# A COMPARATIVE STUDY OF RADIOLOGY PATIENTS WAIT TIMES IN TWO HOSPITALS IN BENIN CITY WITH AND WITHOUT A SCHEDULING SYSTEM.


**BY**

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**BENIN CITY**


**NOVEMBER, 2025**

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF RADIOGRAPHY IN PARTIAL FULFILMENT FOR THE REQUIREMENT OF THE AWARD OF BACHELORS DEGREE IN RADIOGRAPHY UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.**

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# CERTIFICATION

This is to certify that this research project by **ADANLAWO OLUWASEUN ABIMBOLA** with a Matriculation Number of BMS2101763 has been examined and approved for the award of Bachelors of Radiography in the department of Radiography; School of Basic Medical Science, University of Benin, Benin City.

**MRS IGBINEDION F.O**
**(**Project Supervisor**)** _____
Sign and date

**MRS IGBINEDION F.O**
**(**Head of Department**)** _____
Sign and date

**EXTERNAL EXAMINER.** _____
Sign and date

# DEDICATION

I dedicate this project to God Almighty, the giver of knowledge and his favor upon my life.

## ACKNOWLEDGEMENT

I give all glory, honor, and adoration to Almighty God for His endless grace, wisdom, and strength throughout this research work and my academic journey.

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# ABSTRACT

A hallmark of a well-managed radiology department is minimizing the time patients spend before accessing radiology services. Timely access to diagnostic imaging plays a critical role in the quality and efficiency of healthcare delivery. Prolonged wait times can lead to patient dissatisfaction, delay diagnoses, extend hospital stays, and negatively affect clinical outcomes, especially in time-sensitive conditions such as trauma or cancer. This comparative cross-sectional survey aimed to evaluate and compare patient wait times in the radiology departments of two selected hospitals in Benin City: one utilizing a scheduling system (University of Benin Teaching Hospital) and the other operating without a scheduling system (University of Benin Healthcare Centre). A total of 249 participants were recruited using a stratified random sampling technique combined with purposive sampling to ensure adequate representation of patients attending the selected radiology departments. Data were collected using a structured questionnaire and analyzed with the Statistical Package for the Social Sciences (SPSS) version 26.0. Socio-demographic findings revealed that the majority of respondents (24.5%) were aged 36–45 years, followed by 46–55 years (22.5%), 26–35 years (20.9%), and 18–25 years (15.7%). Of the participants, 58.2% attended the hospital with a scheduling system, while 41.8% attended the hospital without a scheduling system. Additionally, 58.2% of respondents had scheduled appointments, while 41.8% did not. Distribution of imaging procedures among participants included X-ray (29.7%), MRI (26.1%), CT scan (24.1%), and ultrasound (20.1%). Regarding wait times, patients attending the hospital with a scheduling system were typically attended to within 10–20 minutes. In contrast, patients at the hospital without a scheduling system waited more than 45 minutes on average. Overall, 78.3% of respondents considered the waiting time acceptable, whereas 21.7% deemed it unacceptable. Communication about waiting times was rated as excellent or good by 77.2% of respondents, fair by 11.2%, and poor by 11.6%. In terms of overall satisfaction, 72.3% reported being very satisfied or satisfied, while 17.4% were dissatisfied or very dissatisfied. Hypothesis testing revealed that comparisons between the two groups yielded p-values $< 0.05$, indicating statistically significant differences. Therefore, the null hypothesis was rejected, and the alternate hypothesis was accepted, confirming a significant difference in patient wait times between radiology departments with and without a scheduling system. These findings underscore the importance of implementing scheduling systems to reduce patient wait times, improve satisfaction, and enhance overall efficiency in radiology departments. Hospitals without scheduling systems are recommended to adopt computerized or manual appointment protocols to better manage patient flow and minimize waiting times.



**KEYWORDS:** Comparative, Patients, Radiology, Wait, Time.

# CHAPTER ONE

## 1.1 Background of Study

The diversity of inputs and range of services provided make the radiology department a complex system to manage (O'Kane, 2016). A hallmark of a well-managed radiology department is minimizing the time patients spend before accessing services. Timely access to diagnostic imaging plays a critical role in the overall quality and efficiency of healthcare delivery. In radiology departments, patient wait time—defined as the time elapsed from a patient's arrival to the completion of the imaging procedure—is a vital indicator of operational performance and patient satisfaction (Donabedian, 2015).

Prolonged wait times can lead to patient dissatisfaction, delay diagnoses, extend hospital stays, and negatively affect clinical outcomes, especially in time-sensitive conditions such as trauma or cancer. Studies show that patient satisfaction is influenced by factors such as the time spent with healthcare providers, the willingness of providers to listen, and expectations for treatment (Leddy, 2023). Lengthy waiting times have been consistently identified as a major cause of dissatisfaction in healthcare services (Fenny, 2020), with evidence demonstrating a negative relationship between patient wait times and overall satisfaction (Anderson et al., 2017).

The radiology department under study offers multiple services, including Accident and Emergency Radiology, conventional and specialized radiographic examinations, theatre and ward radiography, computed tomography (CT), mammography, and ultrasonography. One major contributor to long wait times is the absence of an efficient scheduling system. In many developing countries, including Nigeria, public and some private hospitals often operate using walk-in or first-come, first-served models, often without digital or structured appointment

mechanisms. This results in workflow inefficiencies, overcrowding, patient frustration, and increased stress on healthcare workers (Okeke & Akinola, 2019). Conversely, hospitals adopting structured scheduling systems—manual or electronic—experience improved workflow management, better patient throughput, and enhanced patient experiences.

Globally, studies have explored the benefits of scheduling systems in healthcare. Research in high-income countries such as the United States and the United Kingdom has shown that computerized scheduling can significantly reduce patient wait times, optimize staff workload, and create predictable clinical environments (Moghadasi et al., 2019; Bender et al., 2020). In sub-Saharan Africa, challenges to adopting such systems include infrastructure limitations, lack of digital literacy among staff, funding constraints, and resistance to change (Adejoh & Ogunleye, 2020).

In the Nigerian context, radiology departments are often overwhelmed by high patient volumes and constrained by limited personnel and equipment (Akinboboye et al., 2018). While some urban hospitals have introduced appointment-based systems, many still operate traditional non-scheduled models. Benin City, with its growing healthcare sector, provides a relevant setting for investigating how scheduling practices influence radiology service delivery. Despite the critical need to optimize workflow, there is limited empirical research comparing wait times in hospitals with and without scheduling systems in Benin City. This study seeks to fill that gap by conducting a comparative assessment of patient wait times in two selected hospitals. The findings aim to provide evidence-based recommendations for improving service delivery in radiology departments and inform policy and administrative strategies in resource-constrained healthcare environments (WHO, 2016; Bender et al., 2020).

