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Use of Electronic Medical Records and Job Performance of Health Records Officers in Tertiary Hospitals in North-Central Nigeria

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ABSTRACT

This paper investigated the influence of Electronic Medical Records (EMR) use on job performance of health records officers in tertiary hospitals in North-Central Nigeria. The study employed survey research design with a total population of 211 health records officers as participants. A sample size of 136 health records officers was determined using stratified proportionate sampling technique. Data were collected with a questionnaire tagged data collection on use of Electronic Medical Records (EMR) and job performance of health records officers, reliability coefficients of job performance is (0.91) that of organizational policies is (0.84) while the extent of use of EMR coefficient is (0.85). Data were analysed using descriptive and inferential statistics. Findings showed that the level of job performance of health records officers was very high ($\bar{x}$=3.58). The overall extent of use of electronic medical records (EMR) was very high ($\bar{x}$ =3.65). Use of EMR significantly influenced job performance of health records officers (R^2= 0.117, β = 0.351, t(128) = 4.259, p<0.05). The study concluded that use of EMR plays crucial roles in the job performance of health records officers in tertiary hospitals in North-Central Nigeria. The study

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recommended that the management of tertiary hospitals should sustain the current level of job performance and extent of EMR use and address the identified challenges.

Keywords: **Health records officers, Job performance, Electronic medical records, Tertiary hospitals, Use of electronic medical records**

Introduction

Health records are created to give written account of patients' demographic information, family and medical histories, medications, tests ordered, treatment given and outcome of care rendered. We have manual records also refers to as paper or traditional records and Electronic Medical records (EMR) or digital version of paper records. Health records whether manual or electronics is a veritable tool used in documenting events that happen to patient during the visit or stay in the hospital. It takes accounts of all clinical activities about the patients which is maintained, stored and retrieved to follow up patient's health or medical conditions and as such an important aspect of patient's health life. Health records, sometimes refers to as medical records, is a communication tool between healthcare providers in the course of patient treatment. According to Bali, Bali, Iyer and Iyer (2011) medical records are essential documents that explain all details about patients' medical history, clinical findings, diagnosis test made, patient's progress and medications given. Health records is an important tool in tertiary hospital used to refresh the memory of care providers such as doctors and nurses, take clinical and administrative decisions, evaluate outcome of care, compile morbidity and mortality statistics, conduct clinical or medical research, training, education and as well serves as evidence in the court of law. Health records officers are responsible for health records keeping in tertiary hospitals and as such their performance is vital in the overall delivery of quality of healthcare.

Performance is a key indicator of productivity of employees in the tertiary health institutions. Substandard services and poor quality of care have been reported in tertiary hospitals in Nigeria and this is due to lack of vital equipment, insufficient personnel and poor funding (Alkali, Nura & Bello, 2020). Job performance, according to Campbell (1990), refers to actions or behaviours relevant to organisational goals which include both productive and counterproductive employees' behaviours that either contribute to or detract from organizational goals. Viswesvaran and Ones (2017) defined job performance as behaviour and outcomes that employees undertake that contribute to organizational goals. Health records officers play essential role in healthcare delivery in any given health institution particularly with reference to critical decision making by health professionals, hence the need for high performance. This is because the amount of medical data or information required for clinical planning and decision-making continues to rise, mostly in developing countries. In view of this, poor job performance of health records officers can negatively affect the job of other care providers such as nurses and doctors. Therefore, the job performance of health records officers is central in ensuring effective and efficient service delivery by health and medical professionals.

Consequently, health record officers are required by policy to ensure the creation, archiving and accessibility of vital patients' records that can aid the delivery of quality healthcare services by health workers. Despite these important roles, the literature (John, 2007; Hlengane & Bayat, 2013) have established poor job performance of organizational employees and healthcare professionals including health records officers in tertiary hospitals. Soilkki, Nadeem and Anis (2014) found lack of training (68%), inadequate equipment (70%), inadequate staff (87%), poor remuneration (45%) and communication gap between nurses and management (77%) as major factors responsible for poor job performance of nurses and this can be applied to job performance status of health records officers as well.

