

Journal of Sociology 1(4) September, 2019

Challenges of E-health adoption and integration on maternal health in Uasin Gishu County Hospitals

¹Silas Kipkurui Kosgei
Rongo University

²Dr. Lamek Ronoh Lecturer
Rongo University, Email-ronohlamek@gmail.com

³Dr Maureen Adoyo
Lecturer- Rongo University, Email-maureenadov.univ@gmail.com

Abstract: *E-health has fundamentally shifted the way patient information is accessed and shared across health systems. In Kenya maternal health care still faces challenges including, lack of access to quality maternal health services ante-natal, delivery, and post-natal services. Adoption and integration into maternal health is expected to contribute to delivery of Maternal Health and consequently increasing life expectancy at birth. Relatively few maternal health care providers have fully adopted E-Health, in Uasin Gishu County low diffusion is due partly to the complexity of information Technology investment, which goes beyond acquiring technology to changing work processes and cultures, and ensuring that physicians, nurses, and other staff use it. Manual record keeping associated with medical facilities have been a subject of medical debates owing to the confusion it has caused medical practitioners. The study was guided by the following objective; to identify challenges in adoption and integration of e-health on maternal health delivery in Uasin Gishu County. The study was carried out in sub county hospitals, in Uasin-Gishu County. The study subject was drawn from the target population of 408 respondents from the six sub county hospitals including Ainabkoi, Kapsaret, Kesses, Moiben, Soy and Turbo. The sample size was 124 calculated using 30% formula of Mugenda Mugenda (2003). This study employed a case study research design and used both questionnaire and interview schedule in data collection. Analysis was done using inferential statistics; mean, standard deviation, and in support of Statistical Package for the Social Sciences (SPSS) version 22.0 to generate findings and emerging trends in the data that was collected. Based on the study findings the study concludes that practical implementation of change in healthcare sector actually requires an extensive stakeholder engagement to deliver innovations in patient care and achieve sustainability of change and therefore stakeholders can play an influential role both as promoters, and as inhibitors of organizational change. The study recommends that measures to improve the application of e-health needs to be put in place. Application like enhancing healthcare services availability and access; improving health quality, safety and outcomes and increasing service efficiency, productivity and cost effectiveness were found to be least achieved. In order to rip the maximum benefits that e-health offers, there is need to put measures in place that will ensure these benefits are achieved.*

Key Words: *E-health, Maternal health, Hospitals*

I. INTRODUCTION

Healthcare information technology applications are reported to have positive association with enhanced patient safety outcomes (Siegrist & Kane, 2003). Amarasingham *et al.* (2009) demonstrated HIT Systems could increase patient safety by reducing complications and mortality rates, as well as by minimizing medical errors. Health information management across computerized systems and the secure exchange of health information between consumers, providers, payers, and quality monitors (Ahmed, Desta, Tekle & Mweta, 1993). Through the use of healthcare information technology, hospitals hope to reduce maternal medical errors, such as ordering and administering the wrong dose of a medication. Providers hope to access and share patient information more easily, thereby improving care (Lupton, 2014). Healthcare IT encompasses a broad array of new technologies designed to manage and share health-related information. The most basic type of E-health is a system that electronically collects stores and organizes health information about patients. When properly implemented, such a system can help coordinate patient care, reduce medical errors and improve administrative efficiency (Carlsen & Bystrov, 2014).

Maternal health is very important for pregnant mother and family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality. The computerization of medical records of pregnant mothers in hospitals and health clinics involves the use of various technology which includes; the use of the Internet for communication and information exchange; development of magnetic cards for user identification; electronic scheduling systems for appointments, examinations and hospital admissions; and computerized protocols for diagnosis and treatment support are among other technology applications (Parii, 2014).

For electronic health records (EHRs, also known as electronic medical records, automated medical records, and computer-based patient records, among other names), multiple definitions exist, depending on the constellation of functions that are included (Brailier & Tarasawa 2003). They can be used simply as a passive tool to store patient information or can include multiple decision support functions, such as individualized patient reminders and prescribing alerts.

