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Exploring Factors Influencing Client Experience and Waiting Time in a Public Hospital Setting in Ghana: A Sequential Explanatory Mixed-Methods Study

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Abstract

Background: Access to quality healthcare was identified as a cornerstone of effective health service delivery in Ghana, particularly in public hospitals where pharmacy departments served as vital patient contact points. Long waiting times at hospital pharmacies were found to hinder timely access to medications, negatively affect patient satisfaction, and compromise treatment adherence.

Objective: This mixed-methods study aimed to evaluate client waiting times and overall experiences at the pharmacy department of Korle Bu Teaching Hospital in Accra, Ghana, and identify key factors influencing service efficiency and patient satisfaction.

Methodology: A sequential explanatory mixed-methods design was employed, which combined quantitative data collection through structured questionnaires and time-motion studies with qualitative insights from in-depth interviews, focus group discussions, and direct observations. Data were collected over ten days from 110 pharmacy clients, with additional qualitative data obtained from 17 healthcare staff members and 28 patients across focus groups.

Results: Out of 110 valid responses, it was found that 58.2% were female and 60.0% were outpatients. While 96.3% of respondents reported feeling respected by pharmacists, only 31.3% indicated that pharmacists adequately listened to their concerns, and 34.0% received satisfactory medication dosage explanations. The median waiting time was determined to be 12 minutes (range: 2-62 minutes), with 66.0% of clients served within 15 minutes. Pharmacy dispensing efficiency was calculated at 79.4% (189 of 238 prescribed medications dispensed). Qualitative findings revealed that staff shortages, manual processes, and communication gaps were the primary contributors to waiting times.

Conclusion: The study revealed relatively efficient pharmacy operations but highlighted significant gaps in patient communication and counseling services. It was concluded that multi-level interventions addressing staffing, process automation, and communication training were needed to enhance overall service quality.

Keywords: Patient waiting time, Client experience, Pharmacy services, Mixed-methods research, Ghana

Introduction

Access to quality healthcare services is a universally recognized human right and a fundamental component of sustainable development. In many low- and middle-income countries (LMICs), including Ghana, public hospitals are the primary providers of essential medical services, particularly for economically vulnerable populations [1]; [2]. Within these settings, pharmacy departments serve as crucial patient touchpoints, responsible not only for dispensing medications but also for providing information on their appropriate use and ensuring rational drug utilization [3]..Despite their critical role, pharmacies in public hospitals frequently face operational bottlenecks, with long patient waiting times being among the most commonly reported challenges [4] [5]. Such delays are known to negatively influence the overall patient experience and healthcare outcomes. Long queues and inefficient service processes can result in delayed treatment initiation, particularly for acute and chronic conditions, and may even discourage patients from returning for follow-up care [6] In Ghana, as in many LMICs, these delays are often exacerbated by systemic issues such as limited human resources, inadequate infrastructure, poor inventory management, and lack of automation in prescription processing [7] [8]Patient satisfaction has become an increasingly important metric in evaluating healthcare delivery quality. It is strongly influenced by dimensions such as waiting time, interpersonal relations with healthcare staff, and the perceived responsiveness of services [9]; [10].In pharmacy settings, patients who spend excessive time waiting or receive inadequate communication about their medications often report lower levels of satisfaction [11]; [12] For instance, failure to explain dosage schedules, potential side effects, or drug interactions can undermine treatment adherence and lead to preventable complications [13] ; [14].Although Ghana has made considerable efforts to improve access to healthcare through interventions like the National Health Insurance Scheme, empirical research examining pharmacy service delivery—especially waiting times and client experiences—remains limited [15]. Much of the existing literature has focused on broader health financing and insurance coverage without deeply assessing patient satisfaction at the pharmacy level [16]. However, understanding the pharmacy experience is critical, as it is often the final and most tangible step in the patient's hospital journey. Factors such as drug availability, staff capacity, and service flow design significantly affect this experience and, by extension, health outcomes. Furthermore, studies have highlighted the prevalence of irrational medicine use in Ghana and other LMICs—often linked to poor communication, misunderstanding of prescriptions, or the non-availability of prescribed drugs [17]. These challenges emphasize the need for effective pharmacy practice and patient education. Health system assessments also reveal that insured and uninsured clients may perceive quality of care differently, further complicating the dynamics at pharmacy units [18]. This study, therefore, aims to examine client experiences and waiting times in the pharmacy department of a major public hospital in Accra, Ghana. Using a cross-sectional design that incorporates both survey data and time-motion analysis, the study will evaluate key performance indicators such as dispensing efficiency, medication availability, and patient satisfaction. By identifying bottlenecks and exploring associated factors, the findings will contribute to the growing body of knowledge needed to inform healthcare policy and improve pharmaceutical service delivery in Ghana.

Methodology

Study Design

This study employed a sequential explanatory mixed-methods design that combined quantitative data collection with qualitative insights to provide a comprehensive understanding of factors contributing to patient waiting times. The quantitative phase involved structured surveys and time-motion studies, which were followed by qualitative exploration through interviews, focus groups, and direct observations to explain and contextualize the quantitative findings.

Study Setting

The study was conducted at the Korle Bu Teaching Hospital pharmacy department in Accra, Ghana. As Ghana's premier tertiary referral hospital with approximately 8,000 staff members, Korle Bu served as the teaching hospital for the University of Ghana Medical School. The pharmacy department was identified as providing comprehensive pharmaceutical services to both inpatients and outpatients, making it an ideal setting for examining client experiences and waiting times in a high-volume public healthcare facility.

Study Population and Sampling

Target Population: All clients accessing pharmaceutical services at Korle Bu Teaching Hospital's pharmacy department during the study period were considered as the target population.

Inclusion Criteria: The following inclusion criteria were established:

1. Clients of all age groups visiting the pharmacy during data collection
2. Individuals seeking prescription dispensing, medication refills, or pharmaceutical consultations
3. Clients providing informed consent (or guardian consent for minors)

Exclusion Criteria: The following exclusion criteria were applied:

1. Clients not requiring pharmacy services during their visit
2. Individuals unable to provide informed consent due to cognitive impairment or severe illness
3. Clients declining participation

Sample Size: A total of 110 clients participated in the quantitative component, with additional qualitative data collected from healthcare staff and patient focus groups.

Data Collection Methods

Quantitative Data Collection

Primary Data: The following primary data sources were utilized. Patient Flow Tracking System:
Manual timing records were used to capture key process points from pharmacy entry to medication dispensation. 2. Patient registration data were obtained from appointment books and electronic records 3. Service completion documentation was collected from pharmacy files

Staffing and Resource Data:

1. Daily staffing levels were recorded (pharmacists, pharmacy technicians, support staff).2. Staff qualifications and experience levels with different medication categories were documented. 3. Pharmacy operating hours and staff scheduling patterns were analyzed 4. Medication inventory levels and stock-out frequencies were tracked

Facility Utilization Data:

1. Dispensing window availability and usage patterns were monitored. 2. Patient volume fluctuations by time of day and day of week were recorded. 3. Prescription complexity and processing requirements were assessed

Data Collection Variables:

Dependent Variables: The following dependent variables were measured:

Total waiting time (minutes from pharmacy entry to medication receipt). .2. Component waiting times (registration, prescription processing, counseling, dispensing).3. Client satisfaction scores across multiple dimensions

Independent Variables:

Organizational Factors: The following organizational factors were examined:

1.Pharmacy staffing ratios (pharmacist-to-client ratios).2. Staff experience levels and specialization 3. Daily patient load and prescription volume 4. Medication availability and inventory management 5. Pharmacy layout and workflow efficiency

Operational Factors: These operational factors were investigated:

Prescription processing systems (manual vs. electronic). .2. Queue management approaches. Patient flow processes within the pharmacy 4. Documentation and record-keeping procedures 5. Insurance verification and payment processing

Patient Factors: The following patient-related factors were considered:

1. Demographic characteristics (age, gender, education level). .2. Visit type (new prescription, refill, consultation).3. Prescription complexity (number of medications, special preparations).4. Insurance status (NHIS, private, cash payment).5. Patient mobility and assistance requirements.

