THE RELATIONSHIP BETWEEN PATIENT CHARACTERISTICS AND WAITING TIME FOR LABORATORY RESULTS WITH OUTPATIENT SATISFACTION AT DR. H. ABDUL MOELOEK GENERAL HOSPITAL LAMPUNG

(Thesis)

By

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FACULTY OF MEDICINE
UNIVERSITAS LAMPUNG
BANDAR LAMPUNG
2026

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I hereby declare that this thesis is **my own original work**. If it is later proven that there is plagiarism or fraud in this thesis, I am willing to accept the consequences.

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BIOGRAPHY

The author of this thesis is Ilma Nafia, was born in Magelang on July 2, 2004, as the first of three children of Mr. Tri Wahyono and Mrs. Siti Nurohmah. The author has one brother, Ahmad Abdurrahman, and one sister, Alma Solihah. The author attended her first school at Pertiwi 1 Bandongan Kindergarten, then continued her education at SD Negeri 1 Bandongan (2010-2016), SMP Negeri 7 Magelang (2016-2019), and SMA Negeri 1 Magelang (2019-2022). During school, the author actively participated in mathematics competitions and the English Speaking Club (ESC). After graduating from high school in 2022, the author continued his studies in the Medical Education Study Program at the Universitas Lampung through the UTBK-SBMPTN. This study program will be the author's field of study during his undergraduate or preclinical and clinical education. During his university years, the author was also actively involved in CIMSA and the FSI Ibnu Sina academic division.

“This work is dedicated to my beloved Father, Mother, Siblings, big family, friends, and beloved teachers”

– Ilma Nafia –

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The Author acknowledges that there are still many imperfections in this thesis. Therefore, the Author welcomes constructive criticism and suggestions. The Author hopes that this thesis will benefit its readers.

Bandar Lampung, January 12, 2026
The Author

Ilma Nafia

ABSTRACT

THE RELATIONSHIP BETWEEN PATIENT CHARACTERISTICS AND WAITING TIME FOR LABORATORY RESULTS WITH OUTPATIENT SATISFACTION AT RSUD DR. H. ABDUL MOELOEK LAMPUNG

By

ILMA NAFIA

Background: Patient satisfaction is an important indicator in assessing the quality of healthcare services, including clinical laboratory services. Outpatients often demand fast, accurate services, so patient characteristics and the waiting time for laboratory test results are thought to play a role in determining patient satisfaction. This study aims to determine the relationship between patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory test results with outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital Lampung.
Methods: This study used a quantitative, cross-sectional analytical design on 107 outpatients who underwent laboratory tests using consecutive sampling according to the inclusion and exclusion criteria. Patient characteristics and satisfaction data were collected via questionnaires, while waiting time data were collected via TAT. Univariate data analysis consisted of frequency distributions and percentages, while bivariate testing used the Chi-Square test.
Results: There was a significant relationship between age, the highest level of education, and waiting time for laboratory service results with outpatient satisfaction ($p < 0.001$). Meanwhile, gender ($p = 0.836$) and occupation ($p = 0.688$) did not show a significant relationship with patient satisfaction.
Conclusions: Outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital Lampung is associated with age, the highest level of education, and waiting time for laboratory results. Therefore, the hospital is expected to continue improving the efficiency of laboratory services and reduce waiting times, while paying attention to patient characteristics to increase patient satisfaction.

Keywords: patient satisfaction, patient characteristics, waiting time, laboratory services, outpatients

ABSTRAK

HUBUNGAN KARAKTERISTIK PASIEN DAN WAKTU TUNGGU HASIL PELAYANAN LABORATORIUM TERHADAP KEPUASAN PASIEN RAWAT JALAN DI RSUD DR. H. ABDUL MOELOEK PROVINSI LAMPUNG

Oleh

ILMA NAFIA

Latar Belakang: Kepuasan pasien merupakan indikator penting dalam menilai mutu pelayanan kesehatan, termasuk pelayanan laboratorium klinik. Pasien rawat jalan seringkali menuntut pelayanan yang cepat dan tepat, sehingga karakteristik pasien serta waktu tunggu hasil pemeriksaan laboratorium diduga berperan dalam menentukan kepuasan pasien. Penelitian ini bertujuan untuk mengetahui hubungan karakteristik pasien (usia, jenis kelamin, pendidikan terakhir, pekerjaan) dan waktu tunggu hasil pelayanan laboratorium terhadap kepuasan pasien rawat jalan di RSUD Dr. H. Abdul Moeloek Provinsi Lampung.
Metode: Penelitian ini menggunakan metode kuantitatif analitik desain *cross-sectional* pada 107 pasien rawat jalan yang melakukan pemeriksaan laboratorium dengan pemilihan *consecutive sampling* sesuai kriteria inklusi dan eksklusi. Data karakteristik dan kepuasan pasien berasal dari kuesioner, sedangkan data waktu tunggu diperoleh dari TAT. Analisis data univariat berupa distribusi frekuensi dan persentase sedangkan uji bivariat menggunakan Chi-Square.
Hasil: Terdapat hubungan yang bermakna antara usia, pendidikan terakhir, dan waktu tunggu hasil pelayanan laboratorium dengan kepuasan pasien rawat jalan ($p < 0,001$). Sementara itu, jenis kelamin ($p = 0,836$) dan pekerjaan ($p = 0,688$) tidak menunjukkan hubungan yang bermakna dengan kepuasan pasien.
Kesimpulan: Kepuasan pasien rawat jalan di RSUD Dr. H. Abdul Moeloek Provinsi Lampung berhubungan dengan usia, pendidikan terakhir, dan waktu tunggu hasil pelayanan laboratorium. Oleh karena itu, pihak rumah sakit diharapkan dapat terus meningkatkan efisiensi waktu tunggu pelayanan laboratorium serta memperhatikan karakteristik pasien dalam upaya meningkatkan kepuasan pasien.

Kata Kunci: kepuasan pasien, karakteristik pasien, waktu tunggu, pelayanan laboratorium, pasien rawat jalan

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CHAPTER I
INTRODUCTION

1.1 Background

Hospitals are health institutions that provide comprehensive health services to individuals, covering promotive, preventive, curative, rehabilitative, and/or palliative aspects, and offering inpatient, outpatient, and emergency services (Kementerian Kesehatan RI, 2023). Hospital services consist of two types: health services, including medical services, medical support, medical rehabilitation, and nursing, and administrative services, including administrative activities and financial management (Anandyta, 2020).

Hospital healthcare services are among the most needed in the health sector (Anathasia & Mulyanti, 2023). Therefore, medical services, in carrying out their functions and duties, must be able to provide quality services and meet the expectations and perceptions of the community (Marzuq & Andriani, 2022). One of the main indicators of a health service's success is patient satisfaction, as it reflects how patients view and assess the services they receive (Ferreira D et al., 2023; Sumenge et al., 2020). Therefore, hospitals, as healthcare institutions, need to actively measure and evaluate factors that influence patient satisfaction to improve service quality continuously (Ferreira D et al., 2023).

Patient satisfaction is influenced by patients' perceptions of the quality of services received, which includes five main dimensions: tangibles, reliability, responsiveness, assurance, and empathy (Anggreiniboti & Primal, 2025). The Ministry of Health of the Republic of Indonesia, through Regulation of the Minister of Health of the Republic of

Indonesia Number 129/Menkes/SKII/2008 concerning Minimum Service Standards for Hospitals, stipulates that the minimum standard for patient satisfaction is ≥90% (Kementerian Kesehatan RI, 2008). If patient satisfaction is below this figure, the health services provided are considered not to meet the minimum standards or to be of poor quality (Gusrianti, Ulva & Azka, 2024).

Several studies show that patient satisfaction rates in Indonesia have not yet reached the minimum standard. The average patient satisfaction rate at Siti Hajar Sidoarjo Islamic Hospital in 2021 was 82.25%. This indicates that patient satisfaction at Sidoarjo Islamic Hospital has not yet met the national standard for patient satisfaction (Qoni'ah, Setianto & Handayani, 2024). In Bandar Lampung, a study conducted at Pertamina Bintang Amin Hospital found that outpatient satisfaction remains suboptimal. Of the five dimensions of service quality studied, only the tangibles dimension received the highest satisfaction score of 59%. Meanwhile, the other four dimensions showed satisfaction scores lower than this achievement. This finding confirms that patient satisfaction has not reached the minimum service standard threshold of 90% for both inpatient and outpatient services (Detty, 2020).

In the hospital context, laboratory services play a strategic role. Clinical laboratories function to examine patient specimens to support patient diagnosis, treatment, and recovery (Marlina & Fatriyawan, 2024). Therefore, timely reporting of laboratory test results is crucial to expedite the assessment and diagnosis of a patient's condition (Joint Commission International, 2024). Additionally, the effectiveness and efficiency of laboratory services are important aspects that influence patients' perceptions of hospital quality. Dawande et al. (2022) emphasise that turnaround time (TAT), or the time to laboratory results, is an important indicator of service timeliness and a benchmark for laboratory performance efficiency.

The waiting time for laboratory service results or turnaround time (TAT) is the time span from sample collection to the completion of laboratory results (Kementerian Kesehatan RI, 2008). If the TAT is too long, patients will experience discomfort, anxiety, and the risk of clinical inefficiency, which may potentially reduce satisfaction (Zhang et al., 2023). According to the Indonesian Minister of Health Regulation No. 129/Menkes/SK/II/2008 concerning Minimum Service Standards for Hospitals, the standard waiting time for laboratory results is ≤140 minutes. The laboratory tests referred to are routine blood tests and blood chemistry tests (Kementerian Kesehatan RI, 2008).

