfaction. Because baseline satisfaction levels were low, designing effective quality improvement models requires a precise understanding of the distinct factors that drive user satisfaction or dissatisfaction. Identifying these factors is important for developing target intervention models.

Grounding this analysis in Amartya Sen's capability approach places the individual at the center of evaluative welfare. This framework requires that patients have the freedom and capability to choose from effective healthcare options that align with their needs. In practice, patients approach clinical encounters with distinct expectations that serve as benchmarks for evaluating provider care. When these expectations are unmet, dissatisfaction arises, undermining the patient's agency and overall well-being.

Research Objective

To identify and analyze the direct factors influencing patient satisfaction with the quality of care provided within primary health centers overseen by the Kwango Provincial Health Division.

Central Research Question

What direct factors determine patient satisfaction with the quality of care provided within the primary health centers of the Kwango Provincial Health Division?

Subsidiary Research Questions

i. Which direct organizational and clinical factors are significantly associated with patient satisfaction metrics?

ii. Are the localized satisfaction outcomes observed in Kwango generalizable to other provinces within the Democratic Republic of Congo?

iii. What systemic or methodological biases could impact the interpretation and validity of these evaluative findings?

Research Hypotheses

a) Prolonged waiting times, staff unavailability, poor communication, ineffective pain relief, weak environmental hygiene, un-affordable pricing structures, lack of handwashing installations, poor privacy protections, and absent post-discharge home tracking constitute direct factors significantly linked to overall patient satisfaction profiles.

b) Due to structural constraints, including social desirability biases from face-to-face interviews and the lack of long-term longitudinal tracking in a cross-sectional study, the localized findings from Kwango cannot be broadly generalized to other provinces.

METHODS

Study Setting

The study was conducted across 21 primary health centers and health areas located within seven health zones in the Kwango Health Province: Boko, Kahemba, Kenge, Kimbau, Kisanji, Panzi, and Wamba Lwadi. To ensure an unbiased geographic distribution, three primary health centers were randomly selected from each of these seven health zones.

Design and Scope

This study used a quantitative, cross-sectional analytical design to examine the underlying drivers of patient dissatisfaction. Positioned within health services management research, the study evaluates direct user perceptions of the quality of care delivered across health facilities in the Kwango Provincial Health Division.

Population, Sampling, and Sample Size

The target population comprised all patients seeking curative consultations across the 21 selected health centers, all of which operate under Performance-Based Financing (PBF/FBP) frameworks within the Kwango Provincial Health Division. Collectively, these first-line facilities recorded a total annual volume of 115,733 patient cases (DHIS2, 2024).

I. **Inclusion Criteria:** Patients who received curative treatment at a designated PBF health center within the seven target health zones during the study period, were free from transient or permanent cognitive impairment/dementia, and provided voluntary, informed written consent.

II. **Exclusion Criteria:** Individuals who did not receive care at the PBF health centers during the study period, presented with transient or permanent dementia, or declined to sign the informed consent agreement.

A probability sampling strategy was used to give all eligible patients an equal opportunity for selection. Because the reference population (N = 115,733) exceeded the standard threshold of 10,000, Fisher's exact sample size calculation formula was applied:

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{m^2}$$

Assuming a conservative maximum variability estimate (p = .50), a 95% confidence level (Z = 1.96), and a standard margin of error (m = 0.05), the minimum required sample size was calculated as:

$$n = \frac{(1.96)^2 \cdot (0.5) \cdot (1 - 0.5)}{(0.05)^2}$$

$$= 384.16$$

Thus, a target sample size of 384 randomly selected patients was established.

Data Collection Techniques and Instruments

Primary quantitative data were collected via structured, face-to-face interviews using a standard evaluation questionnaire. The questionnaire was digitized and deployed using KoboCollect software on Android mobile devices. This digital framework minimized data entry errors, reduced administrative costs, expedited fieldwork, and ensured data standardization. To prevent missing data patterns, the application was programmed with mandatory response fields, requiring field investigators to log an entry for every query before proceeding through the survey modules.

Fieldwork Administration

Pre-survey Phase

A pilot study was conducted with 58 patients in the Popokabaka health zone. This pre-test phase served to identify key variables, refine complex phrasing, and eliminate terms causing comprehension difficulties. The modified instrument was reviewed by academic peers, approved by the health division's administrative management team, and authorized by the institutional bioethics committee to ensure alignment with study objectives.

Main Field Investigation

Primary field data were collected during the first half of January 2025. Seven health zone supervisors were trained to manage fieldwork operations. Each supervisor trained three pairs of community health workers (relays), with one pair assigned to each designated health area. Training focused on mobile data collection via KoboCollect and standard random-sampling protocols using outpatient consultation registers.

Upon arrival at a health center, the field team accessed the outpatient log book and assigned sequential numbers to all clinical cases recorded during the target window. To achieve the sample size requirement of 18 respondents per health area in a facility with 620 logged cases, the sampling interval was calculated by dividing the total case volume by the target sample (620 / 18 ≈ 34).

