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FACTORS AFFECTING IMPLEMENTATION OF COMPUTER-BASED CLINICAL DOCUMENTATION AMONG NURSES IN SELECTED HOSPITALS, AKURE, ONDO STATE, NIGERIA

Mary Idowu Edward[1], Olufunke Mercy Iwaola[2], Folakemi Beatrice Adumaza[2], and Oluwatoyin Esther Fayose[3]

[1]Faculty of Nursing Sciences, Department of Adult/ Mental Health Nursing, University of Medical Sciences, Ondo City, Ondo State, Nigeria
[2]Faculty of Nursing Sciences, Department of Maternal Neonatal and Child Health Nursing University of Medical Sciences, Ondo City, Ondo State, Nigeria
[3]University of Medical Sciences Teaching Hospital, Ondo, Ondo State, Nigeria

ABSTRACT: *Computer-based clinical documentation in nursing care is presently been practiced in some hospitals both in developing and developed countries. The research assesses factors influencing implementation of computer-based documentation by nurses in State Specialist and Mother and Child Hospitals, Akure, Ondo State. A well-structured questionnaire was used to collect data. Findings revealed that the majority of the nurses already have good knowledge and perception about computer and computer-based documentation however, it is not being implemented in these hospitals. The results also revealed various factors affecting the non-implementation include lack of infrastructure 93.0% been the highest considered factor and inability to operate computer was the least considered factor 31.9%. Other factors include inadequate power supply 88.9%; time consuming 74%; Non-availability of computers and accessories 71.7%; the cost of selecting and implementing computer system 66.37%; fear of increase task 56%; government policy. 54.6% change of shift, medical rounds 40.1%. It is therefore recommended that the government should provide funds, adequate computers to each ward and adequate power supply should also be available so as to facilitate the use of computers in the documentation.*

KEYWORDS: Computer-Based Documentation, Clinical Documentation, Nurse, Non-Implementation

INTRODUCTION

Background to the Study

The recent advancement in computer and information technology has contributed in no small measures to changes in nursing and the overall health care system. Contemporary health care faces many changes on account of emerging and re-emerging diseases but nothing will change the way health care is provided more than the current advances in information, communication, and technology (Mattew, Kipturgo, Lucy, Kivuti, Ann, Magaret & Muiva 2014). In today's health care environment, it is imperative for nurses to adapt to technological advancement in order to address complex health care issues and deliver optimal nursing care (Sarah, 2013). Quality of care is greatly influenced by a nurse's ability to access accurate and comprehensive health information (Sarah, 2013). The transition from paper documentation to electronic charting can facilitate this process and greatly improve the quality of nursing documentation. This technology change can also address system inefficiencies that result

from paper-based charting (Sarah, 2013). Evidently, the implementation of electronic clinical documentation is essential to enhance the provision of safe, ethical, and effective nursing care. (Sarah, 2013; Curtis, 2011; McDowell, Lending, 2008).

Electronic clinical documentation is also known as computerized documentation or computer-based documentation is an electronic information system used by nurses and other health care professionals to systemically document clinical information that pertains to the health of an individual (Sarah, 2013). In the practice setting, this collection of information is usually referred to as the patient's electronic health or medical record. Information contained in this file includes assessment data, medication orders, clinical interventions, care plans, consults, nursing histories, laboratory data, medication orders, and client outcomes (Gliklich, 2014). This record is also used to facilitate structured communication between nurses and other members of the health care team, and to promote the delivery of quality care. It is theorized that a transformation of health care processes will come about when timely and accurate information is made available when, where and for whom it is needed (Wain & Waring, 2010) including the various stakeholders involved in the delivery and management of care and in some models, the patients themselves or their family (Pincirol & Pagliaric, 2015). The use of effective information and communication technologies and systems (ICT) underpins this vision (Cucciniello, Lapsley, Nasi & Pagliari, 2015; Black, Car, Pagliari, Anandan, Cresswell & Bokun, 2011) although the health care sector has been less successful in exploiting the potential of ICT than other sectors (Ovretveit, Scott, Rundall, Shortelle,& Brommelsa 2007). Despite the above aspiration it has been estimated that between 50 and 80 percent of electronic medical record project fails in the health care sector (Greenhalgh, Humphery, Hughes, Macfarlane, Butler & Pawson, 2009, Cucciniello, et al, 2015).) outside the sphere of carefully controlled trials.

