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Research

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Barriers to healthcare workers´ utilization of scan form technology in Homa Bay County, Kenya: a quantitative study on multiple hospitals

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Abstract

Introduction: Scan Form Technology (SFT) has been adopted in healthcare systems to eliminate manual data entry, improve efficiency, reduce errors, and enhance patient care. However, the extent of SFT utilization plays a critical role in realizing these benefits. The quality of health information systems indirectly affects patient safety, as errors in the system can lead to incorrect treatments. Despite the recent adoption of SFT in Homabay County, Kenya, the uptake has been slow. This study aimed to identify the barriers to SFT utilization among healthcare workers in Homabay County. Methods: this cross-sectional study investigated barriers to utilization of SFT in 54 healthcare facilities in Rachuonyo North and Homa Bay Township Sub-Counties of Homa Bay County, Kenya. Data was collected among healthcare workers using structured questionnaires. A logit regression model was employed to investigate the barriers for utilization of SFT. Results: the majority (84.2%, 107/127) of the respondents had ever used SFT. While barriers to utilization of SFT included incompatibility between SFT and health care workers´ tasks (Coeff=0.89, CI: [0.06, 1.71], p-value=0.035), and inadequate information and communication technology support for information exchange, communication, and collaboration in the health facility (Coeff=0.86, CI: [0.13,1.60], p-value=0.021). Conclusion: the study identified incompatibility between SFT and health care workers´ tasks, and insufficient information and communication technology support for information exchange, communication, and collaboration in the health facility as barriers to utilization of SFT. The study recommended that health facilities should have trained personnel on standby to offer support in case of challenges with SFT application.

Introduction

The Kenya Health Act, of 217 stresses the need for standardization of health information exchange through an interoperability framework and the establishment and maintenance of a comprehensive integrated health information system [1]. This it does, while considering electronic health (eHealth) as a model of health services. eHealth is an emerging field in the intersection of medical informatics, public health, and business. It refers to the delivery or enhancement of health services and information via the Internet and similar technologies [2]. The role of the Ministry of Health (MoH) health information system (HIS) is to capture health information data; process data; and use the processed data to generate health reports. Health Information technology, is argued to improve patient care [3]. Accurate, readily available, timely, and complete data for health planning, workforce management, policy development, monitoring, and evaluation are critical for optimal health system functioning and can only be achieved from well-matured and integrated HIS. The current MoH HIS for data processing and generation of health reports has a series of gaps that make it inaccurate in the generation of health reports [4]. It is against this backdrop, that there is a need for a more advanced HIS technology to provide a solution [5].

Scan Form Technology (SFT) is a new technology that aims to address the weaknesses of the current MoH HIS technology. Health information system technology has been a major innovation in managing health information. As important as this development in information and communication technology (ICT), these tools enabled a significant development in information processing methodology, which made up the other part of these amazing developments. Haux (2006) further notices that within the past decades, societies in general, medicine and health care in particular, have tremendously changed, also by the developments mentioned before. Through this change, health care has been significantly impacted and improved. Medical informatics have changed today, and Low- and Middle-Income countries have adopted digital health systems to improve hospital administration and patient care. Many informaticians are working in the practice of

health care, for example, in health care institutions, and in health care ICT industries [6]. Informatics methodology and ICT not only have become a major factor in the quality and efficiency of health care worldwide, but it has also emerged as a major contributor to the worldwide ICT market [7]. Scan Form Technology (SFT) is a relatively new technology that has been piloted in Kenya [8]. The piloting of this technology has been done by Kenya Medical Research Institute (KEMRI)/Centre for Disease Control (CDC) in collaboration with Palladium Group [9]. The piloting of this HIS technology has been conducted in Siaya, Migori, and Homabay counties in western Kenya [10]. Scan Form Technology (SFT) uses scan form health registers which have been manually filled by health care workers. The pictures of the filled registers are taken using a mobile phone and then uploaded on a scan form server. The processed digital data is then verified and thereafter refined to generate summaries and reports for review by Sub County Health Records and Information Officer (HRIO). The final data is then entered into the Kenya Health Information System (KHIS) [8].

