Medical records management framework to support public healthcare services in Limpopo province of South Africa

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Abstract

Purpose – This study aims to develop a framework for the management of medical records in support of health-care service delivery in the hospitals in the Limpopo province of South Africa.

Design/methodology/approach – The study was predominantly quantitative and has used the questionnaires, system analysis, document analysis and observation to collect data in 40 hospitals of Limpopo province. The sample of 49 per cent (306) records management officials were drawn out of 622 (100 per cent) total population. The response rate was 71 per cent (217) out of the entire sample.

Findings – The study discovered that a framework for management of medical records in the public hospitals is not in place because of several reasons and further demonstrates that public health-care institutions need an integrative framework for the proper management of medical records of all forms and in all media.

Originality/value – The study develops and suggests a framework to embed medical records management into the health-care service delivery workflow for effective records management and ease of access. It is hoped that such a framework will help hospitals in South Africa and elsewhere to improve their medical records management to support health-care service provision.

Keywords Records management, Medical records, Public hospitals, Healthcare services, Limpopo province of South Africa, Records management framework

Paper type Research paper

Introduction

Records management is a critical factor in the successful achievement of many functions such as health care (Katuu, 2015; Marutha, 2011, 2016; Marutha and Ngoepe, 2017), auditing (Ngoepe, 2016; Ngoepe and Ngulube, 2016) and justice (Ngoepe and Makhubela, 2015; Motsaathebe and Mnjama, 2009a) to mention just a few. For records management to be implemented properly and to support organisational functions, it is highly dependent on the model used to manage the records. In most instances, ineffective records management models have many negative effects on the records (Yusuf and Chell, 2005, pp. 129-130). These negative effects include, but are not limited to, poor and untimely recording of data, misfiling, missing files, damaged records and unauthorised destruction of records, records theft and other related perils (Makhura, 2005; Marutha, 2011, 2016), which can compromise the quality of records and affect the support role of records in organisations. In the case of medical records, if the records' quality is poor because of incomplete or duplicated data recordings, the information collected will not reflect the true picture of the health-care service rendered or required (Kristianson, *et al*, 2009). This can have serious consequences

for the lives of citizens, as was evident in the case reported in the newspapers about the Polokwane Hospital not being able to provide medical records for one of its chronic patients suffering from cervical cancer (Maponya, 2013). The file was to be used for further radiotherapy treatment by a private doctor, but, before he could do that, he needed the medical records to obtain information about the patient's medical history. Unfortunately, the medical records, including X-ray films, could not be found and hospital officials' response was that they were either missing or misfiled. That placed the doctor and the patient under severe pressure and risk, as appropriate follow-up treatment and actions were not possible without the medical history of the patient.

As Ngoepe (2016) would attest, in the situation where proper records management models are in place, records can assist organisations with the provision of reliable information and thereby support the line function. The line function comprises the functions discharged by the core business of the organisation. For instance, in the Department of Health, the line function is health-care services. While many organisations, including health-care-based organisations, have developed records management models internationally, this is not the case with public health-care institutions in South Africa. For example, the UK Department of Education has developed a records management model for education services called the Information Workplace Platform (IWP) and launched it in April 2008 to provide secured collaborative services using SharePoint 2007. This also reduced the costs and information technology complexity (Castillo-Soto and Baker, 2011, p. 205). IWP enables access to the right information at the right time for decision-making and provides access to citizens (Castillo-Soto and Baker, 2011). In developing or improving a records management programme and/or model, Ismail and Jamaludin (2009) recommended that the five elements of trusted records management be considered. Although they focussed their study on electronic records, these elements are applicable to all categories of records, in different formats and media. The five elements are as following:

(1) records management governance practice, which is about the legal and regulatory infrastructure, policies, procedures, responsibilities and accountabilities related to records management;

(2) the recordkeeping system, which is about the operations, functional requirements and metadata requirements of records management;

(3) the records archival processes, which is about the appraisal, retention, preservation strategies and storage management of records;

(4) recordkeeping technology, which is about the management of electronic records systems and electronic system security; and

(5) records management staff capacity and competencies, which is about the ability of staff to conduct records management and archives management, and their related skills and competencies such as electronic systems development, information system analysis and design and business and management skills.

Furthermore, quality, timely, trustworthy and reliable knowledge or information may be produced through the use of proper records management models, coupled with an effective electronic records management system such as the enterprise content management (ECM) system or the electronic health records (EHR) system (Harries, 2008; Kumar, 2011; Weeks, 2013). Sadly, as reported in studies in South Africa, such as those done by Katuu (2015), Marutha (2011, 2016) and Ngoepe (2016), many public organisations in South Africa manage records without using a framework. An ideal records management framework needs to enable the organisation to effectively manage records throughout the life cycle – from

creation till disposal. Such a framework should be made up of a records management system, records safety and security measures, backup techniques and a file-tracking function. It should give the audit trail for tracking records creation and movement and be integrated with the business process workflow. The framework needs to be driven through policies and procedures to ensure uniformity in the process (Marutha, 2016; Ngoepe, 2016). This study sought to investigate the development of a medical records management framework that can assist in managing patients' medical records in the public health sector of Limpopo province in South Africa.

