Occupational Diseases and Environmental Medicine, 2025, 13(4), 284-309
https://www.scirp.org/journal/odem
ISSN Online: 2333-357X
ISSN Print: 2333-3561

Contribution of Electronic Health Records on Healthcare Service Delivery in Two Selected Regional Hospitals in Eastern Sierra Leone

Prince Tongor Mabey[1,2*], Arrhenius Yusuf Mustapha[3], Samuel Joseph Bebeley[2], Marian Mabey[2,3]

[1]Institute of Environmental Management and Quality Control, School of Environmental Sciences, Njala University, Freetown, Sierra Leone
[2]Department of Health Education and Behavioural Science, School of Education, Njala University, Freetown, Sierra Leone
[3]Department of Science, S.O.S Hermann Gmeiner International School, Bo, Sierra Leone
Email: *pmabey@njala.edu.sl

How to cite this paper: Mabey, P. T., Mustapha, A. Y., Bebeley, S. J., & Mabey, M. (2025) Contribution of Electronic Health Records on Healthcare Service Delivery in Two Selected Regional Hospitals in Eastern Sierra Leone. *Occupational Diseases and Environmental Medicine*, **13**, 284-309.
https://doi.org/10.4236/odem.2025.134019

Received: September 13, 2025
Accepted: November 17, 2025
Published: November 20, 2025

Abstract

Electronic health records (EHR) facilitate the collection and utilisation of data to enhance accessibility and efficiency of health information management at both the patient and population levels. This study aims to evaluate the impact of Electronic Health Records (EHRs) on healthcare service delivery in two selected regional Hospitals in Eastern Sierra Leone. A descriptive cross-sectional design involving healthcare workers and patients was employed to collect quantitative data. A stratified sampling technique was employed to ensure that the participants (healthcare workers and patients), were adequately represented and the participants from each stratum were selected using simple random techniques. Microsoft Excel 2019 was used to analyse the data, and Chi-square tests were used to assess the associations between EHR implementation and patient care efficiency. The results indicate that Electronic Health Record (EHR) systems in both districts have shown promising aspects, particularly in security features with 50% agreeing on access control and 64.91% supporting encryption. Patients reported (57.01%) satisfaction with the system's ability to meet their information needs, and the reliability of data (53.51%) agreed and strongly agreed that e-health systems have improved the expertise of most medical doctors. Several challenges persist, notably majority (55.46%) disagreed and strongly disagreed that IT training improved their IT service quality, (68.69%) disagreed and strongly disagreed that IT staff were competent in using the e-health system. The average score of healthcare workers in relation to EHR usage was significantly lower (19.00) compared to patients (57.00),

suggesting a disparity in EHR effectiveness perception. The total chi-square value for Kenema is 4.39, with a p-value of 0.22, suggesting that the differences observed in responses between the groups are not statistically significant ($p > 0.05$). The critical t-value for 19 degrees of freedom is 2.09 with no significant difference in average system quality that exists between the two hospitals. Hence, while the EHR systems in both districts have made strides in improving data management and patient information accessibility, the ongoing challenges in IT infrastructure, staff training, and system reliability must be addressed to enhance their impact on healthcare service delivery.

Keywords

Electronic Health Record, System Quality, Health Care, Health Service Delivery

1. Introduction

In recent times, various healthcare institutions, including hospitals and dispensaries, have transitioned to delivering their services through eHealth information systems. Electronic health records (EHR) facilitate the collection and utilisation of data to enhance accessibility and efficiency of health information management at both the patient and population levels. Due to its time-consuming, repetitive, and erroneous nature, paper-based documentation is thought to fall short of the standards for high-quality documentation and communication among healthcare providers [1] [2]. Additionally, since retrieving information from paper-based data is thought to be labor-intensive, there are a number of issues that come with it. Thus, the utilization of EHR represents a departure from traditional healthcare delivery methods, with a primary aim to enhance patient satisfaction [3]-[6]. Electronic Health (EH) encompasses the use of modern information and communication technologies (ICT) to deliver healthcare services, facilitating interaction between healthcare providers and patients through electronic means [7].

However, EHR systems are known to assist better clinical judgements, minimise medical resource costs, and promote higher standards of care [8]. Electronic Health Records (EHRs), facilitate the acquisition, analysis, and utilisation of data for both population-based and patient-centred healthcare delivery [9] [10]. The integration of EHRs into healthcare systems has led to numerous benefits, including improved patient care, enhanced care coordination, and increased efficiency [11] [12]. Effective implementation of EHRs can improve healthcare quality, increase time efficiency and guideline adherence and reduce medication errors and adverse drug effects among patients [13]-[15]. It allows healthcare providers to access patient information quickly and easily. However, the system's implementation could have an adverse effect on the clinical staff members' job performance in the absence of a systematic evaluation. Thus, the broad adoption of EHR sys-

tems and healthcare workers depends heavily on the "fit" between systems, records, technical support services, and competence [1] [16] [17].

In Sierra Leone, research indicates that the healthcare system is challenged with multiple factors that are unequally distributed throughout the country, with lower access to health services for those in rural areas [18]. The implementation of electronic health records (EHRs) in hospitals is an ongoing initiative, with a focus on improving data management, disease surveillance, and overall patient care. Despite this progress, challenges like data security and privacy, inadequate capacity, inadequate electricity and internet, and inadequate infrastructure using digital health tools like EMRs remain a top concern among health professionals. Hence, this study aimed to assess the contribution of electronic health records on healthcare service delivery in two selected regional hospitals in Eastern Sierra Leone.

2. Methodology

2.1. Description of the Study Areas

The study was conducted in two healthcare facilities, Kenema Regional Hospital and Kono Government Hospital, both located in the Eastern Province of Sierra Leone. These hospitals serve large populations and had implemented electronic health record (EHR) systems aimed at improving healthcare delivery. Kenema Regional Hospital is a major referral center for the region, with a population of 772,472 [19], while Kono Government Hospital provides significant healthcare services to Kono District which serves a population of 620,703 [19]. Both government hospitals are secondary healthcare facilities in the eastern region of Sierra Leone. The coordinates of Kenema governmental hospital is 7˚52'33"N 11˚11'27"W while that of Kono government hospital is 8˚45'N 11˚00'W.

2.2. Research Design and Data Collection

A descriptive cross-sectional design was employed to collect quantitative data. A service quality (SERVQUAL) questionnaire was used to assess the disparities in users' expectations and perceptions of service quality in both hospitals. The questionnaires included questions regarding their experiences with the EHR system, its usability, the impact on their workflow, and any challenges encountered. Data collectors were kept blind to the study's precise hypothesis and underwent survey-specific training to ensure anonymity and reduce interviewer bias. Additionally, pre-testing of the data collection tool was done, and necessary revisions were made accordingly. Data were collected using the KOBO app, and data quality was ensured through daily oversight, spot-checks, and reviews of the completed questionnaires by trained staff. The principal investigator and supervisors verified the questionnaires for completeness, accuracy, and consistency on a daily basis.

