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Assessing the acceptance of integrating mobile solutions with EHR in enhancing continuity of care among HIV patients in Kajiado County, Kenya

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ABSTRACT

Background: Globally, millions of people living with HIV (PLHIV) experience interruptions in care, with Sub-Saharan Africa bearing the highest burden of cases and treatment needs. In Kenya, although antiretroviral therapy coverage has improved, challenges such as missed appointments, poor adherence, and loss to follow-up continue to affect continuity of care. The study focused on assessing the acceptance of integrating mobile solutions in enhancing continuity of care among PLHIV.

Methods: A descriptive cross-sectional design was adopted with a sample of 397 respondents. All required approvals and consent were obtained. Quantitative data was collected using questionnaires. Descriptive data were analyzed using SPSS version 25.0, and inferential statistics were computed through Chi-Square tests.

Results: Integration of mobile solutions with EHR, acceptance of mobile health solutions, likelihood of using mobile solutions ($p=0.041$), and useful features such as appointment scheduling ($p= 0.033$) were significantly associated with the continuity of care.

Conclusions: The level of continuity of care for patients integrated into the use of mobile solutions in HIV management in Kajiado County was 90.2%, with 9.8% of them interrupted to care. This was boosted through acceptable integration of such technologies to manage their positive HIV status. The likelihood of using mobile solutions ($p=0.041$) and their useful features ($p= 0.033$) had a significant relationship with continuity of care.

Key words: Acceptance, Mobile Solutions, Electronic Health Records, Appointment Scheduling, Integration.

INTRODUCTION

Integrating mobile solutions with health systems has gained significant attention as a promising approach to improving the continuity of care among patients, particularly those managing chronic diseases such as HIV. The most commonly used mobile solutions include Ushauri, Nishauri, Psurvey, Care for the Caregiver (C4C), and Mlab among others[9]. The increasing adoption of e-health technologies ranging from mobile applications to wearable devices has transformed healthcare delivery, offering patients real-time health

tracking, reminders for medication, and direct communication with healthcare professional[5]. Utilizing the Electronic Health System has strongly improved the management and sharing of patient information, and minimized medical gaps, errors, and quality improvement[7].

Globally, integrating mobile solutions with health systems of care improves patients' outcomes by ensuring continuity of care, enhancing the sharing of patient information by healthcare workers, thus enhancing real-time access to client or patient information[16]. According to[15] a study on integrated systems, can reduce medical errors and improve clinical decision-making; hence, enhancing patient involvement in their care is crucial[11]. Nevertheless, challenges remain, like data security, interoperability layer issues, high implementation costs, and the necessity for training healthcare providers[13].

Initiatives in Kenya focus on integrating mobile solutions with Electronic Health systems to improve healthcare delivery. Efforts include the utilization of mobile or community outreach clinics and telemedicine to reach areas that are in the remote settings[7]. These integrations have resulted in good uptake and access to healthcare services and improving continuity of care, and monitoring and managing patient health data in real time. Notable positive impacts have been observed in maternal and child health and chronic disease management[10].

However, in Kajiado, some challenges are still evident, including the need for healthcare systems to address interoperability issues between different mobile solutions and Electronic Health Systems, as well as concerns around data privacy and security[9]. Even with these challenges, combining mobile solutions with Electronic Health Systems has great potential to improve healthcare management, boost patients' results or outcomes, and lower cost of healthcare.