The health care environment is continually changing and evolving. Nurses are making great strides to adapt to these changes in an attempt to meet complex health care demands (Medifors Health Care Consulting). The transition to electronic documentation is one technological change that showed significant implications for the nursing profession and the overall health care system (David, 2007). This method of documentation has proven to assist nurses in addressing problems that occur as a result of paper-based documentation and also improve the accuracy and comprehensiveness of patient information and enhance the provision of quality nursing care (Laura, 2013) nevertheless, nurses do not use computer-based documentation to document patients information. However, various studies showed that factors like security issues, technical skills, changing in working processes and lack of training and knowledge of users on how to use these systems are the factors which prevent using the information systems in the health care sector(Leila, Nafise, Reza & Sadrieh, 2017); The health care environment is continually changing and evolving. Nurses are making great strides to adapt to these changes in an attempt to meet complex health care demands (Sarah, 2013). The transition to electronic documentation is one technological change that showed significant implications for the nursing profession and the overall health care system (David, 2007). This method of documentation will assist nurses in addressing problems that occur as a result of paper-based documentation, improve the accuracy and comprehensiveness of patient information and ensure provision of quality nursing care**.** However, computer-based document is not in use by nurses in some hospitals. Various studies showed that factors like security issues, technical skills, changing in working processes and lack of training and knowledge of users on how to use these systems are the factors which prevent using the information systems in the health care sector (Leila, Nafise, Reza & Sadrieh, 2017)

Broad Objectives

This study assesses the factors affecting the non-implementation of computer-based clinical nursing documentation in State Specialist and Mother and Child Hospitals, Akure.

Specific objectives

- To assess the knowledge of nurses about computer-based documentation
- To identify the perception of nurses towards the use of computer-based documentation to identify the factors affecting the non-implementation of computer-based documentation

Research Questions

- What is the level of knowledge of nurses on computerized documentation?
- How do nurses perceive computerized documentation?
- What are the factors affecting the non-implementation of computerized documentation?

LITERATURE/THEORETICAL UNDERPINNING

The computerization of nursing documentation systems necessitates both structural and behavioral change (Kelley, Brandon, & Docherty, 2011). The implementation of this electronic documentation project can address many problems experienced by nurses in a practice setting and greatly assist them in meeting professional goals and organizational standards (Oroviogoicoechea, 2010; Pfortimillier, 2011). Electronic documentation can also address workflow issues. According to Turisco& Rhoads, (2008) new computerized documentation systems generate work lists and alerts features that offer nurses an "electronic helping hand," and assist them prioritizing and managing their care. Electronic documentation systems also reduce documentation redundancies and promote quicker retrieval of clinical data (Curtis, Turiscio & Rhoads, 2011).

Furthermore, these systems allow multiple healthcare providers to simultaneously access patient records to enhance collaboration among health care providers and strengthen interdisciplinary care. In a research carried out in some health facilities in North America various factors were identified which are; complexity, cost, adaptive and lack of planning (Jamie, Fiona, & Rosa, 2016) and also according to Pfortmillier (2011), the implementation of computerized systems have a much greater chance to succeed if nurses believe that they can accept the change and change will have positive implications for patient care. Kurt Lewin's theoretical framework demonstrates the complexities that occur as a result of the change process and offers a strategies approach to support the implementation of this technological advancement (Bozak, 2003).

Quality of care is greatly influenced by nurses' ability to assess health information. The transition from paper to electronic charting can facilitate this process and greatly improve the quality of nursing documentation. (Oroviogoicoecha Watson & Remirez, 2012, Pfortmillier, Mustain, Lowry 2011).

According to Kurt Lewis's model of change offers a structured approach that can help nurses identify the need for change, navigate through the change process and achieve desired goal or outcome (Bozak 2003). Lewin's approach to change management can be very useful for health care organizations that strategically plan changes in an attempt to meet ongoing health care demands. Lewin 's force field analysis model can also assist nurses in analyzing the change process and in identifying forces that support or resist the change (Bozak 2003)

Application of Lewin's Change Management Theory

Adhering to Lewin's model, the first step of the changing process involves unfreezing the change. To accomplish this step, it is necessary for the nurse informaticists to identify and prioritize driving and restraining forces in the practice setting (Bozak, 2003). The nurse informacists can generate this information by brainstorming and collaborating with administrative staff and nursing colleagues. Additionally, input should be obtaining from other health care professionals, since all disciplines were affected by the transition from paper to electronic documentation. Examples of driving forces relate to the implementation of electronic documentation include; the desire to improve the method of documentation, the belief that electronic documentation will facilitate access to accurate and comprehensive clinical information, previous experience with computers and positive attitudes towards computerization. Other potential driving forces include adequate training, supportive management, desire to expanding personal knowledge, insufficient financial resources and positive organizational culture (Bozak, 2003).