At the Limpopo Department of Health, a large number of medical records are created every day when patients consult doctors at different hospitals. Yet, they do not have a collaborative system such as the ECM to integrate the records management responsibility. The electronic system currently used for patients' administration has several flaws, including that it is not capable of tracking the movement or creation of paper-based records or the medical history of patients, and captures only personal details and billing data (Marutha, 2011, 2016; Marutha and Ngulube, 2012; Marutha and Ngoepe, 2017). There is no backup technique used; no effective security measure is in place for safety of the records housed in custodies; no audit trail to track file movement and creation. This results in records getting lost and misfiled frequently during health-care service delivery. The policies and procedures are in place but not appropriately implemented because of, among other things, lack of appropriate resources (Marutha, 2016; Marutha, 2011). Furthermore, the system is not integrated with other information management systems within and between the institutions and hospitals. This is critical because information in medical records is used for many reasons in different health-care institutions, forums and functions, and patients may use different health-care institutions for similar or related illnesses or medical problems. Among these other functions and forums are the clinical audit (doctors' peer reviews), nursing audit (nurses' peer reviews), further patient treatment, statistical purposes, the compilation of performance indicators, response to litigations, public access to information, investigations and support to police/court cases (e.g. rape cases and common assaults) (Marutha, 2011, 2016; Marutha and Ngoepe, 2017). This means that the organisation cannot see the impact that health-care service delivery practice and medical records management have on each other, whether negatively or positively, depending on whether the practice is proper or improper. Without authentic records, health-care clients are always likely to suffer. This study investigates the development of a framework for medical records management in support of health-care service delivery in hospitals in Limpopo.

Literature review

A records management framework or model is central to the successful performance of all functional activities. In a simple definition, the records management model refers to the methods used by institutions for the implementation and maintenance of their records management programmes (Ngoepe, 2016). Ngoepe (2016) attests to the fact that a records management framework can play a significant role in the provision of records management services in organisations, including hospitals. He elaborates that many governmental bodies do not consider the appropriateness of the records management models when designing and implementing the records management programme (Ngoepe, 2016; Ngoepe and Van der Walt, 2010). Developing a records management framework is not a task that can be undertaken overnight, as it requires time and numerous critical processes which may be met with adoption or implementation resistance (Ngoepe and Ngulube, 2016). However, the end results are highly valuable to the organisation because, with an appropriate records management framework, records management can be conducted appropriately with regard

to the creation, organising, appraisal and disposal of records, as guided by relevant legislation (Princeton University Records Management, 2017). A suitable records management framework brings about the systematic management of records as created from time to time during the business process in the organisation, enabling the organisation to meet "its administrative, fiscal, and legal obligations" (Princeton University Records Management, 2017). Such a framework is expected to give clear guidance on the location and arrangement of the records in filing custodies, so that records can be retrieved with ease (Ngoepe and Ngulube, 2016). According to the Hywel Dda University Health Board (2015):

> The purpose of the Framework is to set out and promote a culture of good practice around records management to support the provision of high quality care, and to ensure that records are handled to high ethical and quality standards in a secure and confidential manner.

Furthermore, it is important to ensure that the framework is appropriate for the particular records management practice, as it serves as "an outcomes-based regime" (Government of South Australia State Records, 2017). The records management "framework guides the creation, use and management of information and records assets" (National Archives of Australia, 2017). For instance, a framework is important and necessary in the organisation, as it also assists in outlining the basic needs to be met by the organisation in their records management business process. This may eventually result in some type of best practice model. The National Archives of Australia, (2017) underscores that with a records management framework "tangible benefits flow from sound information and records management practices". A records management framework further brings about proper records management planning, resourcing, creation, capturing, controlling, security, appropriate accessibility, managed disposal, monitoring and reviewing (Government of South Australia State Records, 2017). In other words, such a framework enables the proper management of records (Ngoepe and Ngulube, 2016). It also has the ability to identify the process through which the organisation will be able to meet the fundamental requirements of a "wide range of records management related matters" (Hywel Dda University Health Board, 2015). The records management framework plays an important role in the organisation since it:

> Enables the organisation to establish good practices around the handling of records, promote a culture of awareness and improvement, and comply with legislation and other mandatory standards (Hywel Dda University Health Board, 2015).

