

Evaluation of Medical Records Quality and the Potential for Digital Health Technologies Integration in the Obstetrics and Gynecology Department at Cairo University Hospital

***Ola A. Mostafa¹, Yara Mostafa Mohamed Yassin¹
Nadine Sherif², Doaa A Saleh¹***

¹Public Health and Community Medicine Department, Cairo University, Egypt

² Obstetrics and Gynecology Department, Cairo University, Egypt

Abstract

High-quality clinical documentation is essential for effective patient management, especially in Obstetrics and Gynecology (OB/GYN), where timely and accurate information impacts maternal and neonatal outcomes. Despite the benefits of Electronic Health Records (EHRs), many healthcare institutions, including those in Egypt, face challenges in maintaining comprehensive and standardized documentation, which may hinder digital transformation efforts. The objective of this study was to evaluate the quality, completeness, and adherence to documentation standards of inpatient clinical records in the OB/GYN department at Cairo University Hospital, to identify gaps that could affect the integration of Digital Health Technologies (DHTs). A descriptive cross-sectional study was conducted on a convenient sample of 100 medical records from OB/GYN inpatient units at Cairo University Hospital between December 2024 and January 2025. A structured observation checklist, adapted from the General Authority for Healthcare Accreditation & Regulation (GAHAR) and Ministry of Health guidelines, was used to assess documentation quality, completeness, timeliness, and regulatory compliance. The results revealed variable compliance with documentation standards. While patient identification was consistently recorded, critical data such as patient address (57%) and date of birth (2%) were often missing. Only 2% of records contained sufficient information to promote continuity of care, and discharge summaries lacked follow-up instructions entirely. Emergency care documentation was present in 86% of cases but often incomplete. Referral documentation was inconsistent, with key transfer details frequently omitted. The study concluded that significant gaps exist in the quality of clinical documentation in the OB/GYN inpatient records at Cairo University Hospital. Addressing these deficiencies through standardized EHR adoption is crucial to support digital transformation and improve patient care and safety.

Key words: electronic Health records, documentation quality, digital health technologies

Introduction

High-quality clinical documentation is essential for effective patient management, continuity of care, and healthcare quality improvement. In obstetrics and gynecology (OB/GYN), accurate and complete medical records are critical due to the complexity of maternal and neonatal care and the need for timely clinical decisions. However, many healthcare institutions face challenges in maintaining

comprehensive and standardized documentation, which can compromise patient safety and outcomes (*Almuqati et al, 2021*).

Health records are categorized as either paper medical records or electronic health records (EHRs). Paper records present significant limitations, including restricted accessibility (*Featherstone et al, 2012*), poor legibility (*Winslow et al, 1997*), missing or redundant information, high costs, vulnerability to destruction, difficulty tracking access, environmental harm, and security risks. These shortcomings underscore the need to transition to EHRs (*Rodriguez et al, 2018*), (*Moatlhodi et al, 2016*).

The transition from paper records to electronic health records (EHRs) addresses the limitations of traditional documentation by offering secure, real-time, and patient-centered digital access to comprehensive medical histories. EMRs store comprehensive patient data, including clinical histories, lab results, prescriptions, interventions, and prognoses, all of which are electronically updated and accessible (*Abdekhoda et al. 2019*). EHRs improve healthcare delivery through increased accessibility, enhanced security, accurate and up-to-date data management, and greater efficiency in sharing information among providers, ultimately supporting better patient care and safety (*Elsyed et al. 2020*), (*Upadhyay et al, 2022*).

The integration of Digital Health Technologies (DHTs) and Artificial Intelligence (AI) offers promising avenues to enhance healthcare delivery by improving data accuracy, accessibility, and clinical decision support (*Graili et al, 2025*). Despite this potential, the readiness of healthcare facilities, including documentation quality, remains a significant barrier to the successful adoption of these technologies (*Ronald et al, 2024*).