## 1.2 Statement of the Problem

Patient wait time before accessing radiology services remains a significant issue, particularly in developing countries like Nigeria, where healthcare systems face resource limitations and operational inefficiencies (Okeke, 2016). Long waiting times can delay diagnoses, reduce patient satisfaction, result in missed appointments, and lower the quality of healthcare delivery (Eze & Okoye, 2016). In many hospitals, particularly public ones, radiology services are still managed manually or semi-manually, without effective scheduling systems, leading to poor coordination (Howard & Thompson, 2019).

Conversely, some well-resourced private hospitals have adopted electronic and manual scheduling systems, improving workflow and reducing patient wait times. However, there is a lack of comparative studies evaluating the impact of these systems on patient wait times in real-world Nigerian settings, especially in Benin City.

## 1.3 Research Questions

1. What are the patient wait times in radiology departments with and without a scheduling system?
2. What recommendations can improve wait time management and service efficiency in radiology departments based on the study findings?

## 1.4 Hypotheses

**Null Hypothesis ($H_0$):** There is no significant difference in patient wait time between the selected radiology departments with and without a scheduling system.

**Alternate Hypothesis ($H_1$):** There is a significant difference in patient wait time between the selected radiology departments with and without a scheduling system.

### 1.5 Aim of the Study

The primary aim of this study is to evaluate and compare patient wait times in radiology departments of two selected hospitals in Benin City, one utilizing a scheduling system and the other operating without one.

Specific objectives:

1. To measure and compare patient wait times in the radiology departments of the two selected hospitals.
2. To provide recommendations for improving wait time management and service efficiency in radiology departments based on the study findings.

### 1.6 Significance of the Study

The findings will help hospital administrators and policymakers understand how implementing a scheduling system can reduce patient wait times and improve the overall efficiency of radiology departments. This can lead to faster diagnoses, better patient outcomes, and enhanced patient experience.

By addressing long patient wait times, the study can contribute to improving patient satisfaction. Patients who experience shorter wait times are likely to have more positive perceptions of healthcare services. The study will also provide insights into optimizing resource utilization, including better management of radiologists' time, reducing equipment underutilization, and improving patient throughput.

Additionally, the results can inform healthcare policies aimed at improving operational efficiency in hospitals, particularly public facilities where resources are constrained. This may encourage the adoption of scheduling systems in other departments, leading to broader improvements in healthcare management.

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1.7 Scope of the Study

The study will be conducted in two hospitals in Benin City: one with a scheduling system and one without. It will focus on evaluating patient wait times in the radiology departments of the selected hospitals (University of Benin Teaching Hospital and University of Benin Health Center).

**1.8 Operational Definitions of Terms**

**Patient Wait Time:** The total duration a patient spends waiting to receive radiology services, from arrival at the department to the completion of the imaging procedure.

**Scheduling System:** A formal method, either manual or electronic, used to organize, plan, and allocate time slots for patients to undergo imaging procedures, aiming to reduce waiting times and optimize workflow.

**Radiology Department:** The hospital section responsible for diagnostic imaging procedures such as X-rays, ultrasounds, CT scans, MRI scans, and other modalities. Size, technology, and staffing vary depending on the institution.

**Hospital with a Scheduling System:** A hospital where a structured system is in place for managing patient appointments and radiology procedures, aimed at reducing wait times and streamlining operations.

**Hospital without a Scheduling System:** A hospital where radiology services are provided without a formal scheduling system, leading to potential inefficiencies, uncoordinated patient flow, longer wait times, and underutilized resources.

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# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Conceptual Review

Efficient service delivery in radiography departments is crucial for prompt diagnosis, effective treatment planning, and patient satisfaction. One of the major challenges in such departments is prolonged patient wait time, which can significantly disrupt clinical workflows and negatively impact patient outcomes. The implementation of scheduling systems has emerged as a key solution to address problems related to patient flow. These systems are designed to streamline appointments, balance staff workload, optimize resource utilization, and ultimately reduce patient wait time.

This conceptual review focuses on key concepts relevant to this study, including patient wait time, scheduling systems, workflow efficiency in radiology, and patient satisfaction. A thorough understanding of these concepts is essential for evaluating the effectiveness of scheduling systems and their influence on service quality in hospitals with and without such systems, using Benin City as a case study.

### 2.1.1 Patient Wait Time in Radiography Departments

Patient waiting time is defined as the period a patient waits in the clinic before being attended by medical personnel (Umar et al., 2023). It can also refer to the time spent from entering the diagnostic room until the procedure is completed and the patient is discharged (Sobechukwu et al., 2024). Literature shows a strong inverse relationship between patient waiting time and

patient satisfaction. Satisfaction improves when healthcare workers meet patient expectations and minimize total time spent attending to each patient (Ogunfowokan & Mora, 2022).

The experience of waiting significantly influences a patient's perception of service quality. In some cases, patients judge healthcare personnel more based on waiting times than on their professional knowledge and skills (Booth et al., 2022). Shorter wait times can attract more patients, especially in competitive healthcare environments, as it reduces discomfort, anxiety, and disruption to daily life (Umar et al., 2021). Patients benefit from prompt attention through quicker symptom relief, timely diagnoses, and convenient appointments, whereas prolonged waiting can act as a barrier to accessing healthcare services.

Excessive waiting times can also create stress for both patients and staff (Booth et al., 2022). Although technological advancements such as picture archiving and communication systems (PACS), voice recognition software, and other diagnostic innovations have improved service efficiency, they have also increased costs. Longer waiting times generate numerous patient complaints and highlight areas needing improvement. Policymakers face the dual challenge of meeting growing patient demand for diagnostic services while controlling costs. Reducing waiting times not only improves patient satisfaction but can also enhance the financial performance of healthcare practices (Nelson et al., 2017; Umar et al., 2021).

The duration of waiting time varies across countries, healthcare centers, and even among patients. Studies report long waiting times in both developed and developing countries. In the United States, average waiting times of 60 minutes in Atlanta and 188 minutes in Michigan have been reported (Creswell, 2024). In Nigeria, average waiting times of 173 minutes have been recorded in Benin, while the University College Hospital, Ibadan, reported a mean waiting time

of 73 minutes for radiographic examinations. Another study by Nwobi (2024) at the University of Maiduguri Teaching Hospital found waiting times of 2–4 hours for special procedures.

