Original Article

Assessment of Patient Waiting Time in Primary Health Care Settings in Rwanda: A Mixed-Method Study

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Abstract

Background
Patient waiting time as an important indicator of quality of services has been a long-standing concern in health care.

Objective
The aim of this study was to assess patient waiting time in primary health care settings in Rwanda.

Methods
This was a mixed-method study design. In quantitative phase, Patient Flow Time Log was used to track the time patients spent waiting for the service. On exit, a structured questionnaire was administered. Observations were conducted to capture information regarding the flow and processes. In qualitative part, six focus group discussions with patients were conducted. Semi-structured interviews with healthcare providers were held.

Results
Among 410 participants, the majority were females (77.1%). The overall health centre level waiting time was 211 minutes (3.5 hours). To receive a service, patients waited an average of 81.5 minutes (1.4 hours). Three conceptual themes were identified: a) reported sections to have long wait time; b) causes of long waiting time; and c) needs for activities to spend time on as patients wait.

Conclusion
Most patients experienced prolonged waiting times during their visit to the primary health care settings , and the major factors were the huge number of patients, few healthcare providers, and lack of medical equipment. To effectively address these challenges, more resources and personnel must be allocated to primary healthcare settings to help foster a higher level of client satisfaction with minimal primary healthcare waiting time.

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Background

In most healthcare settings, waiting time has consistently been one of the most significant determinants of patient dissatisfaction. [1,2] Waiting time is defined as the amount of time a patient spends between arriving at the healthcare settings and leaving the facility after receiving the final service. It is the estimated period during which a patient is enrolled on a list of those who will receive services, each time spending time on a different service before reaching a healthcare provider or being treated.[3] It is a tangible aspect of practice that patients will use to judge health personnel, even more than their knowledge and skill. Moreover, the degree to which health consumers are satisfied with the care received is strongly related to the quality of the waiting experience. [4] Patients are aware that they should wait to see a health care provider; however, there is no known acceptable 'waiting time'. Evidence shows that patients are less likely to be dissatisfied if their waiting time is within 30 minutes.[4]

Patient waiting time is a major concern in low- and high-income countries. However, it is worse among countries with low provider-patient ratios and fragile healthcare systems. [5,6] A recent study in four low- and middle-income countries, India, Kenya, Mexico and Nigeria, found that waiting time ranked as the top predictor of quality of care.[7] Nevertheless, it is more prevalent in public health than in the private health sector. [8] Additionally, waiting time is unequally distributed among those of low socioeconomic status, albeit in some countries, it may be improving.[9,10] Furthermore, waiting time has the same negative effects in different contexts and settings. For example, patients are dissatisfied with the long waiting time to meet or speak to a doctor,[2]in outpatient clinics and primary healthcare settings, [2,11,12] and emergency departments. [13,14]

Considerable efforts have been made to understand the factors that cause long waits and to determine how this problem can be mitigated.

The commonly identified causes include inadequate staffing, limited resources and high demand due to seasonal illnesses. [2,12] Patients in developing countries experience long waiting times because of the imbalance in the health care provider – patient ratio. A study done in Nigeria found that the commonest reason for the long waiting time in an out-patient department was the large number of patients with few healthcare workers.[4] Another study done in China recognized inadequate staffing, limited resources and high demand due to seasonal illnesses as factors associated with lengthy patient waiting time.[2] Factors such as staff shortages, misfiling of patient records, delay in commencing consultations and simultaneous break times have been adduced for the long waiting time.[15,16]

Waiting time in different departments, including primary healthcare settings, needs to be better characterized. A growing body of knowledge indicates that waiting time in these settings also significantly impacts healthcare access.[10] Long waiting times for patients are commonly seen in outpatient facilities, and this difficulty generates a range of public health issues, including negative effects on health outcomes, patient satisfaction with care, health care utilization, and organizational reputation.[2] Rwanda has prioritized primary health care to promote universal health coverage (UHC).[17]

Although there are studies which have been conducted in Rwanda to assess the patient waiting time and associated factors,[18,19] they were conducted in hospitals and used one single approach to gather data. Primary healthcare settings in Rwanda experience a shortage of nurses compared to district, provincial and tertiary hospitals,[20] and 90% of healthcare needs are addressed at this level.[21] Therefore, there is a need to assess the patient waiting time in Rwandan primary healthcare settings by considering both patients and staff perceptions. Therefore, this study used a mixed method approach to gather data from primary healthcare staff and patients in order to gain a deep understanding of the patient waiting time.

Methods

Study design and study sites

This was a mixed-method study utilizing both quantitative and qualitative approaches to gain a deep understanding of patient waiting time in primary healthcare settings in Rwanda.[22] This study was conducted for a period of 2 months in August-September 2018 in five primary healthcare centres (PHC) in Rwamagana District. This is a rural district, located in the Eastern Province of Rwanda. These PHC settings were selected conveniently. Rwamagana district has one provincial hospital and 14 PHC centres serving a catchment population of 365,652. The PHC centres provide at a minimum a package of services ranging from prevention to curative care; the services provided include Primary Curative Consultations (PCC), Antenatal care (ANC), Expanded Program of Immunization (EPI), Family Planning, management of communicable and non-communicable diseases (NCDs) consultation, laboratory, social services, preventive treatment, Post Exposure Prophylaxis (PEP), mental health, minor surgery with or without local anesthesia, simple circumcision in adults, maternity, nutrition, and pharmacy.[23] All the facilities operate 24 hours per day/7 days a week, with an official opening at 7:00am. Most of the population seeking care at these PHC centres are Community Based Health Insurance users (CBHI), [24] while a few have other insurance types and a minority are private.