Temporal Factors: These temporal variations were analyzed. Time of day (morning, afternoon, evening).2. Day of week variations 3. Seasonal patterns affecting medication demand 4. Holiday periods and staff availability

Qualitative Data Collection

In-Depth Interviews (n=17):

Participants: The following categories of participants were interviewed:1. Pharmacy staff (pharmacists, technicians) (n=8).2. Nursing staff interfacing with pharmacy (n=4).3. Administrative personnel (n=3).4. Hospital management representatives (n=2)

Interview Guide Topics: The interview guide covered the following topics. Perceived factors contributing to pharmacy waiting times 2. Specific bottlenecks in medication dispensing processes 3. Impact of patient volume and prescription complexity 4. Resource constraints affecting service delivery 5. Staff perspectives on patient communication and counseling 6. Recommendations for pharmacy service improvements

Focus Group Discussions:

Patient Focus Groups (n=4 groups, 6-8 participants each): Patient focus groups explored the following areas. Pharmacy service experiences and satisfaction levels. Impact of waiting times on medication adherence and health outcomes 3. Understanding of pharmacy procedures and communication preferences 4. Suggestions for service improvement from patient perspectives

Staff Focus Groups (n=3 groups): Staff focus groups examined the following themes. Interprofessional coordination challenges. 2. Workflow inefficiencies and process improvements 3. Communication barriers with patients 4. Resource allocation and staffing concerns

Direct Observation:

Structured Observation Protocol: The following observation activities were conducted:

1. Patient journey mapping from entry to exit 2. Process bottleneck identification during peak and off-peak hours 3. Staff-patient interaction quality assessment 4. Workflow analysis and communication pattern documentation

Observation Schedule: Twenty hours of structured observation were conducted across different days and times (morning and afternoon sessions) to capture varying operational conditions.

Data Analysis Plan: Quantitative Analysis

Descriptive Analysis: The following descriptive analyses were performed. Measures of central tendency and dispersion for waiting times were calculated 2. Frequency distributions for categorical variables (gender, patient type, payment method) were generated 3. Cross-tabulations were used to explore initial associations between variables

Inferential Statistics:

Univariate Analysis: The following univariate tests were conducted. Independent t-tests were used for comparing waiting times across binary variable 2. ANOVA was applied to compare waiting times across multiple categories 3. Chi-square tests were performed for associations between categorical variables 4. Mann-Whitney U tests were used for non-parametric data distributions

Multivariate Analysis: The following multivariate analyses were conducted. Multiple linear regression was used to identify predictors of waiting time 2. Logistic regression was applied for binary outcomes (satisfaction levels)3. Correlation analysis was performed to examine relationships between continuous variables

Advanced Statistical Methods: The following advanced methods were employed. Time series analysis was conducted to identify temporal patterns in waiting times 2. Regression modeling was used to quantify the relative impact of different factors 3. Statistical significance testing was performed at $p < 0.05$ level

Qualitative Analysis

Thematic Analysis: The following thematic analysis approach was used: 1. An inductive coding approach following Braun and Clarke's six-phase framework was employed 2. Independent coding by two researchers was conducted to ensure reliability 3. Inter-rater reliability assessment (Cohen's kappa > 0.8) was performed 4. Theme development was achieved through iterative consensus-building processes

Framework Analysis: The following framework analysis was applied: 1. Deductive analysis using healthcare operations management frameworks was conducted. 2. A matrix-based approach was used for systematic comparison across participant groups. 3. Pattern identification was performed for common themes and divergent perspectives.

Mixed-Methods Integration

Sequential Explanatory Integration: The following integration approach was used:1. Quantitative findings were used to identify areas requiring qualitative exploration 2. Qualitative data were used to explain and contextualize quantitative results 3. Joint displays were created to visually compare quantitative and qualitative findings 4. Meta-inferences were drawn from triangulated data sources

Quality Assurance and Validity

Internal Validity: The following measures were implemented to ensure internal validity:1. Standardized data collection protocols and instruments were used 2. Comprehensive training of data collectors was provided 3. Regular calibration checks for timing measurements were conducted 4. Double data entry for accuracy verification was performed

External Validity: The following limitations to external validity were the single-site design was recognized as limiting generalizability to other hospital settings 2. Findings were considered applicable to similar tertiary care pharmacy departments 3. Results were deemed relevant to public healthcare systems in similar resource contexts

Reliability Measures: The following reliability measures were implemented. Test-retest reliability assessment for survey instruments was conducted 2. Inter-observer reliability for observational data was evaluated 3. Internal consistency evaluation using Cronbach's alpha was performed

Ethical Considerations

Ethical Approvals: The following ethical approvals were obtained:

Institutional Review Board approval from Korle Bu Teaching Hospital was secured

Informed Consent: The following consent procedures were followed: 1. Written informed consent was obtained for all interview and focus group participants 2. Verbal consent was obtained for observational components with opt-out mechanisms 3. Special provisions for minors with parental/guardian consent were established.

Data Protection: The following data protection measures were implemented. Complete de-identification of all patient data was ensured 2. Secure data storage using encrypted systems was maintained 3. Restricted access protocols for research team members were established 4. Data retention and disposal policies following institutional guidelines were implemented

Study Limitations

Methodological Limitations: The following methodological limitations were the single-site design was recognized as restricting generalizability to other healthcare facilities 2. Self-reported satisfaction data were identified as subject to response and social desirability bias 3. The cross-sectional design was noted as limiting causal inference capabilities 4. Potential observer effect during direct observation periods was recognized

Contextual Limitations: The following contextual limitations were identified. Resource constraints typical of developing country healthcare systems were acknowledged 2. Seasonal variations in patient volume and medication demand were noted 3. Language barriers requiring translation for some participants were recognized 4. Infrastructure limitations affecting electronic data collection were identified