Radiology departments such as the Aminu Kano Teaching Hospital provide a variety of services, including conventional and special radiographic examinations, computed tomography, mammography, and ultrasonography. Since conventional radiography typically serves the majority of patients, there is limited data on patient waiting times for these procedures. The current study seeks to evaluate waiting times for patients undergoing conventional radiography at the Aminu Kano Teaching Hospital. Findings from this research will serve as a baseline for making recommendations to relevant authorities and can guide departmental staff in improving patient flow and service delivery.2.1.2. Scheduling Systems in Radiology (Weave, 2025)

A patient scheduling system in radiology is a specialized software or digital platform designed to manage and optimize appointment booking for radiological procedures such as X-rays, CT scans, MRI, ultrasound, and other imaging services.

The primary aim of a scheduling system in radiology departments is to facilitate prompt and effective access to diagnostic imaging services. Its purpose is to minimize patient waiting periods, decrease the incidence of missed appointments, and maximize the utilization of both personnel and imaging equipment, thereby enhancing workflow efficiency and patient satisfaction (Towbin & Hawkins, 2017).

How It Works: Key Functionalities

**Appointment Booking**

1. Patients or healthcare personnel arrange imaging procedures through an online platform, telephone, or on-site scheduling system.
2. The system verifies the availability of the imaging modality (e.g., MRI scanner), staff assignments, and any necessary preparation time before confirming the appointment.

**Resource Allocation:** The system aligns each appointment with the necessary imaging equipment, assigns an available radiologist or technician, and ensures compliance with specific procedural protocols (e.g., contrast administration).

**Smart Time Slot Management:** Advanced algorithms optimize scheduling by preventing bottlenecks, avoiding overlap of time-intensive procedures, and prioritizing urgent or STAT examinations.

**Automated Reminders and Alerts:** Patients receive timely notifications via SMS, email, or mobile applications to confirm appointments, follow preparation instructions, and minimize the likelihood of missed appointments.

**Integration with RIS and PACS:** The scheduling system interfaces seamlessly with Radiology Information Systems (RIS) and Picture Archiving and Communication Systems (PACS) to access patient history, link appointments to imaging records, and streamline workflow from booking to report delivery.

**Analytics and Performance Monitoring:** The system tracks key metrics such as patient throughput, equipment downtime, waiting times, and no-show rates to support continuous operational improvement.

Customer satisfaction is a cornerstone of success in any business, and radiology is no exception. One of the major challenges for patients in radiology is prolonged wait times—whether in the waiting room, exam room, or post-procedure area. Many patients arrive anxious about their health, and delays in seeing a radiologist can intensify their stress. Non-medical aspects of care, such as registration efficiency, paperwork complexity, and waiting times, directly influence patient perceptions of service quality. These factors can affect satisfaction scores, which in turn impact reimbursement in value-based care systems. Reducing these non-clinical burdens is therefore critical for maintaining revenues and meeting care quality objectives.

Efficient scheduling in radiology ensures that healthcare providers receive diagnostic information promptly, enabling faster and more accurate treatment. However, scheduling is more than simply filling time slots. It requires balancing high patient volumes with complex imaging demands, technician availability, and accommodating cancellations or urgent referrals. Without sophisticated scheduling tools, this process can become chaotic.

A radiology scheduler manages patient appointments while capturing essential information about the imaging procedures to be performed. When done effectively, this leads to several benefits:

1. **Enhanced patient satisfaction:** Timely appointments reduce anxiety and improve overall experience. Patients can prepare in advance by knowing what to wear, eat, or bring.

2. **Optimized resource utilization:** Efficient scheduling maximizes the use of expensive imaging equipment such as MRI, CT, X-ray, and ultrasound machines, preventing idle time.
3. **Minimized downtime:** Streamlined scheduling reduces bottlenecks, ensures all required documentation and physician orders are ready, and improves workflow.

    a. Challenges to efficient scheduling include:

1. **High demand with limited resources:** Balancing patient volume with available staff and equipment often requires advanced software, which some facilities may lack.
2. **Complex appointment types:** Different imaging modalities have unique time requirements, equipment needs, and specialized staff, making scheduling more intricate.
3. **Patient no-shows and cancellations:** Last-minute changes, walk-ins, and urgent requests can disrupt planned schedules.

    a. To address these challenges, radiology departments can implement the following strategies:

1. **Adopt advanced online scheduling software:** Tools with real-time appointment creation, automated reminders, and integration with electronic health records streamline the booking process.
2. **Prioritize sub-specialty scheduling:** Align radiologists' schedules with their specialties to maintain continuity and prevent gaps in care.
3. **Enable patient self-scheduling:** Online booking enhances convenience for patients and reduces administrative workload.
4. **Automate reminders:** Sending SMS or email reminders helps reduce no-shows and ensures patients attend their appointments.

## 2.2 THEORETICAL REVIEW

**2.2.1 Queuing Theory (Green, 2016)** Queuing Theory serves as a foundational framework for analyzing patient waiting times. It applies mathematical models to study the behavior of waiting lines, offering insights into service efficiency in healthcare settings. In radiology departments, queuing theory helps explain patient accumulation, average waiting durations, and the effect of resource constraints—such as limited staff or imaging equipment—on service delivery. This is particularly useful when comparing departments operating with and without structured scheduling systems.

**2.2.2 Donabedian's Model of Healthcare Quality (Donabedian, 2015)** Donabedian's framework evaluates healthcare quality through three dimensions: structure, process, and outcomes. It is instrumental in assessing differences between radiology departments with and without scheduling systems.

- **Structure:** Refers to the physical and organizational infrastructure, such as the availability of scheduling software, trained personnel, and necessary facilities.
- **Process:** Encompasses activities including patient registration, appointment scheduling, imaging procedures, and reporting.
- **Outcome:** Captures measurable results, including shorter patient wait times, increased satisfaction, and reduced congestion within the department.

**2.2.3 Lean Management Theory in Healthcare (Womack & Jones, 2023)** Lean Management, adapted from the Toyota Production System, focuses on optimizing processes and eliminating inefficiencies, including delays caused by poor scheduling. Radiology

departments with structured scheduling systems are more likely to incorporate Lean principles to streamline workflow, minimize patient idle time, reduce congestion, and enhance overall operational efficiency.

## 2.3 EMPIRICAL REVIEW

An empirical review involves critically examining previous research to identify patterns, evidence, and insights related to the current study problem. This section reviews recent studies relevant to the comparative analysis of patient wait times in radiology departments with and without scheduling systems, with a focus on findings that align with the objectives of this research.

### 2.3.1 Impact of Scheduling Systems on Patient Wait Times

Efficient appointment scheduling is a key factor in minimizing patient waiting times in radiology departments. For instance, Akintomide et al. (2019) conducted a prospective, descriptive study involving 350 patients referred to an ultrasound unit in Nigeria over six weeks. Patients were categorized into two groups: those with scheduled appointments and those without. Arrival times, appointment times, and the duration of examinations were recorded. Findings revealed that congestion was primarily caused by ineffective booking and delays by sonologists. Large appointment blocks (over 20 patients) and inconsistent scheduling contributed to prolonged waiting times, which averaged 132.11 minutes (ranging from 62 to 220 minutes). Patients arriving after 11:00 am experienced shorter waits. The study recommended structured scheduling in smaller 30-minute blocks and introducing point-of-care ultrasound in outpatient clinics to reduce congestion and enhance patient satisfaction.