METHODS

The study adopted a descriptive cross-sectional study design using quantitative data collection techniques. The study recruited 397 patients living with HIV/AIDs selected randomly from various Comprehensive Care Centres. Those who consented and were patients living with HIV/AIDs and patients within Kajiado County were included for participation. The study excluded those who were absent from the facility and those who were sick and thus unable to participate. Ethical clearance was from Kenya Methodist University Ethics and Review Committee. The National Commission for Science Technology and Innovation (NACOSTI) authorized the study through the provision of a research permit. Authorization for the study was also sought from Kajiado County and permission from sub-county Health facilities within the county before embarking on the actual study. Informed consent was sought from the study participants. Quantitative data was collected using semi-structured questionnaires from respondents. The researcher ensured collected data was treated with confidentiality and privacy as it deserved. Data was collected between September to November 2025. Descriptive data was analyzed using SPSS version 25.0. To determine the association between acceptance of integrating mobile solutions with EHR in enhancing continuity of care among HIV patients in Kajiado County. The study used Chi-Square tests at 95% confidence interval and an error of precision at 0.05 to conduct inferential statistics. The results were presented using percentages, frequency tables, and charts.

RESULTS

Distribution of socio-demographic characteristics of the respondents

Table 4.1 shows the study findings on the socio-demographic characteristics of participants. The results showed that less than a half 144(36.3%) of participants were aged 26-35 years, majority 259(65.2%) were female, about half 191(48.1%) had a secondary level of education, approximately less than average 177(44.6%) were not employed, about 150(37.8%) earned an average monthly income of less than 10,000 Kenya shillings and most 364(91.7%) were Christians.

Table 1: Distribution of socio-demographic characteristics among respondents (n=397)

Variable.	Respondent response.	Frequency(N)	Percentage (%)
Age in years.	≤ 18	24	6.0
	18-25	95	23.9
	26-35	**144**	**36.3**
	36-45	59	14.9

	46-55	43	10.8
	≥ 56	32	8.1
Gender	Male	138	34.8
	Female	**259**	**65.2**
Highest level of education of attained	No formal education	49	12.3
	Primary	91	22.9
	Secondary	**191**	**48.1**
	Tertiary	66	16.6
Occupation	**Not employed**	**177**	**44.6**
	Self-employed	123	31.0
	Employed	97	24.4
Level of monthly family income (KShs)	**<10,000**	**150**	**37.8**
	10,000-29,999	127	32.0
	30,000-49,999	78	19.6
	≥50,0000	42	10.6
Religion	**Christian**	**364**	**91.7**
	Muslim	33	8.3

Continuity of care

This was measured using a structured questionnaire on patients who were active on care and those who for one reason or another, had interrupted treatment. Those who had never missed any scheduled appointments were considered adherent to care. The study's findings on continuity of care among patients living with HIV/AIDS in Kajiado County. The results show that most 358(90.2%) of participants were actively on care (Figure 1).

