Electronic records management in the public health sector of the Limpopo province in South Africa

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Abstract
Implementation of electronic records management appears to be a serious challenge in the public health sector of Limpopo Province, South Africa, which sacrifices quality of health care. The objective of this study was to establish how electronic records were managed and the current medical recordkeeping practice. Qualitative and quantitative methods were triangulated. Purposive sampling and stratified random sampling methods were applied to select participants for interviews and questionnaires respectively. Data was collected using questionnaires, observation and interviews. The study discovered that records management negatively affected timely and effective health care services, which resulted in long patient waiting times and patients being treated without medical history. The study recommended the introduction of an electronic records management system that is capable of capturing and providing access to a full patient record and tracking paper record movement, such as Electronic Document and Records Management System (EDRMS).
Keywords: Electronic records management, electronic documents management, Electronic Document and Records Management System, medical records, service delivery, public health sector, Limpopo Province, South Africa

1 Introduction and background of the study

This study mainly focused on electronic records management and recordkeeping practices in support of health care service delivery in the public health sector. As in many other government departments worldwide, public service delivery in the public health sector seems to be a problem due to, but not limited to lack of effective systems for opening, tracking and indexing files (Ngulube & Tafor 2006:59-60), lack of effective training, legal and regulatory tools for management of e-records (Nengomasha 2003:66), no proper capturing and preservation of records (Wamukoya & Mutula 2005:70), lack of knowledge about the electronic records program's fundamental elements (e.g. skilled staff and electronic information system necessary competencies; e-records management legal and administrative requirement; and accurately documented policies, standard operating procedures and formal methodologies for managing e-records) (Wamukoya & Mutula 2005:70), lack of core competencies in records management (Nengomasha 2009:112) and no plans for managing e-records (Nengomasha 2009:112).

However, a full implementation of information and communication technology (ICT) can be a major solution. This may ensure that evidence of official human activities and business transactions is safely preserved, safeguarded and timeously accessible. The Limpopo Health Department has more advantage of properly managing electronic records since the National Ar-

chives and Records Service (NARS) made available and accessible to it the necessary guidelines and policies on electronic records management (Keakopa 2007:70). The current means of interaction between professionals and patients, known as telemedicine, determines the need for ICT. ICT will ensure easy and fast access to treatment and retrieval of information or records (Ojo 2009:95).

Hence, it will be easy to implement e-health in hospitals if records were effectively managed. E-health improves the old mode of interaction between clinician and patients. It is about interactive communication that creates an opportunity for knowledge sharing and also creates new knowledge. With e-health, a layperson can turn into an expert in health care through ICT, training and skills development, which leads patients to the ability of managing their own care (Adams & Bal 2009:37; Porter 2004:117; Rawabdeh 2007:516). This is because e-health improves hospitals in terms of clinical diagnosis, home care delivery and education of health professionals. It also assists with health resources, transparent management, and general e-commerce covering both health institutions and patients through ICT (Akeh & Morfaw 2007). This can eventually solve the digital division between patients and health professionals/clinicians.

Furthermore, records management may play an important role in supporting e-health services. This is because e-health, like any other service delivery method, needs to be accounted for and it should also be rendered in compliance with policies and procedures. The people involved in rendering e-health will eventually have to answer how, why, when and who rendered certain services and whether it was rendered properly. Clarke and Meiris (2006) also underscore the point that the web-based personal medical records (PMR), created during e-health services, assist clinicians with patients' engagement, lifelong health information coordination and information access to both patients and health service providers. PMR also bring about effective communication between patients and service providers, improved efficiency in medical practice and increased drug security "via interaction and contra-indication checks". Properly preserved e-health records will enable the evaluation of patient care, medical outcry investigations and medically related administrative decision-making and problem-solving. This implies that records management is crucial to the successful management of the health services and it is deemed necessary for any health system, including an e-health system.

However, in e-health, patients must also have access to their medical records and must be able to annotate on them. According to Cauldwell, Beattie, Cox, Denby, Ede-Golightly and Linton (2007:155-157) accessibility of e-health care records systems will, amongst others, assist patients to view their e-health care records while waiting for the health service and will also enable patients to personally register their arrival at the health care centre/institution. In the Patient Access to Electronic Healthcare Records System (PAERS) patients are also able to personally access information about their "medical history, details of previous consultations, results and referral letters". Their survey also discovered that PAERS contributes much to the reduction of patient waiting time for health service and to patient administration. It takes ±11 minutes for the patients to access the health service, which includes two minutes to administer a new patient. Therefore, it is vital that e-health records be properly managed to comply with all the patients' information requirements.

Moreover, according to Ngoepe (2004) sound records management is the heart of good public management since government services are dependent on access to information. This is because every single activity in government service requires accountability and transparency for proper governance. The State Records New South Wales (2004) emphasises that records are used to prove 'what happened, why and by whom'. Records serve as a tool for easy accountability and are necessary to meet legal, financial and accountability requirements. In e-health all the transac-

tions performed during interaction between patients and service providers need proper management for proper future accountability and also to meet legal, financial and administrative requirements. This implies that a successful e-health system needs maximum support from proper record keeping.

2 Contextual overview of electronic records management

2.1 Definition of electronic records

Electronic records refer to records that are dependable on relevant machines for access or reading, that is computer hardware and software such as e-mails, database and word processing (Tafor 2003:72). To Duranti (1999:152) components of electronic records are not limited to medium, content and action. The major difference between e-records and traditional paper records is that its components do not physically exist but are kept in different parts of the system. According to the National Archives and Records Service of South Africa (2006) electronic records is the "information which is generated electronically and stored by means of a computer technology". "Electronic records are the evidence, in digital form, of transactions undertaken by individuals or by organisations" (McDonald 2006). An electronic record is an intangible soft record created, managed, shared and preserved through the usage of an ICT system.

2.2 Managing electronic records

Electronic records should be preserved in such a way that its form, retrieval, reliability and authenticity as evidence of a particular activity are not subject to change, bearing in mind the safety of the records (Irons 2006:106; Lin, Ramaiah & Wal 2003: 118-119). For example, if the information in the medical records is changed, it will eventually be useless or misleading to clinicians and nurses during patient follow-up visit. That in itself is a health risk since the doctor may repeat the same prescription or treatment conducted during the first consultation.

However, IT is a good tool that can be utilised in smoothening access to records and information. The East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) are still far behind with the adoption of IT for records management. Kenya and South Africa are good examples of lack of records management automation. This may be because computation of archival services requires the purchasing of hardware, software, training, consultancy, networking, system maintenance, user-friendly system identification, records security measures to prevent unauthorised access and virus prevention against data corruption (Mazikana 1999 in Kemoni, Wamukoya & Kiplang'at 2003:40). Looking at the IT requirements listed above, the implementation of records management automation is not easily affordable (Kitching 1991 cited by Kemoni, Wamokoya & Kiplang'at 2003:40). Stephens (2000), as cited in Lin, Ramaiah and Wal (2003:118), expressed that electronic records are now received in a large number of archives. Due to the size some of these records are now loosing value as a result of its age, which is round about 15-20 years. This shows a very serious need to strengthen effective and efficient management of electronic records for easy retrieval and access to records.

