

The Effect of Computerized Patient's Records Systems in Quality Health Care Service Delivery. A Case Study of Essikadu Hospital in the Sekondi Takoradi Metropolitan Assembly.

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Abstract

Health care quality, patient's safety and cost effectiveness are the things which health care providers concern themselves with most of the time. This is the reason for the introduction of the computerized patients records system which is an electronic medical record containing all of an individual's health information. Essikadu hospital, a government hospital located in the Sekondi-Takoradi Metropolitan Assembly in Ghana since March 2009 procured and implemented the use of electronic medical record system (EMR) to curb the problems that were being faced with purely paper based record keeping systems. The main objective of this study was to evaluate the effectiveness of computerized patients' records system in quality health care service delivery at Essikadu Hospital in the Sekondi Takoradi Metropolitan Assembly. A descriptive research methodology was used for this study. Data were collected from clients and staff of Essikadu hospital using a guided questionnaire. Quantitative data were analyzed. The study findings showed that most users preferred using the EMR than paper based records and that overall, found it more effective and efficient.

Keywords: Electronic Medical record System (EMR), computerized patient's record system (CPR), clinical

1. Introduction

This study is to find out the effectiveness of computerized patients records system in quality health care service delivery at Essikadu Hospital in the Sekondi Takoradi Metropolitan Assembly. The medical record is a powerful tool that allows the treating physician to track the patient's medical history and identify problems or patterns that may help determine the course of health care. (CPSO, 2012). Clinicians unofficially encounter the problem of missing folders and they get around this frustration by making decisions as best as they can to ensure the best health of their clients. Smith, Araya-Guerra, Bublitz, Parnes, Dickinson, Van Vorst, Westfall and Pace (2005) at the University of Colorado Health Sciences Centre found that 13.6% of patients cared for in the United States of America had missing clinical information. Missing clinical information has been found to be a contributory factor in medical errors. For instance, Dovey, Meyers, Phillips, Green, Fryer, Galliher, Kappus and Grob (2002) in examining 344 reports of medical errors among United States of America family physicians found that 7.8% were due to unavailability of records that should have been in the patient's medical records.

This is the reason for the introduction of the computerized patients records system which is an electronic medical record containing all of an individual's health information. This system encompasses all the electronic medical records including pharmacy records, financial historical records, laboratory records etc. Computerized patient's record (CPR) systems enable hospitals to store and retrieve detailed patient information to be used by health care providers, and sometimes patients, during a patient's hospitalization, over time, and across care settings (McDonald and Tierney, 1988). Embedded clinical decision support and other tools have the potential to help clinicians provide safer, more effective care than is possible by relying on memory and paper-based systems. In addition, the problem of missing patients' record as in paper based patients records documentation is reduced. CPRs can help hospitals monitor, improve, and report data on health care quality and safety. The Centers for Medicare and Medicaid Services (CMS) calls Electronic Health Record systems, "the next step in continued progress of health care." (IOM, 1991).

In the United States of America, Electronic Health Records (EHRs) are currently used by 12% of physicians and 11% of hospitals nationwide (Hagen, 2008). The promise of the effectiveness of CPRs in saving lives, money, and time – has been around for some time, but the fulfillment of this promise in real-world applications

has remained elusive due to many factors. Among the most frequently cited are cost of implementation, privacy and security. While overcoming these factors is necessary to the successful implementation of any CPRs, they are hardly sufficient. In a third world country like Ghana other problems may be the availability of regular source of energy to power the system and the ability of the medical personnel to use the system. Also in the advent of increase in the patient load due to the introduction of the national health insurance, any system which may end up increasing the time patients are spending in the consulting rooms may not only be problematic for the medical doctors but it will be for the patients as well.

A computer-based patient record could improve health care in several important ways; Anderson (1994) and McDonald et al (1988). First, it could provide practitioners with rapid access to more reliable patient data. Second, it could support clinical decision making, clinical reminders and alerts, quality assurance, and outcomes research. Third, it could be used to manage patient care.

1.1 Overview OF Essikadu Hospital

Essikadu hospital was built in 1964 as the first polyclinic in Ghana with a bed capacity of 20, one doctor, three nurses and fifteen paramedics. In January 2013, the hospital had a bed capacity of fifty, two doctors, one dentist, fifteen nurses and forty paramedics. The hospital serves primarily the communities of Sekondi, Kojokrom, Inchaban, Essikadu and their environments.

It takes referrals from the smaller health centers and clinics and refers patients to EffiaNkwanta Regional Hospital. The outpatient department sees approximately one hundred and fifty (150) patients daily. The labour ward conducts on the average eighty (80) deliveries every month. With the increasing clientele and the lack of spaces available to keep client folders coupled with the regular missing folder, management decided in January 2009 to implement the CPR system. The system was installed with six (6) computers in March 2009. The system involved all the consulting rooms, the laboratory, pharmacy, the finance and the records departments. The CPR system has been in operation since March 2009.

