Patient Waiting Time and Service Type in The Outpatient Department of JM Kariuki Memorial Hospital

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Abstract

Long patient waiting times in outpatient departments (OPDs) continue to present a persistent challenge in healthcare delivery, with significant effects on patient satisfaction, clinical outcomes, and operational efficiency. This study aimed to investigate the correlation between patient waiting time and service type at the outpatient department of JM Kariuki Memorial Hospital in Nyandarua County, Kenya. A descriptive cross-sectional design was utilized, with a sample of 239 respondents selected through stratified and systematic random sampling. Data were collected using structured questionnaires and key informant interviews. Quantitative data were analyzed using SPSS Version 24, while qualitative insights were processed using NVivo. The findings revealed that the average patient waiting time was 3.4 hours, with significant variations across service types. Patients seeking surgical and medical services experienced the longest delays, averaging 5.05 and 4.31 hours, respectively, while emergency care patients faced the shortest waits, averaging 1.32 hours. Regression analysis showed a strong model fit ($R^2 = 0.793$), indicating that the service type, human resource factors, information technology (IT) infrastructure, and health information exchange (HIE) systems together accounted for 79.3% of the variance in patient waiting times. Human resource factors ($\beta = 0.454$, $p = 0.000$) were found to have the greatest impact, followed by HIE systems ($\beta = 0.328$), service type ($\beta = 0.284$), and IT infrastructure ($\beta = 0.204$). These findings underscore the need for targeted resource allocation, improved staffing, enhanced digital systems, and better integration of HIE to optimize outpatient service delivery. The study provides actionable recommendations for healthcare managers and policymakers focused on improving service efficiency and enhancing patient experiences in similar healthcare settings.

Keywords: *Patient waiting time, outpatient department, health information exchange, human resource factors, electronic medical records*

1.0 Introduction

Patient waiting time in outpatient departments (OPDs) is a significant factor influencing both the quality of healthcare delivery and patient satisfaction. Long waiting times have been consistently identified as a challenge worldwide, particularly in public health settings where resource constraints often exacerbate delays in service provision. The World Health Organization (WHO,

2018) defines outpatient waiting time as the duration from a patient's arrival at the OPD to their departure after receiving medical care. These delays are not only inconvenient for patients but also compromise the overall efficiency of healthcare services and can lead to poor health outcomes.

In high-income countries, such as the United States and the United Kingdom, long waiting times have been the subject of policy reforms aimed at improving service efficiency and patient satisfaction. For instance, in the UK, efforts to reduce waiting times in OPDs have been ongoing since the 1980s, with mixed results across various specialties (Rutebemberwa et al., 2018). Similarly, in the United States, patients often wait weeks or even months for non-emergency services, especially in high-demand areas like specialty consultations (Ameh et al., 2019; Chirwa et al., 2019).

In low- and middle-income countries (LMICs), including sub-Saharan Africa, the issue of prolonged patient waiting times is more pronounced due to a combination of factors such as understaffing, insufficient infrastructure, and high patient volumes. Studies from Nigeria, Ghana, and Ethiopia have highlighted how patients in OPDs experience long delays, often averaging several hours before receiving care (Belayneh et al., 2018; Belete et al., 2020). These delays are particularly problematic in public hospitals, where there is a disparity between the demand for services and the available resources. In Kenya, long waiting times in OPDs have been reported at several public hospitals, including Kenyatta National Hospital, which serves as the national referral hospital. At JM Kariuki Memorial Hospital, a Level IV facility in Nyandarua County, patients have been observed to experience varying waiting times depending on the type of service they seek.

Service type has been identified as one of the key factors influencing patient waiting time. Certain services, particularly those that are specialized or require more complex diagnostic procedures, tend to result in longer delays. For example, surgical consultations and diagnostic services are often characterized by longer waiting times due to the need for additional diagnostic testing, medical evaluations, and scheduling of specialized staff. In contrast, emergency care services are typically prioritized, leading to shorter waiting times for patients requiring urgent medical attention. This variation in waiting times across different service types reflects the complex interplay between service demand, resource allocation, and operational procedures within healthcare facilities (Familoni et al., 2021; Hutchinson et al., 2019).