Poor job performance and low productivity of health workforce are due to incompetency resulting from lack of training and required skills, lack of motivation, enabling environment and absenteeism (USAID, 2018). Studies such as (Adeleke, Lawal, Adio & Adebisi, 2015; Takalani, Tebogo, Pamela & Masenyani, 2018) have established poor health records keeping which is an evidence of poor job performance of health records officers. Yaya, Asunmo, Abimbola and Onyenekwe (2015) averred that without accurate, comprehensive, up-to-date and accessible case notes, medical personnel such as doctors and nurses may not be able to offer the best treatment. They may even give wrong diagnoses which can have serious consequences on the affected patient. Poor health records keeping might not be unconnected with manual system of records management being operated. The use of EMR has been identified as a good alternative method to address and improve on the job performance of health records officers (Amin & Yatin, 2020).

Deployment of Information Communication and Technology (ICT) enhances productivity (Ngantchou, 2016; Tomo & Todisco, 2018; Kshirsagar, 2018). Boyinbode and Toriola (2015) asserted that the use of Electronic Health Records (EHR) is to increase patients' access to care while ensuring seamless workflow. The Centre for Diseases Control (CDC) (2020) similarly found an increase of 25% in patients' visits and that patients are better identified after the implementation of EHRs at South Omaha Medical Associates (SOMA), Nebraska. However, few efforts have been made to research the use of Electronic Medical Records (EMR) and job performance of health records officers in tertiary hospitals in North-Central Nigeria. Therefore, this research paper investigated the influence of use of electronic medical records on job performance of health records officers in tertiary hospitals in North-Central Nigeria.

Research Questions

The study has provided answers to the following research questions:

1. What is the level of job performance of health records officers in tertiary hospitals in North-Central Nigeria?

2. How is EMRs used in tertiary hospitals in North-Central Nigeria?

3. What are the challenges of the use of EMRs by health record officers in tertiary hospitals in North-Central Nigeria?

Hypothesis

The study tested the below hypothesis at 0.05% level of significance.

H_0: use of electronic medical records will have no significant influence on job performance of health records officers in tertiary hospitals in North-Central Nigeria.

Literature Review

Job performance is the accomplishment of specific targets measured against pre-set standards or expected level of accuracy and completeness (Sultana, Irum, Ahmed & Mehmood, 2012). When employees have performed their tasks up to the required standard they can be considered as good performers. Sila (2014) stated that performance is how well someone completes a particular task and additionally the perception with which he/she completes that task. Bharadwaj (2015) opined that high performing employees pursue higher level of individual and organisational performance. The findings of a research carried out by Al-Homayan, Shamsudin, Subramaniam and Islam (2013) in Saudi Arabian public sector hospitals showed a moderate level of job performance among nurses'. Ojo and Owolabi (2017) found that patients' overall level of satisfaction with the health information management personnel services in the hospital in Ogun state was moderate; patients' perception of the quality of health information management personnel service was average while the perceived health information management personnel service quality significantly influenced patients' satisfaction. Several other studies have rated job performance of healthcare workers low due to factors such as substandard services and poor quality of care, lack of vital equipment, insufficient personnel and poor funding (Okab, 2017, Alkali, Nura & Bello, 2020). The study of Olapojoye (2017) among health records officers in tertiary hospitals in North-Central Nigeria showed that poor job performance was manifested in records management problems, incompetent staff skills, poor decision making, long patient waiting time and difficulty in filing medical records prescriptions.