2.3 Electronic records management in the public sector

Records management is very important for the public sector since it serves as an important tool for good business governance and efficient administration. Records provide information for improved planning and decision-making. Records also provide evidence for government accountability and transparency, and are often subject to specific legal requirements. In government bodies, records document what is done when, why and also provide evidence of communications, decisions and actions. In the process, some of the records the government officers make will be retained as national and provincial archives. They will eventually become part of South

Africa's documentary heritage (Bhana 2008:3-7; Chachage & Ngulube 2006:2; Man 225:23; Ngoepe 2004:1-3; Willis 2005:94).

Kemoni, Wamokoya and Kiplang'at (2003:40) argued that the main problem in the archival repositories is non-utilisation of information technology to ensure a smooth running of the records management administration. They further cited Mutiti's (1999) observation that IT helps archivists to improve their information services by providing faster access to and usage of data. According to Cowan (2000:179) the movement or improvement of clinical records administration from paper based to electronic is very fast and very successful. On the other hand, it seems to be difficult to achieve some targets due to difficulties in some stages. The argument of Gerntholtz, Van Heerden and Vine (2007:26) is that with electronic medical records it is faster to compile clinical documents which are filed automatically. The formulation of patient summary on referrals, retrieval of information as well as auditing of clinical information is also fast. The adoption of electronic medical records was very slow because it needed a change in the operational ways of doctors and more training is also needed for effectiveness of the new system. Thurston (2005) argues that technological improvement is developing faster than the skills and infrastructure development. There is a need for more training and education in government. The government should consider the records media's instability, obsolete hardware, hardware incompatibility, software, data format, storage media, lack of metadata, context of information, clearly assigned responsibility and long-term records preservation resources in implementing e-records management.

2.4 Electronic document management and paper-based records management

Documents processing is a core in business processes because it is the main source of information when it comes to long-term accountability, authenticity and confidentiality (Klischewski 2006:34-35). The concepts Electronic Records Management System (ERMS) and Electronic Document Management System (EDMS) were initially used interchangeably (Blatt 2011 in Katuu 2012:38). The different between the two concepts is because EDMS record are born in a paper format and then converted to and/or managed electronically, while ERMS records are born digitally, maintained and managed in the same format. The interchangeable use of the two concepts resulted in their combination to eventually form Electronic Record and Documents Management System (ERDMS) or Integrated Document Management Software or Systems (IDMS) (Katuu 2012:38-39).

EDMS includes the conversion of paper-based records or documents into digital documents. Records of paper documents such as photos, plans, microfiche, maps and drawings are converted into digital documents. These kinds of records can be converted by using IT resources such as fax to PDF conversion and several types of scanners. The scanners used include high-speed scanners which are usually used for scanning very large volumes of paper, wide format scanners used for scanning large drawings, photo scanners, negative scanners, and microfiche scanners which are used to convert microfiche to digital documents (Cvision Technologies 2011 in Katuu 2012:38; Klischewski 2006:34-35).

> Traditional paper-based records management systems have limited utility and application to the implementation of e-government. However, ERDMSs can help to promote e-government by ensuring electronic records that document the government's interaction with the public are soundly managed and accessible (Ann 2003:5).

It is a great advantage to integrate or merge both the ERMS System with the EDMS that will reduce duplication of document inventories, document profiling or meta-data, systems and support requirements. This can also minimise capital investments and human resource to support separate EDMS and ERMS needs (Barry 2001).

EDRMS offers additional potential as the corporate information repository of organisations to increase the capacity of information services to integrate the vast array of corporate knowledge being generated by organisations and their employees (Goldschmidt, Joseph & Debowski 2012).

> Documentation refers not only to documents produced but also those actions intended to capture the relation between the activity … and the documents produced thereby …the metadata of why, where, when, how and who conducted the examination and wrote the protocol" (Valtonen 2005:181).

3 Problem statement

The problem that led to this study was that health workers in the public health institutions, such as medical doctors and nurses, were usually not able or were struggling to render timely and effective health services to citizens due to a lack of effective records management systems. Ineffective records management systems usually lead to long patient waiting times before patients receive health service. The health workers usually end up not rendering certain services because the health history of the patient is not contained in medical files. This is due to the fact that, if the health worker proceeds treating patients without enough information about the patients' health background s/he may end up rendering poor health service that might be risky to patients' health. ICT or electronic records management systems can be used to ensure easy and fast access to treatment and retrieval of information or records (Ojo 2009:95). In traditional paper records management systems, the records managers and clerks waste a lot of time looking for missing and/or misfiled records, which is not conducive to the functioning of an organisation. There is a need for an effective records management programme to upgrade the records keeping system for easy and timely retrieval of information, improved office efficiency and productivity (Robek, Brown & Stephens 1995).

4 Research methodology

This study was conducted from the year 2009 to 2011 as part of a dissertation for Master of Information Science degree at the University of South Africa (UNISA) in the Department of Information Science. The purpose of the study was to investigate the extent to which the current electronic records management and recordkeeping practices in the Limpopo Province support or undermine service delivery. In the scientific research study there are several research methods that are applied in conducting the scientific research. This study triangulated quantitative and qualitative methods. Certain problems and challenges for certain research topics need a combination of both methods by their nature to ensure validity of the results or findings (Bryman 1988:173; Cohen, Manion & Morrison 2000:112). This improved the quality of the research by minimising biases, limitations and weaknesses because they closed the loophole for each other. The qualitative method was used to view the experience of the participants about the condition or problem being studied and explored the reasons for their kind of response to the situation (Creswell 1994:2). The quantitative research method explored and measured the situation based on statistical information such as how many people supported or did not support certain issues or statements and interpret the results (Creswell 1994; Fidel 2008; Matveev 2002; Powell 1997).

4.1 Population and sampling

The population of this study was drawn from two units of the 40 hospital within the 5 district of the Limpopo Province of South Africa. The hospital units targeted were the Records Management Unit and the Information Management Unit. These units were more relevant because they are using patients' files on a daily basis to discharge their duties. Table 1 lists the 40 hospitals, 5 districts and 2 units sampled as targeted. The population is a group of elements sharing the same sentiment. It is a large pool from which our sampling elements are drawn and to which the researcher generalised the findings (Babbie, Halley & Zaino 2003:112; Black 1999:111; Ngulube 2005a:129; Welman & Kruger 2001:46).

