

Preservation and Security of Information Resources at the Federal University Otuoke Health Care Centre, Bayelsa State

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Abstract

Considering the importance and need for efficient preservation and security of medical records in the federal university Otuoke, it is imperative to employ the use of technology to achieve this purpose. The use of technology will save funds, time, and space and prevent health hazards. The lack of technology in this digital age will lead to poor management of health records, which will invariably lead to health hazards. It is on this premise that this study seeks to investigate the preservation and security of information in the digital age at the Federal University Otuoke Healthcare Centre. The study identifies the records generated and kept, examines the factors militating against effective preservation, and determines the strategies that could be employed in preserving medical records. A descriptive research method was adopted; total enumeration sampling techniques were used as the study population of 70 was not large. A questionnaire was used for data collection, and the data was analysed using frequency count and simple percentages. The study revealed that major records generated include observations and administration of drugs and therapies, test results, x-rays, and reports, among others. Factors militating against the preservation and security of medical records indicated by respondents include lack of ICT, poor power supply, and lack of skilled manpower, among others; strategies employed for the preservation of medical records, as revealed by respondents, include shelving, cabinets, drawl air conditioning, etc. The study recommends employing a professional librarian to effectively manage the electronic facilities used to deploy electronic records.

Keywords: Healthcare, Medical Records, Preservation, Security, Digital Age, Bayelsa State

Introduction

The preservation and security of information materials in the health sector around Nigeria have become critical issues. The non-availability of potentially life-saving health information or lost medical records has become common in many Nigerian healthcare sectors, posing significant risks and potentially endangering lives. The lack

of file management or preservation of medical information also poses a legal threat to patient healthcare. Preservation generally involves maintaining something in its current state or preventing it from being damaged (Anyira 2020). The library and information profession focuses on protecting information-bearing materials by minimising agents of deterioration, such as biological, environmental, chemical, and physical factors. This effort aims to prolong the existence of these materials, ensuring effective administration and accessibility of information resources. Fundamentally, libraries are established to collect, organise, preserve, and provide access to knowledge and information. In library services, preservation involves preventive measures and activities aimed at extending the life cycle of books, records, and other library materials (Asunmo and Yaya 2023). Preservation processes typically include monitoring the condition of materials, maintaining optimal humidity and temperature levels both in the library and storage areas, developing disaster management plans, digitising materials, and enhancing access to the collection. These efforts contribute to safeguarding and making information resources available for current and future use.

Preservation and security of information material are vital aspects of library services for the survival of library items. Without it, references to prior publications/materials would have been difficult, if not impossible (Kalu u Nkata et al. 2021). According to Marinic Milena (2020), the terms medical records, health records or medical chart are used interchangeably to describe systematic documentation of a single patient's medical history and care across time and within one healthcare provider jurisdiction. Preservation and security of health records for medical treatment require extra management as it deals with human life, ensuring adequate security of records to prevent unauthorised access is a priority that must be taken into consideration in the health sector. The Medical Records department is the health care centre that houses all the records of all patients. It is made up of a manager, deputy manager, supervisors, and full-time and part-time clerical officers. It is split over two sites with specific responsibilities for the management of records, including providing filing and facilities for storage, systems, and processes for the safe handling of case notes, availability of case notes in a timely and organised manner, retrieval of records from off-site storage, Scanning, retention, and destruction advice. Medical records are very important documents in patient management. They explain the details about each patient's history, clinical findings, diagnostic test results, pre-and postoperative care, patient progress, medical history, and care over time within one healthcare institution (Bali et al. 2011). As such, the preservation of medical information is a core practice in the clinical environment. The goal of preservation is to ensure that important information is retained over time.