1.2 Problem Statement

Despite ongoing investments in public healthcare systems, prolonged patient waiting times in outpatient departments (OPDs) remain a major challenge, directly impacting both patient satisfaction and the overall quality of care. At JM Kariuki Memorial Hospital—a key Level IV facility in Nyandarua County—patients frequently face extended delays in accessing essential outpatient services, including consultations, diagnostics, and treatments. These delays vary significantly depending on the type of service being sought, with some services, such as emergency care, benefiting from streamlined prioritization protocols, while others, particularly surgical and medical clinics, experience waiting times that often exceed five hours.

While a range of factors—including inefficient service scheduling, limited technological infrastructure, understaffing, and fragmented health information systems—are known to contribute to these delays, the specific role of service type in determining patient waiting times

remains insufficiently explored. There is a lack of localized empirical data addressing how different service types—such as emergency care, surgery, and routine consultations—affect patient waiting times within the outpatient setting. This gap in knowledge is particularly significant in the context of Kenyan public hospitals, where resource constraints often exacerbate the challenge of managing patient flow. This study seeks to fill this gap by examining the correlation between patient waiting time and service type at JM Kariuki Memorial Hospital, providing actionable insights that can inform targeted interventions to improve service delivery, optimize patient care, and enhance operational efficiency in outpatient departments.

1.3 Study Objectives

i. To ascertain the correlation between patient waiting time and service type in the outpatient department of JM Kariuki Memorial Hospital.

1.4 Significance of the Study

This study is significant for a range of stakeholders within the healthcare system, particularly in public sector hospitals like JM Kariuki Memorial Hospital. By focusing on the correlation between patient waiting time and service type in the outpatient department (OPD), the study addresses a key issue affecting patient satisfaction, care delivery, and overall hospital efficiency. Understanding how different service types contribute to variations in waiting times will enable hospital management to make informed decisions about resource allocation, service prioritization, and operational improvements.

For hospital management, the findings provide actionable insights to optimize patient flow based on service demand, allowing for targeted interventions in departments with longer waiting times, such as surgical and medical clinics. Additionally, the study emphasizes the importance of improving service scheduling, staffing, and operational protocols specific to service types, which can directly reduce waiting times and enhance patient experience. Policymakers and county health administrators will benefit from these findings to guide the development of strategies that focus on reducing delays in OPDs, particularly in high-demand service areas.

The study also contributes to the broader academic discussion on healthcare access and service delivery in resource-constrained settings. By providing empirical data on the relationship between service type and patient waiting times, the research offers valuable insights for other healthcare facilities in Kenya and sub-Saharan Africa, where similar challenges are faced.

1.5 Scope of the Study

This study was conducted at JM Kariuki Memorial Hospital, a Level IV public healthcare facility located in Nyandarua County, Kenya. The focus was restricted to the outpatient department (OPD), specifically examining how the type of services offered—such as emergency care, medical consultations, surgical services, diagnostics, and rehabilitation—affects patient waiting times. The study covered a three-month period between April and June 2023 and involved a sample of 239 patients and key hospital personnel who were involved in outpatient services.

The study specifically explored the correlation between different service types and the corresponding patient waiting times. It did not include inpatient departments, pediatric cases, or emergency situations requiring immediate critical intervention, as these are outside the scope of routine outpatient services. The analysis was limited to the outpatient workflow, focusing solely on the variations in waiting times due to service type. It did not assess post-visit outcomes or treatment effectiveness.

2.0 Literature Review

Patient waiting time in outpatient departments (OPDs) is a significant issue globally, with wide-ranging impacts on patient satisfaction, healthcare access, and operational efficiency. Research indicates that waiting times in healthcare facilities, especially for non-emergency services, can be substantial, affecting both the patients and the healthcare system. In high-income countries, patients often face lengthy delays for specialized consultations and procedures. For example, in the United States, patients typically wait 24 days to see a physician, and in the UK, patients experience an average wait of 79 days for surgical procedures (Mehrotra et al., 2017; BMA, 2021). In sub-Saharan Africa, patient waiting times in OPDs are reported to average 120 minutes, with delays particularly noticeable in services like surgery and specialty care (Belayneh et al., 2018).

The correlation between service type and waiting time is critical to understanding this phenomenon. Different types of services within OPDs—such as emergency care, surgical consultations, and routine check-ups—are affected by distinct operational dynamics. For instance, emergency care is typically prioritized, resulting in shorter waiting times for urgent cases, whereas non-urgent services, such as surgical or medical consultations, experience longer delays due to resource bottlenecks, including understaffing and limited medical equipment (Cacace et al., 2019; Ghorbanian et al., 2019). The absence of effective scheduling systems or triage protocols further exacerbates the situation, leading to delays in serving patients with less urgent needs (Galukande et al., 2021).