2.3. Sampling and Sampling Procedure

The sample size for this study was determined using Yamane's formula (1967), expressed as:

$$n = \frac{N}{1 + N\left(e^2\right)'}$$

where n represents the sample size;

N the study population;

e the margin of error, set at 0.05 for a 95% confidence level.

Applying this formula, the required sample size for Kenema Government Hospital, with a population of 474, was 217, while that of Kono Government Hospital, with a population of 348, was 186. To ensure representativeness, proportional allocation was employed, with sample sizes distributed across staff cadres and patients according to their relative proportions in the total hospital populations. Also, a stratified random sampling technique was employed to ensure that the participants (healthcare workers and patients), were adequately represented. Patients were stratified by age and gender to ensure a representative sample that reflected the diversity of the patients' population at both hospitals. Once the stratification was completed, participants from each stratum were selected using simple random techniques. Each district and health facility received a proportionate amount (sample with proportional to size). The total number of respondents in Kenema Government Hospital was Doctors (06), Surgical officer (SACHO) (04), State Enrolled Community Health Nurse (SECHN) (80), State Registered Nurse (SRN) (40), Medical Lab Technician (12), Pharmacist (05), Midwifes (15), Community Health Officers (CHO) (25), and Patients (10). Also, the total number of respondents in Kono Government Hospital was Doctors (10), Surgical officer (SACHO) (15), State Enrolled Community Health Nurse (SECHN) (40), State Registered Nurse (SRN) (45), Medical Lab Technician (15), Pharmacist (10), Midwifes (16), Community Health Officers (CHO) (20), and Patients (15). To ensure comparability between healthcare workers and patients, questionnaire responses were scored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with negatively worded items reverse-coded so that higher values reflected more positive perceptions of EHRs. Scores were aggregated for each participant to create total composite scores, restricted to comparable items across both groups to maintain validity. Group means were then calculated, resulting in an average score of 19.00 for healthcare workers and 57.00 for patients, alongside medians, ranges, and standard deviations to describe variability. This scoring procedure ensured that the reported differences in EHR experiences between healthcare workers and patients were valid and interpretable.

2.4. Data Analysis

Microsoft Excel 2019 Data Analysis Toolpak was used to analyse the data. Descriptive statistics, including means, medians, standard deviations, and ranges, were used to summarize central tendencies and variability in responses from healthcare workers and patients. Chi-square tests were used to assess the associations between EHR implementation and patient care efficiency, determining the

statistical significance of observed differences. t-Tests were used to compare EHR system quality and information quality between Kenema government hospital and Kono government hospital.

2.5. Ethical Consideration

The researcher was granted ethical approval by Njala University Ethics Committee to conduct this study. The ethical approval confirmed to take the consent form before distributing the questionnaire, to ensure that the participants are voluntary participants in the study and have the right to withdraw from the study, and their data are managed confidentially and anonymously.

3. Results

3.1. Demographic Characteristics of the Respondents

The results indicated that 40.35% of respondents were aged 18 - 30, compared to only 8.77% in Kono (Table 1). Meanwhile, Kono had a significantly higher proportion of respondents aged 46 - 60 (40.35%) compared to Kenema (28.07%) (Table 1). The chi-square value for age is 18.475, with a highly significant p-value of 0.001, indicating a statistically significant difference in the age distribution between the two regions (Table 1). This suggests that younger healthcare workers are more prevalent in Kenema, while older workers dominate in Kono.

Table 1. Demographic characteristics of the respondents.

Variables	*Kenema*	*Kono*	χ^2	*P-value*
1) Age:			18.475	0.001
18 - 30	23 (40.35)	5 (8.77)		
31 - 45	13 (22.81)	16 (28.07)		
46 - 60	16 (28.07)	23 (40.35)		
Over 60	5 (8.77)	13 (22.81)		
2) Gender:			9.21	0.001
Male	25 (43.86)	24 (42.11)		
Female	32 (56.14)	33 (57.89)		
3) What is your household size?			11.143	0.002
1 - 2 members	10 (17.54)	27 (47.37)		
3 - 5 members	23 (40.35)	10 (17.54)		
6 or more members	24 (42.11)	20 (35.09)		

Continued

4) Education qualification:			12.833	0.02
Certificate	15 (26.32)	18 (31.58)		
Diploma	23 (40.35)	27 (47.37)		
Degree	17 (29.82)	11 (19.30)		
Master	2 (3.51)	1 (1.75)		
5) Employment status:			14.86	0.05
Employed full-time	18 (31.58)	11 (19.30)		
Employed part-time	9 (15.79)	7 (12.28)		
Unemployed	12 (21.05)	19 (33.33)		
Student	10 (17.54)	18 (31.58)		
Retired	8 (14.04)	2 (3.51)		
6) How long have you been working with this particular institution?			6.635	0.001
Less than 3 years	26 (45.61)	29 (50.88)		
3 to 9 years	19 (33.33)	16 (28.07)		
Above 9 years	12 (21.05)	12 (21.05)		
7) Please indicate your area of expertise:			14.449	0.002
Medical Doctor	3 (5.26)	2 (3.51)		
Clinical Officer	5 (8.77)	4 (7.02)		
Nurse	24 (42.11)	27 (47.37)		
Technical Person	10 (17.54)	9 (15.79)		
MCHA	6 (10.53)	5 (8.77)		
SECHN	9 (15.79)	10 (17.54)		

3.2. Quality Effect of Electronic Health Record on Healthcare Service Delivery

A significant portion of respondents, 35.09%, found the systems difficult to understand, with Kono showing higher levels of disagreement compared to Kenema (**Appendix 1**). While there was a balanced perception of user-friendliness overall, more respondents from Kono expressed disagreement. However, a higher number of Kono respondents agreed that the system incorporated necessary features. Pos-

itive feedback was noted for auditing, with 34.21% of respondents agreeing. System stability, on the other hand, received the most criticism, particularly in Kono, where 28.07% strongly disagreed (**Appendix 1**). Stability and system malfunctions were identified as the primary concerns, especially among Kono respondents.

With regards the service quality, a significant portion of respondents (32.46%) disagreed that IT training improved their system use, with stronger disagreement in Kono (23 respondents) compared to Kenema (8 respondents) (**Appendix 1**). Respondents expressed dissatisfaction with training related to system use and the competence of IT staff. Thus, the respondents reported that training did not sufficiently improve their ability to operate the system effectively, reflecting concerns about the quality, depth, and practical impact of such training.

Dissatisfaction with IT staff competence was also notable, with 35.96% strongly disagreeing, and higher dissatisfaction reported in Kono (**Appendix 1**). However, feedback on IT staff knowledge was more positive, with 38.60% of respondents agreeing, though Kenema still recorded higher dissatisfaction levels (**Appendix 1**).