Table 1: Number of information and records management staff in each hospital of Limpopo Province of South Africa

DISTRICT	HOSPITAL NAME	HOSPITAL TYPE	TOTAL STAFF	
			RECORDS MAN-AGEMENT	INFORMATION MANAGEMENT
1. Mopani District	1. Letaba Hospital	Regional hospital	15	2
	2. Evuxakeni Hospital	Specialised hospital	2	0
	3. Sekororo Hospital	District hospital	5	2
	4. Nkhesani Hospital	District hospital	4	1
	5. DR. CN Phatudi Hospital	District hospital	5	0
	6. ML Malatji Hospital	District hospital	4	4
	7. Kgapane Hospital	District hospital	8	1
	8. Van Velden Hospital	District hospital	5	1
	SUB-TOTAL		**48**	**11**
2. Capricorn District	1. Mankweng Hospital	Tertiary hospital	16	2
	2. Polokwane Hospital	Tertiary hospital	7	2
	3. Thabamoopo Hospital	Specialised hospital	4	2
	4. Helen Franz Hospital	District hospital	7	2
	5. Seshego Hospital	District hospital	5	3
	6. Bohlokwa Hospital	District hospital	4	2
	7. WF Knobel Hospital	District hospital	3	2
	8. Lebowakgomo Hospital	District hospital	7	2
	9. Zebediela Hospital	District hospital	5	1
	SUB-TOTAL		58	18
3. Sekhukhune District	1. St. Ritas Hospital	Regional hospital	12	3
	2. Dilokong Hospital	District hospital	4	1
	3. Jane Furse Hospital	District hospital	11	1
	4. Matlala Hospital	District hospital	5	1
	5. Groblersdal Hospital	District hospital	0	0
	6. Philadelphia Hospital	District hospital	5	2
	7. Mecklenberg Hospital	District hospital	2	0
	SUB-TOTAL		39	8
4. Vhembe District	1. Tshilidzini Hospital	Regional hospital	8	1
	2. Hayani Hospital	Specialised hospital	8	1
	3. Donald Frazer Hospital	District hospital	8	2
	4. Elim Hospital	District hospital	10	1
	5. Louis Trichard Hospital	District hospital	6	5
	6. Malamulele Hospital	District hospital	7	1
	7. Messina Hospital	District hospital	6	1

	8. Siloam Hospital	District hospital	10	2
	SUB-TOTAL		63	14
5. Waterberg District.	1. Mokopane Hospital	Regional hospital	10	2
	2. Elisras Hospital	District hospital	4	2
	3. Thabazimbi Hospital	District hospital	5	1
	4. Warmbaths Hospital	District hospital	9	1
	5. Witpoort Hospital	District hospital	5	3
	6. FH Odendaal Hospital	District hospital	6	2
	7. George Masebe Hospital	District hospital	6	2
	8. Voortrekker Hospital	District hospital	5	2
	SUB-TOTAL		50	15
GRAND TOTAL			258	66
SAMPLE FROM THE TOTAL POPULATION			155	56
PERCENTAGES FROM THE TOTAL SAMPLE			14%	5%
TOTAL POPULATION (STAFF)			**324 = 100%**	
TOTAL SAMPLE (PARTICIPANTS)			**210 = 65%**	

4.2 Sample frame

The participants sample was framed using the staff establishments that list all employees of each institution, according to their units and position/level or designation. The staff establishment spreadsheets were used to stratify and randomly select employees from the records management unit and information management unit in different levels to participate in this study as also supported by Powell and Connaway (2004:100).

4.3 Sample size

The total sample size of the survey out of the total population of 100% (324) was 65% (210), which represent 74% (155) from records management unit and 26% (55) from information management unit. This difference in sample per category was because the records management category had a greater total population of 258 (79%) and the information management category had little total population of 66 (21%). The researcher used Raosoft sample size calculator in (http://www.raosoft.com/samplesize.html) to calculate confidential level (95%) and margin of error (4, 10%). Seaberg (1988), Neuman (2000:217) and Grinnell and Williams (1990) in Ngulube (2005a:134) underscore that a minimum of 10% of the sample, especially for a large population, is good to draw a valid and reliable data. "There are no rules for sampling size" (Ngulube 2005a:130).

4.4 Sampling methods

Sampling is "the selection of research participants from an entire population, and involves decision about which people, setting, events, behaviour, and/or social process to observe" (Terre Blanche, Durrheim & Painter 2006:49). In sampling the population, the researcher used the probability sampling method, known as stratified random sampling to select participants for quantitative data collection. This was conducted by grouping or separating participants into non-overlapping groups according to their districts and fields of work. The researcher then applied simple random within the grouped population in each institution (Burton, Croce, Masri, Bartholomew & Yefremian 2005:104; Fuller 1993:1; Johnson and Christensen 2004:207; Zou 2006:1). Researcher also applied the non-probability sampling

method, called purposive sampling method to select participants for qualitative data collection. This was conducted by identifying Information and Records managers and/or overall supervisors/heads of the targeted unit in the hospitals as the key participants out of the entire population. This is because they have a better knowledge, understanding and information about the matter being studied. This sampling method depends on the researcher's knowledge about the participants in question (Kumar 2005: 179; Leedy & Ormrod 2005; Wamundila 2008:25).

4.5 Data collection methods and instruments

In collecting data, the researcher mostly used a questionnaire with little employment of interviews and observation. This is because the disadvantages of one instrument are the advantage of the other, and which means one technique closed gaps for the other and vice versa. The questionnaire was compiled and used with categories of several structured questions and some open-ended questions for collecting data to learn about population characteristics, attitudes and beliefs (Marshall & Rossman 2006:125). A questionnaire is a "statistical study of a sample population by asking questions about age, income, opinions, and other aspects of people's lives. A questionnaire is a set of questions used to gather information in a survey" (Mavodza 2010:110). Interviews were used by directly contacting the participant and ask them to answer questions relating to the research problem (Bless & Smith 2000:108) as a means of follow-up questions from the observation schedule. The observation was conducted with the addition of interviews on the same schedule. "In research, the use of various methods to collect the same data or triangulation is highly commendable…to support this Ngulube's study used a questionnaire as the key source of data supplemented by interviews and observation" (Ngoepe 2008:25 cited Nachmias & Nachmias 1996:226).

4.6 Data analysis method

In data analysis, the researcher used both qualitative and quantitative data analysis. The manual data analysis was established by creating a tally sheet from the questionnaire questions and design. The process was that when completed questionnaires were returned regularly from participants to the researcher, they were captured onto the tally sheet immediately. After the questionnaire tally capturing, tallies were counted/calculated on the sheet for each question and the total number was written as total number of respondents for each answer on each question. The Figures calculated were then captured into the MS Excel® Spread-sheet database that was also designed in line with the questionnaire. On the spread-sheet database the researcher then formulated spread-sheet-based calculation for total Figures from the tally sheet for conversion to percentages in the separate columns. The researcher finally developed graphs from the spread-sheet database and then copied them to article of the MS Word® document for proper analysis. On the other side, in quantitative data analysis, data was presented with the use of tables and graphs while qualitative data analysis was done using narratives, explanations and descriptions. Analysing data in a table form made it easier for the researcher to interpret the data. The researcher thereafter gave meaning to the tables and the graphs used for data analysis. According to Fidel (2008:269) the end-product of the qualitative method is text that includes image and drawing while quantitative method output numbers as outcomes of analysis. Both methods support each other without any demarcation. "Quantitative and qualitative approaches are used to address different aspects of the research problem, in order that a fuller picture might be developed and can be regarded as complementary" (Mavodza cited verbatim from Woolley 2009:8).