Similarly, Huang (2023) examined a scheduling scheme that considers patient-specific characteristics. The proposed approach demonstrated up to a 71% reduction in patient wait times, increased radiographer utilization by 83%, lowered overall costs by 54%, and improved patient access by 1.25 times compared to existing schedules. These findings underscore the effectiveness of customized scheduling systems in optimizing radiology department efficiency, improving patient flow, and maximizing the use of medical resources.

### 2.3.2 Influence on Patient Satisfaction

Patient satisfaction in radiology is strongly influenced by waiting times. Anderson (2017) conducted a cross-sectional survey of 5,030 patients to identify the determinants of satisfaction with primary care. The study found that wait times, communication, and care coordination were critical factors affecting satisfaction. Patients valued seven key domains of healthcare quality—access, communication, provider demeanor, medical care processes, continuity, facility quality, and staff behavior. Deficiencies in communication, care coordination, interpersonal skills, and accessibility were major contributors to negative ratings.

Morales et al. (2024) explored strategies to reduce wait times and improve satisfaction using a hybrid framework combining a multiple linear regression (MLR) model with simulation-based optimization. By simulating scenarios to address bottlenecks and resource constraints, the study achieved reductions in registration wait time (15%), vitals (20%), and doctor consultation (25%), with overall processing times improving by 10–15%. The system reduced total patient wait by an average of 22.5 minutes, demonstrating the value of integrating predictive analytics and operational improvements for efficient patient flow management.

### 2.3.3 Comparative Studies on Scheduling Systems

Comparative analyses highlight operational differences between departments with and without scheduling systems. Akintomide et al. (2019) emphasized that ineffective booking and staff tardiness in a Nigerian ultrasound unit created congestion and prolonged wait times. The study suggested small, evenly spaced appointment blocks and point-of-care ultrasound to improve efficiency and patient satisfaction.

Olisemeke et al. (2024) reviewed 57 studies evaluating the impact of service delivery initiatives (SDIs) on radiology patient wait times. Interventions included extended scope practice (ESP), quality management strategies (e.g., Six Sigma, Lean), productivity-enhancing technologies (PETs), multiple interventions, outsourcing, and pay-for-performance. While study designs were often uncontrolled and reporting quality was poor, some SDIs—particularly ESP, Lean methodologies, and PETs (e.g., speech recognition reporting, teleradiology, computerized order entry)—showed promise in reducing waiting times. The authors recommended improved study designs and standardized definitions of patient wait times to enable future meta-analyses and more comparable results across settings.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Research Setting

This study was conducted in two hospitals in Benin City with differing approaches to patient scheduling. The first hospital, University of Benin Teaching Hospital (UBTH), utilizes a structured scheduling system, while the second, University of Benin Health Care Centre, operates without a formal scheduling system. Both institutions house radiography departments that provide a range of diagnostic imaging services to patients. The University of Benin Health Care Centre is located within the University of Benin campus, making it accessible to a diverse patient population.

## 3.2 Study Design

A comparative cross-sectional survey design was employed for this study. This design allowed for the assessment and comparison of patient wait times between the two radiology departments under different scheduling protocols. By examining the two hospitals simultaneously, the study aimed to identify differences in service efficiency, patient flow, and waiting experiences.

## 3.3 Target Population

The target population for this research included all patients attending the radiology departments of the selected hospitals over a three-month period. The study focused on individuals who were scheduled for or seeking diagnostic imaging services during this timeframe.

### 3.4 Sampling Technique

A combination of stratified random sampling and purposive sampling was used to ensure representative participation from both hospitals. Patients were divided into two strata: Stratum 1, consisting of patients from UBTH (with a scheduling system), and Stratum 2, consisting of patients from the University of Benin Health Care Centre (without a scheduling system). This approach allowed for equitable representation of patients from both hospitals while targeting those directly relevant to the study objectives.

### 3.5 SAMPLE SIZE

Using the formula,

$$n = \frac{(\frac{Z\alpha}{2} + Z\beta)^2 (2\sigma)^2}{\triangle^2}$$

where;

- n = sample size
- $\frac{Z\alpha}{2} = 19.6$
- $Z\beta = 0.842$
- $\sigma = 18$
- $\triangle = 6.4$

$$n = \frac{(19.6 + 0.842)^2 (2x18)^2}{6.4^2}$$

$n = 249$ (Group A = 125, Group B = 124).

### 3.6 Instrument for Data Collection

The main tool for gathering data in this study was a structured questionnaire (see Appendix I). The questionnaire was designed to collect both quantitative and qualitative information regarding patient wait times in the selected hospitals in Benin City. Additionally, a structured observation checklist was employed to objectively record actual waiting times at different stages of the patient's visit, ensuring accurate and verifiable measurements. The instrument included items covering socio-demographic information, scheduling status, types of radiological procedures, waiting duration, and patient perceptions of service efficiency.

### 3.7 Validity of the Instrument

Validity refers to the extent to which an instrument measures what it is intended to measure. To ensure content and face validity, the questionnaire was reviewed by experts in radiography as well as the researcher's supervisor. Their feedback helped refine the instrument to ensure that all questions were relevant, clear, and comprehensive with respect to the objectives of the study.

### 3.8 Reliability of the Instrument

Reliability pertains to the consistency and stability of results obtained using an instrument over time. To ensure reliability:

Internal Consistency: Cronbach's Alpha was used to assess how closely related the items in each section of the questionnaire were, confirming that they measured the same underlying construct.

Pilot Testing: A pilot study was conducted with approximately 10% of the intended sample, drawn from patients in hospitals within Benin City. The pilot helped determine the average time needed to complete the questionnaire, identify potential difficulties, and ensure that terminology

was clear and understandable from the participants' perspective. Feedback from participants indicated that the items were clear, comprehensive, and easy to complete.

Adaptation from Previous Research: The reliability testing was guided by a previous study conducted by Grasdalsmoen et al. (2019), ensuring methodological rigor.

### 3.9 Method of Data Collection

Data were collected primarily through the self-administered structured questionnaire, which was distributed to patients attending the selected healthcare facilities in Benin City. The data collection process took place over a period of 3–4 weeks to ensure an adequate number of responses and a representative sample.

### 3.10 Method of Data Analysis

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) version 28.0. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarize demographic characteristics and patient wait times. Inferential statistics were applied to test hypotheses, with a significance level set at $p < 0.05$.

