

# Technological Factors and Electronic Health Record Adoption at De-Martino Public Hospital, Mogadishu, Somalia

Abdullahi Mohamed Ali, Hamza Moahmed Abdullahi, Dr. Rose Ayikukwei, Mr. Musa Olouch

Department of Health Sciences, Kenya Methodist University

DOI: <https://doi.org/10.51244/IJRSI.2026.1315PH00165>

Received: 19 August 2026; Accepted: 24 August 2026; Published: 04 September 2026

## ABSTRACT

The adoption of Electronic Health Records (EHRs) has become an important component of healthcare digital transformation because of the potential of electronic systems to improve the availability, accuracy, accessibility, and management of patient information. However, successful EHR adoption in resource-constrained healthcare environments depends considerably on the technological conditions supporting the system. This study investigated the role of technological factors in the adoption of Electronic Health Records at De-Martino Public Hospital in Mogadishu, Somalia. The study focused on three technological dimensions: technological infrastructure, EHR system quality, and ease of use of the EHR system. The study adopted a positivist philosophy and a descriptive research design. Data were collected using a self-administered questionnaire from 183 respondents comprising healthcare workers and other relevant hospital personnel. Descriptive statistics, Pearson correlation, and linear regression analysis were used to examine the relationship between technological factors and EHR adoption. The findings indicated that respondents generally perceived technological factors as favorable, with a mean technological-factor score of 3.73 on a five-point Likert scale. The findings further showed a very strong and statistically significant positive relationship between technological factors and EHR adoption ( $r = 0.979$ ,  $p < 0.001$ ). Regression analysis established that technological factors explained 95.9% of the variation in EHR adoption ( $R^2 = 0.959$ ), while the regression model was statistically significant ( $F = 4182.618$ ,  $p < 0.001$ ). The technological-factor coefficient was also positive and statistically significant ( $B = 1.083$ ,  $\text{Beta} = 0.979$ ,  $p < 0.001$ ). The findings demonstrate that technological readiness is a critical determinant of EHR adoption at De-Martino Public Hospital. The study concludes that investment in reliable technological infrastructure, high-quality EHR systems, interoperability, system reliability, and user-friendly interfaces is essential for strengthening EHR adoption. The findings have implications for hospital management, health policymakers, technology providers, and healthcare professionals seeking to advance digital health transformation in Somalia.

**Keywords:** Electronic Health Records, technological factors, technological infrastructure, system quality, ease of use, EHR adoption, Somalia, digital health

## INTRODUCTION

### Background

Electronic Health Records (EHRs) have increasingly become an important component of contemporary healthcare information management. An EHR provides a digital representation of patient health information that can be accessed by authorized healthcare professionals and used to support clinical and administrative processes. Compared with paper-based records, electronic systems have the potential to improve information accessibility, facilitate communication among healthcare professionals, support clinical decision-making, improve continuity of care, and enhance patient safety. The uploaded study identifies EHRs as systems capable of facilitating the efficient flow, sharing, and utilization of patient information among healthcare professionals and patients. Despite these potential benefits, adoption of EHRs has not occurred uniformly across healthcare systems. Developed countries have generally experienced more rapid adoption, while healthcare organizations in developing and resource-constrained environments continue to experience technological, human, organizational, environmental, and economic barriers. The problem is particularly relevant in fragile healthcare systems where

infrastructure limitations, unreliable connectivity, inadequate technical support, and limited information technology capacity may affect the implementation and continued use of electronic systems. The study's background identifies Somalia as a setting in which prolonged conflict and weaknesses in healthcare infrastructure have contributed to deficiencies in health information systems and health information technology.