Study population and sampling

This study included patients seeking care and healthcare providers at the selected PHC settings. The researcher did not consider children but instead their care-takers. The study excluded patients who were identified by the receptionist or nurses on duty before or after registration as severely ill requiring emergency referral or admission. This is because such patients were placed ahead in the queue and attended to differently from the rest. In such scenario, such a patient was excluded from the study and a new patient was picked.

Likewise, mentally ill patients, those who came for repeat medications, investigations or procedures only without seeing a consultation nurse were excluded from the study.

Sample size for patients who participated in the Patient exit questionnaire (quantitative part), was calculated using the following formula:

$$n = DEFF \times [1.96^2 \times (P)(1-P)]/d^2.[25]$$

DEFF (design effect) = 1 because there are no clusters in this study. Only the health centres and then random selection of patients.

1.96 = $Z\alpha/2$ value for p = 0.05 or 95% confidence intervals

P (Estimated prevalence) = 0.5 because there is no any similar study conducted in Rwanda

d (Desired precision/tolerable margin of error)= 5% (0.05)

Using the above formula, the expected sample size is 385 subjects.

Adding 5% of the calculated sample size for possible non-responses, then the total sample size became 406 which was rounded up to 410 patients. For patient flow analysis, the sample size was not predetermined. After following up 60 patients, data was considered saturated as no major new information had been revealed during the last patients followed up. The patients from the patient flow analysis were part of the main sample size.

For Patient Flow Analysis and Patients Exit Survey, the participants were selected using a systematic random sampling method. These health centres on average receive 100 patients per day. Data was collected for 2 weeks (cumulated 12 days). Since the required sample size was 406, the daily required sample size was 34 patients seeking health services. Thus, every 3nd patient who consented participated in the patient flow analysis and patient exit survey.

In qualitative, five healthcare providers were interviewed at each health centre, making a total of 25 staff at the 5 Health centres.

The number of FGDs was not predetermined. After six FGDs, data was considered saturated as no major new information had been revealed during the last FGD. Each FGD session was composed of between 5 to 8 patients.

Data collection instruments

Three major data collection tools were developed by the research team based on the study objectives, context and relevant literature.[3,4,7,26–29] In quantitative phase, the first tool was the Patient Flow Time Log which was used to track the time patients spent waiting for the service and the time spent receiving a service at each section of care from the arrival to exit. The second tool was the Patient Exit Survey which was used to capture the socio-demographics and information on aspects of waiting time. Lastly, an observational guide for capturing information regarding the flow and processes. Together with the trained data collectors, we piloted the tools prior to data collection to ensure that they were comprehensible. One week before the study, a one-day pilot study was conducted in two health centers not part of the sample. The tools were tested on ten patients and three staff members conveniently selected. After that, the tools were adjusted and improved based on the feedback and observations from the pilot study. This helped reveal potential areas for improvement. In qualitative phase, data were gathered using semi-structured interview guides. The research team consulted quality assurance experts to improve the developed instruments. The team also conducted test runs to ensure reliability and validity.