According to a 2023 study conducted at Majalengka Regional General Hospital, the average TAT for laboratory test results remains outside the established standard. As many as 40.9% of respondents (laboratory staff) had an average TAT for laboratory test results exceeding 140 minutes. During a certain period, as many as 86.4% of the average TAT for laboratory test results per month was still above 140 minutes (Rabia et al., 2024). Additionally, Research at Dr. RM Djoelham Regional General Hospital, Binjai City, showed that 267 outpatients (7.03%) in July 2020 had a response time >180 minutes, exceeding the standard waiting time for laboratory test results (Yuansyah, Harahap & Suroyo, 2021). A study conducted at the Kediri Health Centre, West Lombok, in 2024 reported that 34 patients (35.1%) received laboratory results with a waiting time of >140 minutes. Of this group, the majority (70.6%) rated the effectiveness of laboratory services as poor (Marlina & Fatriyawan, 2024).

Research by Safitri & Murti (2024), using a meta-analysis across several hospitals, shows that short waiting times (<2 hours) significantly increase outpatient satisfaction compared to longer waiting times. Additionally, research by Masagustian (2024) at Dr. M. Yunus Bengkulu Regional General Hospital also shows that waiting times across various service units, including laboratories, are significantly related to patient

satisfaction. Of all the variables studied, outpatient and laboratory waiting times have the greatest Influence on patient satisfaction.

On the other hand, patient characteristics such as age, gender, education level, and occupation also influence perceptions and satisfaction with healthcare services. Research conducted by Chico, Bauhofer, and Bero (2024) indicates that age, gender, and education level significantly affect patient satisfaction. This is also in line with research by Bhatt, Ghimire, and Khanal (2024) which found that individual factors such as age and occupation Influence patient satisfaction. Patient age often emerges as the most influential and consistent factor affecting patient satisfaction in various studies. This is due to differences in perceptions of service and treatment between older and younger patients (Chico, Bauhofer & Bero, 2024).

Dr. H. Abdul Moeloek General Hospital (RSUDAM) is a type of government hospital and the highest referral hospital in Lampung Province. RSUDAM has a laboratory facility consisting of a clinical pathology laboratory and an anatomical pathology laboratory (RSUDAM, 2025b). The RSUDAM clinical pathology laboratory provides basic and complex diagnostic support services. Laboratory services are not only provided to internal hospital patients but also accept partial referrals from other healthcare facilities, thereby increasing the laboratory's workload (RSUDAM, 2025a). According to data from the Lampung Provincial Health Department in 2024, RSUDAM recorded 40,779 outpatient visits and 21,131 inpatient visits. The high number of visits affects the potential for many patients to undergo laboratory tests and the time spent waiting for laboratory results. Therefore, it is important to determine whether there is a relationship between patient characteristics (age, gender, highest level of education, and occupation) and the waiting time for laboratory results, as well as the satisfaction of outpatient patients at Dr. H. Abdul Moeloek General Hospital Lampung.

1.2 Problem Statement

The Research question of this study is: Is there a relationship between patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory results with outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung?

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study is to determine the relationship between patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory results with outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.3.2 Specific Objectives

1. To determine the characteristics of patients, including age, gender, highest level of education, and occupation of outpatients at the laboratory facility of Dr. H. Abdul Moeloek General Hospital, Lampung.
2. To determine the waiting time for laboratory results for outpatients at Dr. H. Abdul Moeloek General Hospital, Lampung.
3. To determine the overall satisfaction of outpatients based on the five dimensions of SERVQUAL at Dr. H. Abdul Moeloek General Hospital, Lampung.
4. To determine the satisfaction of outpatients in each dimension (tangible, reliability, responsiveness, assurance, and empathy) at Dr H. Abdul Moeloek General Hospital, Lampung.
5. To determine the relationship between patient characteristics (age, gender, highest level of education, and occupation) and outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung.

6. To determine the relationship between waiting time for laboratory results and outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.4 Research Benefits

1.4.1 Benefits for Researchers

1. Expand the researcher's knowledge and understanding of service management, particularly in health laboratories and patient satisfaction.
2. Developing skills in scientific research, data analysis, thesis writing, and the application of knowledge during the study.

1.4.2 Benefits for Hospital Management

1. Serving as evaluation material and strategic input to improve service processes, particularly the waiting time for laboratory test results.
2. Assisting hospital management in developing policies and programs to enhance laboratory service quality in alignment with the hospital's vision and mission.
3. Enhances the hospital's image and reputation through increased patient satisfaction.

1.4.3 Benefits for Future Researchers

1. Serves as an initial reference for research related to outpatient satisfaction in type A hospitals.
2. Providing a comprehensive overview of the relationship between patient characteristics and laboratory service result waiting times on patient satisfaction.

1.4.4 Benefits for Academics

1. Adding to the scientific literature in the field of healthcare management.
2. Serving as teaching material or case studies in courses related to service quality and hospital administration.

CHAPTER II
LITERATURE REVIEW

1.5 Clinical Laboratory Services

1.5.1 Definition of Clinical Laboratory Services

According to the Indonesian Ministry of Health's Department of Public Health (2008), laboratory services are an integral part of the healthcare system that support diagnosis, monitoring, and treatment of diseases to improve public health. This is in accordance with the Minister of Health's Decree No. 129/MENKES/SK/II/2008 on Minimum Hospital Service Standards, laboratory services in hospitals are an inseparable part of the hospital health care system that is oriented towards patient care and is tasked with examining clinical specimens to obtain information on an individual's health condition, especially to support disease diagnosis, disease treatment, and accelerate health recovery (Kementerian Kesehatan RI, 2008). In line with this, Indonesian Minister of Health Regulation No. 411/Menkes/Per/III/2010 concerning Clinical Laboratories defines a clinical laboratory as a facility that provides clinical specimen testing services to obtain information about an individual's health condition, primarily to support the diagnostic and treatment processes (Kementerian Kesehatan RI, 2010).

Meanwhile, the International Organization for Standarization or ISO (2022) states that a medical laboratory or clinical laboratory is an examination entity or facility used to analyse biological samples originating from the human body, such as blood, urine, and other body tissues, for diagnosis, monitoring, management, prevention, and treatment of diseases, or evaluation of health status. The types of

examinations performed include biology, microbiology, chemistry, immunology, immunohematology, haematology, biophysics, cytology, parasitology, and genetics (ISO, 2022).

1.5.2 Purpose and Benefits of Clinical Laboratory Services

Laboratory services have the primary objective of obtaining the information needed for the diagnosis, management, prevention, and treatment of a disease, as well as for assessing an individual's health condition (ISO, 2022). For doctors, laboratory test results play an important role in establishing and confirming a diagnosis, thereby minimizing unnecessary actions or therapies (Rahayu, Nadapdap & Theo, 2021). The provision of accurate and timely test results can significantly contribute to the quality of service and the success of patient care (A. Setiawan et al., 2025). In addition, fast, standard-compliant test result turnaround times are an important indicator of laboratory service quality that influences patient perception and satisfaction (Dawande et al., 2022).

Apart from its analytical function, clinical laboratories also provide consultation services that cover all aspects of laboratory testing, including the interpretation of results and advice on further actions or tests required by patients (ISO, 2022). Laboratories also play an important role in ongoing medical research and development activities to improve the quality of health services (I. P. Rahayu et al., 2024). In addition, laboratories play an important role in infectious disease surveillance and the early detection of unusual events, which support the public health early warning system (WHO, 2011). Laboratory results also support quality assurance of medical services and patient safety, and contribute to the cost efficiency of health services through rapid and accurate diagnosis (ASCLS, 2022).

Laboratories with high-quality services also have a significant impact on both service providers and recipients. When service quality is high, user satisfaction increases, encouraging them to

continue using the services consistently. The positive image of this reputation attracts more users and enhances the institution's value in the community (Suhendar et al., 2024).

1.5.3 Types of Clinical Laboratories

Based on Indonesian Minister of Health Regulation No. 411/Menkes/Per/III/2010 on Clinical Laboratories, clinical laboratories are categorized into two main types: general clinical laboratories and specialized clinical laboratories. This classification is based on the level of capability and the scope of examination services provided (Susanti, 2017).

A. General Clinical Laboratories

General clinical laboratories are laboratories responsible for providing testing services for clinical samples, such as blood, urine, and other bodily fluids, for histological, microbiological, clinical chemistry, and basic immunology analysis (Kementerian Kesehatan RI, 2010). General clinical laboratories consist of:

a. Primary General Clinical Laboratory, which performs clinical specimen testing using simple techniques within a limited scope of examination.
b. Intermediate General Clinical Laboratory, which performs clinical specimen examination services with basic clinical chemistry and immunology testing capabilities, has a broader scope compared to primary general clinical laboratories.
c. Advanced General Clinical Laboratory, which provides complex testing services using automated technology and covers comprehensive immunology and clinical chemistry testing.

B. Specialized Clinical Laboratories

A specialized clinical laboratory is a laboratory that has the capability and authorization to perform tests of higher complexity and usually focuses on a specific field of examination (Kementerian Kesehatan RI, 2010).

a. Clinical Microbiology Laboratory, which performs microscopic examinations, cultures, identification of bacteria, fungi, viruses, and sensitivity tests.
b. Clinical Parasitology Laboratory, which performs identification of parasites or parasite stages, either microscopically with or without staining, by culture, or by immunoassay.
c. Anatomical Pathology Laboratory, which is a laboratory that performs histopathological specimen preparation, simple special staining, cytological specimen preparation, and specimen preparation using frozen section techniques.

