Arab American University
Faculty of Graduate Studies
Department of Health Sciences
Master Program in Quality Management in Health Institutions.

Assessment of Laboratory service interruption and its associated factors in governmental Hospitals, West Bank, Palestine

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Thesis Approval

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Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is substantially my own and has not been submitted for any other degree at the Arab American University or any other institution.

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Dedication

I dedicate this dissertation to my parents, who are my gift from God and the greatest blessing in my life, with the hope that it will continue to be an ongoing charity on both your and my behalf.

To my beloved husband Ahmad, whose words of support and appeal for tenacity still echo in my mind.

To my kids, who accommodate me in every circumstance.

To my friends who have helped me along the way. I will always be grateful for everything they have done.

In addition, I dedicate this study to my best friend Hayah Qaraqe, whom I am especially grateful for supporting me during the master's program. You have been my greatest supporter.

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Assessment of Laboratory Service Interruption and its Associated Factors in Governmental Hospitals, West Bank, Palestine

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Abstract

Introduction: Laboratory services are an integral part of healthcare systems, playing a vital role in providing essential information for diagnosing diseases, determining appropriate treatment, and monitoring their progression.
Aim: The study aimed to assess the quality of laboratory services provided to patients in the West Bank government hospitals in Palestine. Due to the importance of laboratories, which are an essential part of hospitals and have a crucial role in satisfying patients receiving treatment at a particular hospital and conducting examinations.
Methods: The current study was conducted using the cross-sectional descriptive-analytical approach to assess factors that affect the interruption of medical laboratory services in 18 government health facilities. The total number of laboratory technicians and laboratory administrators was 352, and using a 5% margin of error and 95% confidence interval, the sample size was 196 laboratory technicians and members of laboratory administrators. The evaluation of laboratory quality determinants, equipment availability, management practices, and workforce motivation, was studied, in addition to studying the economic and political situation in the West Bank and determining the impact on the quality of laboratories using a data analysis questionnaire.
Findings: The results of the study showed that 28.1% of laboratory workers believe that supplies are available and the quality of laboratories is high enough. As for the quality of equipment, 20.9% believe that the quality of work in laboratories is high if the quality of equipment is high. As for budgetary matters, the results proved that no budget is known and announced by the manager. As there are no annual plans for laboratories by 44.9%. The majority of employees believe that the manager is following up on supplies promptly, 38.8%. And 35.2% confirmed that the manager follows up his daily activity in the laboratories. As for the economic and political situation, 90% of the employees confirmed that these crises affect the continuity of work in laboratories. About 90% of employees are dissatisfied with their salaries, as the most satisfied with their salaries were between 31-40 and the least 51-60.
Conclusion: The study contributed to the knowledge of the quality of laboratories in government hospitals in the West Bank, and the results of the study showed that the laboratories suffer from a lack of supplies and equipment, which negatively affects the quality of work in laboratories. In addition, frequent political and economic crises also hurt laboratory quality and staff satisfaction, as employees suffer from work stress and dissatisfaction with their salaries. These results should be implemented by laboratory managers and officials to improve the quality of laboratories.
Keywords: laboratory, service, interruption, West Bank.

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Chapter One: Introduction

1.1 Introduction

Laboratory services are an integral part of healthcare systems, playing a vital role in providing essential information for diagnosing diseases, determining appropriate treatment, and monitoring their progression. Palestinian laboratories have a vital role in the provision of health services. Therefore, laboratories are an essential part of the healthcare infrastructure in Palestine. Since they help in the diagnosis of diseases. Palestinian laboratories face various challenges such as a lack of resources, services, and technology and this reduces their ability to meet the needs of the population (Al-Worafi, 2020).

Although laboratories are of great importance in the field of providing health care and detecting various diseases, laboratories suffer from various challenges they face while providing health care to patients, as some laboratories suffer from lack of funding and lack of availability of modern technology, and this forces some laboratories to rely on the use of old equipment. In addition, there is a shortage of staff trained in the use of old equipment in some hospitals, because it is possible that during their training they were dependent on the use of modern devices (Al-Worafi, 2020).

The continuity of laboratory services is a pressing necessity, as they enable accurate and sustainable diagnosis, thereby facilitating proper medical treatment. However, interruptions in these services present significant challenges locally and globally, especially in resource-constrained environments. This challenge is partially attributed to the lack of available data shedding light on the factors contributing to these interruptions (Wilson et al., 2018).

The results of laboratory tests significantly influence healthcare decisions, with over 70% of such decisions relying on these results in advanced countries. Hence, understanding the factors leading to interruptions in laboratory services emerges as a crucial challenge requiring continuous attention and sustained efforts to ensure the provision of high-quality healthcare services (Sikaris, 2017).

By understanding the root causes of this problem, the findings of this study can provide valuable insights into enhancing healthcare infrastructure in conflict-affected areas (World Health Organization, 2022). Knowledge of the challenges facing laboratory services contributes to the development of effective strategies for improving healthcare and addressing public health emergencies effectively (Global Health Initiative, 2021).

Consequently, such research can guide policies and necessary investments aimed at enhancing healthcare infrastructure and delivering better-quality healthcare in regions grappling with conflicts and humanitarian challenges (World Health Organization, 2022). In Palestine, the General Directorate of Paramedical Services in the West Bank's Ministry of Health plays a vital role in ensuring service continuity. This management provides modern equipment, establishes long-term maintenance contracts, and ensures a steady supply of necessary materials (Barrimi et al., 2021).

The World Health Organization's annual reports shed light on the economic and political obstacles facing the healthcare sector in Palestine. The laboratories in Palestine suffer from political and economic problems that affect the health care provided negatively. In addition, there are challenges related to infrastructure and technology. According to the WHO report, many government and private hospitals suffer from a shortage of modern equipment and materials necessary for advanced examinations. This results in delayed results and potentially inaccurate results. The presence of political instability makes it more difficult to work on the availability of modern laboratory equipment, this is due to the restrictions imposed on the crossings (WHO, 2022). It is noteworthy that the General Directorate of Paramedical Services in the West Bank's Ministry of Health issues reports on the status of medical laboratories, yet explicit mention of service interruptions is lacking (Ministry of Health Annual Report, 2018). The WHO report indicated that health services are affected by logistical factors and geographical obstacles, and these obstacles negatively affect the availability of basic medical equipment. For example, restrictions on freedom of movement between Palestinian areas due to Israeli checkpoints make it difficult for medical supplies to arrive promptly (WHO, 2022). On the other hand, the Palestinian Ministry of Health pointed out that there is an improvement in the infrastructure of medical laboratories, but the reports do not give an integrated picture related to the interruption of services in laboratories due to a lack of funding and resources, as some laboratories suffer from a shortage of chemicals and modern equipment, and this causes the ability to perform some tests to stop (Ministry of Health, 2019).

Previous research indicates that interruptions in laboratory services can have negative health outcomes, including delays in disease diagnosis and treatment (Khan et al., 2020). Research focusing on the Palestinian context highlights that interruptions in laboratory services are not solely due to economic and logistical challenges but also result from ongoing political instability In the Palestinian context, interruptions in laboratory services

can exacerbate general health problems, including the spread of infectious diseases and difficulties in managing chronic conditions (Ahmed et al., 2021).

Furthermore, prior research has illustrated that the continuity of laboratory services is crucial not only for individual patient outcomes but also for the overall effectiveness of the healthcare system. Regular interruptions in laboratory services have been found to erode public trust in the healthcare system, thereby impacting health-seeking behavior and compliance with medical advice (Greenwood et al., 2019).

1.2 The Study Problem

The primary problem addressed by this study focuses on the interruptions of laboratory services in governmental hospitals across the West Bank, which significantly compromise the quality and efficiency of healthcare delivery in the region. These interruptions, while common in many healthcare settings globally, are particularly problematic in conflict-affected areas where resources are already strained and the infrastructure is fragile. The study seeks to uncover not only the direct impacts of these interruptions, such as delays in diagnosis and treatment of diseases but also their extended effects on healthcare system resilience and patient trust. Furthermore, it aims to understand the myriad factors ranging from economic shortages and political instability to logistical challenges and infrastructural deficits that contribute to these frequent service disruptions.

Identifying these factors is crucial for developing effective strategies to mitigate the problem and improve healthcare delivery in the West Bank. This issue is compounded by the region's unique political and socio-economic context, which can exacerbate the difficulty in maintaining continuous and reliable laboratory services. Thus, the study not only addresses an immediate and practical problem affecting patient care but also contributes to the broader understanding of how health services can be sustained in regions beset by ongoing conflict and instability.

1.3 The Purpose of this Study and Objectives

1.3.1Study Aim

The study aimed to assess the quality of laboratory services provided to patients in government hospitals of the West Bank and improve the quality of laboratories.

1.3.2 Study Objectives

- Through the current study, it is possible to find out the quality of laboratory services provided to patients in government hospitals in the cities of the West Bank in Palestine.
- This study provides essential insights that can assist policymakers in crafting more resilient health systems. Hospital administrators can utilize these findings to enhance their operational strategies, ensuring that laboratory services are less susceptible to disruptions caused by external pressures such as political instability or resource shortages.
- The research aims to advocate for more structured and supported health interventions in areas where political and economic instability frequently affects the continuity of medical services.

1.4 Research Questions

1. How does the availability of equipment in laboratories affect the quality of work of laboratory staff?
2. How does laboratory management affect its quality?
3. What is the impact of the economic and political situation in Palestine on the quality of laboratories in government hospitals in the West Bank?
4. Is there a relationship between the availability of motivation for laboratory staff and the age difference?

1.5 Research Hypothesis

1. Laboratories with more advanced and regularly maintained equipment report higher quality of work among laboratory staff compared to those with outdated or insufficient equipment.
2. Strong and organized laboratory management practices, such as regular staff training, resource allocation, and quality control measures, positively impact the overall quality of laboratory services.
3. The economic and political instability in Palestine negatively impacts the quality of laboratories in government hospitals due to reduced funding, difficulty in accessing supplies, and disruptions in daily operations.
4. Younger laboratory staff tend to be more motivated by financial incentives, whereas older staff are more motivated by job security and professional development opportunities.

1.6 The Significance of the Study

The results of this study can help improve planning and resource allocation to make healthcare systems more resilient in the face of unrest, especially in regions affected by political instability and economic hardship. This is vital for maintaining continuous healthcare services during crises.

In addition, the results of this study will guide policy makers and healthcare officials in making informed decisions that support the stability and efficiency of laboratory services. This includes the implementation of robust emergency preparedness plans and the integration of more flexible infrastructure and operations.

While the study focuses on the West Bank, its findings may apply to other areas with similar challenges. The insights gained can contribute to global health strategies, especially in improving health care in conflict zones and low-resource areas.

Moreover, this research adds to the academic and practical understanding of healthcare delivery in challenging environments. It fills existing research gaps regarding how external factors such as conflict and resource constraints affect essential health services.

Reliable laboratory services increase public confidence in the healthcare system. By addressing the causes of service interruptions, the study supports the development of more reliable and trustworthy healthcare environments.

Despite the increasing volume of research on the ramifications of laboratory service interruptions, several gaps persist in the literature, especially regarding the comprehensive comprehension of such interruptions in conflict-affected regions like Palestine. Most existing studies tend to concentrate on the immediate and direct consequences of service interruptions, such as delayed diagnoses and treatments (Ahmed et al., 2021).

Additionally, many studies lack an in-depth exploration of the specific factors contributing to laboratory interruptions in conflict zones, often treating these interruptions as incidental outcomes of general instability rather than issues necessitating specific investigation (Patel & Jones, 2019). Some studies mention the adoption of standards such as ISO 15189 in governmental laboratories, but there is little empirical evidence on the actual effectiveness of these adaptations in sustaining or enhancing service continuity during prolonged periods of conflict or economic adversity (Wilson et al., 2018).

1.7 Conceptual Definitions of Variables

Laboratory Service Interruption: Interruption or disruption in the provision of laboratory services, adversely affects the analysis of necessary samples related to the diagnosis, treatment, or prevention of diseases. Problems can relate to staff shortages, equipment malfunctions, or sample processing delays. A clinical laboratory is a facility where clinical specimens are analyzed to gather information about a patient's health, assisting in diagnosis, treatment, and disease prevention. Clinical medical laboratories represent applied science, in contrast to research laboratories which concentrate on basic science, often found in academic institutions (Farr, J. 2004).

Associated Factors: The reasons that have a role in the interruption of laboratory services, such as staff shortages, equipment failures, or delays resulting from manual examination. Which leads to increased operational costs and delayed results. Factors associated with laboratory service interruptions often involve issues like inadequate staffing, equipment failures, or delays in the processing of lab results. For instance, manual microscopic examinations are labor-intensive and can be significantly slower compared to automated systems, leading to bottlenecks and increased operational costs (Abebe, D.D.,& et al., 2023).

Governmental Hospitals: They are known as government-run hospitals that rely on the availability of tests, the quality of results, and the prompt reporting of critical results as indicators of patient satisfaction with laboratory services. Governmental hospitals, particularly in regions like Northeast Ethiopia, have been studied for factors affecting satisfaction with laboratory services. These include the availability of tests, quality and reliability of results, and timely notification of critical results. High satisfaction levels are often associated with the prompt availability of test results and reliable test outcomes (Abebe, D.D,& et al., 2023).

Knowledge: The ability of laboratory staff to manage laboratory operations, use advanced technology, and adhere to health protocols. Increase knowledge by regularly training employees to ensure efficiency. To ensure that laboratory services continue to run optimally, and to minimize the occurrences of mistakes that could lead to failures in the healthcare system, professionals (which are in this field) need to be able to do important things, including: managing the laboratory and being able to use any modern technology that may be used. It is very important to train individuals regularly because this will help to increase their efficiency, while at the same time enabling them to use any modern technology and protocols confidently. A study conducted (Tefera et al., 2019) focusing on how the supplies in the laboratory were being handled and organized (in

public Ethiopian hospitals) stressed the importance of training individuals responsible for managing these medical supplies as this will contribute to better quality services provided.