2. Methodology

A descriptive research methodology was used for this study. This involved gathering relevant information from all the departments in the hospital using the computerized patient records system by administering a set of questionnaire to a selected simple random sample population from each department. A sample size of one hundred respondents was used for the study, fifty-four clients and forty-six staff. The study used purposive sampling strategy to get study participants of staffs. This is because not all the staffs come into contact with the direct use of the CPRs. Thus staffs who come into direct contact with the use of the CPRs from the different departments were eligible to take part in the study. There was no one who denied participating in the study.

A sample of fifty four clients was also sampled using simple random sampling method because of their larger numbers compared to the staffs.

3. Results

The study used fifty four clients and forty six staff as respondents after they had given verbal consents to participate in the study. Participants differed with respect to profession, experience with the use of CPRs, age, and were either clients or staff. The study took place in Essikadu Government hospital which is using the CPRs software procured by the hospital.

The study had 54.5% female and 45.5% male respondents for both clients and staff.

Table 1 below summarizes the demographic data for the clients' study participants.

Table 1: Age of clients of Essikadu hospital

Age in years	Frequency (%)
10-20	3(5.7)
21-30	13(24.0)
31-40	16(29.6)
41-50	16(29.6)
51 and above	6(11.1)

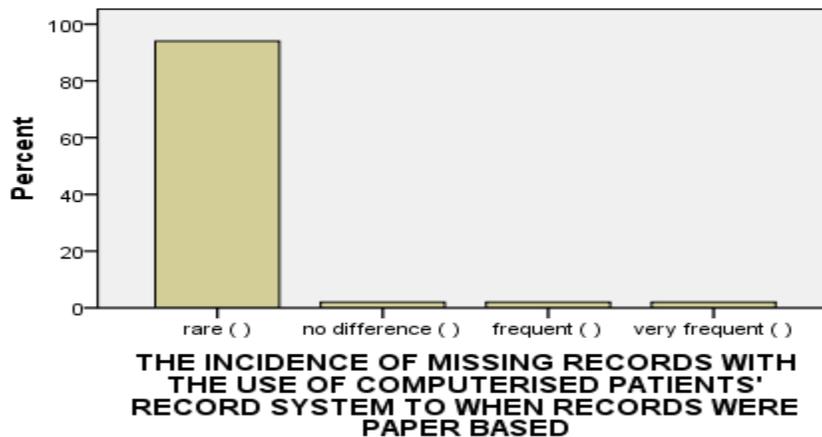
Table 1 above shows age distribution of clients. The minimum age group was 10-20 years and maximum age group was above 50 years. The mean age group was 31-40 years. Of the fifty four clients, 13(24.1%) have been attending the hospital for less than one year, 6(11.1%) have been attending for the duration between 1-2 years, another 6(11.1%) had been attending clinic for 2-3 years and 29(53.74%) have been attending for more than 3 years.

Most clients 42(77.8%) had an idea that their records were stored on the computers as well as in their insurance folders.10 (18.5%)clients thought it was stored by purely electronic method and 2(3.7%)thought it was by only paper based method.

Since the implementation of the CPRs, majority of clients 51(94.4%) have not reported any missing records.3 (5.6%) who had a history of missing records have had their records missing only once.

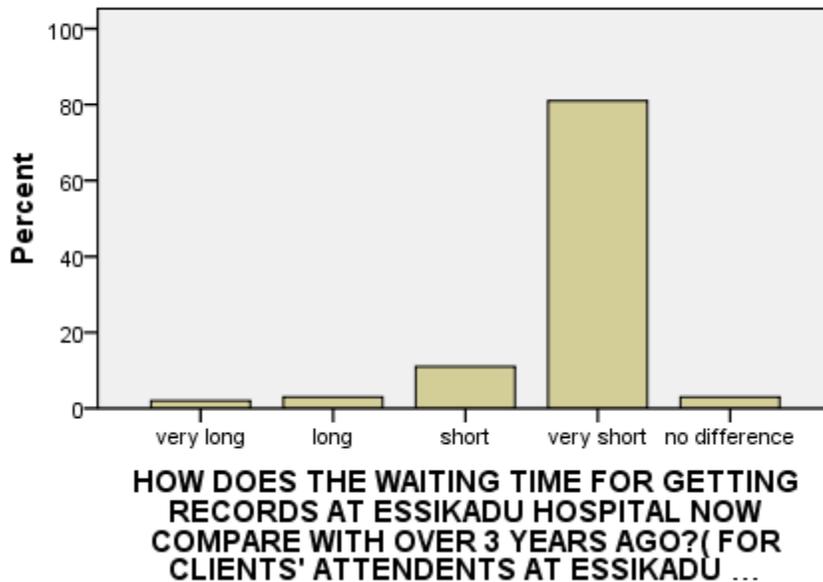
Most of the respondents thought incidence of missing folders were markedly reduced with the use of the CPRs than when records were purely paper based as shown in the figure 1 below.

