

# Implementing Electronic Health Records in Pathology Labs: Challenges and Opportunities

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## ABSTRACT

The potential for improving patient outcomes and healthcare efficiency in pathology labs through the integration of Electronic Health Records (EHRs) is substantial. This shift is with difficulties, though. The main challenges and possibilities related to integrating EHRs in pathology labs are described in this research. Concerns regarding data security and privacy, integrating EHRs with current systems, standardizing various data formats, user training, reluctance to change, and the high implementation costs are some of the difficulties. Robust security protocols, progressive integration techniques, standardizing data via commonly used coding schemes, thorough user training, and cautious budgetary planning are all necessary for finding solutions. For measuring, the research study used smart PLS software and generated results that included descriptive statistics, correlation coefficients and smart Algorithm models between them. Conversely, putting EHRs into practice presents chances for bettering patient interaction, interoperability, sophisticated data analytics, accessibility, and operational efficiency. These possibilities can completely change the way pathology labs operate, substituting improved provider collaboration, more knowledgeable decision-making, and more patient empowerment. In conclusion, even if there are clear obstacles to overcome, there are a lot of potential advantages to using EHRs in pathology laboratories. Overall research founded that direct and significant link between Implementing Electronic Health Records in Pathology Labs. In terms of data management, patient care, and overall system efficiency, the healthcare sector may make tremendous progress by taking deliberate measures to solve these obstacles and seizing the possibilities they bring.

**Key words:** Electronic Health Records (HER), Healthcare Efficiency (HE), Pathology Lab (PL).

## Introduction

The world has made such progress that we do not need manual records today for the management of any data at any kind of organization. Science has made such wonders in our lives that we can send, store, receive, interpret, and analyze data in electronic signals in a very short period. Such a tremendous and exciting innovation in communication and data exchange is the introduction of electronic record systems in each field of life such as industrial, Healthcare, educational, and others.

The term “electronic record” can be effectively explained in these words “a type of automated system in which any kind of information or data can be easily captured, stored, shared and manipulated in the form of electronic signals by automated systems. This is clear evidence of the application of artificial intelligence and automated systems in our daily lives<sup>(1)</sup>.

The term electronic Healthcare records is a broad term used for data related to the health of any person in electronic form. The pathology lab is not a new concept in medical science rather it refers to those labs in which different types of tests are conducted for detection, diagnosis, treatment, or any kind of prevention of diseases. The term electronic health record is abbreviated as EHR. This is a kind of heinous task to implement in every healthcare Centre because it requires proper planning and supervision. In electronic health record systems, the data-related to the patient is not collected and stored

in a manual form of work because it is an automated system that works on computer-based systems<sup>(2)</sup>. This system of electronic health records is more reliable than traditional means of data storage because there is very little chance of data loss in this system. The second benefit of electronic health records is that they can be accessed by different physicians at the same time for the same patient so there is no need for repetitive laboratory tests for examination of disease<sup>(3)</sup>. For example, if a person is diagnosed with any kind of pathogen or any kind of tumor in the body when a lab test is performed, that data will be stored in a computer so that data is stored and only a one-time lab test is enough for further medical procedure. The other benefit related to electronic health records is that they increase the Workflow in the laboratory<sup>(4)</sup>. The Workflow means the rate of work done by any laboratory at a specific time.

When there is no need for prolonged process of manual work, there would be no extra burden of work and Workflow will be accelerated in this regard. The proper implementation of the electronic health record is based on main four steps. The first step in the implementation of the electronic health record is proper planning in which a proper plan is designed for how electronic health record is implemented in any particular healthcare Centre. The overall efficiency of the implementation of electronic health records is dependent upon its prior planning. The second step for the implementation of the electronic health record is the

adaptation of the electronic health record system in that specific healthcare center. In this step, feedback is collected from staff and patients on whether they are comfortable with this record system or not<sup>(5)</sup>. The third step of proper implementation of electronic health records is the optimization of Workflow by using this record system. If staff and patients are fully satisfied by this system, then Workflow must increase and optimize. The fourth and last step for proper implementation of electronic health records is the migration of data and proper training of staff in this regard for useful benefits of the electronic health record system.