Motivation: Conditions that help employees in the laboratory to provide high-quality work, and minimize errors that may disrupt services. Lack of stimulation causes reduced productivity and increased accidents. Motivating staff is fundamental to ensure smooth sailing in laboratory services in public hospitals, as the majority of effective and efficient tasks seem to be completed by motivated individuals, which in turn minimizes any shortcomings. Likewise, the lack of motivating factors in staff is directly linked to a decrease in productivity and an increase in the likelihood of accidents (Lee, 2019).

Equipment: Devices used in laboratories that are constantly checked and replaced when there are any malfunctions, to ensure the continuation of laboratory services efficiently. In most cases, when service interruptions occur, the cause is a breakdown in the equipment being used. To decrease the likelihood of such incidents, and therefore ensure that laboratory service continues to run smoothly, it is essential to periodically examine the equipment being used, and replace them in the cases they were proven to have any flaws (Johnson, 2019).

Work Quality: Adherence to standards and protocols that provide high-quality laboratory services, to minimize the likelihood of disruption of operations. Quality of work is an integral part of ensuring proper laboratory services. Adhering to standards and relevant protocols guarantees high-quality services put forth by the laboratory, and minimizes the possibility of disturbances in the workplace. A study was conducted in 2018 by Hernandez where he evaluates protocols aimed at optimizing the maintenance and improving the quality of the laboratory.

Economic and Political Situation in Palestine: Conditions that adversely affect the availability of basic laboratory resources, such as chemical supplies, equipment parts, and staff funding. An important factor that deeply affects the availability of vital resources used in a laboratory, include: chemical supplies, maintenance parts for certain machines used in the hospital, medical equipment, and most important of all, funding to ensure that staff are fairly paid, has to be the economic and political state of the country. Demonstrates how dependent public health laboratories are on funding, and how the quality of their services significantly declines with financial neglect (O'Brien, 2018).

Management: The existence of an effective management system to organize the work within the laboratories, the distribution of tasks, and the availability of necessary

materials to avoid disruptions in operations. There has to be an effective management system put in place to ensure that everything runs smoothly in public hospitals' laboratories. Each staff member should know exactly what their task at hand is at all times, laboratory processes should have no collisions or clashes, and materials should be sufficient. If the management system fails to achieve this, service interruptions in the workplace are inevitable. Another key element to be integrated with the management of the laboratory is the information systems as this will contribute to fewer accidents happening in the hospital (Davies, 2019).

Communication: Communication is essential, which indicates the existence of an effective communication system between the different departments within the hospital, to solve problems and avoid accidents. A hospital has many departments which are vital for the healthcare system and laboratories are one of them. To ensure quick resolution of any problems that may arise in a hospital, an efficient communication system must be exercised to mitigate any accidents, which are inevitable when there is a poor communication protocol within the hospital. Argues that order can be established in the hospital and its laboratories when there is good communication media in place (Garcia, 2019).

Infrastructure: It emphasizes the importance of designing and organizing a laboratory that significantly affects the efficiency of services to minimize the possibility of disruption of operations. How a laboratory is designed and organized heavily impacts the efficiency of its services and the extent to which the hospital is confident that no service outages will take place. A poorly designed laboratory is known to contribute to inefficiency, delays, and compromises in its tasks. This issue has been discussed by (Smith and Brown, 2018).

Backup and Networking System: The use of Information Technology and data management systems with backup capabilities to continue laboratory operations and avoid chaos caused by system failures. To ensure that laboratory processes are on track, efficient IT and Data Management systems that have backup capabilities need to be put in place. There have been many instances in which a faulty IT system caused chaos not only in the laboratory but also in the hospital as a whole. The dependence of hospitals, and more specifically laboratories, on IT systems, is examined and evaluated (Wang and Kim, 2020)

Workload: The distribution of work among laboratory workers should be carried out fairly and orderly to avoid staff fatigue and minimize errors that can disrupt services. It

is crucial to have adequate staff members working in the laboratory (especially when there is a lot of work to be done) enforced by an efficient staff management system that can equally and fairly distribute tasks among workers to avoid staff members being assigned more tasks than they can handle, as they are more likely to cause errors in the lab, which in turn cause disruptions in the services of the laboratory, creating inconvenience for the patients in the hospital. Lee wrote a paper in 2019 in which she analyses and evaluates the extent to which proper staffing correlates with quality and efficiency in the laboratory (CDC, 2017).

1.8 Conceptual Framework

This part of the study presents the factors that are associated with the conceptual framework components for laboratory services and their related factors. These factors can be placed into several categories. The literature explores variables associated with data workflow by investigating the association between laboratory services and their associated factors. The independent factors are summarized as follows:

1.8.1 Independent Variables:

- Demographic characteristics: (e.g. Sex, Province, Age group, Position, Working experience, and Educational level).
- Knowledge: (e.g. Familiarity with laboratory quality system, and continuous education).
- Motivation: (e.g. communication with upper management, employees' recognition, communication among laboratory staff, satisfaction with salary, and descriptions for assigned tasks).
- Equipment: (e.g. adequate supplies & reagents, adequate equipment, and the number of staff, and documentation).
- Work quality: (e.g. turnaround time, laboratory quality improvement activities, external quality assessment activities, and internal quality control activities).
- Economic and political situation in Palestine: (e.g. economic crises with the laboratory work continuity, the work quality, satisfaction with salary, and Laboratory workload).
- Management: (e.g. annual plan, following up for essential supplies, reagents, and equipment on time).

- Communication: (e.g. continuous communications with upper management, physicians, patients, and regular staff meeting).
- Infrastructure: (e.g. enough space allocated, availability of functional electricity and water power).
- Backup and networking system: (e.g. backup equipment, sample referral linkages system).
- Workload**:** (e.g. sufficient human resources, and trained & skilled laboratory professionals).

1.8.2 Dependent Variables

Laboratory service interruption

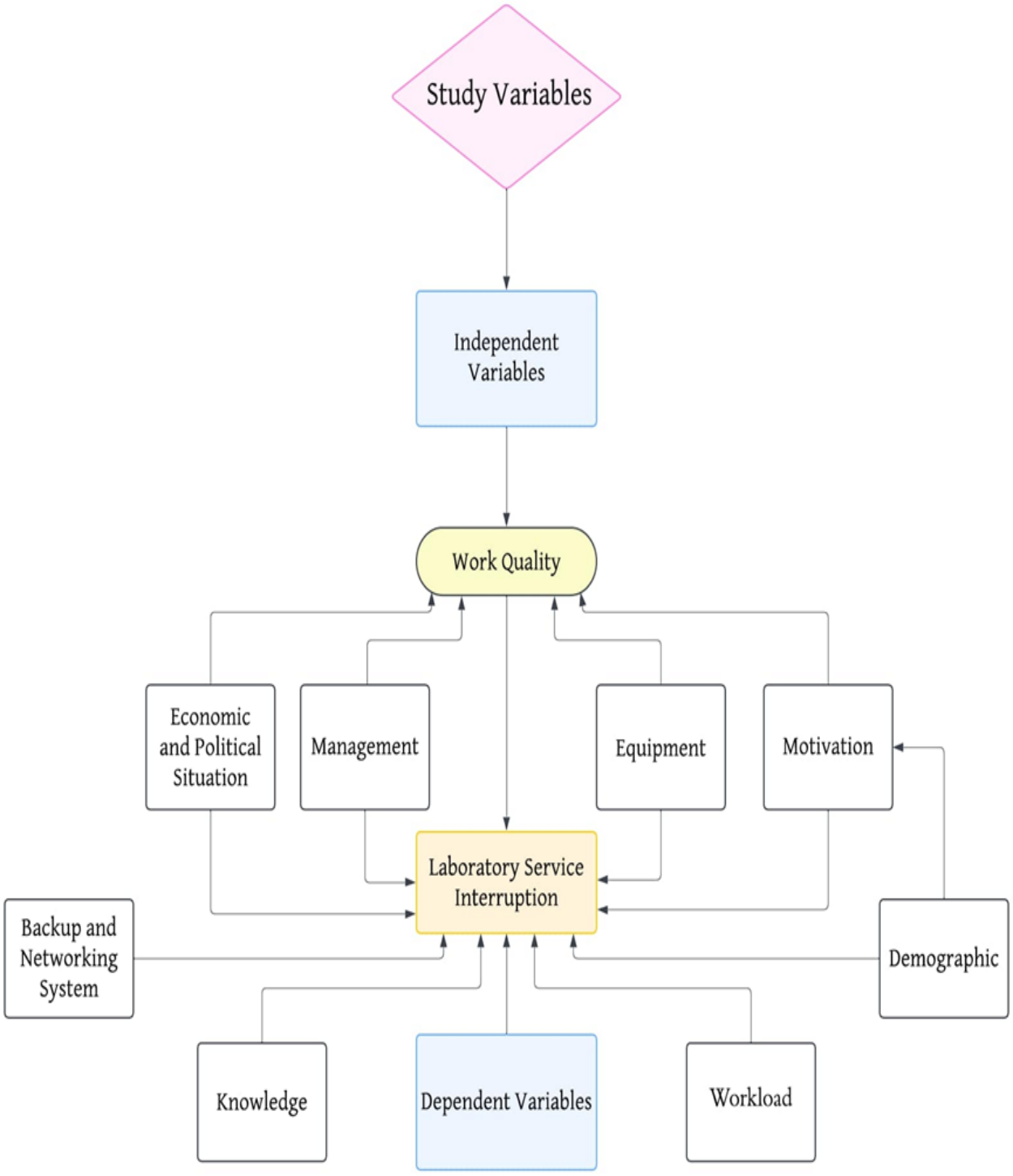

Figure 1.1: Study Conceptual Framework

Chapter Two :Literature Review

2.1 Introduction

This chapter discusses the previous studied related to the quality of laboratory services. An electronic search was done via the library Google Scholar and Research Gate. For the following key terms (laboratory, services, quality, and government hospitals). The research included studies from 2013 to 2023, there were 22 studies, of which only 15 studies were selected and 7 studies were excluded because the research objectives did not match the current research objective. They did not measure the quality of laboratories but focused on the job satisfaction of laboratory workers.

2.2 Importance of Laboratory Services in Public Hospitals

Laboratory services in public hospitals are crucial for accurate diagnosis, which provides the necessary information a doctor needs to work with to present suitable medical assistance a patient needs to cure their illness. If anything goes wrong in laboratory services that can significantly compromise medical care (Wang and Kim, 2020).

2.3 International Studies

In this study, Hail, H. A., (2020), worked on the assessment of doctors ' satisfaction with laboratory services in Ethiopia. The study involved 327 doctors from 60 hospitals. The results showed that the general practitioner's satisfaction with laboratory services was 55%. While satisfaction was noted with aspects such as the laboratory application form, clarity of reports, and notification of new tests, dissatisfaction was noted with the lack of a laboratory manual, a limited test list, and insufficient communication about response times and urgent services. Moreover. The study emphasized the need for hospital management to address gaps such as improving test lists, strengthening communication channels, and ensuring consistent service quality across all shifts to meet doctors ' needs for better patient care. This study is lacking because it is not clear how satisfaction affects the clinical results obtained and the quality of care provided to patients.

The study by Belitbiadgo, A.G., Et al., (2019) aimed to identify factors affecting the quality of services in public health facilities, especially in developing countries such as Ethiopia. The team consisted of 103 medical laboratory specialists. The study found significant correlations between the quality of laboratory services and various factors, including the lack of adequate equipment, inadequate training, and low employee

satisfaction with salary. These findings underscore the need for improvements in laboratory services to enhance healthcare outcomes in the region. In this study, it was not clarified how factors directly affect the quality of healthcare or patient outcomes.

The study by Meyer et al. (2018) aimed to find out about the changes in healthcare services over the past five decades, especially in clinical laboratories. The study showed that quality indicators have spread internationally, but at the same time, the researchers identified the absence of links between structural and practical classifications, and patient outcomes (the results of laboratory tests and whether they were cured of the disease for which they initially came to the hospital). The study lacks clarifying information regarding how strong the impact of quality indicators is and what the study community is.

The study by Adamu and McGill (2018) was conducted in Kaduna State, Nigeria, to assess the impact of drug supply and laboratory services on the effective functioning of the points system. Six centers were selected to provide points for the study, consisting of three participants from each center based on their profession: medical administrator, pharmacist, and laboratory technician, for a total of 18 participants. The results showed that the drugs were mainly supplied to the centers by the Kaduna State tuberculosis and Leprosy Control Program Office from the state capital quarterly, with generally adequate supplies, although occasional logistical interruptions were reported. Regarding laboratory services, respondents expressed the need for improvement due to the shortage of reagents and irregular supply of electricity, which hampered the effective functioning of laboratories. The researcher believes that the number of participants in the study is small, while if the number of participants was larger, the results could be different.

And the study conducted by Badraic, T. C., (2018). It aims to compare performance indicators across a wide range of diagnostic laboratories in various Asia-Pacific countries and provides insight into quality improvement activities, staff productivity, and response time. The results revealed that Indian laboratories face similar challenges to those in the region but also share common solutions, such as adopting a quality systems approach that includes accreditation, enhancing customer responsiveness, increasing the use of IT, and automation. However, Indian laboratories are lagging behind others in the region in terms of automation and the adoption of Laboratory Information Systems. They also show lower productivity rates. Neglected to analyze the effects on the quality of health care provided to patients.