In the United States, efforts have not only increased EHR adoption but also focused on improving the quality of these systems (*Shin et al, 2018*). The Health Information Technology for Economic and Clinical Health (HITECH) Act introduced an investment plan to address the inadequate informatization of United States medical institutions and established a certification system to promote the use of accredited EHRs (*Hoggle et al, 2012*). Similarly, in Korea, the era of big data and AI has motivated researchers to work on structuring and standardizing data for effective clinical use. These efforts include developing guidelines and certification standards to ensure the optimal use of medical data (*Shin et al, 2018*).

Healthcare sector plays a critical role as a part of Egypt's broader digital transformation efforts. Cairo University "Kasralainy" hospitals is a very important tertiary care facility and can be a role model for all other Egyptian health facilities. The Obstetrics and Gynecology (OB/GYN) hospital provides care to a large and diverse patient population, making it an essential component of any transformation effort.

Despite the recognized importance of high-quality clinical documentation in OB/GYN settings, there is a lack of recent, systematic evaluations of medical record quality in Egyptian tertiary care hospitals. Most existing studies focus on general hospitals or other specialties, and there is limited evidence on how documentation gaps may hinder the integration of digital health technologies in OB/GYN departments. Our study addresses this gap by providing a detailed assessment of documentation quality and readiness for digital transformation in a major Egyptian OB/GYN hospital, aiming to inform targeted improvements and policy decisions

Patients and Methods

Study Setting:

The study was conducted at the OB/GYN hospital of Cairo University, a large tertiary care facility in Egypt serving a diverse patient population. The hospital comprises four inpatient units (Units 21, 22, 32, and 33), each responsible for non-emergency admissions and managed by specialized faculty and staff. This setting is representative of high-volume, resource-constrained teaching hospitals in the region, making it an ideal context for evaluating documentation practices and digital health readiness.

Study Design:

This is a descriptive, cross-sectional study aiming at Evaluation of the Quality of Clinical Documentation of Patient Data.

Study Sample:

A consecutive convenient sample of 100 medical records for all patients admitted to OB/GYN hospital during the period between December 2024 and January 2025.

Data Collection Tool (Checklist):

A structured observation checklist was utilized to assess whether the medical records met established quality benchmarks. The checklist used was adapted from the General Authority for Healthcare Accreditation & Regulation (GAHAR) and Ministry of Health medical records guidelines (**GAHAR, 2021**). It systematically assessed domains such as patient identification, completeness of clinical history, diagnostic and treatment documentation, legibility, emergency care records, referral/transfer documentation, and discharge summaries. Each item was scored for presence, completeness, and adherence to standards. The checklist was pilot tested for clarity and consistency, and data abstractor (the researcher) received training to ensure reliable data collection. The checklist examined various aspects, including the completeness and accuracy of the records, the timeliness of data entry, and compliance with regulatory standards

Data Analysis:

Data were analyzed using the IBM SPSS Statistics 27 software program. Descriptive statistics were utilized to assess the percentage of medical records that complied with documentation quality standards.

Ethical Considerations:

The study was ethically approved by the ethical committee of the Faculty of Medicine Cairo University (code: MS-17-2024). Data was anonymized and securely stored; used exclusively for research purposes.

Results

This study was conducted to explore the potential for integrating DHTs to enhance health care delivery and patient management at the OB/GYN Cairo University Hospital. This was accomplished by exploring the availability of digital health care services and the quality of clinical documentation of patient data.

Evaluation of the Quality of Clinical Documentation of Patient Data

A convenient sample of 100 medical records were evaluated using a comprehensive health record quality checklist adapted from the General Authority for Healthcare Accreditation & Regulation (GAHAR) and Ministry of Health guidelines. Compliance with documentation standards varied widely across the different checklist items. While some aspects demonstrated strong adherence, significant gaps were identified in critical areas such as legibility, emergency care records, and discharge documentation.

• Patient identification data and data to support diagnosis

Results show that a unique identifier for each patient was present in all records. All records accurately identify patients by name, demonstrating full adherence to this basic requirement. On the other hand, only 57% of records included the patient's address, while the date of birth was documented in just 2% of cases (**Figure 1**), with more emphasis on patient age.