We came to know that there are many benefits related to the use of electronic health record systems as it has shown rapid response, better management of resources, less error, more accurate results, prevention of data loss, easy data accessibility, and others but there are some challenges which are related to proper implementation of electronic health record system which act as barriers to its implementation<sup>(6)</sup>. An electronic health record (EHR) is a digital version of a patient paper chart, that contains the history of the patient which includes the patient's medicines, diagnoses, treatment plans, immunization dates, allergies, test reports, etc. EHR allows to share the patient information between authorized providers and organizations with complete security<sup>(7)</sup>.

Which Can Help Improve the quality, safety, and efficiency of patient care. Nowadays in modern societies, EHRs play an important role in Healthcare such as EHRs provide a broad view of a patient's health information which helps the healthcare provider to make more precise decisions and deliver individualised care. EHRs make possible and smooth communication between Healthcare professionals and coordinate them to make better decisions and continuity of treatment. EHRs Perform well-organized administrative tasks reduce paperwork and make it possible to access patient information quickly thus increasing efficiency and improving healthcare delivery.

Also, it provides population health management, epidemiological studies, and clinical research by providing variable data for analysis and public health initiatives. EHRs Provide strong security to protect patient information and ensure confidentiality with privacy regulations. EHRs are integral to the Modern healthcare system, providing better patient outcomes, care coordination, and data-driven decision-making. The first and foremost problem which is related to electronic health record systems is the high cost of these systems. As explained before, it is a computer-based system but the cost of this system is still high which acts as a hurdle for its proper implementation.

The second challenge related to proper implementation is the inability of the masses to have the technical ability to run such systems. As these are computer-based systems they need highly skilled professionals to operate these systems for data storage and data exchange. The third problem which is associated with electronic health records is the privacy of people<sup>(8)</sup>. As people are more concerned about their privacy aspects they do not feel free to provide information to healthcare staff because they are unaware of the benefits of electronic health record system. The next challenge related to the proper implementation of this system is the risk of misuse of data by any irrelevant person<sup>(9)</sup>. It is immoral activity to misuse any data related to privacy but we know that this immorality has increased to such an extent in society that people feel hesitant to share their private data

with healthcare staff because of the risk of data misuse<sup>(10)</sup>. The next challenge which is related to this electronic health record system is that it requires training sessions for proper understanding of these systems to healthcare staff and other related persons but these trainings may be prolonged depending upon the idea of using this system and willingness to implement such systems in Healthcare centers.

There is also a challenge related to rural Healthcare centers in which these kinds of systems are not suitable because of the unavailability and instability of the internet network. If all these challenges are coped with effectively, this electronic health record system would be suitable shortly. Although it would be a great step towards moving away from paper and manual work<sup>(11,12)</sup>.

## RESEARCH OBJECTIVE:

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The main objective of this study is to understand the implementation of electronic health record systems in healthcare centers. This study has also effectively explained the opportunities and challenges related to the proper implementation of electronic health record systems in healthcare centers for the betterment of opportunities at these centers.

The research describes that Implementing Electronic Health Records in Pathology Labs. The research paper divided into five specific chapters: first portion represent that introduction included objective of research. The second section represent that literature review the third portion represent that some methods included challenges and opportunities related to the Implementing Electronic Health Records in Pathology Labs. The fourth section describe that result and its descriptions the last section summarized overall research study and present some future recommendations about topic.

## LITERATURE REVIEW

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Researchers claim that These days electronic health data is being collected actively in different healthcare centers, including pathology labs to compare heterogeneous elements involving demographic data, diagnosis, treatments, medical images, test results clinical notes, etc. This helps in actively studying the changing pathological factors occurring at different pathological labs working in the field of diagnosis, medicine, treatment and healthcare<sup>(13)</sup>. For maintaining the patient health, clinical records, and other treatment factors involved in diagnosis at the pathological lab, blockchain technology has recently been suggested by researchers to make electronic health data accessible, transparent, and under trustable authorities<sup>(14)</sup>.