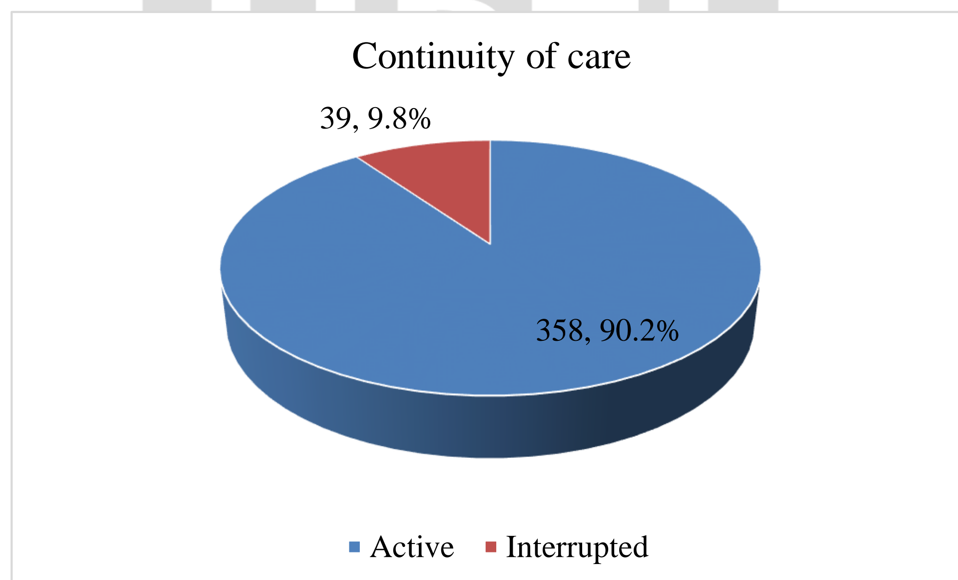

Fig 1: Continuity of care

Acceptance of mobile solutions

In Table 4.2, the results revealed that the main factor influencing acceptance of mobile solutions was ease of use as reported by 130(32.7%) of respondents, most respondents 258(65.0%) indicated they were likely to use such solutions, about a third 131(33.0%) of respondents identified appointment scheduling as the most useful feature and majority of 239(60.2%) respondents stated that mobile solutions significantly improve healthcare efficiency.

Table 2: Distribution of responses on acceptance of mobile solutions (n=397

Variable	Respondent response	Frequency (N)	Percentage (%)
Factors influencing acceptance of mobile solutions	Ease of use	130	32.7
	Trust	34	8.6
	Recommendations from healthcare professionals	46	11.6
	Perceived usefulness	59	14.9
	Cost	40	10.1
	Privacy concerns	88	22.2
Likelihood of using mobile solutions	Likely	258	65.0
	Neutral	56	14.1
	Unlikely	83	20.9
Useful features of mobile solutions	Appointment scheduling	131	33.0
	Remote monitoring	50	12.6
	Medication reminders	56	14.6
	Online consultation with healthcare providers	66	16.6
	Health tracking and reports	94	23.7
Impact of mobile solutions in improving healthcare efficiency	Significantly	239	60.2
	Somewhat	92	23.2
	No impact	66	16.6

Association of acceptance of mobile solutions on continuity of care

Table 4 presents the relationship between selected mobile solution factors and continuity of care among the respondents. Regarding factors influencing acceptance of mobile solutions, 121 (33.8%) of those with active continuity of care reported ease of use as the main factor compared to 9 (23.1%) among those whose care was interrupted. Privacy concerns were cited by 79 (22.1%) of respondents with active care and 9 (23.1%) among those with interrupted care. Other factors such as perceived usefulness 53 (14.8%) versus 6 (15.4%), recommendations from healthcare professionals 42 (11.7%) versus 4 (10.3%), cost 32 (8.9%) versus 8 (10.3%), and trust 31 (8.7%) versus 3 (7.7%) showed relatively small differences between the two groups. Overall, there was no statistically significant association between factors influencing acceptance and continuity of care ($\chi^2 = 9.119$, df = 5, p = 0.158). With respect to the likelihood of using mobile solutions, a majority of 239 (66.8%) respondents with active continuity indicated they were likely to use mobile solutions compared to 19 (48.7%) among those with interrupted care. In contrast, 11 (28.2%) of respondents with interrupted care were neutral compared to 45 (12.6%) among those with active care. Similarly, 74 (20.7%) of those with active care and 9 (23.1%) of those with interrupted care reported that they were unlikely to use mobile solutions. This relationship was statistically significant ($\chi^2 = 13.391$, df = 2, p = 0.041), suggesting that willingness to use mobile solutions is associated with continuity of care. Concerning useful features of mobile solutions, appointment scheduling was the most preferred feature among respondents with active care 119 (32.2%) and those with interrupted care 12 (30.8%). Health tracking and reporting was reported by 84 (23.5%) of respondents with active care and 10 (25.6%) of those with interrupted care. Other features such as online consultation with care providers 60 (16.8%) versus 6 (15.4%), medication reminders 50 (14.0%) versus 5 (12.8%), and remote monitoring 44 (12.3%) versus 6 (15.4%) were also mentioned. There was a statistically significant association between preferred features and continuity of care ($\chi^2 = 10.465$, df = 4, p = 0.033). Lastly, on the perceived impact of mobile solutions in improving healthcare efficiency, 229 (64.0%) of respondents with active continuity believed the impact was significant compared to only 10 (25.6%) among those with interrupted care. Additionally, 80 (22.3%) of those with active care and 12 (30.8%) of those with interrupted care perceived the impact as somewhat. A notable proportion of respondents with interrupted care 17 (43.6%) felt that mobile solutions would have no impact compared to 49 (13.7%) among those with active care. However, the association between perceived impact and continuity of care was not statistically significant ($\chi^2 = 3.165$, df = 2, p = 0.205).