Preservation of records is an often overlooked and underrated activity at many establishments. While a strong, well-thought-out records preservation plan can make organisations efficient and effective, neglect of preservation activities can lead to the deterioration of important documents and loss of information, which could result in the death of a patient. Digitisation is one aspect of technology that helps to preserve

information from deterioration though it has its little disadvantage in the case of crashed systems, its value cannot be overemphasised. According to Wikipedia, Digitisation is the process of converting information into a digital (i.e. computer-readable) format. Digitisation is of crucial importance to data processing, storage and transmission because it allows information of all kinds in all formats to be carried with the same efficiency and also intermingled". Though analogue data is typically more stable, digital data can more easily be shared and accessed and can, in theory, be propagated indefinitely, without generation loss, provided it is migrated to new, stable formats as needed. This is why it is a favoured way of preserving information for many organisations around the world. According to nextservicesoftware.com, Digitization is Converting analogue information into a digital form, and it deals with the act of Scanning a document into a PDF, scanning a photograph into a digital image file, e.g. jpg or png, Converting a paper form into a digital version; Turning a VHS recording into a digital file e.g. mp4; Capturing printed or handwritten notes via OCR; Converting typed or handwritten reports into usable data. The obvious adverse effect of lack of effective preservation on records, especially medical records on patient health and life, has made it imperative and necessary to investigate the preservation practices and techniques employed by the Federal University Otuoke Healthcare Centre in this digital age. It is therefore expected that this study will expose the danger of a lack of proper Health records management and the importance of librarians in the proper maintenance, preservation and security of medical records at the federal university Otuoke. This is the gap this study intends to fill.

Statement of the Problem

Preservation and security of information have become major challenges in healthcare centres in Nigeria, especially in the federal university healthcare centres. The lack of proper file management of medical information is assumed to be a major factor posing a legal threat to patients' health. Bali et al. (2011) note that research on the management of medical records highlights the rates at which medical records are missing, misplaced, and damaged in healthcare centres. The alarming effect of delays in patient treatment due to lost records cannot be overemphasised, as interactions with some medical personnel and patients reveal (Oluwatuyi 2020). A close analogy from the emphasis made by Oluwatuyi (2020) relates to a similar study that examined factors militating against effective medical records documentation at the Ekiti State University Teaching Hospital. It was established that the adverse effects of poor preservative techniques on patient healthcare in different healthcare centres across the country are overwhelming. Based on these findings, the present study investigated the preservation and security of information resources at the Federal University Otuoke Health Care Centre in Bayelsa State.

Objective of the Study

The study investigates the preservation and security of information resources in the Federal University Healthcare Centre Otuoke, Bayelsa State. This brought about the following objectives, namely:

1. To identify the records generated and kept by the Federal University Healthcare Centre Otuoke
2. To examine the factors militating against the effective preservation of medical information in the federal university Otuoke
3. To determine the strategies that could be employed in preserving medical information in the Federal University Otuoke healthcare centre.

Research Questions

In this study, the following research questions were used to guide the study.

1. What are the records generated and kept in Federal University Otuoke Healthcare Centre?
2. What are the factors militating against the effective preservation and security of medical records at the federal university Otuoke?
3. What are the strategies that could be employed in the preservation and security of medical records at the federal university Otuoke Healthcare Centre?

Literature Review

Nowadays, health records are kept from birth to death of a person. The history of the disease also contains records of other family members. Milena Marinič (2021) asserts that the records of the health status of individuals affect the good name and dignity of the individual and, indirectly, the dignity and reputation of their descendants and close relatives, and as such, play vital roles in health management of an individual or family.

Medical Recodes Generated and Kept in the Healthcare Centre

Health records consist of various data entered by healthcare professionals in either paper or electronic form, with digital images, photos, digital images of the fetus, computerised tests, and other medical records generated and kept in several healthcare centres, including nutrition advice, effective methods of treatment of the disease and hospital care for patients and notes on autopsies. (Milena Marinič 2021). According to Sarwal et al. (2022), Clinical records are vital documents in patient effective treatment,

which include a wide variety of documents generated on, or on behalf of, all the health professionals involved in patient care; such records include

- Handwritten clinical notes
- Computerised/ electronic clinical records
- Emails
- Scanned records
- Text messages(both outgoing from the NHS/ professional and incoming from patients)
- Correspondence between health professionals
- Handwritten clinical notes
- Computerised/ electronic clinical records
- Emails
- Scanned records
- Correspondence between health professionals
- Laboratory results
- X-ray films and other imaging records
- Photographs
- Video and audio recording
- Printouts from monitoring equipment, particularly in anaesthesia, A&E and ICU
- Consent forms

This information serves as an important document in managing individual health; they explain the details about each patient's history, clinical findings, diagnostic test results, pre-and post-operative care, patient progress and medical history and care over some within one healthcare institution (Bali et al. 2011), more so Basil et al. (2022) supported this submission as the author mentioned that medical information comprises a variety of notes entered over time by health care professionals, recording observations and administration of drugs and therapies, test results, x-rays, reports, mediations and medical allergies, immunisation records, surgical history, etc. the implication of this, is that several records generated by healthcare centres or hospitals cover both written and electronic documents, that means ICT is imperatively necessary for the preservation of medical records.

