Change Process Factors Influencing Electronic Health Records Adoption by Nurses at Moi Teaching and Referral Hospital, Kenya

3 authors:

Linus K. Chirchir
The University of Edinburgh
11 PUBLICATIONS 47 CITATIONS

SEE PROFILE

Wilson Kipkirui Aruasa
23 PUBLICATIONS 203 CITATIONS

SEE PROFILE

Stanley Kulei Chebon
Moi Teaching and Referral Hospital
8 PUBLICATIONS 45 CITATIONS

SEE PROFILE

CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies 2020

Change Process Factors Influencing Electronic Health Records Adoption by Nurses at Moi Teaching and Referral Hospital, Kenya

Linus Kipkorir Chirchir*, Wilson Kipkirui Aruasa, Stanley Kulei Chebon

Moi Teaching and Referral Hospital

Abstract

This study determined change process factors affecting the uptake of electronic health records (EHR) by nurses at Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya. Descriptive cross-sectional research design was utilised in the inquiry. Data was collected using a structured questionnaire deployed to 279 nurses. Descriptive statistics, correlation and linear regression evaluations were utilised to ascertain the change process factors affecting EHR adoption. Descriptive analysis revealed that most of the nurses agreed that they found MTRH organizational culture supportive of the EHR system (M=4.014, SD=0.9134). Correlation evaluation revealed a positive, strong and statistically significant correlation between the change process factors and the adoption of EHR, r (279) = 0.641, $p < 0.05$. Linear regression assessment showed that there is a statistical and significant linear connection between change process factors and the adoption of EHR, F (1, 277) = 192.818, $p < 0.01$ and that change process factors can statistically and significantly affect the adoption of EHR, β_3 = 0.571, t (279) = 13.886, $p < 0.01$. The inquiry concludes that EHR deployment is a transformational activity that needs to be spearheaded by heads in care practice. It is recommended that healthcare organizations should select an EHR system project champion, preferably an experienced nurse during EHR system execution.

* Corresponding author. P.O. Box 3 - 30100, Eldoret, Kenya
E-mail address: linuschirchir@mtrh.go.ke

1. Introduction

Organizational and social scholars characterize uptake of innovations as a multifaceted socio-technical process [1]. Outcomes arise out of reciprocally reinforcing intersections of technologies, variations in work procedures, and hospital-wide transformations. Organizational issues, for instance its ability to change, could greatly impact the uptake and fruitful deployment of health information technology [2]. Administrators face strategic possibilities when technology is deployed and their choices determine aftermaths across their institutions' sections [2]. EHR adoption has enormous potential for healthcare transformation [3].

In America, an EHR is not a novel phenomenon. Nonetheless, its uptake by caregivers has slowed down in the recent past. The 2009 enactment of the Health Information Technology for Economic and Clinical Health (HI-TECH) Act provided system buying subventions and compensation enticements via Medicare and Medicaid to enhance the pervasiveness of "meaningful use" [4]. It rewarded practitioners who opted to acquire EHR technologies and punished those who filled Medicare dues using paper. The programme also made guidelines to enhance patient access to their own data, health information interchange among practitioners, and severer enforcement of care data confidentiality regulations. An evaluation by the US Department for Health and Human Services found that the count of carers utilising EHR tools rose from 57%-87% from 2011-2015. Although the fragmented characteristic of the healthcare system renders it difficult to assess the percentage of the sick who gain from an EHR, by 2016, 96% of providers in the US took up a federally tried and accredited EHR program - a nine-fold rise since 2008 [5]. The uptake of EHRs promotes the changeover to digital from paper-oriented data, boosts patient data management, optimizes invoicing services, and produces a data storage [6].

For a lengthy period, healthcare was highly consolidated in Russia [7], and public spending of the healthcare system in the country - albeit being historically mismanaged - is still way more than that in the US [8]. Nevertheless, healthcare quality in Russia relies a lot on urban-rural disparities and a caregiver's own training, values, and work experiences [9]. Differences in approaches to care further renders it urgent for EHR to be broadly deployed to enhance case-oriented analysis in decision-making. The Russian EHR environment is growing concurrently with its care sector with an average progression ratio of 10-14% from 2009 [10]. Many private providers have flooded the Russian EHR market to offer rapid EHR information sharing and centralized right of use to healthcare information, at the same time helping facilities to fulfil safe data directions. For instance, in 2011, International Business Machines (IBM) unveiled its Lotus framework, an EHR arena made for application by Russian clinicians. This was thought to be the pioneer entry of a US firm into the Russian EHR arena, and it became a provider for 9 hospitals in the country [10]. When IBM announced their Lotus Notes unveiling, the endeavour was meant not only to digitize sick persons' records, but also systematise hospital procedures.