New technological interventions in HIS a of great importance to health care [11]. Some of the major benefits include the availability of enough information on patients, integrated medical records and that use of technology helps in boosting life expectancy [12]. According to the ministry of Health, in Kenya, all the levels of the health care system are required to report on a weekly and monthly basis [13]. Hundreds of reports are then generated both for the county and national government, including the various health development partners. These reports are relied upon in public health for intervention through data-driven decision-making, development of policies, budget allocation and advocacy in health [14]. According to the Palladium Group/Tupime Kaunti project, Homa Bay Township and Rachuonyo North Sub-Counties are the two main sub-counties in Homa Bay County that are currently implementing the SFT.

Homa Bay County has 260 health facilities including nine tiers, three hospitals, and four mission hospitals [15]. The rest are health centres and dispensaries, most of which are connected to community health units. These facilities are manned by 941 personnel, mostly nurses. The doctor-to-population ratio is at 1: 40,000 while the nurse-to-population ratio is at 1: 1,500 [15]. This is far below the national average, 14: 100,000 for doctors-population and 42: 100,000 for nurses-population, hence the need for more measures to better health care service delivery by adopting an efficient HIS technology [16]. Homa Bay Township sub-county and Rachuonyo North sub-county have a total of fifty-four (54) public health facilities. All fifty-four (54) public health facilities were required by Palladium Group/Tupime Kaunti project to stop using the existing MOH health information system and adopt the use of the SFT in August 2020 with health care workers in the health facilities having undergone all the required training.

However, weekly/monthly support supervision and data quality assessments by Health Informatics Governance and Data Analytics (HIGDA) showed that not all 54 health facilities in Homa bay County have fully embraced the use of the SFT. The Health Informatics Governance and Data Analytics Project (HIGDA) is a five-year project tasked with assisting the Kenyan government's health sector in strengthening organizational and management capacity in governance, health informatics, data analytics, monitoring, evaluation, learning, and accountability at the national and county levels. According to HIGDA, between 20-25 health facilities do not upload the recommended weekly images on time, 10-15 health facilities resort to manual count at the end of the month to generate reports and about 10 health facilities do not follow the set procedures on how to document on the forms [17]. This study therefore sought to investigate barriers to the utilization of SFT among health care workers in Homabay County. Since MOH, Kenya, intends to scale up the use of the SFT to more sub-counties and more health facilities.

Methods

Research design: the study adopted a cross-sectional quantitative study design to investigate barriers to the utilization of SFT among healthcare workers in Homabay County, Kenya.

Study setting: the study was conducted in all public hospitals within Rachuonyo North and Homa Bay Township sub-counties of Homa Bay County in western Kenya. They were selected as these are the sub-counties currently implementing scan form technology in Homa Bay County. Primary data was collected among healthcare workers in all the hospitals from April to May 2022.

Participants: all healthcare workers who were actively working at the selected public hospitals had a chance of being included in the study. Healthcare workers who were not available or unwilling to take part in the study during the designated data collection period were excluded from the study.

Variables: the study included quantitative and qualitative variables. The quantitative variables consisted of age, which was collected as a continuous variable, and the independent variables rated on a Likert scale. The independent variables included the effectiveness and reliability of SFT, the compatibility of SFT with healthcare workers' tasks, and the ICT support in information exchange, communication, and collaboration. The qualitative variables included socio-demographic characteristics of the participants including gender, which had two categories (male and female), educational level with categories such as diploma level, bachelor's level, and post-graduate level, and professional cadre with categories like general doctors, nurses, pharmacist/pharmaceutical technologists, laboratory technicians, clinical officers, and health records officers. Additionally, the dependent variable, the utilization of SFT, was qualitative and categorized as "yes" and "no". To facilitate analysis and interpretation of the results, all categories within each variable were assigned numerical values.