The initial starting index was determined by selecting a random number between 1 and 34 (e.g., case number 11). Subsequent respondents were selected systematically by adding the sampling interval (11 + 34 = 45, then 45 + 34 = 79, etc.) until 18 respondents were identified. Patient identifiers (first names, surnames, ages, sexes, and home villages) were extracted from the log books to facilitate home visits.

Interviews lasted an average of 35 to 40 minutes per respondent, with entries entered directly into the mobile application. If a selected entry met an exclusion criterion (such as an infant without an available adult guardian), investigators advanced to the immediate next entry while adjusting the master sequence. A reserve list of six alternative participants was maintained per health area to replace selected individuals who were unavailable or declined to participate.

Data Processing and Statistical Analysis

Data records were exported from KoboCollect into Microsoft Excel 2016, cleaned, and migrated into SPSS Version 25 for statistical analysis.

Bivariate cross-tabulations were evaluated using Pearson's Chi-square (χ^2) tests to establish statistical relationships between overall patient satisfaction, socio-demographic indicators, and specific service delivery factors.

Multivariate analysis was performed using binary logistic regression models to identify direct risks and protective factors associated with patient dissatisfaction. Independent variables were classified as significant risk factors if they met the following criteria: $\beta \geq 0$, Wald statistic ≥ 3.0, $p \leq .05$, and an Odds Ratio (OR) > 1.0. Predictors with $p > .0$ were considered to have no statistically significant relationship with overall satisfaction outcomes. The predictive performance of the logistic regression model was validated using a Receiver Operating Characteristic (ROC) curve, with an Area Under the Curve (AUC) threshold of 0.850.

Ethical Considerations

This study was conducted in accordance with the ethical tenets of the Declaration of Helsinki. The research protocol received formal approval from the ISTM-Kinshasa Bioethics Committee (Approval No. 0003/CBE/ISTM.KIN.RDC.PMBBL.2024 on February 16, 2024). Participation was entirely voluntary; eligible individuals were free to accept or decline participation without penalty or impact on their ongoing clinical care. All records were anonymized to protect patient privacy. Participants who agreed to join the study signed an informed consent disclosure form prior to interview initiation.

RESULTS

Study results are presented sequentially, starting with bivariate cross-tabulations, followed by the multivariate binary logistic regression model.

Bivariate Analysis

Pearson's Chi-square tests were used to assess the relationships between overall patient satisfaction, socio-demographic characteristics, and specific service attributes.

Table 1:
Relationship Between Overall Patient Satisfaction and Socio-Demographic Characteristics

Socio-Demographic Characteristics	Not Satisfied (n=188)	Satisfied (n=196)	Total (N=384)	Chi-Square (χ2)	p-value
Sex				**0.273**	**.601**
Female	116	127	243		
Male	72	69	141		
Age Group				**0.240**	**.887**
18–29 Years	57	55	112		
30–49 Years	97	104	201		
50–67 Years	34	37	71		
Marital Status				**1.704**	**.636**
Single	22	27	49		
Divorced	4	5	9		
Married	148	155	303		
Widowed	14	9	23		
Educational Level				**7.166**	**.037***
No Formal Schooling	36	31	67		
Primary Education	23	38	61		
Secondary/Graduate	82	94	176		
University	47	33	80		
Profession				**6.016**	**.214**
Administrative	9	13	22		
Trader	4	8	12		
Farmer	105	87	192		
Teacher	42	50	92		
Student	16	20	36		
Police Officer	4	7	11		
Laborer/Worker	8	11	19		
Health Zone				**44.800**	**.001***
Boko	21	34	55		
Kahemba	39	16	55		
Kenge	20	35	55		
Kimbau	28	27	55		

Kisanji	17	38	55
Panzi	21	34	55
Wamba Lwadi	42	12	54
Total	**188**	**196**	**384**

** Statistically significant at the p ≤ .05 threshold.*

The bivariate analysis demonstrated statistically significant associations between overall patient satisfaction, formal educational attainment (p = .037), and the respondent's local health zone (p = .001). Conversely, no statistically significant associations were observed for sex, age group, marital status, or profession (p ≥ .05).

Table 2:
Relationship Between Overall Patient Satisfaction and Specific Service Delivery Factors