Technological factors are particularly important because EHR adoption is fundamentally dependent on the existence of an enabling technological environment. Even when healthcare workers are willing to use an electronic system, adoption may be constrained if computers, networks, servers, internet connectivity, electricity, software, and technical support are inadequate. Similarly, the quality of the EHR system may influence whether users perceive the system as reliable, responsive, secure, and useful. A technically unreliable system can create delays, duplication of work, frustration, and resistance among healthcare workers. The first objective of the study therefore examined technological factors as determinants of EHR adoption at De-Martino Public Hospital. In the study, technological factors were operationalized through technological infrastructure, EHR system quality, and ease of use of the EHR system. This operationalization is consistent with technology-acceptance literature, particularly the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and perceived ease of use as important determinants of technology acceptance. The study also applies the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasizes facilitating conditions, effort expectancy, performance expectancy, and social influence.

The importance of technological conditions is also evident in recent research from developing countries. Chirchir, Aruasa, and Chebon (2021), in a study of nurses at Moi Teaching and Referral Hospital in Kenya, examined ICT infrastructure, internet access, and physical security as technical factors influencing EHR adoption. Their study demonstrates that technical conditions within healthcare facilities can shape the willingness and ability of healthcare workers to use EHR systems. Similarly, Tolera et al. (2022) examined EHR use among healthcare professionals in public health facilities in eastern Ethiopia and highlighted perceived system quality and related technological conditions as important considerations in electronic record use. In Somalia, the technological dimension is especially significant because the country's digital health environment continues to develop within a resource-constrained healthcare system. Ahmed et al. (2024) observed that Somalia's digital healthcare transformation requires attention to modern technologies, infrastructure, health information systems, and the broader conditions necessary to support digital healthcare. Consequently, examining technological factors at the facility level provides important empirical evidence concerning how technological readiness may support or constrain EHR adoption.

## **Problem Statement**

Although EHRs have considerable potential to improve healthcare delivery, the availability of an electronic system does not automatically guarantee its adoption and effective utilization. Healthcare organizations may acquire electronic systems but fail to achieve consistent use when technological infrastructure is inadequate, system quality is poor, or users perceive the technology as difficult to operate. The study notes that a gap may exist between the technology that has been developed or acquired and the technology that healthcare workers actually use in routine practice.

At De-Martino Public Hospital, the transition from paper-based records to electronic health information management requires technological readiness. The hospital operates within the broader Somali healthcare environment, where infrastructure limitations and the effects of prolonged conflict have affected health information systems. The study therefore sought to determine whether technological factors were associated with EHR adoption and the extent to which they could explain differences in adoption levels.

The problem was not merely whether an EHR system existed, but whether the hospital possessed the technological conditions necessary to facilitate meaningful adoption. These conditions included adequate technological infrastructure, acceptable system quality, and ease of use. The first objective was consequently formulated to investigate the role of technological factors in EHR adoption at De-Martino Public Hospital.

## LITERATURE REVIEW

### Technological Factors and EHR Adoption

Technological factors refer to the technical conditions that facilitate or constrain the implementation and use of an EHR system. In the present study, these factors comprise technological infrastructure, EHR system quality, and ease of use. These dimensions are interconnected. Infrastructure provides the physical and network foundation for the system; system quality determines how reliably and effectively the system performs; while ease of use influences the effort required by users to interact with the system.

The relationship between technology and EHR adoption can be explained through TAM. According to TAM, individuals are more likely to accept technology when they perceive it as useful and easy to use. The model therefore provides a useful explanation for why system usability can influence adoption. The uploaded study notes that perceived ease of use can reduce resistance toward new technology and improve user satisfaction.

UTAUT provides a complementary explanation through the concept of facilitating conditions. Facilitating conditions represent the extent to which users believe that organizational and technological infrastructure supports the use of technology. In healthcare, this includes training, technical resources, infrastructure, system updates, and other resources required for actual technology use.

### Technological Infrastructure

Technological infrastructure constitutes the physical and digital foundation required for EHR operation. It includes computers, servers, networks, internet connectivity, electricity, peripheral devices, and other supporting technologies. Without adequate infrastructure, an EHR may not operate consistently even if the software itself is well designed. The study emphasizes that availability of ICT infrastructure is an important determinant of successful EHR adoption. Infrastructure is not useful merely because hardware and software have been purchased; the components must also be compatible with existing operational systems and workflows.