Electronic Medical Records (EMRs) is a digital version of paper records created to store and produce patients' records on demand. It is an important tool in tertiary hospitals which is used to refresh the memory of care providers such as doctors and nurses, take clinical and administrative decisions, evaluate outcome of care, compile morbidity and mortality statistics, conduct or medical research and serves as evidence in the court of law. Ogundele, Ikonne and Madukoma (2021) defined EMR as a digital version of a patient's paper chart that gathers, creates, and stores health record electronically; with facilities for tracking patient demographics, medical histories, medications, test results and other types of patient-specific clinical information, as well as the costs associated with the services provided. Electronic medical record (EMR) is an enabling technology that focuses on improvement in quality healthcare management. Basically, it concerns is to streamline the work processes and accountability, improved results management and patient care with a reduction in errors and legibility of records. According to Lamont (2015), almost 70% medication problems improved when EMR is implemented. In clinical productivity, although EMR is a single entry, it provides multiple uses for healthcare professionals in hospital. Electronic medical records have the capability to capture and store a huge amount of patients'

information; such a large database results in quality improvement and cost effectiveness (Sidorov, 2016).

EMR is often used interchangeably with Electronic Health Records (EHR) but there is difference between the two. While EMR is a narrower view of patient medical history EHR is a more comprehensive overall report of patient health condition. Poba-Nzaou (2016) defined EHR as electronic of health related information of an individual that conforms to nationally recognized interoperability standards and that can be created, managed and consulted by authorized clinicians and staff across more than one healthcare organization. Lambooij, Drewes and Koster (2017) investigated the use of electronic medical records and quality of patient data using different reaction patterns of doctors and nurses to the hospital organization in Bilthoven, Netherlands. Results indicated that doctors and nurses differ in their response to the organizational factors (support of IT, HR and administrative departments) considering the success of the implementation. Kazley, Diana, Ford, and Menachemi (2011) investigated electronic health records use associated with patient satisfaction in hospital in non-federal acute hospital in the US, 3000 hospitals focusing on acute myocardial infarction, congestive heart failure and pneumonia were sampled and found no clear evidence that the EMR use could improve care quality. The study however found a positive effect of the EMR use on four out of ten quality indicators and a negative effect on one out of those ten quality indicators. Hing and Hsiao (2007) conducted an investigation on EMR use by office-based physicians and their practices in US, findings revealed that use of EMR is higher among physicians with multispecialty as against physicians in the solo or general practices. The study also showed that female are more likely in acquiring and use EMR system.

Methodology

The research design was a survey carried out in five tertiary hospitals which are already using Electronic Medical Records (EMR) in North-Central, Nigeria. The population comprised 211 health records technicians and health record officers. F A sample size of 136 was drawn from the population using Krejcie and Morgan (1970) Formula. A stratified proportionate sampling technique was used. Data were collected with a structured questionnaire. Cronbach's alpha reliability coefficients for that the constructs were as follows: job performance (0.91), organisational policies (0.82) and use of EMR (0.85). Data were analysed using descriptive and inferential statistics.

Results

Research Question One: what is the level of job performance of health records officers in tertiary hospitals in North-Central Nigeria.

Table 1: Level of job performance of health records officers in tertiary hospitals in North-Central Nigeria

Statements	**Very High Level (4)**	**High Level**	**Low Level**	**Very Low**	**Mean**	**Std.**
Indicate your level of agreement to the						