### 3.11 Ethical Considerations

Ethical approval for this study was obtained from the Ethics Committee of University of Benin Teaching Hospital (UBTH), Benin City, Edo State. Participants were informed that their involvement was entirely voluntary and that they could withdraw at any time without any negative consequences. Measures were taken to ensure anonymity and confidentiality, including providing participants with a covering letter outlining these protections. Written informed

consent was obtained from all participants, and radiographers involved in the study also provided written permission prior to participation.

# CHAPTER FOUR

# RESULTS

## 4.0 Introduction

This chapter presents the findings of the study on the evaluation and comparison of the patient wait times in radiology departments of two selected hospitals in Benin City, one utilizing a scheduling system and the other operating without a scheduling system. The data was collected from 249 respondents who are patients at the radiology departments of these two hospitals.

## 4.1 Socio-demographic variables of Study Population

Table 4.1 provides an overview of the socio-demographic characteristics of the 249 respondents who participated in the study. Out of the respondents, about 208 participants had visited the hospital's radiology department. These characteristics include age, gender, educational level and the hospital attended. The majority of respondents (24.5%) fall within the 36-45 years age group, followed by 46-55 years (22.5%) and 26-35(20.9%). The lowest proportion of respondents is in the 18-25 years (15.7%). The study includes more male respondents (57.8%) than females (42.2%). A significant portion of the respondents have secondary education (31.3%), primary education (28.1%) and tertiary education (19.7%), indicating a relatively educated population. Only 20.9% of respondents have no formal education. Among the participants, 58.2%attend University of Benin Teaching Hospital (with scheduling system) while 41.8%attend University of Benin Healthcare Centre (without scheduling system).

**Table 4.1 Socio-demographic variables of Study Population**

| Variables | Frequency (n= 249) | Percentage (%) |
|---|---|---|
| **Age** | | |
| **18-25** | 39 | 15.7 |
| **26-35** | 52 | 20.9 |
| **36-45** | 61 | 24.5 |
| **46-55** | 56 | 22.5 |
| **56 and above** | 41 | 16.5 |
| **Gender** | | |
| **Male** | 144 | 57.8 |
| **Female** | 105 | 42.2 |
| **Educational level** | | |
| **No formal education** | 52 | 20.9 |
| **Primary education** | 70 | 28.1 |
| **Secondary education** | 78 | 31.3 |
| **Tertiary education** | 49 | 19.7 |
| **Hospital's Radiology department attended** | | |
| **University Of Benin Teaching Hospital (with scheduling system)** | 145 | 58.2 |
| **University Of Benin Healthcare Center (without scheduling system)** | 104 | 41.8 |

## 4.2 Patient Visit and Wait-time Experience of Patients in Radiology Departments

Table 4.2 presents the experience of patients' visit and wait-time in radiology departments in these healthcare organizations with differing scheduling systems. Among the 249 participants who had visited the radiology departments', 58.2% of respondents were scheduled for an

appointment before coming for the radiology service while 41.8% were not scheduled. Of these 249 participants, 29.7% visited for X-ray procedures, 26.1% for MRI, 24.1 for CT scan and 20.1% for Ultrasound. For patients (58.2%) who attended hospitals with scheduling time it took about 10-20 minutes for them to be attended to while for patients (41.8%) who attended the healthcare center, it took more than 45 minutes to be provided service. Generally, 78.3% consider the waiting time acceptable while 21.7% consider the waiting time unacceptable. Only about 11.2% of these respondents who had visited the radiology departments rate the mode and way of communicating waiting time has been fair while 11.6% consider communication about delays and waiting-times to be poor and the other 77.2% consider communication excellent/good. Regarding the level of satisfaction among the 249 participants, majority (72.3%) were very satisfied/satisfied and 17.4% of those very dissatisfied/dissatisfied.

**Table 4.2 Visit and Wait-time Experience of Patients in Radiology Departments**

| Variables | Category | Number examined (%) |
|---|---|---|
| **Procedure Type** | **MRI** | **65(26.1)** |
| | **X-ray** | **74(29.7)** |
| | **CT scan** | **60(24.1)** |
| | **Ultrasound** | **50(20.1)** |
| **How was the appointment scheduled?** | **Scheduled appointment** | **145(58.2)** |
| | **Walk in(Unscheduled appointment)** | **104(41.8)** |
| **Time of Arrival** | **Morning (before 12pm)** | **118(47.4)** |
| | **Afternoon(12pm-5pm)** | **103(41.4)** |
| | **Evening (after 5pm)** | **28(11.2)** |
| **Wait time before being attended to** | **10 - 20 minutes** | **145(58.2)** |

| | | |
|---|---|---|
| | **Above 45 minutes** | **104(41.8)** |
| **Do you consider this waiting time to be acceptable?** | **Yes** | **195(78.3)** |
| | **No** | **54(21.7)** |
| **How would you rate the communication about delays or waiting times?** | **Excellent** | **156(62.7)** |
| | **Good** | **36(14.5)** |
| | **Fair** | **28(11.2)** |
| | **Poor** | **29(11.6)** |
| **How satisfied are you with the radiology service timing overall?** | **Very Satisfied** | **170(68.3)** |
| | **Satisfied** | **10(4.0)** |
| | **Neutral** | **23(9.2)** |
| | **Dissatisfied** | **19(7.6)** |
| | **Very Dissatisfied** | **27(10.8)** |

## 4.3 Measures that can be taken to reduce the Wait-time of Patients in Radiology Departments

Table 4.3 captures insights into participants' perspectives on measures that can be taken to reduce the wait time of patients in radiology departments. Most people seem to trust that an electronic scheduling system should be implemented with about 74.7% strongly agreeing and 16.9% agreeing. This suggests that many see the advantages of an electronic means that will bring about time efficiency, accessibility and improved organization. When it comes to the radiographers' availability, there's really a need to increase staffs in the department. 29.3% agree, and 40.6% strongly agree that radiology staffs should be employed. Also, the presence of workable equipments could still reduce the wait-time,63% were either agreed or were neutral while 34.1%

disagreed. When administrative policies like registration and payment are simplified, it can also lead to enhance service provision to patients, 28.9% agree, and 49.4% strongly agree. The influence of patients' bookings and appointments are also great measures to be taken, 49.4% agree and 28.5% strongly agree. Finally, there's a clear desire for more education and orientation. With 43.4% agreeing and 28.9% agreeing, it's evident that many believe educating patients help minimize delays caused by misunderstandings and unpreparedness.