The records management framework enables the organisation to ensure that information and records are properly created, described and managed during the business process. This enables management to make robust decisions, manage business risks with ease and work in compliance with regulatory requirements. In short, a records management framework is one of the basic operational needs in the organisation, as it supports organisational governance and serves as an "integral part of the business" (National Archives of Australia, 2017). This is why Ngoepe and Ngulube (2016) stated that for the "framework to be applied successfully, records management has to become part of the way that an organisation is managed". They further elaborated that this will enable robust corporate governance in the organisation. According to the National Archives of Australia (2017), the following are some of the fundamental benefits of a records management framework in an organisation:

- avoiding the need to continually re-create corporate knowledge;
- improved service delivery;
- reducing the staff time and effort required to locate and access relevant and complete information;

- quicker and more accurate responses to organisational demands and requests for information;
- lower costs of compliance with freedom of information requests and other legal discovery;
- the protection of citizen rights; and
- the mitigation of risks to organisational reputation that might arise from media or audit criticism of poor information and records management practices, or non-compliance with legislative and regulatory obligations.

The University of Edinburgh (2017) also emphasised that a records management framework will ensure improved records management functions, as it will lead to compliance with legislation. Ngoepe and Ngulube (2016) underscored that, if properly aligned, a records management framework may assist in combating recordkeeping-related audit queries in auditors' reports, such as a lack of supporting documents or information for administrative activities or expenditure incurred.

The other benefits outlined by the University of Edinburgh (2017) include "better use of staff time, improved control of valuable information resources, compliance with legislation and standards and reduced costs". A framework also enables the organisation to use both physical and server space thriftily. Generally, a records management framework assists the organisation in improving internal organisational management processes as enabled by easy access to controlled and secured information, made possible by the recognised availability of authentic records (University of Edinburgh, 2017). The records management framework enables the records manager to develop the records management policies and procedures that are relevant and applicable to all staff members in the organisation with ease (University of Edinburgh, 2017). In a nutshell, "This framework and relevant materials developed as part of the records management programme, including procedural guidelines, are made available to members of the organisational community for their on-going reference" (Princeton University Records Management, 2017).

Generally, it is deemed necessary for governmental bodies to map their business processes with activities and define appropriate records management models to be implemented in the organisation (Ngoepe, 2016; Ndenje-Sichalwe *et al*, 2011). After designing the model, the organisation must also consider the business information system in the organisation. The system must be made up of, among other things, processes, policies, procedures, software and hardware for the purpose of capturing organisational business transactions that produce records in different formats and media. Examples are paper-based records, electronic documents, electronic records and Web-based transactional records integrated into a single records management system (National Archives of Australia, 2003, p. 27; Ndenje-Sichalwe *et al*, 2011).

The development and implementation of records management models in South Africa is still problematic. For instance, in his study about records management models in South Africa, Ngoepe (2016) discovered that in most government bodies there were no mapped records management processes and no determined models for the implementation of a records management programme. Ndenje-Sichalwe *et al*. (2011) also confirmed this in their study about managing records as a strategic resource in government ministries.

Research problem
The main problem that led to this study was that health-care providers, mostly nurses and doctors, are still experiencing difficulties in attempting to render quality health-care services

as also reported by Erasmus (2013), Marutha (2011) and Marutha and Ngulube (2012). As a result, patients wait too long before receiving the required health-care service. At times, patients receive inappropriate health-care services or the service is not rendered to them at all because of missing medical history records, as some of the medical practitioners avoid taking risks. Therefore, it is necessary that a framework to embed medical records management in health-care service delivery be developed. This study aims to design a framework that can embed medical records management into the health-care service delivery business process in the hospitals of Limpopo, to support health-care services. The specific objectives of the study were to:

- determine the need for a records management framework in the public hospitals of Limpopo, South Africa; and
- propose an integrative framework that can facilitate medical records management practice in public hospitals by overcoming the problem of missing records in the hospitals

Research methodology
In this quantitative study, questionnaires and observation were used to collect data. The target population was 40 public hospitals in the Limpopo province of South Africa. The study used a stratified random sampling method to select records management officials from each hospital who were assigned the duty and responsibility to manage records. A total population of 622 was identified, from which a sample of 49 per cent (306) was drawn and out of which a response rate of 71 per cent (217) was obtained. The confidence level was confirmed to be more than 95 per cent and the margin of error was 4 per cent, according to the Raosoft sample size calculator. The Raosoft sample size calculator also recommended the sample size of 306 out of the total population of 622, which was adopted by the researcher. The questionnaire data were supplemented with observations, document analysis and system analysis to enhance the interpretation of the results.

Presentation of the findings of the study
The results are presented according to the objectives of the study
The medical record management framework. The observations revealed that there were no effective tracking systems and not all records management functionalities were implemented fully. The electronic system was also not in place and patients were carrying their files along the workflow. Patients' queue control was also chaotic in the hospitals, with patients always complaining about long waiting times and about some people being assisted before others. Document analysis shows that appropriate policies and procedures were in place but not implemented effectively.