following statements		**(3)**	**(2)**	**level (1)**		
Timely job delivery					**3.60**	**.37**
I usually type patients' data faster and better while using EMR to a…	97(74.0%)	34(26.0%)			3.74	.44
I keep to time in delivering any assignment given to me to a…	99(75.6%)	29(22.1%)	01(0.8%)	02(1.5%)	3.72	.56
Saved patients' data are accessed timely and easily as at when due to a…	98(74.8%)	29(22.1%)	03(2.3%)	01(0.8%)	3.71	.55
Effectiveness of access to patients' records is to a…	85(65.6%)	39(29.8%)	06(4.6%)		3.62	.59
Answering information requests is usually timely to a…	76(58.0%)	47(35.9%)	07(5.3%)	01(0.8%)	3.51	.64
Period of accessing patients' records is usually timely the use of EMR to a…	48(36.6%)	75(57.3%)	05(3.8%)	03(2.3%)	3.28	.65
Effective communication					**3.56**	**.48**
I communicate meaningfully with patients in my line of duty to a…	110(84.0%)	19(14.4%)	01(0.8%)	01(0.8%)	3.82	.46
I communicate with my colleagues regularly to a…	98(74.8%)	23(17.6%)	03(2.3%)	07(5.3%)	3.62	.78
I receive useful feedback from superiors on my job performance to a…	87(66.5%)	38(29.0%)	04(3.0%)	02(1.5%)	3.60	.63
I communicate regularly with my supervisor to a…	89(67.9%)	33(25.2%)	05(3.8%)	04(3.1%)	3.58	.71
Hospital goals are clearly communicated to me to a…	82(62.6%)	40(30.5%)	05(3.8%)	04(3.1%)	3.53	.72
The people in my department have shared understanding of departmental goals to a…	48(36.6%)	72(55.0%)	06(4.6%)	05(3.8%)	3.24	.71
Minimal supervision					**3.55**	**.32**
Without supervision, I pay attention to details to a…	108(82.4%)	19(14.5%)	03(2.3%)	01(0.8%)	3.79	.51
I enjoy autonomy in discharging my duties to a…	93(71.0%)	34(26.0%)	04(3.0%)		3.68	.53
I enjoy working with my supervisor around me to a…	88(67.1%)	30(22.9%)	12(9.2%)	01(0.8%)	3.56	.69
I complete my tasks faster without supervision to a…	71(54.3%)	56(42.7%)	04(3.0%)		3.51	.56
I enjoy working with my co-workers to a…	61(46.6%)	70(53.4%)			3.47	.50
Under supervision, my performance is to a...	62(47.4%)	59(45.0%)	08(6.1%)	02(1.5%)	3.38	.67
Job performance (Average Weighted Mean = 3.58)						

Decision Rule: 1.0-1.49 = Very Low Level; 1.50-2.49 = Low Level; 2.50-3.49 = High Level; 3.50-4.0= Very High Level.

The result of Table 1 showed that, the level of job performance of health records officers in tertiary hospitals in North-Central Nigeria was very high ($\bar{x}$=3.58). Job performance was divided into three dimensions, namely timely job delivery ($\bar{x}$=3.60), effective communication ($\bar{x}$=3.56) and minimal supervision ($\bar{x}$=3.55) in the tertiary hospitals.

Research Question Two: To what extent are EMRs used in tertiary hospitals in North-Central Nigeria?

Research question two was analysed with frequency counts, percentage, mean and standard deviation. The results of the analysis are reported in Tables 2.

Table 2: Extent of use of EMR in tertiary hospitals

Statements Indicate the extent to which your use of EMR enhances your job performance	**Very High extent (4)**	**High Extent (3)**	**Low Extent (2)**	**Very Low Extent (1)**	**Mean**	**Std.**
I use EMR to create and maintain patients' records faster to a…	107(81.7 %)	23(17.5%)	01(8%)	0	3.81	.41
The use EMR enables me to easily enter codes for diagnosis or procedures to a…	104(79.4 %)	27(20.6%)	0	0	3.60	.55
Use of EMR enables faster entering of patients' daily notes to a…	76(58.0%)	54(41.2%)	01(0.8%)	0	3.51	.64
My use of EMR enhances seamless access to other computer terminals to a...	77(58.7%)	42(32.1%)	12(9.2%)	0	3.50	.66
Using EMR helps me to create and maintain patients' demographic data with less effort to a…	100(76.3 %)	28(21.4%)	02(1.5%)	01(0.8%)	3.73	.52
I use EMR to book patients' appointment to a…	106(80.9 %)	23(17.6%)	02(1.5%)	0	3.79	.44
I use EMR to code patients' diagnoses according to ICD10 provisions to a…	102(77.9 %)	21(16.0%)	06(4.6%)	02(1.5%)	3.70	.63
I use EMR to transfer patients' records and related information to a…	85(64.9%)	38(29.0%)	08(6.1%)	0	3.59	.61
I use EMR to document patients' admission and discharge instruction to a…	102(77.9 %)	29(22.1%)	0	0	3.78	.42
I use EMR to create and maintain	100(76.3	28(21.4%)	02(1.5%)	01(0.8$)	3.73	.52