Results

Participant Characteristics

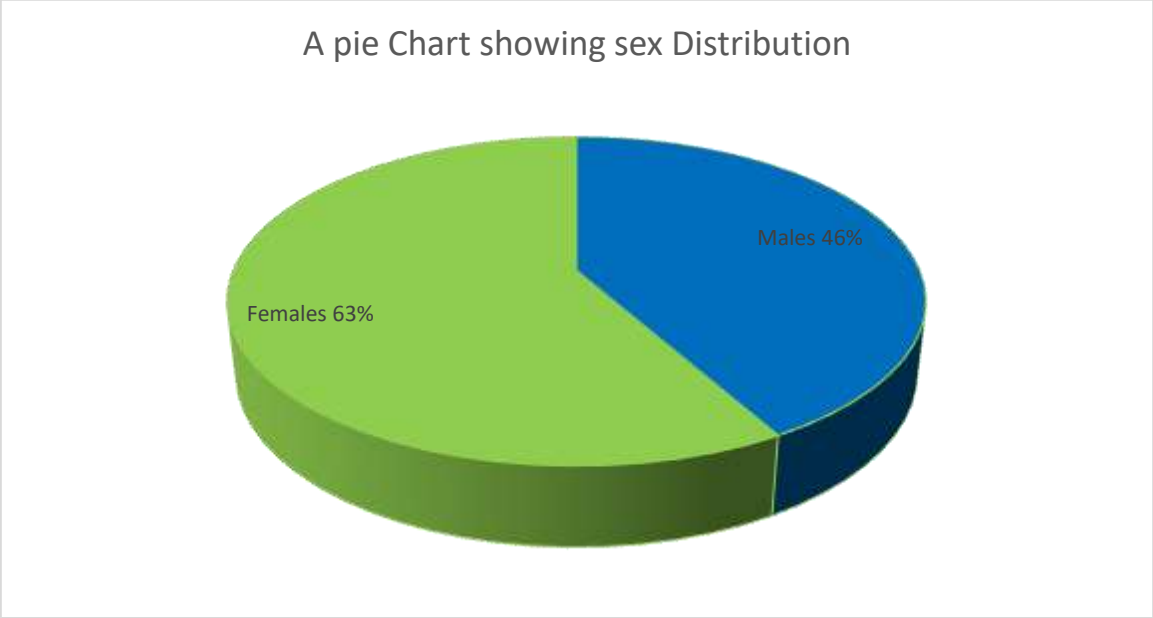
A total of 110 clients participated in the quantitative phase of the study. It was found that the majority were female (64 participants, 58.2%) compared to male participants (46 participants, 41.8%). Outpatients were determined to comprise 60.0% of the sample (66 participants), while inpatients accounted for 40.0% (44 participants). It was observed that most participants (95.5%) paid cash for their medications, with

minimal use of other payment methods, including Visa cards (1.8%) and other payment options (2.7%) to other pharmacies since the chest Clinic Pharmacy does not accept cash

Regarding visit patterns, it was discovered that 72.7% of participants (80 individuals) were repeat visitors to the pharmacy, while 27.3% (30 participants) were first-time users. Educational levels were found to vary considerably, with tertiary education being the most common (50.8%), followed by secondary education (16.4%) and junior high school education (12.7%). A small proportion was identified as having no formal education (5.5%).

It was noted that most participants (76.4%) were relatives or caregivers collecting medications on behalf of patients, while 23.6% were the patients themselves seeking their medications.

Figure1.



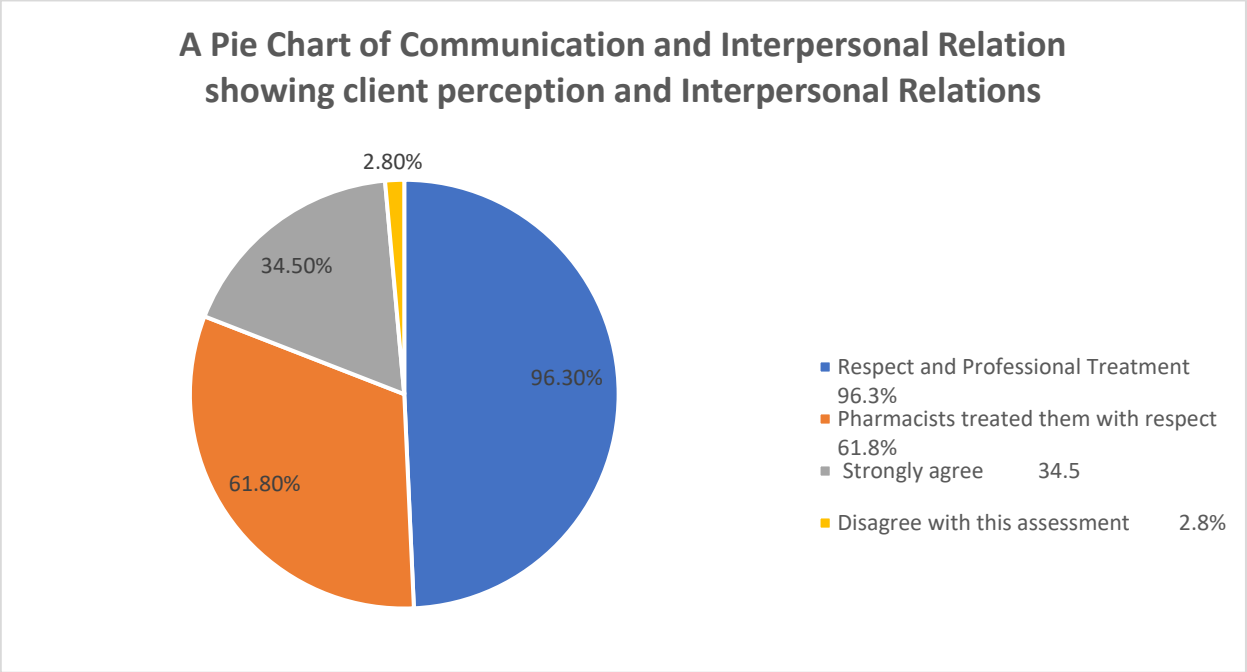
Client Assessment of Pharmacy Services

Communication and Interpersonal Relations

Client perceptions of pharmacist interactions revealed mixed results across different service dimensions. Regarding respect and professional treatment, it was found that 96.3% of clients reported positive experiences, with 34.5% strongly agreeing and 61.8% agreeing that pharmacists treated them with respect. Only 2.8% were found to express disagreement with this assessment.

However, significant gaps were identified in communication quality. It was determined that only 31.3% of clients felt that pharmacists adequately listened to their concerns, with the majority (68.1%) indicating that pharmacists did not provide sufficient attention to their questions or concerns. This was identified as representing a critical area for improvement in patient-provider communication.

Figure2.



Medication Counseling and Education

Medication dosage explanation showed concerning results, with it being found that only 34.0% of clients reported receiving adequate explanations about their medication dosages. The majority (66.0%) were determined to indicate insufficient dosage counseling, which was recognized as having significant implications for medication adherence and patient safety.

Regarding medication purpose and therapeutic use, it was found that 55.7% of clients reported receiving adequate explanations about why their medications were prescribed. However, it was noted that 44.3% did not receive sufficient information about their medication's therapeutic purpose.

Side effect counseling was found to show the poorest performance, with only 21.7% of clients reporting that they were adequately informed about potential medication side effects. The majority (78.3%) were determined not to receive appropriate side effect counseling, which was identified as representing a significant gap in pharmaceutical care provision.

Environmental and Service Quality Perceptions

It was found that most clients (81.4%) rated the pharmacy environment positively, indicating satisfaction with the physical space and facilities. However, 18.6% were identified as expressing concerns about the pharmacy environment, suggesting room for improvement in facility management.

Client Experience and Satisfaction

Overall Service Quality Assessment

Client satisfaction with overall pharmacy services was generally found to be positive, with 66.6% reporting positive experiences (7.5% strongly agree, 59% agree). However, it was determined that 29.9% expressed dissatisfaction with the service quality, indicating substantial room for improvement.