Noah (2011) also identified possible restraining forces such as inadequate training, unsupportive management, reluctance to learn something new, insufficient financial resources, and negative organizational culture. Other restraining forces include; the desire to continue to use paper-based documentation, lack of computer experience and negative attitudes towards computers. Once all these forces have been identified, the nurse informaticists should proceed to develop a plan to strengthen the driving forces and weaken or eliminate the restraining forces, it is crucial for the nurse informaticist to maintain open communication with the nursing staff and involve them in all stages of the planning process (Bozak, 2003, Sassen, 2009).

The second step of lewin's model involves perusing the plan that was proposed in step one, and actually implementing the change (Kaminski, 2011). As with the previous step, the nurse informaticists should continue to communicate with the nursing staff and acknowledge their suggestions and opinions. The nurse informaticist should also help the staff to recognize the benefits of electronic documentation according to Bozak (2003); employees are more likely to support the change if they understand the benefits of electronic documentation and are actively involved during the planning and implementation process. The nurse informacists should also help the staff to recognize the benefits of electronic documentation. Employees are more likely to support the change if they understand the benefits of electronic documentation and are actively involved during the planning and implementation process. The nurse informatics' should also continue to closely monitor for changes in staff attitude and behaviors throughout this step (Pfortmiller et al 2011). Undoubtedly, the implementation of the electronic documentation will disrupt normal changes in workflow, which may evoke negative feeling or behaviors among staff. If this occurs, the nurse informaticist must return to strategies used during the unfreezing stage (Kaminski, 2011). Once the staff has accepted

and successful transitioned from paper to electronic documentation, the organization can proceed to final stage of lewin's model.

At this point of the process, the organization will be using computerized systems to electronically document patient information. The refreezing stage is a time for stabilizing and re-evaluating the change to electronic documentation (Bozak, 2003).

METHODOLOGY

This study adopted a descriptive non –experimental research design to assess the factors affecting the non-implementation of computerized documentation of nursing procedures in State Specialist and Mother and Child Hospitals, Akure. The sample size was determined using Taro Yamane's while convenient sampling techniques were used to select 172 nurses from state specialist hospital and mother and child hospital in Akure.

A self-developed questionnaire with predetermined validity and reliability was used for data collection was structured three sections A, B and C. The data collected were analyzed using statistical package for social sciences version 21. Ethical approval was sought from State Specialist Hospital and Mother and Child Hospitals, Akure.

RESULT/FINDINGS

Table 1: The Socio-demographic Data of Respondents

Variables	F=172	%
Age		
21-30	60	34.88
31-40	73	42.44
41-50	39	22.67
Sex		
Male	13	7.56
Female	159	92.44
Religion		
Christian	120	69.77
Muslim	52	30.23
Ethnicity		
Yoruba	155	90.12
Igbo	17	9.88
Hausa	-	
Marital status		
Single	48	27.91
Married	124	72.09
Professional qualification		
RM	17	9.88
RN	52	30.23
RNRM	69	40.12
RNRMPH	34	19.77

Table 1, The age group 31-40 accounts for the majority of the respondents (42%). About 92% were female while the remaining 8% were males. Also, the majority of the respondents are married 72% while 28% were singles. On academic qualifications, about 40 % were RN & RM, and 20% were degree holders.

Table 2: Knowledge of nurses on computerized documentation

Variables	F=172	%	Remark
What is computer			
Paper system	134	77/9	Poor
Electronic device	34	19.7	
Operating system	4	2.3	
Is booting in computer the act of switching computer on the	148	86.1	Good
Yes	24	13.9	
No			
Computer can be used for			
Communication	3	1.7	Good
Storing and processing information	169	98.3	
Discussing findings	0	0	
Have you heard of computer based documentation			
Yes	167	97	Good
No	5	2.9	
If yes, where			
Seminar	56	32.5	
School training	65	37.8	
Mass media	46	26.7	
I don't know	5	2.9	
What is computer-based nursing documentation?			
Operating computer	2	1.2	Good
The use of computer to document client care	157	91.3	
Writing on paper	8	4.7	
I don't know	5	2.9	

Table 2 The Majority of the respondents 98% knew that computers could be used for storing and documentation. About 97.1% of the respondents have heard about computer-based documentation. The respondents demonstrated good knowledge in all questions asked regarding computer–based nursing documentation as response to four (4) out of five (5) categories of questions were good.