Figure 1: Incidence of missing folders with the implementation of CPRs



Majority of clients who have been patronizing the services of Essikadu hospital for more than three years said the waiting time for retrieving records is very much reduced with the implementation of the CPRs as summarized by figure 2 below.

Figure 2. Waiting time for patients records

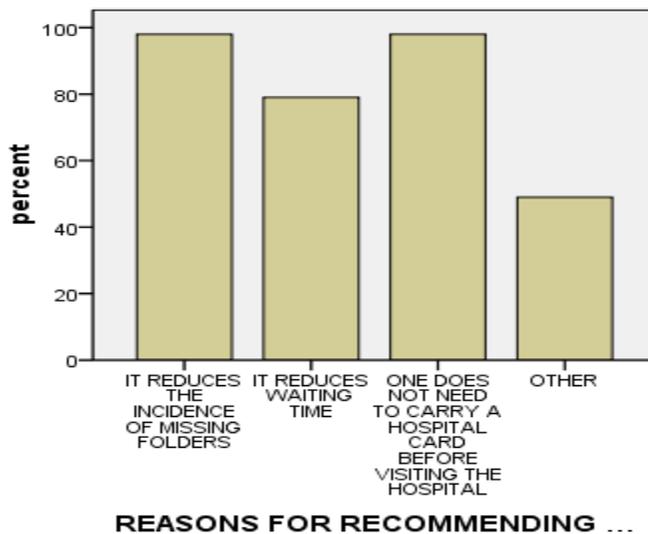


In all, 48(88.9%) of the clients did not think that clinicians spent more time on the computer than with clients .4(7.9%) of clients however thought clinicians spend more time on the computer than with them and 2(3.7%) of the client were indifferent. Most of the client’s 33(61.1%) were indifferent about the effect of CPRs on duration of consultation whereas 16(29.6%) thought it made consultation long and 5(9.3%) said it made consultation short.

Majority of clients 49(90.7%) recommended the use of CPRs to other facilities whilst only 4(9.3%) did not recommend it for other facilities.

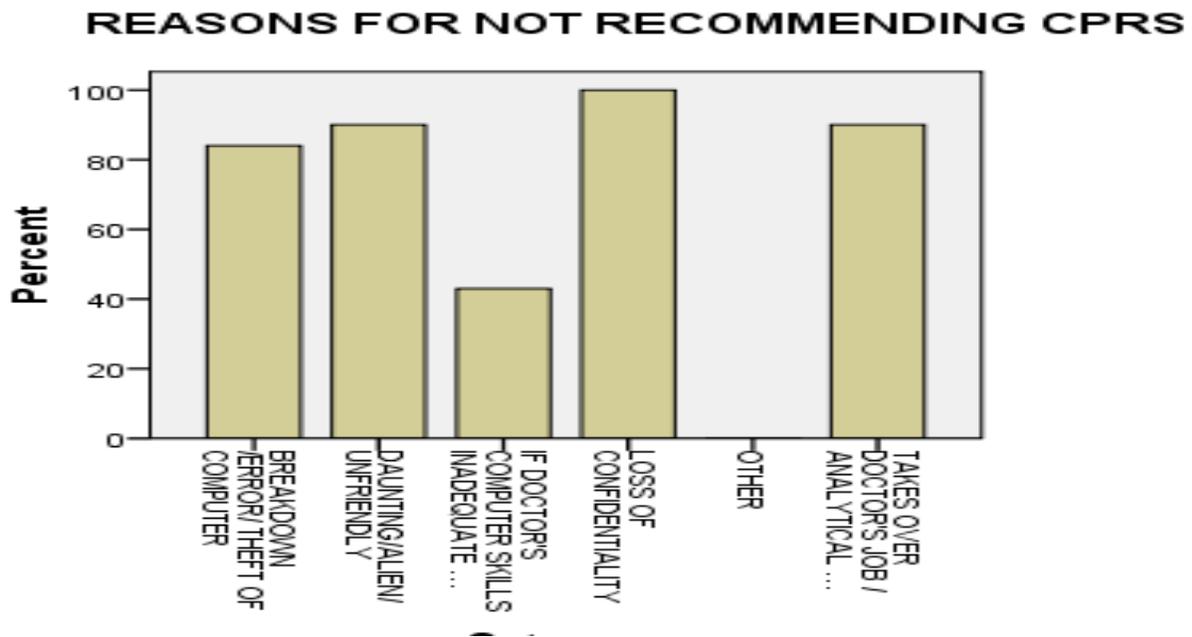
Figure 3 below summarizes the reasons given by clients for recommending CPRs to other facilities. Most clients recommended it because it reduces waiting time for getting records and the incidence of missing folders.