In Saudi Arabia, efforts for roll-out of hospital information systems (HIS), like EMR, have been happening over the last three decades [11,12]. Previous works have disclosed that HIS adoption is minimal in Saudi public providers. Nevertheless, it is evident that there are numerous key providers and firms that have achieved complete EMR roll-out in the country [12]. Hasanain, Vallmuur and Clark [12], in their study, found that both English knowledgeability and training extents were considerably associated with computer competence and EMR training. The respondents who were secondary speakers of Arabic tended to opt for EMR use more than native speakers of Arabic. Past studies on EMRs in Saudi Arabia demonstrated that the rationale for such decreased EMR take-up is the absence of competence or exposure operating with EMRs, and staff unwillingness to taking up the appropriated EMR mechanisms [13]. This range of obstacles have equally been documented in various other advanced and transitional nations, in which low or even no computer competence is among the popular obstacles to EMR roll-out [14].

Cuba has been establishing a national framework using ICTs for care since the launch of the National Medical Sciences Information Centre (CNICM) in 1965. Previously, important statistics and care information were relayed by hand or over the telephone. With technology being enhanced in the following thirty years, microprocessors and computers were incorporated into the process [15]. In 1992, at the height of its economic problems, Cuba established the countrywide health telematics system called INFOMED, hoping that ICTs would enhance access to

care at affordable rates. Since these first endeavours to date, the state has adhered to a policy to establish and reinforce a virtual health information infrastructure.

The EMR uptake in Africa has been low, basic and restricted to anti-retroviral treatment, care recordings, or more generalized record-keeping in some firms [16,17]. For instance, EMR utilization in anti-retroviral treatment has promoted care in Malawi by raising the precision and exhaustiveness of records collation [18]. Additionally, EMR deployment was found to strengthen care provision and management of public care strategy in Cameroon [19]. Both Cameroon and Malawi are low-revenue states going by the World Bank conceptualization. Moreover, it is reported that the uptake of EMR in Ghana may increase efficiency of public health policies [16]. Gyamfi, Mensah, Oduro, Donkor and Mock [20], in their study, found that the EMR was fractionally successful, as the Emergency Centre was in a position to roll out the EMR, plus documenting a specified limited count of records on all care recipients. The study went ahead to conclude that ongoing formation on EMR was an enabler while a key obstacle noted was lack of finances. Additionally, proposals were preferred for the development of a state specific EMR policy.

In Kenya, the Ministry of Health (MOH) strongly reinforces the standard adoption of EMR frameworks so as to enhance care, administration and services [21]. Several EMR systems exist in Kenya to collect and manage data, analyze data, manage patients or hospitals, provide Administrative or Management support and to manage external processes like supply chain management. These systems are increasingly being adopted to improve medical record management, health program management, and the quality of patient care. In 2012, MTRH deployed Funsoft Integrated Healthcare Management Information System (I-HMIS), a Java and PostgreSQL based HIS, as an Enterprise Resources Planning solution for end-to-end hospital automation covering both support and core business functions. The system has a wide range of modules from Electronic Medical Records (EMR), Finance and Accounting, Supply Chain Management, Laboratory, Pharmacy and Radiology. The system is being utilized by Nurses [22].

Adopting EMR tools in a facility is a significant change for all the shareholders. This adoption process could prove highly complex in itself. The prevailing organizational ethos and the desire to stay the same, absence of encouragements, personnel and community resistance and absence of appropriate direction are some of the difficulties that can come up at the start. Firm-wide ethos and concerns around roll-out of technology in care contexts are critical, yet not a lot of investigation exists on it [22]. In the view of Kemper *et al.* [23], over half (58.1%) of the practitioners bereft of an EMR are unsure that EMRs can enhance sick persons' care or medical results. Other scholars have argued that entities reluctant to deploy such tools are doubtful of views that EMRs will enhance the value of care processes [24]. This engenders individual unwillingness to take up EMRs. Walter and Lopez [25] deduced that practitioners' disposition of the risk to their work freedom are quite critical in their response to EMR roll-out. The head hence must persuade these clinicians to take up and pursue a shared aim, for successful EMR roll-out.