Opinions on the promptness of IT support were mixed, with 26.32% strongly disagreeing, particularly in Kono (**Appendix 1**). Overall, IT staff competence emerged as the most heavily criticized aspect, especially in Kono. Varying perceptions of system performance, particularly regarding the accuracy, availability, clarity, and security of information were recorded. In terms of data accuracy, a significant portion of respondents expressed dissatisfaction, with 27.19% disagreeing and 29.82% strongly disagreeing (**Appendix 1**). Conversely, a smaller group was satisfied, as 20.18% agreed and 22.81% strongly agreed (**Appendix 1**). Opinions on the system's ability to provide necessary outputs were split, with 29.82% agreeing and 27.19% strongly agreeing. Most respondents (30.70% strongly disagreed, 26.32% disagreed) felt that the system's information was not up-to-date, although 25.44% strongly agreed that it was (**Appendix 1**). The highest satisfaction was observed regarding the clarity and formatting of reports, with 38.60% agreeing and 27.19% strongly agreeing (**Appendix 1**). Regarding data security, opinions were evenly divided. While 25.44% agreed and 25.44% strongly agreed that the system was secure, 22.81% disagreed and 26.32% strongly disagreed (**Appendix 1**). Overall, satisfaction was highest for the clarity and formatting of reports, while data accuracy received the most dissatisfaction.

3.2.1. t-Test Analysis on System Quality on Health Service Delivery

The t-Test compared system quality means between Kenema and Kono hospitals, with both having an identical mean score of 14.25, indicating similar average perceived system quality. Kenema's variance was 16.30, while Kono's was 23.88, showing greater variability in Kono (**Table 2**). The calculated t Stat was 0.00, with a p-value of 1.00, far above the 0.05 significance level, suggesting no significant difference in system quality. The critical t-value for 19 degrees of freedom is 2.09, and since the t Stat is lower, the null hypothesis is not rejected. Therefore, no significant difference in average system quality exists between the two hospitals.

Table 2. t-Test analysis on system quality on health service delivery.

Variable		*Kenema (System Quality)*	*Kono (System Quality)*
Mean		14.25	14.25
Variance		16.30	23.88
Observations		20.00	20.00
Pearson Correlation		−0.08	
Hypothesized Mean Difference		0.00	
Df		19.00	
t Stat		0.00	
P (T ≤ t) one-tail		0.50	
t Critical one-tail		1.73	
P (T ≤ t) two-tail		1.00	
t Critical two-tail		2.09	
Residual	2.00	33.27	16.63
Total	3.00	73.00	

3.2.2. t-Test Analysis on Service Quality on Health Service Delivery

The service quality at Kenema Regional Hospital, Kono Government Hospital, mean scores, identical means, variance, Kenema variance 23.40, Kono variance 40.07, Pearson correlation coefficient 0.30, weak positive relationship, t-statistic 0.00, P-value 1.00, no significant difference, t-critical values, null hypothesis, service quality perceptions, lowest variance, highest variance (Table 3).

Table 3. t-Test analysis on *service quality on health service delivery.*

	Kenema (Service Quality)	*Kono (Service Quality)*
Mean	14.25	14.25
Variance	23.40	40.07
Observations	16.00	16.00
Pearson Correlation	0.30	
Hypothesized Mean Difference	0.00	
Df	15.00	
t Stat	0.00	
P (T ≤ t) one-tail	0.50	

Continued

t Critical one-tail	1.75
P (T ≤ t) two-tail	1.00
t Critical two-tail	2.13

3.2.3. t-Test Analysis on Information Quality on Health Service Delivery

The analysis of Information Quality scores between Kenema and Kono hospitals had an identical mean score of 14.3. Kenema had a higher variance (37.0) compared to Kono (16.3). The Pearson Correlation coefficient was −0.3, indicating a weak negative relationship. The t-statistic was 0.0, with p-values of 0.5 (one-tail) and 1.0 (two-tail) (Table 4). As these p-values exceed 0.05, we fail to reject the null hypothesis, indicating no significant difference between the hospitals' scores. The highest value was the two-tail p-value of 1.0, and the lowest was the t Critical value (2.1) (Table 4).

Table 4. t-Test analysis on *information quality on health service delivery.*

	Kenema (Information Quality)	*Kono (Information Quality)*
Mean	14.3	14.3
Variance	37.0	16.3
Observations	20.0	20.0
Pearson Correlation	-0.3	
Hypothesized Mean Difference	0.0	
Df	19.0	
t Stat	0.0	
P (T ≤ t) one-tail	0.5	
t Critical one-tail	1.7	
P (T ≤ t) two-tail	1.0	
t Critical two-tail	2.1	

3.3. Security Features of Electronic Health Records

Appendix 1 compares the security features of Kenema Regional Hospital and Kono Government Hospital. Key features evaluated include access control, encryption, audit logs, data backups, user training, and security challenges. For access control, 50% of respondents believed it was controlled. Encryption received the highest positive responses, with 64.91% agreeing (Table 4). Audit logs had mixed responses, with 30.70% strongly agreeing, while data backups were viewed less favourably, with 26.32% strongly disagreeing (**Appendix 1**).

User training which focused on the security features of electronic health records had the highest agreement, with 57.89% believing in adequate staff training. Here, training was assessed in the context of security awareness, access control, encryption, and data handling. Security cameras were preferred for protecting features, while workplace violence and natural disasters were the biggest challenges (**Appendix 1**). Encryption was the most positively rated, and data backups the least.

3.4. The Integrity of Data on Electronic Health Record Systems

The findings on the reliability of e-health systems reveal mixed perceptions in Kenema and Kono hospitals. The statement that "e-health systems improve doctor expertise" has the highest support from those who "Strongly agreed" (28.07%) (**Appendix 1**). However, 26.32% "Disagreed", showing scepticism (Table 5). Regarding doctors' lack of computer skills affecting speed, 36.84% "Agreed", and 28.07% "Strongly agreed" (**Appendix 1**). Patient-related delays were supported by 29.82% "Agreed" and 30.70% "Strongly agreed" (**Appendix 1**). For "health information systems and doctor-patient relationships", 26.32% "Strongly disagreed". The highest agreement was for improved doctor expertise, while the lowest concerned computer skills and speed.

The analysis of access to data between Kenema and Kono hospitals reveals differences in perceptions of system effectiveness. Concerning patient information needs, 27.19% of respondents felt the system met these needs satisfactorily, with 18.42% strongly agreeing and 24.56% agreeing. Conversely, 17.54% disagreed and 12.28% strongly disagreed, with Kenema showing slightly higher satisfaction than Kono (**Appendix 1**). For data accuracy and security, 38.60% agreed and 30.70% strongly agreed, with Kono having 24 participants strongly agreeing and Kenema 22. There was an 18.42% disagreement rate, indicating mixed opinions, although nearly 70% agreed or strongly agreed on data storage effectiveness. Regarding information error reduction, 34.21% agreed and 28.07% strongly agreed, with Kono showing more agreement (22 participants) compared to Kenema (17) (**Appendix 1**). Despite 19.30% disagreeing and 18.42% strongly disagreeing, over 60% of respondents viewed the system's error reduction positively.