Data source: data for all the variables in the study were obtained through self-reporting during the data collection process. The study participants provided the primary data by responding to questions asked from a structured questionnaire administered by a team of 12 trained and qualified research assistants. The questionnaire included different sections, such as the socio-demographic characteristics of the participants, effectiveness, and reliability of SFT, compatibility between scan form technology and healthcare workers' tasks, ICT support for information exchange, communication, and collaboration, and a specific question on the utilization of SFT.

Bias: to minimize potential selection bias, a systematic approach was implemented to select participants from the target population. Clear inclusion criteria were established, and efforts were made to ensure a diverse range of participants, increasing the generalizability of the study findings. To mitigate information bias, a structured questionnaire was developed and employed for data collection. The study questionnaire was carefully designed based on the study objectives and relevant literature, ensuring comprehensive coverage of all relevant variables. Detailed instructions were provided to research assistants to maintain consistency and minimize potential biases during data collection. Additionally, to minimize recall bias, participants were asked to provide information based on recent experiences and their best knowledge. Research assistants were trained to ask specific and relevant questions, enhancing the accuracy of participant responses. Lastly, social desirability bias was addressed by assuring participants of the confidentiality and anonymity of their responses. The respondents were encouraged to provide honest and unbiased information, emphasizing that there were no right or wrong answers.

Study size: the sample size for the study was determined using Slovin's formula [18], which is:

$$n = \frac{N}{(1 + Ne^2)}$$

Where n represents the desired sample size, N is the known population size of healthcare workers, and e is the desired level of precision. The study population consisted of 322 healthcare workers from the 54 Ministry of Health (MoH) facilities in Rachuonyo North sub-county and Homa Bay Township sub-county in Homa Bay County. Based on the calculation, the sample size determined for the study was 127 healthcare workers. The sample size for each health facility was determined using the following EXCEL formula.

$$n = \frac{127 \times N}{322}$$

In this formula, 'N' represents the population of healthcare providers in each respective facility. The study conveniently selected health care workers, considering different cadres, from each health facility for interviews until the number needed was obtained.

Quantitative variables: the quantitative variables included in the study were age and items rated on a Likert scale. The study categorized age into different groups, such as 21-30 years, 31-40 years, 41-50 years, and above 50 years. The Likert scale was used to assess participants' perceptions towards scan form technology (SFT). The respondents were asked to rate their agreement or disagreement with statements related to the effectiveness and reliability of SFT, the compatibility of SFT with healthcare workers' tasks, and the ICT support in information exchange, communication, and collaboration. The Likert scale items provided quantitative data, as the responses were assigned numerical values on a scale ranging from 1 to 5 (1-strongly agree, 2-disagree, 3-neutral, 4-disagree, and 5-strongly disagree). The items were then grouped together to create latent variables representing the effectiveness and reliability of SFT, the compatibility of SFT with healthcare workers' tasks, and the ICT support in information exchange, communication, and collaboration.

Statistical methods: the analysis began with the computation of the dependent variable (utilization of SFT) among the 127 health care workers interviewed. A pie chart was used to show the proportion of healthcare workers (HCWs) using SFT. Secondly, the study calculated the proportion of healthcare workers utilizing SFT across respondents´ socio-demographic characteristics with Pearson´s Chi-square test and Fisher´s exact test showing independence at 0.05 level of significance. To investigate barriers to utilization of SFT among HCWs in Homabay County, the study used an adjusted Logit regression model to examine the relationship between explanatory variables (Effectiveness and reliability of SFT, compatibility of the SFT and health care workers´ tasks, ICT support in information exchange, communication, and collaboration) and the dependent variables (utilization of SFT among health care workers). The study carried out Logit regression analysis in a hierarchical odder where the first model was a bivariable analysis of each of the statements under each independent variable on the dependent variable. In the second model, the study adjusted for the effect of other independent variables, not as statements but now as latent variables, using a multivariable analysis. The dependent variable of this study (utilization of SFT) was measured as a binary factor coded as 1-´Yes´ and 0- ´No´. The result for the regression analysis is presented as coefficients (Coeff), with their corresponding confidence intervals (CI) showing the range at which the population parameters are expected to lie with a 95% degree of confidence. A positive confidence interval shows a positive association, while a negative confidence interval shows a negative association. Probability values less than 0.05 showed a significant relationship. SPSS software (IBM Corp. Released 2011. IBM SPSS Statistics for Windows,