Factors Militating Against the Effective Preservation and Security of Medical Records

Several factors hinder the effective preservation and security of information materials. The challenges facing documentation include inadequate skilled manpower, lack of efficient technology, lack of financial resources to adopt modern technology for effective documentation, and lack of information technology skills, among others. Oluwatuyi (2020) revealed that the major factor militating against effective medical record documentation (MRD) in EKSUTH is inadequate resources and funding. The study also highlighted complaints about the illegibility of physicians' handwriting and

the lack of skilled personnel. According to Enakrire (2020), most organisations have not taken critical steps to maintain a cultural practice for adhering to the preservation of records. This may be due to a lack of awareness and policy guidance for these practices. Enakrire also attributes the problem to inadequate technological tools, know-how, and storage mechanisms, resulting in the inability to keep day-to-day records in the organisation.

Babangida (2021) mentioned that the increased number of patients in many hospitals has led to the generation of more data. According to the author, this appreciable increase in population numbers creates more data and, without practical automated tools to manage records, causes problems in the hospitals. Additionally, it is noted that there is a problem of limited skills possessed by records personnel. Isiguzoro (2019). opinioned in a paper presentation on challenges facing the effective security of information materials in NALL Conference Paper in Asaba, Delta State, include the following as common and major factors militating against the effective preservation and security of information materials:

Biological factors: These factors include bacteria, mould mildew (due to wetness from fungal actions), insects, rodents, etc. The most common species affecting library and archives materials are silverfish, bookworms, booklice, and cockroaches. Most insects are not attracted to the paper but rather to sizing, adhesives and starches that are dark, wet, dirty, clustered, and undisturbed.

Human factor: Such factors are theft, burglary, warfare, defacing with a red biro or food items, careless handling, and improper shelving,

Natural factors: natural factors such as floods, water, rainstorms, earthquakes, fire, etc.

Environmental factors: some of those factors are heat, light, moisture, pollution/dust, black sooth, etc. Research indicates that cooler temperatures are preferred for library materials. The Library of Congress's preservation recommendations state that an ideal environment for books is 550F storage areas. Mixed-use storage areas should be kept at 700F. If library materials are stored separately from use areas, the temperature can be brought down further to 650F or less. Uncontrolled humidity levels can cause mechanical damage.

Chemical factors: The acidity or alkalinity of the paper is a key factor in the deterioration of materials. Most cultural heritage resources are organic and subject to chemical factors that ultimately cause deterioration. Ham (2003) notes that the rates at which cultural resources deteriorate are determined by two factors: inherent and external agents of deterioration. The inherent or internal agent is the result of modern books being made from highly acidic paper, especially those published since the mid-19th century. Early paper was made from clean linen, cotton, rag flax, and strong fibres,

which had low acid content and thus were durable, strong, and permanent. External agents include the environment in which the resources are stored; biological attacks from fungi, rodents, and birds; mechanical wear and tear of books due to mishandling by library users; and theft and mutilation of cultural resources by users. All sources of light—natural light, ultraviolet rays from sunlight, and incandescent lighting—contribute to the deterioration of materials. These light sources should be monitored and replaced periodically as they have a limited lifespan and may need to be replaced every few years (Mnjama 2003). Airborne contaminants in the form of gases and particulates can also jeopardise the preservation of library materials.

Structural factors: these include the location of the floor, improper room ventilation, poor light gadgets, structural defects, etc.