Data collection procedures
Quantitative phase

Data was captured both on working days and weekends and waiting times were observed throughout the day. Patient arrival documentation, patient flow time measurement and administering of patient exit surveys were done by six research assistants (RAs) who were trained by the principal investigator (IK) while the key informant sessions were conducted by the principal investigator. Since the Patient Flow Analysis was happening within a functioning clinical environment, it was valuable to brief the staff about the study. While the "Hawthorne effect" of improved or modified performance of staff under observation was possible,[30] the briefings encouraged staff to go about their normal daily work processes, in order to get an accurate perspective of the system. For patient flow analysis, we divided the health centre into six main stations of care (reception, CBHI, consultation, laboratory, pharmacy, and payment counter). So, to avoid unnecessary movements and ensure time is well calculated and participants are well observed, each RA was stationed at a specific section of care where they were using a stop watch, recorded the time each patient waited in the queue (waiting time) and the time the patient was in contact with the health worker (service time). At the exit point, the RAs administered the Patient Exit Survey to the consented patients. The RAs positioned themselves according to the patient's movements in the health centre (Figure 1). The researcher also documented through direct observation other process and facility-related items that could affect patient waiting times throughout; efficiency of triage, number of staff available, number of patients, equipment and shared facility rooms. The number of health centres' personnel at 4 critical patient contact areas-reception, CBHI section, consultation rooms and laboratory were recorded.
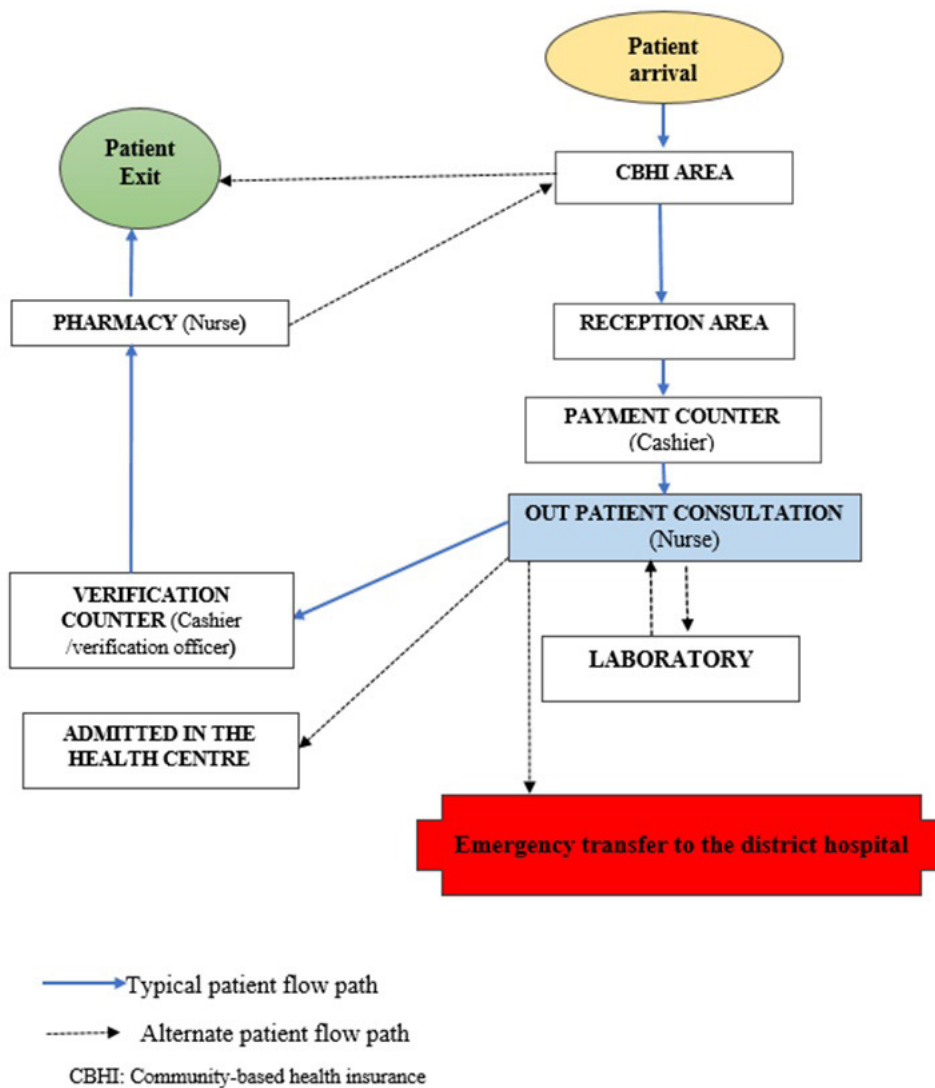
Figure 1. Flowchart showing the patients' movement in the health centre from arrival to exit.

Qualitative phase

At the end of the patient exit survey, eligible participants were purposively invited to take part in the qualitative interview through the FGDs and all interviews were conducted in Kinyarwanda in private places and audio-recorded. Finally, the researcher and one key note taker approached each staff at different sections of care and held individual interviews with each through audio-recording. For patients, at least one FGD was conducted at each PHC setting. However, another FGD was added to achieve data saturation.[31] After six FGDs, data was considered saturated as no major new information had been revealed during the last FGD. The average length of interview was 17 minutes 22secs.

The staff were selected purposively depending on the service where they work. They included staff members who were at different sections of care during the study. The shortest interview duration was 9min32secs while the longest interview was 21min33secs.

Data management and analysis
Quantitative

Dependent variable is overall time spent in the health centre. Total average waiting time was obtained by adding up all sections waiting times. The explanatory variables on the outcome include: number of staff available, number of patients, efficiency of triage, day of the week, equipment and shared facility rooms.

The socio-demographics and patient clinical factors: age, education level and severity of illness. Thus, information from each of the variables was collected and their influence on the dependent variable measured. Data were organized and entered into statistical product and service solution, IBM SPSS Statistics for Windows version 23.0 (IBM Corp, Armonk, NY, USA). Data were analyzed and presented using descriptive and inferential statistics.

Qualitative

Data were transcribed verbatim and translated back in English by the research team. Thematic analysis was used.[32] In this study, differences and similarities were highlighted in the text and these were organized into themes, categories, sub-categories and codes.

Ethical considerations

This study was approved by the University of Rwanda College of Medicine and Health Sciences Institutional Review Board (Approval notice: No 293/CMHS IRB/2018). The participants' rights were protected. Ethical clearance and a formal authorizing letter were presented to the Rwamagana District administration to obtain approval for data collection in the health centres. After getting permission from the management, the researcher explained to the participants the aim of the study and the possible benefits. Participants were informed that participation was voluntary and they could withdraw from the study at any time without penalty. Participants` privacy and confidentiality were maintained using identification numbers instead of their names. There were no risks for participants in this study. In addition, participants were informed that there was no compensation/ direct benefit from participating in this study. The researcher sought participants' consent to participate.