Pregnant mothers should however go along with other investments in the maternal care as observed in some countries that have successfully adopted free maternal care. For example in Australia where the maternal healthcare system is lauded as one of the best in the southern hemisphere, there is universal maternal care

that is tax-funded by public insurance program and covers most medical care, including physician and hospital services and prescription drugs before the inception of the program, the government of Australia invested heavily on health facilities to the extent that two thirds of the entire bed spaces of hospitals in Australia are found in public hospitals, there is a proportion of 10 nurses and midwives for every 500 women and up to 9% of the GDP is spent on health (Dento, 2015). Other studies point out that cost is just one important factor in determining utilization of maternal care. A number of socio demographic characteristics of the individual affect the underlying tendency to seek and utilize maternal care. With the advent of a devolved system of health in most developed countries such as the United States, the sharing of medical information is a key factor to ensure successful treatment rates of patients (Carlsen & Bystrov, 2014). The maternal health care in particular requires patients records be kept properly during the pre and the post visits of patients. The Healthcare Information technology plays a crucial role in capturing, sharing, storing and retrieving patients information safely and in a way that it can be accessed from various locations within a given authorized networks (Oleru, 2015). According to Dents (2013), the United States and England have made tremendous gains in ensuring that the health sector is well devolved. These countries have invested heavily in infrastructure that lead to the successful implementation and use of Healthcare Information Technology that are necessary in the hospital setting to assist doctors perform their medical functions. Parii (2014) however notes that the success of this healthcare information technology heavily depends on their design and continuous improvement.

Kenya health sector was devolved in 2013 and counties have been given the responsibility of managing all structures relating to health. Despite challenges such as underfunding of the counties by the national government, some of the counties have managed to put in place healthcare information technology that assist medical practitioners treat patients (Sharma *et al.*, 2015). A case in point is the Bomet County where level 4 hospitals are currently using customized maternal healthcare application to capture patient's records. There are however major challenges in the efficient storage and retrieval of records. A lot needs to be done in our counties relating to the storage of maternal health records necessitating the need for Healthcare Information technology to assist in the management of records in the devolved system of governance currently being used by counties to manage the health docket (Axelsson, 2000).

In Uasin Gishu County the quality of health care remains wanting. In 2013, of the 250 maternal deaths (per 100,000), 184 were due to poor quality health care in the

county hospitals (Mwaliko, 2009). The usage of clinical services in the region in 2015 is well documented indicating that there is a higher utilization of self-medication compared clinical visits. For examples, the number of women who have self-medicated within the CBD were 12381 women, 75810 in major sub counties and about 2558 men in the CBD while 6692 men have self-medicated (National Center for Health Statistics, 2017). This is a clear indication of the poor quality of health in the county to the extent that the citizens don't believe in the county health services. Automation among many other solutions has been proposed.

II. EMPIRICAL REVIEW

2.1 Telehealth and Telemedicine On Maternal Health

This new perspective of healthcare information technology integration is made of different systems as a whole in order to be integrated and orchestrated so as to support care in a patient-centric view of organizations and processes (Calsen, 2014). From this viewpoint, e-health has much to offer to support health care cost management and to improve the quality of care (Kolodner *et al.*, 2008). In addition to the embedded role of ICT in clinical and diagnostic equipment (Dal Corso, 2014), healthcare information systems are uniquely positioned to capture, store, process, and communicate timely information to decision makers for better coordination of health care at all the aforementioned levels of analysis (Finchman *et al.*, 2011).

According study done by Gurdasani *et al.* (2015) on system integration of patients clinical data for clinical research examined electronic health records (EHRs), augmented with advancements in technology and greater adoption rate, are used in healthcare facilities as an integrated digital repository system to facilitate effective management of patients and care related data using integration information systems in hospitals (Dal Corso, 2011). EHRs, promising to provide an ideal form of longitudinal patient health record, offer remarkable and enhanced opportunities for clinical research (Kipruto *et al.*, 2015). The study objective focuses on the identifying the clinical-data needs and requirements of clinical researchers from available EHR systems, and map their data need with existing EHR infrastructure the study employed qualitative methods study design was used to assesses the clinical-data needs and requirements of clinical researchers (involved in allergy & asthma, and airway research) and to evaluate what is actually documented in EHRs (Haley & Bég, 2012). And following observational study, the study evaluated two clinical research protocols considered to be concrete examples of the granularity and scope of clinical-data that might be required for a clinical research study.

The study findings revealed those clinical researchers' positive attitudes in reusing here to support and expedite their clinical research and related processes (Haley & Bég, 2012). EHR data quality and data access issues were denoted to impede EHR reuse in clinical research studies. Training on assets of existing EHR systems, seamless integration of standalone systems for automatic clinical-data transfer and access, and integration of search and notification tools within EHR systems were considered compulsory to effectively and efficiently exploit EHRs in clinical research (Kolodner *et al.*, 2008). With few exceptions, identified data elements of the two protocols were mapped with available EHR clinical-data; though there was no planned connection of the studies with EHR systems.