Specific Evaluation Factors	Not Satisfied (n=188)	Satisfied (n=196)	Total (N=384)	Chi-Square (χ2)	p-value
Initial Reception Quality				**17.335**	**.001***
Very Bad	36	28	64		
Bad	67	40	107		
Good	73	103	176		
Very Good	12	25	37		
Waiting Room Comfort				**17.703**	**.001***
Not Satisfactory	18	8	26		
Less Satisfied	93	67	160		
Satisfactory	71	111	182		
Very Satisfactory	6	10	16		
Clinical Waiting Time				**24.541**	**.001***
Very Long	25	12	37		
Long	89	77	166		
Moderately Long	25	12	37		
Acceptable	49	95	144		
Staff Interpersonal Behavior				**21.707**	**.001***
Discourteous	20	5	25		
Less Courteous	72	51	123		
Courteous	75	117	192		
Very Courteous	21	23	44		
Staff On-Site Availability				**30.883**	**.001***
Unavailable	28	8	36		
Less Available	81	54	135		
Available	61	108	169		
Very Available	18	26	44		
Permanence of Services				39.497	.001*
Not Permanent	29	26	55		
Less Permanent	83	37	120		
Permanent	72	109	181		
Very Permanent	4	24	28		
Collaboration with Patients				**75.040**	**.001***
Non-collaborative	25	3	28		
Less Collaborative	114	65	179		
Collaborative	32	112	144		
Very Collaborative	17	16	33		
Respect for Bodily Privacy				**4.054**	**.256**
Not Respected	18	22	40		
Less Respected	45	43	88		
Respected	122	121	243		
Very Well Respected	3	10	13		
Prescription Quality				**53.028**	**.001***
Bad	28	4	32		
Less Good	83	44	127		
Good	69	126	195		
Very Good	8	22	30		
Pain Relief Efficacy				**53.269**	**.001***
Not Satisfactory	12	0	12		
Less Satisfactory	103	53	156		
Satisfactory	70	127	197		

Very Satisfactory	3	16	19		
Provider Glove Usage				**18.822**	**.001***
Not Satisfactory	6	0	6		
Less Satisfactory	93	65	158		
Satisfactory	89	131	220		
Center Hygiene/Cleanliness				**38.747**	**.001***
Not Satisfactory	47	10	57		
Less Satisfactory	77	71	148		
Satisfactory	52	91	143		
Very Satisfactory	12	24	36		
Handwashing Installations				**40.124**	**.001***
Not Available	78	50	128		
Less Available	54	26	80		
Available	51	102	153		
Very Available	5	18	23		
Essential Drug Availability				**15.791**	**.001***
Not Available	28	9	37		
Less Available	72	69	141		
Available	83	105	188		
Very Available	5	13	18		
Pricing of Care Services				**69.034**	**.001***
Not Affordable	86	21	107		
Less Affordable	12	4	16		
Affordable	85	157	242		
Very Affordable	5	14	19		
Post-Discharge Home Tracking				**77.596**	**.001***
Not Satisfactory	25	1	26		
Less Satisfactory	112	64	176		
Satisfactory	34	113	147		
Very Satisfactory	17	18	35		

** Statistically significant at the p ≤ .05 threshold.*

Bivariate tabulations identified highly significant associations (p = .001) between overall satisfaction and nearly all analyzed service delivery factors. Respect for patient privacy was the sole exception, showing no statistically significant relationship in the bivariate model (p = .256).

Multivariate Analysis

Binary logistic regression was performed to distinguish true risk factors from protective factors regarding overall patient dissatisfaction.

Table 3:
Binary Logistic Regression of Direct Factors Influencing Overall Patient Dissatisfaction

Explanatory Predictor Variables	Coefficient (β)	Wald	p-value	Adjusted OR	95% CI for OR (Lower)	95% CI for OR (Upper)
Risk Factors (Non-Promoting)						
Prolonged Waiting Time	0.396	5.695	.017	1.486	1.073	2.057
Staff Unavailability	0.462	3.027	.011	1.302	0.782	2.168
Weak Patient Collaboration	1.027	18.004	.001	2.794	1.738	4.491
Ineffective Pain Relief	1.200	12.586	.001	3.321	1.711	6.445
Inadequate Glove Usage	0.815	5.601	.018	2.260	1.150	4.440
Center Un-cleanliness	0.546	31.182	.001	2.109	1.623	2.741
Absent Handwashing Gear	0.734	14.047	.001	2.084	1.419	3.059
Essential Drug Stockouts	0.177	3.438	.008	1.194	0.706	2.019
Un-affordable Pricing	0.897	20.358	.001	2.452	1.661	3.619
Protective Factors (Promoting)						
Respect for Bodily Privacy	-0.143	3.046	.031	0.958	0.645	1.422
Post-Discharge Home Tracking	-0.750	9.637	.002	0.472	0.294	0.758
Permanence of Service	0.355	2.800	.094	1.426	0.941	2.161
Constant	-1.754	26.886	.001	0.173	–	–

The multivariate regression model shows that prolonged waiting times significantly increase the probability of dissatisfaction by 0.396 log-odds units (p = .017, OR = 1.486). Staff unavailability increases dissatisfaction risk by

0.462 units (p = .011, OR = 1.302). Weak collaboration with patients increases dissatisfaction risk by 1.027 units (p = .001, OR = 2.794), while ineffective pain relief management increases the likelihood of dissatisfaction by 1.200 units (p = .001, OR = 3.321).