In a study by Gila (2020), I set out to examine the pre-analytical stage of testing in a pathology laboratory of a hospital somewhere in southern Nigeria, and to what extent it caused inaccuracies. Each laboratory test must go through three stages when conducting such a test: pre-analysis (which is the stage concerned with collecting samples and samples from the patient, handling these samples, and preparing them for testing). (71%) showed unsatisfactory results, the performance of indicators was considered good (12%), and the performance of the remaining three indicators was excellent. She concluded that, as the results clearly show, pre-analysis practices lack accuracy and, in turn, lead to a large number of errors. The study lacks the analysis of the other two phases, which the study did not address in detail.

A study conducted by Kenenji et al., (2023), aimed to evaluate all laboratory services based on their quality in primary health care centers in Tanzania. For their analysis, the researchers examined 6,663 Primary Health Care Centers for the quality of their services and compiled a rating for each of them. The results of the study showed that there are significant challenges faced by primary health care centers in living up to the standards described above, with an impressive overall quality level of 30.8%. Moreover, the researchers showed that recruitment compliance was found to have a positive correlation with quality (Beta = 5.770), which means that improving the quality of recruitment in laboratories will play a key role in improving overall quality. The results also showed that the quality was negatively affected by dispensaries (beta = -6.342), rural areas (beta = -0.945), and publicly owned primary health care centers (beta = -1.459). The study lacks its analysis to find out the reasons for the lack of quality in health centers that suffer from a lack of quality.

In the study, Desalegn, D. M., et al. (2016) assessed the status of focused antenatal care (FANC) laboratory services at public health facilities in Addis Ababa, Ethiopia. Findings revealed incomplete provision of FANC laboratory investigations, with shortages in supplies and electric power disruptions being major challenges. Only 38.5% of visited health facilities reported availability of all basic FANC laboratory tests. Shortages of reagents and power disruptions led to interruptions in laboratory services. Efforts to address these challenges and ensure the fulfillment of FANC laboratory resources are crucial for improving pregnancy outcomes and promoting safe motherhood. The study lacks a determination of the number of antenatal care laboratories in public health facilities.

Mulu and others conducted a study in 2020 looking at disorders occurring in laboratory services in Ethiopian public hospitals, specifically in Addis Ababa. 23% of public hospitals experienced some kind of disturbance in their laboratory tests for 76 days (which is 84% of the days when this analysis was collecting data), and in private hospitals, only 17% (on average) of the tests performed in laboratories experienced some kind of interruption. Public hospitals experienced a 28% test failure rate in their laboratories. The researchers have shown that the types of tests responsible for most testing disorders are tests related to serology (6.9% failure rate) and hematology (5.5% failure rate). Due to the lack of laboratory services in the majority of hospitals in Addis Ababa. The study lacks a determination of the number of laboratories included in the study.

The study conducted by Sek, Voeurng, and Perrone, (2016) aimed to find out the quality of laboratories in Cambodian hospitals through a structured program. Taking advantage of the gradual implementation of laboratory quality, the researchers were able to train a total of four laboratory technicians to be trained to implement the quality levels set by ISO 15189, and two workers from 12 selected Cambodian hospitals were trained on how to deliver the quality level. And to ensure that these workers continue to carry out their assigned work. The results showed the importance of regular monitoring (in the native language of the workers, in this case, Khmer) of well-organized activities because this will help Cambodian hospitals monitor the progress of the quality of their laboratory services without causing actual harm to them. The study lacks a detailed explanation of the training and the plan followed.

2.4 Arabic Region Studies

A study conducted by Alzeyara, F.,(2022) aimed at how well-equipped laboratories in Qatar are in terms of providing basic supplies during the pandemic, focusing on their supply chain management capabilities and flexibility. The results showed varying degrees of progress, highlighting the importance of strategic planning, strong community management systems, and enhanced collaboration between health sectors to improve emergency responses and ensure continuity of supply during crises. The study lacked a determination of the number of laboratories and the sample included in the study.

While the study conducted by Al-Ghamdi, R. S. Et al., (2021) research focused on quality standards in pathological anatomy laboratories and work facilities in developed countries. The results indicated that a comprehensive assessment, treatment, and monitoring of the institution, procedures, and activities within pathological anatomy laboratories is crucial

for their effective and safe operation. Ensuring the safety of operations personnel and the environment is equally important. To maintain high standards. The study lacks clarity on what quality criteria it focused on.

And this study by Al-Matrafi, Dr., Et al., (2018) aimed to assess the levels of satisfaction of doctors and patients with clinical laboratory and phlebotomy services provided in the outpatient department of King Abdullah Medical City. The sample consisted of 435 randomly selected patients and all available doctors who needed regular laboratory tests. Patients expressed great satisfaction with the availability of laboratory tests but showed dissatisfaction with the clarity of phlebotomy warnings given by phlebologists. The results indicated overall satisfaction with laboratory services but highlighted specific areas such as the explanation of the phlebotomy process and the collection and delivery of samples, which require improvements to better meet the expectations and needs of both patients and doctors. The message lacked in that it focused on one city, in case it included multiple cities it was possible to get more accurate results.

2.5 Local Studies

The study conducted by Markby, J., Et al., (2023) evaluated laboratory services in conflict-affected low-middle-income countries, specifically in the eastern Democratic Republic of the Congo and Gaza, Palestine, to identify gaps and opportunities for strengthening laboratory capacities. The results showed that the average score using the WHO tool was 41% in the Democratic Republic of the Congo, with particularly low scores in biohazard management and documentation, and 78% in Gaza. In contrast, the highest scores in the DRC were in facilities, data, and information management, while in Gaza they were in data information management and the public health function. In terms of accreditation, no laboratory in the Democratic Republic of the Congo received a Slipta star rating, while two laboratories in Gaza received a 3-star rating, one received 2 stars, and two received 1 star. The findings highlight significant gaps in laboratory systems within these conflict-affected areas, underscoring the challenges of implementing improvement strategies in such environments. This study lacks the identification of a community and a study sample.

2.6 Summary

There is a gap in previous studies, as there are few local studies that aim to find out the quality of laboratory services provided to patients. There are no studies in the West Bank

that have focused on this topic. The present study is characterized by knowing the quality of laboratory services provided to patients in government hospitals in the cities of the West Bank in Palestine, knowing the factors and services that lead to a lack of laboratory services, developing solutions to them, and improving the quality of laboratories. It took into account the political and economic conditions and how they affect the quality of laboratory services provided to patients.

Chapter Three : Methodology

3.1 Introduction

This chapter describes the study design, procedures, sampling, population, the study instrument, and data collection process, its validity and reliability, and the data analysis of this study to achieve the study's primary purpose and answer the study questions.

3.2 Study Design

The current study was conducted using the cross-sectional descriptive-analytical approach. This approach is appropriate for achieving the aims and answering this study's main questions. Therefore, a quantitative study method is adopted. A descriptive analytical approach study was conducted using a questionnaire to assess factors that affect the interruption of medical laboratory services in 18 owned by government health facilities.

The design that was adopted was that of Mesfin et al. (2017) and by Mulu, (2020) are suitable for the current study since it was used in the same field, as well as its feasibility and practical application, where real randomness is not available for study.

3.3 Study Period The writing of the dissertation began in May 2024 and during the study period, ethical approval was obtained related to facilitating the task of distributing the questionnaire and starting data collection from 4-8-2024 to 20-9-2024.

3.4 Site and Setting

The study was conducted in the laboratories of government hospitals in the West Bank, numbering 18 hospitals in the following cities: Jenin, tubas, Tulkarem, Nablus, Qalqilya, Salfit, Ramallah and Al-Bireh, Jericho, Beit Jala, Hebron, Yatta, Dora, Ateel and Bethlehem. The selected locations are suitable for conducting the study, as they represent the majority of health care provided in these cities.

Table 3.1 Shows the Distribution of Government Hospitals in the West Bank

Specialized hospitals	**Small hospitals**	**Intermediate hospitals**	**Central hospitals**
Bethlehem psychiatric hospital	Martyr Yasser Arafat hospital-Salfit	Al Hussein BeitJala hospital	Palestine Medical Complex
Hogochaviz Eye Hospital	Dr. hospital Darwish Nazal-Qalqilya	Abu Hassan Al Qasim hospital-Yatta	Rafidia hospital
	The New Jericho government hospital	Dr. martyr hospital ThabitThabit-Tulkarm	Alia government hospital-Hebron
	Atil hospital-Tulkarm	Al Watani Hospital	Martyr Khalil Suleiman hospital-Jenin
	Dura government hospital		
	TubasTurkishhospital		
	Al-Mohtasebhospital		
	President Mahmoud Abbas hospital-solutions		

Table 3.2 Shows the Distribution Areas of Government Hospitals in the West Bank.

Southern hospitals	**Central hospitals**	**Northern hospitals**
Bethlehem psychiatric hospital	Palestine Medical Complex	Martyr Khalil Suleiman hospital-Jenin
Al Hussein hospital-Beit Jala	Tubas hospital	
Alia government hospital-Hebron	Dr. martyr hospital Yasser Arafat	Al Watani Hospital
Dura government hospital		Rafidia hospital
Al-Mohtaseb hospital	Hogochaviz Eye Hospital	Martyr Thabit Thabit hospital-Tulkarm
Abu Hassan Qasim hospital-Yatta	The New Jericho government hospital	Atil hospital-Tulkarm
President Mahmoud Abbas hospital-Halhoul	Dr. hospital Darwish Nazal-Qalqilya	

3.5 Study Population and Sample

The population of the study contained all laboratory staff in government hospitals in the West Bank. They consist of 352 laboratory staff, employed in all West Bank hospitals, with 18 laboratories.

Table 3.3: Distributes the Number of Laboratory Technicians and Laboratory Administration Samples that Were Collected from Each Hospital.

Hospital	No. Lab	Percentage	Sample
Jenin (Khaleel Sulaiman)	1	%9.2	17
Tubas Turkish	1	%4.3	8
Tulkarm (Thabit Thabit)	1	%5.9	11
Al Watani / Nablus	1	%8.1	15
Rafidia / Nablus	1	%11.4	21
Qalqilya (Darweesh Nazal)	1	%3.8	7
Salfit (Yasser Arafat)	1	%3.8	7
Palestine Medical Complex	2	%12.5	23
Jericho	1	%4.3	8
Beit Jala (Al Hussein)	1	%9.2	17
Hebron (Alia)	1	%11.9	22
Yatta	1	%3.8	7

Mohammad Ali Al Mohtaseb	1	%2.7	5
Dora	1	%3.8	7
President Mahmoud Abbas	1	%2.7	5
Ophthalmic Hospital Huge Chavez	1	%1.6	3
Ateel	1	%1.6	3
Kamal Adwan for psychiatric diseases (Bethlehem)	1	%1	2

The sample size was calculated using the Sample Size Calculator where the total number of laboratory technicians and laboratory administrators was 352, and using a 5% margin of error and 95% confidence interval, the sample size was 334 laboratory technicians and 18 members of laboratory administrators.

$$n = \frac{N * Z_{\frac{\alpha}{2}}^2 * p * q}{e^2 * (N-1) + Z_{\frac{\alpha}{2}}^2 * p * q}$$

n: sample size

N: population size

E: Marginal error

a: significancelevel= 95%

z: 1.96

p=q=0.5

According to the formula, the sample size is 196 laboratory technicians and members of laboratory administrators.

Which was proportionally recruited from each hospital according to its participation in the overall population size, as distributed in the previous table. The samples were recruited using a convenient sampling technique.

3.6 Eligibility Criteria

3.6.1 Inclusion Criteria:

1. The sample includes all laboratory staff only in West Bank governmental hospitals.
2. The sample does not exclude any age group, educational level, or working experience.

3.6.2 Exclusion Criteria:

1. Possible exclusions may appear for laboratory staff who do not fall under laboratory technician or laboratory administrator.
2. Exception of laboratory technicians with less than one year of experience.

3.7 The Data Collection Tool

A self-administered questionnaire was developed based on previous literature by Mesfin et al. (2017) and by Mulu, (2020) and was modified to suit the satisfaction of laboratory staff and technicians, and was used to collect data from lab staff (Appendix C).

Both forms started with an informed consent that explained the aims of the study, as well as ensuring the commitment to ethical considerations of anonymity and confidentiality, the first section related to the demographic data for each of the lab staff, including age, gender, educational level, working experience in laboratory fields, Position, and Province.

Both forms included the satisfaction scale.

The questionnaire begins with demographic information, namely: Sex, Age group, educational level (profession), Practical experience in laboratory fields, Position, and Province. It has been adopted from Mulu (2020) and the related variable in the Salary was deleted from it because it's an unimportant variable to study. In addition to omitting the following variables, they have no significance in the current study (laboratory discipline and working organization) by Mesfin et al. (2017)

The questionnaire includes ten sections: the first section knowledge consists of 3 paragraphs, the second section motivation consists of 5 paragraphs, the third section equipment consists of 6 paragraphs, the fourth section work quality consists of 5 paragraphs, and these sections have all been adopted by Mesfin et al. (2017). The fifth section was added entitled The Economic and political situation in Palestine of 6 paragraphs, as the previous studies did not study the impact of political and economic conditions on the quality of laboratories.

The sixth section management consists of 5 paragraphs, the seventh section communication consists of 4 sections, the eighth Section infrastructure consists of 3 paragraphs, the ninth section backup and networking System consists of two paragraphs, and the last section workload consists of two paragraphs. These sections have all been approved by Mulu, (2020).

The following sections were deleted from it: Motivation part and Equipment part because it was adopted from Mesfin et al. (2017) with a slight difference in the paragraphs related to the section.

Rely on the answer to the questionnaire in yes and no.

Data collection started with laboratory staff and technicians (each in separate groups at each hospital), who were asked to fill in the pretest questionnaire, which took around 10 minutes to complete. The collected data has been saved in closed envelopes until the start of data analysis.