patients' demographic data to a…	%)					
I use EMR to create and maintain patients' medical history to a…	90(68.7%)	33(25.2%)	08(6.1%)	0	3.63	.60
I use EMR to document and treat patients' complaints to a…	87(66.9%)	35(26.8%)	07(5.4%)	01(0.8%)	3.60	.63
I do not require expertise to use EMR before creating and maintaining patients' personal records to a…	78(59.6%)	39(29.8%)	11(8.3%)	03(2.3%)	3.47	.75
EMR Use (Average Weighted Mean = 3.65)						

Decision Rule: 1.0-1.49 = Very Low Extent; 1.50-2.49 = Low Extent; 2.50-3.49 = High Extent; 3.50-4.0= Very High Extent.

Respondents were asked to indicate their extent of use of EMRs used in tertiary hospitals in North-central Nigeria. The result in Table 2 shows that the overall extent of use of EMR was considered to be 'Very High', as indicated by the average weighted mean score (3.65), on a scale of 4. The very high extent of utilisation of EMR could be based on the fact that the health records officers performed very high in nearly all indicators of use of EMR as shown in Table 2.

Research Question Three: What are challenges of the use of EMRs by health record officers in tertiary hospitals in North-Central Nigeria?

The result of research question three is as shown in Table three below:

Table 3: Possible challenges of the use of EMRs

Challenges	**Yes**	**No**
Lack of alternative sources of power supply affects the use of EMRs.	104(73.4%)	27(26.6%)
Lack of technical training and support affect EMR use.	105(80.1%)	26(28.2%)
Long time to learn the system affect EMR use.	96(73.3%)	35(26.7%)
Lack of computer skills of the medical record staff affect EMR use.	98(74.8%)	33(25.2%)
Uncertainty over return on investment affects EMR adoption and use.	93(71.0%)	38(29.0%)
Management at the top have not embraced EMR adoption and use.	75(57.3%)	56(42.7%)

High start-up costs affect EMR systems adoption and use.	100(76.3%)	31(23.7%)
Using EMR causes breach of confidentiality and invasion of patient's privacy.	74(56.5%)	57(43.5%)
Lack of back-up facilities (other computer terminals) to facilitate the use of EMR.	88(67.2%)	43(32.8%)
Using EMR leads to spending more time per patient.	69(52.7%)	62(47.3%)

The result in Table 3 showed that challenges of use of EMR are lack of alternative sources of power supply (74.8%), lack of technical training and support (80.1%) and long time to learn the EMR system 73.3%) constituted major challenges impeding the use of EMRs by health record officers in tertiary hospitals of North-central Nigeria. Other challenges of the use of EMRs by health record officers in tertiary hospitals of North-Central Nigeria include lack of computer skills of the medical record staff (74.8%), uncertainty over return on investment (71.0%), management at the top have not embraced EMR adoption and use (57.3%), high start-up costs (76.3%), breach of confidentiality and invasion of patient's privacy (56.5%), lack of back-up facilities (67.2%) and spending more time per patient (52.7%)

Test of Hypothesis

Use of Electronic Medical Records (EMRs) will not significantly influence job performance of health records officers in tertiary hospitals in North-Central Nigeria. The hypothesis was tested with simple linear regression analysis. The results of the regression analysis are presented in Tables 4.