Infrastructure adequacy is particularly important in developing healthcare systems. Hospitals may face unreliable electricity, inadequate network capacity, limited hardware, insufficient maintenance, and inconsistent internet connectivity. Such conditions can cause interruptions in electronic documentation and reduce user confidence in the system. Where healthcare workers experience repeated system downtime, they may revert to paper-based alternatives, thereby undermining the objective of digitization.

Chirchir et al. (2021) examined technical factors influencing EHR adoption among nurses at Moi Teaching and Referral Hospital in Kenya. Their study specifically considered ICT infrastructure and internet access among the technical factors associated with EHR adoption. The relevance of this finding to De-Martino Public Hospital lies in the fact that both settings represent healthcare environments in which successful digital health implementation depends on the adequacy of supporting technological infrastructure. The infrastructure challenge is also connected to system interoperability. An EHR system should be capable of exchanging information with other relevant healthcare information systems. Hossain, Quaresma, and Rahman (2019), as cited in the thesis, emphasize that interoperability allows different EHR systems to work together and enables information to be shared across systems. The inability to share information can undermine one of the principal benefits of electronic records.

Recent literature continues to identify interoperability as a major challenge in developing countries. A 2024 review of EMR interoperability in developing countries found that fragmented systems, inadequate infrastructure, limited resources, and insufficient standardization continue to constrain information exchange. Thus, technological infrastructure should be understood broadly. It is not simply the number of computers available in a hospital. It includes the availability, reliability, compatibility, connectivity, security, and maintainability of the technological ecosystem supporting the EHR.

## EHR System Quality

System quality refers to the extent to which an EHR performs reliably, efficiently, securely, responsively, and consistently. A high-quality EHR system should enable users to access and enter patient information efficiently while minimizing errors and interruptions. System quality therefore affects both perceived usefulness and actual use.

A system that frequently crashes, responds slowly, loses information, or presents confusing interfaces may discourage healthcare workers from using it. Conversely, a reliable system that provides accurate and timely information may increase user confidence and encourage continued use. The study recognizes EHR system quality as one of the main dimensions of technological factors. The conceptual framework identifies EHR system quality alongside technological infrastructure and ease of use as technological determinants of EHR adoption.

System quality also interacts with clinical workflow. An EHR should support rather than disrupt the work of healthcare professionals. Healthcare workers operate in time-sensitive environments, meaning that systems that require excessive navigation or duplicate data entry may create frustration. The quality of an EHR therefore needs to be considered in relation to the practical requirements of doctors, nurses, laboratory personnel, pharmacists, administrators, and other users.

Tolera et al. (2022) investigated electronic medical record use among healthcare professionals in public health facilities in Dire Dawa, Ethiopia, and included perceived EMR system quality among the factors relevant to use. This supports the argument that system characteristics are important not only during implementation but also during routine use. A systematic review published in 2024 similarly identified multiple technological and organizational success factors associated with EHR implementation in developing countries. The review emphasizes that successful implementation requires more than acquisition of software and must address the wider set of conditions needed to sustain electronic records.

## Ease of Use

Ease of use refers to the extent to which healthcare workers perceive that an EHR can be operated without excessive effort. This dimension is central to TAM and is particularly relevant where healthcare workers have different levels of computer literacy and previous exposure to digital systems. When an EHR is intuitive, users can learn its functions more easily and incorporate it into routine workflows. However, complicated systems can increase cognitive and operational burdens. Healthcare workers may perceive the system as an additional workload, especially if they are required to perform documentation through several complicated steps.

The study identifies perceived ease of use as an important determinant of EHR adoption. Derecho et al. (2024), as discussed in the thesis, argue that perceived ease of use and perceived usefulness shape staff attitudes and consequently influence intention to use and actual use of EHR systems. Ease of use is particularly important in developing-country healthcare environments because technological experience may vary considerably across healthcare workers. Chirchir et al. (2021) emphasize that using ICT infrastructure requires a level of IT expertise that can be developed through training and exposure. Thus, ease of use and user capability can reinforce each other: a simpler system may encourage use, while repeated use and training may improve user competence. The study's findings also provide evidence that technological perceptions were generally positive at De-Martino. The high overall technological-factor mean suggests that respondents generally considered the technological conditions relatively favorable for EHR adoption.