5 Findings of the study

5.1 Electronic records management in the public health sector

The government was aware of the fact that working with the old manual system did not assist the improvement of their services since people were used to online service (Sinclair 2002:103). The Department of Health did not fully take advantage of technology to handle a large volume of their records. They did not maximally use the new technology to improve their business transactions (Tafor 2003:72 cited from Ngulube 2001). It was due to the above reasons that electronic records did not enable individual users to access quality, timely, effective and efficient records to improve service delivery in the public health sector. It was not fully able to complete the organisation's work quicker with little effort, with quality, less costs and with compliance with law and regulations (Johnson & Bowen 2005:134; Ojo 2009:99; Tafor 2003:75).

5.2 Electronic records management system

The electronic records system in the hospitals was not fully effective for records management. The survey indicated that 73% of the respondents stated that the system used for electronic records management in hospitals did not cover all patient details, but only captured personal and financial details of the patients. The reasons given were that the system had space to cover all the details but the hospital officials decided not to use those other functionalities and this resulted in poor records administration. It will be an advantage for the system to cover all the details of the patient records, because 70% of the respondents stated that the electronic system was utilised every day as illustrated by Figure 1. That might be to check personal and financial details of the patients only. If the officials captured every detail onto the system it may enable the hospital to fully rely on the electronic records system for every detail/information about the patient. This was to be unlike an electronic system covering patients' personal details, dates and patients' payments (bill) per se as stated by 100% respondents. The system did not cover prescriptions, diagnoses and wards for patients admitted as rated by 5%, 4% and 14% of the respondents, respectively. Figure 2 illustrates these issues. The results were also the same with observation conducted. The hospitals used the patient administration system called E-HIS (Electronic Health Information System). The observation also reported that in all 40 (100%) hospitals electronic records were half done. The paper records were the one covering the entire scope of patients' consultation and treatment, which was the only information on patients' record.

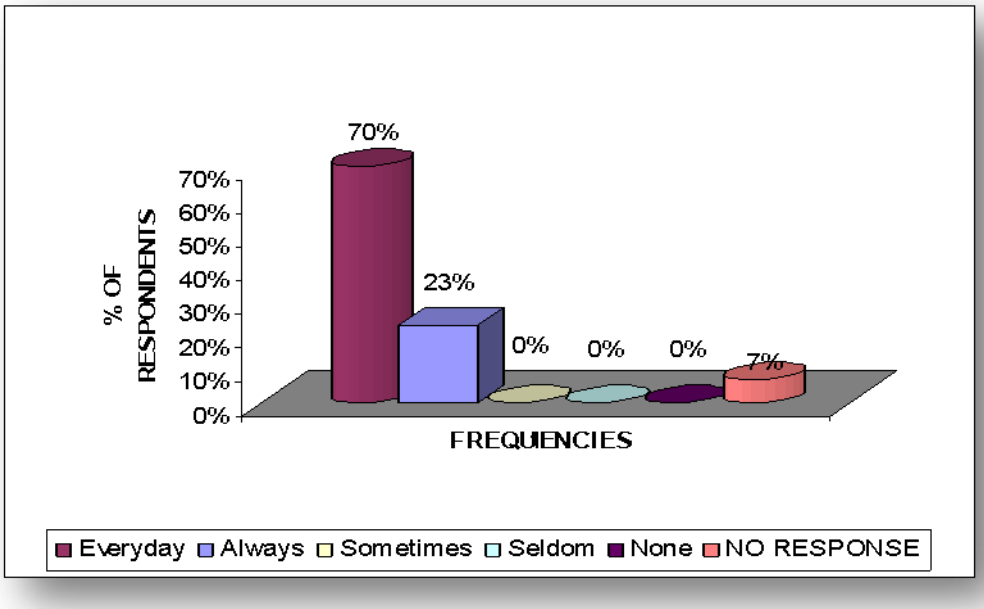

Figure 1: Frequency of electronic records utilisation

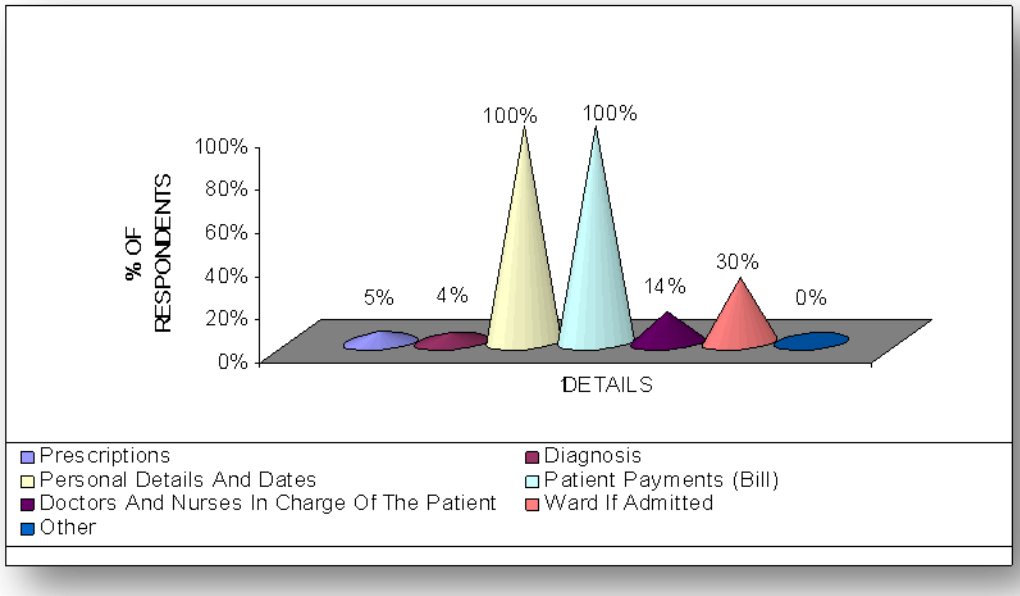

Figure 2: Patients details covered in the electronic records system

5.3 Electronic Records Management System (ERMS) and Electronic Documents Management System (EDMS) integration

There was a necessity for scanning and integrating both Electronic Records Management System (ERMS) and Electronic Documents Management System (EDMS) in the hospitals as supported by 85% respondents in the survey. They stated that it was necessary

and important since it will eliminate most of the paper records management challenges such as lack of enough filing space, misfiling, and records sharing. Figure 3 illustrates issues discussed in this paragraph.