Results

Quantitative findings
Socio-demographic characteristics of patients

Table 1 shows that among 410 participants, the majority were females 77.1% and 34.1% of the participants were between the age of 31 to 45 years. The married comprised 75.6%; and concerning work, the majority 54.1% were self-employed or farmers. Half 50.2% of the respondents had completed primary level of education and 94.9% used CBHI.

**Table1 . Socio-demographic characteristics of patients**

Variables	Frequency (N=410)	%
Gender		
Female	316	77.1
Male	94	22.9
Age group (years)		
18-30	140	34.1
31-45	141	34.4
46-60	80	19.5
60+	49	12.0
Marital status		
Divorced	27	6.6
Married	310	75.6
Single	73	17.8
Employment status		
Formally employed	18	4.3
Self-employed/ Farmer	222	54.1
Student	40	9.8
unemployed	130	31.7
Education background		
None	77	18.8
Primary	206	50.2
Secondary	122	29.8
University	5	1.2
Type of insurance		
CBHI	389	94.9
MMI	2	.5
Private	2	.5
RSSB	17	4.1

Abbreviations: CBHI = Community-based Health Insurance, MMI= Military Medical Insurance   RSSB = Rwanda Social Security Board.

Waiting time vs service time

Sixty (60) patients participated in the Time Flow Analysis part of the study. Patients waited least at the verification counter for about 8.32 minutes on average. Service time was much higher at the laboratory 85.5minutes. Patients waited a significant amount of time at the laboratory for a total mean of 91.5 minutes.

Likewise, patients waited a considerable amount of time at the consultation office for an average of 40.17 minutes. Overall, patients waited to receive service for a mean duration of 81.5 minutes (1.4 hours). At the health centre level, patients spent an average of 211 minutes (3.5 hours), Figure 2.
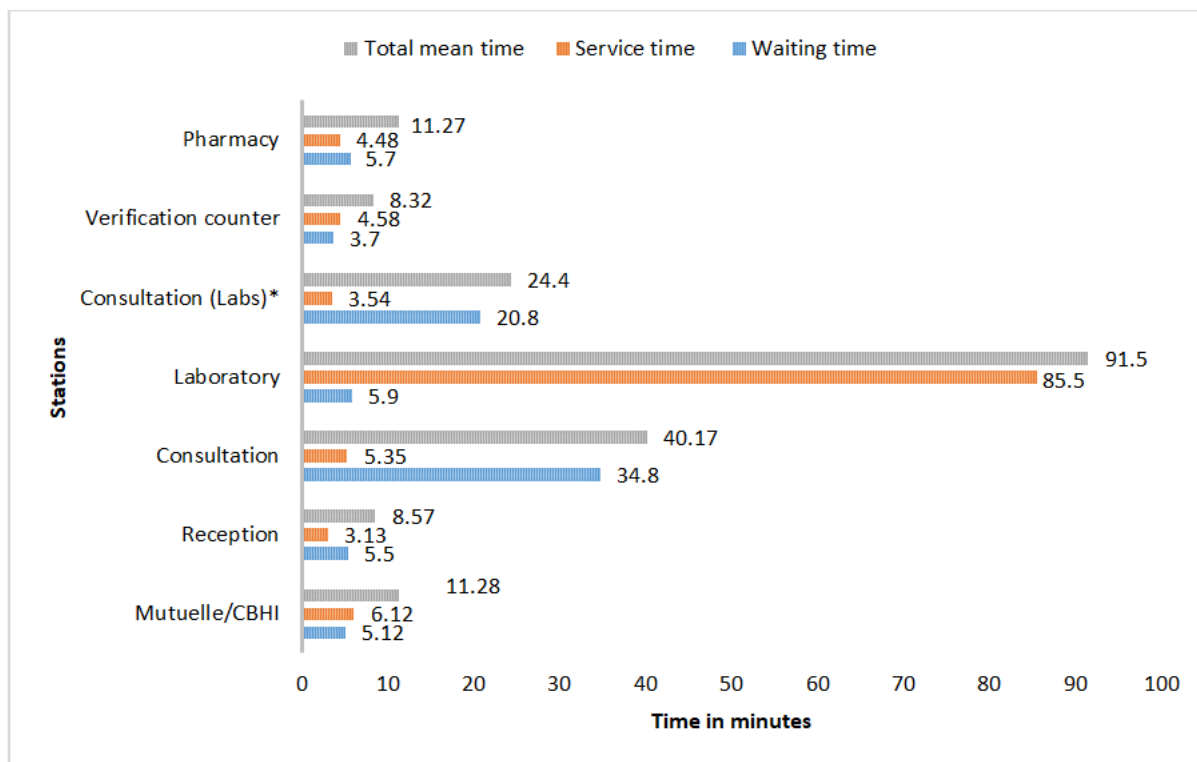
*Consultation (labs): Patients come back to consultation for interpretation of laboratory results .