Table 4: Simple linear regression analysis on the influence of use of EMR on job performance of health records officers in tertiary hospitals in North-Central Nigeria

Predictors	**B**	**Beta (β)**	**T**	***P***	**R^2**	***Adj.* R^2**	**F**	**ANOVA (Sig.)**
(Constant)	2.525		10.193	.000	0.123	0.117	18.143	0.002
Use of EMR	.288	.351	4.259	.000				
Dependent Variable: Job performance Predictors: (Constant), Use of EMR DF (F-Statistic) = 1, 129 DF (T-Statistic) = 128								

According to the result of Table 4, use of Electronic Medical Records (EMR) has significant influence on job performance of health records officers in selected tertiary hospitals in North-

Central Nigeria (R^2= 0.117, β = 0.351, *t* (128) = 4.259, *p*<0.05). The model shows that use of EMRs accounts for 11.7% (R^2= 0.117) change in job performance of health records officers in the tertiary hospitals.

Discussion of the findings

This study examined the use of Electronic Medical Records (EMR) use and job performance of health records officers in tertiary hospitals in North-Central Nigeria. Findings from research question one show that the level of job performance of health records officers in tertiary hospitals in North-Central Nigeria was very high. This finding supports Bharadwaj (2015) who opined that high performance work practices is associated with relational coordination and that high performance employees pursue higher level of individual and organisational performance which involves quality and productive performance. In support also, is Ojo and Owolabi (2017) who argued that patients' overall level of satisfaction with the health information management personnel services in the hospital studied was moderate; patients' perception of the quality of health information management personnel service was average while the perceived health information management personnel service quality significantly influenced patients' satisfaction. However, in contrast to this study, some other studies rated job performance of healthcare workers low due to factors such as substandard services and poor quality of care, lack of vital equipment, insufficient personnel and poor funding (Okab, 2017; Alkali et al, 2020).

Findings further showed that the use of EMRs in tertiary hospitals in North-central Nigeria was considered to be very high. This finding is in line with those of Kharrazi et al. (2018) in the United States, Poissant et al. (2005) Canada and Mohammedjud et al. (2020) in Ethiopia. For instance, Poissant et al. (2005) found that the use of EMR connected with bedside terminals and central station desktops saved nurses' overall time spent documenting during a shift by 24.5 percent and 23.5 percent respectively. There are a number of challenges of the use of EMRs by health record officers in tertiary hospitals of North-central Nigeria. These challenges include lack of alternative sources of power supply, lack of technical training and support, long time to learn, lack of computer skills of the medical record staff, uncertainty over return on investment, management at the top have not embraced the use of EMRs, high start-up costs, breach of confidentiality and invasion of patients' privacy, lack of back-up facilities and spending more time per patient.

This finding is in agreement with the studies such as (Attah, 2017; Gans, Kralewski & Dowd, 2005; Mller & Sim, 2004) which found out similar challenges associated with the use of Electronic Health Records (EHRs).

The result of the hypothesis revealed that use of Electronic Medical Records (EMRs) has significant influence on job performance of health records officers in selected tertiary hospitals in North-Central Nigeria (R^2= 0.117, β = 0.351, *t* (128) = 4.259, *p*<0.05).

Conclusion

The study demonstrated that use of EMR is the key and critical factor for improving job performance of health records officers in tertiary hospitals in North-Central Nigeria. It revealed

that health records officers in the tertiary hospitals in North-Central performed very highly in areas such as typing of patients' data, quick accessibility of saved patents' data, and access to patients' records. The work established a positive and significant influence of the independent variable (EMR use) on job performance of health records officers in tertiary hospitals in North-Central. It can be concluded that Electronic Medical Records (EMR) has significant relationship with the job performance of health records officers in tertiary hospitals in North-Central Nigeria.

Recommendations

Based on the findings of the study, it was recommended that:

1. The high job performance of health records officers and the high extent of use of EMRs discovered in the study should be sustained by the management of tertiary hospitals in the study areas.

2. The management should address the challenges limiting the of use of EMR namely, lack of alternative sources of power supply, lack of technical training and support, long time to learn and lack of computer skills of the medical record staff.

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