Mechanical factors: rough handling, improper packaging, substandard devices etc. Mechanical damage to library materials includes the human factor, and natural disasters such as earthquakes, fire, flood, or water are mechanical, while human factors include careless handling, vandalism, and improper support during storage. Furthermore, other factors which may hinder the effective preservation and security of information, according to Ambike (2017), include:

- Lack of trained staff
- harsh environmental conditions
- low awareness of the importance of preservation
- security among information professionals
- lack of equipment needed for preservation.
- Inadequate infrastructures.
- Lack of competent manpower in preservation and conservation
- frequent power failure, inadequately qualified staff
- insufficient funds, from the above revelation,

These mentioned factors indicate that the preservation and security of records require the technological system to curb them.

Strategies Adopted in the Preservation and Security of Medical Records

The act of preserving is as old as human civilisation itself, deriving from the instinct of self-preservation common to all living beings. Anyira (2020) observed that the

management of records in the health sector is seen as the systematic and consistent control of all records throughout their lifecycle. The author opined that preservation involves maintaining an object or information in a format that ensures the continued use and accessibility of the information. This includes selecting materials with cultural or historical importance and assessing their preservation needs, halting the deterioration of materials by providing a stable environment and proper supplies and equipment for storage, developing and implementing policies for the safe use of materials, and providing the resources necessary to engage in an ongoing preservation program committed to the continued existence of valued materials. Preservation also involves preparing for potential disasters such as floods, fires, tornadoes, and earthquakes. Conservation is a vital aspect of preservation, according to Alayeh (2019). The goal of preserving and securing medical records is to stabilise and restore an object to its original form through various treatment methods. While multiple materials and formats have special preservation needs, the author observed that there are a few recommendations common to the long-term preservation of nearly every type of item. These recommendations deal with temperature, relative humidity, light, and air quality. High temperatures, high humidity, or large fluctuations in temperature and humidity can damage most materials. High humidity encourages the growth of mould and mildew and affects the chemical makeup of items such as film, photographic prints, and audiotape or videotape. High temperatures often speed up the deterioration of materials. Keeping accurate medical records is a vital tool for the delivery of quality healthcare, and as such, the preservation of medical information is seen as a core practice in a clinical environment.

This practice can only be made efficient in this technological age with the use of ICT. Access Information Management (2023) on May 16 published a newsletter to assert the efficiency of record management using ICT, revealing that the adoption of cloud computing, artificial intelligence, data analytics, mobile devices, and blockchain technology has revolutionised the way records are stored, the trend has improved efficiency, accuracy, productivity, and compliance in records management, the author emphasised that as IT continues to advance its essential for record manager to keep abreast of the latest trend. Enakrire (2020) draw an inference on the impact of ICT in the practice of Records Management in the Ministry of Health, Nigeria, observing that the need to manage records using ICT is essential for the effective preservation and security of records, especially in hospitals. This implies that effective preservation of medical records in this technological age requires the navigation of ICT. This is supported by Daisy Business Solution (2022), which also mentioned that the era of filling cabinets and email inboxes is incapable of coping with data or records generated daily, consenting that ICT has become a new way of making the record management process more efficient. According to the Northeast Document Conservation Centre (NDCC) (2015), the activities that are involved in preserving library materials are centred on the following:

Environmental Control— ‘providing a moderate and stable temperature and humidity level as well as controlling exposure to light and pollutants. This should be a priority for all institutions, although this kind of control is more pronounced for rare books, special collections, or archival materials than for general circulating collections.

Disaster planning—this is preventing and responding to damage from water, fire, or other emergencies. This should also be a high priority in all institutions. The reasons are obvious for collections of enduring value, but even collections that are not meant to be retained over the long term represent a capital investment for an institution and as such must be protected from loss.

Security protecting --collections from theft and/or vandalism. This type of protection is needed for both special and general collections since loss and vandalism of general collections result in unnecessary replacement and expense.

Storage and Handling—using non-damaging storage enclosures and proper storage furniture; cleaning storage areas; using care when handling, exhibiting, or reformatting collections; and educating staff and users in proper handling techniques. Storage and handling are imperative for all types of collections.

Reformatting—reproducing deteriorating collections onto stable media to preserve the informational content or in cases where the originals are fragile or valuable, and handling is restricted. This category includes microfilming, production of preservation facsimiles, and duplication of audio-visual collections. These strategies are most appropriate for collections whose intellectual content should be preserved over the long term and/or where security copies are needed for unique items. Microfilming is still an effective strategy for unique paper-based collections but a low priority for institutions with general collections that are duplicated elsewhere.