Figure 3: Reasons for recommending CPRs by clients



For the few clients who did not recommend CPRs use, the bar chart below (figure 4) is a breakdown of their reasons.

Figure 4: Reasons for not recommending CPRs use



For the forty six staff respondents, table 2 summarizes the demographic data of the respondents.

Table 2: age of staff of Essikadu Hospital

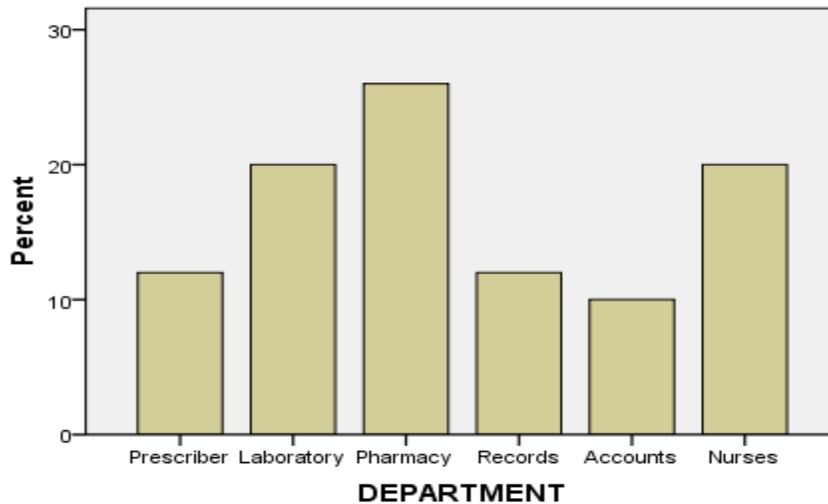
Age in years	Frequency (%)
10-20	1(2.1)
21-30	12(26.0)
31-40	11(23.9)
41-50	10(22.0)
51 and above	12(26.0)

Table 2 above shows age distribution of the staff. The minimum age group was 10-20 years and maximum age group was above 50 years. The mean age group was 31-40 years.

For all the staff attending to the clients, 18(39.0%) were males and 28(61%) were females.

For the various departments of the staff, the figure 5 below shows the graphical representation.

Figure 5: Percentage distribution of staff of the various departments.



From figure 5 above it can be seen that nursing, laboratory and pharmacy staff in all formed twenty eight 28 (61%) of the total staff compared with that of medical doctors or prescribers who formed just 7(16%) of the total staff respondent.

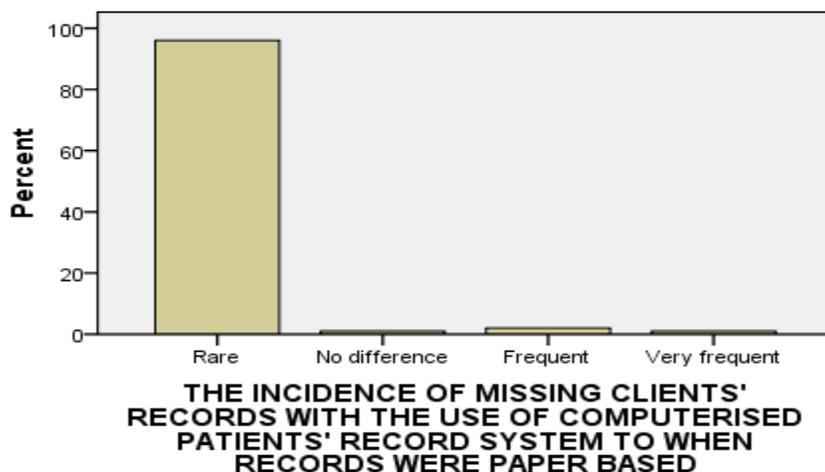
A substantial number of the staff, 37(80.4%) have been working in the hospital for more than three years, 7(15.2%) working between two- three years and only 2(4.4%) working for less than 1 year.

Most staff of the hospital 35(76.0%), had an idea that records were stored on the computers as well as in their insurance folders. 8 (17.4) % of the respondent thought it was stored by purely electronic method and 3(6.6 %) by purely paper based method.

Since the implementation of the CPRs, majority of staff 41 (89.1%) have not reported any missing records of their clients. Out of the 5(10.9%) with history of missing clients’ records; 4(80%) have had their clients’ records missing only once and the other 1(20%) on two occasions.

The bar chart below (figure 6) compares the incidence of missing clients’ records with the use of the CPRs to when records were paper based i.e. before the implementation of the CPRs in Essikadu hospital.

Figure 6: Comparing the incidence of missing clients’ records with the use of CPRs to when records were purely paper based.