Service Recommendation and Loyalty

Despite communication gaps, it was found that 95.4% of clients indicated they would recommend the pharmacy services to relatives and friends, demonstrating overall loyalty to the facility despite identified

service deficiencies.

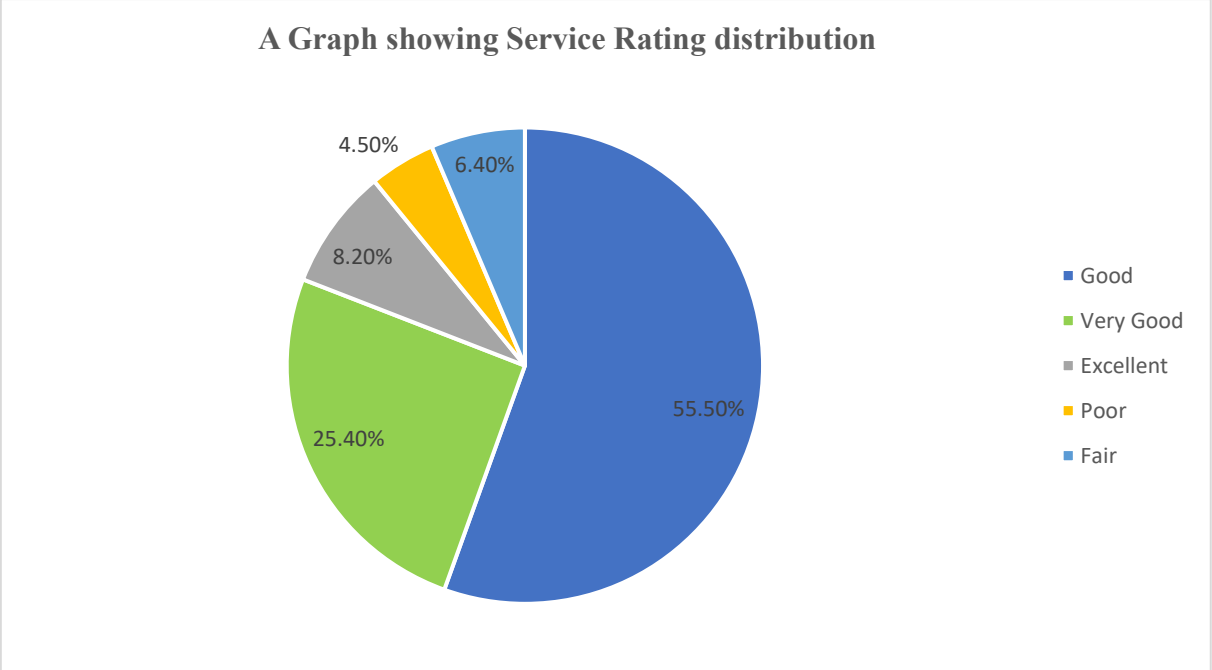
Waiting Time Perceptions

Regarding time spent at the pharmacy, it was determined that 73.7% of clients perceived their waiting time as acceptable (66.4% rated it as "short" and 26.3% as "very short"). Only 7.3% were found to perceive their waiting time as excessive, indicating generally efficient service delivery from the client perspective.

Service Rating Distribution

When asked to rate overall service quality, it was found that 91.8% of clients provided positive ratings: 8.2% rated services as excellent, 25.4% as very good, and 55.5% as good. Only 10.9% were determined to provide negative ratings (6.4% fair, 4.5% poor), suggesting general satisfaction despite identified communication deficiencies.

Figure3.



Waiting Time Analysis

Descriptive Statistics

Waiting time data were found to demonstrate a positively skewed distribution (skewness = 1.85), indicating that while most clients experienced shorter waiting times, a subset experienced considerably longer delays. The median waiting time was determined to be 12.0 minutes, which was considered more representative of the typical client experience than the mean of 14.5 minutes due to the skewed distribution.

The waiting time range was found to be substantial, from a minimum of 2 minutes to a maximum of 62 minutes, indicating significant variability in service delivery efficiency. The standard deviation of 10.2 minutes was determined to reflect this considerable variation around the central tendency.

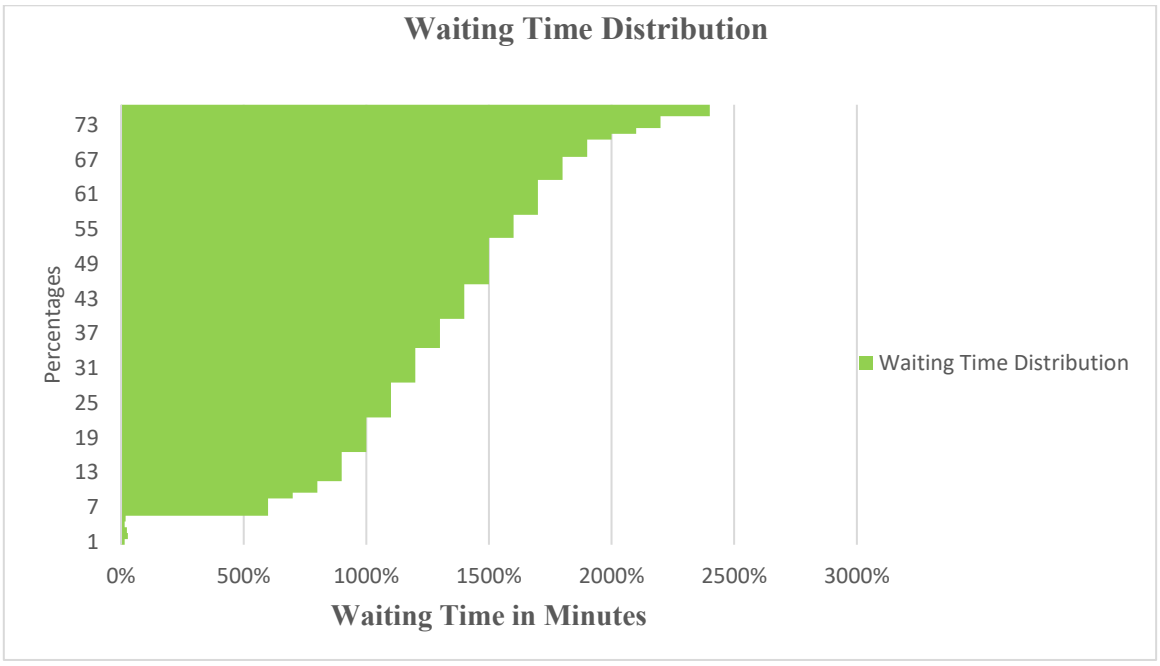
Waiting Time Distribution: Analysis of waiting time categories revealed that 66.0% of clients were served within 15 minutes of arrival, which was interpreted as indicating efficient service delivery for the majority. Specifically, it was found that:

- 15.1% waited less than 5 minutes

- 27.4% waited 6-10 minutes
- 23.6% waited 11-15 minutes
- 15.1% waited 16-20 minutes
- 18.9% waited more than 21 minutes

The finding that approximately one-third of clients (34.0%) waited longer than 15 minutes was interpreted as suggesting opportunities for process improvement, particularly for the 18.9% who experienced waits exceeding 21 minutes.

Figure4.



