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Critical Environmental Factors that Affects the Implementation of Ehealth, Kenya

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ABSTRACT

Information technology is used to offer Health services, the use of computers in health is referred to as eHealth. The benefits of using eHealth is enormous, however people have not appreciated it fully because of problematic factors associated with its adoption and implementation. The main objective of the study was to investigate the environmental factors that influences the adoption and implementation of eHealth in Kenya. The study was guided by technology organization and environmental framework (TOE) as the base that informed it. This study used quantitative approach methods. The quantitative research used the deductive research approach. This was achieved by using primary research where organized questionnaire was deployed for the interaction with primary research responded. The respondents were individuals or experts with knowledge of eHealth, ICT in health care service provider's facilities at the county referral hospital and other health facilities in Kakamega county in Kenya. The results suggest that there is a significant statistical relationship between the environmental sub factors and decision to adopt and implement eHealth technology. The findings advocate that for adoption and implementation of the eHealth technology do not just rely on technical expertise to evaluate the technology but also evaluate the environmental factors of the organization. This study mutually supports and contrasts previous findings providing new insights and avenues for future study.

Keywords : Information technology, eHealth, adoption, implementation, environmental factors, organization.

I. INTRODUCTION

Information technology is widely used to offer and convey health services globally. The application of technology or computer in health care facilities its fundamental for improving services and utilizing limited resources available [1]. Though there is extensive pact about the significance and benefits of using computers in healthcare (eHealth), accepting of these benefits has been slower than expected,

frequently because of problems with adoption and implementation of eHealth [2]. This point out a need for stakeholders involved in adoption and implementation of eHealth to appreciate factors that impacts the implementation and prepare themselves with plans to improve the actual use of eHealth. Numerous factors affect the implementation of eHealth [3]; in this study the researcher were only interested at Environmental factors that affects the implementation of eHealth.

The aim of this study was to investigate environmental factors that obstructs the implementation of eHealth and also provide knowledge for eHealth implementation to healthcare professional and investigators. The specific objective was to look at the environmental factors that were critical to implementation of eHealth and focus was mainly on six major factors i.e. Government Funding, Legal framework or policies, Infrastructure and availability of network, Government Implementation body, Political support and NGO/FBO and donors support.

2. Related study

Results from other study like one that was carried out by Ahmed Zayyad that investigated on factors that were affecting adoption of eHealth technology in Nigeria. The outcome from that study exposed that the level of adoption and implementation was low and mostly it was at pilot stages and poorly coordinated. Some environmental factors were pointed out like infrastructure, policies and strategies as some of the factors that were affecting the adoption and implementation [4].

Results from other studies like Health care expenditure, health status and national productivity in Nigeria by Eneji, admitted that there was low funding for healthcare services and gave example of Nigeria budget of 2016 where only 4.4% was allocated to healthcare and 4.1% allocation in 2017, the allocation was not as per the recommended world health organization which requires that at least 13 percent of the national budget should be allocated to health [5]. Funding either by the government or NGO is part of environmental factors that influences the adoption and implementation of eHealth.

3. Method

The purpose of the study was to investigate environmental factors that determines eHealth adoption and implementation. This was accomplished by administering questionnaire to the sampled respondents and also used evidence that was captured from secondary data. To get information about factors that determines eHealth implementation questionnaire was formulated on the following Environmental factors: government funding, legal framework and policies, infrastructure like electricity and power backups, political support and NGO support.

4. Sample size

The study used convenience sampling approach. Convenience sampling approach provided a simple and urgent approach in identifying potential respondent to the primary research. We had total of 112 respondents. The sample size was determined by Krejcie and Morgan [6].

5. Environmental factors and other factors affecting eHealth implementation.

A unit increase in environmental practices results in 0.158 increase in eHealth implementation. The model incorporating the variables is as shown below.