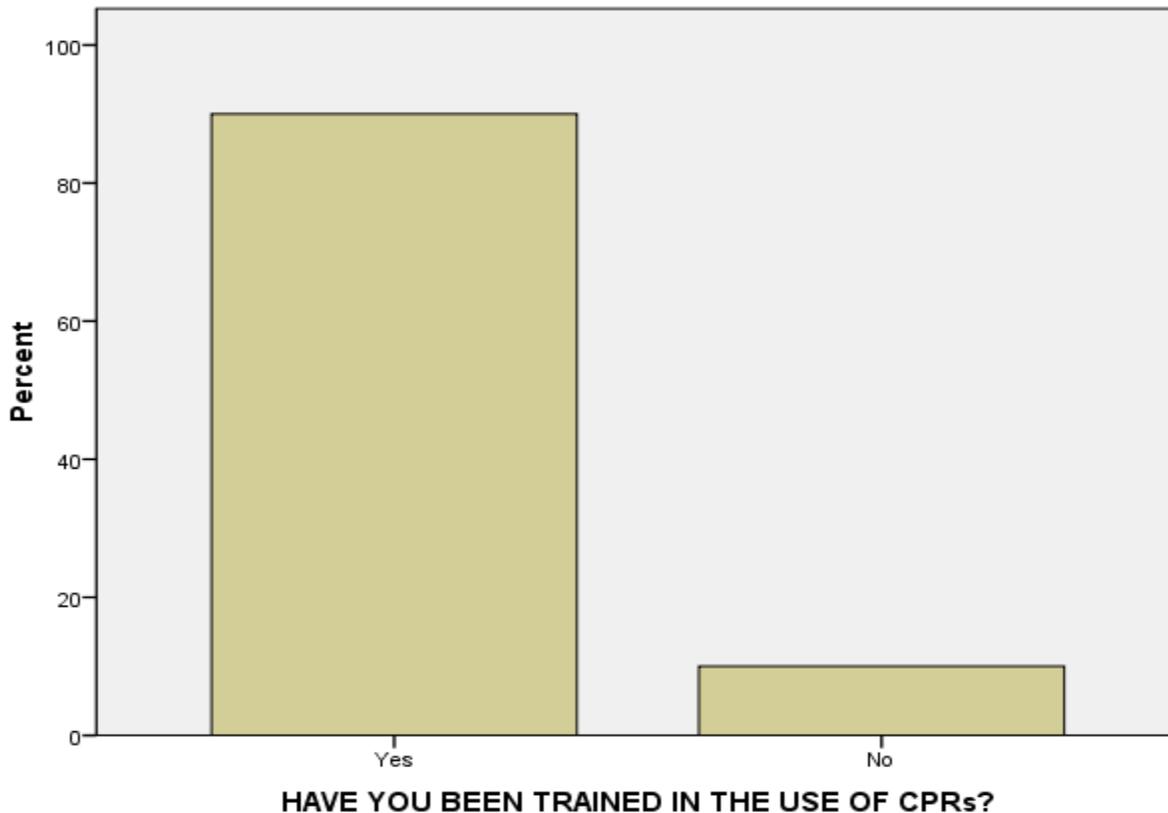


From figure 6 it can be seen that majority of the staff 35(94.6%) out of the 37 who have been in Essikadu hospital for more than three years thought the incidence of missing folders are rare with the use of the CPRs compared to the paper based records system.

Out of the six record staff, 5(83%) had secondary education and only 1(17%) had tertiary education.

Majority of the staff 42(91.3%) had received training on the use of CPRs as shown in figure 7 below.

Figure 7: Percentage of staff trained on the use of CPRs.



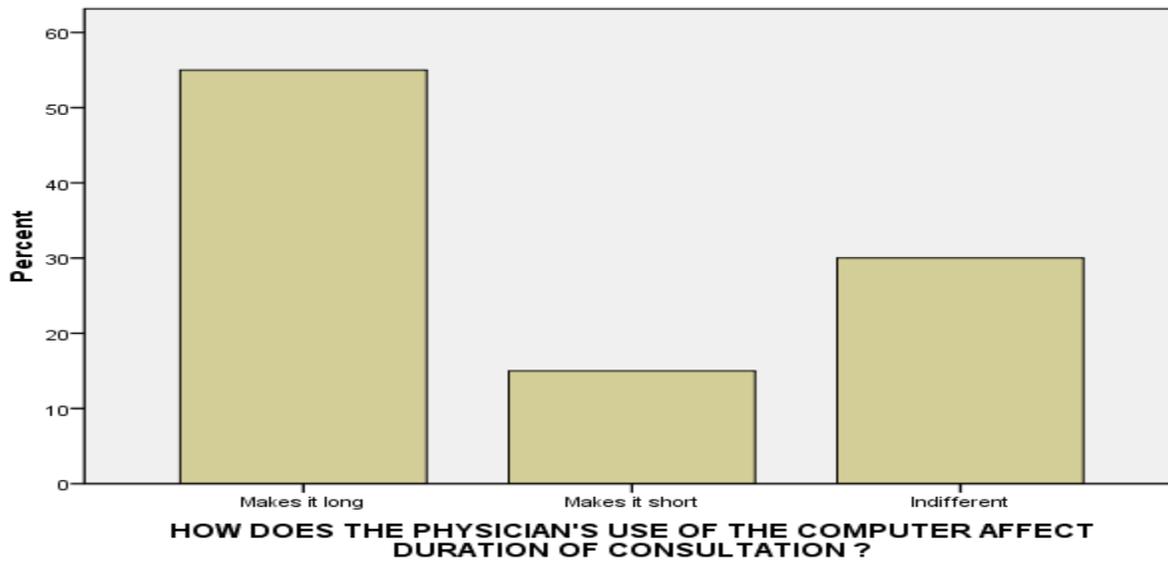
Most staff of Essikadu hospital who had been working for more than three years said the waiting time for getting records is very much reduced with the implementation of the CPRs as summarized by table 3 below.