Pharmacy Dispensing Efficiency

Medication Availability and Dispensing Rates

The pharmacy was found to demonstrate a dispensing efficiency rate of 79.4%, with 189 medications successfully dispensed out of 238 total prescriptions requested. This was interpreted as indicating that approximately one in five prescribed medications was unavailable at the time of the visit, which was recognized as representing a significant challenge for patient care continuity and treatment adherence.

The 20.6% non-dispensing rate (49 medications) was interpreted as suggesting systematic issues with inventory management, supply chain coordination, or medication procurement processes that required attention to improve pharmaceutical care delivery.

Qualitative Findings

Staff Perspectives on Waiting Time Factors

Organizational Challenges: Healthcare staff identified several organizational factors that were reported as contributing to waiting times:

Staffing Constraints: Pharmacy staff consistently reported inadequate staffing levels relative to patient volume, particularly during peak hours. Pharmacists noted that staff-to-patient ratios often exceeded optimal levels, which was described as leading to rushed consultations and longer queues.

Resource Limitations: Limited availability of essential medications requiring alternative sourcing or patient referrals to external pharmacies was reported as contributing to delays. Staff reported frequent stock-outs of commonly prescribed medications that were described as affecting **service efficiency.**

Infrastructure Deficits: Physical space limitations and outdated dispensing systems were identified as creating bottlenecks in patient flow. The manual prescription processing system was identified as a significant contributor to delays compared to automated systems.

Operational Inefficiencies: Process Bottlenecks: Staff identified prescription verification, insurance processing, and medication preparation as primary bottlenecks. Complex prescriptions requiring compounding or special preparations were described as creating significant delays affecting subsequent patients.

Communication Challenges: Language barriers and health literacy issues requiring extended patient education were reported as contributing to longer consultation times. Staff noted insufficient time allocation for adequate patient counseling within current workflow constraints.

Coordination Issues: Poor coordination between different hospital departments was described as resulting in incomplete prescriptions or missing clinical information, requiring additional verification time.

Patient Perspectives

Service Expectations: Patient focus groups revealed that patients generally held realistic expectations about waiting times, with most participants considering waits under 15 minutes as acceptable. However, patients expressed frustration with unpredictable waiting times and a lack of communication about expected delays.

Communication Preferences: Patients emphasized the importance of clear medication instructions and side effect information, which was found to corroborate quantitative findings about counseling deficiencies. Many participants requested more detailed explanations about their medications and treatment plans.

Suggestions for Improvement: Patients recommended implementing queue number systems, providing waiting time estimates, and creating separate fast-track lanes for simple prescription refills. They also suggested better signage and clearer instructions about pharmacy procedures.

Integrated Mixed-Methods Findings

Convergent Findings

The integration of quantitative and qualitative data revealed several convergent themes:

Efficiency Paradox: While quantitative data showed relatively efficient waiting times (median 12 minutes), qualitative findings revealed underlying system strains and staff stress that may not be sustainable long-term.

Communication Gap Confirmation: Both quantitative surveys (showing low counseling satisfaction) and qualitative interviews (revealing time constraints) were found to confirm significant deficiencies in patient communication and medication counseling.

Resource Constraint Impact: Quantitative dispensing efficiency (79.4%) and qualitative staff reports both highlighted medication availability issues as a critical factor affecting both service quality and patient satisfaction.

Divergent Findings

Satisfaction-Quality Discrepancy: While quantitative data showed high overall satisfaction rates, qualitative findings revealed deeper concerns about service quality that may not be captured in satisfaction surveys, suggesting potential response bias or low expectations.

Staff-Patient Perspective Differences: Staff emphasized resource constraints and system limitations, while patients focused more on communication and interpersonal aspects of care, indicating different priorities and perceptions of service quality.

Table 1: Characteristics of Pharmacy Clients

Questions	Responses	Freq.	Percent (%)	Cum. (%)	Percent
Gender	Male	46	41.82	41.82	
	Female	64	58.18	100.0	
	Total	110	100.0		
Patient type	Inpatient	44	40.0	40.0	
	Out-patient	66	60.0	100.0	
	Total	110	100.0		
Mode of payment	Cash	105	95.5	95.5	
	Others	3	2.7	98.2	
	Visa Card	2	1.8	100.0	
	Total	110	100.0		
Client type	Relative	84	76.4	76.4	
	Patient/Client	26	23.6	100.0	
	Total	110	100.0		
First time	Yes	30	27.3	27.3	
	No	80	72.7	100.0	
	Total	110	100.0		
Education	None	6	5.5	5.5	
	Primary	9	8.2	13.7	
	JHS/MSLC	14	12.7	26.4	
	SHS/O/A Level	18	16.4	42.8	
	Vocational/Technical	7	6.4	49.2	
	Tertiary &beyond	56	50.80	100.0	
	Total	110	100.0		

Client Assessment or Experience at The Pharmacy

Majority of the clients responded positively that the pharmacists had much respect (99.1%) for them and listened (31.3%) to them. The clients indicated that the dosage intake was explained (34.0%) to them whiles only a few (21.7%) claimed otherwise. A greater (49.1%) mentioned that they were told about the side effects of medications as against 5.6% who claimed otherwise