1.5.4 Types of Clinical Laboratory Services

Clinical laboratory services are a form of medical support services that provide diagnostic information through the analysis of human biological specimens, such as blood, urine, and other body fluids. Laboratory test results are used to assist doctors in establishing diagnoses, monitoring the course of disease, assessing the success of therapy, and supporting disease prevention efforts. Routine blood tests and blood chemistry tests are clinical laboratory services often requested by doctors for diagnosis, monitoring patient conditions, and evaluating therapy results, both for outpatients and inpatients (Trisnawati, 2020). These tests include various hematology and biochemistry parameters commonly used in clinical practice (Kementerian Kesehatan RI, 2011; Tiveny, 2020; Khatimah, Hasanuddin & Amirullah, 2021; Aliviameita & Puspitasari, 2024), namely:

Table 2. 1 Types of Clinical Laboratory Services

Types of Laboratory Examination	Sub-types of Laboratory Examination	Parameter Findings
Routine Blood Laboratory Test	Hematology/ complete blood count	1) Blood cell count (counting the number of erythrocytes, leukocytes, thrombocytes or platelets, eosinophils, reticulocytes, and leukocyte (differential count)) 2) Hemoglobin (Hb) 3) Hematocrit (Ht) 4) Erythrocyte sedimentation rate (ESR) 5) Erythrocyte index 6) Peripheral blood smear evaluation (PBSE) 7) Osmotic resistance/osmotic fragility 8) Hematology analyzer
	Routine urinalysis	1) Color, clarity, pH, specific gravity 2) Glucose, ketones, pH, bilirubin, urobilinogen, red blood cells, white blood cells, nitrites, albumin, and protein. 3) Sediment (erythrocytes, leukocytes, casts, crystals, epithelial cells, mucus, spermatozoa)
	Routine stool	1) Color, food residue consistency, amount, shape, odor, mucus, pH 2) Occult blood (fecal occult blood) 3) Worm eggs, parasites, bacteria
Blood Chemistry Laboratory Test	Kidney function	1) Urea (BUN) 2) Creatinine 3) Uric acid
	Liver function	1) SGOT (AST) 2) SGPT (ALT) 3) Alkaline phosphatase (ALP) 4) Gamma-glutamyl transferase (GGT) 5) Total, direct, and indirect bilirubin 6) Albumin 7) Globulin 8) Protein
	Lipid profile	1) Total cholesterol 2) HDL (direct/ indirect calculation) 3) LDL (direct/ indirect calculation) 4) Triglycerides
	Electrolytes and minerals	1) Sodium (Na^+) 2) Potassium (K^+) 3) Chloride (Cl-)

Types of Laboratory Examination	Sub-types of Laboratory Examination	Parameter Findings
		4) Calcium (Ca_2^+)
		5) Phosphate (PO_4^{3-})
		6) Total calcium
	Blood Glukose and metabolism	1) Fasting Plasma Glukose (FPG)
		2) 2-Hour Postprandial Blood Glukose (2HPG)
		3) HbA1c
	Heart enzymes	1) Creatine Kinase (CK)
		2) CK-MB
		3) Troponin T/I
		4) Lactate dehydrogenase (LDH)

1.5.5 Clinical Pathology Laboratory Services at Dr. H. Abdul Moeloek General Hospital

Dr. H. Abdul Moeloek General Hospital, Lampung provides laboratory services through two main facilities, namely the clinical pathology laboratory and the anatomical pathology laboratory. These services include tests referred internally by RSUDAM doctors and externally by collaborating health facilities. The types of tests that can be performed at the clinical pathology laboratory at RSUDAM are as follows:

Table 2. 2 Types of Tests at the Laboratory of Dr. H. Abdul Moeloek General Hospital

Type of Laboratory Examination	Parameter Findings
Coagulation Test	1) Prothrombin Time (PT)
	2) Activated Prothrombin Time (Aptt)
	3) INR
	4) Fibrinogen
	5) D-Dimer
	6) BT/CT
Hematology	1) Routine blood test
	2) Peripheral blood morphology
	3) Bone marrow morphology
	4) LE cells
	5) Malaria
	6) Filaria
	7) Blood type
	8) Hemoglobin electrophoresis
Clinical Chemistry	1) Liver function test
	2) Renal function tests

Type of Laboratory Examination	Parameter Findings
	3) Lipid profile
	4) Blood sugar
	5) HbA1C
	6) CK-Nac
	7) CK-MB
	8) LDH
	9) Serum Iron
	10) Electrolytes
	11) Amylase Lipase
	12) Arterial Blood Gas (ABG)
Routine Clinic	1) Complete Urinalysis
	2) Feces
	3) LCS Analysis
	4) Pleural Fluid Analysis
	5) CAPD Fluid Analysis
	6) Joint Fluid Analysis
	7) Pericardial Fluid Analysis
Immunoserology	1) HBsAg Rapid
	2) HBsAg Titer
	3) Anti-HBs
	4) Anti-HCV
	5) Anti-HIV
	6) CRP
	7) RF
	8) ASTO
	9) NS-One
	10) TUBEX
	11) WIDAL
	12) TPHA
	13) VDRL
	14) T3
	15) FT3
	16) T4
	17) FT4
	18) TSH
	19) FTSH
	20) Ferritin
	21) Serum BHCG
	22) CEA
	23) PSA
	24) Narcotics
Molecular Biology	1) HBV-DNA
	2) HCV-RNA
	3) Viral Load
	4) RT-PCR Covid
	5) Rapid Antigen
	6) CD4

1.5.6 Standard Operating Procedures for Laboratory Services

Standard operating procedures (SOPs) for laboratory services are written guidelines that regulate work steps across the pre-analytical, analytical, and post-analytical stages and are consistently carried out by laboratory personnel. SOPs serve as references to ensure services comply with standards, maintain examination quality, and minimize work errors. The implementation of SOPs ensures that test results have accurate diagnostic value and can be used to support diagnosis and therapy evaluation. In addition, SOPs serve as a guide for new personnel, a monitoring tool for management, and a means to improve efficiency and coordination among departments in laboratory services (Dianaulina & Fajar, 2024).

The implementation of SOPs in laboratory services not only covers the technical aspects of testing but also all stages of the work process (Dianaulina & Fajar, 2024). Each stage has standard procedures that must be consistently followed to ensure the quality, reliability, and safety of laboratory test results (ISO, 2022).

1. Pre-analytical Stage (Pre-examination Processes)

   This stage covers all activities prior to the examination, from the request for examination to the receipt of specimens at the laboratory.

   a. Service information for patients and users: laboratories must provide clear information to those requesting examinations regarding the services available, the types of specimens that can be accepted, the laboratory's location and operating hours, sample collection and delivery procedures, the time results will be available, and other relevant information.
   b. Test requests: all requests must be recorded in writing, including patient identity, test type, and supporting clinical data.

c. Patient preparation: includes educating patients on requirements regarding fasting or discontinuation of medication, if necessary, sample collection time, body position, and other special conditions that may affect test results.
d. Specimen collection: includes patient consent, technical procedures, volume, tools, timing, additives, and labeling procedures.
e. Specimen transportation and storage: laboratories must ensure that specimens are shipped and stored under conditions that maintain analyte stability, including appropriate packaging, temperature, and shipping time, to preserve integrity.
f. Specimen reception at the laboratory includes checking label accuracy and volume, verifying the container, recording the time of receipt, and initial evaluation of specimen quality.
g. Pre-examination handling, preparation, and storage, including separation and cooling.

2. Analytical Stage (Examination Processes)

The examination stage includes all analytical activities, namely testing and analyzing specimens to produce laboratory data. This process includes:

a. Verification and validation of examination methods ensure accurate and reliable results.
b. Evaluation of measurement uncertainty.
c. Reference intervals and clinical decision limits are determined according to the population and method.
d. Documented examination procedures to ensure consistency of results.
e. Internal and external quality control, to ensure the ongoing validity of results

3. Post-analytical Stage (Post-examination Processes)
    a. Results are reported quickly, accurately, and securely, including interpretation if necessary.
    b. Post-analysis sample handling, including storage, relabeling if needed, and documentation.
    c. Sample disposal, in accordance with biological and environmental safety regulations.

1.5.7 Standard Operating Procedures for Laboratory Services at Dr. H. Abdul Moeloek General Hospital

Laboratory services at Dr. H. Abdul Moeloek General Hospital, Lampung are carried out in accordance with established standard operating procedures to ensure patient quality and safety. In practice, outpatients may be general patients or BPJS Health participants, with different service requirements according to their respective administrative provisions. The following are the service requirements for outpatients.

1. General Patients
    a. Bring the Laboratory Pathology Examination Request Form from the Specialist Clinic Doctor (Patient's Responsible Doctor/PRD).
    b. Attach the receipt for payment of the Clinical Pathology Laboratory examination.
    c. Provide proof of the request slip and diagnostic support services/medical procedures issued by the Clinical Pathology counter.
2. BPJS
    a. Bring the Clinical Pathology Laboratory examination request form from the Specialist Clinic Doctor (Patient's Attending Physician/PAP).

b. Bring the SEP (Participant Eligibility Letter), along with the diagnosis and treatment sheet issued by the outpatient administration service (ORIGINAL).
c. Proof of request slips and diagnostic support services/medical procedures issued by the Clinical Pathology counter.

3. Jamsostek/Company (Insurance)
   a. Bring the request form for Clinical Pathology Laboratory examinations from the Specialist Clinic Doctor (Patient Responsible Doctor/PRD).
   b. Attach the SJP (Service Guarantee Letter) from the company/Jamsostek.
   c. Bring the SEP (Participant Eligibility Letter), as well as the diagnosis and treatment sheet issued by the outpatient administration service (ORIGINAL).
   d. Proof of request and diagnostic support services/medical procedures issued by the Clinical Pathology counter.
4. Regional Health Social Security
   a. Bring the request form for Clinical Pathology Laboratory examinations from the Specialist Clinic Doctor (Attending Physician/DPJP).
   b. Bring your SEP (Participant Eligibility Letter), as well as the diagnosis and treatment sheet issued by the outpatient administration service (ORIGINAL).
   c. Proof of request and action for diagnostic support services/medical procedures issued by the Clinical Pathology counter.
5. Cooperation Agreement
   a. Bring the Clinical Pathology Laboratory examination request form from the Specialist Clinic Doctor (Patient Responsible Doctor/PRD).

b. Proof of request and action for diagnostic support services/medical procedures issued by the Clinical Pathology counter.
c. Invoices are sent monthly to the relevant healthcare facility.

Laboratory services at Dr. H. Abdul Moeloek General Hospital, Lampung are carried out through a system and mechanism that has been regulated to ensure order, accuracy, and efficiency in the service process. Every outpatient undergoing laboratory tests must follow the established service flow from registration through test result collection. The system, mechanisms, and procedures for outpatients' laboratory services are as follows.