The respondents were requested to rate the current medical records management system framework at their institutions. Their responses are depicted in Table I. To the statement that the framework enables a record's safety and security from creation to disposal in its life cycle, the respondents reacted as follows: 34.1 per cent (74) strongly disagreed, 44.7 per cent (97) disagreed, 6.5 per cent (14) agreed, 3.2 per cent (7) strongly agreed and 11.5 per cent (25) were unsure. Observation showed that the framework lacked a records backup and file-tracking function, especially at the records creation stage. In addition to this, 65 per cent (141) disagreed to the statement that the framework system detected when records were created, 9.2 per cent (20) strongly disagreed, 15.2 per cent (33) were unsure, 9.7 per cent (21) agreed and 0.9 per cent (2) strongly agreed. The system analysis and framework observation

Medical records management system framework	Strongly agree	Agree	Ratings Unsure	Disagree	Strongly disagree
The framework enables a record's safety and security from creation to disposal in its life cycle					
NO	7	14	25	97	74
%	3.2	6.5	11.5	44.7	34.1
The framework system detects when records are created					
NO	2	21	33	141	20
%	0.9	9.7	15.2	65.0	9.2
The framework system gives the records manager an audit trail of the records from the date of creation to the current date					
NO	4	9	16	141	47
%	1.8	4.1	7.4	65.0	21.7
The medical records management framework is collaborated or integrated into the workflow					
NO	13	31	28	95	50
%	6.0	14.3	12.9	43.8	23.0
The medical records management framework utilises the electronic system					
NO	6	11	15	110	75
%	2.8	5.1	6.9	50.7	34.6
Medical records on the framework are managed using the business administration system					
NO	12	21	14	128	42
%	5.5	9.7	6.5	59.0	19.4
Records are only handled by business-rendering officials on the framework, but not the clients					
NO	7	16	4	108	82
%	3.2	7.4	1.8	49.8	37.8
Records are created and managed electronically in the business process					
NO	2	17	8	113	77
%	0.9	7.8	3.7	52.1	35.5
Records are created manually and managed using the business administration system					
NO	28	23	21	88	57
%	12.9	10.6	9.7	40.6	26.3
Records are created manually and managed using a manual system					
NO	48	108	15	31	15
%	22.1	49.8	6.9	14.3	6.9

Notes: N = 217; NO = Number; % = Percentage

Table I.
State of the current
medical records
management system
framework

revealed that the system framework did not detect record creation, as records were created manually in the absence of the records management officials. Looking at the statement that the framework system gives the records manager an audit trail of the records from the date of creation to the current date, 65 per cent (141) disagreed, 21.7 per cent (47) strongly disagreed, 7.4 per cent (16) were unsure, 4.1 per cent (9) agreed and 1.8 per cent (4) strongly agreed. The system was not able to provide an audit trail of records because it was incapable of tracking the creation, movement and disposal of medical files or perform any other functional records management activity.

Furthermore, 6 per cent (13) strongly agreed to the statement that the medical records management framework collaborated with or was integrated into the workflow, 14.3 per cent (31) agreed, 43.8 per cent (95) disagreed, 23 per cent (50) strongly disagreed and 12.9 per cent (28) were not sure whether to agree or disagree. It was also observed that no medical records management techniques were used in the workflow because, during the business process, medical records are moved by hand by the patient from one health-care service station to the next. The fact that the medical records management framework uses an electronic system in the institution was disagreed to by 50.7 per cent (110), strongly disagreed to by 34.6 per cent (75), agreed to by 5.1 per cent (11), strongly disagreed to by 2.8 per cent (6) and 6.9 per cent (15) were unsure. The observation was that the medical records management framework was not using the e-system, since the system was not able to track file movements, nor perform many other records management functionalities, and was also not capable of capturing the metadata of records, nor record scanned images.

Nevertheless, 5.5 per cent (12) strongly agreed, 9.7 per cent (21) agreed, 6.5 per cent (14) were unsure, 59 per cent (128) disagreed and 19.4 per cent (42) strongly disagreed with the statement that medical records on the framework were managed using the business administration system. It was observed that the business electronic system was not being used for medical records management, but instead to capture the personal and billing details of patients. Respondents also strongly agreed (3.2 per cent [7]), agreed (7.4 per cent [16]), were unsure (1.8 per cent [4]), disagreed (49.8 per cent [108]) and strongly disagreed (37.8 per cent [82]) with the statement that records were only handled by officials rendering a business service on the framework, and not the clients. Observation confirmed that in the workflow, patients moved with their medical records from service point to service point during health-care service delivery.