Figure5

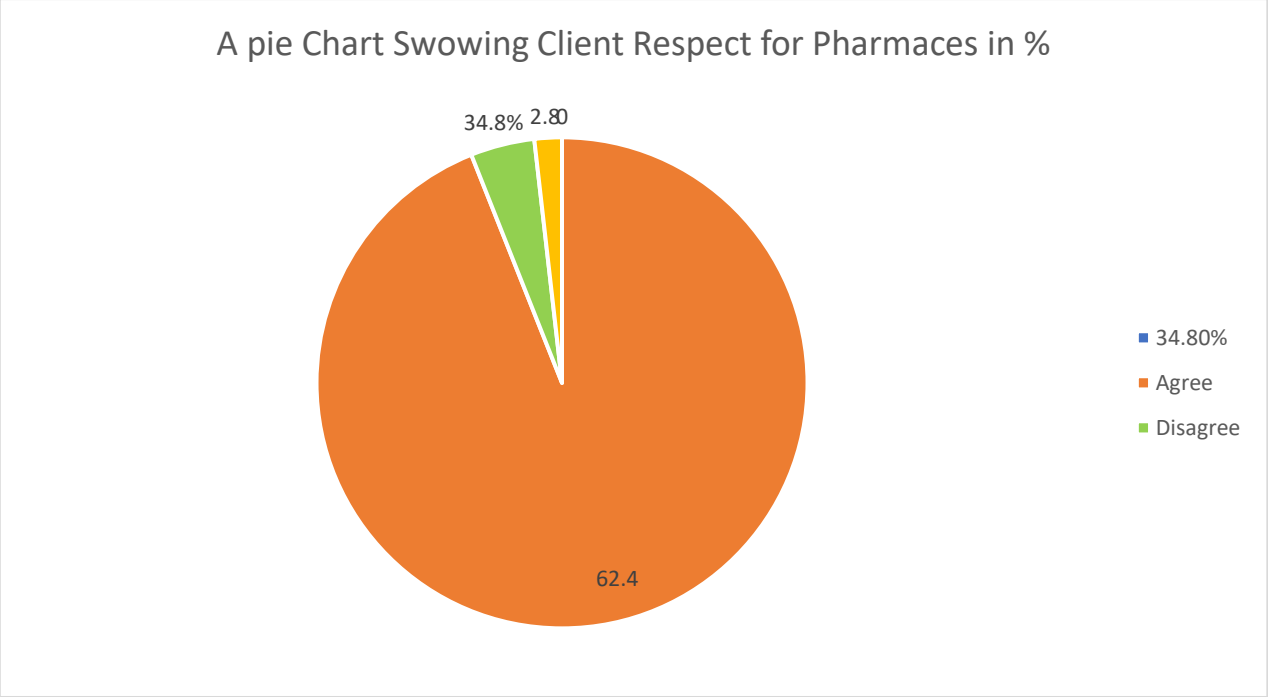


Table 2: Clients experience at the Pharmacy

Questions	Responses	Freq.	Percent (%)	Cum. Percent (%)
Respect	Strongly agree	38	34.5	34.5
	Agree	68	61.8	96.3
	Disagree	2	1.8	98.1
(n=110)	Strongly disagree	1	1	99.1
	N/C	1	0.9	100.0
Listen	Strongly agree	41		
	Agree	64		
(n=110)	Disagree	3	81.9	86.7
	Strongly disagree	2	11.4	98.1
	N/C	0	1.9	100.0
	Total	110	100.0	
Explained	Strong Agree	30	2.8	2.8
(n=110)	Agree	59	28.3	31.1
	Disagree	9	6.6	37.7
	Strongly Disagree	9	17.9	55.7
	N/C	3	44.3	100.0
Dosing (n=110)	Strongly agree	45	3.8	3.8
	Agree	57	30.2	34.0
	Disagree	5	5.7	39.6
	Strongly Disagree	2	16.0	55.7
	N/C	1	44.3	100.0
	Strongly agree	55		

Purpose (n=110)	Agree	49	8.5	8.5
	Disagree	3	12.3	20.8
	Strongly Disagree	3	34.9	55.7
	N/C	0	44.3	100.0
Side Effect	Agree	28	1.9	1.9
(n=110)	Strongly Agree	29	4.7	6.6
	Disagree	38	6.6	13.2
	Strongly disagree	15	42.5	55.7
	N/A	5	44.3	100.0
			12.3	12.3
Environment	Agree	21		
	Strongly agree	37		
(n=110)	disagree	41	73.6	85.8
	Strongly disagree	8	7.5	93.4
	NC	1	1.9	95.3
				100.0

Client assessment or experience at the Pharmacy

A greater proportion rated the time spent at the pharmacy to be short, they constituted 71.7% as against those who rated that it was long (26.5%). Majority (89.7%) agreed they would recommend the pharmacy to other relatives or friends, and that their experience was best at the pharmacy (68.8%). Only a few (15.2) mentioned that the service was poor

Table 3: Client Experience at the Pharmacy

Questions	Responses	Freq.	Percent (%)	Cum. Percent (%)
Best	Strongly Agree	8	7.5	7.5
	Agree	65	59	66.6
	Disagree	30	27.2	97.2
	Strongly Disagree	3	2.7	93.8
	N/A	4	3.6	100.0
	Total	110	100.0	
Recommend	Strong Agree	25	22.7	22.7
	Agree	80	72.7	95.5
	Disagree	5	4.5	
	Strongly Disagree	0	0	
	N/A	0	0	100.0
	Total	110	100.0	
Rate time	Very long	1	0.9	0.9
	Long	7	6.4	7.3
	Short	73	66.4	73.7

	Very short	29	26.3	
	N/C	0	0	100.0
	Total	110	100.0	
Referred	Yes	71	64.5	64.5
	No	39	35.5	100.0
	Total	110	100.0	
Rate Service	Poor	5	4.5	4.5
	Fair	7	6.4	10.9
	Good	61	55.5	66.4
	Very Good	28	25.4	91.8
	Excellent	9	8.2	99.0
	N/C	0		100.0
	Total	110	100.0	

Client Waiting Time at the Pharmacy

The results demonstrated a positively skewed distribution of the waiting times recorded. The skewness was 1.85. Therefore, the average waiting time to be reported is the median (12minutes). The minimum and maximum waiting times at the pharmacy were 2min and 62minutes respectively. Majority of the clients (66.0%) waited at the pharmacy between 0-15min before medication were dispensed to them. A few 18.9% waited for more than 21 minutes before their medication was dispensed to them.

Table 4: Characteristics of Client waiting times

Characteristics	Times in Minutes
Mean	14.5
Std. Error of Mean	0.99
Median	12.0
Mode	8.00
Std. Deviation	10.2
Skewness	1.85
Std. Error of Skewness	0.23
Range	60.0
Minimum	2.00
Maximum	62.0

Table 5: Classification of client waiting time at the pharmacy

Class	Freq.	Percent (%)	Cum. Percent (%)
<5min	16	15.1	15.1
6-10min	29	27.4	42.5

11-15 min	25	23.6	66.0
16-20min	16	15.1	81.1
21min	20	18.9	100.0
Total	106	100.0	

Factors Influencing Client Waiting Time in Ghana's Healthcare System

Client waiting time remains a critical challenge in Ghana's healthcare delivery system, significantly impacting patient satisfaction and health outcomes. Multiple interconnected factors contribute to prolonged waiting periods across healthcare facilities, ranging from systemic infrastructure deficits to human resource constraints. Understanding these factors is essential for developing targeted interventions to improve healthcare efficiency and patient experience.

Health System-Related Factors: The structural foundation of Ghana's healthcare system presents several challenges that directly influence client waiting times. Inadequate infrastructure emerges as a primary constraint, with limited consultation rooms, laboratories, and pharmacies creating significant service bottlenecks throughout the healthcare delivery process [19] [20] . These physical limitations force facilities to operate beyond their optimal capacity, inevitably extending patient waiting periods. The absence of effective appointment systems compounds these infrastructure challenges. Most Ghanaian hospitals continue to rely on walk-in models rather than structured scheduling systems, leading to unpredictable patient loads and overcrowding during peak periods. This reactive approach to patient management creates inefficiencies that ripple throughout the entire healthcare delivery chain. Over-centralization of healthcare services represents another critical systemic factor contributing to extended waiting times [21]. The concentration of specialized services at referral hospitals, coupled with weak primary healthcare systems, results in these facilities bearing disproportionately high patient volumes [22] [23]. This imbalance strains resources at higher-level facilities while underutilizing capacity at primary care levels. Inefficient patient flow processes further exacerbate waiting time challenges. Poor signage systems and unclear navigation pathways delay patient movement between departments, creating unnecessary delays in service delivery [24]. These seemingly minor operational inefficiencies accumulate to significantly impact overall waiting times. The limited adoption of digital health systems perpetuates delays through reliance on manual record-keeping processes. The time required for folder retrieval, manual documentation, and laboratory report processing creates substantial delays in patient care delivery [25] [26]. These technological gaps represent missed opportunities for efficiency improvements that could substantially reduce waiting times.