## Theoretical Foundation

### Technology Acceptance Model

The Technology Acceptance Model provides a strong theoretical basis for understanding the technological dimension of EHR adoption. TAM proposes that perceived usefulness and perceived ease of use influence users' attitudes and intentions toward a technology. In the context of De-Martino Public Hospital, the model implies that healthcare workers are more likely to adopt EHRs when they believe that the system is useful for their work

and can be used without excessive effort. Ease of use is therefore not merely a technical characteristic; it has behavioral consequences.

The study's findings provide empirical support for this proposition. The very strong relationship between technological factors and EHR adoption suggests that favorable perceptions of infrastructure, system quality, and ease of use correspond with higher levels of adoption. The study specifically concludes that when staff perceive the EHR system as usable and of good quality, adoption intentions and actual use are correspondingly high.

### **Unified Theory of Acceptance and Use of Technology**

UTAUT complements TAM by emphasizing facilitating conditions. Facilitating conditions are especially relevant to healthcare organizations because the successful use of an EHR requires infrastructure, technical support, training, and organizational resources. At De-Martino Public Hospital, the technological factors investigated under the first objective correspond closely with facilitating conditions. An EHR cannot be used effectively if the hospital lacks appropriate hardware, network infrastructure, connectivity, system support, or a user-friendly technological environment. The combined application of TAM and UTAUT therefore provides an appropriate theoretical explanation for the observed relationship between technological conditions and EHR adoption.

## **METHODOLOGY**

### **Research Design**

The study employed a descriptive research design. A self-administered questionnaire was used to collect quantitative data from respondents. The design enabled the researcher to describe perceptions concerning technological factors and statistically examine their relationship with EHR adoption. The methodology section of the thesis confirms the use of positivism and a descriptive design.

### **Study Population and Sample**

The study was conducted at De-Martino Public Hospital in Mogadishu, Somalia. The target population included healthcare workers and other relevant hospital personnel. The final analysis was based on 183 respondents. The respondents included doctors, nurses, and non-medical staff, with doctors accounting for 37.2%, nurses 45.4%, and non-medical staff 17.5%.

### **Measurement of Technological Factors**

Technological factors were measured using indicators relating to:

1. Technological infrastructure;
2. EHR system quality; and
3. Ease of use of the EHR system.

The study's methodology specified that technological factors would be evaluated using these three dimensions.

### **Data Analysis**

Data were analyzed quantitatively using descriptive and inferential statistical techniques. Frequencies and percentages were used to summarize responses concerning technological factors. Pearson correlation was used to determine the strength and direction of the relationship between technological factors and EHR adoption. Linear regression was subsequently used to assess the extent to which technological factors predicted EHR adoption. Statistical significance was assessed at  $p < 0.05$ .

## RESULTS

### Respondents' Perceptions of Technological Infrastructure

The findings indicate that respondents generally had a positive perception of the technological infrastructure supporting EHR adoption at De-Martino Public Hospital. Specifically, 37.2% of respondents agreed that the current infrastructure supporting EHR was good, while 18.6% strongly agreed. Therefore, 55.8% of respondents expressed a positive assessment of the infrastructure.

On the other hand, 17.5% disagreed, while 26.8% remained neutral.

Table 1: Perception of EHR Infrastructure

| Response       | Frequency | Percentage |
|----------------|-----------|------------|
| Disagree       | 32        | 17.5       |
| Neutral        | 49        | 26.8       |
| Agree          | 68        | 37.2       |
| Strongly Agree | 34        | 18.6       |
| Total          | 183       | 100.0      |

The findings indicate that more than half of respondents considered the technological infrastructure adequate. However, the relatively large neutral category demonstrates that infrastructure was not viewed as uniformly satisfactory by all respondents. The neutral responses may indicate uncertainty concerning the consistency or reliability of technological resources. The findings are important because infrastructure constitutes the foundation upon which an EHR system operates. Computers, network connectivity, electricity, servers, and related technological resources must function consistently for healthcare workers to use electronic records effectively.