Regarding clinical hygiene, inadequate provider glove usage increases dissatisfaction risk by 0.815 units (p = .018, OR = 2.260), structural un-cleanliness increases risk by 0.546 units (p = .001, OR = 2.109), and the absence of functional handwashing devices increases risk by 0.734 units (p = .001, OR = 2.084). Financial barriers also played a key role: un-affordable pricing structures increase the risk of dissatisfaction by 0.897 units (p = .001, OR = 2.452). Finally, essential drug stockouts increase dissatisfaction risk by 0.177 units (p = .008, OR = 1.194).

Conversely, explicit respect for patient privacy serves as a significant protective factor against dissatisfaction (β = -0.143, p = .031, OR = 0.958). Functional post-discharge home monitoring similarly reduces patient dissatisfaction by -0.750 log-odds units (p = .002, OR = 0.472). The service permanence parameter did not reach statistical significance in the multivariate model (p = .094).

Model Validation via Area Under the ROC Curve (AUC)

The overall predictive validity of the logistic regression architecture was confirmed using a Receiver Operating Characteristic (ROC) curve analysis.

Table 4:
Area Under the ROC Curve (AUC) Parameter Metrics for the Global Predictive Model

Calculated Area Under Curve (AUC)	Standard Error	Asymptotic Significance (p-value)	95% Asymptotic Confidence Interval (Lower Bound)	95% Asymptotic Confidence Interval (Upper Bound)
0.850	0.020	.001	0.810	0.889

The predictive model demonstrated strong performance with an AUC value of 0.850 (95 CI [0.810, 0.889], p = .001). This confirms the statistical validity and high discriminative capacity of the model.

DISCUSSION

Multivariate analysis demonstrated that several variables initially suspected of driving overall user dissatisfaction functioned instead as significant protective buffers or had no statistical relationship with satisfaction outcomes. For example, while respect for privacy was non-significant in bivariate cross-tabulations, it emerged as a significant protective factor in the multivariate model. Similarly, post-discharge home tracking consistently reduced the probability of dissatisfaction.

In contrast, initial reception quality (p > .05), waiting room comfort profiles, staff comments, service permanence, and prescription writing patterns showed no independent statistical association with overall patient satisfaction in the final regression analysis.

The primary risk factors driving user dissatisfaction include prolonged clinical waiting times, un-available medical personnel, weak provider-patient collaboration, ineffective pain relief management, inadequate glove usage, absent handwashing infrastructure, un-affordable care prices, un-clean facility environments, and essential drug stockouts.

Identifying these risk factors is essential for designing effective remediation strategies. The widespread operational deficiencies identified here conflict with Sustainable Development Goal 3 (Good Health and Well-being) and Universal Health Coverage goals, which require accessible, affordable, and high-quality healthcare services. These performance failures also undermine patient welfare under the capability approach.

The availability of essential medicines serves as a key indicator of clinical quality; stockouts disrupt treatment continuity and increase patient mortality risk. Similarly, weak environmental hygiene in healthcare facilities compromises patient safety by increasing the risk of nosocomial infections and worsening baseline clinical conditions.

Effective communication and collaboration between providers and patients are also critical for understanding patient preferences, improving treatment adherence, and building institutional trust. Conversely, a lack of provider-patient collaboration can lead to diagnostic errors, treatment delays, and higher dissatisfaction. Finally, while short waiting times improve the patient experience and

optimize facility operations, prolonged delays drive user dissatisfaction and erode confidence in the broader health system.

Bivariate Structural Assessment

Relationship Between Overall Satisfaction and Socio-Demographic Sub-Attributes

Bivariate analysis revealed significant associations between overall patient satisfaction, formal educational attainment ($p = .037$), and the local health zone ($p = .001$). However, no significant differences were observed across sex, age group, marital status, or profession ($p \geq .05$).

The lack of a significant association between sex and overall satisfaction aligns with the findings of Amani (2020), who evaluated general medicine patients at the Gombe-Matadi General Reference Hospital in the Democratic Republic of Congo and found no significant gender-based differences in satisfaction. Similarly, Matee et al. (2006) reported no significant relationship between gender and satisfaction among dental patients in Dar es Salaam.

In contrast, these results differ from an oncological evaluation in Rabat, Morocco, which identified a significant link between gender and satisfaction among cancer patients (Barlési et al., 2008). That study also reported a significant association between age and satisfaction, whereas our findings indicate that age group is not significantly related to overall satisfaction ($p = .887$). This lack of an age-based association supports Amani (2020), but diverges from Kravitz and Lewis (as cited in Amani, 2020), who argue that age is consistently linked to satisfaction, often showing a decline in satisfaction scores once patients pass specific age thresholds.

Regarding marital status, our findings show no significant association with overall satisfaction ($p = .636$). This conflicts with Hall and Lewis (as cited in Hall et al., 2011), who suggest that marital status frequently influences patient evaluation scores.

Our study did find a significant association between formal educational attainment and patient satisfaction, which contrasts with Amani (2020) but aligns with Barlési et al. (2008) in their evaluation of hospital users in Kerman, Iran. Additionally, the significant association found between profession and patient satisfaction corresponds with patterns documented by Bachisse (n.d.) among oncology users in Rabat, but differs from the results reported by Barlési et al. (2008) in France.