Figure 2. Waiting and service times per section (minutes)

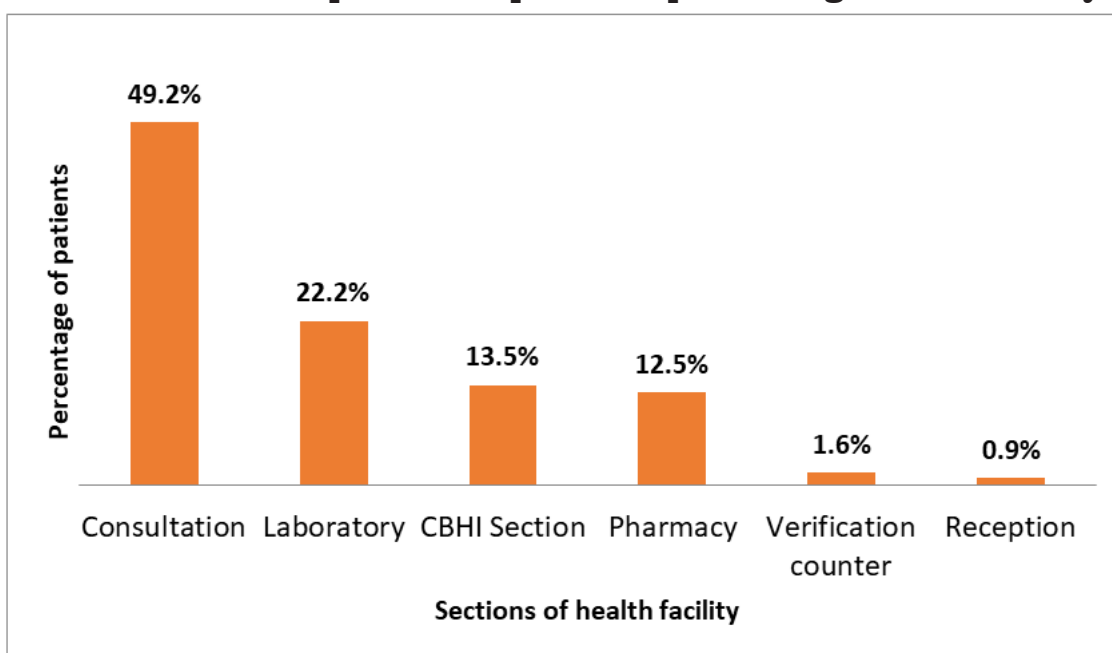**Sections of care where patients reported experiencing the most delay (n=319)**

Figure 3. Sections of care where patients reported experiencing delay (n=219)

Among the 319 patients who reported to have delayed, Figure 3, majority of patients 49.2% delayed at the consultation office; this included patients that had come back for interpretation of results. A considerable number of patients 22.2% reported to have delayed at the laboratory and included those who waited to get laboratory results. The least patients, 0.9% reported to have delayed at the reception.

Reasons for the delay
Over half of the patients 59% mentioned high number of patients coupled with low number of service providers to be the reasons for the delay. 34% of the patients stated other reasons for the delay including very ill patients being taken a head of other patients, poor weather (cloudy days) that resulted in laboratory blood slides taking long to dry in the sun, securing laboratory results for large groups rather than a few individuals and health care providers' nepotism and negligence.

Patients' preferred waiting time at the sections of care
The majority of the patients 42% stated that they would be willing to wait between 15

and 30 minutes to be received by the health care provider while a few of the patients 6% mentioned they could tolerate to wait above 45 minutes.

Activities in the waiting area
A significant number of patients (78.9%) were seated idle as they waited to receive a service while the minority (0.2 %) were doing other activities that included reading the bible. The TV was only available at one out of five health centres.

Activities patients would like to do while waiting
The majority 71% of patients would prefer to spend their waiting time watching a TV while the least patients 2% would prefer to spend time on other things like reading a bible and conversing with fellow patients.

Information given on the reason of the delay
The majority of the patients (72%) were not given enough information about the reason for the delay while they waited.
Patient satisfaction with waiting time (N=410)
A large number of patients (34.9%) were both satisfied and somewhat satisfied with the waiting time while only 1.2% reported to be very dissatisfied with the time they had waited (Figure 4).
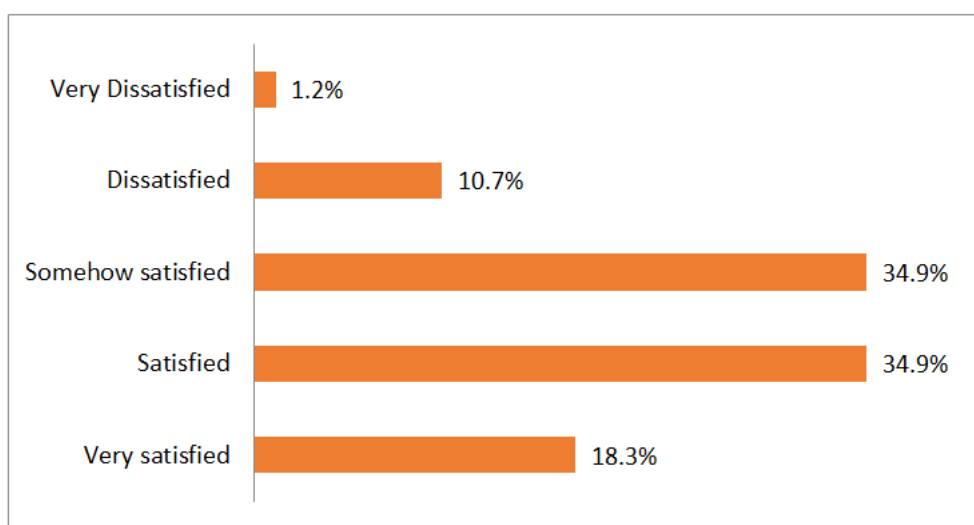