### Overall Technological-Factor Descriptive Statistics

The overall technological-factor index produced a mean of 3.7268 and a standard deviation of 0.85594. The minimum observed score was 2.25 and the maximum was 5.00.

Table 2: Descriptive Statistics for Technological Factors

| Statistic          | Value   |
|--------------------|---------|
| N                  | 183     |
| Minimum            | 2.25    |
| Maximum            | 5.00    |
| Mean               | 3.7268  |
| Standard Deviation | 0.85594 |

The mean of 3.73 is above the midpoint of 3.0 on the five-point scale, indicating that respondents generally agreed that technological conditions were favorable for EHR adoption. The standard deviation of 0.86 indicates moderate variation in responses. The result suggests that although technological factors were not perceived as

perfect, respondents generally regarded them positively. This provides an important context for interpreting the subsequent correlation and regression findings.

### Correlation between Technological Factors and EHR Adoption

Pearson correlation analysis demonstrated a very strong positive relationship between technological factors and EHR adoption. The correlation coefficient was  $r = 0.979$  and the relationship was statistically significant at  $p < 0.001$ .

Table 3: Correlation between Technological Factors and EHR Adoption

| Variables             | Technological Factors | EHR Adoption |
|-----------------------|-----------------------|--------------|
| Technological Factors | 1.000                 | 0.979**      |
| EHR Adoption          | 0.979**               | 1.000        |
| Significance          | —                     | 0.000        |
| N                     | 183                   | 183          |

Correlation is significant at the 0.01 level, two-tailed.

The result indicates that higher perceptions of technological adequacy were associated with higher levels of EHR adoption. The magnitude of the correlation is exceptionally high, suggesting that technological conditions were closely associated with the adoption outcome at De-Martino Public Hospital.

### Regression Analysis

Linear regression analysis was used to determine whether technological factors significantly predicted EHR adoption. The model produced  $R = 0.979$  and  $R^2 = 0.959$ . Therefore, technological factors explained 95.9% of the variation in EHR adoption. The adjusted  $R^2$  was 0.958, while the standard error of the estimate was 0.193.

Table 4: Model Summary

| Model | R     | R Square | Adjusted R Square | Std. Error |
|-------|-------|----------|-------------------|------------|
| 1     | 0.979 | 0.959    | 0.958             | 0.193      |

The ANOVA results further demonstrate that the regression model was statistically significant,  $F(1,181) = 4182.618$ ,  $p < 0.001$ .

Table 5: ANOVA Results

| Model      | Sum of Squares | df  | Mean Square | F        | Sig.  |
|------------|----------------|-----|-------------|----------|-------|
| Regression | 156.393        | 1   | 156.393     | 4182.618 | 0.000 |
| Residual   | 6.768          | 181 | 0.037       | —        | —     |
| Total      | 163.161        | 182 | —           | —        | —     |

The regression coefficient for technological factors was  $B = 1.083$ , with a standardized Beta of 0.979. The coefficient was statistically significant,  $t = 64.673$ ,  $p < 0.001$ .

Table 6: Regression Coefficients

| Predictor             | B      | Std. Error | Beta  | t      | Sig.  |
|-----------------------|--------|------------|-------|--------|-------|
| Constant              | -0.336 | 0.064      | —     | -5.251 | 0.000 |
| Technological Factors | 1.083  | 0.017      | 0.979 | 64.673 | 0.000 |

The resulting regression equation can be expressed as:

$$\text{EHR Adoption} = -0.336 + 1.083(\text{Technological Factors})$$

The positive coefficient indicates that an improvement in technological factors was associated with an increase in EHR adoption.