1. Patients/patient families come from the outpatient clinic and from clinics outside the hospital with a laboratory test request form and patient status.
2. Registration at the Clinical Pathology laboratory administration counter.
3. Patients wait for laboratory administrative details. If the patient is paying through BPJS, they must present the verification form.
4. Patients proceed to the inpatient/outpatient payment counter.
5. After payment is completed, the patient returns to the Clinical Pathology Laboratory.
6. Specimen collection at the Clinical Pathology Laboratory.
7. Patients receive the form for collecting test results.
8. The typing of laboratory test results is carried out by ATLM officers, validated by ATLM personnel, and signed by a clinical pathology specialist.
9. Laboratory test results are delivered to patients on the date of collection, as determined by laboratory administrative staff.

1.5.8 Laboratory Service Quality Indicators

Quality indicators or quality are measures of the degree to which an object meets a set of characteristics. Quality in clinical laboratories encompasses two main aspects: the quality of test results and the quality of service. The quality of results refers to the accuracy and reliability of laboratory test results that can be trusted (i.e., that meet quality standards). Meanwhile, the quality of laboratory services refers to the extent to which services provided meet patients' needs or expectations (Siregar et al., 2018).

Quality indicators reflect the level of service quality provided by clinical laboratories. The establishment of these indicators serves as a management control tool and as a basis for decision-making in planning future activities. In addition to serving as guidelines for managing service quality and patient safety, quality indicators are also used to monitor service quality, direct structured quality improvement efforts, and facilitate each work unit's understanding and implementation of the established indicators (Rachmawati et al., 2018).

Based on Ministry of Health Regulation No. 129 of 2008 on Minimum Service Standards for Hospitals, several quality indicators are used to assess the quality of laboratory services (Kementerian Kesehatan RI, 2008). These indicators include:

1. Waiting time for laboratory service results
2. Laboratory test result expertise implementers
3. Accuracy or reliability of test results (absence of laboratory test errors)
4. Customer satisfaction

Based on Minister of Health Regulation No. 30 of 2022 concerning National Quality Indicators for Health Services at Independent Medical and Dental Practices, Clinics, Community Health Centers,

Hospitals, Health Laboratories, and Blood Transfusion Units, there are seven quality indicators in health laboratories (Kementerian Kesehatan RI, 2022), namely:

1. Hand Hygiene Compliance

   Healthcare providers maintain hand hygiene as a basis for improving and ensuring the safety of staff and patients/service users by reducing the risk of healthcare-associated infections. Hand hygiene is performed by washing hands with soap and running water when hands are visibly dirty or contaminated with bodily fluids, or by using alcohol-based hand rubs with an alcohol content of 60-80% when hands are not visibly dirty. Hand hygiene compliance is measured by the number of hand hygiene actions performed compared to the total number of hand hygiene opportunities that should have been performed during the observation period, then multiplied by 100%. The target achievement is 85%.

2. Personal Protective Equipment (PPE) Compliance

   Personal protective equipment (PPE) is a device designed to prevent the penetration of substances, solid particles, liquids, or air into the wearer's body, protecting the wearer from injury or the transmission of infection or disease. Compliance with PPE use is the personnel's appropriate use of PPE according to indications when performing actions that may expose the body or mucous membranes to blood, body fluids, or other infectious fluids, based on the type of transmission risk (contact, droplet, or airborne). The target achievement is 100%.

3. Patient Identification Compliance

   Healthcare providers correctly identify patients in every situation involving patient intervention, such as specimen collection and test result delivery. The target achievement is 100%.

4. Critical Result Reporting Compliance

   Critical results are reported promptly to expedite decision-making and follow-up actions, ensuring patient/service user safety and security. The target achievement rate is 100%.

5. Missing Sample/Specimen Incidents

   Aiming to prevent sample loss and ensure the availability of samples for examination at a specific time to avoid financial loss and legal implications. The target achievement is 0%.

6. Repeated Test Results

   Repeated test results may occur when specimens/samples do not meet the requirements for type, quantity, condition, or method specified in the test request, requiring the tests to be repeated. The target achievement is 0.

7. Patient Satisfaction

   Patient satisfaction is the result of patients' opinions and assessments of the performance of services provided by health care facilities. It aims to measure community satisfaction as a basis for efforts to improve quality and service delivery across all units capable of providing patient satisfaction. The target achievement is ≥76.61.

Based on the ISO (2022) guidelines, there are several quality and safety standards for laboratories, where laboratory management must ensure that patient well-being, safety, and rights are the primary considerations. Laboratories must establish and implement the following processes:

1. Provide opportunities for patients and laboratory service users to provide useful feedback to support the selection of examination methods and the interpretation of results.
2. Providing publicly accessible information regarding testing procedures, including cost details if applicable, as well as estimated turnaround times for results.

3. Conducting periodic evaluations of available testing services to ensure that each type of test offered is clinically relevant and necessary.
4. If necessary, openly communicate with patients, users, and other relevant parties about incidents that have caused or could cause harm to patients, and document the steps taken to minimize their impact.
5. Handle patients, specimens, and remains with care.
6. Seek informed consent when required.
7. Ensure the continuity of specimen storage and patient medical records, including during laboratory closure, mergers, or ownership transfers.
8. Provide necessary information to patients and healthcare workers upon their request, either directly or through authorized representatives.
9. Upholding the rights of patients to receive fair services free from all forms of discrimination.

1.5.9 Factors Affecting Laboratory Service Quality

Laboratory quality can be defined as the accuracy, reliability, and timeliness in the production and reporting of laboratory test results (WHO, 2011). According to the Indonesian Ministry of Health (2011), quality laboratory results must meet three main criteria, namely: accurate in reflecting the patient's condition, reliable in the sense that all procedures performed are consistent and repeatable, and reporting is done promptly so that it is useful in a clinical or public health context (WHO, 2011).

According to Ekosiswoyo and Sutarto in Letelay (2021) several factors that affect service quality include the competence of laboratory personnel, the completeness of facilities and infrastructure, educational background and training, and the implementation of standard operating procedures (SOPs). The

quality of laboratory services is largely determined by the availability and capability of available resources, particularly the workforce in health laboratories. Limited laboratory staff competence, the absence or inconsistent implementation of SOPs, and limited laboratory facilities and infrastructure are the main challenges that can reduce the quality of laboratory services (Yauharoh & Utami, 2020; Letelay, 2021).

Besides that, according to (Suhendar et al., 2024), the quality of laboratory services is influenced by five main dimensions: tangible, reliability, responsiveness, assurance, and empathy. The tangible dimension includes cleanliness, equipment condition, and waiting room comfort. Reliability includes test result accuracy, service consistency, and staff competence. Responsiveness focuses on service speed and response to complaints. Assurance includes a sense of security, compliance with standards, and preventive measures. Meanwhile, empathy includes attention, understanding, and a friendly attitude from staff.

1.6 Waiting Time for Health Laboratory Service Results

1.6.1 Definition of Waiting Time for Laboratory Service Results

According to World Health Organization (2023) time, in the context of healthcare service quality, is the ability to provide services without unnecessary delays and to reduce waiting times that could endanger patients. Ministry of Health (2008) defines waiting time as the duration from when a patient first interacts with a registration staff member until they receive medical services. Meanwhile, Biya et al. (2022) explain that waiting time includes the total time patients spend from registration until leaving the service facility, including the interval between registration and receiving services before treatment. Waiting time is one factor that can cause patient dissatisfaction and discomfort (Biya et al., 2022).

In the context of laboratory services, turnaround time is an important indicator of service quality and efficiency. According to ISO (2022), turnaround time (TAT) is the time from when a specimen is received at the laboratory until the test results are completed and delivered to service users, such as doctors or patients. This time span covers three main stages: pre-analytical, analytical, and post-analytical (ISO, 2022). Meanwhile, the Indonesian Ministry of Health (2008) defines the waiting time for laboratory service results as the duration of time from the collection of patient samples to the receipt of test results by patients or medical personnel. The length of the waiting time reflects how healthcare facilities, such as hospitals or clinics, manage service aspects to align with patient conditions and expectations (Wijayanti, Lidiana & Widiastuti, 2023). Long waiting times can reduce patients' interest in returning to healthcare facilities, thereby decreasing service utilization (Biya et al., 2022).

1.6.2 Standard Waiting Times for Laboratory Service Results

The Ministry of Health emphasizes that every hospital must establish and monitor waiting-time standards across various service units to improve patient quality and safety (Kementerian Kesehatan RI, 2016). Hospitals have a responsibility to ensure the speed of health services, including in laboratory units. Even if patients are not in an emergency condition, services must still be provided within a specified time limit. This is important to ensure that patient needs are met in the diagnosis and treatment process (Kementerian Kesehatan RI, 2022).

Timely reporting of laboratory test results is a crucial aspect of the quality of services provided by clinical laboratories. Faster, more accurate results significantly Influence doctors' medical decisions. The timeliness of laboratory result reporting is also vital for medical decision-making in operating rooms and emergency departments (Rahayu, Nadapdap & Theo, 2021).

Based on Minister of Health Regulation No. 129/Menkes/SK/II/2008 concerning Minimum Hospital Service Standards, the standard waiting time for clinical pathology laboratory service results is ≤140 minutes. The laboratory services referred to include routine blood tests and blood chemistry tests. This waiting time standard is calculated by dividing the cumulative waiting time for laboratory test results for patients in one month by the number of patients tested in the laboratory during that month (Kementerian Kesehatan RI, 2008).

1.6.3 Factors Influencing Laboratory Service Result Waiting Time

The duration of laboratory service result waiting times can vary, influenced by the following factors:

1. Human Resources (Man)

   Human resources refer to all laboratory staff involved in the laboratory service process, from the pre-analytical to the post-analytical stages.

   a. Number of staff: a limited number of staff and ineffective task distribution play an important role in service speed.
   b. Staff experience: longer tenure leads to greater understanding and mastery of procedures and policies, resulting in faster, more skilled work.
   c. Uneven technical abilities and skills can delay the examination and reporting processes.