Figure 4. Patient satisfaction with waiting time (N=410)

Knowledge of the service location according to age and education

There was a significant association between both age and education in knowing the service location (P < 0.001). For example, 22.4% of the patients aged 60 years and above stated that they were unable to tell the location of the needed service while 16.9% of non-educated patients were also unable to find the location (Table 2).

Table 2. Knowledge of the service location according to age and education

Variables	Knew the location		P value
	Yes	No	
Age group			
18-30	131 (93.6%)	9 (6.4%)	
31-45	134 (95.0%)	7 (5.0%)	<0.001
46-60	77 (96.3%)	3 (3.8%)	
>60	38 (77.6%)	11 (22.4%)	
Education			
None	64 (83.1%)	13 (16.9%)	
Primary	198 (96.1%)	8 (3.9%)	<0.001
Secondary	113 (92.6%)	9 (7.4%)	
University	5 (100.0%	0 (0.0%)	

Waiting long and willingness to return to the facility

There was a significant association between perceiving waiting time as so long and willingness to return to the facility. A few patients (3.5%) who thought they waited for so long were not willing to return (P-value <0.001) while 100% of the patients that did not think they experienced any delay were willing to return to the facility (Table 3).

Table 3. Perceived waiting time duration and willingness to return to the facility

Perceived waiting time as long	Willing to return		P value
	Yes	No	
Yes	305 (96.5%)	11 (3.5%)	< 0.001
No	94 (100%)	0 (0.0%)	

Qualitative findings

A total of six FGDs among patients and 25 semi-structured interviews with staff were conducted and three conceptual themes were identified: a) sections reported to have long waiting times; b) causes of long waiting time; and c) needs for different activities to spend time on as patients wait.

Theme 1: Sections reported to have long waiting times

According to experiences of the patients, they mentioned being delayed most at the consultation followed by laboratory and then pharmacy, with a few citing to delay at CBHI section. For example, one participant stated: "*When the file reaches the nurse so the nurse can call you…seeing the nurse, aaa!! That's where delaying much…sitting and waiting for a long time doesn't make us happy*". (Participant FGD 5) In similar context, another participant said "*When you to take a test at laboratory, after…. you find that you have to wait like 3 to 4 hours, for example, I reached here 7:58am as you can see on my badge, but you can see the time I have got my result, the time I have got medication! At 1pm!*" (participant FGD1)

Healthcare providers explained the causes at some specific sections. They reported that the high demand may be due to different reasons such us seasonal diseases and days of the week while the number of healthcare providers does not change. For example, one study participant mentioned: "*When the rains cease, usually there is an increased number of malaria cases, we have many consultations and hospitalized cases. Unfortunately, the number of staff would be the same to cater for this increased numbers*". (Laboratory technician 1) Another participant added: "*Many patients come on Monday, maybe they think during the weekends we don't treat patients!!! Also there are many patients on Friday, I think they want to be treated before the weekend comes in*". (Nurse 7)

Theme 2: Causes of long waiting time

The study participants have highlighted different contributing factors of the waiting time at the healthcare facility. The majority of the study participants mentioned that the health centres have few healthcare providers compared to the number of patients as one participant mentioned: *"There are times when CHWs don't have medications, you find here there are many patients, to the extent that a person comes here and due to many patients who are very full, a person can spend half a day".* (Participant FGD 6) This was also supported by a healthcare staff who noted, *"Most times, there is only one nurse doing consultation. When it's a day that there are many patients, a patient can reach here at 8am and leave at 3pm".* (CBHI personnel 1) The shortage of nurses may be due to poor planning as one nurse states, *"Like last month, the nurse in charge of NCDs and Family planning was on leave, so I had to take turns working at both these units in addition to performing out-patient consultations. Patients in any case had to take turns to wait for me".* (Nurse 4) This impacts the way the healthcare providers work, which is by juggling multiple responsibilities, as reported by the study participants. For example, one study participant explained: *"Sometimes, there is no dispensing nurse, you find I am doing consultation at the same time going to dispense medications. Patients at the two sections will indeed take some time waiting for me".* (Nurse 5) Other participants said that sometimes the long waiting time is caused by the healthcare providers' negligence as one study participant mentioned:

> *There is a time when I had come for consultation, when I was called into the consultation room, immediately other two nurses entered and started narrating about a certain wedding that took place, they took a very long time chatting about this… it ended up with me spending like 40 minutes in the room without any care.* (Participant FGD 1)