These waiting times have significant consequences for both patients and healthcare providers. For patients, long delays may lead to dissatisfaction, increased healthcare costs, and even the decision to seek care at alternative facilities, often with poorer quality (Kainth et al., 2020; Hutchinson et al., 2019). For healthcare providers, extended waiting times can result in higher operational costs, including overtime and the need for additional staffing, as well as lower patient satisfaction rates (Familoni et al., 2021).

To address these challenges, several strategies have been implemented globally. Increasing staffing levels, particularly in high-demand departments, and improving technological infrastructure, such as implementing appointment scheduling and triage systems, can significantly reduce waiting times (Cacace et al., 2019; Galukande et al., 2021). Additionally, optimizing service flow by prioritizing urgent care and expanding healthcare capacity, particularly in underserved regions, has been suggested as effective measures for improving patient access to timely medical services (Wagstaff et al., 2020). Understanding the specific relationship between service type and waiting time in Kenyan healthcare settings, such as at JM Kariuki Memorial Hospital, will provide valuable insights into how these factors influence operational efficiency and patient satisfaction.

3.0 Research Methodology

This study utilized a descriptive cross-sectional research design, employing both quantitative and qualitative approaches to investigate the factors influencing patient waiting times in the outpatient department at JM Kariuki Memorial Hospital. A structured questionnaire was administered to a sample of 239 patients, selected through a combination of stratified and systematic random sampling across six service categories. Additionally, purposive sampling was used to select key informants, including hospital staff involved in patient care and service delivery.

The study focused on several independent variables—service type, information technology infrastructure, human resource factors, and health information exchange systems—while patient waiting time was considered the dependent variable. Pre-testing was carried out with 10% of the sample at a comparable hospital to ensure the reliability and validity of the research instruments. Cronbach's Alpha value (≥ 0.7) confirmed the internal consistency of the questionnaire.

Quantitative data were analyzed using SPSS Version 24. Descriptive statistics, ANOVA, t-tests, and multiple linear regression analysis were employed to assess relationships between variables and evaluate their predictive power. In parallel, qualitative data collected from key informant interviews were analyzed thematically using NVivo software, providing a complementary perspective to the quantitative findings and enhancing the overall robustness of the study.

Ethical approval for the study was obtained from the Kenyatta University Ethics Review Committee and the National Commission for Science, Technology, and Innovation (NACOSTI). All participants provided informed consent, and the study adhered to strict confidentiality, cultural sensitivity, and voluntary participation protocols throughout the research process.