Table 3. Waiting time for getting patients’ records

Duration	Number of staff	Percentage
Very long	0	0.0
Long	1.0	2.1
Short	5.0	10.9
Very short	40	87.0
No difference	0	0.0

On the physicians’ use of the computer, figure 8 summarizes how the staff sees the effect on the duration of consultation. 25(54.3%) thought the duration of consultation was prolonged, 14(30.4%) were indifferent and 7(15.2%) thought the duration was shortened.

Figure 8. Effect of the physicians' use of the computer on the duration of consultation.

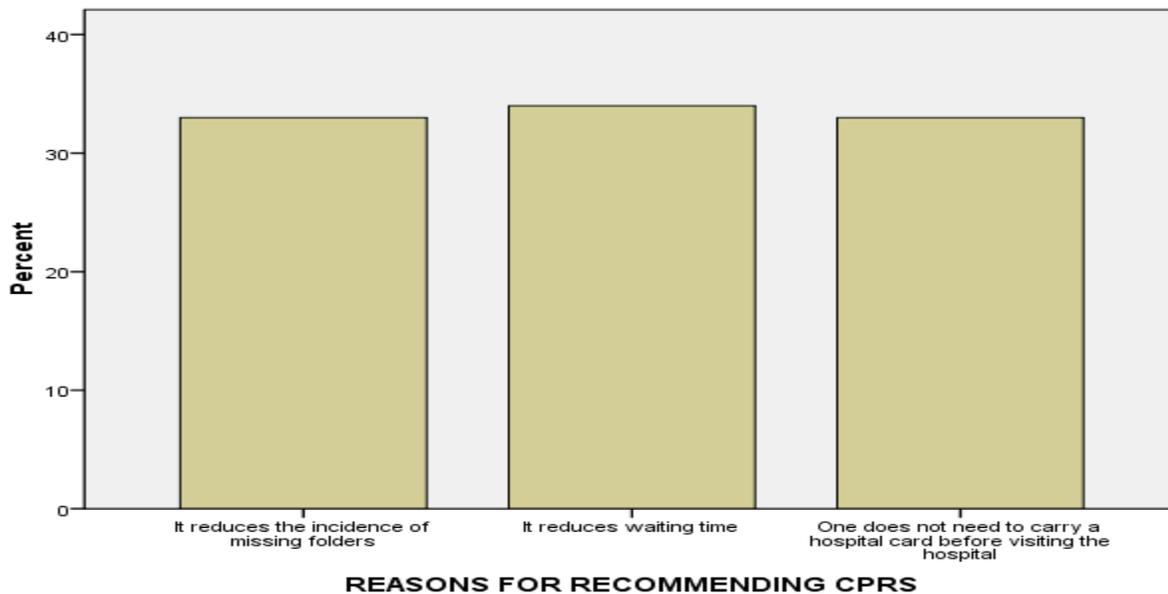


More than half of the staff respondents 25(54.3%) said physicians did not spend more time with computer than the clients whereas 21(45.7%) thought otherwise.