2. Facilities and Infrastructure (Machine)

   Facilities and Infrastructure are tools that support the success of processes in public services, ensuring the achievement of expected and planned results. Facilities can include all laboratory equipment, such as hematology analyzers, photometers, microscopes, and centrifuges. Meanwhile, infrastructure can consist of patient waiting rooms, sample collection rooms, reagent storage rooms, and so on. In addition, reagent shortages and technical problems with laboratory

equipment, such as damaged or poorly calibrated instruments, also contribute to delays in test results.

3. Administration and Work Management System

   The flow of specimen collection, recording, archiving, and distribution of test results that are not well coordinated can prolong waiting times.

4. Number and Type of Laboratory Tests

   The number of samples and the complexity of the tests also affect the time to results.

1.6.4 Impact of Laboratory Test Result Waiting Time on Patient Satisfaction

Delays in laboratory test results have a significant impact on the administration or implementation of therapy for patients (P. L. Rahayu et al., 2021). Delays in laboratory test results submitted to clinicians can also hinder clinicians' efficiency, disrupt established work plans, and increase risks to patients due to delays in the administration or implementation of therapy (Kementerian Kesehatan RI, 2008). Besides that, the timeliness of laboratory test results is very important to clinicians in helping them diagnose patients and thereby minimize unnecessary actions. However, if laboratory test results take a long time, the diagnostic process is delayed, especially for certain diseases that require a definitive diagnosis and require waiting for clinical laboratory results. In such situations, doctors can usually only provide temporary treatment or therapy to patients until laboratory results are available (Rahayu, Nadapdap & Theo, 2021).

Delays in medical decision-making by doctors prolong uncertainty about the patient's condition, ultimately increasing the risk of adverse events. For example, when a patient is suspected of requiring a blood transfusion, hemoglobin (Hb) test results are crucial for decision-making. If these results are not yet available,

doctors cannot determine whether a transfusion is necessary, which ultimately risks delaying medical treatment and endangering the patient's condition (Rahayu, Nadapdap & Theo, 2021).

1.7 Patient Satisfaction

1.7.1 Definition of Patient Satisfaction

Patient satisfaction is defined as an individual's or customer's response to the discrepancy between their prior expectations and the service they received. Patient or customer satisfaction is the main focus in patient- or customer-oriented marketing (Mokodompit et al., 2022). Patient satisfaction reflects the interaction among interrelated service elements, ranging from medical services and nursing to contributions from other units within a health institution. In this process, it is necessary to respect patient rights and create a supportive environment that encourages improvements in the quality of health services (Gavurova, Dvorsky & Popesko, 2021).

Patient satisfaction is also defined by several experts, such as Donabedian (1966), who considers it an important indicator for assessing service quality and a reliable instrument for designing, implementing, and evaluating hospital service systems. Linder-Pelz (1982) also expressed his opinion on patient satisfaction, namely a positive evaluation of health services, which is formed from a combination of individual patients' expectations and experiences, encompassing emotional and cognitive aspects. According to Zeithaml & Bitner (2000) patient satisfaction is the tendency to recommend services to others, make repeat visits, and be willing to pay higher prices.

According to Joint Commission International (2025) patient satisfaction is a subjective assessment of how patients view the quality of service they receive relative to their prior expectations. Patient satisfaction reflects the extent to which individuals' feelings are shaped by their evaluation of the medical services they receive

relative to their initial expectations before undergoing treatment. This assessment is an important indicator in determining the quality of services provided. Therefore, patient satisfaction can be considered the "outcome" or final result of the healthcare process, which is oriented towards improving the quality of medical services (Sodali, Dian & Abidin, 2024). Quality services that satisfy patients will encourage patient/customer loyalty. Additionally, satisfaction is strongly correlated with word-of-mouth dissemination (Mokodompit et al., 2022).

1.7.2 Dimensions of Patient Satisfaction

The dimensions of patient satisfaction encompass all stages of service in the healthcare system, from the registration process to patient discharge, the duration of waiting time for treatment, and medical care to interpersonal communication between service providers and patients (Asamrew, Endris & Tadesse, 2020). Patient satisfaction with healthcare services can be measured using various dimensions of healthcare service quality.

According to the SERVQUAL theory used in service satisfaction Research and developed by A. Parasuraman, VA Zeithaml, and L. L. Berry, it is a scale designed to measure the difference between individuals' expectations and perceptions of the quality of service received. This scale covers five main dimensions that represent important aspects of service, namely tangibles, reliability, responsiveness, assurance, and empathy (Porsuk & Cerit, 2023).

1. Tangibles are aspects of the appearance of physical facilities, equipment, and health workers. A clean, tidy environment, coupled with the professional and attractive appearance of health workers, contributes to increased patient satisfaction with the services received (Tonis & Wiranata, 2020).
2. Reliability is the ability to provide promised services accurately and dependably.

3. Responsiveness is the willingness and speed with which staff assist patients and respond to requests.
4. Assurance is the knowledge, courtesy, and ability of staff to foster trust and a sense of security.
5. Empathy is the individual attention and concern given to patients.

Satisfaction indicators according to Tjiptono in Rizaldy, Budiman, and Sugianor (2024), are follows:

1. Expectation alignment is the degree of alignment between the expected service performance and the service performance the patient receives. This includes the quality of service from healthcare personnel, supporting facilities, and accurate laboratory results.
2. Willingness to revisit reflects the patient's likelihood of using the service again. This can occur due to a satisfying experience, benefits obtained, and adequate facilities.
3. Willingness to recommend is the patient's readiness to recommend hospital services to friends or family.

According to Pohan in Anggreiniboti and Primal (2025) several main dimensions are often used in measuring patient satisfaction, namely:

1. The quality of medical services refers to how well services meet patient expectations, including the competence of healthcare personnel, the accuracy of diagnoses, and the effectiveness of treatment.
2. Accessibility refers to the ease with which patients can obtain healthcare services, including geographical location, availability of facilities and healthcare personnel, and effective administrative processes (registration and payment).
3. Communication and interaction between patients and medical personnel. This includes how well doctors and medical

personnel explain diagnoses or procedures, listen to patient complaints, and show full attention in every interaction.

4. Healthcare facilities and environment, which can include cleanliness, comfort of the space, and the completeness of facilities and infrastructure.
5. Costs and financial transparency, which include affordability and clarity of cost information.

1.7.3 Factors Affecting Patient Satisfaction

According to Simamora in Kosassy and Mulya (2020) factors influencing patient satisfaction are divided into internal and external factors.

A. Internal Factors

Internal factors are those originating from the individual, including:

a. Age

As age increases, an individual's need for goods and services, including healthcare services, tends to increase. In particular, the need for treatment or curative services is higher in the adult age group than for preventive services.

b. Gender

Women tend to have higher rates of illness than men. This causes them to require access to healthcare services more often.

c. Level of Education

People with higher education generally have greater awareness of the importance of maintaining good health. This awareness leads to increased use of healthcare services.

d. Occupation

The type of job affects income, which in turn determines a person's ability to choose and access healthcare services.

e. Social

The social environment, including family and friends, influences decision-making about selecting health services.

f. Emotional Factors

Others' experiences can influence a person's belief in the quality of a service. When someone hears positive feedback from previous users, their trust in the service increases. For example, if an individual hears that others are satisfied with a service, they will be more confident in using that service.

g. Culture

The beliefs and cultural values held by patients greatly Influence their behavior in accessing health services. Therefore, medical personnel need to understand patients' cultural backgrounds when providing care.

B. External Factors

According to Budiastuti in Rosyida (2024), factors that can influence patient satisfaction are:

a. Product or service quality: patient satisfaction with the services or products received arises when their assessment shows that the services meet quality standards. Patients' views on service quality are influenced by two main factors, namely the actual condition of the service itself and the way hospitals convey information or promote their services to the public.

b. Quality of service: if the service patients receive meets or exceeds their expectations, they will feel satisfied. This satisfaction is closely related to patients' perceptions of the quality of service provided.

c. Price: when service fees are high, patients usually demand better quality. Conversely, hospitals with high-quality services at affordable costs will be considered to provide "added value" to patients.

d. Cost and time efficiency: if patients are not burdened with additional costs or excessive waiting times, they are likely to be satisfied with the services provided.

According to Moison, Walter, and White in Rosyida (2024) patient satisfaction can be influenced by the following factors:

a. Product characteristics, which include the appearance of the hospital building, hospital cleanliness, and the completeness of the facilities available in the rooms.
b. Price, the higher the service price, the higher the patient's expectations.
c. Service quality, which includes the friendly attitude and speed of service provided by both medical and non-medical staff.
d. Location, including the hospital's geographic location, its surroundings, and the position of the inpatient rooms, is an important consideration. Good accessibility, proximity to the city center, and easy transportation are added values for a hospital.
e. Facilities, including the completeness of facilities and Infrastructure, such as adequate parking, comfortable waiting rooms, inpatient rooms, and complete medical facilities.
f. The hospital's reputation and its staff's attitude towards the surrounding environment are part of its image.
g. Visual design, interior layout, spatial planning, and decorative elements of the hospital have a psychological impact on patient comfort.
h. Atmosphere, a quiet, comfortable, beautiful, and cool hospital supports the patient's recovery process and creates a positive impression for families and other visitors.
i. Communication, the ability of medical staff, especially nurses, to respond to and follow up on patient complaints

quickly, is one indicator of good service and contributes greatly to patient satisfaction.

1.7.4 Patient Satisfaction as an Indicator of Service Quality

Patient satisfaction is one of the important indicators in assessing the quality of service in hospitals. Patients tend to feel satisfied when the services they receive meet or exceed their expectations. The high quality of services provided contributes directly to increased patient satisfaction, which ultimately encourages them to return to use health services at that facility (Yunita & Gunarti, 2022).