A small number of patients stressed favoritism among health care providers to be a major reason that cause them to wait long. *"Waiting long therefore, is due to those patients who sidesteps into the room, … a person comes and enters, you see he is treated, for you, you remain seated waiting".* (Participant FGD 4) Even though there are various reasons for delays, the study participants reported that they are not even given explanation of the reason why and other participants said that they received a negative feedback when they tried to ask. For example, one study participant said: *"No explanation! Nothing! We just wait and can't find anyone to inform us".* (Participant FGP 5) In this similar context, another participant mentioned: *"Hummm!!! Instead when you even dare to request for an explanation…. they rather harshly reply 'all these people you found here are not human?".* (Participant FGD 4)

Some staff mentioned how equipment is at times a barrier to deliver services on a timely manner. Often, the equipment would be either not functional or shared between services. One study participant said: *"Sometimes, you will find an equipment here at consultation is not functioning, this means I would need to go to another service to borrow while my patient is left waiting".* (Nurse 5) Another study participant added: *"Not having enough equipment, for example for malaria, eeee… for malaria, there are equipment that can make the testing process quicker, if they are not there, it can make results take long".* (Laboratory technician 1) The study participants mentioned that sometimes the waiting time is caused by the factors they cannot control as evidenced by the following quote:

> *There are things that we can't change, if a laboratory test is expected to take certain minutes for the result to be ready, you understand the patient isn't aware of the expected time to get results, e,g if it's a rainy season, the blood smear takes long to get dry as there is need to expose it to the sun. Patients therefore waiting for malaria results will have to delay! I can't control the weather.* (Laboratory technician 2)

A number of health care providers reported that patients wait at the CBHI section due inefficiency in the CBHI system. For example, a study participant reported: *"The CBHI system, staff at CBHI has to first confirm the patient in the system that he/she paid. Sometimes the internet connection is poor and it can take time".* CBHI Personnel 3

Theme 3: Needs for different activities to spend time on as patients wait

According to the study participants' narratives, having something to occupy them would be helpful while they are waiting. Majority of the patients preferred watching TV or reading a book as one participant mentioned: *".… We [patients] love watching TV, as you can see it's here, that's why they put it there, we are watching it while we wait to see the nurse".* (Participant FGD 2) In this similar context another participant added, *"It's better if they find something to watch. Sometimes the TV is not on, so having books to read would be that okay".* (Participant FGD) One healthcare provider added, *"The problem is that some patients do not know how to read but you find that books are helpful while they are waiting. So, we need more books even those for kids".* (Nurse 4) Other participants preferred to receive health education from the healthcare providers while they are waiting *"While we wait here, if we can get a health care provider to be talking to us".* (Participant FGD 1) This would be a great opportunity from healthcare providers to address different health topics through health education.

Process-related observational findings
- On average, the health centres received an average of 86 patients per day
- Patient flow exceeded seating capacity; patients sit on floors while waiting.
- No process for initial triage or recognition of severely ill patients.
- At two health centres, two nurses were doing consultation while at the remaining 3 health centres, only one nurse was responsible for consultation

- At two health centres, one of their consultation room was not being used for consultation while only one health centre had only one consultation room available
- Nurse doing consultation was the same interpreting laboratory results
- During the study period, none of the health centres had books/newspaper and only one health centre had a TV.
- Also, two of the five health centres did not have blood smear dryer machine which results in blood smear taking long to dry and patients waiting long for malaria results.
- There were no common toilet facilities available to the patients during the period of the study.

Discussion

This study aimed to understand the patient waiting time from the patients' and health care providers' perspectives in primary healthcare centres. Overall, patients spent an average of 211 minutes (3.5 hours) in the health centre which is lower than the previous study in Rwanda which found the aveerage of four hours.[19] These findings were consistent with similar studies done in Ethiopia and Nigeria which documented that the average patient waiting time, from registration to receipt of a prescription slip, was more than three hours.[33,34] Furthermore, this study demonstrates that the overall amount of time that patients spent in the primary healthcare centres in Rwanda is much less compared to findings from studies done in other low-income countries such as Ghana, which found that patients could spend approximately at least five hours in health facility waiting for services.[29] These differences in patient waiting time could be due to the differences in the healthcare systems between countries.

From the current study, the majority of the patients in the FGDs stated that they would be willing to wait for an overall period of 2 hours in the health centre.

This amount of time as by patients was the same as what the majority of health care providers mentioned that it would be realistic for a patient not to exceed 2 hours waiting in the health centre. This view is congruent with what was obtained in a similar study done in Ethiopia,[33] and South Africa,[35] and higher than what was reported in other studies done in Dubai,[36] and the United Kingdom.[37] It is understandable that patients from low-income countries face long waiting times compared to high-income countries. However, a key challenge for policymakers as highlighted by various studies is defining what constitutes reasonable waiting times given that different circumstances lead to differing perceptions regarding appropriate waiting times. Studies indicate that there is insufficient published data to support the acceptable waiting in primary healthcare clinics.[38]

The Patient Flow Analysis showed that patients waited a significant amount of time at the laboratory for a total mean of 91.5 minutes (~1.5 hours). These findings are cnsistent with one study conducted in Nigeria.[34] The waiting time at the laboratory included time that patients spent waiting for laboratory results. This indicates a need for health centres to determine the turnaround times for different laboratory tests so as to identify if this is the expected amount of time that patients should be waiting at the laboratory. Furthermore, patients waited a considerable amount of time at the consultation for a an average of 40.17 minutes, followed by consultation laboratory where patients spent a mean of 24.4 minutes. In most cases, the nurse performing consultation has a line of patients from laboratory investigations and another line of new patients.