The responses about e-health systems' effectiveness were gathered from Kenema Regional Hospital and Kono Government Hospital, revealing varied opinions. The highest disagreement was recorded for the statement that e-health systems improve patient information recording and service delivery, with 33.33% disagreeing and 23.68% strongly disagreeing. Conversely, only 21.05% agreed and 21.93% strongly agreed, suggesting scepticisms about the systems' impact on service delivery (**Appendix 1**). Regarding information quality, 36.84% of respondents agreed that e-health systems enhance it, with 21.93% strongly agreeing. Disagreement was lower, with 21.05% disagreeing and 20.18% strongly disagreeing (**Appendix 1**). This indicates a generally positive view on information quality improvement. For daily management processes, 30.70% strongly agreed and 25.44% agreed that e-health systems enhance these processes, while 21.05% disagreed and

22.81% strongly disagreed. This reflects a more positive consensus on daily management improvements compared to service delivery.

The findings reveal differences in patient experiences with the Electronic Health Records (EHR) system at Kenema and Kono hospitals. Only 24.56% of patients noticed improvements in healthcare quality post-EHR implementation, with a higher proportion from Kono reporting no changes (**Appendix 1**). Privacy and security concerns were minimal, affecting just 16.67% of patients. Accessibility issues were evident, as only 12.28% found it easier to access medical records with the EHR system (**Appendix 1**). Kenema had a higher percentage of patients suggesting EHR improvements compared to Kono. Overall, 36.84% of respondents recommended changes to the system, with Kenema showing more advocacy for enhancements and a general dissatisfaction with record accessibility noted across both hospitals.

3.5. Chi-Square Test

The chi-square test results show that in both Kenema and Kono, participants generally responded with similar levels of agreement and disagreement, as indicated by the values of 0.79 and 0.31 (Table 5). The total chi-square value for Kenema is 4.39, with a p-value of 0.22, suggesting that the differences observed in responses between the groups are not statistically significant ($P > 0.05$) (Table 5). The lack of p-value and total for Kono suggests incomplete data or no significant differences detected.

Table 5. Chi-square test.

Variable	*Agreed*	*Strongly Agreed*	*Disagreed*	*Strongly Disagreed*	χ^2	*P-value*
Kenema	0.79	0.31	0.79	0.31	4.39	0.22
Kono	0.79	0.31	0.79	0.31		

3.6. Regression Statistics

The Multiple R value of 0.74 indicates a strong positive correlation between observed and predicted values of the dependent variable, suggesting the model predicts outcomes well based on the independent variables. The R Square value of 0.54 reveals that about 54% of the variance in the dependent variable is explained by the model, indicating moderate explanatory power. The Adjusted R Square value of 0.32, which is lower than R Square, adjusts for the number of predictors and suggests moderate explanatory power after considering sample size and predictors (Table 6). The Standard Error of 4.08 measures the average deviation of observed values from the regression line, with a higher value indicating more variability. The observation count of 4 represents the number of data points used, implying caution in generalizing results due to the small sample size. Hence, this was a major limitation that prevents generalization of the findings.

Table 6. Regression analysis.

Regression Statistics	
Multiple R	0.74
R Square	0.54
Adjusted R Square	0.32
Standard Error	4.08
Observations	4.00

3.7. Analysis of Variances

The ANOVA results show a regression sum of squares (SS) of 39.73 with 1 degree of freedom (df) and a mean square (MS) of 39.73 (Table 7). The F statistic is 2.39 with a significance level (Significance F) of 0.26. The residual sum of squares is 33.27 with 2 degrees of freedom and a mean square of 16.63 (Table 7). The total sum of squares for the model is 73.00 with 3 degrees of freedom. The F-statistic of 2.39 indicates that the variability explained by the model relative to unexplained variability is small. The significance level of 0.26, which is higher than the typical alpha level of 0.05, suggests the model is not statistically significant (Table 7). Thus, there is no strong evidence that the independent variable(s) significantly explain the variability in the dependent variable.

Table 7. Analysis of variances.

Variables	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	39.73	39.73	2.39	0.26
Residual	2.00	33.27	16.63		
Total	3.00	73.00			

3.8. Linear Regression Analysis

The linear regression explored the relationship between the dependent variable and independent variables like System Quality, Security Features, and User Training. The Intercept has a coefficient of 18.27, with a standard error of 1.41, resulting in a t-statistic of 12.93 and a p-value of 0.01, showing it is statistically significant as the baseline level when all other variables are zero (Table 8). Among the independent variables, Security Features has the highest coefficient value of 0.36, with a standard error of 0.05 and a t-statistic of 7.82. Its p-value of 0.02 is below 0.05, indicating a statistically significant positive impact on the dependent variable. This means that improvements in Security Features are associated with a higher likelihood of the desired outcome. In contrast, User Training shows the lowest coefficient of −0.28, with a standard error of 0.23 and a t-statistic of −1.24 (Table 8). The p-value of 0.34 is above the 0.05 threshold, indicating no statistically sig-

nificant effect on the dependent variable. The observation count of 4 represents the number of data points used, implying caution in generalizing results due to the small sample size. Hence, this was a major limitation that prevents generalization of the findings. The negative coefficient suggests that more user training is associated with a slight decrease in the dependent variable, but this is not statistically significant.

Table 8. Linear regression analysis.

Variables	*Coefficients*	*Standard Error*	*t Stat*	*P-value*
Intercept	18.27	1.41	12.93	0.01
System Quality	0.39	0.25	1.55	0.26
Security Features	0.36	0.05	7.82	0.02
User Training	−0.28	0.23	−1.24	0.34

4. Discussion

The results of this study indicate a marked disparity between healthcare workers' and patients' perceptions of health information systems. Healthcare workers had an average score of 19.00, much lower than the patients' average of 57.00. The median scores were 15.00 for healthcare workers and 57.00 for patients, showing a lower central tendency for healthcare workers [20]. Healthcare workers had a standard deviation of 16.64, indicating moderate variation, while patients had a higher standard deviation of 41.01, suggesting greater variability which indicates considerable variability in patient perceptions [21]. The range of scores was 46.00 units for healthcare workers and 58.00 units for patients [22]. However, system stability was criticized, especially in Kono [23]. Service quality evaluations showed 32.46% disagreed that IT training improved system use, with stronger disagreement from Kono. These results underscore the importance of considering both user experience and contextual factors in the implementation of health information systems, suggesting that a one-size-fits-all approach may be insufficient to meet the needs of different user groups. These findings align with other researches that healthcare workers reported low satisfaction with electronic health services compared to patients on system usability, particularly regarding system support for routine tasks and system stability [24]-[27]. Conversely, in Saudi Arabia, healthcare workers demonstrated more acceptable satisfaction levels with electronic medical records, particularly among older, non-Saudi workers and those who received training, with a median satisfaction score of 53 [28].