Figure 1 below shows the relationship between the environmental factors and other factors that affects the e-health implementation

Framework for eHealth implementation

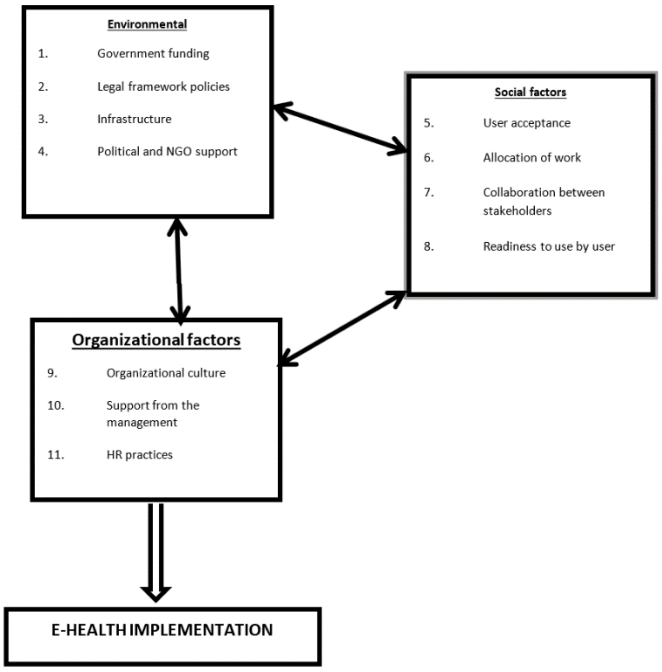

Figure 1

II. RESULTS AND DISCUSSION

Environmental factors as shown in table 1. below were critical in the adoption and implementation of eHealth, where the aspects were derived from primary studies which were classified under the six main factors: Government Funding or grants, Legal framework or policies formulated by the government providing support to eHealth, Infrastructure like electricity and power backup like electricity, solar, stand by generator and network readily available and working, Government Implementation body at the facility level, Political support and NGO/FBO and donors support.

From the findings it indicated that majority of the participant in the study were undecided on Government Funding by allocation of budget or grants at 34 (30.4%) even though we had 27 (24.1%) and 23 (20.5%) agreeing and strongly agreeing respectively we had a group that strongly disagreed and also disagreed at 10(8.9%) and 18 (16.1%) respectively. From this statistic it confirms that yes the government was allocating funds however as per national and county health budget analysis of 2018/2019 the majority of the allocation might be going for personnel emoluments which was high at 76% as opposed to 50 to 60%, hence the counties need to increase the allocation to critical inputs like eHealth to improve services [7]. The large percentage of those undecided means, from the allocation they get for development mostly it's not classified which illustrate that the budget was not efficient [7]. This was an indicator that counties need to increase allocation to development, where eHealth will be included as per health budget analysis of 2018/2019 by ministry of health it showered that counties like, Bungoma, Taita Taveta, Mombasa, Nairobi and Nyandarua almost their entire budget was for recurrent [1]. From the statistics if 16.1% of the respondent disagree that government funds by allocating budget or grants its means it concurs with the report on health budget analysis of 2018/2019 that counties per capita allocations were still low which averages at ksh 253 as compared to the WHO figure of ksh 8,600 which is recommended [7].

On Legal framework or policies formulated by the government providing support to eHealth, majority of the respondent 42 (37.5%) agreed and 18 (16.1%) strongly agreed however 25 (22.3%) were undecided and 10 (8.9%) and 17 (15.2) strongly disagreed and disagreed respectively. This means that most stakeholders were not aware that Ministry of Health established the Kenya Health Policy (2014-2030), which requires the country to provide the highest achievable standard of healthcare. By having more than 15.2% disagreeing that Kenya lack framework or policy formulated by the government contradicts the Kenya eHealth Policy which signifies an obligation towards using Information Communication Technology modernizations to improve health and wellness of Kenya's. We have eHealth Policy which suggests all-inclusive and inventive method to addressing an extensive variety of eHealth practices, investigation that represent an essential departure

from traditional healthcare delivery and access models. In addition, the policy is attached in the Constitution of Kenya 2010, Vision 2030, ICT Policy 2006 and the Health Policy (2014-2030) [8]. So by having a large percentage of participant strongly disagreeing or undecided means that the policy need to be made available to the stakeholders to be aware of it.

On Infrastructure like electricity and power backup like, solar, stand by generator and network readily available and working, the majority of the respondent 36 (32.1%) agreed that electricity was available, followed by 34 (30.4%) who strongly agreed. However, we had undecided and those who strongly disagreed at 26 (23.2%) and 10 (8.9%) respectively. This means that some hospital doesn't have electricity, solar, generator or network is not available. And this are key to successful implementation and adoption of eHealth systems [8]. So necessary infrastructural like electricity need to be in place as it's a drive for implementation of eHealth systems.

On political support majority of the participant 33 (29.3%) disagree followed by 21 (18.8%) strongly disagreed and 23 (20.5%) being undecided. Only 17.9% and 13.4 % agreed and strongly agreed respectively that we have political support. The findings fail to concur with the fact that political support will provides an enabling environment for eHealth as per Ayub Manya presentation on eHealth and Mobile Strategies in Kenya [9].