## DISCUSSION

### Technological Factors and EHR Adoption

The first objective sought to investigate the role of technological factors in EHR adoption at De-Martino Public Hospital. The findings provide strong evidence that technological factors play a major role in EHR adoption. The overall technological-factor mean of 3.73 indicates that respondents generally perceived the technological environment positively. More importantly, Pearson correlation demonstrated a very strong positive relationship between technological factors and EHR adoption ( $r = 0.979$ ,  $p < 0.001$ ).

The result is consistent with the theoretical expectations of TAM. If healthcare workers perceive an EHR system as easy to use, useful, and supported by appropriate technological resources, they are more likely to adopt it. The finding therefore confirms that the technological characteristics of the system are not peripheral issues but central conditions for successful adoption. The finding also supports UTAUT's facilitating-condition construct. An EHR cannot be successfully used without appropriate technological infrastructure and supporting conditions. The strong association identified in this study indicates that technological readiness may be especially important at De-Martino because the hospital operates within a broader healthcare environment characterized by infrastructure limitations.

The finding is also consistent with evidence from Kenya. Chirchir et al. (2021) examined technical factors influencing EHR adoption among nurses at Moi Teaching and Referral Hospital and considered ICT infrastructure, internet access, and physical security as important technical conditions. This provides regional support for the argument that technological conditions influence EHR adoption within African healthcare settings. The result is further consistent with research from Ethiopia. Tolera et al. (2022) examined EHR use among healthcare professionals in public health facilities in eastern Ethiopia and identified perceived EMR system quality among the factors associated with use. The similarity between the Ethiopian findings and the De-Martino findings suggests that system-related characteristics are relevant across resource-constrained African healthcare environments.

### Technological Infrastructure

The infrastructure findings showed that 55.8% of respondents agreed or strongly agreed that the current infrastructure supporting EHR at De-Martino was good. This represents a majority, although 26.8% were neutral and 17.5% disagreed. The positive majority suggests that the hospital had established a technological foundation capable of supporting EHR adoption. However, the neutral and negative responses indicate that infrastructure remains an area requiring attention.

The finding is particularly relevant because infrastructure problems can directly disrupt healthcare information management. An unreliable network or inadequate computer availability can delay patient registration, clinical documentation, laboratory reporting, pharmacy processes, billing, and other activities. Consequently,

infrastructure deficiencies may cause healthcare workers to perceive the EHR as an obstacle rather than an enabler of healthcare delivery.

The results are consistent with the wider literature from developing countries. Chirchir et al. (2021) emphasized the importance of ICT infrastructure and internet access in EHR adoption. Similarly, the 2024 systematic review of EHR implementation in developing countries identified technological and infrastructural conditions among the critical success factors requiring attention. The findings are therefore significant for De-Martino Public Hospital because the hospital should not view infrastructure investment as a one-time activity. Continuous investment is necessary to ensure that equipment remains functional, networks remain reliable, and system capacity grows alongside user demand.

### **EHR System Quality**

The strong technological-factor score and very high correlation with EHR adoption suggest that the quality of the EHR system is an important component of the technological environment. A quality EHR should be reliable, responsive, secure, accurate, and compatible with clinical workflows. If the system performs these functions effectively, healthcare workers are more likely to perceive it as useful. Conversely, poor system quality may increase frustration and encourage users to rely on paper-based records.

The results therefore support the argument that EHR adoption should be evaluated in terms of actual system performance rather than merely the existence of software. A hospital can technically possess an EHR but still experience low adoption if the system is slow, unstable, difficult to navigate, or poorly integrated. This observation is consistent with the study's literature review, which emphasizes the importance of system compatibility and integration. The thesis notes that incompatibility between EHR components and existing operational frameworks can undermine ease of use and generate resistance. Recent literature on interoperability in developing countries reinforces this argument. Fragmented systems and limited interoperability can prevent healthcare information from being exchanged efficiently, reducing the value of EHR systems.

### **Ease of Use**

Ease of use is another important explanation for the strong relationship between technological factors and EHR adoption. Healthcare professionals work in environments where time and accuracy are important. Therefore, a system that requires excessive effort can interfere with clinical activities. The thesis literature indicates that perceived ease of use affects staff attitudes and intentions toward EHR use. This finding is consistent with TAM, which identifies perceived ease of use as one of the central determinants of technology acceptance.