The study concluded that clinical researchers perceive EHRs as able to support and expedite their studies; however, to facilitate reuse in clinical research, considerations on clinical researchers' data needs and system requirements should be realized in close collaboration with EHR vendors (Mills *et al.*, 2010).

One of the primary motivators for adopting of Decision support system in maternal health carries the belief that they improve the quality of maternal health (Sidrov, 2006). Yet, further research is needed to better document and understand the link between decision support system and maternal health needed to make these decision changes frequently; the guidelines and clinical evidence continually evolve, as does knowledge about the condition of the patient. IT may provide a tool to store, integrate, and update this information base (Sidrov2006).

Clinical decision support can be broadly and simply defined as the use of information to help a clinician diagnose and/or treat a patient's health problem (Dents, 2013). Two kinds of information are involved information about the patient; and information about the kind of health problem afflicting the patient and alternative tests and treatments for it (Aitken 2009).Clinical decision support is by no means a new phenomenon such information traditionally has been available from several sources. However, those sources have limitations that often diminish their reliability or their accessibility at the point of care (Aitken *et al.*, 2009).

III. METHODOLOGY

This study employed a case study research design. A case study is research strategy, an empirical inquiry that investigates a phenomenon within its real-life context (Schneider & Wagemann, 2010). The study targeted a total of 408 respondents from the six sub county hospitals including Ainabkoi, Kapsaret, Kesses, Moiben, Soy and Turbo. The researcher used records of 2018 to

get the target population of Sub County Hospitals in Uasin Gishu County.

Table 3.1 Target Population

Category	Total
Directors	2
MOHs	12
HRIOs	22
Nurses	372
Total	408

Source: Human Resource Office Data, Uasin Gishu County (2018)

For the purpose of getting a representative sample, the sample size of the study was calculated using 30% rule as recommended by (Mugenda & Mugenda, 1999).

To reach the sample size, probability sampling technique was used in this study to ensure fair representation and a generalization of the findings to the general population (Kothari, 2004). In specific terms there was the use of stratified random sampling, where by the study was carried out in a natural setting where the participants were approached as they carried out the daily routines.

Table 3.2 Table Sample size

Category	Strata	Sample size
Director	2x0.3	1
MOHs	12 x0.3	4
HRIOs	22x0.3	7
Nurses	372x0.3	112
TOTAL	408	124

Source: Human Resource Office Data, Uasin Gishu County (2018)

The study employed both questionnaire and interview schedule.

IV. FINDINGS

4.1 Challenges in Implementation of e-Health

Despite the potential benefits of e-health, implementation of these systems is often reported as problematic. Implementation of EHR and electronic prescribing systems has lagged in most European nations as well as in the USA (Ross *et al*, 2015). Costs associated with implementing e-health often spiral and time delays are reported. Barriers to implementation of innovations within the healthcare setting may arise at the individual, organizational and wider levels of the healthcare systems, and interact in complex and variable ways (Lau, 2014). These factors may also be innovation-specific and context-specific. Studies have described financial, legal,

social and ethical barriers to implementation, arising at the organizational and individual level, including users' lack of awareness of the benefits, low e-health literacy, a shortage of evidence of cost-effectiveness and interoperability. The ability of different information technology systems and software applications to communicate, exchange data and use the information that has been exchanged) as well as security concerns (Stroetmann *et al*, 2012). Recognizing and understanding barriers and facilitators is crucial for devising strategies and interventions to improve the widespread effective use of e-health, and addressing blockages to implementation. This study sought to investigate the challenges faced by the different facilities in Uasin Gishu County.

From the data collected the results were as follows: 12.9% indicated e-Health standards challenges, 10.5% indicated ICT capacity, 9.7% indicated E-legislation, 12.9% indicated e-Health Infrastructure, 23.4% indicated Security and privacy issues and the remaining 30.6% indicated Technical Organizational issues. From these results we infer that the biggest challenge of implementing e-Health is technical organizational issues. Security and privacy issues was also found to be another major challenge facing the implementation of e-Health.