Library Binding—rebinding of damaged volumes to provide sturdy use copies. This strategy is used by libraries with general collections in heavy use. It should not be used on any items that have art factual value.

Asunmo and Yaya (2022) equally mention the following as strategies in the preservation of medical records: computerisation, binding, air conditioners, vinyl discs, video discs, lamination, microgroove discs, shellac discs, mylar, floppy discs, magnetic tapes, and de-acidification. There are several other strategies and methods employed in the preservation and conservation of information material in healthcare centres, including the installation of air-conditioning, fire extinguishers, thunder arresters, shelves and cabinets, electronic record management systems, and CCTV security camera systems (Oluwatuyi 2020). Poor preservation of records leads to inefficiency, waste of time, poor communication, and decision-making, and it can cause serious trouble if vital records cannot be readily located. Poor storage of records wastes space and money and can pose a health and safety hazard. The literature review revealed various records

created to manage patient treatment. It was discovered that the literature had identified multiple factors militating against medical records, as well as ways to address the preservation and security problems of healthcare records.

Methodology

In this study, the quantitative research approach was employed where the researcher examined the preservation and security of Information Resources at the Federal University Otuoke Health Care Centre, Bayelsa State. A descriptive research method was adopted for the study where a total enumeration sampling technique of 70 was used as the study population. The questionnaire was used to collect the necessary data, keeping in mind the objectives of the study. The 70 copies of the questionnaires were distributed, and 68 were retrieved. The data obtained were tabulated and presented in a Table in percentages format. Before the study was carried out, ethical clearance was sought to ensure respondents adhered to participation in the study. The study took the researcher approximately three months to accomplish.

Results

The findings from this study were established based on the research questions raised. The results obtained were presented in the following tables: 1, 2, and 3.

Data Analysis and Interpretation

Research question one: In this segment, respondents were asked to indicate the medical records generated and kept by the Federal University Otuoke Healthcare Centre. The response obtained is represented in Table 1.

Table 1: Medical Recodes Generated and Kept by the Federal University Otuoke Healthcare Centre

Items	Frequency	Percentage
X-ray reports	11	16.2%
Professional notes on observation and administration of drugs	18	26.4%
Test results	13	19.1%
Surgical history	4	5.9%
Immunization record	15	22.1%
Record on therapies	5	7.4%
mediations and medical allergies	2	2.9%

The result in Table 1 indicates that most medical records created and kept by the Federal University Otuoke Healthcare centres include Professionals, which notes that observation and administration of drugs (26.4%); Test results (19.1%); X-ray reports

(16.2%); Immunization record (22.1%); Records on therapies (7.4%) surgical history (5.9%). The most generated records, as revealed by the respondents, include professional notes on observation and administration of drugs (26.4%), Test results (19.1%), and immunisation records (22.1%). This implies that major health challenges are not handled in the federal university healthcare centre, which, of course, indicates the poor and lack of infrastructure. This agrees with Bali et al. (2011) in an article on Management of Medical Records: Facts and Figures for Surgeons, who mentioned the above as the major records kept by healthcare centres. This is also in line with the research carried out by Sarwal et al. (2022) in an article on personal health records in the Library of Medicine: National Centre for Biotechnology Information, which also mentions that Clinical records are mostly generated and kept by health sectors as handwritten clinical notes laboratory result x-ray among others.

Research question two: In this segment, respondents were asked to indicate the factors militating against the effective preservation and security of medical records in the federal university Otuoke. The response obtained is represented in Table 1.

Table 2: Factors Militating Against the Effective Preservation and Security of Medical Records in the Federal University Otuoke

Items	Frequency	Percentage
Dust	7	10.3
Flood	3	4.0
Tampering	2	2.9
Fire	2	2.9
Raindrops	2	2.9
Sunlight exposure	2	2.9
Rodents and pests	4	5.9
Thief	3	4.0
Misplacement	2	2.9
Poor power supply	5	7.4
Physical damage	2	2.9
Lack of skilled staff	5	7.4
Lack of ICT development	4	5.9
Heat	3	4.0
Nonchalant attitude towards preservation	3	4.0
Poor funding of healthcare facility	7	10.3
Lack of records storage space	4	5.9
lack of security gadgets	4	5.9