Boonstra and Broekhuis [6] grouped obstacles associated to identical challenges into one class and came up with eight classes: change process, time, social, financial, technological, legal, psychological and organizational. Most of these groups are interconnected with organizational and change process, being intervening issues on the other obstacles. A change management approach would be needed to establish certain barrier-affiliated mechanisms to handle the documented challenges. Nonetheless, the issue of the competence that clinical heads must have and actions to aid the efficient incorporation of IT into daily practice has not been sufficiently tackled. Addressing this issue could aid in the establishment of improved IT competencies and result in successful IT uptake [26]. Therefore, this study explored the change process factors affecting the adoption of EHRs by nurses at MTRH. The outcome from this investigation will be provided to the hospital management for reference during policy making decisions, further studies and in addressing the said challenges. Based on the study, this paper presents and discusses the study findings on the change process issues shaping the adoption of EHRs by nurses at the MTRH.

2. Materials and Methods

Descriptive cross-sectional survey design was adopted for the study. The target demographic were nurses engaged at MTRH, Eldoret, Kenya. There were 926 Nurses at MTRH at the time of study [27]. The sampling frame employed comprised the entire list of nurses working at Moi Teaching and Referral Hospital. The selection frame utilized was the straight numerical system of work force numbers. The inclusion conditions were: qualified nurses

employed permanently and registered and licensed by the Nursing Council of Kenya. Simple random selection technique was deployed to isolate the participants to be engaged. To actualize the simple random sampling, a numbered list of all nurses in MTRH was prepared and computer randomization program was used to select 279 random numbers between 1 and 926. The sample size for nurses was arrived at using Taro Yamane's procedure [28] below.

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

where: n = Sample Size, N = Population Size, e = Error Limit

In applying Yamane's procedure of participants' number with an error margin of 5% and with a confidence score of 95%, the determination from the whole subject group of 926, then a participants' number of 279 respondents was selected as shown below.

$$n = \frac{926}{1 + 926(0.05)^2} = 279.34$$

Primary data was collected using the questionnaire by the main researcher, aided by 5 research assistants who were engaged and inducted. The questionnaire was based on the change process barrier identified by Boonstra and Broekhuis [6]. The collected data was stored safely in appropriate format that permits numerical evaluation. All the data collated were put into the statistical package and dressed for missing measures and data entry errors. Data evaluation was undertaken using IBM SPSS Version 21.0 statistical data analysis tool. Descriptive statistics, including mean, standard deviation, skewness and kurtosis, were deployed to evaluate the demographic variables. A simple linear regression by Hayes [29] was used to ascertain the change process factors affecting the adoption of EHR systems. The responses were converted to continuous variables by estimating the averages of the responses. The significance score was set at probability $p < 0.05$ for every statistical test. The findings and results were presented in tables and figures with brief descriptions.

3. Results

The study examined the impact of change process factors on EHR adoption at MTRH. The data was analysed and results of the descriptive statistics, i.e. averages and standard deviations; and inferential statistics, i.e. correlation and regression analysis, were as presented in the subsequent segments.

3.1. Descriptive Statistics

Research findings revealed that nurses find MTRH organizational culture supportive of the EHR system (Mean = 4.01); that there were EHR system incentives in MTRH (Mean 3.95); that all the relevant stakeholders were involved when deploying the EHR system in MTRH (Mean = 3.90), and that there were EHR system champions in MTRH (Mean 4.01). Change process factors summed up to a mean of 3.97, standard deviation of 0.73, skewness of -0.74 and a kurtosis of 0.37. Since the values of skewness were tending to zero then there was a relatively normal distribution of the responses. This statistic ranged from -1 to +1. Absolute values exceeding 0.2 designated great skewness. All the items in kurtosis ranged from -3 to 3, as shown in Table 1.