Version 20.0. Armonk, NY: IBM Corp.) was used to conduct the analysis.

Ethical considerations: this research was cleared, and ethics approved by Jaramogi Oginga Odinga University of Science and Technology (JOOUST) Ethical Review Committee, H153/4169/2019. Permission was granted from the Homabay county, department of health on data collection among the 54 health facilities in Homa Bay Township Sub County and Rachuonyo Sub County before the commencement of the study. Informed consent was sought from each of the participants with a surety that their participation was voluntary and that they were at liberty to withdraw from participation at any time.

Results

Participants: out of the 127 questionnaires administered to health care workers, 127 were registered for data analysis, which translates to 100% response rate.

Descriptive data: the majority of participants were nurses, comprising 50.39% of the total. Following nurses, health records personnel constituted the next largest group at 26.77%. In terms of education level, the majority of participants (85.83%) had a diploma, while 11.81% held a bachelor's degree, and a smaller percentage (2.36%) had a post-graduate qualification. The age distribution showed that the highest number of participants fell within the 31-40 years range (42.52%), closely followed by the 21-30 years group (40.16%). There were also participants in the 41-50 years range (11.81%) and those above 50 years (5.51%). Gender distribution was relatively equal, with 46.46% male participants and 53.54% female participants. Regarding the use of scan form technology, most participants reported using it in various categories, including nurses (84.37%), health records personnel (88.24%), and individuals with a diploma level education (83.49%).

Outcome data

Utilization of the SFT by health care workers in Homa Bay County: the study investigated uptake of SFT among health care workers in Homabay County. The result shows that majority (84.25%, n=107, CI: 76.73,89.67) of health care workers in Homa Bay County have used SFT to capture information in a health care system.

Main result

Barriers to the utilization of the SFT in Homa Bay County

Effectiveness and reliability of SFT: a bivariable logit regression model was used to assess the association between each of the statements (variables) assessing the effectiveness and reliability of SFT and utilization of SFT. Table 1 shows the result from the bivariable logit regression analysis. Healthcare workers who agreed that SFT improved health outcome were more likely (Coeff=0.43, CI: [0.04, 0.83], P-value=0.033) to use SFT compared to those who disagreed. Health workers who reported an episode where SFT has or nearly caused medication errors were less likely (Coeff=-0.51, CI: [-0.88, -0.14], p-value=0.007) to use SFT compared to healthcare workers who did not report any case where incorrect functionality of SFT had or nearly caused medication errors.

Compatibility between SFT and health care workers´ tasks: the result from bivariable logit regression model in Table 2 shows that healthcare workers who agreed that SFT performs tasks in a straightforward manner (Coeff=0.7, CI: [0.25,1.15], p-value=0.002) were more likely to use SFT compared to those who disagreed. The respondents who agreed that SFT makes it easy to manage patients´ information (Coeff=0.64, CI: [0.16,1.12], p-value=0.009) were more likely to use SFT compared to those who disagreed. High likelihood of SFT usage was also observed among those who agreed that SFT provides appropriate feedback (Coeff=0.96, CI: [0.4,1.53>], p-

value=0.001), has a clear concept (Coeff=0.46, CI: [0.03,0.89], p-value=0.037), and is easy to learn and use (Coeff=0.5, CI: [0.05,0.95], p-value=0.031).