Studies have stated that maintaining and improving the detection of disease from the data present as electronic health records can help in diagnosis and case study of the disease at a pathology lab and can help in accessing the root cause and issues of pathogens involved with the causing of a particular infection or disease<sup>(15)</sup>. Recently, the use of electronic health data in pathology labs for the advancement and innovations in treatments has been implemented by US labs for performance measurement and patient management to double the benefits of the results<sup>(16)</sup>. The data gathered from electronic health records can help manage population health

research by comparing the data on the population's health with conventional epidemiological methods. It can also help in making the research productive for accessing the health of the population of a particular area and the estimation of the disease that might emerge in that area and can give rise to more concerns that may cause fatal threat to a community inhabiting a particular location<sup>(17)</sup>. Studies reveal that initially electronic health systems were implemented only for academic medical purposes, but now with the advent of modern technologies and implementation of these technologies in pursuing diagnostic work at pathological labs has been revolutionary and specialists are working to operate an electronically mediated health care system in near future<sup>(18)</sup>.

Researchers have stated that with the usage of blockchain technology in electronic health data, the data can be transferred among different medical specialists seamlessly and enhanced coordination in patient care can be made possible<sup>(19)</sup>. The advancement in the field of big data has done wonders in pathological labs to diagnose a certain disease by case studying any previous data available instantly and can help in studying the newly emerging diseases by comparing them with previously mentioned diagnostic techniques<sup>(20)</sup>. Radiologists and pathologists can easily act as information specialists and providers of electronic health records that can be linked with artificial intelligence to make progress in the field of disease and diagnostics<sup>(21)</sup>.

Recent advancements have led to fog-associated systems to manage the challenges of data mobility among healthcare centers, in which an architecturally designed arrangement containing sensors and cloud systems is used to manage the e-health data<sup>(22)</sup>. Also, some pathology labs offer mobile telehealth systems to facilitate patient health information and make case discussion easier. This can help reduce person-to-person contact, which reduces the contamination chances of pathological labs and also helps gather health information through a mobile source more efficiently<sup>(23)</sup>. On the other hand, some researchers have also pinpointed the data from electronic health systems dependent on machine learning and algorithmic methods, as this data can have biased interpretations due to the lack of sample identification and mismeasurements caused by the data inputs<sup>(24)</sup>.

At Harvard University, an electronic health data model was presented named Fast Health Interoperability Resources (FHIR), according to which the goal was to introduce a platform in which the medical application needed to be typed in only at once and that could be accessed by different healthcare IT systems anytime. This system, as implied in pathological labs, can help make case studies easier and more accessible<sup>(25)</sup>. The electronic health data collected at pathological labs can be scaled and deeply learned to develop diagnostic strategies. This can help increase the chances of accurately diagnosing a certainly emerging anomaly<sup>(26)</sup>.

Researchers have even recommended using electronic health data in pathological records to treat cases that need immediate attention and real-time reporting to make faster decisions to support the active diagnosis of a certain medical condition<sup>(27)</sup>. Danish healthcare systems have been using these electrical records to collect clinical, administrative, and medical health data due to their providence of health supervision. Their success in this department is because of the intricate infrastructure that actively

collects data related to long-time health registration and recordkeeping of life<sup>(28)</sup>. Moreover, consortium blockchain is an advanced technology for collecting and sharing electronic healthcare data in pathological labs. It allows the user to send and receive data and information in a privacy-preserving, seamless, and secure form, making data collection easy, authentic, and dependable<sup>(29)</sup>. Also, studies have shown that the maintenance and management of electronic health data in pathological labs enables keeping track and history of a patient's medical status and allows the caregiver to have an insight into allergies and other specificities regarding the patient's health and performance, therefore precise and on point diagnosis can be done<sup>(30,31)</sup>.

However, some researchers stand out that interoperability among electronic health data and other systems like hospital and radiology information systems cannot be efficient, as it requires complex strategies to get the transmission done<sup>(32)</sup>. Similarly, adapting healthcare systems can be complex regarding the demands of pathological labs. The evolution of healthcare systems according to the requirements can be challenging as it requires standardization of data according to the lab's needs so that the exchange policy among different electronic systems can be made possible, which can result in increased efficiency and more accurate diagnostic techniques to be adopted to meet the demands of public, administration and pathological labs working platforms<sup>(33)</sup>. The cost required to set up new electronic health data collection technologies can be costly and disturb the economy of a pathology lab. Besides, the researchers working at pathological labs may resist leaving the paperwork and management instead of using the electronic data collection systems<sup>(34,35)</sup>.