3.8 Piloting

Before the official data collection, a pilot sample was collected and consisted of 10% of the calculated sample size of 36 laboratory staff (31 laboratory technicians and 5 lab administrators), who were asked to answer the study questionnaire and give feedback about the building of the questions, and how much time they took to complete the questionnaire. Most of the piloting sample reported positive feedback, which included easy-to-comprehend questions, and not taking too long to answer. The piloting sample was also used to measure the reliability of the satisfaction scales as explained later.

Table 3.4: Shows the Result of the Coefficient of Constancy

Cronbach's Alpha	N of Items
0.842	41

3.9 Tool Reliability and Validity

The reliability of the tool was verified in the previous study by Mesfin et al. (2017), and Mulu (2020) who used the same tool, including the same elements, to achieve their goals. Moreover, the same tool was used to assess the laboratory's accreditation status by Meseret Tessema et al. (2023), to investigate the satisfaction of doctors. The questionnaire was taken in English, as it is clear and easy, and the terms are simple and understandable to the study community consisting of technicians and informants. Moreover, reliability lies in its ability to provide us with a clear understanding of the point of view of the laboratory staff on the current situation to find the possibility of service interruptions by understanding the situation from different angles Bibi et al. (2023).

Table 3.5: Shows the Result of the Coefficient of Constancy

Cronbach's Alpha	N of Items
0.841	41

The table shows that the result of the Cronbach's Alpha coefficient is high, which indicates that the stability of the tool is high.

3.10 Data Analysis

For data analysis, The SPSS program was used. The arithmetic mean, percentage, standard deviation, the choice of T-test, and one-way ANOVA were found. The analysis of the data included descriptive and analytical aspects, as the descriptive results included the distribution of laboratory technicians and laboratory managers, answering questions related to demographic data, and responses to the items of the satisfaction scale by frequencies and percentages. It also included a description of the satisfaction scale, means of subscales, and standard deviations.

3.11 Ethical Considerations:

Ethical approval has been granted by the Arab American University IRB "R-2024/A/118/N" (Appendix A), which was followed by approval to start data collection from the scientific research department of the Palestinian Ministry of Health (Appendix B), which allowed the start of data collection from the targeted government hospitals.

For laboratory technicians and workers, data collection began with the provision of informed written consent that was printed on the first page of the questionnaire, and consisted of an explanation of the objectives of the study, as well as the components of the questionnaire, the expected time to answer it, the part on ensuring anonymity and confidentiality of the data collected, since no names or contact information were collected, and the confidentiality of the data was maintained in sealed envelopes until the data analysis began. The researcher and his supervisor were the only people who reviewed the data, while the data was blindly analyzed by the data analyst. The Informed Consent also included a statement informing the lab staff that he could withdraw from the study at any time without having to declare any reason.

Chapter Four :Result

4.1 Introduction

A total of 352 participants filled the used data collection tool, reliability and internal consistency of the used tool showed very good reliability with a Cronbach's alpha of 0.842 in all 41 variables of the used tool, data were tested for normality and results showed that the data were normally distributed, data analysis was used SPSS.

4.2 Related Results in Demographic Characteristics

Table 4.1 Characteristics of Respondents Based on the Gender Variant

sex	Frequency	Percent
Male	63	32.1
Female	133	67.9
Total	196	100.0

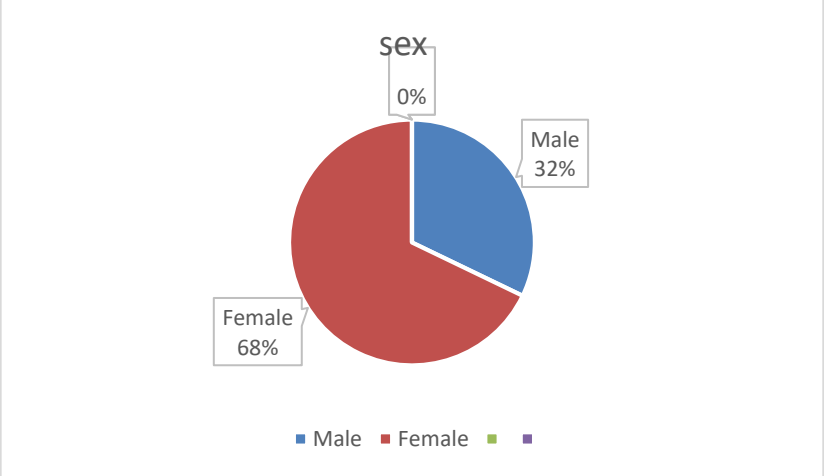

Figure 4.1 Characteristics of Respondents Based on the Gender Variable

The sample consists of 196 laboratory workers, including 63 males, at a rate of 32.1%, and 133 females, at a rate of 67.9%.

Table 4.2 Characteristics of Respondents Based on the Age Variable

Age group	Frequency	Percent
20-30	43	21.9
31-40	93	**47.4**
41-50	52	26.5
51-60	8	**4.1**
Total	196	100.0

In the sample, the percentage for the age group 31-40 was 47.4% and the lowest percentage was for the age group 51-60 at 4.1%.

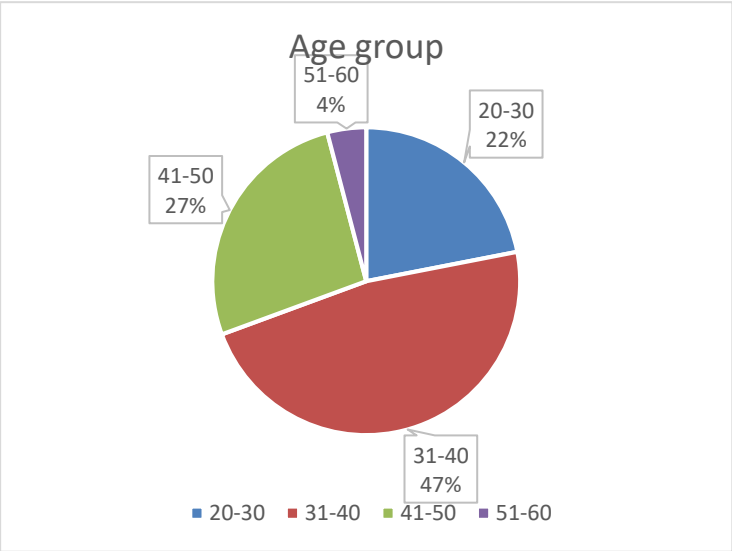

Figure 4.2 Characteristics of Respondents Based on the Age Variable

Table 4.3 Characteristics of Respondents Based on the Educational Qualification Variable

Educational level	Frequency	Percent
Diploma	13	6.6
bachelor	136	**69.4**
MA	46	23.5
more	1	**0.5**
Total	196	100.0

The highest percentage of laboratory workers in the sample is for those with a bachelor's degree, and the lowest is for those with a master's degree or higher.

Table 4.4 Characteristics of Respondents Based on the Years of Experience Variable

Experience	Frequency	Percent
1-3	18	9.2
4-6	24	12.2
7-10	39	19.9
more than 10	115	**58.7**
Total	196	100.0

The highest percentage of laboratory workers are those with more than ten years of experience, at a rate of 58.7%, and the lowest percentage are those with 1-3 years of experience, at a rate of 9.2%.

Table 4.5 Characteristics of Respondents Based on Position

Position	Frequency	Percent
Lab technician	178	90.8
Lab.administrators	18	9.2
Total	196	100.0

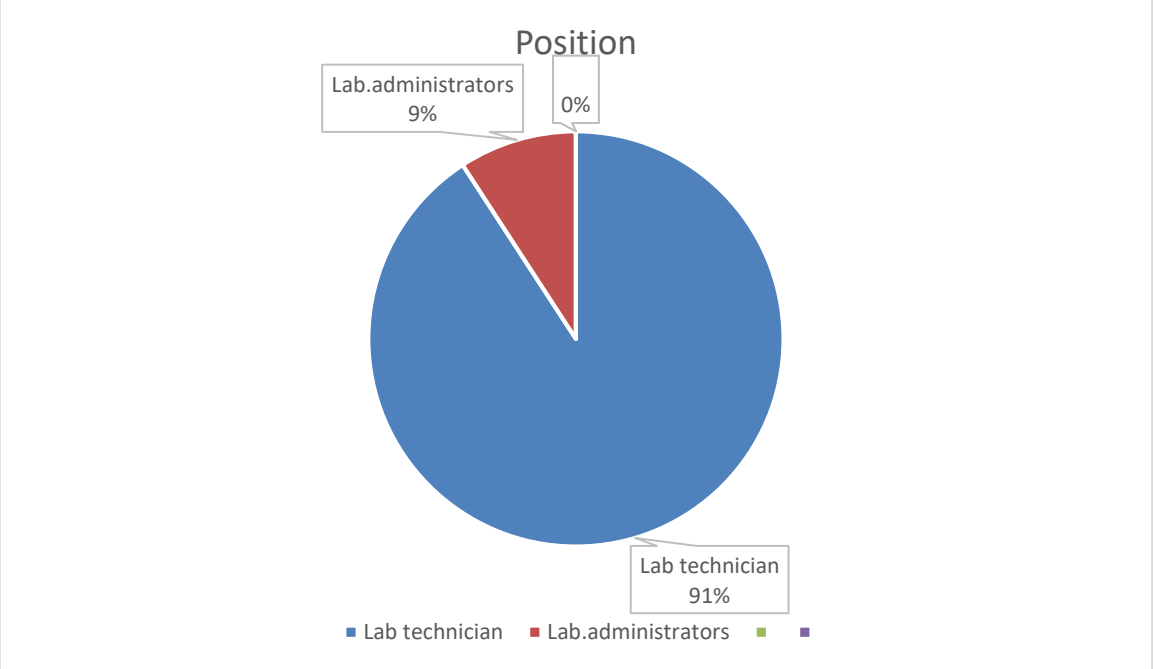

Figure 4.3 Characteristics of Respondents Based on Position

It was found in the sample that 178 people who work in laboratories work as laboratory workers, at a rate of 90.8%, and 18 people work as administrators, at a rate of 9.2%.

Table 4.6 Ratios of Employees Based on the Province

Province	Frequency	Percent
Ramallah	35	17.86
Hebron	26	13.27
Nablus	43	**21.94**
Jenin	24	12.24
Tulkarm	13	6.633
Jerico	16	8.163
Tubas	11	5.612
Salfit	6	**3.061**
Qalqilya	19	9.694
Bethlehem	3	**1.531**
Total	196	100.0

The sample contains the largest percentage of laboratory workers from Nablus Governorate, the least of which is Bethlehem and Salfit.

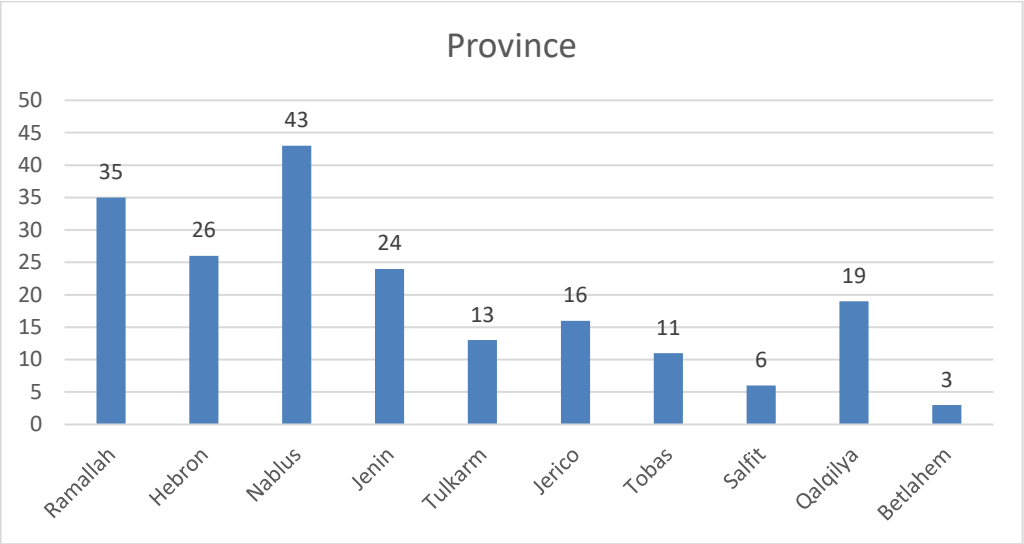

Figure 4.4 Ratios of Employees Based on the Province

Table 4.7 Ratios of Employees Based on the Name of the Hospital

name of the hospital	Frequency	Percent
Palestine Medical Complex	31	**15.8**
Alia government hospital-Hebron	10	5.1
Rafidia - Nablus	27	**13.8**
Jericho hospital	16	8.16
Jenin -Khaleel Sulaiman hospital	24	12.2
Martyr Thabit Thabit hospital-Tulkarm	12	6.12
Al Watani - Nablus	16	8.16
Tubas -Turkish hospital	11	5.61
Dora hospital	6	3.06
Dr. Darwish Nazal hospital- Qalqilya	19	**9.69**
Yasser Arafat Government -Salfit	6	3.06
Muhammad Ali al-Muhtasib-Hebron	5	2.55
Abu Alhasan Alqasem- Yatta	2	1.02
Hogochaviz Eye Hospital	4	2.04
Beit Jala (Al Hussein)	2	1.02
President Mahmoud Abbas hospital-Halhul	3	1.53
Atil hospital-Tulkarm	1	**0.51**
Kamal Adwan for psychiatric diseases (Bethlehem)	1	**0.51**
Total	196	100.0

The sample contains the largest number of workers in the laboratories of the Palestine Medical Complex Hospital Then Rafidia Government Hospital and Darwish Nazzal Hospital, a smaller number than the Attil-Tulkarm Hospital and Kamal Adwan for Psychiatry (Bethlehem).