The importance of ease of use is also supported by the study's discussion of TAM. The thesis explains that stronger perceived ease of use can reduce resistance and improve satisfaction, particularly among users with limited technological experience. For De-Martino Public Hospital, this means that technology providers and hospital management should prioritize user-centered system design. The EHR should be intuitive, easy to navigate, and aligned with the workflow of healthcare professionals.

### **Interpretation of the Very High $R^2$**

One of the most notable findings of the study is that technological factors explained 95.9% of the variation in EHR adoption. This is an exceptionally high level of explanatory power. The finding suggests that technological conditions were extremely closely associated with EHR adoption among the respondents. The study itself notes that the unusually high  $R^2$  may be partly related to De-Martino's stage of EHR implementation, where basic technological adequacy may function as a prerequisite for other forms of adoption.

However, the result should be interpreted cautiously. An  $R^2$  of 0.959 does not mean that technology is the only factor that determines EHR adoption in all healthcare settings. Rather, it indicates that, within this sample and model, the technological-factor index accounted for a very large proportion of the observed variation in the EHR adoption index. The high correlation may also partly reflect conceptual proximity between the measures of technological factors and EHR adoption. Where both variables are measured through related perceptions,

respondents who rate the technological environment positively may also be more likely to rate adoption positively. This does not invalidate the finding, but it suggests that future studies should consider longitudinal designs, objective measures of system usage, and multi-variable models to establish whether the relationship remains similarly strong.

### **Comparison with Previous Studies**

The present findings are generally consistent with the available literature. Chirchir et al. (2021) demonstrated the importance of technical factors in EHR adoption among nurses in Kenya. Tolera et al. (2022) similarly investigated system-related factors associated with electronic medical record use among healthcare professionals in Ethiopia. The findings also correspond with recent reviews emphasizing technological infrastructure, system functionality, interoperability, and implementation conditions in developing countries. Mwogosi (2024), for example, synthesized evidence on critical success factors for EHR implementation in developing countries and highlighted the importance of addressing the broad conditions necessary for successful implementation.

However, the magnitude of the relationship found at De-Martino is considerably stronger than might normally be expected from many healthcare technology studies. This may reflect the particular context of a public hospital in a fragile healthcare system. In such environments, technological readiness may represent a threshold condition. When infrastructure and system quality are inadequate, adoption becomes difficult regardless of other factors. The Somali context also makes the findings particularly important. Ahmed et al. (2024) describe the development of digital healthcare in Somalia and highlight the need for technological and health information system development. The current study provides facility-level evidence supporting the importance of these broader digital-health priorities.

### **Implications Of The Findings**

#### **Implications for Hospital Management**

Hospital management should recognize technological infrastructure as a strategic requirement rather than simply an IT responsibility. Management should ensure adequate computers, network connectivity, reliable electricity, system maintenance, technical support, and appropriate backup systems. The 26.8% neutral response concerning infrastructure indicates that some staff members may still be uncertain about the adequacy or reliability of the technological environment. Management should therefore conduct periodic technological-readiness assessments and identify departments or workflows experiencing technological challenges.

#### **Implications for Healthcare Workers**

Healthcare workers should be involved in the design, evaluation, and continuous improvement of EHR systems. User participation can help ensure that system functions correspond with actual clinical and administrative workflows. Training should also accompany technological investments. Even a technically sophisticated system may not achieve its intended benefits if users do not understand how to use it effectively.

#### **Implications for Technology Providers**

Technology vendors should prioritize user-centered design, system reliability, interoperability, responsiveness, and ease of use. Systems developed for resource-constrained environments should also consider connectivity limitations and infrastructure realities. The development of flexible systems that can operate under variable network conditions may be especially relevant in fragile settings. Research on EHR architecture for developing countries has similarly considered approaches such as offline functionality to address connectivity limitations.