Table 4.9 Challenges in Implementation of e-Health

Implementation	Frequency	Percent	Total
E-Health standards	16	12.9	12.9
ICT capacity	13	10.5	23.4
E-legislation	12	9.7	33.1
E-Health Infrastructure	16	12.9	46.0
Security and privacy issues	29	23.4	69.4
Technical Organizational	38	30.6	100.0
Total	124	100.0	

Source: Field Data (2019)

V. CONCLUSION AND RECOMMENDATIONS

The study concludes that practical implementation of change in healthcare sector actually requires an extensive stakeholder engagement to deliver innovations in patient care and achieve sustainability of change and therefore stakeholders can play an influential

role both as promoters, and as inhibitors of organizational change. The study recommends that measures to improve the application of e-health needs to be put in place. Application like enhancing healthcare services availability and access; improving health quality, safety and outcomes and increasing service efficiency, productivity and cost effectiveness were found to be least achieved. In order to rip the maximum benefits that e-health offers, there is need to put measures in place that will ensure these benefits are achieved.

REFERENCES

- Siegrist, J. R., & Kane, N. M. (2003). Exploring the relationship between inpatient hospital costs and quality of care. *The American journal of managed care*, 9, SP43-9.
- Amarasingham, R., Plantinga, L., Diener-West, M., Gaskin, D. J., & Powe, N. R. (2009). Clinical information technologies and inpatient outcomes: a multiple hospital study. *Archives of internal medicine*, 169(2), 108-114.
- Ahmed, A. M., Desta, A., Tekle, K., & Mweta, E. A. (1993). Pursuing better health care delivery at district level.
- Carlsen, I. C., & Bystrov, D. (2014). *U.S. Patent No. 8,705,819*. Washington, DC: U.S. Patent and Trademark Office.
- Parii, L. V., (2014). Suchasni tendentsii rozvytku rynku syru v Ukraini. *Naukovyi visnyk Natsionalnoho universytetu bioresursiv i pryrodokorystuvannia Ukrainy. Seriya: Ekonomika, ahraryni menedzhment, biznes. Vyp. 200 (3)*, pp.255-261.
- Denton, C. P. (2015). Systemic sclerosis: from pathogenesis to targeted therapy. *Clin Exp Rheumatol*, 33(4 Suppl 92), S3-7.
- Oleru, 2015
- Finchman *et al.*, 2011
- Gurdasani, D., Carstensen, T., Tekola-Ayele, F., Pagani, L., Tachmazidou, I., Hatzikotoulas, K., & Ritchie, G. R. (2015). The African genome variation project shapes medical genetics in Africa. *Nature*, 517(7534), 327.
- Kolodner, R. M., Cohn, S. P., & Friedman, C. P. (2008). Health information technology: Strategic initiatives, real progress. *Health Affairs*, 27(5), w391-w395.
- Dal Corso, A. (2014). Pseudopotentials periodic table: From H to Pu. *Computational Materials Science*, 95, 337-350.
- Kipruto, H., Mung, J., Ogila, K., Adem, A., Mwalili, S., Kibuchi, E., & Sang, G. (2015). Spatial Temporal Modelling of Tuberculosis in Kenya Using Small Area Estimation Spatial Temporal Modelling of Tuberculosis in Kenya Using Small Area Estimation. *International Journal of Science and Research*, 4(9), 1216-1224.
- Haley, D. R., & Béq, S. A. (2012). The road to recovery: Egypt's healthcare reform. *The International journal of health planning and management*, 27(1), e83-e91.
- Mills, D., Martin, J., Burbank, J., & Kasch, W. (2010). *Network time protocol version 4: Protocol and algorithms specification* (No. RFC 5905).
- Sidorov, J. (2006). It ain't necessarily so: the electronic health record and the unlikely prospect of reducing health care costs. *Health Affairs*, 25(4), 1079-1085.
- Aitken, M., Berndt, E. R., & Cutler, D. M. (2009). Prescription drug spending trends in the United States: looking beyond the turning point. *Health Affairs*, 28(1), w151-w160.
- Schneider, C. Q., & Wagemann, C. (2010). Qualitative comparative analysis (QCA) and fuzzy-sets: Agenda for a research approach and a data analysis technique. *Comparative Sociology*, 9(3), 376-396.
- Mugenda, O. M., & Mugenda, A. G. (1999). *Research methods: Quantitative and qualitative approaches*. Acts press.
- Kothari, C. R. (2004). *Research Methodology: Methods and Techniques*. New Delhi: NewAge International (P) Limited, Publishers.
- Ross, J., Stevenson, F., Lau, R., & Murray, E. (2015). Exploring the challenges of implementing e-health: a protocol for an update of a systematic review of reviews. *BMJ open*, 5(4), e006773.
- Lau, R., Stevenson, F., Ong, B. N., Dziedzic, K., Eldridge, S., Everitt, H., & Rogers, A. (2014). Addressing the evidence to practice gap for complex interventions in primary care: a systematic review of reviews protocol. *BMJ open*, 4(6), e005548.