4.0 Findings
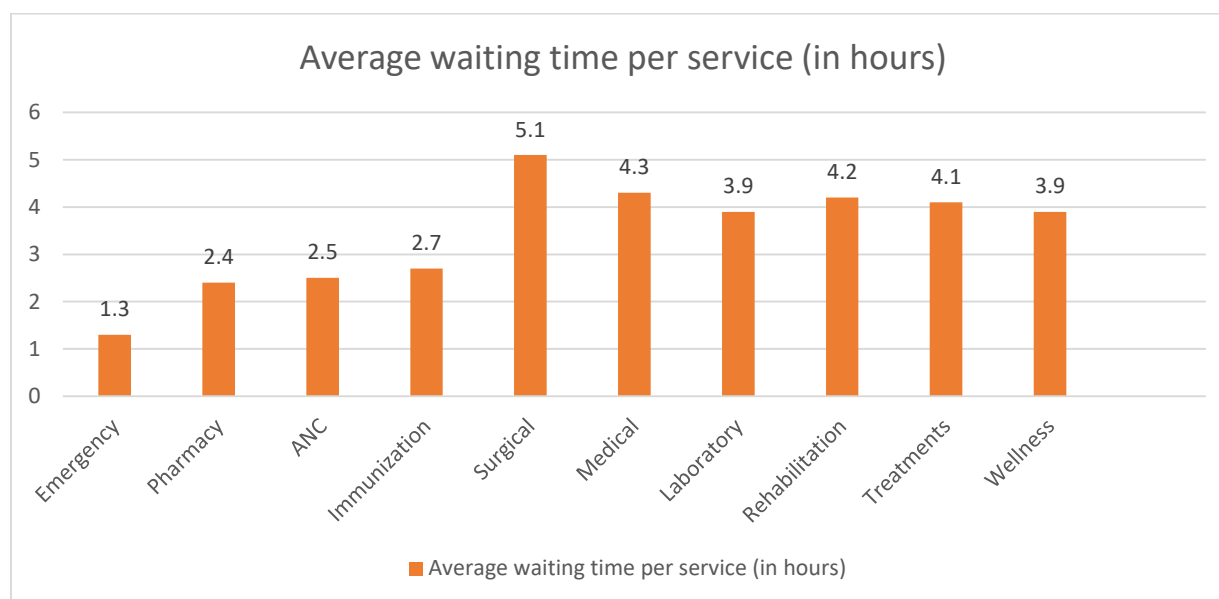
4.1 Patient Waiting Time

This study sought data regarding the patients' waiting time for different types of services offered at the JM Kariuki Memorial Hospital. This was important in providing insights into the efficiency of patient care delivery at this hospital. Table 1 shows the results. According to the data, patients who visit surgical clinics have a far longer average waiting time of 5.05 hours with a standard deviation of 1.353, while those who visit the emergency room have the shortest average waiting time of 1.32 hours with a standard deviation of 0.88. Additionally, the table's results show that, at the time of this study, the total waiting time for all hospital patients for various services was 3,295 hours.

Table 1: Total and average waiting time for different services

Type of Service	Total waiting time per service (in hours)	Average waiting time per service (in hours)	Std. Deviation
Emergency	157	1.32	.844
Pharmacy	524	2.42	1.572
ANC	110	2.45	1.015
Immunization	68	2.71	.756
Surgical	217	5.05	1.353
Medical	362	4.31	1.561
Laboratory	524	3.91	1.111
Rehabilitation	419	4.19	1.235
Treatments	508	4.10	1.196
Wellness	406	3.90	1.338
Total	**3295**		

4.2 The Relationship Between Different Types Of Services And Patient Waiting Times In JM Kariuki Memorial Hospital's Outpatient Department

One of this study's objective was to establish the relationship between different services and patients waiting time in the outpatient section of JM Kariuki Memorial Hospital. Figure 4.1 below presents average patient waiting time by service. Precisely as shown, patients who were in surgical clinics waited for the longest period compared to those who were in the emergency department which is characterized b effective prioritization of urgent care.

Figure 1: Average waiting time per service (in hours)

Considering that the lowest waiting time for services was around 1.32 hours and a highest of 5 hours, these findings depict that on average, a patient seeking services at the JM Kariuki Memorial Hospital has to wait for around 3.4 hours. This relatively high waiting time was echoed by their opinions that were captured on a Likert scale, and summarized through the descriptive statistics in Table 2.

The results in this table indicate that most respondents claimed that they experience longer waiting times at the hospital's outpatient department (mean=4.59, standard deviation=0.697). In this case, 4 represented 'often' and 5 'very often' on the Likert scale. A mean of 4.59 shows that most answered often or very often. This was further confirmed by a majority who claimed that they were very dissatisfied with the waiting time at the hospital's outpatient department (mean=1.27, standard deviation=0.541). 1 on this Likert scale stood for 'very dissatisfied'. In addition, there was an agreement among most respondents that the type of service sought had an impact on the waiting time in the outpatient department at JM Kariuki Memorial Hospital for both scheduled appointments and walk-in patients (mean=1.18, standard deviation=0.382). 1 on this scale represented 'completely agree'. Furthermore, these findings were echoed by some of the health management professionals who were interviewed in this study. For example, when asked how they would rate the waiting for each time of service on a scale of 1 to 10, with 1 being very short and 10 being very long, one of the key informants rated it at "5/10". Also, when asked whether the type of service sought by patients affected the waiting time, another one responded:

"Yes. There are some services that have longer waiting time compared to others based on the number of people seeking that specific service" – Interviewee 3

Thus, these findings also depict some relationship between patient waiting time and type of service.

Table 2: Patients' Opinions On Wait Time

What should be here	n	Mean	Std. Deviation
On a scale of 1 to 5, how often do you experience longer waiting times in the outpatient department at JM Kariuki Memorial Hospital when seeking basic primary care services (e.g. Vaccinations, routine check-ups)?	216	4.59	.697
How satisfied are you with the waiting time in the outpatient department at JM Kariuki Memorial Hospital when seeking specialized services (e.g. Surgeries, complex treatments)?	216	1.27	.541
How much do you agree or disagree that the type of services you seek has an impact on the waiting time in the outpatient department at JM Kariuki Memorial Hospital for both scheduled appointments and walk-in patients?	216	1.18	.382
Valid N (listwise)	**216**		