Given these divergent empirical findings, our results support the broader conclusions of Hall and Dorman (2011) and Dorman (2014), who argue that socio-demographic factors generally exert a weak or inconsistent influence on patient satisfaction. Consequently, socio-demographic traits offer limited predictive power regarding user satisfaction, a conclusion also shared by Rubin et al. (2004). This perspective is further supported by Gurdal et al. (2000) whose sample of 674 patients attending dental clinics in Turkey showed no significant influence of socio-demographic attributes on satisfaction metrics.

Relationship Between Overall Satisfaction and Specific Quality Dimensions

The bivariate analysis revealed highly significant statistical associations ($p = .001$) between overall patient satisfaction and almost all specific care parameters evaluated. These parameters included initial reception quality, waiting room comfort, clinical waiting times, staff interpersonal communication, medical staff availability, service permanence, provider-patient collaboration, prescription quality, clinical pain management, hygienic glove utilization, facility cleanliness, presence of handwashing installations, essential drug availability, care pricing structures, and post-discharge home monitoring. Conversely, respect for patient bodily privacy demonstrated no statistically significant association with overall satisfaction in the raw bivariate cross-tabulation ($\chi^2 = 4.054$, $p = .256$).

Our findings align with several regional studies but contrast with others. For instance, in a cross-sectional study of 400 patients evaluating care quality within the dentistry department of the National School of Health and Social Development in Dakar, Diouf et al. (2010) demonstrated that overall patient satisfaction was directly tied to the active listening skills of providers, the quality of patient information, explicit respect for privacy, and optimal clinical hygiene conditions. While our bivariate findings confirm the critical importance of hygiene and

interpersonal collaboration, they diverge regarding privacy protections, which did not emerge as a significant driver during our initial cross-tabulations.

Furthermore, the overall satisfaction rate recorded in our study (51%) is substantially lower than the 82.5% satisfaction rate reported by Diallo (2021a) in Togo, highlighting a severe geographic and structural deficit in care quality within the Kwango health centers. This baseline high dissatisfaction rate (49%) mirrors the findings of Nguyen Thi et al. (2002) in Ho Chi Minh City, where 50.2% of healthcare users reported explicit dissatisfaction. Like our cohort, their dissatisfaction was driven by protracted waiting times, poor behavioral posture from nursing staff, and inadequate clinical hygiene.

Logistic Regression on Direct Determinants of Overall Patient Dissatisfaction

To isolate true confounding variables and calculate adjusted effect sizes, we used a multivariate binary logistic regression model. The model showed that 12.5% of the specific quality variables evaluated functioned as significant protective (promoting) factors that reduced overall patient dissatisfaction. Specifically, explicit respect for patient privacy ($p = .031$, OR = 0.958, 95% { CI } [0.645, 1.422]) and functional post-discharge home monitoring ($p = .002$, OR = 0.472, 95% { CI } [0.294, 0.758]) substantially buffered against negative evaluations.

Conversely, 56.25% of the quality metrics emerged as significant risk factors ($p \leq .05$, OR > 1.0), multiplying the likelihood of patient dissatisfaction across the Kwango Provincial Health Division. These primary systemic bottlenecks include:

- Prolonged clinical waiting times ($p = .017$, OR = 1.486)
- Weak provider-patient collaboration ($p = .001$, OR = 2.794)
- Ineffective pain relief management ($p = .001$, OR = 3.321)
- Inadequate provider glove usage practices ($p = .018$, OR = 2.260)
- Absent or non-functional handwashing infrastructure ($p = .001$, OR = 2.084)
- Un-affordable care pricing structures ($p = .001$, OR = 2.452)
- On-site medical staff unavailability ($p = .011$, OR = 1.302)
- Structural facility un-cleanliness ($p = .001$, OR = 2.109)
- Essential drug stockouts ($p = .008$, OR = 1.194)

These operational failures present clear structural barriers that undermine patient well-being and directly impede the realization of Sustainable Development Goal 3 (Good Health and Well-being) and Universal Health Coverage frameworks.

On the other hand, 31.25% of the evaluated variables—including initial reception quality, waiting room comfort, staff comments, service permanence, and prescription writing patterns—exerted no independent statistical influence on overall satisfaction outcomes within the multivariate model ($p > .05$). This finding contrasts with Pierre (2019) in Geneva, who concluded that overall satisfaction was heavily associated with service availability, staff friendliness, and rapid emergency responses. It also differs from Didier et al. (2020) in Lubumbashi, where high satisfaction was driven by a warm welcome (88%), a positive clinical atmosphere (80%), and professional provider attitudes (78%).

The role of waiting times as a primary driver of dissatisfaction in our study matches findings by Pierre (2019) and Lumumba (2013), both of whom established strong statistical associations between waiting delays and low satisfaction scores. Furthermore, the extensive delays observed in Kwango are consistent with Diallo (2021b) in Mali, where nearly half of all surveyed patients waited over 30 minutes before receiving clinical attention.