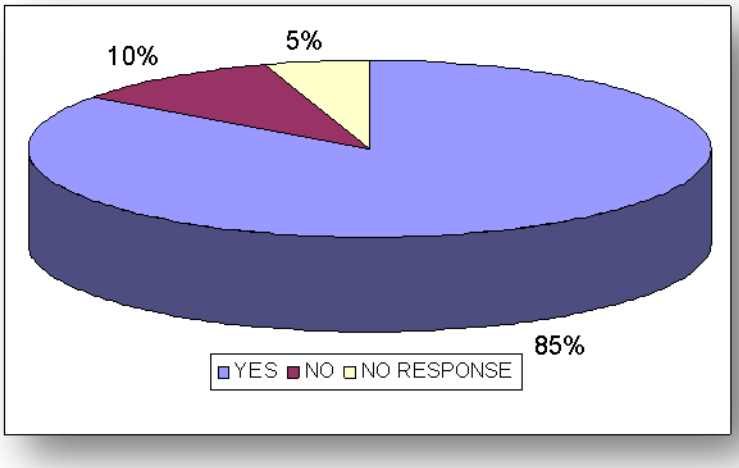

Figure 3: Scanning and integration of both ERMS and EDMS necessity and possibility

5.4 Electronic records disposal

The survey reported that 85% of the respondents stated that disposal authority for electronic records was not available, while 80% stated that they did not have a disposal plan for e-records in the institutions as illustrated by Figure 4 and 5. The records inventory was not developed, an appraisal guideline was not created, and retention schedule informed by the records inventory list was not developed. This was going to assist in showing the individual records retention period (Chachage & Ngulube 2006:14).

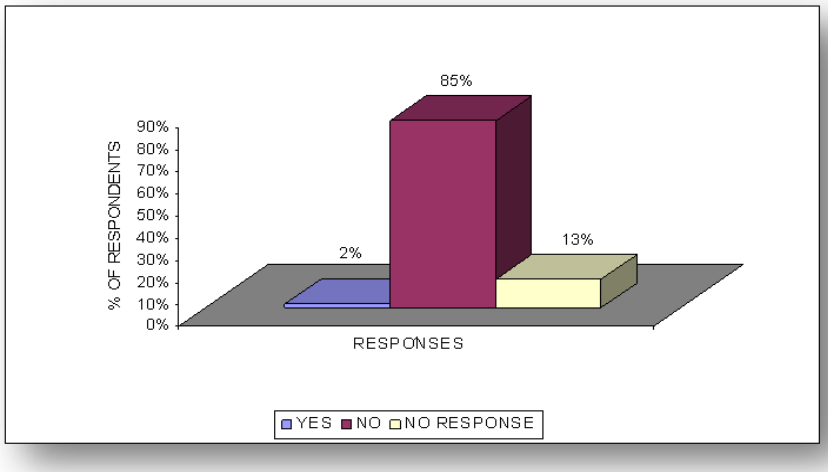

Figure 4: Electronic records disposal authority availability

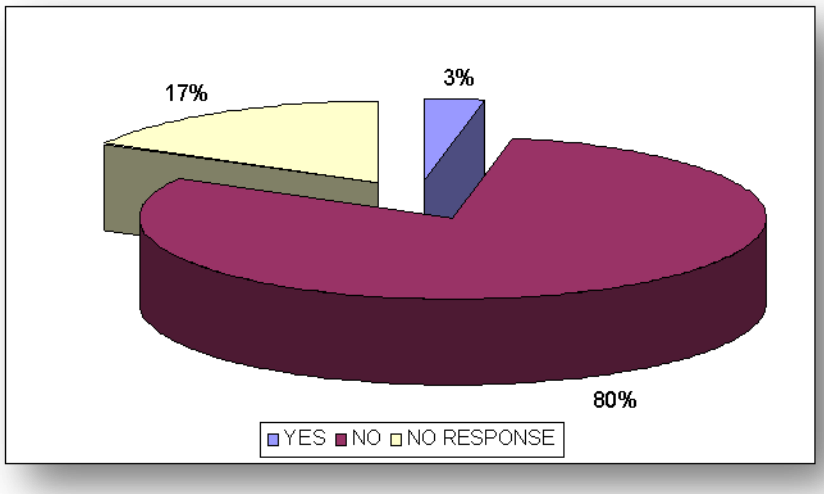

Figure 5: Availability of e-records disposal plan in the institutions

5.4.1 Electronic record-keeping

According to Figure 6, for proper and safer electronic records keeping 83% of the respondents preferred the server to be used as the electronic records storage. In so doing, records will be kept safe for several reasons such as accountability (75%), keeping the memory of the institution (70%) and referring for patients' health history (100%) as illustrated by Figure 7. The observation revealed that all 40 hospitals had patients' records management system servers, but they did not have a disaster backup for recovery if affected by disaster like fire and water. For viruses they used the antivirus, Symantec endpoint protection.