Furthermore, out of all the respondents, 0.9 per cent (2) strongly agreed, 7.8 per cent (17) agreed, 3.7 per cent (8) were unsure, 52.1 per cent (113) disagreed and 35.5 per cent (77) strongly disagreed with the statement that records were created and managed electronically in the business process. As observed, medical records were not managed electronically in the health-care institutions, apart from the fact that the system was used to capture personal information and billing data *per se*. It was used neither to track the movement of paper records nor to provide an audit trail. Looking at the statement that records are created manually and managed using the business administration system, 12.9 per cent (28) strongly agreed, 10.6 per cent (23) agreed, 9.7 per cent (21) were unsure, 40.6 per cent (88) disagreed and 26.3 per cent (57) strongly disagreed. As observed, the only aid provided by the system for medical records management was the patient's unique number that was generated or created automatically by the system during the first visit of the patient to the health-care facility. This number is also used as a filing number for medical records and is usually verified through the system before records practitioners go to the shelves to retrieve the files. According to the observation, records were created manually and were also managed manually. Indeed, 22.1 per cent (48) of the respondents strongly agreed, 49.8 per cent (108) agreed, 6.9 per cent (15) were unsure, 14.3 per cent (31) disagreed and 6.9 per cent

(15) strongly disagreed with the statement that records were created manually and were managed using a manual system in the business process. As indicated before, the report is presented in Table I. Observation also supported the statement that medical records are created manually and managed using a manual system in the business process. One respondent stated that "everything is still done following paper manual process here; no computer is used for any of our records management activities".

Discussion of the findings

In the literature reviewed, Ngoepe (2016) attested to the fact that "records management models play a significant role in the provision of records management services in organisations". Many government bodies do not consider the appropriateness of the records management model when designing and implementing the records management programme (Ngoepe, 2016; Ngoepe and Van der Walt, 2010). This was the case with the Limpopo health-care institutions, as the medical record management framework was not effectively enabling the institutions to manage medical records properly, as was confirmed by 71.9 per cent (156) of the respondents. There was no effective tracking system and not all records management functionalities were fully implemented and were therefore not covered by the electronic system. Patients carrying their files along the workflow also sacrifices the security of records.

The literature reviewed underscores that the development and implementation of records management models in South Africa are still problematic. For instance, in most government bodies there were no mapped records management processes and no determined models for the implementation of a records management programme (Ngoepe, 2016; Ndenje-Sichalwe *et al*, 2011).

The organisational leadership needs to consider a sound records management model as a necessity in the organisation. That will assist in ensuring that records are managed and preserved properly through the deployment of well-trained staff, appropriate governance tools and appropriate systems and technology, from creation to disposal (Ngoepe and Van der Walt, 2010). It is deemed necessary that government bodies should "map their processes and define the models appropriate for the implementation of records management" (Ngoepe, 2016; Ndenje-Sichalwe *et al*, 2011). When designing the model, the organisation must also take into consideration the business information system in the organisation. The system must consist of, among other things, processes, policies, procedures, software and hardware for the purpose of capturing organisational business transactions that produce records in different formats and media, such as paper-based records, electronic documents, electronic records and Web-based transactional records, integrated into a single records-management system (National Archives of Australia, 2003; Ndenje-Sichalwe *et al*, 2011).

In the Limpopo health-care institutions too, as confirmed by 44.7 per cent (97) of the respondents, the medical records management framework did not ensure the safety and security of records from creation to disposal in their life cycle. One of the reasons for this was that the framework lacked a function for backing up records and tracking files, especially at the records creation stage. The framework system was unable to detect when records were created, as attested by 65 per cent (141) of respondents. Moreover, the system framework did not detect records creation because records were created manually in the absence of the records management officials to control the recording of the newly created records. The framework was also unable to give the records manager an audit trail of records, from the date of creation to the current date, as was confirmed by 65 per cent (141) of the respondents. The system was not able to give an audit trail of records, because it was

incapable of tracking the movement of medical files. Furthermore, not the creation, disposal, nor any other functional activity of a records management was covered by the system.

According to the literature, it seems advantageous to use a records management system that includes records in different formats and media, for the smooth management of records such as paper-based and electronic records (Mcleod, 2012; Ngoepe, 2016; Ndenje-Sichalwe *et al*, 2011). The recordkeeping system should also be developed with the guidance of organisational business procedures and activities (Horsman, 2001; Ngoepe, 2016). This is unlike in the Limpopo health-care institutions, where the medical records management framework did not collaborate with and was not integrated into the workflow, as indicated by 43.8 per cent (95) of the respondents. There were no medical records management techniques in the workflow because, during the business process, medical records are moved from one health-care service station to the other through the hands of the patient. In the consulting rooms and the wards, records management staff were not sure about what might be happening with the records, since they were handled in their absence and there was no electronic system to track and inform them regularly about new records created and the type of records contained in the files. The medical records management framework did not use an electronic system in the institution, as confirmed by 50.7 per cent (110) of respondents. The medical records management framework was not using the e-system, as the system was not able to track file movements nor perform many other records management functionalities and was also not capable of capturing neither the metadata of records nor scanned images. This was the reason why the system could not provide an audit trail for records.