Our model also identified a highly significant association between overall patient dissatisfaction and unsatisfactory facility cleanliness ($p = .000$). This finding aligns with Diouf et al. (2010) in Dakar, who reported neglected clinical hygiene conditions and a strong statistical link to negative patient outcomes (OR = 8.47, 95% { CI } [3.40, 21.14]). Such poor hygiene underscores wider structural

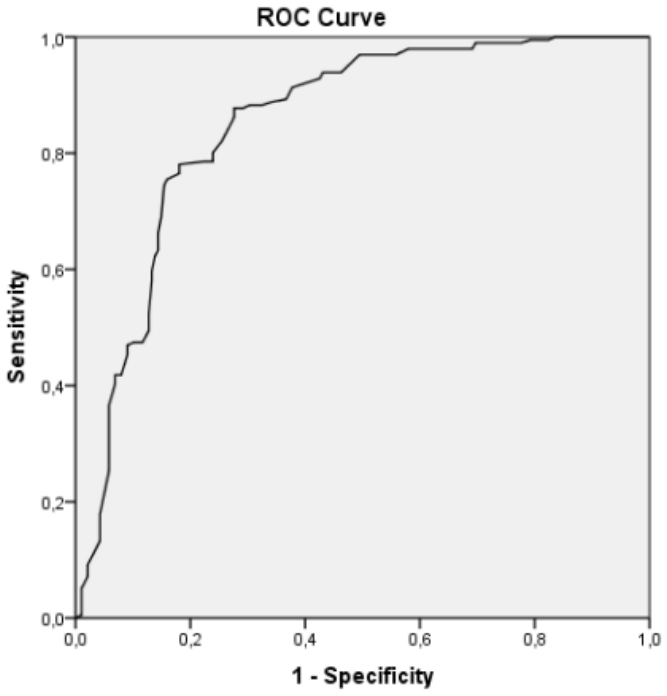
challenges across Sub-Saharan Africa. For example, according to the MICS (2018) data cited by Diallo (2021a), only 12% of health facilities nationwide maintain a functional hygiene committee, and a mere 2% provide adequate hand hygiene installations.

Finally, our findings can be contrasted with Adamou (2018), who evaluated acute surgical emergency units and reported a baseline satisfaction rate of 54.62%. In that acute setting, initial reception (OR = 0.27, $p < .001$) and rapid symptom management (OR = 0.28, $p < .001$) served as primary drivers of satisfaction, while prolonged pre-care delays (OR = 16.57, $p < .0001$), poor environmental conditions (OR = 3.89, $p < .001$), financial inaccessibility (OR = 5.85, $p < .001$), and weak provider communication (OR = 13.76, $p < .0001$) drove user dissatisfaction. This highlights how distinct clinical environments shape patient expectations and evaluations.

Diagnostic Validation of the Predictive Model (ROC Curve Analysis)

The discriminative power and predictive validity of our multivariate logistic regression architecture were evaluated using a Receiver Operating Characteristic (ROC) curve analysis.

Figure 1:
Receiver Operating Characteristic (ROC) Curve



The calculated Area Under the Curve (AUC) is 0.850 (85%), with a 95% asymptotic confidence interval ranging from 0.810 to 0.889 and a high level of statistical significance ($p = .001$).

As noted by Broniatowski and Gayrard (2014), an AUC value greater than 0.80 demonstrates strong classification accuracy in epidemiological and public health modeling, confirming high sensitivity and specificity in distinguishing between binary cohorts. Consequently, our model possesses strong discriminative accuracy, reliably differentiating between satisfied and dissatisfied patients based on key service delivery bottlenecks. This epidemiological approach aligns with Yameogo et al. (2017), demonstrating that integrating multi-faceted quality dimensions—such as waiting times, clinical collaboration, environmental cleanliness, drug availability, financial cost, and handwashing infrastructure—provides a highly reliable framework for predicting overall patient experiences.

Implications and Limitations of the Study

Structural and Managerial Implications

This study highlights critical operational failures that drive patient dissatisfaction across rural first-line health facilities. Healthcare administrators and provincial managers can leverage these findings as specific empirical indicators to optimize service delivery. Addressing these identified bottlenecks offers a direct pathway to improve primary care quality, restore institutional trust, and enhance the reputation of public health centers within the Kwango Provincial Health Division.

Methodological Limitations

While this study follows a rigorous methodological framework, several limitations should be considered when interpreting the findings:

- **Cross-Sectional Constraints:** The cross-sectional design captures data at a single point in time, preventing the establishment of clear temporal order or causal relationships over time.
- **Residual Confounding:** Despite adjusting for multiple variables in the multivariate regression model, a risk of residual confounding from

unmeasured socioeconomic or environmental factors remains.