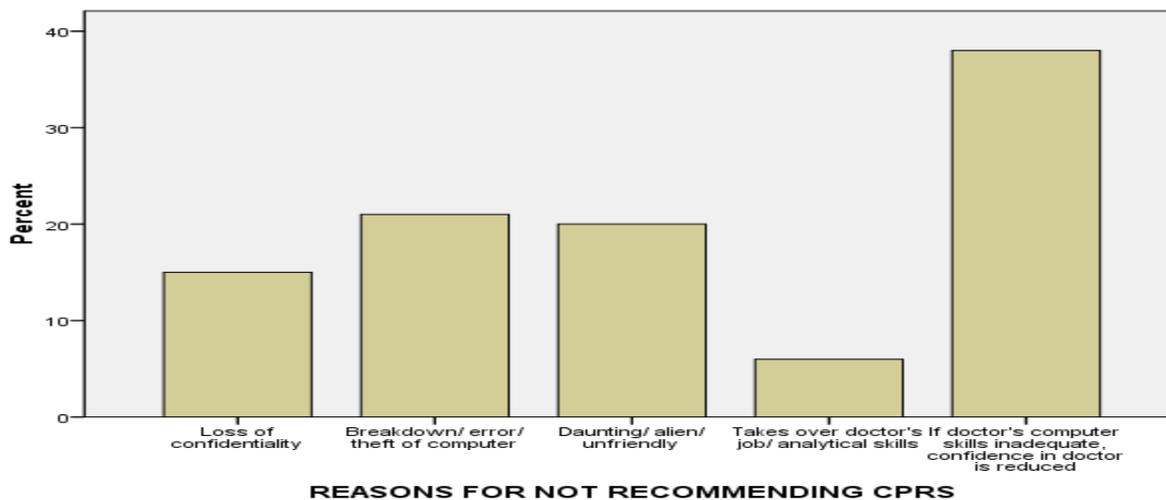
Majority of the staff respondent 37(80.4%) wanted CPRs to be introduced to other facilities. Only 9(19.6%) did not think that CPRs should be introduced to other facilities.

Of those who wanted CPRs to be introduced to other facilities, their reasons are summarized in figure 9 below.

Figure 9: Reasons for recommending CPRs use by staff



For the staff who did not recommend CPRs use, the figure 10 below is a breakdown of their reasons.

Figure 10: Reasons for not recommending CPRs use by staff

4. Discussion

This discussion involves the finding of the study in relation to the reviewed literature. The discussion will be in the order; users' demographic characteristics, effectiveness and efficiency of EMR in comparison to paper based records in Essikadu hospital and how that data compares with documented data from the literature review, users' perception of the benefits and challenges of using EMR in Essikadu hospital and experiences on EMR use in relation to reviewed literature.

The introduction of the EMR in Essikadu hospital is one of the ways towards the attainment of the number eighth goal of the United Nations Millennium Development Goals (MDGs) which is to "Develop a global partnership for development" (UNMDGs, 2008) and also a way of improving health service delivery in the face of increasing patients' demands and critical shortage of human and material resources especially with the introduction of the national health insurance scheme. One of the key targets of this goal is to make available in health care settings the benefits of new technologies, especially information and communications technologies, in cooperation with the private sector. There has already been rapid progress in bridging the gap on the mobile phone sector, but large gaps and challenges still remain in improving access to key technologies that are essential to increase productivity, sustain economic growth and improve service delivery in areas like health and education (UNMDGs, 2008).

4.1 Demography of participants

From the study it can be realized that there are more female clients and staff (54.5%) than their male counterpart. Also majority of the respondents, (89.9%) of clients and (74.0%) of staff were below the ages of 51 years. These findings are consistent with that of the Ghana demographic and health survey (GDHS, 2008) which states that there are more females than males in Ghana and also majority of Ghanaians are below 51years.

Majority of clients (53.74%) have been attending the hospital for over three years because Essikadu hospital started as a community hospital therefore the local people perceive it as their hospital and therefore are more likely to attend the hospital unless they are referred to other hospitals. Of the fifty four clients, 13(24.1%) have been attending the hospital for less than one year which could be attributed to referrals to the hospital or new occupants of the communities the hospital serve.

Nursing, laboratory and pharmacy staff in all formed twenty eight 28 (61%) of the total staff compared with medical doctors or prescribers who formed only 7(16%) of the total staff respondent which is consistent with

the Ghana demographic and health survey (GDHS,2009) which states that there are fewer medical practitioners than nursing, laboratory and pharmacy staff in Ghana.

A substantial number of the staff 37(80.4%) have been working in the hospital for more than three years. There is not much research done to ascertain the duration of staff in a particular facility though one can speculate that staff either need to be transferred or be dissatisfied with working conditions in order to leave a particular facility. The 2(4.4%) working for less than 1 year may be those who have been recently transferred or employed by the hospital.

4.2 Storage of health records

Most clients and staff said records were stored on the computers (77.8%) as well as in insurance folders (76.0%). This is because whereas diagnosis and only important health history are kept electronically, the paper based records are kept as well for the national health insurance staff who routinely use the detailed records to verify financial claims made by the hospital. The few clients (18.5%) and staff (17.4%) respectively whose records are stored purely by electronic method are not national health insurance subscribers.

From the study it can be seen that (90%) of the records staff had received EMR training which can be said to be effective in reducing the time needed for records retrieval and the incidence of missing folders. This is consistent with Lowes argument that effective training for new system operation will obtain value for money for developers and implementers (Lowes, 2004).