4.3 Results Related to the Questionnaire Axes

The participants ' responses were analyzed by finding the percentage of those who answered yes and no.

Table 4.8 Analysis of Participants ' Responses Based on Motivation

Motivation		**Count**	**Column N %**
The laboratory staff has communication with upper management	no	81	41.3%
	yes	115	58.7%
We have a system for employee recognition	no	172	87.8%
	yes	24	**12.2%**
We have communication among laboratory staff	no	13	6.6%
	yes	183	**93.4%**
I am satisfied with my salary (with no regard to the recent economic crisis)	no	140	71.4%
	yes	56	28.6%
Laboratory staff has job descriptions for assigned tasks	no	43	21.9%
	yes	153	**78.1%**
Total	no	462	46.5%
	yes	531	**53.5%**

Through the sample, it was found that the most influential factor on employee motivation is the presence of communication between workers in the laboratory Where 93.4% of employees believe that it has an impact, then laboratory employees have a job description for the task assigned to them by 78.1% of employees. We have a system to evaluate employees, at least 12.2% of employees. Also, 53.5% of all employees believe that these factors together have an impact on motivation.

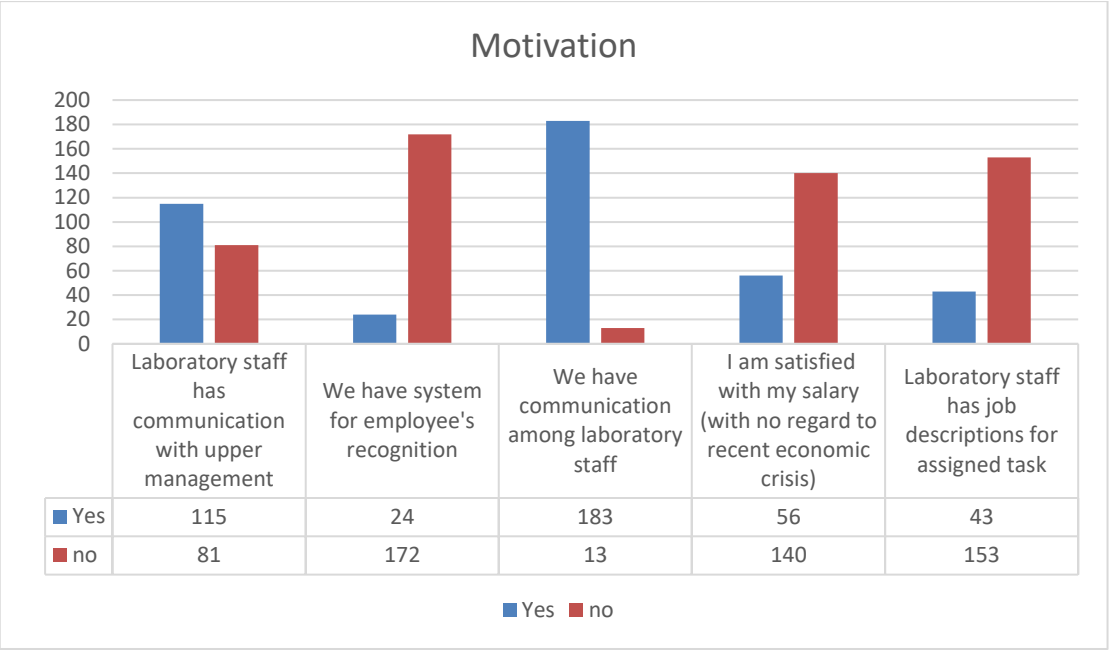

Figure 4.5 Ratio of Employees Based on Motivation

Table 4.9 Analysis of Participants ' Responses Based on Equipment

Equipment		**Count**	**Column N %**
Availability of quality and adequate supplies & reagents	No	124	63.3%
	Yes	72	36.7%
Availability of quality and adequate equipment in the laboratory	No	80	40.8%
	Yes	116	59.2%
Adequate number of staff for laboratory services	No	175	89.3%
	Yes	21	**10.7%**
Equipment calibration & maintenance	No	26	13.3%
	Yes	170	86.7%
The laboratory has documentation (documents and records)	No	9	4.6%
	Yes	187	**95.4%**
Adherence to the standard operating procedures	No	25	12.8%
	Yes	171	**87.2%**
Total	No	439	37.3%
	Yes	737	**62.7%**

Through the sample, it was found that the most influential factor on the quality of equipment in laboratories is the laboratory's possession of documentation (documents and records), as 95.4%

of employees believe that it has an impact, then adherence to standard operating procedures by 87.2% of employees. The presence of a sufficient number of employees for laboratory services is the least influential factor with 10.7%. Also, 62.7% of employees believe that these factors in the table have an impact on the quality of equipment in laboratories.

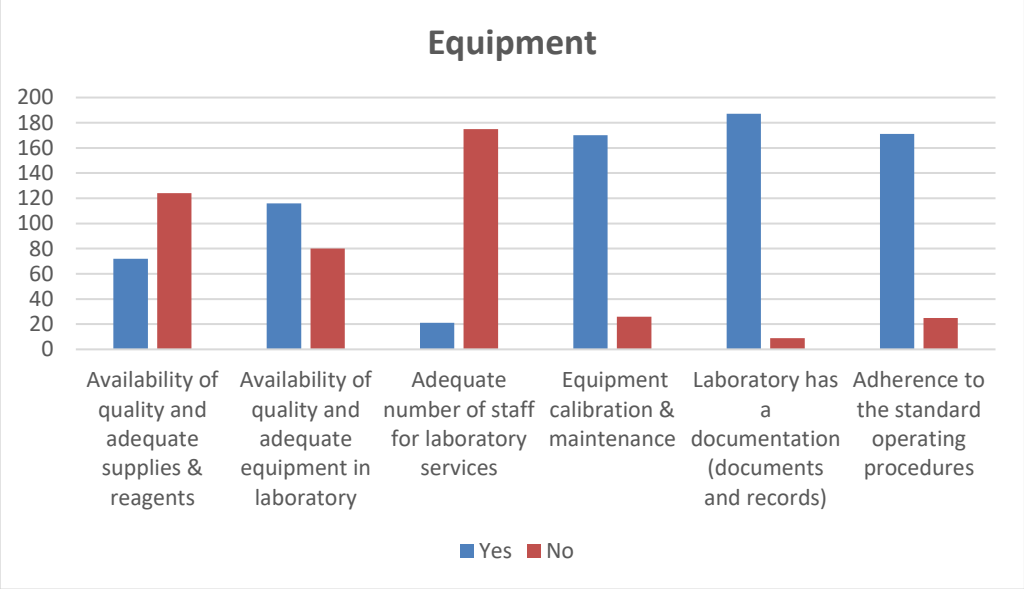

Figure 4.6 Ratio of Employees Based on Equipment

Table 4.10 Analysis of Participants ' Responses Based on Work Quality

Work quality		Count	Column N %
Laboratory results are reported within turnaround time	no	21	10.7%
	yes	175	89.3%
There are laboratory quality improvement activities	no	97	49.5%
	yes	99	**50.5%**
There are external quality assessment activities	no	21	10.7%
	yes	175	**89.3%**
There are internal quality control activities	no	13	6.6%
	yes	183	**93.4%**
Providing uninterrupted laboratory services	no	76	38.8%
	yes	120	61.2%
Total	no	228	23.3%
	yes	752	**76.7%**

Through studying the variable of work quality, it was found that the most influential factor on the quality of work is the presence of internal quality control activities, as 93.4% of workers believe that they have an impact, then reporting laboratory results during the period, and there are external

quality assessment activities, with the same percentage of 89.3% of workers. The least factors there are activities to improve laboratory quality, at a rate of 50.5% of workers. Also, 76.7% of workers believe that these factors have an impact on the quality of work.

Table 4.11 Analysis of Participants ' Responses Based on Management

Management		**Count**	**Column N %**
The hospital manager announces the laboratory budget at the beginning of the year	no	155	79.1%
	yes	41	**20.9%**
The laboratory has an annual plan	no	122	62.2%
	yes	74	37.8%
The laboratory manager requests and follows essential supplies, reagents, and equipment on time	no	59	30.1%
	yes	137	**69.9%**
The upper manager of the hospital gives immediate feedback for questions related to laboratory service	no	97	49.5%
	yes	99	50.5%
The laboratory managers follow your daily activity	no	61	31.1%
	yes	135	**68.9%**
Total	no	494	50.4%
	yes	486	49.6%

It was found in the sample that the most influential factor on the quality of management from the point of view of laboratory workers is the laboratory director's request and follow-up of basic supplies, reagents, and equipment on time, as seen by 69.9% of workers, then followed by laboratory managers who follow your daily activity by 68.9% of workers, and the least influential factor is The hospital director's announcement of the laboratory budget at the beginning of the year By 20.9% of employees.

Table 4.12 Analysis of Participants ' Responses Based on Communication

Communication		**Count**	**Column N %**
Continuous communications with upper management about laboratory service	no	81	41.3%
	yes	115	58.7%
Continuous communications with physicians about laboratory services	no	49	25.0%
	yes	147	**75.0%**
Continuous communications with patients about laboratory service	no	78	39.8%
	yes	118	**60.2%**
Have regular staff meetings concerning laboratory service	no	119	60.7%
	yes	77	**39.3%**
Total	no	327	41.7%
	yes	457	**58.3%**

Through studying the communication variable, it was found that continuous communication with physicians about laboratory services was the highest influencing factor, as 75% of workers saw this, then continuous communication with patients about laboratory services, where 60.2% of workers saw this, and the least of which was organizing a meeting with employees regarding the service of Laboratory with 39.3% of workers. The influence of the combined factors on communication reached 58.3% of workers.

Table 4.13 Analysis of Participants ' Responses Based on Infrastructure

Infrastructure		**Count**	**Column N %**
Enough space is allocated based on the number and the type of tests performed within the hospital	no	107	54.6%
	yes	89	**45.4%**
Functional electricity power available in the laboratory continuously	no	38	19.4%
	yes	158	**80.6%**
Functional water available in the laboratory continuously	no	46	23.5%
	yes	150	**76.5%**
Total	no	191	32.5%
	yes	397	**67.5%**

Through studying the variable of infrastructure in laboratories from the point of view of the workers, the most influential factor was Functional electricity power available in the laboratory continuously with 80.6% of the workers seeing it as having an impact, and the least influential factor was Enough space allocated based on the number and the type of tests performed within the hospital, with 45.4% of the workers seeing it. 67.5% of workers believe that these factors have an impact on the infrastructure in laboratories.

Table 4.14 Analysis of Participants ' Responses Based on Backup and Networking System

Backup and networking system		**Count**	**Column N %**
Additional laboratory equipment used as backup	no	93	47.4%
	yes	103	**52.6%**
Sample referral linkages system with other health facility laboratories	no	62	31.6%
	yes	134	**68.4%**
Total	no	155	39.5%
	yes	237	**60.5%**

68.4% of workers believe that the Sample referral linkages system with other health facility laboratories has the most impact on the backup system and networks, then 52.6% of workers

believe that Additional laboratory equipment used as backup has the most impact. 39.5% of workers believe that working together does not affect the system.

Table 4.15 Analysis of Participants ' Responses Based on Work load

Work load		**Count**	**Column N %**
Sufficient human resources for laboratory work	no	170	86.7%
	yes	26	**13.3%**
Trained and skilled laboratory professionals	no	45	23.0%
	yes	151	**77.0%**
Total	no	215	54.8%
	yes	177	45.2%

Only 13.3% of employees believe that Sufficient human resources for laboratory work, and 77% of employees believe that Trained and skilled laboratory professionals.

Table 4.16 Analysis of Participants ' Responses Based on the Economic and Political Situation in Palestine

Economic and political situation in Palestine		**Count**	**Column N %**
Economic crisis impacts the laboratory work continuity	No	19	9.7%
	Yes	177	**90.3%**
Economic crisis affects the work quality in the laboratory	No	52	26.5%
	Yes	144	73.5%
The service is interrupted	No	77	39.3%
	Yes	119	**60.7%**
I am not satisfied with may salary in economic crisis time	No	24	12.2%
	Yes	172	87.8%
Laboratory work may be interrupted because of ongoing conflict	No	48	24.5%
	Yes	148	75.5%
Laboratory workload becomes higher because of ongoing conflict	**No**	**6**	3.1%
	Yes	**190**	**96.9%**
Total	**No**	**226**	19.2%
	Yes	**950**	**80.8%**

From the point of view of laboratory workers on the subject of the economic and political situation in Palestine, it was found that 96.9% of workers see that Laboratory workload becomes higher

because of ongoing conflict, 90.3% of scientists see that Economic crisis impacts the laboratory work continuity, and 60.7% of employees see that Economic crisis affects the work quality in the laboratory The service is interrupted. Also, 80.8% of workers see that the economic and political situation in Palestine has an impact on the work of laboratories.

Table 4.17 Analysis of Work Quality

Work quality	N	%
Low quality	16	8.2
Average quality	119	60.7
High quality	61	31.1
Total	196	100.0

The laboratory workers see that the quality in the laboratories is low at a rate of 8.2%, 119 see that the quality is average at a rate of 60.7%, and 61 see that the quality is high at a rate of 31.1%.