Proposed framework to embed medical records management into health-care service delivery

The central purpose of this study was to design a framework that would embed the medical records management system in the health-care service delivery business process or workflow of the health-care institutions in Limpopo. The framework illustrated in Figure 1 was introduced with the intention of assisting health-care institutions in closing gaps in health-care records management such as theft, access control, the backing up of records, disaster management, the conditions of records custody and required resources and other enablers. Closing these gaps will result in resolving long patient waiting times because of long turnaround times for file retrieval, and patients not being treated correctly or receiving incorrect treatment because of lack of medical history. To achieve this, researchers investigated and developed the recommended collaborative medical records management framework system for sound patient records management practice as illustrated in Figure 1. Sound patient records management practice would support the creation, safety and security of records. The intention was to ensure that records always contain quality information. It should also be ensured that records provide timely, accessible, complete, valid and accurate information for different purposes, such as to support management decision-making, aid in problem-solving and ensure health-care service continuity.

The health-care institutions in Limpopo had established and implemented a records management programme, but the study discovered that they still struggle with the timely retrieval and provision of records and the collection of accurate data for health-care professionals. The aim of this study was therefore to prove that this framework would make a positive contribution to the improvement of the state of records management in the health-care institutions, in such a way that records are secured and can be located and retrieved easily and timeously, through sound records management. This would be possible because the records management process would be embedded in the health-care service delivery practice. The process of developing a framework and embedding it in the health-care
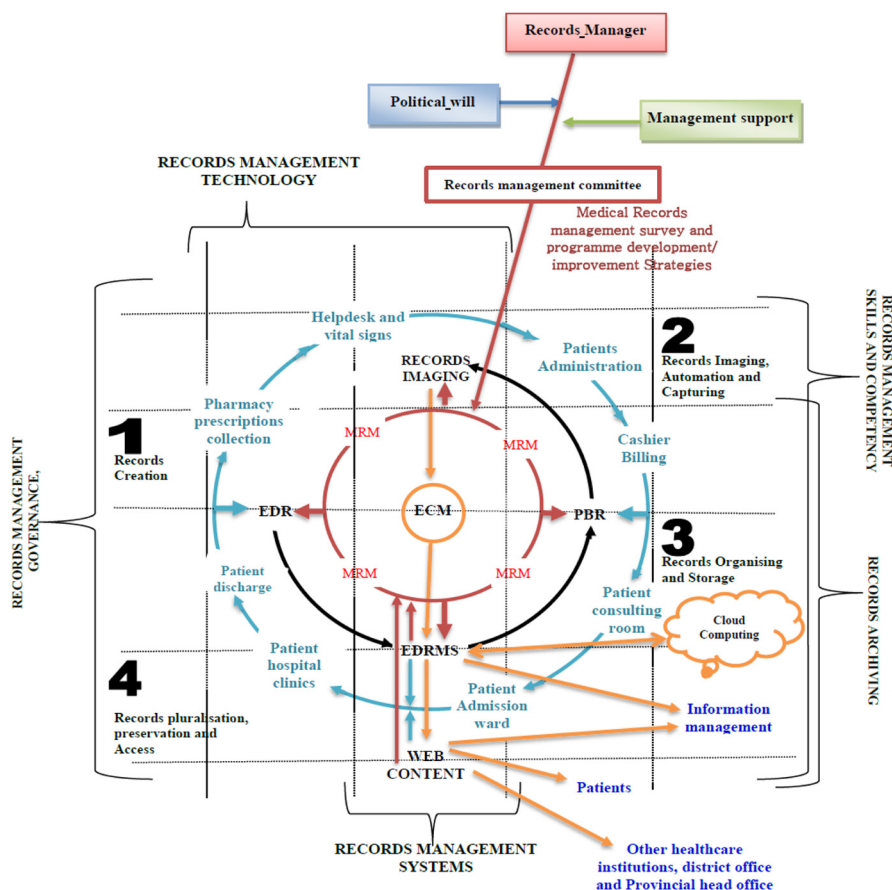
Notes: MRM - Medical Records Management; EDR -- Electronic Documents and Records; PBR -- Paper-Based Records; EDRMS -- Electroic Documents and Records Management System; ECM -- Enterprise Content Management

services process is not a task to be undertaken overnight, as it involves many activities and critical resources. As depicted in Figure 1, this study proposes a non-prescriptive framework to embed medical records management into the health-care service delivery workflow. The intention was to allow the organisations to incorporate the proposed framework into their own local environment and situation. Hence, the framework would be integrated into the health-care service delivery workflow or activities as per the findings of the study.