### **Policy Implications**

Health policymakers should recognize that digital health policies require corresponding technological investments. National digital-health strategies should therefore include infrastructure development, interoperability standards, technical capacity, cybersecurity, data governance, and sustainable maintenance

mechanisms. The findings support the broader argument that digital-health transformation requires an ecosystem rather than isolated technology procurement.

## CONCLUSION

The study concludes that technological factors play a significant role in the adoption of Electronic Health Records at De-Martino Public Hospital in Mogadishu, Somalia. The findings demonstrated generally positive perceptions of technological conditions, with an overall technological-factor mean of 3.73. Technological infrastructure was viewed positively by the majority of respondents, although a considerable proportion remained neutral, indicating that technological adequacy may not be uniformly experienced across the hospital. The findings further demonstrated a very strong positive and statistically significant relationship between technological factors and EHR adoption, with Pearson's  $r = 0.979$  and  $p < 0.001$ .

Regression analysis provided further evidence of the importance of technological factors. The technological-factor model explained 95.9% of the variation in EHR adoption, and the regression model was statistically significant. The positive regression coefficient further indicated that improvement in technological conditions was associated with increased EHR adoption. The study therefore establishes that technological infrastructure, EHR system quality, and ease of use constitute important conditions for EHR adoption at De-Martino Public Hospital. The findings are consistent with TAM and UTAUT, which emphasize perceived ease of use, perceived usefulness, and facilitating conditions as important components of technology acceptance and use.

However, the exceptionally high explanatory power should be interpreted with appropriate caution. The result reflects the specific study context and measurement approach and should not be generalized to all healthcare institutions without further evidence. Future research should employ longitudinal designs, objective measures of EHR usage, and multi-hospital comparisons to establish whether similarly strong relationships exist in other Somali healthcare facilities.

## RECOMMENDATIONS

Based on the findings, the study makes the following recommendations.

First, De-Martino Public Hospital should strengthen and continuously maintain its technological infrastructure. This should include adequate computers and related equipment, reliable internet connectivity, network infrastructure, electricity backup, servers, and technical support. Second, hospital management should establish routine assessment mechanisms for EHR system performance. System downtime, response speed, errors, data availability, and user complaints should be monitored regularly to ensure that technological problems are identified and resolved promptly.

Third, the hospital should prioritize user-friendly EHR interfaces. Technology providers should work closely with healthcare workers to ensure that system functions correspond with clinical and administrative workflows. Fourth, interoperability should be incorporated into future EHR development. The hospital should seek systems that can exchange information with relevant laboratory, pharmacy, billing, registration, and other health information systems where appropriate.

Fifth, continuous training should accompany technological improvements. Healthcare workers should receive practical training on system functionality, troubleshooting, data entry, information retrieval, and appropriate use of electronic patient information. Sixth, hospital management and relevant health authorities should develop sustainable mechanisms for technological maintenance. EHR adoption should not be treated as a one-time procurement project; it should be supported through long-term investment in hardware replacement, software upgrades, technical support, cybersecurity, and system improvement.

## Areas For Further Research

Future studies should examine technological factors across several hospitals in Mogadishu and other regions of Somalia. A multi-hospital study would enable comparisons between public and private facilities and would

improve the generalizability of findings. Future research should also employ longitudinal designs to examine whether technological improvements lead to sustained increases in EHR adoption over time. This would provide stronger evidence concerning the temporal relationship between technological readiness and actual system use.

Researchers should further consider objective measures of EHR utilization, including login frequency, number of electronic records completed, system downtime, transaction volumes, and feature utilization. Such measures could complement self-reported questionnaire data. Finally, future research should investigate how technological factors interact with human, organizational, environmental, and economic factors. The current study demonstrates a very strong technological relationship, but EHR adoption is a complex phenomenon involving multiple levels of the healthcare system.

### Declaration by the candidate

I, Abdullahi Mohamed, declare that this MSc research project that I submit in partial fulfilment of the requirements of the degree of Masters in Health Systems Management of Kenya Methodist University, is entirely my original work and has not been submitted for the award of any degree in any other university.

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