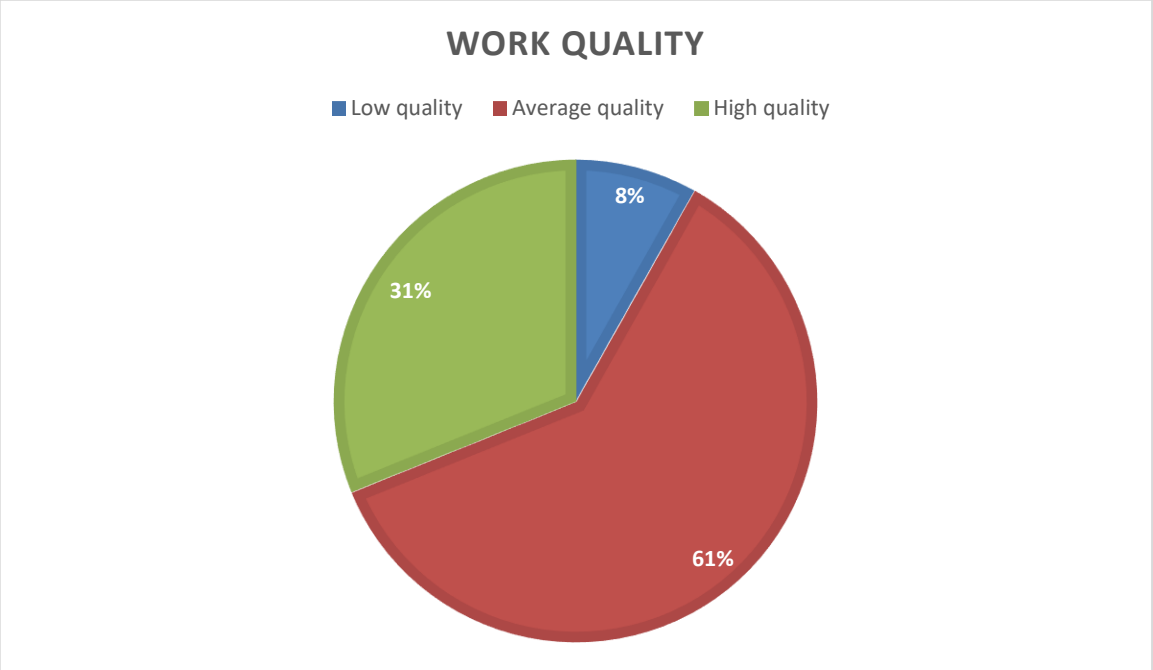

Figure 4.7 Ratio of Work Quality Level Based on the Laboratory Workers' Response.

Table 4.18 Median and IQR for the Variables

variable	Median	Percentiles			IQR
		25	50(median)	75	(Q3-Q1)
Knowledge	3.0000	2.0000	3.0000	3.0000	1.0000
Motivation	3.0000	2.0000	3.0000	4.0000	2.0000
Equipment	4.0000	3.0000	4.0000	5.0000	2.0000
Work Quality	4.0000	3.0000	4.0000	5.0000	2.0000
Management	3.0000	1.0000	3.0000	4.0000	3.0000
Communication	3.0000	1.0000	3.0000	4.0000	3.0000
Infrastructure	2.0000	2.0000	2.0000	3.0000	1.0000
Backup and networking system	1.0000	1.0000	1.0000	2.0000	1.0000
Work load	1.0000	1.0000	1.0000	1.0000	0.0000
Economic and political situation in Palestine	5.0000	4.0000	5.0000	6.0000	2.0000

The previous table shows the median, first quartile, third quartile, and interquartile range (IQR) for each variable. The highest median was the Economic and political situation in Palestine with IQR 2, then Equipment and work quality with a median of 4 and IQR 2 for each of them, and the lowest median was 1 for the Backup & networking system and workload with IQR 1 and 0 respectively.

4.4 Question and Hypothesis Testing

The results related to the first study question and its hypothesis

Q1**:** How does the availability of equipment in laboratories affect the quality of work of laboratory staff?

Table 4.19 Results in the First Question and its Hypothesis

Availability of quality and adequate supplies & reagents											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
0	0.0%	13	6.6%	6	3.1%	16	**8.2%**	106	54.1%	55	**28.1%**
Availability of quality and adequate equipment in the laboratory											
no						Yes					

Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
0	0.0%	32	16.3%	20	10.2%	16	**8.2%**	87	**44.4%**	41	**20.9%**
Equipment calibration & maintenance											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
0	0.0%	10	5.1%	14	**7.1%**	16	**8.2%**	109	55.6%	47	24.0%

From the point of view of laboratory workers, 28.1% of those who believe that supplies are available and consider the quality of laboratories to be sufficiently high, 54.1% consider the quality to be average, and 8.2% consider the quality to be low. As for the quality of equipment, laboratory workers consider the quality to be high, with 20.9% considering the quality of work in laboratories to be high if the quality of equipment is appropriate, 44.4% consider the quality of work in laboratories to be average if the quality of equipment is appropriate, and 8.2% consider the quality of work in laboratories to be low if the quality of equipment is not appropriate. As for the parameters and maintenance of equipment, the proportions were similar to the previous ones.

We see from the previous table that the quality of work in laboratories whose equipment is maintained is better compared to Laboratories whose equipment is not maintained continuously, as the percentage of quality of work in laboratories whose equipment is maintained is high by 24% compared to those whose equipment is not maintained by 7.1%.

H1: Laboratories with more advanced and regularly maintained equipment report a higher quality of work among laboratory staff compared to those with outdated or insufficient equipment.

Based on the result of the non-parametric Mann-Whitney test U = 1237.0 and Z = -3.782 and p-value = 0.00 (value p <0.05) we accept the hypothesis that therefore there are significant differences between the work quality averages of laboratory workers due to the regularly maintained equipment report.

The results related to the second study question and its hypothesis

Q2**:** How does laboratory management affect its quality?

Table 4.20 Results in the Second Question and its Hypothesis

There is laboratory refreshment training											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
7	3.6%	25	12.8%	1	.5%	9	**4.6%**	94	48.0%	60	30.6%
Adequate number of staff for laboratory services											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
16	**8.2%**	108	**55.1%**	51	26.0%	0	0.0%	11	5.6%	10	5.1%
The hospital manager announces the laboratory budget at the beginning of the year.											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
12	6.1%	99	50.5%	44	22.4%	4	2.0%	20	10.2%	17	8.7%
The laboratory has an annual plan.											
no						Yes					
Work quality						Work quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
14	7.1%	88	44.9%	20	10.2%	2	1.0%	31	15.8%	41	20.9%
The laboratory manager requests and follows essential supplies, reagents, and equipment on time.											

no						Yes					
Work Quality						Work Quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
9	**4.6%**	43	21.9%	7	3.6%	7	3.6%	76	**38.8%**	54	27.6%
The upper manager of the hospital gives immediate feedback for questions related to laboratory service.											
no						Yes					
Work Quality						Work Quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
11	5.6%	71	36.2%	15	7.7%	5	2.6%	48	**24.5%**	46	23.5%
The laboratory managers follow your daily activities.											
no						Yes					
Work Quality						Work Quality					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
N	%	N	%	N	%	N	%	N	%	N	%
8	4.1%	50	25.5%	3	1.5%	8	4.1%	69	**35.2%**	58	29.6%

From the point of view of laboratory workers, 83.2% believe that there is training for laboratory workers, of which 48% believe that the quality is average, 4.6% that the quality is low and 30.6% that the quality is high, and 10.7% of the workers believe that the number of workers in the laboratories is sufficient, while 89.3% of the workers believe that the number is insufficient, 55.1% of them think that the quality of work in the laboratories is average and 8.2% that the quality is low.

Most of the lab workers also believe that the manager does not announce the annual budget and most of them believe that the quality of work in the laboratories is average, more than half of the workers believe that the laboratory does not have an annual plan and 44.9% believe that the quality of work is average, and most of the lab workers believe that the manager is following up on supplies promptly and 38.8% of them think that the quality is average, half of the employees think that the top manager is providing

immediate feedback for questions related to laboratory service and 24.5% of them think that the quality is average, and more than half of the employees think that the manager is following up on his daily activity and 35.2% of them think that the quality is average.

H2: Strong and organized laboratory management practices, such as regular staff training, resource allocation, and quality control measures, positively impact the overall quality of laboratory services.

The variables in the previous table were entered in the multiple regression analysis and using the gradual method, it was found that the influencing variables are the request of the laboratory manager and the follow-up of supplies, reagents, and basic equipment on time, the laboratory has an annual plan and there is training on laboratory refreshments.

The remaining variables were excluded and it was found that the model is as follows:

$$\hat{Y} = \widehat{\beta_0} + \widehat{\beta_1}X_1 + \widehat{\beta_2}X_2 + \widehat{\beta_3}X_3$$

From the regression, we find that our model is

$$\hat{Y} = 2.912 + 0.654X_1 + 0.413X_2 + 0.468X_3$$

Where X_1: The laboratory has an annual plan.

X_2: The laboratory manager requests and follows essential supplies, reagents, and equipment on time.

X_3: There is laboratory refreshment training.

All variables in the model had a positive relationship with quality.

The results related to the third study question and its hypothesis

Q3**:** What is the impact of the economic and political situation in Palestine on the quality of laboratories in government hospitals in the West Bank?

Table 4.21 Results in the Third Question and its Hypothesis

Economic crisis impacts the laboratory work continuity											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
0	0.0%	13	6.6%	6	3.1%	16	8.2%	106	**54.1%**	55	28.1%
Economic crisis affects the work quality in the laboratory.											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
0	0.0%	32	16.3%	20	10.2%	16	8.2%	87	**44.4**%	41	20.9%
The service is interrupted in times of military clashes.											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
2	1.0%	41	20.9%	34	17.3%	14	7.1%	78	**39.8%**	27	13.8%
I am not satisfied with my salary in the economic crisis time.											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
0	0.0%	10	5.1%	14	7.1%	16	8.2%	109	**55.6%**	47	24.0%

Laboratory work may be interrupted because of ongoing conflict.											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
0	0.0%	30	15.3%	18	9.2%	16	8.2%	89	45.4%	43	21.9%

Laboratory workload becomes higher because of ongoing conflict.											
No						Yes					
Economic and political situation in Palestine						Economic and political situation in Palestine					
Low quality		Average quality		High quality		Low quality		Average quality		High quality	
Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %	Count	Table N %
0	0.0%	2	1.0%	4	2.0%	16	8.2%	117	**59.7%**	57	29.1%

From the point of view of laboratory workers, almost 90% of them believe that the economic crisis affects the continuity of work in laboratories, about 54% of them believe that the quality is average, about a quarter of workers believe that the economic crisis does not affect the quality of work in laboratories, 44.4% believe that the quality is average, about 60% of employees believe that Laboratory Service is interrupted in military clashes, 39.8% of them that the quality at this time is average, and about 90% of employees are dissatisfied with the salary in light of the economic crisis and more than half employees consider the quality to be average, and about 70% of employees believe that work may stop during the ongoing military conflict, and 97 % Some of the employees believe that the workload in laboratories becomes higher during the conflict, and about 60% of the employees believe that the quality of work is average.

H3: The economic and political instability in Palestine negatively impacts the quality of laboratories in government hospitals due to reduced funding, difficulty in accessing supplies, and disruptions in daily operations.

Table 4.22 The Results of The Chi-Score Test

The economic and political situation in Palestine*Work quality	**Economic crisis impacts the laboratory work continuity**	**Economic crisis affects the work quality in the laboratory**	**The service is interrupted in times of military clashes**	**I am not satisfied with my salary in economic crisis time**	**Laboratory work may be interrupted because of ongoing conflict**	**Laboratory workload becomes higher because of ongoing conflict**
Pearson Chi-Square	1.915	7.011	12.900	10.373	6.053	3.782
df	2	2	2	2	2	2
Asymp. Sig.	.382	.030	.002	.006	.048	.152

From the results of The Chi-Score test of autonomy in the table, it is clear that the non-autonomous variables are: the economic crisis affects the quality of work in the laboratory, the service is stopped in time for military clashes, I am not satisfied with my salary at the time of economic crises, Laboratory work may be interrupted because of ongoing conflict.

As for the economic variables affecting the continuity of laboratory work and the laboratory workload becoming higher due to the constant conflict, they are variables independent of the quality of work in laboratories.

We note from the first table that the quality of work in laboratories decreases in non-independent variables, therefore, economic and political crises negatively affect the quality of work in laboratories.

The results related to the fourth study question and its hypothesis

Q4: Is there a relationship between the availability of motivation for laboratory staff and the age difference?

Table 4.23 Results in the Fourth Question and its Hypothesis

Age group															
20-30				**31-40**				**41-50**				**51-60**			
We have a system for employee recognition.															
no		yes		no		yes		no		yes		no		yes	
N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
43	21.9 %	0	0.0 %	77	**39.3 %**	16	8.2%	44	**22.4 %**	8	4.1 %	8	**4.1 %**	0	0.0 %
Age group															
20-30				31-40				41-50				51-60			
I am satisfied with my salary (with no regard to the recent economic crisis)															
N		yes		no		yes		No		yes		no		yes	
N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
38	19.4 %	5	2.6 %	59	30.1 %	34	17.3 %	36	18.4 %	16	8.2 %	7	3.6 %	1	.5%

All laboratory workers in the 20-30 Category believe that there is no system for employee recognition, 39.3% of the 31-40 category do not see it, 22.4% of the 41-50 category, and 4.1 of the 51-60 category. The most satisfied with the salary was 31-40 and the least 51-60

H4: Younger laboratory staff tend to be more motivated by financial incentives, whereas older staff are more motivated by job security and professional development opportunities.

Table 4.23 Results of The Chi-Score Test

Age group*Motivation	**We have a system for employee recognition**	**I am satisfied with my salary (with no regard to the recent economic crisis)**
Pearson Chi-Square	9.722	10.092
df	3	3
Asymp. Sig.	.021	.018

From the results of The Chi-Score test of independence in the table, it is clear that the non-independent variables are: we have an employee recognition system and I am satisfied with my salary (regardless of the recent economic crisis).

The table shows that interest in both material and developmental motives increases significantly in the 31-40 age group, decreases to a lesser extent in the 20-30 and 41-50 age groups, and decreases significantly in the 51-60 age group.