Looking at the framework illustration in Figure 1, in preparation for the customisation of the proposed framework and its implementation, it is clear that the organisational records management programme will have to be reviewed and improved, together with the records management system. As illustrated in the diagram, to begin with the process of records management improvement, the organisation will need to make sure that they have a suitably qualified *records manager* to lead the process. It is deemed vital that the records manager receive *management support* and *political will* to succeed in his/her endeavour. As illustrated,

the records manager will have to identify all stakeholders in records management in the organisation and involve them in the formation of a *records management committee*. This will help to advance and support proposals or submissions and will help to combat barriers that may hinder progress. The stakeholders must consist of people who can affect records management strategies directly or indirectly, through the provision of resources, through recommendations and motivations, and through approval for implementation.

As illustrated, after the establishment of the records management committee, the committee may start by conducting the *medical records management survey* under the leadership and guidance of the records manager, as an expert in the field of records management. The survey will help to identify the current kinds of medical records, their state and mode of management, existing records management systems and issues relating to retention periods, disposal mode and many more details (Fanning, 2013; Yusuf and Chell, 2005; Yusof and Chell, 2000; Chaterera *et al*, 2014). The survey will also help to discover whether the current systems capture and maintain business activity records properly, will explore any records requirements and will determine system performance and capabilities (ISO 15489, 2016b and ISO 15489, 2016a; Van der Westhuizen *et al*, 2010; Chaterera *et al*, 2014). Such a survey is essential because information about what has to be improved, maintained, added to or removed from the programme is required before any action can be taken by the organisation or committee.

Generally, the records survey or audit will enable the records management committee to explore valuable information relating to records management governance tools, records management technologies, records management skills and competencies requirements, records archiving processes and the records management system itself, and to strategise about these. This implies that policies and procedures will need to be reviewed if available or developed if not available at all. Furthermore, the qualifications, skills and competencies of suitably qualified officials to manage medical records must be identified at all levels of the sectional division. The electronic records system, which will be covering all operational functionalities and meeting all security requirements, must also be specified.

However, reverting back to the recommended records management framework illustrated in the Figure 1, it is important to remember that the organisation was still have been managing their records manually and therefore the records management system may also need to be improved to be electronic, with the provision of adequate resources. After the survey, the institutions should be able to design their own suitable records management system based on their environmental and situational requirements. The ECM system was merely used as a recommendation for the sake of this model in Figure 1; however, organisations are at liberty to choose or design another appropriate system based on their needs and technological development. At the current technological level, it is recommended that the organisation apply the ECM as a modern records management technology that comprises an electronic document and records management system (EDRMS) and is capable of records imaging, paper-based file tracking and Web-content management. This is not exhaustive, as ECM may integrate as many content management technologies as required, including document management, records management, Web-content management, workflow or business process management, collaboration, imaging, portals and knowledge management (Katuu, 2012a; Katuu, 2012b; Katuu, 2015). For the purpose of this non-prescriptive framework, only the EDRMS, records imaging, web content and paper-based file tracking are covered as a baseline.

Importantly, the records management functionalities must be incorporated into the ECM to manage the medical records properly using the system in the health-care workflow. Based on the findings of the study as interpreted, the recommended framework will have to be built into the health-care service delivery process workflow which includes all the activities

conducted by the health-care providers. For each aspect/activity of the health-care services, records about the activities conducted during that day or time are created. At the same time, records about the previous health-care services rendered are also consulted to see what the illness and diagnosis was, what treatment was given and which medications were prescribed to the patient. Through the proper e-records management system, different hospitals may share records about the same patients for any of their consultations at any hospital. In the situation where a file had already been opened for a patient at another hospital, the next hospital will not have to create a new file, but will merely continue to use the same file, updating it with new information about the current consultation of the same patient. This requires health-care records to be managed properly at each stage of health-care service delivery to ensure their safety, appropriate accessibility and timely provision to health-care givers. Such a system will assist the institutions to avoid long patient waiting times, unacceptable health-care services or the inability to render certain kinds of health-care services because of doctors not having the patient's medical background or history. Proper records management may eventually be considered as one of the top priorities and a key enabler for the successful rendering of health-care service to patients, if embedded properly into the health-care service process. This is because the recommended framework may assist in sound records management throughout the health-care service process.

Sound health-care records management that effectively ensure successful health-care service delivery is only possible with the positive support of the health-care institution's management and the political will of the departmental and institutional political stakeholders. Records management objectives will also need to be linked to or informed by the organisational health-care service delivery objective, as it is the core function of the institution. To achieve compliance with the legal and regulatory requirements of records management, the records management unit or officials will have to obtain the buy-in from the health-care service providers, as they are the creators and users of the records. They also need buy-in from management, who is responsible and accountable for the records management strategies, policies, procedures and the endorsement and approval of the standards and norms in the institution. The health-care service providers, together with the entire organisation, must be of the understanding that medical records management is a collective responsibility and that they all have an important role to play in ensuring that the records are managed and safeguarded properly as long as they are in their possession. They must understand that this is done for the benefit of the patients as fellow citizens, for making their own health-care service work easier and for the satisfaction of patients and other clients.