Table 3: Association of acceptance of mobile solutions on continuity of care (n=397)

Variable	Respondent response	Continuity of care		Statistical significance
		Active (N=358)	Interrupted (N=39)	
Factors influencing acceptance of mobile solutions	Ease of use	121(33.8%)	9(23.1%)	χ^2=9.119 df=5 p*=0.158
	Trust	31(8.7%)	3(7.7%)	
	Recommendations from healthcare professionals	42(11.7%)	4(10.3%)	
	Perceived usefulness	53(14.8%)	6(15.4%)	
	Cost	32(8.9%)	8(10.3%)	
	Privacy concerns	79(22.1%)	9(23.1%)	
Likelihood of using mobile solutions	Likely	239(66.8%)	19(48.7%)	χ^2=13.391 df=2 **p=0.041**
	Neutral	45(12.6%)	11(28.2%)	
	Unlikely	74(20.7%)	9(23.1%)	
Useful features of mobile solutions	Appointment scheduling	119(32.2%)	12(30.8%)	χ^2=10.465 df=4 **p=0.033**
	Remote monitoring	44(12.3%)	6(15.4%)	
	Medication reminders	50(14.0%)	5(12.8%)	
	Online consultation with care providers	60(16.8%)	6(15.4%)	
	Health tracking and reporting	84(23.5%)	10(25.6%)	
Impact of mobile solutions to improve healthcare efficiency	Significantly	229(64.0%)	10(25.6%)	χ^2=3.165 df=2 p=0.205
	Somewhat	80(22.3%)	12(30.8%)	
	No impact	49(13.7%)	17(43.6%)	

DISCUSSION

Acceptance of mobile solutions

The results revealed that the main factor influencing acceptance of mobile solutions was ease of use as reported by 130(32.7%) of respondents, most respondents 258(65.0%) indicated they were likely to use such solutions, about a third 131(33.0%) of respondents identified appointment scheduling as the most useful feature and majority of 239(60.2%) respondents stated that mobile solutions significantly improve healthcare efficiency.

The study's findings on continued medical care for patient living with HIV/AIDS in Kajiado showed that 90.2% of participants were actively on care. This may be attributed to improved access and utilization of HIV/AIDS medication as well as having information concerning the need of adherence to care among such clients. The results corroborate in a study exploring how community health workers are incorporated on HIV programs and primary care units where the proportion for African American male patients who were actively on care was 91.3%[3]. Contrary results were also reported in another study that focused on the effect of interruptions on HIV/AIDS care among patients where 73.3% of participants were actively on care[8].

The main factor that influenced acceptance of mobile solutions in seeking HIV/AIDS treatment was their ease of use. User-friendliness greatly determines acceptance of mobile solutions as indicated in the current study. Consistent results were also highlighted in a related research on the analysis of the intention and factors influencing acceptance of mobile information follow-ups in China where ease of their usage, perceived usefulness, and innovation were the most significant factors enhancing their usage[6]. However, there was no significant association between factors influencing acceptance of mobile solutions and continuity of care. Majority of those who identified ease of use as the main factor influencing acceptance were on active care. This is contrary to a qualitative study that explored variables impacting the implementation and utilization of digital health technology for managing individuals diagnosed with HIV/AIDS, where ease of their use was among the facilitators of acceptance of using mobile solutions[5].