ICT support for information exchange, communication, and collaboration in the health facility: Table 3 shows the result from a bivariable logit regression analysis assessing the association between statements(variables) assessing effectiveness of ICT support for information exchange, communication, and collaboration in the health facility and use of SFT. According to the result, health care workers who agreed that Information about laboratory results is presented in a logical format (Coeff=0.6, CI: [0.08,1.12], p-value=0.024) and nursing information is accessible and readable (Coeff=0.55, CI: [0.09,1.02], p-value=0.020) were more likely to report that they had used SFT compared to those who disagreed. High likelihood of SFT usage was also observed among participants who agreed that patients´ medication list is clearly presented (Coeff=0.71, CI: [0.21.22], p-value=0.006) compared to those who disagreed. Respondents who agreed that ICT support collaborative collaboration between health care workers in their health facility (Coeff=0.5, CI: [0.05, 0.96], p-value=0.03) were more likely to report that they ever used SFT compared to health care workers who disagreed.

Factors influencing utilization of the SFT among health care workers in Homa Bay County: a bivariable logit regression analysis was conducted to assess the association between each of the independent variables and utilization of SFT. Only the independent variables that had significant association with utilization of SFT at 0.05 significance level were included in the multivariable logit regression model (Table 4). Then result from bivariable logit regression analysis shows that compatibility between SFT and health care workers´ tasks (Coeff=1.00, CI: [0.35, 1.66],0.002), and ICT support for information exchange, communication, and collaboration in the health facility (Coeff=0.86, CI: [0.13,1.60], p-value=0.021) had a positive association with utilization of SFT among health care workers in

Homa Bay County. However, the result from multivariable regression analysis shows that only compatibility between SFT and health care workers´ tasks had statistically significant positive association (Coeff=0.89, CI: [0.06, 1.71], p-value=0.035) with utilization of SFT.

Discussion

The use of modern Information and Communication Technology (ICT) has significantly improved patient care and information sharing among healthcare professionals across the globe. E-health programs supported by organizations like United Nations (UN), World Health Organization (WHO), Non-Governmental Organization (NGO´s) and Governments have led to a successful implementation of E-health programs in developed countries [19]. In Kenya, with the pioneering effort of introducing the SFT in clinical settings, significant growth is anticipated to be made in encouraging healthcare workers to efficiently use SFT for improved information management and patients´ care [20]. This study investigated the extent of the use of SFT by healthcare workers in Homabay County and identified that more than half of the HCWs ever used SFT in Homa Bay County. This study found that majority of HCWs using SFT were nurses, followed by health records officers. A longitudinal qualitative study on nurses´ experience with Health Information Technology (HIT) indicated that nurses are the largest group of HIT users in healthcare system, and their adaption is vital in the successful implementation of any HIT [21]. The end users of SFT in the public hospitals visited were, in general, happy to use SFT provided it met their needs and served its purpose flawlessly. However, some HCWs have not fully accepted the new technology citing challenges, which is not addressed, could lead to rejection of the new system.

The rise of Information Communication Technology has posed a challenge to the developing countries in their endeavour to

develop the Health Management Information Systems (HMIS). Poor economic communication infrastructure has been reported as one of the challenges facing the modernization of HMIS [22]. Health Management Information Systems (HMIS) is a crucial tool of ICT that decreases healthcare expenditure and improves healthcare delivery [23]. Lack of proper ICT support has also been identified as a barrier to utilization of the HMIS systems in public health facilities [7]. Our study found that inadequate ICT support for information exchange, communication, and collaboration in the health facility is a barrier to the utilization of SFT. Incompatibility between SFT and healthcare workers´ tasks was also found to be a barrier to the utilization of SFT. Healthcare workers who agreed that SFT helps them in accomplishing tasks in a straightforward manner makes management of patient information easy, easy to learn and use, and gives appropriate feedback were more likely to use SFT compared to those who disagreed. A phenomenological study on nurses´ confirmed expectations regarding HIT showed that nurses expect that a good HIT should promote efficiency and task achievement, should be easy to use, and improve quality of care among other expectations [24]. The study further indicated that if the HIT meets the expectations of the healthcare workers, then users become satisfied and continue using the HIT.