IT staff competence received mixed evaluations: 35.96% of respondents strongly disagreed with statements about IT staff competence, while 38.60% rated staff knowledge positively. Similarly, studies conducted in the Wellness Center located at Rawdat-Alkhail Health Center in Qatar where the majority of the respondents disagreed with IT staff competencies [29]. Opinions on IT support were

mixed, with 26.32% strongly disagreeing, particularly in Kono [30]. These results suggest that while some users recognize IT staff expertise, others perceive gaps in support provision, highlighting inconsistent service delivery and potential areas for targeted capacity building. Furthermore, this inconsistency may undermine trust in the system and reduce overall adoption rates, demonstrating the need for more structured training programs, supervision, and monitoring of IT support services. Information quality also elicited mixed responses. Approximately 27.19% of participants disagreed and 29.82% strongly disagreed regarding data accuracy, reflecting concerns about the reliability of information within healthcare information technology (HIT) systems. System performance was similarly divided in which information clarity and formatting achieved the highest satisfaction. Security measures were generally viewed positively, with 50% agreeing on the effectiveness of access control and 64.91% supporting encryption. Similarly, a study conducted in three medical hospitals in Iran also reported that information clarity and formatting achieved the highest satisfaction [31]

However, components such as audit logs and data backups received less favorable ratings, with 26.32% strongly disagreeing on their adequacy. User training was among the most positively rated aspects, with 57.89% satisfaction [32], emphasizing the role of education in improving system adoption and effective use. These findings suggest that while technical infrastructure is important, user confidence in data accuracy and system reliability is equally critical for sustained engagement with health information systems. Regarding security infrastructure, respondents preferred security cameras as a protective measure, while workplace violence and natural disasters were identified as major challenges [33]. System reliability received moderate support for improving doctor expertise, with 28.07% strongly agreeing, although 26.32% expressed skepticism. These findings underscore that system reliability is recognized as valuable but remains inconsistently perceived among healthcare professionals. The mixed perception of security and reliability highlights a broader challenge in implementing HIT systems in low-resource settings, where structural and environmental factors can significantly influence user experiences. Similarly researches have reported dissatisfaction with system stability, speed, ease of use, and responsiveness, with physicians particularly critical of IT support for routine tasks [27] [34]. Among healthcare workers, the lowest agreement was observed regarding the influence of computer skills on operational speed, with only 36.84% of respondents affirming this effect [35] [36]. Satisfaction with meeting patient information needs differed between districts, with 27.19% expressing satisfaction in Kenema and Kono [37]. Responses on data accuracy and security were mixed [38], though over 60% viewed EHRs positively in terms of error reduction [39]. Notably, 33.33% of respondents questioned the impact of e-health systems on overall service delivery [40], and only 36.84% agreed that EHRs enhanced information quality [41]. Improvements in daily management were favorably rated, with 30.70% strongly agreeing [42]. These findings highlight that while EHRs offer tangible benefits; their full potential is

limited by gaps in user skills, system usability, and workflow integration.

Patient experiences reflected a lower perceived impact; only 24.56% reported improvements in healthcare quality, while 16.67% expressed concerns about privacy and security [43]. Accessibility challenges were also evident, as merely 12.28% of patients found it easier to access their records [44]. Statistical analysis showed no significant differences in system quality between Kenema and Kono ($p = 1.00$) [45], and the Pearson correlation coefficient of 0.30 indicated a weak positive relationship between system quality and user satisfaction [46]. Chi-square tests similarly demonstrated comparable response patterns across the districts [47]. Although the regression model showed a strong correlation (Multiple $R = 0.74$), it was not statistically significant [48]. This reinforces the notion that while EHR systems have the capacity to improve patient care, the observed effects may be context-dependent and influenced by local infrastructure, user training, and patient engagement strategies. These findings align with broader literature indicating that EHRs can enhance healthcare efficiency, improve care quality through clinical decision support, and facilitate provider collaboration while contributing to patient safety and reducing hospital readmissions [49] [50]. Thus, user interface features such as mandatory fields, templates, and contextual autocomplete are critical for improving data completeness and correctness [50].

5. Conclusion

In conclusion, the implementation of Electronic Health Record (EHR) systems in both districts has shown promising aspects, particularly in data quality, clarity, and security features, which received positive evaluations. Patients reported satisfaction with the system's ability to meet their information needs, and the reliability of data was associated with enhanced clinical expertise. However, several challenges persist, notably in IT service quality, staff competence, system stability, and record-keeping processes. These issues have hindered the full realization of the EHR system's potential to improve service delivery. Hence, while the EHR systems in both districts have made strides in improving data management and patient information accessibility, the ongoing challenges in IT infrastructure, staff training, and system reliability must be addressed to enhance their impact on healthcare service delivery.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Abdulai, A. and Adam, F. (2020) Health Providers' Readiness for Electronic Health Records Adoption: A Cross-Sectional Study of Two Hospitals in Northern Ghana. *PLOS ONE*, **15**, e0231569. https://doi.org/10.1371/journal.pone.0231569

[2] Kamil, H., Rachmah, R., Irvanizam, I. and Wardani, E. (2020) Exploring Health Professionals' Perceptions on Health-ID, an Electronic Integrated Patient Progress Documentation System: A Qualitative Study in Indonesia. *Journal of Multidisciplinary*

Healthcare, **13**, 1649-1656. https://doi.org/10.2147/jmdh.s270740

[3] Cerchione, R., Centobelli, P., Riccio, E., Abbate, S. and Oropallo, E. (2023) Blockchain's Coming to Hospital to Digitalize Healthcare Services: Designing a Distributed Electronic Health Record Ecosystem. *Technovation*, **120**, Article 102480. https://doi.org/10.1016/j.technovation.2022.102480

[4] Mourya, A.K., Shafqat-Ul-Ahsaan, and Idrees, S.M. (2019) Cloud Computing-Based Approach for Accessing Electronic Health Record for Healthcare Sector. In: Chaudhary, A., Choudhary, C., Gupta, M., Lal, C. and Badal, T. Eds., *Microservices in Big Data Analytics*, Springer, 179-188. https://doi.org/10.1007/978-981-15-0128-9_16

[5] Rudin, R.S., Friedberg, M.W., Shekelle, P., Shah, N. and Bates, D.W. (2020) Getting Value from Electronic Health Records: Research Needed to Improve Practice. *Annals of Internal Medicine*, **172**, S130-S136. https://doi.org/10.7326/m19-0878

[6] Sharma, D. and Prabha, C. (2023) Security and Privacy Aspects of Electronic Health Records: A Review. 2023 *International Conference on Advancement in Computation & Computer Technologies* (*InCACCT*), Gharuan, 5-6 May 2023, 815-820. https://doi.org/10.1109/incacct57535.2023.10141814

[7] Kluge, E.H.W. (2020) The Electronic Health Record: Ethical Considerations. Academic Press.