- **Social Desirability and Courtesy Biases:** The use of face-to-face interviews may introduce social desirability or courtesy biases, as patients might overreport satisfaction out of politeness or discomfort when speaking directly to investigators.
- **Selection and Non-Response Risks:** Potential selection biases related to non-response or participant replacement were managed by providing each data collection pair with a randomized reserve list of 10 alternative respondents.

To minimize these limitations, field investigators completed intensive training on standardized interview techniques and building participant rapport. The KoboCollect mobile software was also configured with mandatory response fields to eliminate missing data across the survey modules. Despite these limitations, face-to-face interviews provided a valuable mechanism for building trust with participants and ensuring high data completeness in this rural context.

CONCLUSION

This study identified the direct organizational and clinical factors influencing patient satisfaction within primary health centers across the Kwango Provincial Health Division. Multivariate logistic regression isolated prolonged waiting times, weak provider-patient collaboration, ineffective pain management, inadequate glove usage, absent handwashing infrastructure, un-affordable care pricing, on-site staff unavailability, poor facility cleanliness, and essential drug stockouts as significant structural risks driving user dissatisfaction ($p \leq .05$, $OR > 1.0$).

Conversely, explicit respect for patient privacy and functional post-discharge home monitoring served as key protective factors that improved patient evaluations. These persistent operational bottlenecks directly impact patient well-being and hinder regional progress toward Universal Health Coverage and Sustainable Development Goal 3.

Recommendations

To the Provincial Executive Health Team:

1. **Formulate a Provincial Fair-Pricing Framework:** Review existing primary care fee structures and introduce targeted financial protection mechanisms or subsidies for vulnerable socio-economic cohorts to reduce out-of-pocket barriers.
2. **Establish an Institutional Quality Monitoring System:** Implement continuous patient experience indicators alongside standardized, post-consultation evaluation mechanisms to track satisfaction trends and monitor clinical compliance.
3. **Advocate for Infrastructure Development:** Partner with national health authorities and international donors to secure capital investments for upgrading basic facility infrastructure, including water supply, sanitation, and electrical systems.

To Health Zone Management Teams:

a) **Conduct Local Facility Needs Assessments:** Perform regular, structured audits of primary health centers to identify and address specific gaps in service delivery, staffing, and logistics.

b) **Strengthen Clinical Communication and Hygiene Capacity:** Implement ongoing training modules for frontline healthcare workers focused on patient-centered communication, active listening, and strict adherence to infection prevention protocols (such as routine glove usage and hand hygiene).

c) **Enhance Formative Supervision:** Increase the frequency and quality of supportive supervisory visits to first-line facilities, providing direct clinical coaching to healthcare workers to improve compliance with national standards.

Suggestions for Future Research

Because this investigation was restricted to the Kwango province, we recommend scaling this evaluative model across other provinces within the Democratic Republic of Congo to verify the generalizability of these findings across diverse socio-ecological regions. Additionally, given the limitations of cross-sectional data, future

research should prioritize longitudinal study designs to track changes in patient satisfaction over longer periods and assess the impact of quality improvement interventions.

Use of Artificial Intelligence (AI) Declaration: The authors declare that no generative artificial intelligence was used to produce, modify, or manipulate the primary research data. This manuscript underwent formal editorial and linguistic refinement under the sole responsibility and oversight of the authors.

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REFERENCES

Amani, V. J. (2020). The effect of customer satisfaction on their loyalty by mediating the mental image of the brand and trust using structural equations in the banking industry (Case study: Pasargad Bank). *Journal of Internet Banking and Commerce*, *25*(4), 1–13.

Bachisse, I. (n.d.). *Mesure de satisfaction des usagers de l'unité des soins palliatifs/traitement de la douleur/urgences à l'institut national d'oncologie de Rabat*. Inist-CNRS. https://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=27778705

Barlési, F., Barrau, K., Loundou, A., Doddoli, C., Simeoni, M.-C., Auquier, P., & Thomas, P. (2008). Impact of information on quality of life and satisfaction of non-small cell lung cancer patients: A randomized study of standardized versus individualized information before thoracic surgery. *Journal of Thoracic Oncology*, *3*(10), 1146–1152. https://doi.org/10.1097/JTO.0b013e318186a113

Broniatowski, M., & Gayrard, H. (2014). *Contrôle non destructif, détection, courbes ROC*. HAL Open Science. https://hal.science/hal-01058750/

Daniel, S. L., David, D. T., Ernest, D. U., Robert, A. U., Mangaza, L., Achille, L. C., Promesse, B. M., Hippolyte, B. M., Bertille, N. B., & Salomon, B. B. (2025). Etude des facteurs influençant la qualité de relation soignant-soigné: Perception des malades hospitalisés à l'Hôpital Général de Référence de Bunia, au Nord-est de la République Démocratique du Congo. *Revue Internationale de la Recherche Scientifique (Revue-IRS)*, *3*(2), 2125–2135.

Diallo, B. (2021a). Étude des facteurs de la satisfaction des usagers du service de chirurgie générale du CHU Gabriel Touré à Bamako. *Mali Santé Publique*, 44–49.