Table 1: Change Process Factors Descriptives

NO.	Item	Mean	Std. Dev.	Skewness	Kurtosis
1.	I find MTRH organizational culture supportive of the EHR system.	4.014	.9134	-1.084	.985
2.	There are EHR system incentives in MTRH.	3.953	1.0185	-1.182	.919
3.	All the relevant stakeholders in MTRH are involved when deploying the EHR system in MTRH.	3.903	.9899	-1.082	.794
4.	There are EHR system champions in MTRH.	4.011	.9075	-1.010	.727
	Change Process Factors	**3.9704**	**0.73441**	**-0.736**	**0.372**

3.2. Correlation Analysis

Correlation analysis was conducted to ascertain the strength and course of the association between the change process factors and EHR adoption. The study findings depicted a positive, strong and statistically considerable association between the change process factors and EHR adoption as shown in Table 2, $r(279) = 0.641, p < 0.05$.

Table 2: Correlation between Change Process Factors and EHR Adoption

		Change Process Factors	EHR Adoption
	Pearson Correlation	1	.641[**]
Change Process Factors	Sig. (2-tailed)		.000
	N	279	279
	Pearson Correlation	.641[**]	1
EHR Adoption	Sig. (2-tailed)	.000	
	N	279	279

**. Correlation is significant at the 0.01 level (2-tailed).

3.3. Linear Regression Analysis

Based on a bivariate linear regression model, the study proceeded to establish the effect of change process factors on EHR adoption. The study tested the following hypothesis:

H₁: Change process factors affect electronic health records adoption by Nurses at MTRH.

The study findings revealed that change process factors explained 41.0% variation in EHR adoption, $R^2 = 0.410$. This implied that 41.0% of change process factors could be justified by EHR adoption depicted in Table 3.

Table 3: Model Summary for Change Process Factors and EHR Adoption

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.641[a]	0.410	0.408	0.50318

a.   Predictors: (Constant), Change Process Factors

The study outcomes indicated that the model was statistically significant in change process factors and the adoption of EHR, $F(1, 277) = 192.818, p < 0.01$, as depicted in Table 4. The model was important in explaining the relationship. Considering the value of the F-statistic, the alternate hypothesis that change process factors affect EHR adoption by nurses at MTRH was accepted.

Table 4: ANOVA for Change Process Factors and EHR Adoption

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	48.820	1	48.820	192.818	.000[b]
Residual	70.135	277	.253		
Total	118.955	278			

a. Dependent Variable: EHR Adoption
b. Predictors: (Constant), Change Process Factors

These study findings indicated that change process factors positively and significantly predicted the adoption of EHR, $\beta = 0.571, t(279) = 13.886, p < 0.01$, as shown in Table 5. This implied that change process factors predicted a magnitude of 57.1% on EHR adoption.

Table 5: Coefficients for Change Process Factors and EHR Adoption

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	t	Sig.
1	(Constant)	1.905	0.166		11.483	0.000
	Change Process Factors	0.571	0.041	0.641	13.886	0.000

a. Dependent Variable: EHR Adoption

4. Discussion

This study sought to establish the change process factors affecting EHR adoption by nurses at MTRH. The study findings showed that change process factors significantly influenced EHR adoption. The findings from descriptive analysis showed that the nurses agreed that they found MTRH organizational culture supportive of the EHR system. The findings were in line with those of Vest, Jung, Wiley Jr, Kooreman, Pettit, and Unruh [30] who concluded that an institutional culture that cultivates innovation and sensitization campaigns by professional communities could promote increased uptake and effective use of technology. Another study by Ballaro and Washington [31] indicated that a compelling association existed between organizational culture and perceived institutional support among doctors and nurses implementing a new EHR system within the Military Health System. Employees who perceived their facility had a clan culture perceived greater institutional support, while those from the pecking order and market cultures tended to perceive less organizational support.

The results from the correlational analysis illustrated that a positive, strong and statistically meaningful association existed between change process factors and EHR adoption. The findings of this study concurred with those of Sumbi [32], which indicated that change process factor has the greatest influence on adoption of EMRs. The respondents strongly agreed that resistance to varying of the usual way of operating is an impediment to the adoption of EMR. Yusif, Hafeez-Baig and Soar [33] in their study also made a call for more attention to be paid to change as part of preparatory measures towards the acceptance of health information technology in Ghana.