**Table 4.3 Measures that can be taken to reduce the Wait-time of Patients in Radiology Departments**

| **Statement** | **Strongly Agree (%)** | **Agree(%)** | **Neutral (%)** | **Disagree( %)** | **Strongly Disagree (%)** |
|---|---|---|---|---|---|
| Electronic scheduling system should be implemented. | 186(74.7) | 42(16.9) | 6(2.4) | 8(3.2) | 7(2.8) |
| More radiology staff should be employed. | 101(40.6) | 73(29.3) | 59(23.7) | 10(4.0) | 6(2.4) |
| Number of imaging machines should be increased. | 7(2.8) | 64(25.7) | 93(37.3) | 77(30.9) | 8(3.2) |
| Administrative processes (registration, payment, reporting) should be streamlined. | 123(49.4) | 72(28.9) | 41(16.5) | 5(2.0) | 8(3.2) |
| Patient appointment/booking systems should be introduced. | 71(28.5) | 123(49.4) | 39(15.7) | 9(3.6) | 7(2.8) |
| Patient education and orientation should be provided. | 72(28.9) | 108(43.4) | 13(5.2) | 49(19.7) | 7(2.8) |

### 4.4 Test of Hypothesis

The researcher employed T-test statistics to test the hypothesis at a significance level of 0.05. The choice rule was based on the p-value linked with the T-test. Thus, if the p-value is less than 0.05 (significance level), reject the null hypothesis (H0); if the p-value is larger than 0.05, accept H0.

The following hypothesis was confirmed and tested using T-test statistics:

**H1;** There is significant difference of patient wait time between the selected radiology departments with and without a scheduling system.

| Comparison | Outcome | Group A (With Scheduling, n= 145) | Group B (Without Scheduling, n= 104) | p-value |
|---|---|---|---|---|
| Overall Wait-time | Mean Wait-time(**minutes**) | **14.55** | **58.80** | **<0.05** |
| Wait-time by Procedure: X-ray | Mean Wait-time(**minutes**) | **10.00** | **45.00** | **<0.05** |
| Wait-time by Procedure: MRI | Mean Wait-time(**minutes**) | **10.00** | **45.00** | **<0.05** |
| Wait-time by Procedure: CT scan | Mean Wait-time(**minutes**) | **15.00** | **60.00** | **<0.05** |
| Wait-time by Procedure: Ultrasound | Mean Wait-time(**minutes**) | **20.00** | **70.00** | **<0.05** |
| Satisfaction with Wait- time | %Very satisfied | **93% (135/145)** | **34% (35/104)** | **<0.05** |

***<0.05 – Statistically significant**

## 4.5 Discussion of Findings

The sociodemographic characteristics of the study participants revealed notable patterns that both align with and diverge from existing literature. The majority of respondents (24.5%) were aged 36–45 years, followed by 46–55 years (22.5%) and 26–35 years (20.9%), while the smallest proportion (15.7%) were aged 18–25 years. In terms of gender distribution, male respondents accounted for 57.8%, whereas females represented 42.2% of the sample. Educational attainment among participants showed that a significant portion had completed secondary education (31.3%), primary education (28.1%), and tertiary education (19.7%), indicating a relatively educated population, with only 20.9% having no formal education. Among the participants, 58.2% attended the University of Benin Teaching Hospital (UBTH) with a scheduling system, while 41.8% attended the University of Benin Health Care Centre without a scheduling system.

Regarding patient visits and wait-time experiences in the radiology departments, 58.2% of respondents had scheduled appointments prior to their visit, while 41.8% did not. The distribution of procedures among the 249 participants included X-ray (29.7%), MRI (26.1%), CT scan (24.1%), and ultrasound (20.1%). Patients attending hospitals with scheduling systems were attended to within 10–20 minutes, whereas those at hospitals without scheduling systems waited more than 45 minutes. These findings are consistent with Akintomide et al. (2019), who recommended structured appointment schedules with smaller patient blocks to reduce congestion and improve satisfaction. Overall, 78.3% of respondents considered the waiting time acceptable, while 21.7% viewed it as unacceptable.

Communication regarding waiting times was generally perceived positively, with 77.2% rating it as good or excellent. Only 11.2% rated communication as fair, and 11.6% as poor. In terms of

overall satisfaction, the majority of participants (72.3%) reported being very satisfied or satisfied, whereas 17.4% indicated dissatisfaction.

Concerning strategies to reduce patient wait times in radiology departments, a strong preference for electronic scheduling systems was evident, with 74.7% of respondents strongly agreeing and 16.9% agreeing that such systems would improve efficiency, accessibility, and organization. Increasing the number of radiology staff was also highlighted as a key measure, with 40.6% strongly agreeing and 29.3% agreeing on the need for additional personnel. Regarding equipment availability, 63% of respondents agreed or were neutral that functional equipment could reduce wait times, while 34.1% disagreed. Simplifying administrative policies, including registration and payment procedures, was supported by 49.4% strongly agreeing and 28.9% agreeing. Similarly, enhancing patient bookings and appointment management received substantial support, with 28.5% strongly agreeing and 49.4% agreeing. These findings correspond with Morales et al. (2024), who emphasized that combining predictive modeling with operational adjustments—such as increasing staff during peak hours, optimizing workflows, and automating tasks—can substantially reduce patient waiting and processing times.

Finally, hypothesis testing indicated that comparisons between the two groups (hospitals with and without scheduling systems) yielded p-values less than 0.05, demonstrating statistical significance. Consequently, the null hypothesis was rejected, and the alternative hypothesis accepted, confirming that patient wait times differ significantly between radiology departments with and without a scheduling system.

# CHAPTER FIVE

# CONCLUSION, RECOMMENDATIONS AND LIMITATIONS OF STUDY

## 5.1 Introduction

This chapter presents the conclusion and key recommendations derived from the evaluation and comparison of patient wait times in the radiology departments of two selected hospitals in Benin City—one operating with a structured scheduling system (University of Benin Teaching Hospital) and the other without a scheduling system (University of Benin Health Care Centre). The findings of this study provide insights into how scheduling practices influence patient flow, satisfaction, and overall service efficiency, and form the basis for evidence-based recommendations aimed at improving radiology service delivery.

## 5.2 Conclusion

This study assessed and compared patient wait times in the radiology departments of two hospitals in Benin City—one utilizing a structured scheduling system and the other operating without such a system. The findings indicate that the hospital with a scheduling system consistently experienced shorter patient wait times, more efficient workflow management, and higher levels of patient satisfaction. In contrast, the hospital without a scheduling system faced longer queues, frequent congestion, and delays in image acquisition and reporting, which negatively impacted operational efficiency and patient experience. These results underscore the importance of structured scheduling in radiology departments, demonstrating that such systems can significantly reduce waiting times, optimize the use of personnel and equipment, and ultimately improve the quality of radiological services delivered to patients.