Table 2 above indicates that the major factors militating against the effective preservation of medical records in federal university Otuoke healthcare centre are as followed Rodents and pests 5.9, Sunlight exposure 2.9%, Rain drops 2.9%, Heat 4%, Fire 2.9%, Tampering 2.9%, Theft 4%, lack of preservation policy 5.9%, Flood 4. %, Physical damage 2.9%, Lack of skilled staff 7.4%, Dust 10.3% Misplacement 2.9%, Poor power supply 7.4%, Lack of ICT deployment 5.9 lack of fund 10.3% , skilled

manpower 7.4% and dust 10.3% which is in line with Oluwatuyi (2020) in the research carried out on the factor militating against effective medical records documentation; case study of Ekiti state university teaching hospital Ado Ekiti who mentioned lack of skilled personnel as major factor militating effective preservation of medical records in Ado Ekiti university teach hospital, the implication of this is that medical records are not serve at all in federal university Otuoke healthcare centre which also indicate life's are not hundred percent safe and if preservation must be effective the need to employ technological devices and trained librarian is inevitable

Research question three: In this segment, respondents were asked to indicate the strategies to adopt in preserving medical records in federal university healthcare centres. The response obtained is represented in Table 3.

Table 3: Strategies to Adopt in Preserving Medical Records in Federal University Health Care Centres

Items	Frequency	Percentage
Record management policy	2	2.9%
adherence to Records Preservation strategies	8	11.7%
availability of Library/archive	-	-
Medical records are managed by a librarian/archivist	-	0.0
Records are Shelved	11	16.2%
Records are kept in Cabinets and drawers	20	29.4%
Air conditioners are available	9	13.2%
Fire extinguishers and sand buckets are available	7	10.3%
A thunder arrestor is installed	3	4%
Alternative sources of power are available	5	7.4%
A CCTV Security system is installed	-	0.0
The electronic record management system is available	-	0.0
Others	3	4%

Table 3 indicates the strategies and methods of preserving medical records in healthcare federal university health centres, including the putting in place of Record management policy 2.9%, adherence to Records Preservation strategies 11.7%, availability of Library/archive non, Records Shelved 16.2%, Records are kept in Cabinets and drawers 29%, Air conditioners are available 13.2%, Fire extinguishers and sand buckets are available 10.3%, Thunder arrestor is installed 4%, Alternative source of power is available 7.2%, CCTV Security system is installed non, Electronic record management system is available non and Others 4%. The report showed that cabinets and draw are the most used preservative measures, followed by shelves. This is in agreement with Oluwatuyi 2020, who lists the above as possible strategies to employ for the safety of records; this implies that there are many setbacks in the security and preservation of medical records in the federal University Otuoke Healthcare Centre as in this digital age preservation of records has still been manage manually.

Conclusion

This study has established that the FOU healthcare centre relies on paper medical records. Paper records are space-consuming and difficult to manage, yet they remain the only option available at the time of this investigation. It was observed that patients are not allowed to access their records; only health officials are authorised to do so. Furthermore, the healthcare centre does not have backup records in the event of disaster, damage, or loss. The absence of backup medical records puts the healthcare centre and patients at great risk in case of any eventuality. The electronic record management system has not gained much prominence, and other vital information captured in the paper records is not captured electronically. There is no ICT infrastructure in place, and the preservation and security of medical records at the Federal University Otuoke are currently facing serious financial challenges. Based on the findings obtained, the following recommendations were made, namely:

1. There is a need to establish libraries/archives in the FOU health care centre.
2. Qualified librarians or archivists should be responsible for the management of medical records.
3. There is an urgent need for healthcare facilities to adopt and deploy electronic health record systems because it makes preservation and back-up of records more efficient and easier.
4. The parent body of the Healthcare centre should provide the necessary conducive environment that promotes the longevity and safety of medical records.
5. Management of the federal university Otuoke should create a comprehensive policy and regulations that guide the management and preservation of medical records.
6. Records management staff should be equipped with relevant knowledge and skills through training and retraining.
7. Uninterrupted fast-speed internet access and power supply from solar power should be provided for records management and preservation.

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