The findings of the linear regression analysis of this study revealed that change process factors could statistically and significantly predict EHR adoption. The study findings are consistent with those of Fragidis and Chatzoglou [34] who indicated that the most critical failure factor in the implementation process of a nationwide electronic health record system is the lack of backing and the adverse reaction to any metamorphosis from the medical, nursing and administrative community. Another study recommends that implementers of healthcare information systems should unanimously agree with system goals and functionalities through wider consultations and participation in approaches realised through consensus building [35].

4. Conclusion and Recommendations

The linear regression findings confirmed that that social factors statistically and significantly predict EHR adoption at MTRH. These study findings led to the acceptance of the alternate hypothesis that change process factors influence EHR adoption by Nurses at MTRH. From the outcomes of this inquiry, it is deduced that EHR deployment is a transformational activity that needs to be spearheaded by heads in care practice. The value of transformation control is critical in the excellence of EHR roll-out. Consequently, it is proposed that health organizations should select an EHR system project champion, preferably an experienced nurse. Senior executives should let nurses to take part in EHR system execution as well as ensuring that there is facilitation, guidance and sensitization.

References

[1]   Litwin AS. Technological Change at Work: The Impact of Employee Involvement on the Effectiveness of Health Information Technology. Industrial & Labor Relations Review 2011;64:863–888.
[2]   Avgar AC, Kuruvilla S. Dual Alignment of Industrial Relations Activity: From Strategic Choice to Mutual Gains. Advances in Industrial and Labor Relations 2011;18:1–39.
[3]   Chirchir LK, Aruasa WK, Chebon SK. Determining Role of Social Factors in Adoption of Electronic Health Records by Nurses. Studies in Health Technology and Informatics 2020;272:111–4. https://doi.org/10.3233/SHTI200506.
[4]   Middleton B, Bloomrosen M, Dente MA, Hashmat B, Koppel R, Overhage JM, et al. Enhancing patient safety and quality of care by improving the usability of electronic health record systems: recommendations from AMIA. Journal of the American Medical Informatics Association 2013;20:e2–e8.
[5]   Reisman M. EHRs: The Challenge of Making Electronic Data Usable and Interoperable. Pharmacy and Therapeutics 2017;42:572–5.
[6]   Boonstra A, Broekhuis M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. BMC Health Services Research 2010;10:231. https://doi.org/10.1186/1472-6963-10-231.
[7]   Gordeev VS, Pavlova M, Groot W. Two decades of reforms. Appraisal of the financial reforms in the Russian public healthcare sector. Health Policy 2011;102:270–7. https://doi.org/10.1016/j.healthpol.2010.08.009.
[8]   Young TK, Chatwood S. Health care in the North: what Canada can learn from its circumpolar neighbours. Canadian Medical

Association Journal 2011;183:209–14. https://doi.org/10.1503/cmaj.100948.

[9] Taranik M, Kopanitsa G. Decision Support System for Medical Care Quality Assessment Based on Health Records Analysis in Russia. In: Damaševičius R, Mikašytė V, editors. Information and Software Technologies, Cham: Springer International Publishing; 2017, p. 203–9. https://doi.org/10.1007/978-3-319-67642-5_17.

[10] Parikh H. Overview of EHR Systems In BRIC Nations. Clinical Leader 2015. https://www.clinicalleader.com/doc/overview-of-ehr-systems-in-bric-nations-0001 (accessed March 30, 2020).

[11] Hasanain R, Vallmuur K, Clark M. Progress and challenges in the implementation of Electronic Medical Records in Saudi Arabia: a systematic review. Health Informatics - An International Journal 2014;3:1–14.

[12] Hasanain RA, Vallmuur K, Clark M. Electronic Medical Record Systems in Saudi Arabia: Knowledge and Preferences of Healthcare Professionals. Journal of Health Informatics in Developing Countries 2015;1:23–31.

[13] Alanazy S. Factors Associated with Implementation of Electronic Health Records in Saudi Arabia. Doctoral Dissertation. University of Medicine and Dentistry of New Jersey, 2006.

[14] Huryk LA. Factors influencing nurses' attitudes towards healthcare information technology. Journal of Nursing Management 2010;18:606–12. https://doi.org/10.1111/j.1365-2834.2010.01084.x.

[15] Delgado A, Gorry C. Cuba's National eHealth Strategy. MEDICC Review 2008;10:6–8.

[16] Healy L. Patient Information Privacy and Security in Ghana: A Review of Current Policy and Suggestions for the Future. Undergraduate Thesis. University of California Santa Cruz, 2012.