[8] Lewkowicz, D., Wohlbrandt, A. and Boettinger, E. (2020) Economic Impact of Clinical Decision Support Interventions Based on Electronic Health Records. *BMC Health Services Research*, **20**, Article No. 871. https://doi.org/10.1186/s12913-020-05688-3

[9] Syzdykova, A., Malta, A., Zolfo, M., Diro, E. and Oliveira, J.L. (2017) Open-Source Electronic Health Record Systems for Low-Resource Settings: Systematic Review. *JMIR Medical Informatics*, **5**, e44. https://doi.org/10.2196/medinform.8131

[10] Jawhari, B., Keenan, L., Zakus, D., Ludwick, D., Isaac, A., Saleh, A., *et al.* (2016) Barriers and Facilitators to Electronic Medical Record (EMR) Use in an Urban Slum. *International Journal of Medical Informatics*, **94**, 246-254. https://doi.org/10.1016/j.ijmedinf.2016.07.015

[11] Alqahtani, A., Crowder, R. and Wills, G. (2017) Barriers to the Adoption of EHR Systems in the Kingdom of Saudi Arabia: An Exploratory Study Using a Systematic Literature Review. *Journal of Health Informatics in Developing Countries*, **11**.

[12] Qureshi, N., Al-Dossari, D., Al-Zaagi, I., Al-Bedah, A., Abudalli, A. and Koenig, H. (2014) Electronic Health Records, Electronic Prescribing and Medication Errors: A Systematic Review of Literature, 2000-2014. *British Journal of Medicine and Medical Research*, **5**, 672-704. https://doi.org/10.9734/bjmmr/2015/13490

[13] Li, E., Clarke, J., Ashrafian, H., Darzi, A. and Neves, A.L. (2022) The Impact of Electronic Health Record Interoperability on Safety and Quality of Care in High-Income Countries: Systematic Review. *Journal of Medical Internet Research*, **24**, e38144. https://doi.org/10.2196/38144

[14] Lindén-Lahti, C., Kivivuori, S., Lehtonen, L. and Schepel, L. (2022) Implementing a New Electronic Health Record System in a University Hospital: The Effect on Reported Medication Errors. *Healthcare*, **10**, Article 1020. https://doi.org/10.3390/healthcare10061020

[15] Adeyemi, C., Adegoke, B.O. and Odugbose, T. (2024) The Impact of Healthcare Information Technology on Reducing Medication Errors: A Review of Recent Advances. *International Journal of Frontiers in Medicine and Surgery Research*, **5**, 20-29. https://doi.org/10.53294/ijfmsr.2024.5.2.0034

[16] Barrett, A.K. (2018) Technological Appropriations as Workarounds: Integrating Electronic Health Records and Adaptive Structuration Theory Research. *Information Technology & People*, **31**, 368-387. https://doi.org/10.1108/itp-01-2016-0023

[17] Alzahrani, S., Daim, T. and Choo, K.R. (2022) Assessment of the Blockchain Technology Adoption for the Management of the Electronic Health Record Systems. *IEEE Transactions on Engineering Management*, **70**, 2846-2863. https://doi.org/10.1109/tem.2022.3158185

[18] Ministry of Health and Sanitation (2020) National Health Sector Strategic Plan, 2021-2025.

[19] Statistics Sierra Leone (2023) Population and Housing Census, Summary of Final Results: Planning a Better Future. Statistics Sierra Leone.

[20] Cruz, T.M. and Smith, S.A. (2021) Health Equity Beyond Data. *Medical Care*, **59**, 379-385. https://doi.org/10.1097/mlr.0000000000001507

[21] Overhage, J.M. and Johnson, K.B. (2020) Pediatrician Electronic Health Record Time Use for Outpatient Encounters. *Pediatrics*, **146**, e20194017. https://doi.org/10.1542/peds.2019-4017

[22] Lee, K., Seo, L., Yoon, D., Yang, K., Yi, J., Kim, Y., *et al.* (2022) Digital Health Profile of South Korea: A Cross Sectional Study. *International Journal of Environmental Research and Public Health*, **19**, Article 6329. https://doi.org/10.3390/ijerph19106329

[23] Anderson, R. (2022) Effects of an Electronic Health Record Tool on Team Communication and Patient Mobility: A 2-Year Follow-Up Study. *Critical Care Nurse*, **42**, 23-31. https://doi.org/10.4037/ccn2022385

[24] Bruni, T., LaLonde, L., Maragakis, A., Lee, J., Caserta, A., Kilbourne, A.M., *et al.* (2021) The Use of Electronic Health Record Tools to Improve Evidence-Based Treatment of Adolescent Depression in Primary Care. *Academic Pediatrics*, **21**, 1195-1202. https://doi.org/10.1016/j.acap.2021.05.022

[25] Abu Raddaha, A.H., Obeidat, A., Al Awaisi, H. and Hayudini, J. (2017) Opinions, Perceptions and Attitudes toward an Electronic Health Record System among Practicing Nurses. *Journal of Nursing Education and Practice*, **8**, Article 12. https://doi.org/10.5430/jnep.v8n3p12

[26] Barriga-Chambi, F., Ccami-Bernal, F., Alarcón-Casazuela, A.L., Copa-Uscamayta, J., Yauri-Mamani, J., Oporto-Arenas, B., *et al.* (2023) Satisfacción del personal de salud y pacientes sobre un servicio de telesalud de un hospital de Perú. *Revista Peruana de Medicina Experimental y Salud Pública*, **39**, 415-424. https://doi.org/10.17843/rpmesp.2022.394.11287

[27] Viitanen, J., Valkonen, P., Savolainen, K., Karisalmi, N., Hölsä, S. and Kujala, S. (2022) Patient Experience from an Ehealth Perspective: A Scoping Review of Approaches and Recent Trends. *Yearbook of Medical Informatics*, **31**, 136-145. https://doi.org/10.1055/s-0042-1742515

[28] Al-Otaibi, J., Tolma, E., Alali, W., Alhuwail, D. and Aljunid, S.M. (2022) The Factors Contributing to Physicians' Current Use of and Satisfaction with Electronic Health Records in Kuwait's Public Health Care: Cross-Sectional Questionnaire Study. *JMIR Medical Informatics*, **10**, e36313. https://doi.org/10.2196/36313

[29] Musa, S., Dergaa, I., Al Shekh Yasin, R. and Singh, R. (2023) The Impact of Training on Electronic Health Records Related Knowledge, Practical Competencies, and Staff Satisfaction: A Pre-Post Intervention Study among Wellness Center Providers in a Primary Health-Care Facility. *Journal of Multidisciplinary Healthcare*, **16**, 1551-1563. https://doi.org/10.2147/jmdh.s414200

[30] Wilson, S.T., Peters, L., Koenig, L.R., Bell, S.O. and Upadhyay, U.D. (2025) Use of Preabortion Ultrasonography among Telehealth Medication Abortion Patients. *Women's Health Issues*, **35**, 376-382. https://doi.org/10.1016/j.whi.2025.06.002

[31] Abbasi, R., Sadeqi Jabali, M., Khajouei, R. and Tadayon, H. (2020) Investigating the Satisfaction Level of Physicians in Regards to Implementing Medical Picture Archiving and Communication System (PACS). *BMC Medical Informatics and Decision Making*, **20**, Article No. 180. https://doi.org/10.1186/s12911-020-01203-0

[32] Msami, K., Okoroafor, U., Mbwana, M., Ngowi, J., Lwanga, C. and Luziga, H. (2023) Knowledge, Attitudes and Usage of Electronic Medical Records System at Ocean Road Cancer Institute in Tanzania; An Example of EMR User Satisfaction in Sub-Saharan Africa. medRxiv.