According to Karunia et al. (2022) there are several indicators of quality and patient satisfaction, namely:

1. Satisfaction with access to health services
2. Satisfaction with the quality of healthcare services
3. Satisfaction with the healthcare service process, including interpersonal interactions
4. Satisfaction with the healthcare system

1.7.5 Measuring Patient Satisfaction

The measure of success in service delivery depends heavily on how satisfied service recipients are. Satisfaction is achieved when the services provided meet the needs and expectations of service users. Therefore, patients also have high expectations for the delivery of quality services. Quality services are believed to increase service recipients' satisfaction, because patient satisfaction essentially reflects their assessment of the quality of the healthcare services they receive, whether they are considered good or otherwise (Nugraha & Kurniawansyah, 2022).

According to Kotler in Nur (2021), four general approaches can be used to assess customer satisfaction, including:

1. Complaint and Suggestion System

Measurement can be done by counting the number of customer complaints submitted within a given period. The more complaints received, the greater the dissatisfaction with the service provided. Therefore, a system that effectively accommodates complaints and suggestions is needed.

2. Customer Satisfaction Surveys

   Customer surveys, such as through direct interviews or questionnaires, to evaluate the patient's experience during service delivery. This is useful for determining the extent to which the services provided meet patient expectations.

3. Ghost Shopping

   This method involves individuals pretending to be patients to observe the quality of service provided by healthcare personnel firsthand. In this way, management can obtain a realistic picture of staff attitudes and treatment towards patients.

4. Lost Customer Analysis

   By tracing the history of patients who have stopped using the service, the main reasons for their departure can be identified. This information is useful as evaluation material to improve service quality and better meet patient needs and expectations.

1.7.6 Implications of Patient Dissatisfaction

Inefficient management of waiting times can lead to patient backlogs, increased discomfort, and a decline in the quality of interaction between healthcare workers and patients. These conditions can lead to frustration among patients, prompting them to complain for immediate service and to repeatedly ask staff about the service process (Komariah & Ismawatie, 2024). Patient dissatisfaction can drive them to switch to other healthcare providers. Therefore, improvement efforts focused on enhancing service quality are needed. This is because patient satisfaction is closely related to the quality of service they receive (Geofani, Masrul, & Kasra, 2023).

1.8 Theoretical Framework

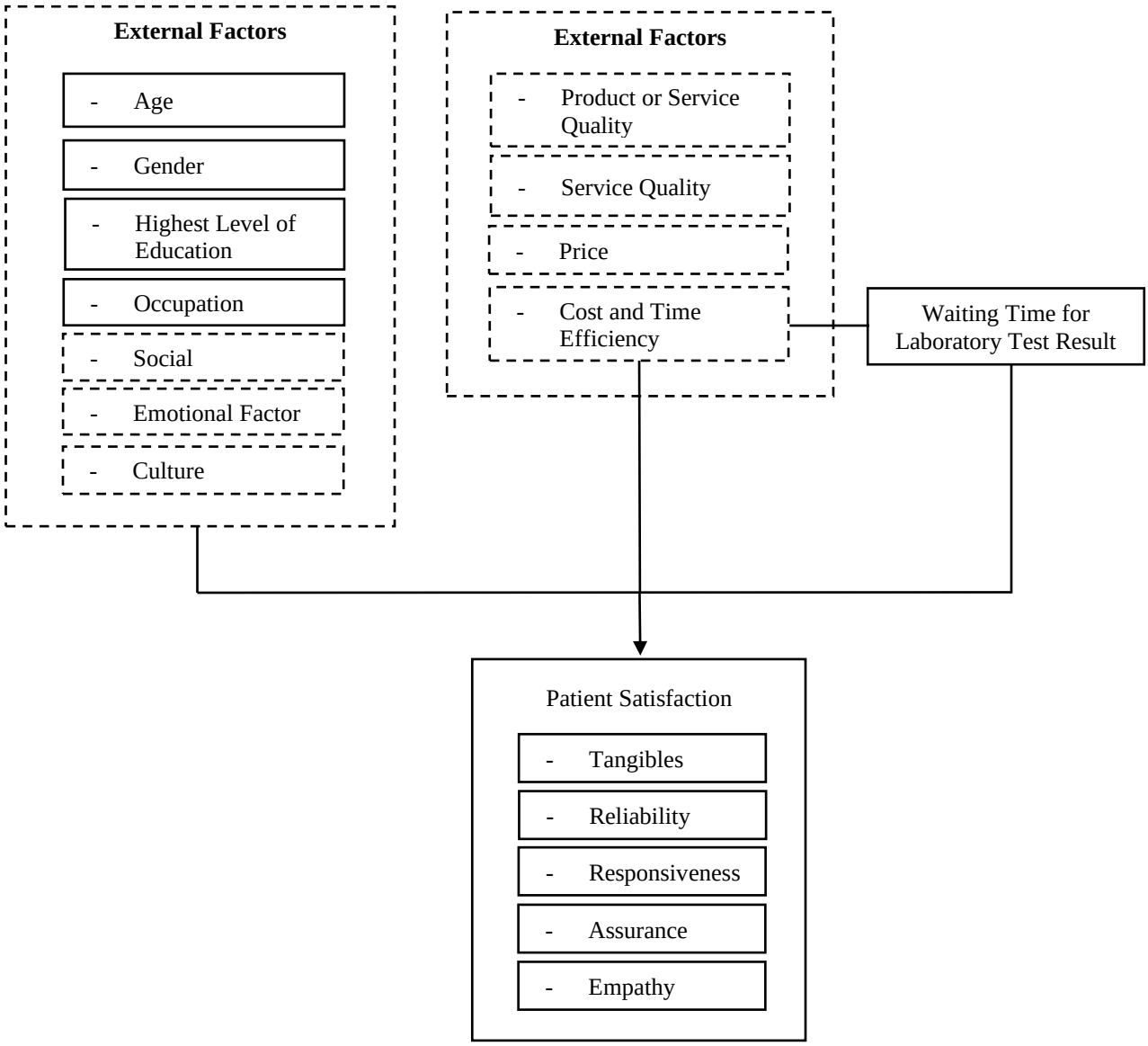

Figure 2. 1 Theoretical Framework

Source: (Parasuraman, Berry and Zeithaml, 1988; Simamora in Kosassy and Mulya, 2020; Budiastuti in Rosyida, 2024)

Description:

——— = Studied

- - - - - = Not studied

1.9 Conceptual Framework

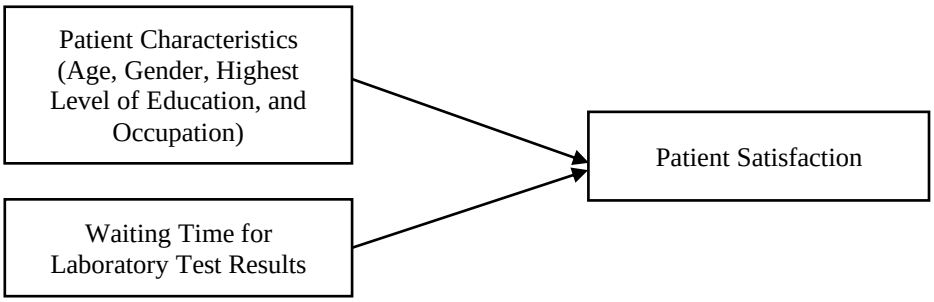

Figure 2. 2 Conceptual Framework

1.10 Research Hypothesis

The hypothesis in this study is formulated as follows:

1. Ha: There is a relationship between patient characteristics (age, gender, highest level of education, and occupation) and outpatient satisfaction at Dr. H. Abdul Moeloek Regional General Hospital Lampung.

   H0: There is no relationship between patient characteristics (age, gender, highest level of education, and occupation) and outpatient satisfaction at Dr. H. Abdul Moeloek Regional General Hospital Lampung
2. Ha: There is a relationship between the waiting time for laboratory results with outpatient satisfaction at Dr. H. Abdul Moeloek Regional General Hospital Lampung.

   H0: There is no relationship between waiting time for laboratory results with outpatient satisfaction at Dr. H. Abdul Moeloek Regional General Hospital Lampung.

1.11 Previous Research

Various studies have examined the relationships among patient characteristics, waiting times for health services, and patient satisfaction across countries and service contexts. In general, most studies show that waiting time duration has a significant effect on patient satisfaction.

Table 2. 3 Previous Research

No	Researcher (Year)	Research Title	Method	Main Results
1.	Almessabi and Alshamsi (2025)	The impact of waiting time on patient satisfaction with laboratory with laboratorry samples collection in Sheikh Khalifa Medical City, United Arab Emirates	Cross-sectional	Shorter waiting times increase patient satisfaction.
2.	Biya *et al.* (2022)	Waiting time and its associated factors in patients presenting to outpatient departements at public hospitals of Jimma Zone, Southwest Ethiopia	Cross-sectional	The average waiting time was longer than the standard and was influenced by education, place of residence, time of arrival, and date of visit.
3.	Fu *et al.* (2021)	Service quality improvement of outpatient blood collection by lean management	Before-after comparative study	Patient waiting times decreased while patient satisfaction increased. Sociodemographic factors had no significant effect.
4.	Ren *et al.* (2021)	The situation and influencing factors of outpatient satisfaction in large hospitals: evidence from Henan province, China	Structural Equation Model (SEM)	Satisfaction is influenced by waiting time, service quality, age, and frequency of visits.
5.	Rizany (2021)	The relationship between waiting time and patient satisfaction in the outpatient of public hospital in Banjarbaru	Cross-sectional	There is a significant relationship between waiting time and patient satisfaction.
6.	Tian *et al.* (2024)	Propensity score matching analysis of the influence of waiting time satisfaction on community resident's satisfaction with medical institutions: an extensive survey of outpatient population in Shantou City of Southern China	Cross-sectional	Process efficiency, service facilities, and access to hospitals.
7.	Umoke *et al.* (2020)	Patients' satisfaction with quality of care in general	Cross-sectional	Patients were satisfied with the quality of service, but the

No	Researcher (Year)	Research Title	Method	Main Results
		hospitals in Ebonyi State, Nigeria, using SERVQUAL theory		highest satisfaction was observed in the empathy dimension and the lowest in tangibility.
8.	Zhang *et al.* (2020)	Predictors of patient satisfaction and outpatient health services in China: evidence from the WHO SAGE survey	Random forests (RFs) and ordinal logistic regression models	Treatment outcomes, communication quality, and sociodemographic factors, including waiting time and age, influence satisfaction.
9.	Zhang *et al.* (2023)	Effect of waiting time on patient satisfaction in outpatient: an empirical investigation	Cross-sectional	Demographic factors (age, education, gender), appointment process, and visit experience did not significantly affect patient satisfaction.
10.	Zhou *et al.* (2022)	Factors associated with outpatient satisfaction in Provincial Tertiary Hospitals in Nanchang, China: a structural equation modeling approach	Structural Equation Modeling (SEM)	The environment, hospital facilities, and waiting time Influence patient satisfaction.