[17] Achampong EK. Electronic Health Record System: A Survey in Ghanaian Hospitals. Journal of Health & Medical Informatics 2012;1. https://doi.org/10.4172/scientificreports.164.

[18] Marcus DD, Lubrano J, Murray J. Electronic medical records–the physician's guide. Texas: Medical Foundation 2009.

[19] Kamadjeu RM, Tapang EM, Moluh RN. Designing and implementing an electronic health record system in primary care practice in sub-Saharan Africa: a case study from Cameroon. Journal of Innovation in Health Informatics 2005;13:179–86. https://doi.org/10.14236/jhi.v13i3.595.

[20] Gyamfi A, Mensah KA, Oduro G, Donkor P, Mock CN. Barriers and facilitators to Electronic Medical Records usage in the Emergency Centre at Komfo Anokye Teaching Hospital, Kumasi-Ghana. African Journal of Emergency Medicine 2017;7:177–82. https://doi.org/10.1016/j.afjem.2017.05.002.

[21] Waithera L, Muhia J, Songole R. Impact of Electronic Medical Records on Healthcare Delivery in Kisii Teaching and Referral Hospital. Med Clin Rev 2017;03. https://doi.org/10.21767/2471-299X.1000062.

[22] Chirchir LK. Factors Influencing Electronic Health Records Adoption by Nurses at Moi Teaching and Referral Hospital, Eldoret, Kenya. Master's Project. United States International University - Africa, 2019.

[23] Kemper AR, Uren RL, Clark SJ. Adoption of Electronic Health Records in Primary Care Pediatric Practices. Pediatrics 2006;118:e20–4. https://doi.org/10.1542/peds.2005-3000.

[24] Jha AK, Bates DW, Jenter C, Orav EJ, Zheng J, Cleary P, et al. Electronic health records: use, barriers and satisfaction among physicians who care for black and Hispanic patients. Journal of Evaluation in Clinical Practice 2009;15:158–63. https://doi.org/10.1111/j.1365-2753.2008.00975.x.

[25] Walter Z, Lopez MS. Physician acceptance of information technologies: Role of perceived threat to professional autonomy. Decision Support Systems 2008;46:206–15. https://doi.org/10.1016/j.dss.2008.06.004.

[26] Chirchir LK, Aruasa WK, Chebon SK. Technical factors influencing electronic health records adoption by nurses at Moi Teaching and Referral Hospital, Kenya. African Journal of Science, Technology, Innovation and Development 2020. https://doi.org/10.1080/20421338.2020.1777676.

[27] Moi Teaching and Referral Hospital. Staff Compliment Control. 2019.

[28] Yamane T. Statistics: An Introductory Analysis. 2nd Edition. New York: Harper & Row; 1967.

[29] Hayes AF. Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach. New York: Guilford Publications; 2017.

[30] Vest JR, Jung H-Y, Wiley K, Kooreman H, Pettit L, Unruh MA. Adoption of Health Information Technology Among US Nursing Facilities. Journal of the American Medical Directors Association 2019;20:995-1000.e4. https://doi.org/10.1016/j.jamda.2018.11.002.

[31] Ballaro JM, Washington ER. The Impact of Organizational Culture and Perceived Organizational Support on Successful Use of Electronic Healthcare Record (EHR). Organization Development Journal 2016;34:11–29.

[32] Sumbi EM. Investigating Challenges to Electronic Medical Record Systems Adoption: A Case of Coast Province General Hospital. Master's Thesis. Strathmore University, 2016.

[33] Yusif S, Hafeez-Baig A, Soar J. Change management and adoption of health information technology (HIT)/eHealth in public hospitals in Ghana: A qualitative study. Applied Computing and Informatics 2019. https://doi.org/10.1016/j.aci.2019.11.007.

[34] Fragidis LL, Chatzoglou PD. Implementation of a nationwide electronic health record (EHR): The international experience in 13 countries. International Journal of Health Care Quality Assurance 2018;31:116–30. https://doi.org/10.1108/IJHCQA-09-2016-0136.

[35] Sidek YH, Martins JT. Perceived critical success factors of electronic health record system implementation in a dental clinic context: An organisational management perspective. International Journal of Medical Informatics 2017;107:88–100. https://doi.org/10.1016/j.ijmedinf.2017.08.007.