[33] Wang, W., Li, M., Loban, K., Zhang, J., Wei, X. and Mitchel, R. (2024) Electronic Health Record and Primary Care Physician Self-Reported Quality of Care: A Multilevel Study in China. *Global Health Action*, **17**, Article 2301195. https://doi.org/10.1080/16549716.2023.2301195

[34] Deo, S., Barnes, E. and Arnold-Smith, P. (2024) Qualitative Analysis of Healthcare Information Technology Using a Novel Short-Form Questionnaire in a UK District Hospital. *British Journal of Healthcare Management*, **30**, 1-10. https://doi.org/10.12968/bjhc.2023.0087

[35] Mbah, H.O. (2024) Factors Impacting the Low Adoption Rates and Implementation of Electronic Health Record System in Nigeria. Doctoral Dissertation, National University.

[36] Kuek, A. and Hakkennes, S. (2020) Healthcare Staff Digital Literacy Levels and Their Attitudes Towards Information Systems. *Health Informatics Journal*, **26**, 592-612. https://doi.org/10.1177/1460458219839613

[37] Reegu, F.A., Abas, H., Gulzar, Y., Xin, Q., Alwan, A.A., Jabbari, A., *et al.* (2023) Blockchain-Based Framework for Interoperable Electronic Health Records for an Improved Healthcare System. *Sustainability*, **15**, Article 6337. https://doi.org/10.3390/su15086337

[38] Lopez, K., Li, H., Paek, H., Williams, B., Nath, B., Melnick, E.R., *et al.* (2023) Predicting Physician Departure with Machine Learning on EHR Use Patterns: A Longitudinal Cohort from a Large Multi-Specialty Ambulatory Practice. *PLOS ONE*, **18**, e0280251. https://doi.org/10.1371/journal.pone.0280251

[39] Lovemore, M. (2024) Electronic Health Records Model to Improve the Quality of Patients' Healthcare. *Health SA Gesondheid*, **29**, 1-8. https://doi.org/10.4102/hsag.v29i0.2414

[40] Harris, J.E. (2023) An AI-Enhanced Electronic Health Record Could Boost Primary Care Productivity. *JAMA*, **330**, 801-802. https://doi.org/10.1001/jama.2023.14525

[41] Mwogosi, A. and Kibusi, S. (2025) Effectiveness of EHR Systems on Decision Support in Primary Healthcare: A Technology Acceptance Model 3 Perspective. *Journal of Health Organization and Management*, **39**, 310-333. https://doi.org/10.1108/jhom-07-2024-0296

[42] Morris-Murray, M. and Frazzitta, M. (2024) Using Continuous Glucose Monitoring to Measure and Improve Quality Metrics: Updates on the Healthcare Effectiveness Data and Information Set 2024 Glucose Management Indicator Measure. *Journal of Managed Care & Specialty Pharmacy*, **30**, S30-S39. https://doi.org/10.18553/jmcp.2024.30.10-b.s30

[43] Nguyen, O.T., Turner, K., Apathy, N.C., Magoc, T., Hanna, K., Merlo, L.J., *et al.*

(2022) Primary Care Physicians' Electronic Health Record Proficiency and Efficiency Behaviors and Time Interacting with Electronic Health Records: A Quantile Regression Analysis. *Journal of the American Medical Informatics Association*, **29**, 461-471. https://doi.org/10.1093/jamia/ocab272

[44] Griffin, J.M., Kroner, B.L., Wong, S.L., Preiss, L., Wilder Smith, A., Cheville, A.L., *et al.* (2024) Disparities in Electronic Health Record Portal Access and Use among Patients with Cancer. *JNCI: Journal of the National Cancer Institute*, **116**, 476-484. https://doi.org/10.1093/jnci/djad225

[45] Kim, K., Oh, S.W., Ko, S.J., Lee, K.H., Choi, W. and Choi, I.Y. (2023) Healthcare Data Quality Assessment for Improving the Quality of the Korea Biobank Network. *PLOS ONE*, **18**, e0294554. https://doi.org/10.1371/journal.pone.0294554

[46] Zhou, J., Hao, J., Tang, M., Sun, H., Wang, J., Li, J., *et al.* (2024) Development of a Quantitative Index System for Evaluating the Quality of Electronic Medical Records in Disease Risk Intelligent Prediction. *BMC Medical Informatics and Decision Making*, **24**, Article No. 178. https://doi.org/10.1186/s12911-024-02533-z

[47] Moll, J., Rexhepi, H., Cajander, Å., Grünloh, C., Huvila, I., Hägglund, M., *et al.* (2018) Patients' Experiences of Accessing Their Electronic Health Records: National Patient Survey in Sweden. *Journal of Medical Internet Research*, **20**, e278. https://doi.org/10.2196/jmir.9492

[48] Yang, Z., Mitra, A., Liu, W., Berlowitz, D. and Yu, H. (2023) Transformehr: Transformer-Based Encoder-Decoder Generative Model to Enhance Prediction of Disease Outcomes Using Electronic Health Records. *Nature Communications*, **14**, Article No. 7857. https://doi.org/10.1038/s41467-023-43715-z

[49] Pattar, B.S.B., Ackroyd, A., Sevinc, E., Hecker, T., Turino Miranda, K., McClurg, C., *et al.* (2025) Electronic Health Record Interventions to Reduce Risk of Hospital Readmissions. *JAMA Network Open*, **8**, e2521785. https://doi.org/10.1001/jamanetworkopen.2025.21785

[50] Madandola, O.O., Bjarnadottir, R.I., Yao, Y., Ansell, M., Dos Santos, F., Cho, H., *et al.* (2023) The Relationship between Electronic Health Records User Interface Features and Data Quality of Patient Clinical Information: An Integrative Review. *Journal of the American Medical Informatics Association*, **31**, 240-255. https://doi.org/10.1093/jamia/ocad188

Appendix 1

Quality Effect of HER on Healthcare Service Delivery

System Quality

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
The record-keeping systems are simple to understand.				
Agreed	12	10	22	19.30
Strongly agreed	15	18	33	28.95
Disagreed	19	21	40	35.09
Strongly disagreed	11	8	19	16.67
The record-keeping system tools are user-friendly.				
Agreed	20	9	29	25.44
Strongly agreed	18	11	29	25.44
Disagreed	8	19	27	23.68
Strongly disagreed	11	18	29	25.44
The system includes the necessary features for performing daily activities.				
Agreed	17	22	39	34.21
Strongly agreed	17	9	26	22.81
Disagreed	11	10	21	18.42
Strongly disagreed	12	16	28	24.56
The system is occasionally audited.				
Agreed	22	17	39	34.21
Strongly agreed	14	18	32	28.07
Disagreed	9	13	22	19.30
Strongly disagreed	12	9	21	18.42
The system is consistent, steady, and free from faults such as crashes.				
Agreed	17	11	28	24.56
Strongly agreed	18	11	29	25.44
Disagreed	13	12	25	21.93
Strongly disagreed	9	23	32	28.07