Diallo, B. (2021b). Étude des facteurs de la satisfaction des usagers du service de chirurgie générale du CHU Gabriel Touré à Bamako. *Mali Santé Publique*, 44–49.

Didier, C. K., Anastasie, K. M., Ezéchiel, M. L., Laeticia, E. L., Trésor, K. K., Antho, M. A., Vincent, N. M., & Mukalayi, A. M. W. (n.d.). *Accueil des usagers à la première ligne des soins en milieu urbain: Appréciation et suggestions des usagers au Centre de Santé d'Apprentissage et de Recherche Tshamilemba (CSART) à Lubumbashi, RD Congo*. CORE. https://core.ac.uk/download/pdf/613701193.pdf

Diouf, M., Cisse, D., Lo, C. M. M., Faye, D., & Tal, R. (2010). Évaluation de la satisfaction des patients admis en service d'odontologie à Dakar. *Pratiques et Organisation des Soins*, (3), 225–230.

Dorman, P. (2014). *Microeconomics: A fresh start*. Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-37434-0

Gürdal, P., Çankaya, H., Önem, E., Dinçer, S., & Yílmaz, T. (2000). Factors of patient satisfaction/dissatisfaction in a dental faculty outpatient clinic in Turkey. *Community Dentistry and Oral Epidemiology*, *28*(6), 461–469. https://doi.org/10.1034/j.1600-0528.2000.028006461.x

Hall, J. A., Blanch-Hartigan, D., & Roter, D. L. (2011). Patients' satisfaction with male versus female physicians: A meta-analysis. *Medical Care*, *49*(7), 611–617. https://doi.org/10.1097/MLR.0b013e318213c141

Matee, M. I. N., Simon, E. N. M., & Lembariti, B. S. (2006). Patients' satisfaction with dental care provided by public dental clinics in Dar es Salaam, Tanzania. *East African Medical Journal*, *83*(4), 98–104. https://doi.org/10.4314/eamj.v83i4.9405

Mokdadi, F., & Chikh, R. (2022). *Audit et amélioration du «service au client» dans la culture du management public Cas: CHU de Tizi-Ouzou* [PhD thesis, Université Mouloud Mammeri]. Mouloud Mammeri University of Tizi-Ouzou Institutional Repository. https://dspace.ummto.dz/items/6726cadf-06ed-4ec8-a311-86171bef2e04

Nguyen Thi, P. L., Lê, T. G., Empereur, F., & Briançon, S. (2002). Satisfaction des patients hospitalisés à Hô Chi Minh-Ville, Viet Nam. *Santé Publique*, (4), 345–360. https://doi.org/10.3917/spub.024.0345

Philippe, C. M., Eleuthère, M. K., Ghislain, K. K., Crispin, M. M., Sylvie, K. M., Eric, M. S., Ghislain, M. N., & Oscar, L. N. (2015). Facteurs déterminants la faible utilisation par le ménage du service curatif dans la zone de santé de Pweto, province du Katanga, République Démocratique du Congo en 2013. *The Pan African Medical Journal*, *21*(173). https://panafrican-med-journal.com/content/article/21/173/full/

Pierreb, S. O. (2019). Enquête de satisfaction des soins dans un centre de santé mentale ambulatoire à Genève. *Psychotherapy*, *170*, Article w03042.

Rubin, H. R., Fink, N. E., Plantinga, L. C., Sadler, J. H., Kliger, A. S., & Powe, N. R. (2004). Patient ratings of dialysis care with peritoneal dialysis vs hemodialysis. *JAMA*, *291*(6), 697–703. https://doi.org/10.1001/jama.291.6.697

Satisfaction *des patients, element important dans la globalite des soins-cas.pdf*. (n.d.). Google Docs. Retrieved March 27, 2026, from https://drive.google.com/file/d/17X-x8VlVOUi2bK2LV00hm-68eKBd-BLA/view?usp=embed_facebook

Souaka, N., Tigalekou Ognaligui, C., Zang Ndong, A., Madjynou Binza, A., Mangombi Mouleka, B., Mickala, D. P., & Nze Bibang, A. D. (2025). Qualité de l'accueil des patients dans deux établissements hospitaliers au Gabon: Une étude descriptive observationnelle. *Recherche et Avancées en Sciences Infirmières*, (1). https://www.unilim.fr/reasci/204

Weber, J.-C. (2012). L'impact de l'Internet sur la relation médecin-malade. *Ethique & Santé*, *9*(3), 101–106. https://doi.org/10.1016/j.etiqe.2012.06.002

Yameogo, A. R., Millogo, G. R. C., Palm, A. F., Bamouni, J., Mandi, G. D., Kologo, J. K., Samadoulougou, A. K., & Zabsonre, P. (2017). Évaluation de la satisfaction des patients dans le service de cardiologie du CHU Yalgado Ouedraogo. *The Pan African Medical Journal*, *28*(267). https://doi.org/10.11604/pamj.2017.28.267.13288