CHAPTER III
RESEARCH METHOD

1.12 Research Design

This study used a quantitative analytical method with a cross-sectional research design. The analysis focused on observing the relationship between patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory results with outpatient satisfaction at Dr. H. Abdul Moeloek Regional General Hospital Lampung.

1.13 Research Time and Place

1.13.1 Research Time

This Research was conducted in November 2025.

1.13.2 Research Location

This Research was conducted at the Outpatient Clinical Laboratory Facility of Dr. H. Abdul Moeloek General Hospital Lampung.

1.14 Research Population and Sample

1.14.1 Research Population

The study population comprised all outpatient patients who underwent laboratory tests at Dr. H. Abdul Moeloek General Hospital Lampung. This population was selected because outpatient patients receive the most laboratory services, providing a complete experience of the waiting time for laboratory results at the hospital.

1.14.2 Research Sample

The population in this study was categorized as an unlimited population because the number of outpatients undergoing routine laboratory and blood chemistry tests fluctuated daily. This makes population size inconsistent and difficult to predict accurately (Paramita, 2024). Therefore, to obtain a sample size that accurately represents the population, the researcher used a calculation approach based on the formula of Lemeshow (1991), as follows:

$$n = \frac{Z^2\ P\ (1 - P)}{d^2}$$

Explanation:
n = required sample size
Z = Z-score at a 95% confidence level (Z = 1.96)
p = maximum estimated population proportion (p = 0,5)
d = sampling error (d = 10%)

Using this formula, the sample size can be calculated as follows:

$$n = \frac{Z^2\ P\ (1 - P)}{d^2}$$

$$n = \frac{1{,}96^2\ .\ 0{,}5\ (1 - 0{,}5)}{0{,}1^2}$$

$$n = \frac{3{,}8416\ .\ 0{,}25}{0{,}1^2}$$

$$n = 96{,}04$$

Based on the Lemeshow formula, the sample size (n) is 96.04. To anticipate the possibility of respondent loss or dropouts, the author added 10% to the calculated total sample size (Lwanga & Lemeshow, 1991). Thus, the sample size was increased by 10% using the following formula:

$$n = \frac{n}{1 - f}$$

Explanation:

n’ = calculated sample size

f = estimated proportion of dropouts

$$n' = \frac{96{,}04}{1 - 0{,}10}$$

$$n' = \frac{96{,}04}{0{,}9}$$

$$n' = 106{,}71 = 107$$

The minimum total sample size in this study, after adjustment, is 107.

1.15 Sample Criteria

1.15.1 Inclusion Criteria

1. Outpatients who have undergone examination and received routine blood test or blood chemistry results at Dr. H. Abdul Moeloek Regional General Hospital Lampung.
2. Patients with non-emergency cases (non-critical).
3. Outpatients aged ≥17 years.
4. Patients who can communicate verbally and cooperatively during questionnaire completion.
5. Patients who visit in person (not through a representative or escort).

1.15.2 Exclusion Criteria

1. Patients with mental or cognitive disorders that hinder the questionnaire completion process.
2. Patients or patient companions who are illiterate.
3. Patients who are unwilling to participate as respondents and sign the informed consent form.

1.15.3 Sampling Technique

The sampling technique used in this study is non-probability sampling with consecutive sampling, where respondents are selected sequentially based on inclusion and exclusion criteria until the required sample size is reached. This method was chosen because it is efficient, the patient population is large, and patient arrivals are continuous, allowing the data obtained to reflect the actual conditions of laboratory services.

1.16 Identification of Research Variables

1.16.1 Independent Variables

The independent variables in this study are patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory service results.

1.16.2 Dependent Variable

The dependent variable in this study is patient satisfaction.

1.17 Operational Definitions

Operational definitions are used to explain the meaning of each research variable in concrete terms, enabling it to be measured objectively in accordance with the research objectives (Nadjib et al., 2023). The variables used are patient characteristics (age, gender, highest level of education, occupation), waiting time for laboratory results, and patient satisfaction.

Table 3. 1 Operational Definitions

Variable	Operational Definitions	Tools	Measurement Results	Scale
Age	Age is the length of time a person has lived since birth (WHO in Seventeen, Arnova & Fitriano, 2023).	Respondent Identity Questionnaire	1. 0 = Late Adolescence to Late Adulthood (17-45 years old) 2. 1 = Early Elderly to Seniors (≥46 years old) (Departemen Kesehatan RI, 2009)	**Ordinal**
Gender	Gender is a biological characteristic that naturally distinguishes humans based on body structure and reproductive function, divided into male and female (Seventeen, Arnova & Fitriano, 2023).	Respondent Identity Questionnaire	1. 0 = Male 2. 1 = Female	**Nominal**
Highest Level of Education	The highest level of education is the last level pursued to hone experience, skills, knowledge, and attitudes through formal and informal institutions (Ariga, 2022).	Respondent Identity Questionnaire	1. 0 = Low Education (No Schooling up to High School/ Vocational School/ equivalent) 2. 1 = Higher Education (Academy/ University)	**Ordinal**
Occupation	Occupation is a social activity carried out by individuals or groups, involving effort over a certain period of time and space, with the hope of obtaining rewards or	Respondent Identity Questionnaire	1. 0 = Employed (Civil Servant/Military/ Police, Private Sector Employee, Self-Employed) 2. 1 = Not Working	**Nominal**

Variable	Operational Definitions	Tools	Measurement Results	Scale
	simply a sense of responsibility towards others, as well as maintaining social status (Wiltshire in Rembune Z *et al.*, 2022).		(Housewife, Student/College Student, Not Working)	
Laboratory Service Results Waiting Time	The waiting time for laboratory service results is the time span from sample collection, followed by the processing stage, until the results have been examined (cut-off value based on the median waiting time for laboratory service results at Dr. H. Abdul Moeloek Regional Hospital, Lampung).	The turnaround time (TAT) is recorded by the laboratory supervisor	1. 0 if <61 minutes 2. 1 if ≥61 minutes (Median ± IQR = 61 ± 25)	**Nominal**
Patient Satisfaction	Respondents' subjective perception of the quality of service received while waiting for laboratory results (Joint Commission International, 2024).	Patient Satisfaction Questionnaire (Mayro et al., 2019)	1. 0 = Satisfied (>90%) 2. 1 = Dissatisfied (≤90%) (Susetyo et al., 2008)	**Nominal**

1.18 Research Instrument

1.18.1 Research Instrument

The following are the instruments used in the research process, namely:

A. Patient Identity Sheet

The patient identification sheet is used as an instrument to record the basic characteristics of respondents that form part of the patient characteristics variable. This instrument is designed in the form of a fill-in form that is completed directly by the respondent. This sheet serves to identify demographic data and socio-economic conditions of respondents relevant to the Research objectives. The information collected includes:

a. Respondent Number
b. Respondent Name
c. Gender (Male/Female)

d. Age
   - Late Adolescence to Late Adulthood (Late Adolescence: 17-25 years, Early Adulthood: 26-35 years, Late Adulthood: 35-45 years)
   - Early Elderly to Seniors (Early Elderly: 46-55 years old, Late Elderly: 56-65 years old, and Seniors: >65 years old)

e. Highest Level of Education
   - Low Education (No schooling, Elementary School/equivalent, Junior High School/equivalent, Senior High School/Vocational School/equivalent)
   - Higher Education (College/University)

f. Occupation
   - Employed (Civil Servant/Military/Police, Private Sector Employee, Self-Employed)
   - Not Working (Housewife, Student/University Student, Not Working)

B. Laboratory Service Result Waiting Time Data Sheet

Data on waiting times for laboratory test results were obtained from secondary data sources, including TAT records kept by officers at the clinical pathology laboratory of Dr. H. Abdul Moeloek General Hospital, Lampung. The waiting time information recorded included the time from when the sample was received at the laboratory until the test results were available and could be delivered to the patient. The data was then extracted using a recording sheet prepared by the researcher while maintaining patient confidentiality. The measured patient waiting times were then categorized based on the median, as follows:

a. 0 if <61 minutes
b. 1 if ≥61 minutes

C. Patient Satisfaction Questionnaire

The patient satisfaction questionnaire used in this study measured satisfaction with services received at the laboratory facility of Dr. H. Abdul Moeloek General Hospital, Lampung. This instrument was developed based on the SERVQUAL framework, which comprises five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. This questionnaire is self-administered, so patients fill it out independently. However, if respondents have difficulty filling it out, researchers can help by reading the questions aloud, and respondents can then answer according to the actual conditions.

This questionnaire was adapted from research by Mayro et al. (2019) with adjustments to the context of hospital laboratory services. There are 17 closed-ended statements, each organized into two assessment aspects: expectations (E) and reality (P). Respondents are asked to check one (√) of the numbers 1, 2, 3, or 4 in each column, based on their expectations and actual experiences with laboratory services.