Table 3: Perception of nurses toward computer-based clinical documentation.

Variables	Strongly agree	Agree	Strongly disagree	Disagree	Remark
Transition from paper to computer based will increase costs.	40(23.2%)	32(18.6%)	40(23.2%)	60(34.8%)	Good
Computer documentation is time consuming	25(14.5%)	12(7%)	60(34.8%)	85(49.4%)	Good
Transition from paper to computer-based documentation will save steps of nursing practice	100(58.1%)	56(32.6%)	10(5.8%)	6(3.5%)	Good
Increases efficiency in documentation	30(17.4%)	40(23.2%)	59(29.1%)	52(30.2%)	Poor
Brings about an improvement in patient care	50(29.1%)	35(20.3%)	50(29.1%)	37(21.5%)	Fair
Transition from paper to computer-based documentation will disrupt the quality of care given to patient	10(5.8%)	4(2.3%)	100(58.1%)	58(33.7%)	Good

Table 3 reveals that majority 40(23.2%) and 60(34.8%) of respondents strongly disagreed and agreed respectively that computer-based documentation will increase cost; 60(34.8%) and 85(49.4%) of the respondents strongly disagreed and agreed respectively that computer documentation is time consuming; an average number of respondents demonstrated fair perception regarding computer-based documentation bringing about improvement in patients' care. The overall perception of the respondents about computer-based documentation is good

Table 4: Factors affecting non implementation of computer-based documentation

Variables	Frequency/Percentage F=172	
	Yes (%)	No (%)
Is computer-based documentation implemented in your institution/hospital	0	0
Yes	172	100
No		
Lack of infrastructures	160(93.0)	12(7.0)
Inadequate power supply	153(88.9)	19(11.1)
Inability to operate computer	(93.0%)55(31.9)	117(68.1)
Time consuming	128(74.4)	44(25.6)
Change of shift, medical rounds	69(40.1)	103(59.8)

Non-availability of computers and accessories	122(71.7)	50(28.2)
The cost of selecting and implementing computer system	114(66.37)	58(33.7)
Fear of increase task.	97(56.3)	75(43.6)
Government policy.	94(54.6)	77(45.3)

In table 4 finding reveals that computer-based documentation was not utilized in the two health institutions under study. It was discovered that lack of infrastructure 160(93.0%) has the higher score in factors influencing non-implementation of computer-based documentation. This is followed by inadequate power supply 153 (88.9%); time consuming 128(74%); Non-availability of computers and accessories 122(71.7%); the cost of selecting and implementing computer system 114(66.37%); fear of increase task 97(56%); government policy. 94(54.6%) change of shift, medical rounds 69(40.1%) and the least is inability to operate computer 55(31.9%).

DISCUSSION OF FINDINGS

Demographic Characteristics

This study aimed at determining the factors affecting the non-implementation of computer-based clinical nursing documentation among nurses in State Specialist and Mother and Child

Hospitals, Akure. The demographic statistics show that the majority of the respondents are between the ages of 31-40 years out of which 92.44% of them were female while 7.56% of them were males. The majority of the respondents (69.8%) are Christians and 90.1% are Yorubas. Only 72.1% of the respondents are married. About 40.1% of the respondent had RN and RM qualifications.