Association of acceptance of mobile solutions on continuity of care

The results showed that less than half 121(33.8%) of respondents who identified ease of use as the main factor influencing acceptance were on active care, while only 9 (23.1%) had interrupted care. However, there was no significant association between factors influencing acceptance of mobile solutions and continuity of care (p=0.158). Most respondents, 239(66.8%) who were likely to use mobile solutions were on active care, compared to 19(48.7%) who had interrupted care. There was a statistically significant association between the likelihood of using mobile solutions with continuity of care (p= 0.041).

The findings revealed that most cited useful feature of mobile health solutions was appointment scheduling, reported by 119(32.2%) of respondents who were on active care and 12(30.8%) of those with interrupted care. The association between useful features and continuity of care was shown to be statistically significant (p =0.033). Majority 229(64.0%) of respondents on active care stated that mobile health solutions significantly improve healthcare efficiency, while 17(43.6%) of those with interrupted care reported no impact. However, no significant statistical association between perceived improvement in healthcare efficiency and continuity of care was reported (p=0.205).

The study also noted that appointment scheduling was the most identifiable feature of mobile solutions in managing patients living with HIV/AIDS. This highlighted the value of convenience and time management in medical care practices, especially among HIV/AIDS patients. The findings were also replicated by research conducted in Nigeria on how mobile health interventions influence the retention of the HIV/AIDS patients receiving treatment, where mobile solutions enhanced timeliness in attending clinic appointments with the healthcare providers[4]. The association between useful features and continuity of care was found to be statistically significant. In fact, the majority of those who reported appointment scheduling as the most useful feature of mobile solutions remained actively on care for HIV/AIDS treatment. This implies that features enhancing convenience such as appointment scheduling, positively influence care adherence thus making patients actively remain on care. The results concur with a systematic review on use of short message reminders on appointment to attendance to HIV/AIDS clinics from across African regions where mobile solutions is a significant factor in improving clinic attendance and mitigating missed medical appointments and loss to follow-ups among HIV/AIDS patients seeking care[2]. In Germany, developing mobile applications and digital health promoted management of HIV/AIDS patients through improved appointment scheduling, daily medical consumption and eventual adherence to ART[12].

Majority of respondents stated that mobile solutions significantly improve healthcare operational efficiency. This demonstrates their strong belief in their potential to enhance service delivery. Findings from Nigeria reports a similar scenario where mobile health interventions for managing HIV/AIDS patient care showed a significant gain in system efficiency by reducing waiting times and long queues thus improving patient outcomes[1]. The association between perceived improvement in healthcare efficiency and continuity of care was not statistically significant despite, majority of those who were on active care stating that mobile health solutions significantly improve healthcare efficiency. This may also mean that continuity of care might have been affected by a combination of other factors. These findings agree with a review of evidence on mobile phone interventions on managing HIV/AIDS patients, where the efficacy of such interventions supported adherence to ART and continued engagement with patients in developing countries in East Asia[9]. It concurs with results from Vietnam where advances in mobile technologies were noted to have the ability to support HIV treatment and management as they influenced health behaviors thus improving adherence and making sure that patients remain actively on care[14].

CONCLUSION

The level of continuity of care for patients integrated into the use of mobile solutions in HIV management in Kajiado County was 90.2%, with 9.8% of them interrupted to care. This was boosted through acceptable integration of such technologies to manage their positive HIV status. The likelihood of using mobile solutions (p=0.041) and their useful features (p= 0.033) had a significant relationship with continuity of care. Kajiado County Government and relevant stakeholders or collaborators who develop and implement mobile solutions should emphasize the useful features of the mobile solutions in management of HIV. This would change the attitude of patients towards acceptance of the integration of mobile solutions in the management HIV thus improving adherence to continuity of care in Kajiado County.

STUDY LIMITATIONS

This research study focused on integrating mobile solutions with Electronic Health Systems to ensure improved continuity of care in Kajiado County. However, the study experienced limitations such as fear of information disclosure and patient literacy on the use of mobile solutions.

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DECLARATIONS

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Conflict of interest: None declared

Ethical approval: The study was approved by the Kenya Methodist University Ethics and Review Committee.

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