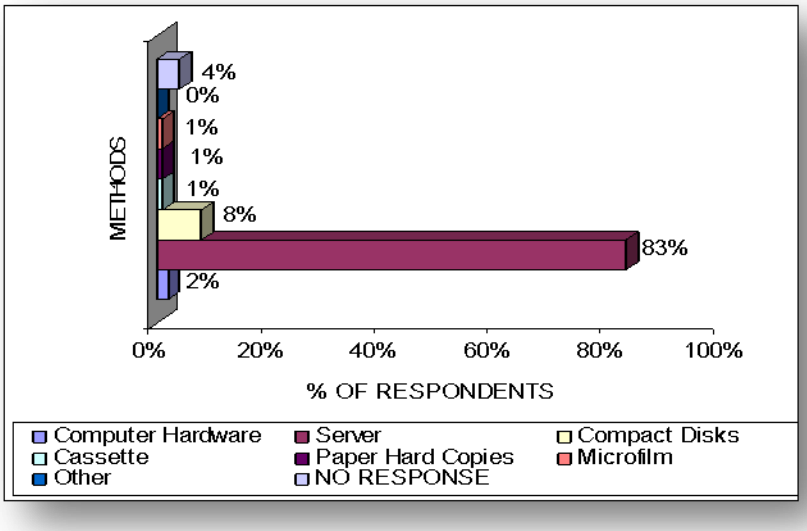

Figure 6: The best methods for keeping patients records

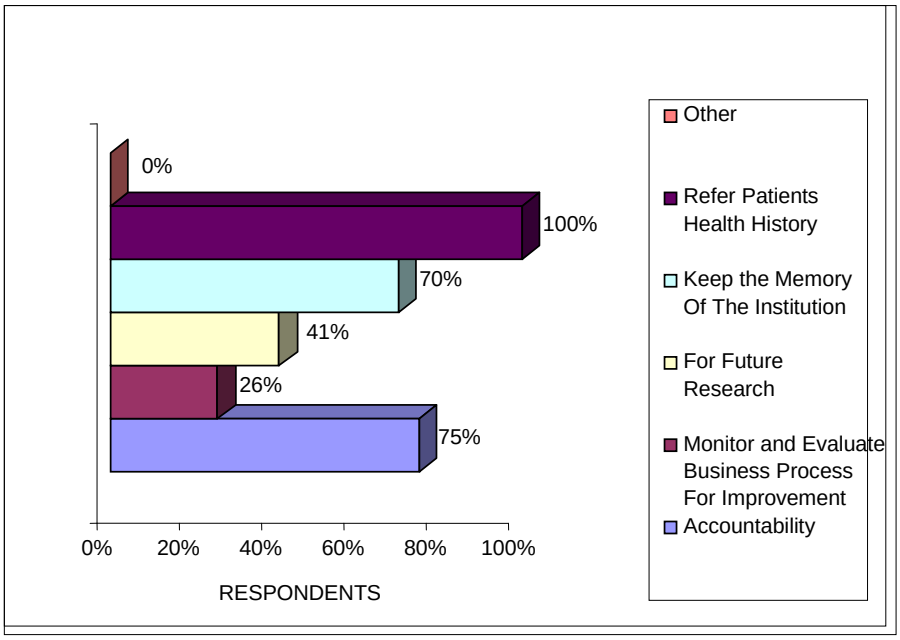

Figure 7: The use of electronic records

5.4.2 Inappropriate electronic records management and capacity

The Eastern and Southern African countries had several challenges with regard to capturing and preservation of electronic records. These challenges entailed lack of records management plan, inadequate knowledge about the importance of records management for organisational efficiency and accountability. Some other challenges included lack of records handling coordination and responsibility, no legislation, no policies and procedures, lack of central ability to manage records, understaffing on records management unit. There was also no budget for records management, poor records security and access control, no records retention and disposal policy, and no records movement control techniques. In Africa, development was still hindered by, amongst others, a lack of ICT, illiteracy, politics and poor infrastructure (Mnjama 2005:458-459 cite Mnjama & Wamukoya 2004; Nengomasha 2003:66; Ngulube & Tafor 2006:59-60; Ojo 2009:95; Wamukoya & Mutula 2005b:70). The study conducted by Gunnlaugsdottir (2008:33-34) concluded that a lack of management support, a lack of general training in records management, a lack of effective system training to employees and resistance to change were the causes of failure in implementing electronic records management system.

Most of these challenges were not exclusive to the Limpopo Department of Health hospitals. The survey reported through Figure 8 that 100% of the respondents stated shortage of filing space, 94% stated misfiling and missing files, 91% stated incompetent/unskilled staff, 100% stated shortage of staff, 77% stated lack of support for resources, 96% stated lack of general staff awareness about the importance of records and 100% stated insufficient budget as the major problems.

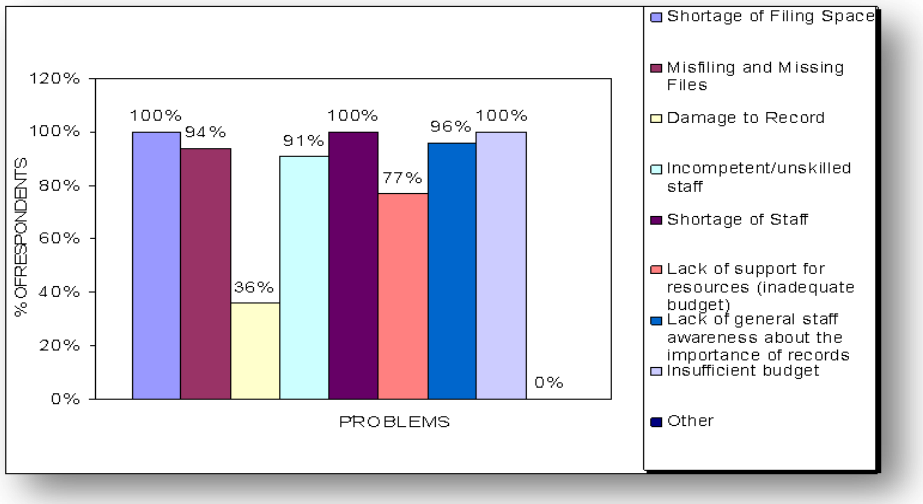

Figure 8: Serious administrative problems for records management

5.4.3 Electronic record management resources availability and functionality

In order to ensure timely and quicker retrieval of records in response to records requests in the public health sector, proper records management must be exercised. This will assist in avoiding records management barriers like misfiling and missing files. Proper records keeping will result in a proper file tracking system in an organisation (Marutha & Ngulube 2010:10). It is encouraged that in electronic records management proper records keeping systems and documentation of disposal be done as authorised (National Archives and Records Service of South Africa 2006:3). Like in many countries of the ESARBICA, in the Limpopo hospitals there were no proper systems for opening, tracking and indexing files (Ngulube & Tafor 2006:59-60). The survey reported in Figure 9 that 87% respondents confirmed that the hospitals were using the records tracking system, but 56% of respondents stated that the tracking system used were in the form of manual registers as illustrated by Figure 10. Out of this situation, 51% had a desire for the hospitals to keep patient records electronically, survey reported.

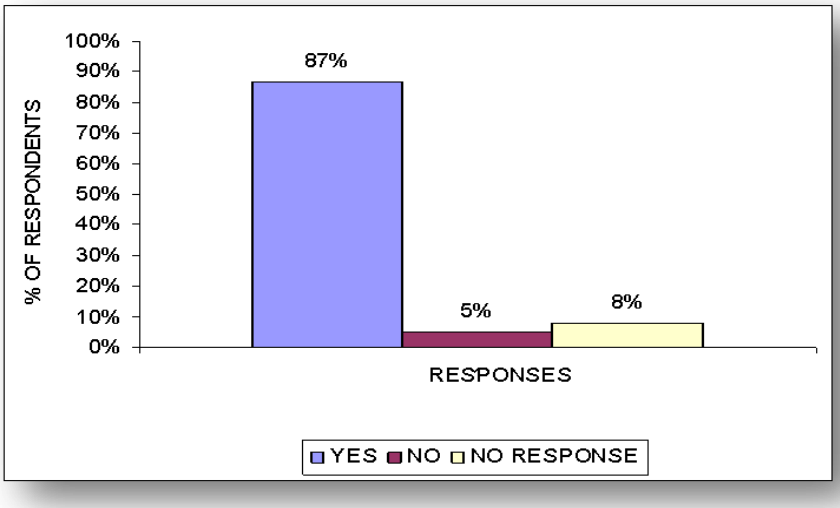

Figure 9: Availability of the document tracking system for manually managed records to control its movement

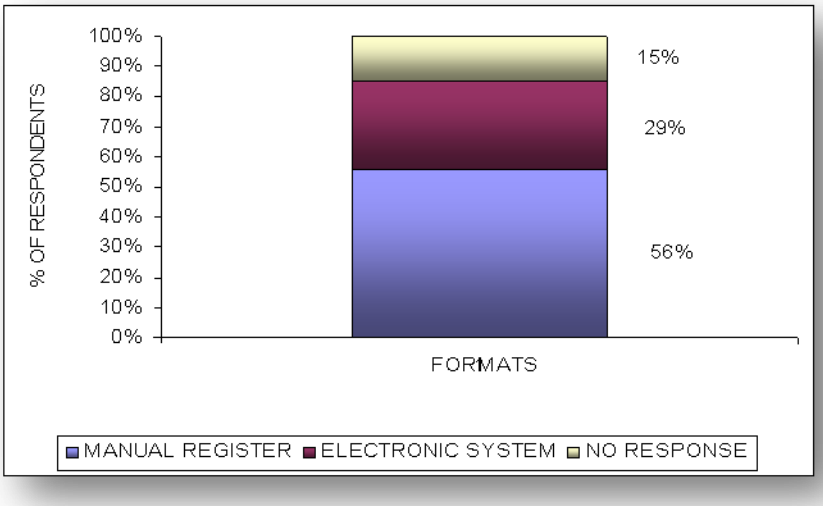

Figure 10: Types/formats of document tracking system

5.4.4 Advantages of electronic records management

Electronic records management is important and necessary in the hospitals. The survey reported through Figure 11 that 100% of the respondents stated that electronic records management will save retrieval time, 99% stated that it will save filing space, 77% stated it will save stationery like toner and blank papers, 69% stated it will pave a way to paperless offices, and 98% stated it will assist in avoiding user queuing for one file. This can be a great contribution to business processes improvement on organisational business.