The researcher was also interested to find out whether there are significant differences in waiting times across the various services provided in the outpatient department at JM Kariuki Memorial Hospital. Table 3 below depicts the output of this analysis. According to the findings, in the emergency department, the F-value is 1.519 with a significance level of 0.226. This implies that there is no discernible difference in the waiting times across the groups at the emergency room, suggesting that random sampling, not variations in service delivery, is the cause of the waiting time variation. The F-value for the pharmacy is 0.722, and the significance level is 0.891. Patient experiences are uniform across this service category, as Regarding Antenatal Care (ANC), the F-value of 1.967 with a significance of 0.321 likewise indicates that waiting times among ANC service users do not differ statistically significantly, indicating that the variation seen is not caused by varying service levels. Similarly, the immunization time of service shows no significant changes in waiting times with an F-value of 0.486 and a significance level of 0.835, confirming the consistency of patient experiences.

evidenced by the fact that waiting times for pharmacy services do not change significantly. This is similar for surgical clinics where the F-value is 4.900 with a significance level of 0.107, which approaches significance but does not reach the conventional threshold ($p < 0.05$). This suggests a trend towards variability in waiting times that may warrant further investigation. On the contrary, the F-value for medical services is 8.064 with a significance of 0.027, indicating statistically significant differences in waiting times. This suggests that variations in waiting times for medical services are not random and may be influenced by factors related to service delivery. However, for laboratory services, the F-value is 2.556 with a significance level of 0.052, which is close to the threshold for significance, indicating that there may be meaningful differences in waiting times for laboratory services that should be explored further. The F-value for rehabilitation services is 5.725 with a significance of 0.160 suggests that while there may be some differences in waiting

times, they are not statistically significant. This is the same case for treatments and wellness and prevention services that have significance levels of 0.774 and 0.211 respectively. They also indicate no significant differences in waiting times among these services.

Table 3: Relationship between different types of services and patient waiting times

		Sum of Squares	df	Mean Square	F	Sig.
Emergency	Between Groups	78.781	107	.736	1.519	.226
	Within Groups	5.333	11	.485		
	Total	84.114	118			
Pharmacy	Between Groups	443.364	188	2.358	.722	.891
	Within Groups	88.169	27	3.266		
	Total	531.533	215			
ANC	Between Groups	43.690	41	1.066	1.967	.321
	Within Groups	1.625	3	.542		
	Total	45.315	44			
Immunization	Between Groups	12.575	23	.547	.486	.835
	Within Groups	1.125	1	1.125		
	Total	13.700	24			
Surgical	Between Groups	75.644	39	1.940	4.900	.107
	Within Groups	1.188	3	.396		
	Total	76.832	42			
Medical	Between Groups	201.113	79	2.546	8.064	.027
	Within Groups	1.263	4	.316		
	Total	202.376	83			
Laboratory	Between Groups	159.175	123	1.294	2.556	.052
	Within Groups	5.063	10	.506		
	Total	164.238	133			
Rehabilitation	Between Groups	150.412	97	1.551	5.725	.160
	Within Groups	.542	2	.271		
	Total	150.954	99			
Treatments	Between Groups	159.227	114	1.397	.748	.774
	Within Groups	16.809	9	1.868		
	Total	176.036	123			
Wellness	Between Groups	181.266	99	1.831	2.344	.211
	Within Groups	3.125	4	.781		
	Total	184.391	103			

5.0 Discussion

The analysis of patient waiting times in the outpatient department at JM Kariuki Memorial Hospital revealed significant variations across different service types, reinforcing the hypothesis that service complexity directly influences waiting times. Patients seeking services at surgical and medical clinics experienced the longest delays, with average waiting times of 5.05 and 4.31 hours,

respectively. In contrast, patients in the emergency department, where urgent cases are prioritized, experienced the shortest waiting times, averaging 1.32 hours. These findings align with studies by Ghorbanian et al. (2019) and Kainth et al. (2020), which emphasize that specialized or high-demand services tend to have longer wait times due to factors such as triage procedures, diagnostic testing, and the availability of specialized clinicians. The qualitative data from patients further support these findings, with most respondents expressing dissatisfaction and indicating that the type of service directly impacted their wait duration.