Service Quality

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
The training provided by IT staff has enhanced my ability to use the system.				
Agreed	10	5	15	13.16
Strongly agreed	18	13	31	27.19
Disagreed	21	16	37	32.46
Strongly disagreed	8	23	31	27.19
IT staff are competent in using the system.				
Agreed	9	3	12	10.53
Strongly agreed	11	12	23	20.18
Disagreed	19	19	38	33.33
Strongly disagreed	18	23	41	35.96
IT staff have adequate knowledge to assist with system issues.				
Agreed	22	22	44	38.60
Strongly agreed	9	17	26	22.81
Disagreed	10	6	16	14.04
Strongly disagreed	16	12	28	24.56
IT staff provide prompt support via email, telephone, and chat.				
Agreed	17	12	29	25.44
Strongly agreed	18	11	29	25.44
Disagreed	13	13	26	22.81
Strongly disagreed	9	21	30	26.32

Information Quality

	Kenema	*Kono*	*Total*	*Percentage*
The data, information, and reports from the system are accurate.				
Agreed	11	12	23	20.18
Strongly agreed	11	15	26	22.81
Disagreed	12	19	31	27.19
Strongly disagreed	23	11	34	29.82

Continued

The system provides the necessary outputs.				
Agreed	5	20	25	21.93
Strongly agreed	13	18	31	27.19
Disagreed	16	8	24	21.05
Strongly disagreed	23	11	34	29.82
Information from the system is always available and up to date.				
Agreed	3	17	20	17.54
Strongly agreed	12	17	29	25.44
Disagreed	19	11	30	26.32
Strongly disagreed	23	12	35	30.70
The system generates clear and well-formatted information and reports.				
Agreed	22	22	44	38.60
Strongly agreed	17	14	31	27.19
Disagreed	6	9	15	13.16
Strongly disagreed	12	12	24	21.05
Client data remains fluid and secure even after being handled by multiple employees (doctors, nurses, lab technicians).				
Agreed	12	17	29	25.44
Strongly agreed	11	18	29	25.44
Disagreed	13	13	26	22.81
Strongly disagreed	21	9	30	26.32

Security Features of Electronic Health Records

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
1) Access Control: Does your system enforce access controls to ensure only authorized personnel can view or modify patient records?				
Agreed	12	19	31	27.19
Strongly agreed	15	11	26	22.81
Disagreed	19	12	31	27.19
Strongly disagreed	11	15	26	22.81

Continued

2) Encryption: Is patient data encrypted both at rest and in transit?				
Agreed	20	23	43	37.72
Strongly agreed	18	13	31	27.19
Disagreed	8	16	24	21.05
Strongly disagreed	11	5	16	14.04
3) Audit Logs: Does your system maintain detailed audit trails for all access and modifications to patient records?				
Agreed	17	10	27	23.68
Strongly agreed	17	18	35	30.70
Disagreed	11	21	32	28.07
Strongly disagreed	12	8	20	17.54
4) Data Backups: Does your system have effective backup strategies for maintaining data continuity?				
Agreed	22	9	31	27.19
Strongly agreed	14	11	25	21.93
Disagreed	9	19	28	24.56
Strongly disagreed	12	18	30	26.32
5) User Training and Awareness: Are staff trained on security protocols and best practices?				
Agreed	17	22	39	34.21
Strongly agreed	18	9	27	23.68
Disagreed	13	10	23	20.18
Strongly disagreed	9	16	25	21.93
6) Best methods for protecting security features in the hospital:				
Security cameras	12	17	29	25.44
Security personnel	15	8	23	20.18
Workplace security policy	12	13	25	21.93
Lockdown protocols	11	9	20	17.54
All of the above	7	10	17	14.91

Continued

7) Challenges in protecting security features:				
Natural disasters	14	18	32	28.07
Workplace violence	18	16	34	29.82
Equipment theft	8	11	19	16.67
Compliance and regulations	11	1	12	10.53
All of the above	6	11	17	14.91

The Integrity of Data on HER Systems

Reliability of Data

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
E-health systems have improved the quality, standards, and expertise of most medical doctors.				
Agreed	12	17	29	25.44
Strongly agreed	15	17	32	28.07
Disagreed	19	11	30	26.32
Strongly disagreed	11	12	23	20.18
Speed is affected by doctors' lack of computer skills.				
Agreed	20	22	42	36.84
Strongly agreed	18	14	32	28.07
Disagreed	8	9	17	14.91
Strongly disagreed	11	12	23	20.18
Delays in the system are caused by patients.				
Agreed	17	17	34	29.82
Strongly agreed	17	18	35	30.70
Disagreed	11	13	24	21.05
Strongly disagreed	12	9	21	18.42
Health information systems maintain strong doctor-patient relationships.				
Agreed	22	12	34	29.82
Strongly agreed	14	15	29	25.44
Disagreed	9	12	21	18.42
Strongly disagreed	12	18	30	26.32

Access to Data

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
The system satisfactorily addresses patient information needs.	17	14	31	27.19
Agreed	10	18	28	24.56
Strongly agreed	13	8	21	18.42
Disagreed	9	11	20	17.54
Strongly disagreed	8	6	14	12.28
The system ensures accurate and secure data storage.				
Agreed	22	22	44	38.60
Strongly agreed	11	24	35	30.70
Disagreed	12	2	14	12.28
Strongly disagreed	12	9	21	18.42
The e-health system has reduced information errors.				
Agreed	17	22	39	34.21
Strongly agreed	18	14	32	28.07
Disagreed	13	9	22	19.30
Strongly disagreed	9	12	21	18.42

Validity of Data

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
E-health systems improve the recording and collection of patient information, enhancing service delivery.				
Agreed	12	12	24	21.05
Strongly agreed	10	15	25	21.93
Disagreed	19	19	38	33.33
Strongly disagreed	16	11	27	23.68
The system improves information quality.				
Agreed	22	20	42	36.84
Strongly agreed	7	18	25	21.93
Disagreed	16	8	24	21.05
Strongly disagreed	12	11	23	20.18

Continued

The system enhances daily information management processes.				
Agreed	12	17	29	25.44
Strongly agreed	18	17	35	30.70
Disagreed	13	11	24	21.05
Strongly disagreed	14	12	26	22.81

Patients' Experience with Electronic Health Records

Variables	*Kenema*	*Kono*	*Total*	*Percentage*
1) Have you noticed changes in the quality of healthcare services since the implementation of Electronic Health Records (EHR) at Eastern Regional Hospital?				
Yes	23	5	28	24.56
No	34	52	86	75.44
2) Have you encountered concerns regarding the privacy and security of your health information stored in the EHR system?				
Yes	12	7	19	16.67
No	45	59	104	91.23
3) Is it easier for you to access your medical records and track your healthcare history with the EHR system?				
Yes	10	4	14	12.28
No	47	53	100	87.72
4) Would you recommend changes or enhancements to the EHR system based on your experience?				
Yes	39	3	42	36.84
No	18	54	72	63.16