### 5.3 Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance patient wait time management and overall service efficiency in radiology departments:

1. **Adoption of Scheduling Systems:** Hospitals currently operating without structured scheduling systems should implement either computerized or manual scheduling protocols to manage patient flow efficiently and minimize waiting times.
2. **Integration with Digital Systems:** The integration of Radiology Information Systems (RIS) and Electronic Health Records (EHR) can streamline appointment scheduling, reduce administrative delays, and facilitate timely delivery of radiological services.
3. **Continuous Monitoring and Assessment:** Hospitals should regularly monitor patient flow and waiting time metrics to identify operational inefficiencies and guide continuous improvements in service delivery.
4. **Staff Training:** Radiology personnel should receive adequate training on effective patient scheduling, time management, and communication skills to ensure strict adherence to appointment times and enhance service quality.
5. **Patient Education:** Patients should be informed about the importance of keeping scheduled appointments to reduce delays and maintain smooth departmental operations.
6. **Policy Development:** Hospital management should establish policies that prioritize minimizing patient wait times through the adoption of scheduling systems, coupled with the use of performance monitoring indicators to evaluate effectiveness.

## 5.4 Limitations of the Study

Despite the insights gained, this study had several limitations that should be considered when interpreting the findings:

1. **Limited Scope:** The study was conducted in only two hospitals, which may not fully represent all radiology departments or healthcare facilities, thereby limiting the generalizability of the results.
2. **Variations in Hospital Characteristics:** Differences in case mix, staff strength, equipment availability, and overall departmental workload between the two hospitals could have influenced patient wait times independently of the presence or absence of a scheduling system.
3. **Potential Bias in Wait Time Measurement:** Wait time data were collected through a combination of manual observation and patient self-reporting, which may have introduced observer or recall bias.
4. **Fluctuations in Patient Volume:** Variations in patient flow due to time of day, day of the week, or unforeseen events such as equipment breakdowns or emergency cases may have affected the accuracy of the measured wait times.
5. **Procedure Complexity:** The study did not account for differences in the complexity of radiological procedures (e.g., MRI versus X-ray), which naturally influence patient throughput and waiting times.

### 5.5 Suggestions for further studies

Based on the findings and limitations of this study, the following recommendations are proposed for future research:

1. **Multicenter Replication:** Conduct studies across multiple hospitals, including teaching, private, mission, and tertiary facilities, to evaluate the generalizability of findings. Use a standardized protocol, a larger sample size, and stratify results by hospital type.
2. **Randomized Controlled Trials of Scheduling Models:** Randomly assign clinic days or patient blocks to "scheduled" versus "walk-in" systems to minimize confounding. Evaluate outcomes such as wait times, patient satisfaction, and no-show rates.
3. **Interrupted Time-Series / Before-and-After Studies:** Implement a scheduling system in a hospital and collect repeated measures of wait times, throughput, and staff workload before and after implementation to assess causal impacts over time.
4. **Mixed-Methods Studies on Stakeholders' Perspectives:** Combine quantitative measurements of wait times with qualitative interviews or focus groups involving patients, radiographers, schedulers, and administrators to explore barriers, acceptability, and unintended effects of scheduling systems.
5. **Time-Motion and Workflow Analysis:** Use direct observation and time stamps to map detailed patient flow (registration → waiting → imaging → reporting) to identify bottlenecks that scheduling alone may not address.
6. **Cost-Effectiveness and Resource Utilization Analysis:** Assess costs (staff time, overtime, equipment idle time) and benefits (reduced wait time, increased throughput) of scheduled versus unscheduled systems to inform policy and management decisions.

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## APPENDIX I

# QUESTIONNAIRE

**RESEARCH TITLE:** A COMPARATIVE STUDY OF RADIOLOGY PATIENTS WAIT TIMES IN TWO HOSPITALS IN BENIN CITY WITH AND WITHOUT A SCHEDULING SYSTEM. I am a researcher in the Department of Radiography, School of Basic Medical Science, University of Benin, Benin City; I am carrying out research on the above topic in partial fulfillment for the award of Bachelor of Radiography degree.
Could you please spare some of your time to fill this questionnaire?

Your cooperation and support are deeply appreciated.

**GENERAL INSTRUCTION FOR PARTICIPANTS:**

- Do not write personal details not asked (for example phone number) and be truthful as much as possible
- Tick [√] where appropriate
- Please answer all questions

## SECTION 1: Demographic Information

*(Tick (✓) the appropriate response or fill in where necessary.)*

3 **Age Group:** 18–25 years: [ ]; 26–35 years [ ]; 36–45 years [ ]; 46–55 years [ ]; 56 years and above [ ].

4 **Gender:** Male [ ]; Female [ ].

5 **Level of Educational:** No formal education [ ]; Primary School [ ]; Secondary [ ]; Tertiary [ ].

**6 Hospital's Radiology department attended:**

- University Of Benin Teaching Hospital(with scheduling system)

[ ];

- University Of Benin Healthcare Center(without scheduling system)

  [ ].

## SECTION B: Patient Visit and Wait Time Experience in the Radiology Department

*(Tick (✓) the appropriate response or fill in where necessary.)*

- **What type of radiology procedure did you have today?**

  X-ray [ ]; MRI [ ]; CT scan [ ]; Ultrasound [ ];

- **How was the appointment scheduled?**

  Scheduled appointment [ ]; Walk-in(Unscheduled) [ ]

- **What time of the day did you arrive at the department?**

  Morning (before 12pm) [ ]; Afternoon (12pm-5pm) [ ] ; Evening (after 5pm) [ ]

- **How long did you wait before you were attended to? (Enter time in minutes e.g. 10 or 15).**

  _____minutes

- **Do you consider this waiting time to be acceptable?**

  Yes [ ]; No [ ];

- **How would you rate the communication about delays or waiting times?**

  Excellent [ ]; Good [ ]; Fair [ ]; Poor [ ]; No communication at all [ ];

- **How satisfied are you with the radiology service timing overall?**

  Very satisfied [ ]; Satisfied [ ]; Neutral [ ]; Dissatisfied [ ]; Very dissatisfied [ ];

## SECTION C: RECOMMENDATIONS FOR IMPROVEMENT

- **. Which measures do you think will help reduce waiting time in the radiology department?**

  *(Please indicate your level of agreement using the scale below for each item.)*

**Scale: 1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree**

| S/N | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | **Implementing an electronic scheduling system** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |
| 2 | **Employing more radiology staff** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |
| 3 | **Increasing the number of imaging machines** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |
| 4 | **Streamlining administrative processes (registration, payment, reporting)** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |

| S/N | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 5 | **Introducing patient appointment/booking systems** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |
| 6 | **Providing patient education and orientation** | [ ]. | [ ]. | [ ]. | [ ]. | [ ]. |

- **What other recommendations would you suggest for improving wait time and service delivery in radiology department?**

  *(Open-ended)*

  _____

  _____

  _____

  _____

**Thank you for your participation in this questionnaire. Your input is essential to the success of this research project. Your responses will be kept confidential, and your involvement is greatly appreciated.**

**APPENDIX II**

# INFORMED CONSENT FORM

Dear Sir/Ma,

## Permission to Include Your Facility/Site in a Research

**Title of Research:** A COMPARATIVE STUDY OF RADIOLOGY PATIENTS WAIT TIMES IN TWO HOSPITALS IN BENIN CITY WITH AND WITHOUT A SCHEDULING SYSTEM.