Chapter Five :Discussion

5.1 Introduction

This chapter reviews and discusses the results obtained through the research. Then, the recommendations from these findings are formulated. This chapter represents the final step in the research, where the data and conclusions reached are interpreted, and practical guidance is provided for future policies and practices in the studied field.

The discussion of the results revolves around data analysis and understanding what has been achieved, including clarifying the relationships, trends, and contradictions discovered. Additionally, the importance of the results in the context of the study and the factors that may have influenced them will be discussed.

Subsequently, practical recommendations will be formulated aimed at guiding future policies and practices. These recommendations are based on the actual results of the research, with an explanation of how they can be applied and the potential benefits they can bring to the field.

5.2 Research Questions

1. How does the availability of equipment in laboratories affect the quality of work of laboratory staff?
2. How does laboratory management affect its quality?
3. What is the impact of the economic and political situation in Palestine on the quality of laboratories in government hospitals in the West Bank?
4. Is there a relationship between the availability of motivation for laboratory staff and the age difference?

5.3 The Objectives of this Study

Through the current study, it is possible to find out the quality of laboratory services provided to patients in government hospitals in the cities of the West Bank in Palestine. Because of the importance of laboratories, which are an essential part of hospitals and have a major role in the satisfaction of patients receiving treatment in a particular hospital and conducting examinations, therefore, the research aims to find out the factors and services that lead to a lack of laboratory services and develop solutions to them and improve the quality of laboratories.

5.4 Summary of Key Findings

5.4.1 Recap of Major Findings from the Research.

The evaluation of laboratory quality determinants was studied: equipment availability, management practices, and workforce motivation, in addition to studying the economic and political situation in the West Bank and determining the impact on the quality of laboratories using a data analysis questionnaire**.**

The results of the supply study showed that 28.1% of laboratory workers believe that supplies are available and the quality of laboratories is high enough. 54.1% consider it medium quality, and 8.2% consider it low quality. As for the quality of equipment, 20.9% believe that the quality of work in laboratories is high if the quality of equipment is high, 44.4% believe that it is average if the quality of equipment is appropriate, and 8.2% believe that it is low.

As for budgetary matters, the results proved that no budget is known and announced by the manager. As there are no annual plans for laboratories by 44.9%. The majority of employees believe that the manager is following up on supplies promptly, 38.8%. And 24.5% believe that the manager provides direct feedback for research-related questions. And 35.2% confirmed that the manager follows up his daily activity in the laboratories.

As for the economic and political situation, 90% of the employees confirmed that these crises affect the continuity of work in laboratories. About 90% of employees are dissatisfied with their salaries, as the most satisfied with their salaries were between 31-40 and the least 51-60. And 70% believe that laboratory work may stop due to the military conflict.

5.4.2 Connection to Research Questions or Hypotheses.

The research results are closely related to the hypotheses of the study. Whereas, the results of the hypothesis related to the first question: confirmed the existence of significant differences between the averages of the quality of work of laboratory workers due to the regularly maintained equipment report. And that the quality of work in laboratories whose equipment is maintained is better compared to Laboratories whose equipment is not maintained continuously. As for the results of the hypothesis related to the second question: the results confirmed that the functions required by the manager related to laboratory management, the development of annual plans, and the follow-up of the necessary supplies positively affect the commitment of employees and the success of laboratory management.

The hypothesis related to the third question: its results confirmed that the economic and political crises affect the quality of work negatively. Laboratory services are suspended during military clashes. As for the hypothesis related to the fourth question: the results showed that the age groups of 31-40 are significantly more interested in material motives, while the groups of 20-30 and 41-50 to a lesser extent are low among the groups 51-60.

5.5 Discussion of the Survey Results Based on the Median and the Range of the (IQR) Quarter:

IQR is used to find abnormal values, as the tool was a choice of a yes or no answer, so there can be no anomaly in it.

There is a clear difference between the variables in terms of average values and the Quadrant range, reflecting a difference in the impact of those variables on the participants. This shows that the most challenging is the economic and political situation in Palestine, attracting the highest average (2), where a large quadrant range indicates a significant difference in the assessment of this factor by respondents. The second place in the ranking goes to the equipment and work quality, which score the same mid-range and quarter, indicating a similar effect among the participants.

On the other side, the challenges associated with backup systems & networks, and workload were less significant, receiving the lowest average value and a very low quarter range (1 and 0, respectively). This means that these variables were not significantly worrisome for most participants, reflecting a relative consensus about their low impact.

5.6 Discussion of the Results Related to the First Question and its Hypothesis

Q1**:** How does the availability of equipment in laboratories affect the quality of work of laboratory staff?

H1: Laboratories with more advanced and regularly maintained equipment report a higher quality of work among laboratory staff compared to those with outdated or insufficient equipment.

The results of the study confirmed that the regular availability of equipment and its maintenance greatly affect the quality of work in laboratories. However, the results showed that there is a disparity between laboratories in the attention to equipment and supplies, and this affects the quality of laboratories. The largest percentage of employees believe that the available equipment affects the quality of laboratories by an average of

54.1%, 28.1% believe that the quality of equipment is high, while 8.2% believe that the quality of equipment is low.

The current results are consistent with Sek, Voeurng, and Perrone, (2016) and Belitbiadgo, A.G., Et al., (2019), And Mulu et al (2020). These studies pointed to the need for the availability of equipment in laboratories to increase their efficiency and improve the quality of services provided to patients. In addition to the role of the availability of equipment in increasing the efficiency of work and reducing possible errors when conducting patient examinations. This shows that the relationship between the quality of equipment and the performance of personnel is a direct one.

One of the unexpected results obtained was that the quality of work, based on the opinions of employees, was 20.9%, although the equipment was available. It is likely that the reason is not only the availability of equipment but is related to several other reasons that have not been addressed in the current study, such as the insufficient number of employees and suffering from high job pressure. The lack of continuous training of employees in conjunction with the emergence of modern devices and equipment and knowledge of how to use them.

The results of the current study agreed with the results of Adamu and McGill (2018) & Belitbiadgo, A.G., Et al., (2019), who confirmed that the quality of equipment has a big role in influencing the performance of laboratory workers, and the presence of high-quality equipment leads to positive performance laboratory workers. Its results were that there is no significant correlation between the availability of equipment and the performance of workers and that the constant training of workers and the provision of support do not correlate with their circulation.

The main highlight of the results related to the first study question is that it showed a correlation between improving the quality of equipment and the performance of laboratory workers. The study focused on the laboratories located in the West Bank due to its constant exposure to wars, which leads to a constant shortage of supplies. Therefore, an environment must be provided that supports the full range of tools and provides support for workers.

The results obtained from the first question led to an increased theoretical understanding of the importance of the relationship between the quality of work by personnel and the availability of necessary supplies for laboratories. This indicates the need for integration of factors related to the surrounding environment and organizational factors of laboratories by officials and workers, this is necessary to obtain high-quality work. Where

it is necessary to work on the availability of the necessary equipment in laboratories and train workers on how to use the new and advanced equipment to achieve a great quality of work. Those responsible for the quality of laboratories should work to improve the available equipment and provide laboratories with the necessary equipment, constantly supervise the effectiveness of the equipment, and continuously train laboratory personnel. This leads to an improvement in the quality of the laboratories and the results obtained.

5.7 Discussion of the Results Related to the Second Question and its Hypothesis

Q2**:** How does laboratory management affect its quality?

H2: Strong and organized laboratory management practices, such as regular staff training, resource allocation, and quality control measures, positively affect the overall quality of laboratory services.

The results related to the second question and the hypothesis confirmed the existence of various variables that affect the quality of laboratories and services provided to patients, namely:

First: the results of the study on regular staff training showed that 83.2% of employees believe that there is ongoing training. However, 48% proved that the quality of work is average. In addition, continuous training contributes to improving the performance of employees, as confirmed by previous studies such as the study of Sek, Voeurng, and Perrone, (2016), where they confirmed that the continuous training of workers positively affects the improvement of laboratory quality, as well as improving the professional competence of laboratory workers .

Second: the results related to the number of laboratory workers confirmed that the presence of a shortage of workers leads to obtaining a low quality of work and increasing the work pressure on other workers, and when there is pressure in the laboratories and a shortage of workers, this is likely to lead to errors in the test results. This is confirmed by Williams & Taylor (2018) and O'conner et al. (2021) in their study, where their results showed that increasing the number of laboratory workers has a significant role in increasing the quality of laboratories and reducing the percentage of errors in test results .

Third: the results related to annual planning showed that the lack of a clear and specific annual plan for laboratory workers negatively affects the achievement of the required goals and causes problems in achieving long-term goals. Which negatively affects the performance of employees. The Mulu (2020) study agrees that annual planning has a big role in setting priorities and ensuring high quality .

Fourth: the results confirmed that following up the work of supplies and equipment on an ongoing basis leads to ensuring the continuation of the work of laboratories and obtaining high efficiency, and the presence of a shortage in following up the work of supplies and equipment leads to disruption of the work of laboratories and their quality. This is confirmed by the relevant results in the study of Desalegn, D. M., et al,. (2016) & Adamu and McGill (2018) where their results confirmed that the presence of a lack of follow-up supply equipment in laboratories negatively affects the quality of laboratories and the results obtained.

Fifth: the results showed that the presence of continuous follow-up from senior management and follow-up of daily activity significantly affects the performance of laboratories positively, and getting employees continuous feedback and follow-up by officials has a great role in raising awareness of employees and improving the quality of performance and laboratory work.

Previous studies have stressed the importance of continuous training for laboratory workers and the importance of increasing the number of workers to relieve pressure on all workers. However, the results of the current study showed that the presence of training is not only a sufficient tool to increase the experience of employees and reduce mistakes but also a supportive work environment. Especially in the affected areas and where conflicts occur continuously it is necessary to have a working environment that supports laboratory workers. In some laboratories, they confirmed the lack of strategic planning, and this led to a lack of planning knowledge and understanding of the upcoming changes resulting from the annual plans .

Previous studies have not shown how important it is to have management and follow-up continuously by senior management, and this leads to increasing the efficiency and effectiveness of employees, and the importance of having clear and well-known annual plans for employees. The current study focused on the importance of developing annual plans and the presence of continuous follow-up .

The results of the theoretical study focus on the importance of improving laboratories in terms of management, providing adequate human resources, and having adequate strategic planning. In addition to the importance of a positive relationship between laboratory staff and the administration, the relationship is essential to obtain high-quality laboratories .

The importance of the results from a scientific and fundamental point of view, that they benefit the responsibility for laboratory management, is concentrated in the importance

of continuous training of employees, the development of annual plans, and the need to improve the work environment. It is also important to increase the number of employees to relieve stress and ensure positive results.

5.8 Discussion of the Results Related to the Third Question and its Hypothesis

Q3**:** what is the impact of the economic and political situation in Palestine on the quality of laboratories in government hospitals in the West Bank?

H3: the economic and political instability in Palestine negatively affects the quality of laboratories in government hospitals due to low funding, difficult access to supplies, and disruption of daily operations.

The results showed that economic and political crises affect the quality of work in laboratories, and this indicates that laboratories face external challenges, not just internal challenges related to laboratory work and health care delivery. When there are economic and political crises, they lead to a shortage of supplies and hinder the work of laboratories, and the percentage of employees ' satisfaction with their salaries ranges from medium to low, and this is due to the frequent political and economic situations.

The current study agreed with earlier studies such as the Hail study (2020) and the Belitbiadgo et al study. (2019) shows that political and economic crises negatively affect laboratory management and their quality. The presence of political and economic crises negatively affects workers and their job satisfaction. This indicates that it is necessary to have positive political and economic conditions, along with the availability of supplies and the quality of work and services provided.

One of the unexpected results obtained is that despite the existence of political and economic crises, some laboratory workers feel satisfied. It is possible that the reason is the ability of some laboratory officials to provide the necessary equipment even under various crises, and that the workers have sufficient managerial experience to enable them to exploit the available materials necessarily.

Although there is agreement between previous studies and the current study that political and economic crises affect the quality of laboratories, the current study was characterized by focusing on hospitals in the West Bank. This study contributed to the knowledge of the quality of laboratories and the development of appropriate solutions.

The results of the theoretical study focus on the fact that laboratory health care depends on the availability of resources and the presence of positive political and economic conditions. Therefore, Laboratory officials should work to try to mitigate the impact of

these conditions on staff satisfaction and laboratory quality. The scientific theory aims to develop strategies related to the management of resources in laboratories. Training of personnel on how to act in the event of a crisis. It can be used by laboratory officials to develop various techniques during crises. The study helps decision-makers improve the working environment in laboratories and provides the necessary supplies that workers need to try to meet the challenges.

5.9 Discussion of the Results Related to the Fourth Question and its Hypothesis

Q4**:** is there a relationship between the availability of motivation for laboratory staff and the age difference?

H4: younger laboratory staff tend to be more motivated by financial incentives, while older employees are more motivated by job security and professional development opportunities.

The results of the study showed that there is a difference in the motivation of employees to work and this is due to the age group of employees. The most satisfied with the salary of their work are between the ages of 31-40 years, while those 51-60 years old are the least satisfied with their salary. This indicates the importance of providing material incentives to employees between each other period and this is for their interest in employee satisfaction. The satisfaction of employees with their jobs has a big role in the success of their work and the success of the organization in which they work. The results showed that the younger age groups are the most attracted to material incentives, but the older age groups may be the incentives associated with job security and professional development is the most important for them.

The theoretical study contributes to making officials aware of the direction of motivating workers, the importance of motivation in their job satisfaction, and that the economic factor and age group have a relationship in motivating workers. As for the scientific theory, it contributes to raising the awareness of officials in the direction of providing incentives and improving them to suit the age groups, as the younger age groups want to receive material incentives, unlike the older age groups tend to provide training opportunities.