Staff and Human Resource Factors: Human resource challenges constitute a fundamental driver of extended client waiting times across Ghana's healthcare system. Staff shortages, characterized by low doctor and nurse density ratios, create significant patient backlogs as limited personnel struggle to manage increasing patient loads [27]; [19]. This scarcity of healthcare workers directly translates to longer waiting periods as each provider must attend to more patients within limited time frames. Staff attendance and punctuality issues further compound these challenges. Late reporting and absenteeism, often attributed to inadequate supervision systems, reduce available service hours and create unpredictable service delivery patterns [28]. These behavioral factors introduce additional variability in waiting times, making it difficult for patients to predict service availability. Inefficient staff allocation within healthcare facilities represents

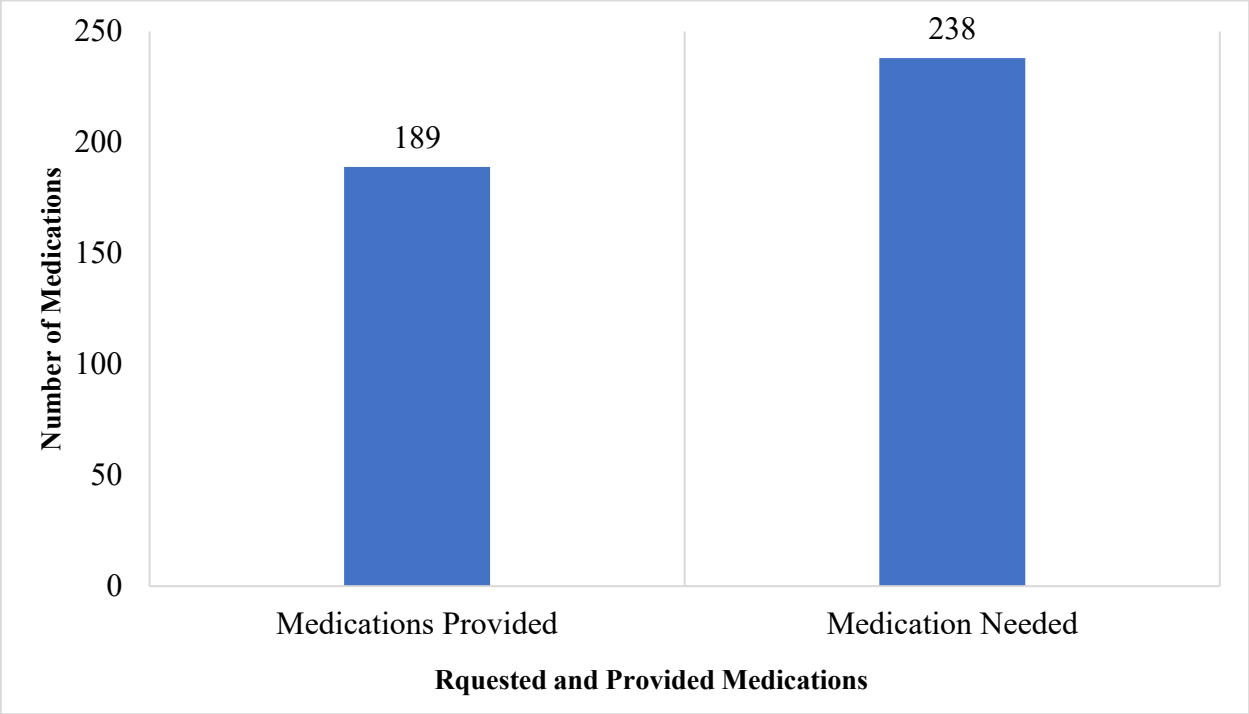
a systemic challenge that contributes to uneven waiting times across departments. Disproportionate distribution of personnel creates bottlenecks in some areas while leaving others underutilized [29]. This misallocation of human resources prevents optimal service delivery and contributes to extended waiting periods in high-demand areas. The experience and training levels of healthcare staff also influence client waiting times. Less experienced personnel typically require more time per patient interaction, leading to slower service delivery and extended waiting periods [3]. This factor highlights the importance of continuous professional development in improving healthcare efficiency.

Client and Patient-Related Factors: Patient behavior and characteristics significantly influence waiting time dynamics within Ghana's healthcare system. Arrival time patterns create predictable fluctuations in service demand, with early or late arrivals potentially affecting both individual wait times and overall service availability [30]. Understanding these patterns is crucial for optimizing service delivery schedules. The type of service sought by patients naturally influences waiting times, with certain services such as antenatal care and specialist consultations requiring more extensive time allocations [31]. These inherent service requirements must be factored into facility planning and resource allocation decisions. Patient load variations, particularly the concentration of visits on specific days such as Mondays, create periodic pressure on healthcare facilities with limited staff capacity [32]. These predictable demand surges highlight the need for flexible staffing models and enhanced capacity planning. Health literacy levels among clients significantly impact service delivery efficiency. Patients unfamiliar with hospital processes and procedures may require additional guidance and support, extended interaction times, and contribute to overall delays [25]. This factor emphasizes the importance of patient education and clear communication systems in reducing waiting times.

External and Systemic Factors: External factors beyond direct healthcare system control significantly influence client waiting times in Ghana's healthcare facilities. Power outages and equipment failures represent critical disruptions that interrupt laboratory and imaging services, causing cascading delays in diagnosis and treatment processes [33]. These infrastructure challenges reflect broader national development issues that impact healthcare delivery. National Health Insurance Scheme (NHIS) processing delays create additional administrative burdens that extend patient waiting times. Challenges in insurance validation and copayment resolution processes create bottlenecks in patient flow, particularly affecting vulnerable populations who rely heavily on NHIS coverage [34] [34]. Industrial actions, including health worker strikes, periodically disrupt service continuity and create substantial backlogs that persist beyond the duration of the industrial action itself [36]. These labor disputes highlight underlying systemic issues within the healthcare sector that require comprehensive policy responses. The factors influencing client waiting time in Ghana's healthcare system are multifaceted and interconnected, requiring comprehensive, multi-level interventions. Addressing these challenges demands coordinated efforts spanning infrastructure development, human resource strengthening, process optimization, and policy reform. Successful reduction of waiting times will require sustained commitment from policymakers, healthcare administrators, and service providers, supported by adequate resource allocation and strategic planning initiatives.

Pharmacy Drug Dispense Efficiency The figure below shows the accumulated sum of medications requested and the number dispensed to them. Out of the sum of 238 medications requested or needed, only one hundred and eighty-nine (189) were dispensed to them. This resulted in an efficiency of 79.4%.

Figure 5: Quantity of Medicines requested and quantity dispensed



Discussion: This mixed-methods study provides comprehensive insights into factors contributing to patient waiting times and service quality in a major public hospital pharmacy in Ghana. The findings reveal a complex interplay of organizational, operational, and communication factors affecting patient experiences.

Key Findings in Context: The median waiting time of 12 minutes at the Korle Bu Teaching Hospital pharmacy compares favorably with other studies in similar settings. Previous research at a tertiary health facility in Ghana reported average waiting times of 6.9 minutes, while another study at Holy Family Hospital in Techiman found significantly longer waiting times averaging 65.7 minutes. International comparisons show even greater disparities, with South African clinics reporting waiting times of 102-196 minutes, highlighting the relatively efficient operation of the Korle Bu pharmacy system. However, the 79.4% dispensing efficiency rate indicates significant room for improvement in medication availability. This finding aligns with broader challenges in pharmaceutical supply chain management in sub-Saharan Africa, where medication stock-outs remain a persistent problem affecting treatment continuity.