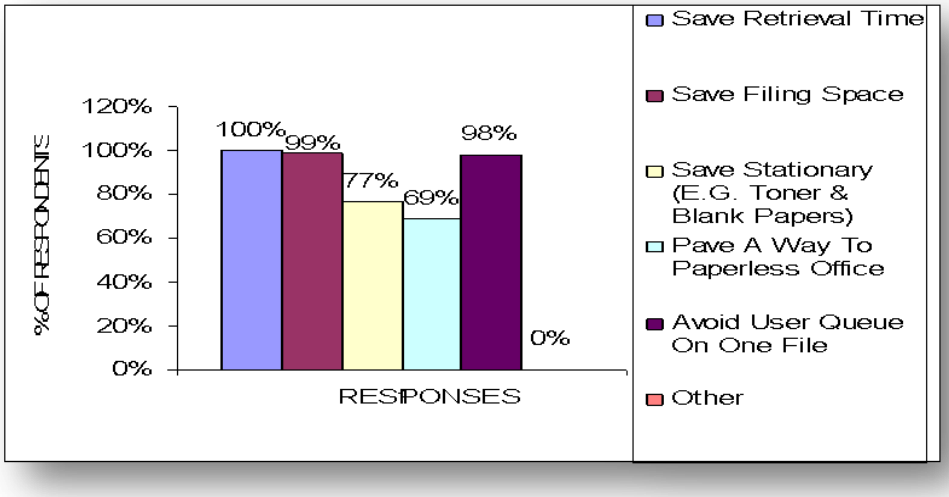

Figure 11: Electronic records management assistance in improving business pro cesses

Furthermore, the disadvantage of the handwritten medical records is that it might be illegible, incomplete, not well organised and could sacrifice the quality of care. Electronic medical records have several benefits such as minimum paperwork, maximum communication with users, low medical errors, low costs, timely access to information, accurate data and high physical efficiency (Tsai & Bond 2007:136). The survey revealed in Figure 12 that out of all the respondents, 98% thought that electronic records management can minimise some of the problems like shortage of filing space, missing and misfiling, damage to records, and shortage of staff. Looking at the specific solution to the problems discussed above, the survey revealed several alternative solutions and reported by Figure 13 such as moving to electronic records management as a solution (100%), reviewing staff establishment and adding more staff (77%), capacitating records management staff (92%) and providing enough budget specifically for records management (98%), more training for staff (100%), and conducting regular scheduled records awareness workshop (88%).

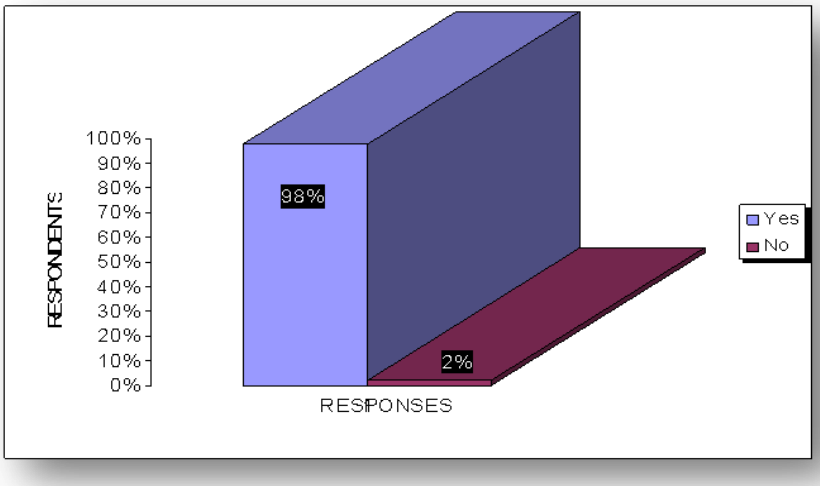

Figure 12: The electronic records management problem minimisation ability

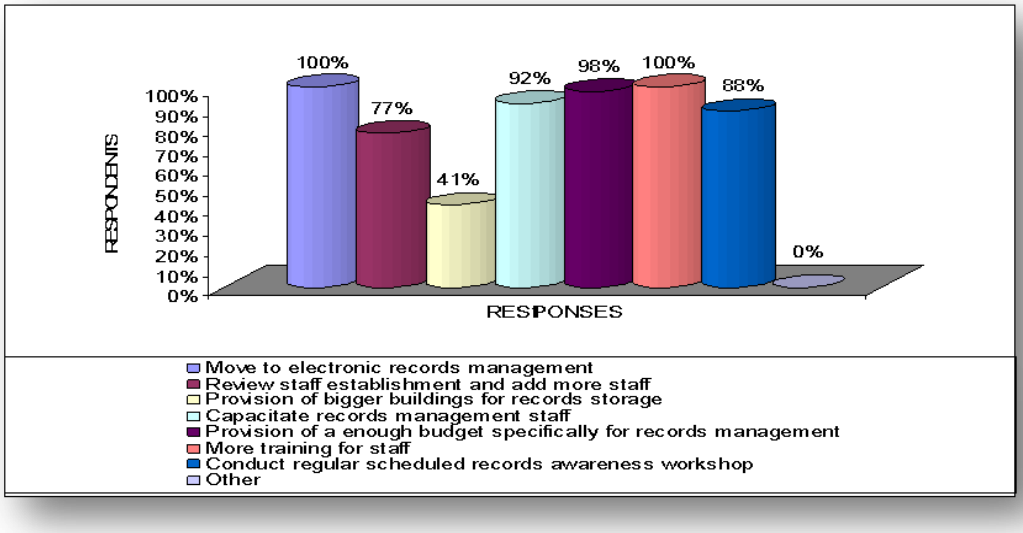

Figure 13: Recommended solutions for records management problems

Electronic records management can improve service delivery in the institutions. Looking on table 1 with the eye focus on good, very good and excellent, the survey indicate that 96% respondents rated that electronic records management can improve business processes, file retrieval time and the quality of service, 95% rated that it will also improve patient waiting time and 94% rated that it will improve customer satisfaction, compliance with policies and norms, and improve job satisfaction. Looking at the readiness for e-records management, the observation discovered that the computer hardware, server and network line were available at all 40 (100%) hospitals in the most necessary offices and all patient records management officials had computer workstations although their conditions differed.