The results can influence policy applications by providing incentives and training programs according to age group to increase the motivation of employees and their positive job satisfaction.

5.10 Recommendations

Training programs should be established for all laboratory workers to improve their skills, and knowledge, and develop their ability to deal with various pressures resulting from political and economic crises. And to increase their level of awareness of the direction of professional practices and their ability to deal with modern setups.

Laboratory managers and officials should work on the development of annual plans on an ongoing basis to clarify the vision for the staff, and to maintain the success of laboratory work.

Maintaining the supplies and equipment needed by laboratories, as the success of the quality of laboratories is linked to the availability of sufficient supplies and required equipment.

5.11 Strengths and Limitations of the Study

5.11.1 Strength of the Study

The study was conducted in the laboratories of the southern, central, and northern government hospitals in the West Bank which makes it a comprehensive study that covers all government hospitals in West Bank with different levels.

5.11.2 Methodology

The study relied only on the quantitative analytical method and the data was collected employing a questionnaire distributed electronically, if laboratory managers and officials were also interviewed, it is possible to obtain more accurate results, but due to political and security conditions, it was difficult to reach many areas.

5.11.3 The Sample

The sample consisted only of employees in the laboratories of government hospitals, but if it also included private hospitals, it would have been possible to obtain different results, and this could have helped in comparing the quality of laboratories in government and private hospitals and the ability to generalize the results to all hospitals in the West Bank, whether government or private.

5.11.4 Scope

The study was conducted in 2024 and the results obtained do not reflect changes in the future, or the challenges that employees may face, as they may face new changes. This

means that the recommendations that the study will provide cannot be worked out for years.

5.12 Recommendations for Future Research

Another study should be conducted to compare the quality of laboratories in government hospitals and private hospitals.

In addition to using the quantitative method, it is recommended to use the qualitative method by conducting interviews with laboratory managers and officials to obtain more accurate results.

Researchers should conduct related studies in determining the quality of laboratories, the availability of equipment and supplies, and evaluating the performance of employees, to monitor the extent of improving the quality of laboratories and the satisfaction of employees with their jobs.

5.13 Conclusion

The study contributed to the knowledge of the quality of laboratories in government hospitals in the West Bank, and the results of the study showed that the laboratories suffer from a lack of supplies and equipment, which negatively affects the quality of work in laboratories. In addition, frequent political and economic crises also hurt laboratory quality and staff satisfaction, as employees suffer from work stress and dissatisfaction with their salaries. These results should be implemented by laboratory managers and officials to improve the quality of laboratories.

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Appendices

Appendices A: IRB Approval Letter

Arab American University
Institutional Review Board - Ramallah

الجامعـــة العربيـــة الأمريكيـــة
مجلس اخلاقيات البحث العلمي – رام الله

IRB Approval Letter

Study Title: "Assessment of Laboratory Service Interruption and its Associated Factors in Governmental Hospitals, West Bank, Palestine".

Submitted by: Alia Mohammad Abu-Judeh

Date received: 9th July 2024

Date reviewed: 17th July 2024

Date approved: 18th July 2024

Your Study titled **"Assessment of Laboratory Service Interruption and its Associated Factors in Governmental Hospitals, West Bank, Palestine"** with the code number **"R-2024/A/118/N"** was reviewed by the Arab American University Institutional Review Board - Ramallah and it was approved on the 18th of July 2024.

الجامعة العربية الأمريكية - فلسطين
مجلس اخلاقيات البحث العلمي - رام الله
IRB-R
ARAB AMERICAN UNIVERSITY-PALESTINE
INSTITUTIONAL REVIEW BOARD - RAMALLAH

Sajed Ghawadra, PhD
IRB-R Chairman
Arab American University of Palestine

General Conditions:

1. Valid for 6 months from the date of approval.
2. It is important to inform the IRB-R with any modification of the approved study protocol.
3. The Bord appreciates a copy of the research when accomplished.

رام الله – فلسطين

Tel: 02-294-1999 **E-Email:** IRB-R@aaup.edu **Website:** www.aaup.edu

Appendices B: Letter

State of Palestine
Ministry of Health
Education in Health and Scientific
Research Unit

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ref.: ……………… Date:………………

الرقـــم: ٢٠٢٤/١٧٠٥/٢٢٦
التـاريخ: ٤/٨/٢٠٢٤

عطوفة الوكيل المساعد لمجمع فلسطين الطبي المحترم،،،

عطوفة الوكيل المساعد لشؤون المستشفيات والطوارئ المحترم،،،

عطوفة الوكيل المساعد للمهن الصحية المساندة وبنوك الدم المحترم،،،

تحية واحترام،،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالبة: **علياء محمد عبد القادر ابو جودة – ماجستير ادارة الجودة في المؤسسات الصحية**– الجامعة العربية الامريكية، بعنوان:

"تقييم انقطاع خدمة المختبر والعوامل المرتبطة به في المستشفيات الحكومية، الضفة الغربية، فلسطين"

حيث ستقوم الطالبة بجمع معلومات عن حول موضوع البحث من خلال تعبئة استبانة، وذلك في:

- **جميع المستشفيات الحكومية في الضفة الغربية**
- **مجمع فلسطين الطبي**

مع العلم ان مشرف الدراسة: د. عاطف الريماوي.

على ان يتم الالتزام بالمحافظة على اخلاقيات البحث العلمي وسرية المعلومات، وعدم التعرض للمعلومات التعريفية للمشاركين.

على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة وزارة الصحة.

مع الاحترام،،،

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

Appendices C :The Questionnaire

Arab American University

Faculty of Graduate Studies

حضرة التقنيين وأعضاء الهيئة الإدارية المحترمين

تحية طيبة،

السلام عليكم ورحمة الله تعالى وبركاته،

يسرني أن أضع بين أيديكم هذا الاستبيان الذي يأتي في إطار استكمال متطلبات الرسالة لنيل درجة الماجستير في تخصص إدارة الجودة في المؤسسات الصحية، بعنوان "تقييم انقطاع الخدمة المخبرية و العوامل المرتبطة بها في المستشفيات الحكومية، الضفة الغربية ، فلسطين". ونظراً لأهمية رأيكم في هذا المجال، نطلب منكم تكرماً الإجابة على أسئلة الاستبيان بدقة ، حيث أن دقة النتائج تعتمد بشكل كبيرعلى صحة إجاباتكم . لذا ،مشاركتكم ضرورية ورأيكم أساسي لنجاح هذا البحث ، علماً بأن جميع إجاباتكم ستستخدم فقط لأغراض البحث العلمي .

- يرجى ملاحظة أن المشاركة في البحث اختيارية.
- مدة تعبئة الاستبيان حوالي 10 دقائق .

تفضلوا بقبول فائق الاحترام ،

علياء محمد أبوجودة

Alia.abujudeh@gmail.com

Sex	male	female	
Age group	20-30 \ 31-40 \ 41-50 \ 51-60		
Educational level (profession)	Diploma \ bachelor\ MA\ more		
Working experience in laboratory fields	1-3 4-6 7-10 10		
Position	Lab technician	Lab Administrators	
Province			
The name of the hospital that you work in			

Part one: Demographic Data

Part Two: Assessment of laboratory service interruptions

The following sections have been approved by mesivin et al. (2017)

- **Please put a mark (X) in the box indicating your degree of agreement with each of the following statements:**

Knowledge		yes	no
1.	I am familiar with laboratory quality system essentials		
2.	There is laboratory refreshment training		
3.	I am attending continuing education program		
Motivation		yes	no
1.	Laboratory staff has communication with upper management		
2.	We have system for employee's recognition		

3.	We have communication among laboratory staff		
4.	I am satisfied with my salary (with no regard to recent economic crisis)		
5.	Laboratory staff has job descriptions for assigned task		
Equipment		yes	no
1.	Availability of quality and adequate supplies & reagents		
2.	Availability of quality and adequate equipment in laboratory		
3.	Adequate number of staff for laboratory services		
4.	Equipment calibration & maintenance		
5.	Laboratory has a documentation (documents and records)		
6.	Adherence to the standard operating procedures		
Work quality		yes	no
1.	Laboratory results are reported within turnaround time		
2.	There are laboratory quality improvement activities		
3.	There are external quality assessment activities		
4.	There are internal quality control activities		
5.	Providing uninterrupted laboratory services		
Economic and political situation in Palestine		yes	no

1.	Economic crisis impacts the laboratory work continuity		
2.	Economic crisis affects the work quality in the laboratory		
3.	The service is interrupted in time military clashes		
4.	I am not satisfied with my salary in economic crises time		
5.	Laboratory work may be interrupted because of ongoing conflict		
6.	Laboratory workload becomes higher because of ongoing conflict		

The following sections have been approved by Mulu (2020)

• Please put a mark (X) in the box indicating your degree of agreement with each of the following statements:

	Management	yes	no
	Hospital manager announce the laboratory budget at the beginning of the year		
	The laboratory have annual plan		
	Laboratory manager request and follow essential supplies, reagents and equipments on time		
	Upper manager of the hospital give immediate feedback for questions related to laboratory service		
	The laboratory managers follow your daily activity		
	Communication	yes	no
	Continuous communications with upper management about laboratory service		
	Continuous communications with physicians about laboratory services		

	Continuous communications with patients about laboratory service		
	Have regular staff meeting concerning laboratory service		
	Infrastructure	yes	no
	Enough space allocated based on the number and the type of tests performed within the hospital		
	Functional electricity power available in the laboratory continuously		
	Functional water available in the laboratory continuously		
	Backup and networking system	yes	no
	Additional laboratory equipments used as backup		
	Sample referral linkages system with other health facility laboratories		
	Work load	yes	no
	Sufficient human resources for laboratory work		
	Trained and skilled laboratory professionals		

تقييم انقطاع الخدمة المختبرية والعوامل المرتبطة بها في المستشفيات الحكومية، الضفة الغربية، فلسطين

عليا محمد عبد القادر أبو جودة

أسماء لجنة الإشراف:

الدكتور عماد رشيد علي أبو خضر

الدكتور ساجد فيصل حسين غوادرة

الدكتور إيمان أبو لبن

ملخص

مقدمة: هدفت الدراسة إلى تقييم جودة الخدمات المختبرية المقدمة للمرضى في المستشفيات الحكومية بالضفة الغربية في فلسطين. نظرا لأهمية المختبرات التي تعد جزءا أساسيا من المستشفيات ولها دور حاسم في إرضاء المرضى الذين يتلقون العلاج في مستشفى معين وإجراء الفحوصات
الأساليب: أجريت الدراسة الحالية باستخدام المقطع العرضي الوصفي التحليلي لتقييم العوامل التي تؤثر على انقطاع خدمات المختبرات الطبية في 18 منشأة صحية حكومية.
بلغ العدد الإجمالي لفنيي المختبرات ومسؤولي المختبرات 352 ، وباستخدام هامش خطأ بنسبة 5٪ وفاصل ثقة بنسبة 95 ٪ ، كان حجم العينة 196 فنيا للمختبر و عضوا من مديري المختبرات. تمت دراسة تقييم محددات جودة المختبرات: توافر المعدات، وممارسات الإدارة، وتحفيز القوى العاملة، بالإضافة إلى دراسة الوضع الاقتصادي والسياسي في الضفة الغربية وتحديد الأثر على جودة المختبرات باستخدام استبيان تحليل البيانات.
النتائج: أظهرت نتائج الدراسة أن 28.1 ٪ من العاملين في المختبرات يعتقدون أن الإمدادات متوفرة وأن جودة المختبرات عالية بما يكفي. 54.1 ٪ يعتبرونها متوسطة الجودة ، و 8.2 ٪ يعتبرونها منخفضة الجودة. أما بالنسبة لجودة المعدات ، فإن 20.9 ٪ يعتقدون أن جودة العمل في المختبرات عالية إذا كانت جودة المعدات عالية ، و 44.4 ٪ يعتقدون أنها متوسطة إذا كانت جودة المعدات مناسبة ، و 8.2 ٪ يعتقدون أنها منخفضة.

أما بالنسبة لمسائل الميزانية ، فقد أثبتت النتائج أنه لا توجد ميزانية معروفة ومعلنة من قبل المدير. حيث لا توجد خطط سنوية للمختبرات بنسبة 44.9٪. يعتقد غالبية الموظفين أن المدير يتابع الإمدادات في الوقت المناسب ، 38.8٪. ويعتقد 24.5 ٪ أن المدير يقدم ملاحظات مباشرة للأسئلة المتعلقة بالبحث. وأكد 35.2٪ أن المدير يتابع نشاطه اليومي في المختبرات.

أما بالنسبة للوضع الاقتصادي والسياسي ، فقد أكد 90 ٪ من الموظفين أن هذه الأزمات تؤثر على استمرارية العمل في المختبرات. حوالي 90 ٪ من الموظفين غير راضين عن رواتبهم ، حيث كان الأكثر رضاءً عن رواتبهم بين 31–40 وأقل 51–60. ويعتقد 70 ٪ أنه من الممكن أن يتوقف العمل المختبري بسبب الصراع العسكري.

خاتمة: ساهمت الدراسة في معرفة جودة المختبرات في المستشفيات الحكومية في الضفة الغربية، وأظهرت نتائج الدراسة أن المختبرات تعاني من نقص في المستلزمات والمعدات ، مما يؤثر سلبا على جودة العمل في المختبرات. بالإضافة إلى ذلك ، فإن الأزمات السياسية والاقتصادية المتكررة لها أيضا تأثير سلبي على جودة المختبر ورضا الموظفين ، حيث يعاني الموظفون من ضغوط العمل وعدم الرضا عن رواتبهم. يجب تنفيذ هذه النتائج من قبل مديري المختبرات والمسؤولين من أجل تحسين جودة المختبرات.

الكلمات المفتاحية: المختبر، خدمة ، انقطاع ، الضفة الغربية.