## Methods:

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This research study represents the Implementation of Electronic Health Records in Pathology Labs. The research was based on primary data analysis to determine the research data using smart PLS software and generate informative results. Descriptive statistics and correlation coefficients also present the smart PLS Algorithm model between electronic health records and pathology labs.

### Shifting Traditional paper-based records:

Shifting from traditional paper-based records to digital formats like electronic health records (EHRs) represents an essential transformation in healthcare. This transformation has brought several changes and benefits, like accessibility and probability. EHRs Help Healthcare providers access patient information from anywhere with Secure internet access, promoting perfect care coordination and reducing the dependency on physical records stored in specific locations. Patient data in digital format can easily be shared among authorised healthcare professionals, leading to improved collaboration, faster decision-making, and better-informed treatment plans.

EHRs can perform administrative tasks, automate repetitive processes, and perfectly reduce the time spent on manual record-keeping. Digital records minimise the risk of error associated with handwritten notes and improve the liability of medical information, which helps in more accurate patient care. Shifting to digital format

has revolutionized how healthcare information is managed, shared, and utilized, which helps increase patient outcomes, enhance efficiency, and a more interconnected healthcare ecosystem.

### Implementing EHRs in pathology labs:

Implementing electronic health records in the pathology labs is of supreme importance. There are several reasons why electronic health record systems should be integrated into pathology labs. EHR systems allow pathologists to get patient data, including medical history, laboratory test results, and imaging studies, in a centralized and easily accessible manner. This accessibility can become a bridge for more informed decision-making and improved patient care. EHR systems can save time in the workflow of Pathology labs by efficiently managing patient information, test orders, and results. This can improve operational efficiency and reduce turnaround times for diagnostic reports.

The increasing adoption of digital pathology integrating EHR systems with digital imaging and whole slide imaging (WSI) platforms can enable perfect access to digital slides, enhancing the diagnostic process. EHR systems can provide advanced data analysis and reporting capabilities, allowing pathologists to generate comprehensive, standardized reports. This can help in quality assurance research and population health management. Implementing EHR in pathology labs promotes compatibility, enabling the exchange of patient data across different healthcare centres. This can facilitate collaboration, second opinions, and telepathology consultations. Implementation of EHR in pathology lab is crucial for improving data accessibility, workflow efficiency, integration with digital pathology, and advanced data analysis, ultimately leading to enhanced patient care and Diagnostic outcomes.

### Challenges:

Implementation of electronic health records in pathology labs can undergo several challenges. Integrating the EHR system with the existing laboratory information system can be complex and require significant customization to ensure effortless data exchange and compatibility. A pathology lab deals with diverse data types, including images, reports, and diagnostic findings. Ensuring data format standardisation across different systems and platforms is an important challenge in EHR implementation. In pathology labs, sensitive patient information and ensuring the security and privacy of electronic health records are handled critically. Implementing strong data security measures and compiling with privacy regulations such as HIPAA (Health Insurance Portability and Accountability Act) can be challenging.

Training pathologists, laboratory technicians, and other staff members to effectively use EHR systems is essential for successful implementation in a pathology lab. Implementing an EHR system often requires a redesign of the existing workflow and the process that has already been used in pathology labs because adapting a new digital workflow and ensuring minimal disturbance to daily operations can be a significant challenge. Implementing an EHR system requires financial investment and dedicated resources for system deployment, maintenance, and ongoing support; maintaining all these combined can be challenging. There are several advantages to using Electronic Health Records (EHRs) in pathology laboratories, including increased data management, better patient care, and increased efficiency.

It does, however, also provide a unique set of difficulties. Below is a summary of the obstacles and prospects:

### Problems:

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#### 1. Privacy and Security of Data:

- **Difficulty:** Pathology laboratories handle sensitive patient data; thus, protecting the privacy and security of this information is essential. Complying with HIPAA and other healthcare data privacy laws increases complexity.
- **Remedy:** Establish strong security measures, access restrictions, encryption protocols, and security protocol updates regularly to ensure compliance with laws.