Figure 1 also shows that at each stage of health-care service delivery, records need to be created and managed electronically in an effective way, as guided by the four dimensions of the records continuum model (create, capture, organise and pluralise), using the ECM system as recommended for the framework. For the purpose of this framework, records are managed in four steps, as constructed from the dimensions of the records continuum model. The four steps are:

(1) creation of records;
(2) imaging, automation and capturing of records;
(3) organising and storage of records; and
(4) pluralisation, preservation and access to records.

The following is a discussion of the four steps in relation to the processes embedded in health-care service delivery activities.

Records creation

Records are created during every health-care service point process/activity. When these records are created, they need to be managed effectively, as required by the health-care business. At some of the health-care service points, the records are frequently reutilised for different business-related purposes, such as to refer to the patient's medical history before rendering further services, for reporting, for checking patients' payments and billing or to respond to public records requests and/or litigations. The system will show the kinds of records created, business transactions that led to the creation of the record and the use and kind of information the records contain for each health-care business process activity. During this period, the records management system must be able to track the creation of the new record, the business transaction and the movements of the record. The system must also be capable of keeping an audit trail for each record in terms of its creation, use and movement. This will be possible with relevant and complete metadata creation and capturing.

Records imaging, automation and capturing

The health-care/medical history records created in all the health-care service point activities are automated and captured electronically on the system after creation. The old medical records with an enduring value that were created manually in a paper-based format may also be converted as images in the form of PDF documents on individual patients profiles or accounts, so that they can also be captured in the patients' e-files. The capturing can be done using the EDRMS that is built into the ECM, to ensure that the health-care givers will be able to access the patients' records with ease and on time.

Records organising and storage

The records management practitioners will need to ensure that the patients' medical history records are properly classified in accordance with the approved organisational classification scheme or filing plans. The records management officials must also ensure that patients' medical history records are properly captured with appropriate metadata to the patient files in the electronic system – preferably the ECM system with its built-in EDRMS. The paper-based files containing patients' entire records can also be preserved as part of the backup for the e-records and can be managed using the same electronic system for movement tracking. The records should also preferably be stored in the government cloud computing storage to ensure that all health-care institutions are able to access the medical records for each patient wherever and whenever they attend to patients' illnesses.

Records pluralisation, preservation and access

The patients' medical history records must eventually be integrated and preserved as an asset of the organisation for access by relevant and authorised individuals and organisations. During this time, third parties who request records will need written consent from the patient. For the purpose of this framework, patients can access their medical records through the web content with their account username and password, as provided by the institutions, through the system. Information in patients' medical history records may be shared or made accessible by the relevant organisational departments or units such as information management, hospital clinics, the pharmacy, the cashier and many more units and other health-care institutions within the country during the health-care business process and/or workflow. Medical information sharing with global health-care facilities can also be made possible if there is a need for it and if cooperation is obtained and agreement is reached with different nations. Relevant officers or units based in the districts, at other health-care

institutions and at the provincial office may also be provided with access to the records through the web content. In this framework, records may be accessed internally (through the ECM built-in EDRMS or the web content), especially by officials attached to the institution, but external individuals like patients and institutions like head office, the districts and other hospitals may always use the Web content to access records held by other institutions. As the system will be integrated, all health-care facilities must share the same file for each patient online. This means that instead of opening a new file for a new patient who has already consulted or received a health-care service at another public health-care institution, health-care providers will simply have to update the patient file with the current information.

Conclusion and implications for theory, policy and practice

The findings of this study outlined and highlighted many of the fundamental issues for consideration in improving health-care service records management. Most of the issues dealt with in the study are critical to the extent that they affect health-care service and patients directly. Various problems were explored and appropriate solutions to challenges were recommended. If properly implemented, the recommendations of this study may result in acceptable or satisfactory patient waiting times, may completely combat the problem of missing files and may yield improved quality health-care data. This is because the study also discussed issues relating to how records management affects health-care services, patients and professionals, as well as the operation and management of organisational health-care services. That is, of course, depending on whether the management of records is proper. This means the negative impact on health-care services may result from poor records management, and sound records management may result in a positive impact on such services. The organisation must also ensure that their health-care records are backed up, prepared for disaster and effectively safeguarded against any hazards or perils.

The study, most practically, proposed and recommended as a baseline for the institutions a framework to embed medical records management in health-care service delivery. This framework can be customised to suit their own institutional needs, situation or environment. Overall, this study contributes to the theoretical and conceptual knowledge in the field of records management and health-care records in particular. Most significantly, the study ensured that health-care organisations will have a source of reference for establishing their policies, procedures and best practices, based on the findings, recommendations and framework that was proposed. It also serves as a guide for health-care services on the systematic establishment of a records management programme, its operation and its systems.

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