Communication and Counseling Deficits: The study revealed significant gaps in pharmacist-patient communication, with only 31.3% of clients feeling adequately heard and 34.0% receiving satisfactory dosage explanations. These findings are consistent with research by Gebretekle et al. in Ethiopia, which found that poor communication significantly impacted client satisfaction. The particularly low rate of side effect counseling (21.7%) represents a critical patient safety concern requiring immediate attention.

Mixed-Methods Integration Value: The sequential explanatory design provided valuable insights that neither quantitative nor qualitative methods alone could have revealed. While quantitative data showed acceptable waiting times and high satisfaction rates, qualitative findings uncovered underlying system strains and communication deficits that may not be sustainable or optimal for patient care quality.

Implications for Practice

The findings suggest several priority areas for intervention:

1. **Staff Training Programs:** -Focused training on patient communication skills and counseling techniques could address identified deficits in patient education and interpersonal interactions.
2. **Process Optimization**: -Implementing lean management principles could reduce bottlenecks and improve workflow efficiency without requiring significant resource investments.
3. **Technology Integration:** - Adopting digital queue management systems and electronic prescribing could reduce manual processes and improve service predictability.
4. **Supply Chain Strengthening:** -Addressing medication availability through improved inventory management and supplier coordination could enhance dispensing efficiency.

The mixed-methods approach, while providing rich insights, also introduced complexity in data integration and interpretation. Language barriers and varying health literacy levels among participants may have affected response quality and comprehensiveness. The findings suggest that overall, client satisfaction with pharmacy services was high, with only 15.2% of respondents rating the services as poor. The median waiting time was 12 minutes, and 66.0% of clients waited 15 minutes or less, indicating relatively efficient pharmaceutical service delivery compared to other public health facilities in similar settings. The pharmacy efficiency rate of 81.1%, measured by the proportion of medications dispensed out of those requested, is comparable to findings from other Ghanaian studies. For instance, Okai et al. [19] reported an average waiting time of 6.9 minutes at a tertiary health facility in Ghana. However, some patients in that study perceived the waiting times as excessive. In contrast, a study at Holy Family Hospital in Techiman found significantly longer pharmacy waiting times, averaging 65.7 minutes, which resulted in substantial dissatisfaction among clients [19]. International comparisons further contextualize these findings. In South Africa, a study examining two busy clinics revealed much higher waiting times despite client volumes being relatively comparable. Clinic A, with an average monthly attendance of 18,000 clients, had a mean pharmacy waiting time of 102 minutes, while Clinic B, serving 13,000 clients per month, recorded an average of 196 minutes [20]. These figures highlight the comparatively efficient operation of the Korle Bu pharmacy, though client volume and workflow systems may differ substantially across contexts. Another relevant comparator is from Saudi Arabia, where Abdelhadi and Shakoor [21] conducted a study in Abha City to evaluate public hospital pharmacy services. They found prolonged waiting times for both inpatients and outpatients, prompting the adoption of Lean Manufacturing techniques to improve service delivery. Their intervention significantly reduced waiting times and streamlined pharmaceutical care. Innovative strategies to reduce pharmacy waiting time have been documented across healthcare systems globally. Arafeh et al. implemented Six Sigma methodologies in an oncology-focused outpatient pharmacy in Pakistan and reported a 50% reduction in waiting times through process reengineering, staff reallocation, and better prescription processing workflow [22] Similarly, Fahrurazi et al., in a systematic review of pharmacy waiting times, concluded that organizational factors, including staff numbers, automation, and layout design, significantly influence client waiting time and satisfaction [14]. From a satisfaction standpoint, Bader et al. reported that after targeted interventions to improve patient flow, 82% of clients expressed satisfaction or high satisfaction with reduced waiting times. This aligns with our findings, where high levels of respect and communication were reported by clients, even though only 43.2% felt pharmacists listened adequately—a potential area for improvement in soft skills and patient engagement. [23] Furthermore, a study by Gebretekle et al. in Ethiopia found that poor communication and long waiting times significantly impacted client satisfaction,

echoing the need for balanced attention to both technical efficiency and interpersonal interaction [24]. Similarly, Donabedian's quality framework emphasizes that structural and process variables—such as staffing levels, workflow, and communication—jointly determine healthcare outcomes and client satisfaction [10]. In summary, while the Korle Bu Teaching Hospital pharmacy performs relatively well in terms of waiting times and service efficiency compared to regional and international counterparts, there remains room for improvement in pharmacist-client communication, medication counseling, and operational innovation. Future interventions could consider adopting evidence-based models like Lean, Six Sigma, or Digital Queue Management System.

Limitations:

1. Self-Reported Data: Client experiences and satisfaction ratings were based on self-reports, which may be subject to recall bias or social desirability bias.
2. Limited Scope of Pharmacy Performance: Pharmacy efficiency was measured primarily by drug dispensing rates, without accounting for other performance indicators like medication counseling quality, error rates, or patient outcomes.
3. Unmeasured External Factors: The study may not have accounted for all external systemic influences such as power outages, NHIS delays, or industrial actions that could impact client waiting time.

Conclusion:

1. This mixed-methods study of patient waiting times and service quality at Korle Bu Teaching Hospital pharmacy was found to reveal generally efficient service delivery with significant opportunities for improvement in patient communication and counseling. While median waiting times of 12 minutes and 66% of clients served within 15 minutes were interpreted as indicating operational efficiency, the low rates of adequate medication counseling and side effect education were identified as representing critical gaps in pharmaceutical care quality.
2. The 79.4% dispensing efficiency rate, while being considered reasonable for a resource-constrained setting, was interpreted as indicating substantial room for improvement in medication availability and supply chain management. The integration of quantitative and qualitative findings was found to reveal important discrepancies between measured satisfaction and underlying service quality concerns.

Recommendations

Based on the integrated findings, the following recommendations were made: Immediate Actions:

1. Implementation of Communication Training Programs for pharmacy staff focusing on active listening skills and patient counseling techniques was recommended
2. Development of Standardized Counseling Protocols ensuring all patients receive essential medication information including dosage instructions and side effects was suggested
3. Creation of Patient Education Materials in local languages to support medication counseling and improve health literacy was proposed

Medium-term Improvements:

1. Adoption of Digital Queue Management Systems to provide waiting time estimates and improve patient flow predictability was recommended

2. Implementation of Lean Process Improvement Methodologies to identify and eliminate workflow inefficiencies was suggested
3. Strengthening of Inventory Management Systems to reduce medication stock-outs and improve dispensing efficiency was proposed

Long-term Strategic Changes:

1. Integration of Electronic Prescribing Systems to reduce manual processing delays and improve prescription accuracy was recommended
2. Development of Specialized Service Lines for complex prescriptions and routine refills to optimize workflow was suggested
3. Establishment of Continuous Quality Improvement Programs with regular monitoring of waiting times, satisfaction, and counseling quality was proposed

Research Recommendations:

1. Conducting Multi-site Studies to enhance generalizability of findings across different healthcare settings in Ghana was recommended
2. Implementation of Longitudinal Studies to assess the impact of improvement interventions over time was suggested
3. Exploration of Technology-based Solutions including mobile applications and telepharmacy services for routine consultations was proposed

These evidence-based recommendations were presented as providing a roadmap for enhancing pharmaceutical care delivery while maintaining the efficiency demonstrated in current operations. The mixed-methods approach was concluded to have proven valuable for uncovering the complexity of factors influencing patient waiting times and service quality, providing a model for future healthcare operations research in similar settings.

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