#### 2. Including Pre-existing Systems:

- **Difficulty:** Legacy systems are already in place in many pathology labs. Integrating EHRs with these systems can be difficult and may call for considerable adjustments.
- **Workaround:** A more seamless transition may be achieved by employing middleware, grading integration, and verifying compatibility when choosing EHR systems.

#### 3. Standardisation of Data:

- **Difficulty:** Pathology reports can involve a variety of data formats and terminologies. It is a difficult effort to standardise this information across many labs and platforms.
- **Resolution:** To enhance interoperability, commonly used standards such as LOINC (Logical Observation Identifiers Names and Codes) for laboratory result coding should be implemented.

#### 4. User Training and Resistance:

- **Challenge:** Due to a lack of training or worries about upsetting established processes, healthcare professionals may be reluctant to accept new technologies.
- **Recommendation:** Make a substantial investment in training initiatives that offer continuous assistance and include end users in designing and customising the system to suit their requirements.

#### 5. Implementation Costs:

- **Difficulty:** Putting EHRs into practice may be costly, involving not just software improvements but also hardware upgrades, training, and continuous maintenance expenses.
- **Solution:** To efficiently control expenses, conduct a comprehensive cost-benefit analysis, look for grants or financing options, and select scalable solutions.

### Prospects:

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#### Opportunities:

Implementing electronic health records (EHR) provides many opportunities and numerous positive outcomes across pathology labs. Using EHR systems in pathology labs provides healthcare providers with broad and up-to-date patient information, which helps them make correct decisions, provide individualized care, and improve patient outcomes. It also facilitates flawless communication and collaboration among healthcare professionals and causes better

care coordination, thus providing continuity of treatment. EHRs gracefully perform administrative tasks, automate processes, and reduce the time spent on record keeping manually, leading to improved healthcare provider productivity and more time for patient care. EHRs enable the analysis of a large dataset supporting population health management and identifying trends and patterns for public health initiatives. Patients can also access their health information using EHR, communicate with their healthcare provider, and actively participate in their cases, promoting a more patient-centred approach to healthcare. EHRs are designed to meet the regulatory requirement for data security, privacy and confidentiality, ensuring that patient information is protected and Healthcare organizations remain obedient to relevant laws and standards. Implementation of EHRs in pathology labs provides many opportunities, including improved patient care, enhanced efficiency, better data management, and the potential for transformative advancement in healthcare delivery and public health.

### 1. Enhanced Effectiveness:

- Opportunity: Automating repetitive procedures, streamlining workflows, and cutting down on paperwork, EHRs can improve pathology lab operations' efficiency.
- Implementation: Create an EHR system that automates communication, result reporting, and data input so pathologists may concentrate more on patient care and analysis.

### 2. Improved Data Accessibility:

- Possibility: Electronic medical records offer convenient patient data access, speeding up decision-making and improving collaboration amongst healthcare practitioners.
- Implementation: Ensure an intuitive user interface enables authorised staff members to see and exchange pertinent patient data

safely.

### 3. Data Analytics and Insights:

- Possibility: Electronic Health Records (EHRs) provide the chance for data analytics to detect patterns, trends, and insights that may aid in making more informed decisions about diagnosis and treatment.
- Implementation: Use analytics tools to examine huge datasets inside the EHR system, facilitating proactive decision-making and individualised patient care.

### 4. Interoperability:

- Possibility: Electronic Health Records (EHRs) provide interoperability among diverse healthcare systems, promoting enhanced coordination and collaboration among healthcare practitioners.
- Implementation: Prioritise EHR systems that follow interoperability guidelines and promote data sharing among laboratories, medical facilities, and other healthcare organisations.

### 5. Patient Engagement:

- Opportunity: By giving patients access to their medical information, adoptive openness, and enticing them to take an active role in their care, EHRs may empower patients.
- Implementation: Create patient portals and communication tools in the EHR system so patients can interact with their treatment, access pathology results, and pose queries. Collaboration, thorough preparation, and dedication to overcoming obstacles are necessary to implement EHRs in pathology labs successfully. Pathology laboratories may improve patient care, expedite processes, and help improve healthcare systems by taking advantage of these opportunities.