Knowledge of Computer-Based Documentation

The findings of this study revealed that the majority (77.9%) of the nurses had good knowledge of computer and 98.3% of the respondents knew that it can be used for storing and processing information. Also, 91.2% of the respondents knew that computers can be used for documentation of patient care. All the respondents affirmed that computer-based documentation was not in the use of the two hospitals. The study also revealed that 97.1% of respondents have heard of computer-based nursing documentation, which is in support with research conducted at Nairobi, Kenya on the attitude of nursing staff towards computer-based documentation by Mathew et al (2014) in which 70% of all the nurses showed higher knowledge on computer-based documentation. It is also supported by a study conducted at Midwestern hospital among 225 fulltime and part-time nurses' 85% of nurses completed the survey and the knowledge section had an alpha coefficient of 360. However, 100% of the respondents revealed that computer-based documentation is not being implemented in their hospital, which is consistent with the findings of this study but in contrast with a study done by Millier et al (2014), that reveals that computer-based documentation is being used for documenting patient care in their health institution. The general assessment of nurses' knowledge revealed that nurses have good knowledge of on computer-based documentation

Perception of Nurses Towards Computer-Based Documentation

This research revealed that transition from paper to computer-based documentation would save time, bring about an improvement in care and increase efficiency in documentation which is in contrast with Police et al (2010) that reports a negative attitude and perception of his respondents to computer-based documentation as that they believed it would not benefit the patients or bring about an improvement in the care rendered. Majority of the respondents in this study also disagreed that transition from paper to computer-based documentation will disrupt the quality of care given to patients, this is in contrast with the findings of Moexy et al (2010) who opined that they doubt if these systems can improve patient care, clinical outcomes or improve the quality of medical practices. An average number of respondents demonstrated fair perception regarding computer-based documentation bringing about improvement in patients' care. The overall perception of the respondents about computer-based documentation is good. The researcher opined that with this good perception of the respondents, if computer-based nursing documentation become the hospital policy, the nurses with embrace it.

Factors Affecting Non-Implementation of Computer-Based Documentation

Findings on this study also revealed that nurses perceived factors affecting non-implementation of computer-based documentation as non-availability of computers, inadequate power supply which is in correlation with the study conducted by Pfortmillier et al, (2011), which stated that lack of supply of computers and inadequate power to support computerized documentation are also factors affecting non-implementation of computer-based documentation. This was also supported by Saliba (2012) which reported that lack of supply of computers is also a factor affecting the non-implementation of computer-based documentation.

The study also reveals that computerized documentation would be time-consuming which was also observed in a survey conducted by Poissant et al., (2005) to test time efficiencies in their research of 23 studies, in which only two employed self-reported time and the two documented an increase in recording time with computer-based documentation, so also a study was done at Nairobi Kenya among nurses in Kenya national hospital also showed that computerized documentation will cause nurses to give less time to quality nursing 54% and 56 % believed it would increase workload. Findings also show that inability of respondents to operate a computer as one of the factors affecting non-implementation of computer-based documentation, which is in contrast with a study conducted at Aga khan university hospital by Matthew et al (2014) in which 93.2 percent of their respondents were able to operate a computer. Also, government policy was identified as another factor responsible for non-implementation of computer-based documentation which was in support of Boonstra's (2012) study who identified absence or inadequacy of legislation and policies and liability concerns as hampering the implementation of e-health system at organizational and health level. (Ross, Stevenson, Lau, & Murray, 2016)

The Implication to Nursing Practice

The study found out that the majority of the respondents were in support that computerized documentation in nursing care would go a long way in ensuring quality and holistic care for the patients in the ward. So, the implementation of computer-based documentation will be of

great benefit to nursing and nursing practices by making documentation easier, minimizes the cost associated with the chart by pulling supplies required to sustain paper charts. It will also bring about professionalism and career satisfaction.

SUMMARY

This study was done to determine the factors affecting the non-implementation of computer-based clinical documentation among nurses in the State Specialist and Mother and Child hospitals, Akure. A well-structured questionnaire was administered to 172 respondents. It was discovered that nurses and the government have a major role to play in the implementation of computerized documentation of nursing procedures in ensuring that quality care given and also to promote the standard of the nursing profession. The research study shows that the majority of respondents were of the opinion that computerized documentation in nursing care will go a long way in ensuring quality and holistic care for the patients. However, computer-based documentation is not being implemented in their hospitals. So, there is a need for nurses to advocate for use of computer in documenting client care.

RECOMMENDATION

The following recommendations are made from the findings;

- Nurses should update their knowledge about the use of computer in documenting of nursing procedures
- The adequate power supply should be available so as to facilitate the use of computers in the documentation.
- The government should sponsor seminars and workshops and should give room for employees to go for further studies in information communication technology-related courses.
- The government should provide funds and adequate computers to each ward in the hospitals
- The government should employ ICT experts to help with any problem nurses might encounter when using their computer.

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