On Faith-Based and Nongovernmental Organizations the majority were 37(33.0%) who agreed and 17.0% who strongly agreed. But also we had 25.0 % who strongly disagreed meaning we have some health facilities which were not getting NGO support. And from our discussion on government budget allocation it was not enough to provide enabling environment for eHealth adoption and implementation. Hence from these findings it indicated that most hospitals were operating within constraint budget because of underfunding from both government and NGO's. Because adopting and implementing of eHealth is costly and calls for higher funding may not be easy to adopt and implement eHealth because of low funding from both government and FBO and NGO [10]. Funding of the health sectors determines the adoption of e-health [10]. This shows that increased funding from NGO/FBO and donors support is strongly collated with adoption of eHealth even in cases of developed countries and this should apply to Kenya too [10].

Table 1. Descriptive statistics on Environmental factors

Description	N	SD (%)	D (%)	U (%)	A (%)	SA (%)	Mean	S.D
Government Funding by allocation of budget or grants	112	10 (8.9)	18 (16.1)	34 (30.4)	27 (24.1)	23 (20.5)	3.31	1.223
Legal framework or policies formulated by the government providing support to E-health	112	10 (8.9)	17 (15.2)	25 (22.3)	42 (37.5)	18 (16.1)	3.37	1.185
Infrastructure like electricity and power backup like electricity, solar, stand by generator and network readily available and working.	112	10 (8.9)	6 (5.4)	26 (23.2)	36 (32.1)	34 (30.4)	3.70	1.214
Government Implementation body at the facility level	112	5 (4.5)	18 (16.1)	35 (31.3)	41 (36.6)	13 (11.6)	3.35	1.029
Political support	112	21 (18.8)	33 (29.5)	23 (20.5)	20 (17.9)	15 (13.4)	2.78	1.313
NGO/FBO and donors support	112	6 (5.4)	28 (25.0)	22 (19.6)	37 (33.0)	19 (17.0)	3.31	1.178

Source: Researcher (2021)

The results of correlation analysis are as shown in Table 2 The findings indicated that there was a strong positive and significant relationship between environmental factors and Implementation of e-health services. This is depicted by a Pearson

correlation coefficient r=0.716, p-value =0.002<0.05 which was significant at 0.05 level of significance. This implies that increased environmental services results in an increase of implementation of e-health services

Table 2 Correlation analysis

		Implementation of e-health services	Environmental factors
Implementation of e-health services	Pearson Correlation	1	
	Sig. (1-tailed)		
Environmental factors	Pearson Correlation	.716	1
	Sig. (1-tailed)	.002	

*. Correlation is significant at the 0.05 level (1-tailed).

III.CONCLUSION

The investigation results have shown that there are environmental challenges for assimilating technology in health care facilities. Some health facilities are lacking infrastructures; Health facilities are not meeting the requirements for technology implementation (eHealth) because of the budget allocation which is not enough to use to acquire infrastructure, equipment, for training programs, and the change management required to introduce the associated new technology (eHealth).

Due to the underlined problems not being determined, it's likely that the adoption and implementation of eHealth commonly will be delayed cross health facilities. From the analysis our health facilities are not in position to meet the threshold necessary to propel them to fruitful status for eHealth implementation, slightly most health facilities will remain at stages of experimental or trial. The investigation shows that there is need for stakeholders to analytically reflect on environmental factors relationship and interaction with the other aspect.

Authors' Note

The sentiments conveyed here are exclusively the authors' and do not reflect the opinions or official position of any other person or groups.

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Declaration of Conflicting Interests

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Appendix I

Questions Addressing environmental factors.

Indicate how the following factors positively or negatively affect the daily use of eHealth systems of health practitioner

Scale of 5: 1=Strongly disagree 2=Disagree 3=Undecided 4=Agree 5=Strongly agree

Environment Factors (Factors External to the Organization)

B1. Government funding by allocation of budget or grants.

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐

B2. Legal framework or policies formulated by the government providing support to E-health

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐

B3. Infrastructure like electricity, sola, stand by generator and network readily available and working

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐

B4. Government Implementation body at the facility level

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐

B5. Political support

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐

B6. NGO support

1. Strongly disagree ☐ 2 Disagree ☐ 3 Undecided ☐ 4 Agree ☐ 5 Strongly agree ☐