## Result and description:

### Descriptive statistic:

Table 1

Name	No.	Mean	Median	Scale min	Scale max	Standard deviation	Excess kurtosis	Skewness	Cramér-von Mises p value
EHR1	0	1.408	1.000	1.000	3.000	0.569	0.200	1.063	0.000
EHR2	1	1.469	1.000	1.000	3.000	0.610	-0.042	0.958	0.000
EHR3	2	1.408	1.000	1.000	4.000	0.668	3.702	1.835	0.000
EHR4	3	1.469	1.000	1.000	3.000	0.575	-0.329	0.788	0.000
PL1	4	1.531	1.000	1.000	4.000	0.703	1.837	1.344	0.000
PL2	5	1.490	1.000	1.000	3.000	0.610	-0.184	0.874	0.000
PL3	6	1.429	1.000	1.000	3.000	0.571	-0.006	0.967	0.000
PL4	7	1.551	1.000	1.000	4.000	0.641	2.657	1.243	0.000
PL5	8	1.551	1.000	1.000	3.000	0.608	-0.484	0.641	0.000

The above results show that descriptive statistical analysis results describe the mean values, median rates, and minimum values and that the maximum values of each indicator included dependent and independent values. The result describes that EHR1 shows that the mean value is 1.408, and the standard deviation rate is 0.56, which shows that 56% deviates from the mean. The result shows that the skewness value is 1.063, and the probability value is 0.000, which shows 100% significant values for each variable. The EHR2, EHR3, and EHR4 represent mean values of 1.469, 1.408, and 1.469, respectively.

All values describe the positive average value of the mean. The standard deviation rates, 61%, 66%, and 57%, deviate from mean values. According to the result, the overall minimum value is 1.000, and the maximum value is 4.000. The PL is considered a dependent variable. According to the result, its mean values are 1.531, 1.490, 1.429, and 1.551. It describes the positive average values of the mean. The standard deviation rates of 61%, 57%, 64%, and 60% deviate from mean values. The skewness rates are 1.344, 0.874, 0.967, 1.243 and 0.641, showing the positive skewness values of PL.