4.3 Effectiveness of CPRS

Most of the respondents thought the incidence of missing folder were markedly reduced i.e. (94.4%) for clients and (89.1%) with the use of the CPRs than when records were purely paper based which is consistent with Dassenko, et al (1995) who says implementing CPR systems improved access to the patient chart and gave staff access to the medical record, and eliminated the need for providers to locate patient information to answer questions or return telephone calls. Secondly, CPRs improved clinical decision making and disease management through enhanced integration of treatment outcomes and reminders (Jha, et al 2009).

From the study, most of the client's 33(61.1%) were indifferent about the effect of CPRs on duration of consultation whereas 25(54.3%) staff think the use of the EMR prolongs the duration of consultation. This can be attributed to the fact that data entry and retrieval may be the delaying factor aside the routine examination of clients by the doctors. CPRs have loads of challenges aside all its benefits. Data entry is a major obstacle to healthcare professionals' acceptance of electronic records. Most input makes use of structured data entry, where the user has to select relevant clinical terms from a predefined list. This is restrictive, and extracting this information from a narrative requires more work from the clinician. Also, entering structured data can subtly change the meaning of the item coded. Furthermore, creating a standardized clinical set of terms and keeping these up to date is resource intensive (Stephen, 2004). These are the reasons duration of consultations were seen by the staff to be delayed by the use of EMR by doctors.

A study of EMR system use by Israeli primary care physicians showed that "screen-gazing" occurred during an average of 25% of the patient contact time, with some providers spending close to 42% of the visit viewing their computers (Freeman, Taylor, and Adelman 2007). The greater the time the physician spent keyboarding, the less time he spent conversing with the patient. This is consistent to the findings of this study where according to the staff, doctors use of computers increased the duration of consultation. From the study, clients were indifferent in the effect of EMR to duration of consultation by doctors probably because the overall waiting time they spent in the hospital was now reduced compared to when their records were paper based.

This study showed that majority of clients (90.7%) and staff (80.4%) recommended CPR use by other facilities because of the several benefits it offers including reducing waiting time for getting records and the reduction of the incidence of missing folders which is consistent with most of the studies on EMR. Several studies also suggest cost-effectiveness of electronic patient records (Schmitt, and Wofford, 2002). The benefits associated with CPRs are organized into four categories: clinical, workflow, administrative, and revenue enhancement.

Renner (1996) states that measuring all the benefits associated with CPRs is virtually impossible, and that it is probably safe to select those that can make the greatest financial difference, and incorporate them into a financial model.

Clinical benefits seen after implementing a CPR include: improved clinical decision making and disease management, enhanced documentation, simplified patient education, and increased free time to spend with patients, accompanied by improved perception of care and quality of work life. These benefits ultimately result in better delivery of patient care (Fromberg, et al 1995). Administrative benefits after CPR implementation include objective monitoring of physician practices, outcomes research, and disease management (Erstad, 2003). CPR implementation also resulted in easier means to create report cards for managed care plans, simplified and improved claims processing, and better customer service (Erstad, 2003).

4.4 Reasons for not recommending CPRS

This study found out that only (9.3%) of client and (19.4 %) of staff did not want to recommend CPR use to other facilities because of several reasons including security of records of clients, data entry difficulties etc. which is inconsistent with studies undertaken in the 1980s which found that one third of patients were concerned about reduced confidentiality with their records held on computer (Rethans, Hoppener, Wolfs, and Diederiks, 1988). Over two thirds of the patients interviewed in this study expressed concerns about loss of confidentiality when doctors used CPRs. Subjects with experience of computers were more aware of the limitations of computers in terms of error, breakdown and potential loss of confidentiality but despite more knowledge of these problems, they still favored use of computers in the consultation. Studies of patients with little exposure to computers found that between a third and a half of patients believed that the introduction of computers would lead to a loss of the personal touch (Cruickshank, 1984).

5. CONCLUSION

This study evaluated the effectiveness of CPRS in the provision of quality health care in Essikadu hospital in the Sekondi Takoradi metropolitan assembly. Overall, though there are challenges with CPRs use, majority of users were satisfied with the system and prefer CPRs to purely paper based system. The study has also found that patient waiting time at the clinic has greatly reduced. It has also been learnt from this study that with the introduction of the CPRs, the incidence of missing folders of clients has drastically reduced as opposed to the paper based system which had high rate of missing folders.

From the study, though majority of both staff and client said doctors spent less time on the computers than with them during consultation, clients were indifferent on the effect of computers on the duration of consultation whereas hospital staff were of the opinion that duration of consultation were increased by the use of the CPRs.

The study also observed that most Essikadu hospital staff were well trained in the use of the CPRs and regular training are needed for new staff to get used to the CPRs.

Simple and effective electronic data system can be established and adopted in a developing country like Ghana to improve on patients care. There is the need for regular proper and adequate training for all users for sustainability. The EMR is used to guide care and improve patient outcomes especially in the era of the national health insurance scheme.

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