Results in the current study shows that patients waited to receive a service for an average of 81.5 minutes (1.4hours). However majority of the patients (42%) stated that they would be willing to wait between 15 and 30 minutes tobe received by the health care provider. A very few of the patients (6%) mentioned they would be willing to wait for over 45 minutes. This is similar to a study conducted in Nigeria which found that the majority of patients (78%) believed the ideal waiting period should not be longer than 30 min from the time of arrival in the hospital, till the time the patient is attended to by the health care provider.[28] Evidence shows that patients are less likely to be dissatisfied if their waiting time is within 30 minutes.[28] Therefore, efforts should be made to keep waiting times to a minimum.

Keeping the patients occupied while they are waiting through availability of entertainment such as television, health information and reading materials may improve the anticipation of waiting.[39] However, the current study revealed that the majority of patients (78.9%) were seated idle as they waited to receive a service. The Television was only available at one out of five health centres while none of the health centres had reading materials. The patients in this study preferred to spend their waiting time watching a TV or reading a books or newspaper. similarly various studies have demonstrated the need to provide information to the patient regarding the reason for the delay and the duration of wait time that patients should expect.[2,39] However, in the present study, the majority of the patients (72.44%) reported to have not been given information while they waited. Furthermore, respondents from the FGD emphasized that health care providers rather harshly respond to them when the patients dared asking about their waiting process. Other patients revealed that it depends on the health care provider that has worked, as some would provide information while others won't.

The current study found a significant association between waiting for long and willingness to return to the facility, whereby 3.5% of the patients who waited long were not willing to return, while 100% of the patients who did not experience any delay were willing to come back to the facility. This suggests that waiting time is an important factor in patient satisfaction.

The longer the waiting time, the less likely the patient is to return to the facility. Therefore, it is important for healthcare providers to reduce waiting times to ensure customer satisfaction.

The present study also revealed the causes of prolonged waiting as stated by patients and staff. The patients mentioned high number of patients, lack of equipment, shortage of staff, very ill patients being taken a head of other patients, poor weather that resulted in laboratory results to take long, securing laboratory results for large groups rather than a few individuals and health care providers' nepotism and negligence. The reasons stated by the patients were quite similar to those mentioned by the staff apart from the staff citing that high patient numbers turn up in morning hours and specific days, high demand due to seasonal illnesses, many staff leaving for annual leaves at once and challenges in insurance system. Various studies have identified similar causes of waiting time;[2,4,5,15,16] however, none of the studies have documented poor weather that results in laboratory results being delayed. This might be a particular case of the Rwandan primary healthcare settings and needs to be addressed.

Our findings showed that there is a significant association between both age and education on knowing the service location. Slightly more than 20% (22.4%) of patients aged 60 years and above and 16.9% of non-educated patients stated that they were unable to tell the location of the needed service. This is in consistent with other studies which have found that elderly patients usually find it hard to navigate through the "tunnel" of the outpatient department (OPD); and that compared to the less educated, the more educated could easily communicate with staff and read instructions thus allowing them navigate better.[40,41] It is therefore important to consider the needs of the elderly when designing the OPD. Healthcare providers should strive to make sure that elderly patients can easily find what they are looking for and that they have access to the services they need. Additionally, healthcare providers should make sure that elderly patients understand the instructions and can communicate effectively with staff.

Conclusion

This study has shown that the majority of patients experience prolonged waiting times during their visit at the PHC centres with the greatest time spent at the consultation and laboratory sections. This remains a key challenge for patients, caregivers and health care providers. The major cause is the huge number of patients, few health care providers, and lack of medical equipment. To effectively address these challenges, more resources and personnel need to be allocated in primary healthcare settings to ensure quality care. The Ministry of Health and other stakeholders should consider providing enough medical equipment and other essential materials, such as TVs, books, etc., to primary healthcare settings to occupy patients while they wait.

Strength and limitations
This study has several strengths. To our best of knowledge, this is among the first study conducted on patient waiting time in primary health care centres in Rwanda using mixed methods study design. To gain a comprehensive understanding, this study considered multiple sources of data including patients, observations, and healthcare providers. However, this study has limitations. It was conducted in only five primary health care centres in Eastern Rwanda which can affect the findings generalization. In addition, this study included only patients who had come for primary curative care, which could lead to selection bias, as patients from other departments could have different views. Future researches should focus on extending the study to many more study settings such as other departments including Family planning, Antenatal Care, NCDs.

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Authors' contribution

All authors made a substantial contribution to this study. IK and MN designed the study. IK collected data. IK, MN, IT, and AN analyzed and interpreted data. IK, and IT prepared the first draft of the manuscript. MN and AN were also involved in providing a critical review of the manuscript. All authors reviewed the drafts of this manuscript and approved the final version for submission.

Competing interests

The authors declare that they have no competing interests.

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