The meaning of the scores in each column is as follows:

a. 1 = Very Dissatisfied
b. 2 = Dissatisfied
c. 3 = Satisfied
d. 4 = Very Satisfied

The respondents' item scores are used to calculate the average expected value (E) and the average actual value (P). Next, the difference (gap) between the two values is calculated using the following formula:

$$Gap = P - E$$

This gap value describes the level of conformity between the expected service and the service received in each SERVQUAL

dimension. If the gap value is close to zero (0), it means that the patient's expectations are almost the same as the actual service received. A positive gap value (+) indicates that the service exceeds patient expectations, while a negative gap value (-) indicates that it falls short. The average gap for each dimension describes the level of service quality in that aspect. Patient satisfaction is determined based on the percentage of alignment between actual scores and expectations, using the following formula:

$$Level\ of\ Conformity\ (\%) = \frac{\Sigma P}{\Sigma E} + 100\%$$

Explanation:

ΣP = total actual score

ΣE = total expected scores

The results of the calculation of the level of conformity (%) are then categorized into two groups, namely:

1. 0 = Satisfied, if the level of conformity is >90%
2. 1 = Not satisfied, if the level of conformity is ≤90%

1.19 Validity and Reliability Test

Validity testing assesses the extent to which an instrument or measuring tool accurately measures the variables under study. In contrast, reliability testing reflects the degree of consistency of an instrument in providing relatively similar measurement results when used repeatedly on similar subjects and conditions. Validity testing in this study was conducted on the patient satisfaction questionnaire prior to the main statistical analysis, involving 30 respondents. Based on the number of respondents, a t-value of 0.361 (df = 28) was obtained. The test results showed that of the 17 statements tested, 16 were declared valid because their calculated r values were greater than the table r, with a correlation coefficient range of 0.547 to 0.799. In contrast, 1 statement (item P6) was declared invalid and removed from the instrument. Furthermore, the reliability test using

Cronbach's Alpha yielded a value of 0.938 on 16 statement items, indicating excellent reliability and suitability for use in this study.

1.20 Data Processing and Research Flow

1.20.1 Data Processing

The research data were analyzed using statistical analysis software. The data processing stages were carried out systematically as follows:

1. Data Editing

   Editing was carried out by reviewing the collected data to ensure completeness and consistency. This activity aimed to identify and correct filling errors or invalid data.

2. Data Transformation (Coding)

   Data coding was performed by assigning each questionnaire response a numerical code corresponding to its variable category. Each response option was assigned a numerical code to facilitate data input, processing, and analysis.

3. Data Entry

   Entering data into a statistical program for further processing and analysis.

4. Data Cleaning

   Data cleaning is performed by rechecking the data entered to minimize coding errors and ensure data completeness.

1.20.2 Research Flow

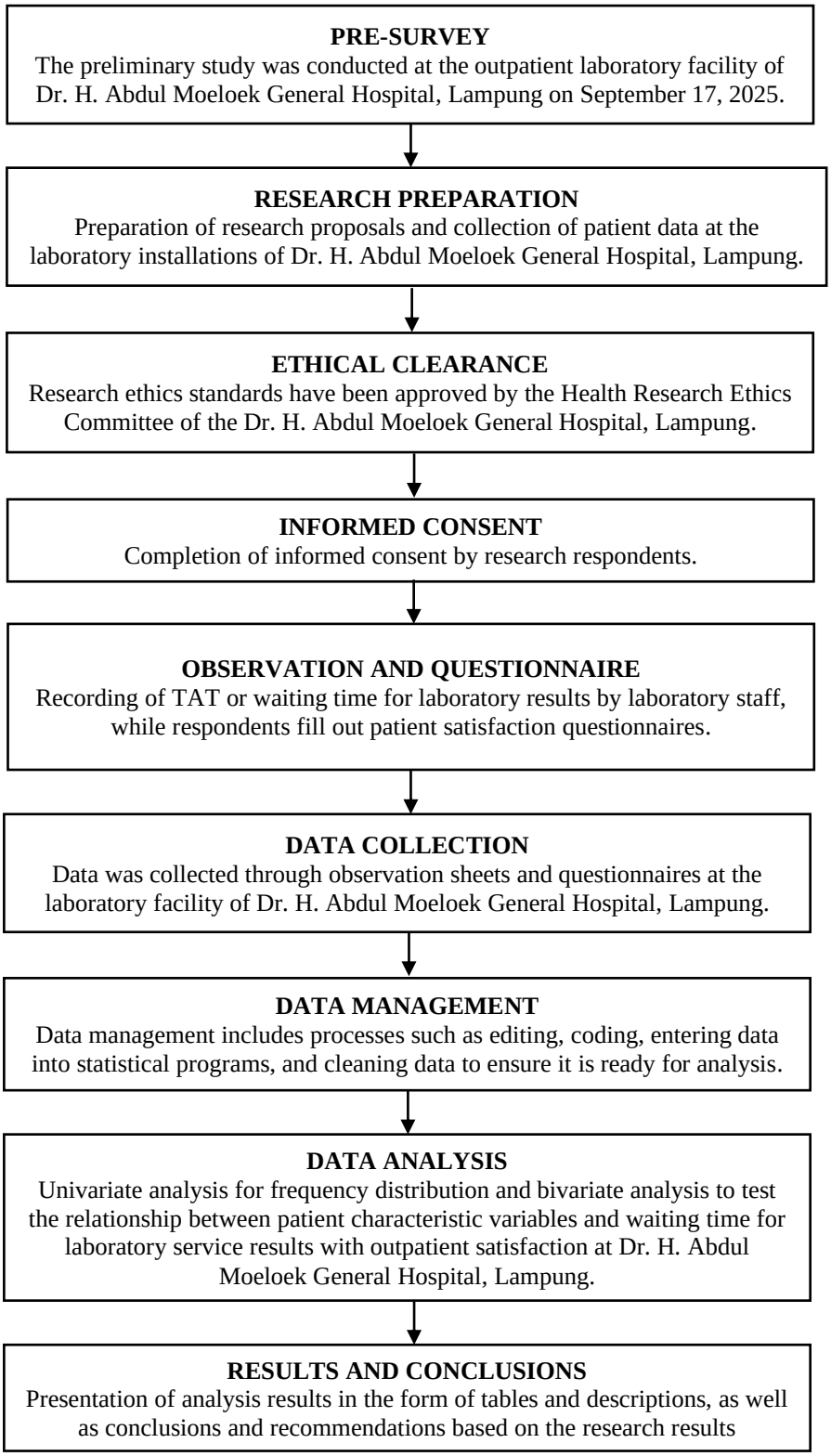

Figure 3. 1 Research Flow

1.21 Data Management

1.21.1 Data Sources

1.21.1.1 Primary Data

Primary data is data obtained directly from respondents through questionnaires. In this study, primary data includes patient characteristics (age, gender, highest level of education, occupation) and outpatient satisfaction with laboratory results at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.21.1.2 Secondary Data

Secondary data is information obtained indirectly from respondents, namely through data already available at the hospital. Secondary data in this study includes TAT laboratory service data and the number of outpatients who used laboratory services at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.21.2 Data Analysis

1.21.2.1 Univariate Analysis

Univariate analysis was performed to describe each variable. The results of this analysis are presented as frequency distributions and percentages. The variables analysed univariately in this study included patient characteristics (gender, age, highest level of education, and occupation), waiting time for laboratory service results, and outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.21.2.2 Bivariate Analysis

Bivariate analysis was aimed at determining the relationship between the independent variables, namely patient characteristics (age, gender, highest level of education, occupation) and waiting time for laboratory results, with the

dependent variable in the form of outpatient satisfaction. The Chi-Square test was used because the data met the test requirements, namely, less than 20% of cells had an expected count <5. The significance criterion in bivariate analysis was set at $p < 0.05$. If $p < 0.05$, it was concluded that there was a significant relationship between the independent and dependent variables. Conversely, if $p > 0.05$, it was concluded that there was no significant relationship between the two variables.

1.22 Research Ethics

This study has obtained ethical approval from the Health Research Ethics Committee of Dr H. Abdul Moeloek General Hospital, Lampung with letter number 623/KEPK-RSUDAM/X/2025. It has been declared feasible, so that the entire research process was conducted in accordance with health research ethics guidelines. Before data collection, each respondent was informed of the study's purpose and objectives and asked to sign an informed consent form as proof of their willingness to participate.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

1.27 Conclusion

Based on the results of the study and the discussion above, the following conclusions can be drawn:

1. Based on the study's results and the discussion above, the following conclusions can be drawn. The characteristics of outpatients at the laboratory facility of Dr. H. Abdul Moeloek General Hospital, Lampung are dominated by the early elderly to seniors age group, female gender, low educational level, and most are unemployed.
2. The waiting time for laboratory test results for outpatients is mostly ≥61 minutes and falls within the Indonesian Ministry of Health's category (≤140 minutes).
3. Overall, 74,8% of patients stated that they were satisfied with the outpatient laboratory services at Dr. H. Abdul Moeloek General Hospital, Lampung.
4. The majority of patients expressed satisfaction with the service dimensions, namely tangible (91.35%), reliability (94.67%), responsiveness (95.50%), assurance (94.44%), and empathy (97.26%) towards outpatient laboratory services at Dr. H. Abdul Moeloek General Hospital, Lampung.
5. There is a significant relationship between patient characteristics, such as age and the highest level of education, and outpatient satisfaction. At the same time, gender and occupation do not show a significant relationship with patient satisfaction.

6. There is a significant relationship between the waiting time for laboratory service results and outpatient satisfaction at Dr. H. Abdul Moeloek General Hospital, Lampung.

1.28 Recommendations

Based on the research findings, the following recommendations can be provided by the researcher:

1. For hospital management, it is recommended to use the results of this study as evaluation material to improve waiting times and the quality of laboratory services, and to develop quality improvement policies and programs aligned with the hospital's vision and mission to increase patient satisfaction and the hospital's image.
2. For future researchers, it is recommended to develop research by adding other variables related to the service process, such as staff workload, laboratory information systems, and examination flow, as well as using multivariate analysis (such as logistic regression) to identify the most dominant factors related to patient satisfaction after controlling for confounding variables. In addition, using a longitudinal design or qualitative approach will provide a deeper understanding of outpatient satisfaction.
3. For academics, it is hoped that this study will contribute to the scientific literature in health service management and be used as teaching material or case studies in courses related to service quality and hospital administration.

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