ITEM RATED	1 (excellent)	2 (Very good)	3 (Good)	4 (Poor)	5 (Very poor)
1. Improved business processes	57%	28%	11%	3%	1%
2. Quality of service	53%	26%	17%	2%	2%
3. File retrieval time	64%	19%	7%	5%	5%
4. Patient waiting time	48%	28%	18%	4%	2%
5. Customer satisfaction	45%	36%	13%	4%	2%
6. Compliance to policies and norms	43%	29%	22%	4%	2%
7. Job satisfaction	51%	22%	21%	4%	2%

Table 1: The rate of electronic records management improvement to service delivery

5.4.5 Electronic records management-major challenges

Sometimes, if the department is not proactive, dependency on e-records in a changing technology and fragile media result in records missing or lost (Thurston 2005). Several challenges may be experienced in introducing the new technology and it might also pose some training challenges and problems. The issue of employees afraid of the new changes should also be taken into account because usually change is a painful learning process to learn the new operational ways. People should be trained in how to use the system and how they were going to benefit out of the new system (Johnson & Bowen 2005:135-136). The results of the survey also stated that electronic records, although necessary, might also bring several challenges such as system offline and lack of system usage skills as stated by 100% respondents and system slow response stated by 93% of the respondents. This is illustrated in Figure 14.

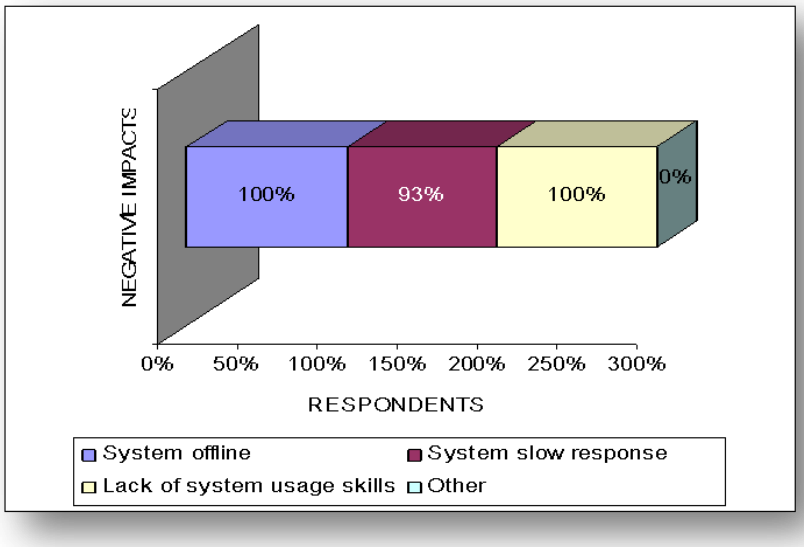

Figure 14: Negative impact of electronic records management on the business processes

6 Recommendations and conclusion

The hospitals were not effectively utilising information technology to ensure a smooth running of the records management and administration since an electronic records system was not fully effective for records management purposes. It did not cover all patient details. The system had a provision to cover all the details, but the hospital officials were not using the system for their other administration such as patient treatment and prescriptions. The hospital used electronic system called E-HIS (Electronic Health Information System) every day, but it did not hold enough information. The paper records were the one covering the entire scope of patients' consultations and treatments, which was all information on patients' record. The hospitals utilised servers as a storage media for electronic records keeping without disaster backup for recovery if affected by disaster. The hospitals did not use the ERDMS. They found ERDMS a necessity and relevant to their situation or environment to eliminate most of the paper records management challenges such as lack of enough filing space, misfiling and records sharing. The hospitals did not have a disposal plan and disposal authority for e-records and any other type of records. Records appraisal, sentencing, destruction or transfer to archive repository was not done in the hospitals.

6.1 Recommendations

The hospitals need to fully utilize ERMS or move to EDRMS, to save retrieval time, save filing space, save stationery such as toner and blank paper, pave a way to paperless offices and avoid users queuing for one file, allow maximum communication with users, low medical errors, low costs, and timely access to information, accurate data and high physical efficiency. They need to do that for business processes improvement, minimise shortage of filing space, missing and misfiling, resolve damage to records and shortage of staff. The hospitals need to upgrade and use the existing servers as a storage media for complete electronic patient records keeping. They also need to make available disaster backup for recovery in case it is affected by disaster like fire and water. They need to maintain the antivirus as they used Symantec endpoint protection.

The system used for electronic records management in hospitals need to cover all patient details, instead of only personal and financial details of the patients. Since the system has a provision to cover all the details, the hospital officials like doctors, nurses, pharmacists and clinical support staff need to use it through those available system functionalities. The systems should be common to all Limpopo Province hospitals and interlink to communicate with each other. The hospitals need to have a disposal plan and apply for disposal authority of e-records and any other type of records in their institutions. The hospitals need to develop policies specifically focused on patients' records administration and management. The records officials should also be trained in the policy after creation, together with relevant pieces of legislative framework governing management of patient records. This will ensure that the officials are exposed to legislative frameworks and policies governing patient records management.

However, government should have rules to indicate what types of records qualified to be kept on the system, responsibility for capturing and retrieval of records in the system, records usage, retention period and method (Tafor 2003:73-4 cited InterPARES Project 2001). People must have effective plans to manage electronic records. This will assist to avoid duplication, lack of security or access control to ensure that records are not deleted or accessed without authority. All the challenges can be addressed or prevented through the establishment and implementation of an effective records management policy (King1997:657). A proper records management programme is guided by policies, rules and

procedures to ensure an environment conducive to proper records management (Chinyemba & Ngulube 2005).

6.2 Conclusion

The hospitals were not effectively utilising information technology to ensure the smooth running of the records management administration. There was no advanced system for opening, tracking and indexing files. They were still using the manual registers as their file tracking system. The electronic records system in the hospitals was not fully effective for records management purposes. The system used for electronic records management in hospitals did not cover all patient details, but only captured personal and financial details of the patients. The system had a provision to cover all the details but the hospital officials like doctors, nurses, pharmacists and clinical support staff did not use those system functionalities. Although not capturing enough information, the electronic system was utilised every day to check personal and financial details of the patients only. Furthermore, the hospitals were not using the ERDMS. Although it was not started yet, they found merging the two systems a necessity. The hospitals had servers utilised as a storage medium for electronic records keeping, but they lacked disaster backup for recovery after a disaster for fire and water. They used the antivirus program Symantec endpoint protection. The hospitals did not have a disposal plan and disposal authority for e-records. The hospitals were ready for e-records management since they had computer hardware; server and network lines were available at all 40 (100%) hospitals.

In conclusion, the key recommendation for this study was for the hospitals to move to full electronic record creation and management in assisting medical professionals to provide timely and effective access to records. This is because the current records management system somehow contributed to the long patient waiting time before patients receive health services. The hospitals, through the support of the Department of Health, should take the advantage of improving records keeping systems in order to experience improvement in the health care service delivery. The timelines of health service to patients depend on, amongst others, timely retrieval and provision of patients' records to clinicians and nurses. On the other hand, the quality or proper health service depends on, amongst others, quality records that are authentic, reliable, trustworthy, unaltered, not erased/changed, retrievable, usable and accurate. The department should ensure that the necessary resources and budget are available to assist in improving records management and administration since this will positively impact on improvement in the health care services delivery.

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