Although information technology (IT) infrastructure did not emerge as the most significant predictor of waiting times, it still played a notable role. Regression analysis indicated that IT-related factors, including the presence of Electronic Medical Records (EMRs) and reliable internet connectivity, contributed to reduced waiting times (B = 0.612, β = 0.204, p < 0.001). However, patients also noted the absence of crucial IT systems, such as online scheduling, queue management, and telemedicine platforms, which would help to streamline the waiting process. These findings echo previous research by Horwitz et al. (2017) and Ringard & Hagen (2016), who argue that robust IT infrastructure improves responsiveness and operational efficiency in outpatient care settings.

The human resource factor was identified as the most critical determinant of waiting times. The regression model revealed a strong association between staffing levels, coordination, and workload management, and patient waiting times (B = 1.196, β = 0.454, p < 0.001). Adequate staffing, particularly in high-demand departments like surgery and medical clinics, was found to be crucial in reducing delays. This is consistent with findings from Okotie et al. (2018) and Carr et al. (2018), who highlighted the importance of sufficient and well-coordinated staff in ensuring timely service delivery.

Health Information Exchange (HIE) systems also had a significant impact on managing waiting times. The study found that the integration of patient records, laboratory results, and diagnostic information across departments helped to improve patient flow and reduce delays (B = 0.938, β = 0.328, p < 0.001). This finding aligns with the work of Smith et al. (2017) and Anderson et al. (2021), who noted that interoperable HIE systems facilitate faster decision-making and reduce redundant testing, thus improving overall service efficiency. The regression analysis demonstrated that the four predictor variables—service type, IT infrastructure, human resources, and HIE—jointly explained 79.3% of the variance in waiting times, confirming the complex and interconnected nature of these factors.

The findings from this study align with the principles of Queuing Theory, which suggests that waiting times in service settings are influenced by a combination of operational factors, including service demand, resource availability, and system efficiency. The results highlight the need for a holistic, system-level response to address the issue of prolonged waiting times, particularly in resource-constrained healthcare settings.

6.0 Conclusion

This study concludes that patient waiting times in the outpatient department at JM Kariuki Memorial Hospital are primarily influenced by a combination of interrelated operational factors, with human resource availability, service type, IT infrastructure, and health information exchange systems all playing significant roles. Among these, human resource constraints were found to be

the most influential determinant, underscoring the critical need for adequate staffing and effective shift management. Delays associated with complex service types and limited IT infrastructure, including the absence of automated scheduling systems and unreliable internet connectivity, further exacerbate waiting times. Overall, the findings emphasize the importance of comprehensive, system-level reforms, particularly in strengthening digital tools and optimizing service delivery, to reduce patient delays and improve overall efficiency in public hospitals.

7.0 Recommendations

To effectively address the issue of prolonged patient waiting times at JM Kariuki Memorial Hospital's outpatient department, several key interventions are necessary. First and foremost, it is essential for hospital management to prioritize the recruitment of qualified healthcare professionals, particularly in high-demand service areas such as surgery and medical consultations. Ensuring adequate staffing levels will help alleviate delays caused by human resource shortages, which were identified as the most significant determinant of waiting times in this study. Additionally, improving staff coordination and shift management practices will be crucial in enhancing operational efficiency and reducing delays during peak hours.

In parallel, strengthening the hospital's IT infrastructure is an immediate necessity. The implementation of electronic queue management systems, appointment scheduling platforms, and ensuring reliable internet connectivity will streamline administrative functions and help manage patient flow more effectively. The absence of such systems has been noted as a key challenge contributing to delays, and enhancing these technological solutions would directly impact waiting times, making the outpatient process more efficient.

Furthermore, resources should be strategically allocated to high-demand services, such as surgical and medical consultations, which are particularly prone to longer waiting times. By better managing these services and providing additional support where necessary, hospital management can reduce delays and improve service delivery. The study also recommends expanding and integrating Health Information Exchange (HIE) systems across departments within the hospital. Improved interoperability, timely access to patient records, and faster clinical decision-making through integrated systems would not only reduce waiting times but also enhance overall service quality.

At the policy level, it is crucial for the Ministry of Health to develop targeted guidelines and funding strategies aimed at improving staffing levels and technological infrastructure in public healthcare facilities. These strategies should prioritize the optimization of outpatient services, particularly in resource-constrained settings like Level IV hospitals. By addressing these gaps, policy interventions can contribute to more effective healthcare delivery across the country.

Lastly, further research is recommended to examine comparative waiting times across different healthcare facilities and explore the relationship between patient satisfaction and waiting times. Additionally, future studies could investigate systemic bottlenecks that were not fully addressed in this study, providing deeper insights into the broader challenges faced by public healthcare systems.

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