**Principal Investigator:** (1) - **MRS IGBINEDION F.O**

**Co-Investigator:** (2) - **ADANLAWO OLUWASEUN ABIMBOLA**

**Institution and Contact Address:** Department of Radiography,
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University of Benin,
P. M. B 1154
Benin City, Edo State.

**Phone Number:** +234 906 322 1780

| | |
|---|---|
| **Email address:** | Abimbolafisayomi27@gmail.com |
| **Commencement Date of Research:** | July, 2025. |
| **Proposed duration of Research:** | Two (2-3) Months |
| **Financial Sponsors:** | Self-Sponsored Research. |
| **Conflict of Interest:** | We declare that there is no conflict of interest |

**The Purpose of Research:** The specific objective is to evaluate and compare the patient wait times in radiology departments of two selected hospitals in Benin City, one utilizing a scheduling system and the other operating without a scheduling system.

**Sample Size:** Two Hundred and Forty-Nine (249).

**Procedure Involved in the Study:** Administration of structed questionnaire.

**Research Design and method:** The study is a comparative cross-sectional survey.

**Benefits to Participants:** No special benefits to the participants.

**Risk to Participant:** There is no risk to participants

**Compensation/Inducement:** Participants will receive no financial compensation and will not be forced to participate.

**Statement of Voluntaries and Circumstances for withdrawal:** Participants are allowed to withdraw from the research at any stage and the withdrawal will have no adverse effect on them in any form.

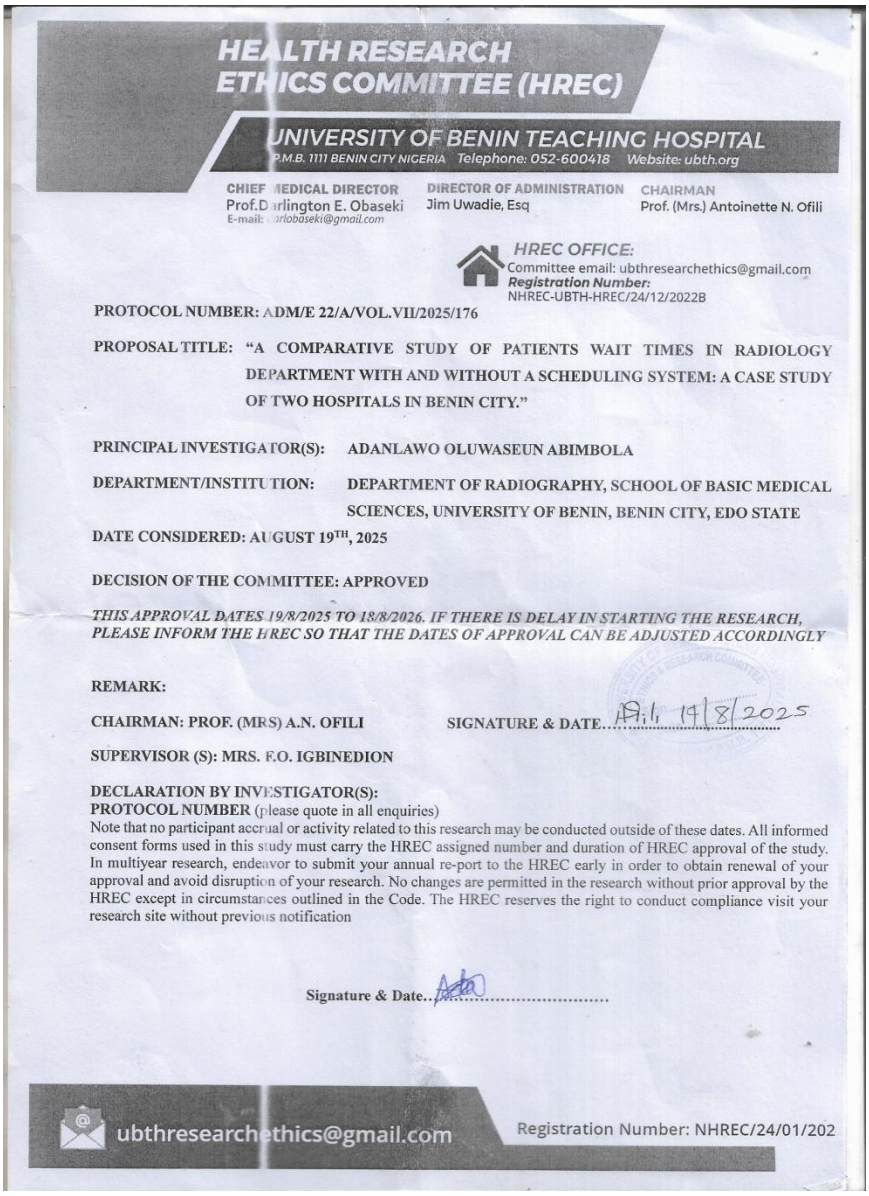
**Confidentiality of Participant:** To protect patient privacy, the following measures will be implemented: All patient identifiers (name, hospital number, date of birth) will be removed

before data analysis. Each record will be assigned a unique study code to replace personal identifiers.

Only authorized research personnel will have access to the raw data.

## APPENDIX III

## ETHICAL APPROVAL



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

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Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/176

PROPOSAL TITLE: "A COMPARATIVE STUDY OF PATIENTS WAIT TIMES IN RADIOLOGY DEPARTMENT WITH AND WITHOUT A SCHEDULING SYSTEM: A CASE STUDY OF TWO HOSPITALS IN BENIN CITY."

PRINCIPAL INVESTIGATOR(S): ADANLAWO OLUWASEUN ABIMBOLA

DEPARTMENT/INSTITUTION: DEPARTMENT OF RADIOGRAPHY, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

DATE CONSIDERED: AUGUST 19TH, 2025

DECISION OF THE COMMITTEE: APPROVED

*THIS APPROVAL DATES 19/8/2025 TO 18/8/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY*

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE..... 19/8/2025

SUPERVISOR (S): MRS. F.O. IGBINEDION

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual re-port to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date.....

ubthresearchethics@gmail.com Registration Number: NHREC/24/01/202