Limitations of the study: the study acknowledges two limitations. Firstly, the variables included in this study were selected based on prior literature. However, there may be other moderators of SFT utilization that were not included in this study and can become the subject of future research. Secondly, not all HCWs interact with HIS such as SFT in their daily activities. Therefore, there was the need to make a conclusion on the utilization of SFT among HCWs with caution.

Generalisability the study was conducted in Rachuonyo North sub-county and Homa Bay Township sub-county of Homa Bay County, Kenya, among healthcare workers in public health facilities that had implemented Scan Form Technology (SFT). Therefore, the findings can be generalized to similar healthcare settings and populations where SFT has been adopted.

Conclusion

This study helps in understanding the challenges faced by both vendors and public health facilities in implementing digital health systems in developing countries such as Kenya. Investigating these challenges provide opportunities to improve digital hospital information management system to enable health care providers to dispense high quality care to their clients. The study´s findings have demonstrated a high utilization of SFT among healthcare workers in Homabay County. However, there remains a small proportion of health care workers who have never used SFT. Barriers to the utilization of SFT included incompatibility between SFT and healthcare workers´ tasks, and inadequate information and communication technology support for information exchange, communication, and collaboration in the health facility. Thus, for successful implementation of SFT in Homabay County and other regions of Kenya, the health service providers and other health stakeholders should address the aforementioned factors to improve the utilization of SFT among healthcare workers.

What is known about this topic

- *The Health Informatics Governance and Data Analytics Project (HIGDA) has identified challenges in Homabay County, including delayed image uploads, manual count for report generation, and non-compliance with documentation procedures in some health facilities.*

What this study adds

- *Most healthcare workers in Homa Bay County (84.25%) have used SFT to capture information in the healthcare system;*

- *Lack of proper ICT support within health facilities is identified as a significant barrier to the adoption and use of SFT;*
- *Incompatibility between SFT and the tasks performed by healthcare workers also emerges as a critical barrier to its utilization.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Collince Ochieng Odhiambo conceived, designed the study, analyzed the data, and wrote the first draft manuscript. Esther Auma Osir and Shehu Shagari Awandu supervised the study. All authors read and approved the final manuscript.

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Tables

Table 1: relationship between effectiveness and reliability of scan form technology and its utilization

Table 2: relationship between compatibility between scan form technology and health care workers´ tasks and its utilization

Table 3: effect of information and communication technology support in the health facility on utilization of scan form technology

Table 4: factors influencing utilization of the scan form technology in Homa Bay County

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Table 1: relationship between effectiveness and reliability of scan form technology and its utilization

Variable	Mean (SD)	Mean interpretation	Unadjusted coefficient (95% CI)	P-value
SFT provides support for decision-making	4(1.1)	Agree	0.4(-0.02,0.82)	0.06
SFT provides a proper summary view	4(1.1)	Agree	0.22(-0.18,0.63)	0.283
It took too long to log in	3(1.3)	Neutral	0.12(-0.24,0.49)	0.502
SFT is stable and reliable	3(1.1)	Neutral	0.33(-0.11,0.77)	0.145
Data scanned disappear from the server	3(1.3)	Neutral	-0.03(-0.38,0.32)	0.874
Information from SFT is easily accessed	4(1.2)	Agree	0.36(-0.03,0.75)	0.073
Easily get help	3(1.2)	Neutral	0.16(-0.21,0.54)	0.394
Technical problems and time wastage	3(1.3)	Neutral	-0.29(-0.66,0.08)	0.128
Loss of patients' information	3(1.4)	Neutral	-0.07(-0.43,0.29)	0.703
Incorrect functionality has or nearly caused medication errors	3(1.4)	Neutral	-0.51(-0.88, -0.14)	0.007
SFT improves health outcome	4(1.2)	Agree	0.43(0.04,0.83)	0.033
SFT interrupted the power shortage	3(1.4)	Neutral	-0.17(-0.52,0.18)	0.348