**Correlation coefficient:**

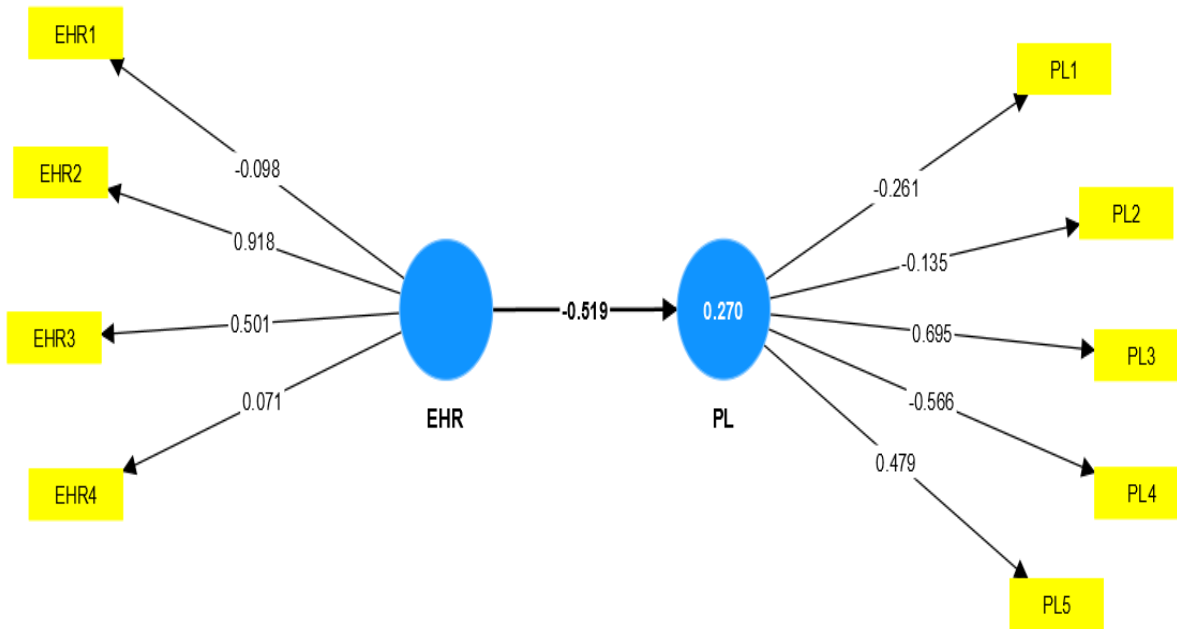
**Table 2**

	EHR1	EHR2	EHR3	EHR4	PL1	PL2	PL3	PL4	PL5
EHR1	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EHR2	0.036	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EHR3	-0.116	0.131	1.000	0.000	0.000	0.000	0.000	0.000	0.000
EHR4	0.101	0.070	0.192	1.000	0.000	0.000	0.000	0.000	0.000
PL1	-0.031	0.181	-0.027	-0.162	1.000	0.000	0.000	0.000	0.000
PL2	0.071	0.095	0.110	0.043	-0.320	1.000	0.000	0.000	0.000
PL3	0.215	-0.285	-0.191	0.133	-0.058	0.042	1.000	0.000	0.000
PL4	0.055	0.226	0.142	-0.037	0.166	0.145	-0.088	1.000	0.000
PL5	-0.119	-0.312	-0.051	-0.214	0.128	0.043	0.084	0.006	1.000

The above result shows that the correlation coefficient analysis result 1.000 shows a 100% correlation between one variable and another. EHR2 shows a 0.036 3% positive and significant correlation with EHR1.

The EHR3 presents that -0.116 shows a negative link with EHR1, and its positive connection with EHR2 rate level is 13% respectively. PL1 shows that -0.031, -0.027, and -0.162 have some negative and some positive interrelations between them.

**SMART PLS Algorithm Model:**



The above model represents the smart PLS Algorithm Model between HER and PL. According to the model, it shows that -0.098, 0.918, 0.501 and 0.071 show that 9%, 91%, 50% and 7% have significant rates between them. The PL represents that -0.261, -0.135, 0.695, -0.566 and 0.479 show negative and positive relations between HER and PL, but all of them are significantly linked.

**Conclusion:**

In conclusion, several chances and obstacles are associated with using Electronic Health Records (EHRs) in pathology laboratories to raise the calibre of healthcare provided. Although many barriers exist, including system integration, user resistance, and data security, strategically resolving these problems can help EHRs reach their full

potential. Pathology lab operations and patient outcomes may undergo a radical change due to the potential for increased patient involvement, interoperability, data analytics, and efficiency improvements. The future implementation of electronic health records (EHR) in pathology labs promises an environment characterized by continuous Innovation and technological advancement, confident to elevate the efficiency and accuracy of Pathology Laboratory services. A development like integrating artificial intelligence and machine learning into EHR systems shows another side for automated diagnosis, predicated analysis, and personalized treatment plans for patient needs. The research was based on primary data analysis to determine whether the study used smart PLS software and generated informative results, including descriptive statistics, correlation coefficients and smart PLS

Algorithm models between them. Blockchain technology is expected to enhance the security and privacy of patient data in the EHR, ensuring confidential yet secure Information sharing among authorized healthcare providers. The Future of EHR implementation in pathology Labs offers enhanced Data Management and Technology solutions that contribute to improved patient outcomes and many treatment strategies. The effective implementation of EHRs in pathology laboratories requires a comprehensive approach. This entails prioritising data security and privacy, offering users thorough training and support, and ensuring that current systems integrate seamlessly. Effective communication and cooperation within the healthcare ecosystem depend on standardising data formats and terminology and adherence to interoperability standards. Overall, the research concluded that there is a direct and significant link related to Implementing Electronic Health Records in Pathology Labs.

Furthermore, data-driven insights from EHRs can help with more accurate diagnosis and individualised treatment strategies, providing advantages beyond operational effectiveness. In addition to facilitating better decision-making, improved patient information accessibility gives patients more power to engage actively in their healthcare experience. The long-term benefits of EHR use, such as less paperwork, simplified procedures, and better overall patient care, outweigh the initial expenses, which should be handled appropriately. Collaboration between administrators, IT specialists, and healthcare practitioners is necessary for a successful deployment. Pathology laboratories may play a critical role in achieving the larger objectives of healthcare modernization by overcoming obstacles and taking advantage of the opportunities provided by EHRs, which will eventually improve outcomes for patients and healthcare professionals.

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