Note: CI-Confidence interval, SD-Standard deviation, SFT-Scan Form Technology, P-value-probability value, Significant at the 0.05 level, Bivariable Logit regression analysis was used to test the association between each variable and use of scan form technology

Table 2: relationship between compatibility between scan form technology and health care workers tasks and its utilization

Variable	Mean (SD)	Mean interpretation	Unadjusted coefficient (95% CI)	P-value
Tasks performed in a straightforward manner	4(1.1)	Agree	0.7(0.25,1.15)	0.002
With SFT it's easy to manage patient information	4(1.0)	Agree	0.64(0.16,1.12)	0.009
SFT responds quickly	4(1.0)	Agree	0.42(-0.04,0.87)	0.075
SFT provides appropriate feedback	4(1.0)	Agree	0.96(0.4,1.53)	0.001
SFT concepts are clear	4(1.1)	Agree	0.46(0.03,0.89)	0.037
Easy to learn and use SFT	4(1.0)	Agree	0.5(0.05,0.95)	0.031
SFT does not require long training	4(1.2)	Agree	0.38(-0.02,0.78)	0.062
SFT requires a fixed sequence of tasks	3(1.1)	Agree	0.05(-0.38,0.47)	0.822

Note: CI-Confidence interval, SD-Standard deviation, SFT-Scan Form Technology, p-value-probability value, Significant at the 0.05 level, Bivariable Logit regression analysis was used to test the association between each variable and use of scan form technology

Table 3: effect of information and communication technology support in the health facility on utilization of scan form technology

Variable	Mean (SD)	Mean Interpretation	Unadjusted Coefficient (95% CI)	P-value
Information about laboratory results is presented in a logical format	4(0.9)	Agree	0.6(0.08,1.12)	**0.024**
Nursing information is accessible and readable	4(1.0)	Agree	0.55(0.09,1.02)	**0.020**
Patient's medication list is clearly presented	4(0.9)	Agree	0.71(0.2,1.22)	**0.006**
Information about the patient's medication from other health facilities is easily accessible	3(1.1)	Neutral	0.32(-0.1,0.74)	0.139
Delivery of patients' information from other organizations often takes too long time	3(1.2)	Neutral	-0.15(-0.57,0.26)	0.473
ICT systems support the achieving of continuity of care	4(1.0)	Agree	0.39(-0.08,0.85)	0.105
ICT supports collaborative collaboration between healthcare workers in this health facility	4(1.0)	Agree	0.5(0.05,0.96)	**0.030**
The ICT system monitors the use of SFT in this health facility	3(1.1)	Neutral	0.16(-0.25,0.58)	0.436
ICT systems support collaboration between healthcare workers and patients	4(1.1)	Agree	0.36(-0.06,0.78)	0.089

Note: SFT-Scan Form Technology, ICT - Information and Communication Technology, CI-Confidence interval, SD-Standard deviation, P-value-probability value, Significant at the 0.05 level, Bivariable Logit regression analysis was used to test the association between each variable and use of scan form technology

Table 4: factors influencing utilization of the scan form technology in Homa Bay County

Variable	Unadjusted coefficient (95% CI)	P-value	Adjusted coefficient (95% CI)	P-value
Compatibility between SFT and healthcare workers' tasks	1.00(0.35, 1.66)	0.002	0.89(0.06, 1.71)	0.035
ICT support for information exchange, communication, and collaboration in the health facility	0.86(0.13, 1.60)	0.021	0.22(-0.76, 1.19)	0.658
Effectiveness and reliability of SFT	0.33(-0.33, 0.99)	0.330		

Note: ICT - Information and Communication Technology, SFT-Scan Form Technology, CI-Confidence interval, P-value-probability value, Significant at the 0.05 level, Bivariable Logit regression analysis and multivariable logit regression analysis were used to test the association between independent variables and use of scan form technology