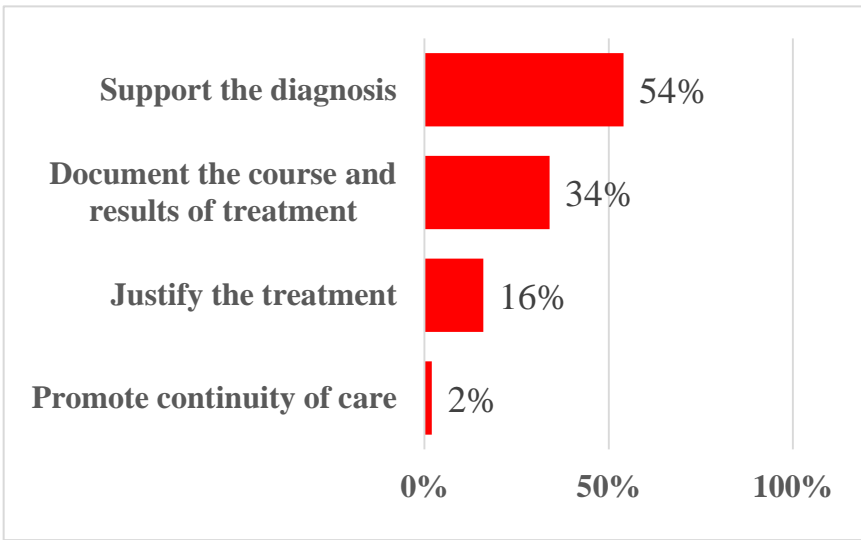


Figure 1:

Availability of patient identification data in the medical records at the OB/GYN inpatient wards

Additionally, sufficient information to promote continuity of care and support the diagnosis were present in only 2% and 54% of medical records respectively. This was determined by the presence of complete history, examination sheets, lab and/or radiology results, drug sheet and a diagnosis that is clearly stated. Additional emphasis was put on discharge summaries and follow up instructions for continuity of care. Similarly, sufficient information to justify treatment and document the course and outcomes of treatments was present in only 16% and 34% of medical records respectively (**Figure 2**). This was mainly assessed by checking lab and/or radiology results, complete nurse and physician notes and an identified patient diagnosis.

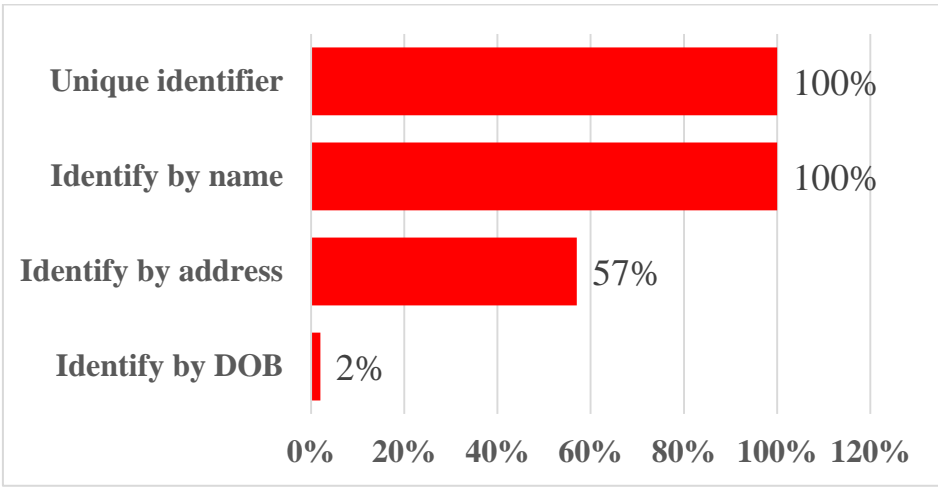


Figure 2:

Presence of sufficient information to support diagnosis and treatment in the medical records at the OB/GYN inpatient wards

• **Uniform/Consistent Structure of the Medical Record**

Figure 3 illustrates the structure of the studied medical records. The majority of records demonstrated compliance in maintaining a uniform location for medications and other orders (94%). Nurses documented directly into the medical record (96%). Additionally, 94% of records clearly identified the author of entries by name and title.

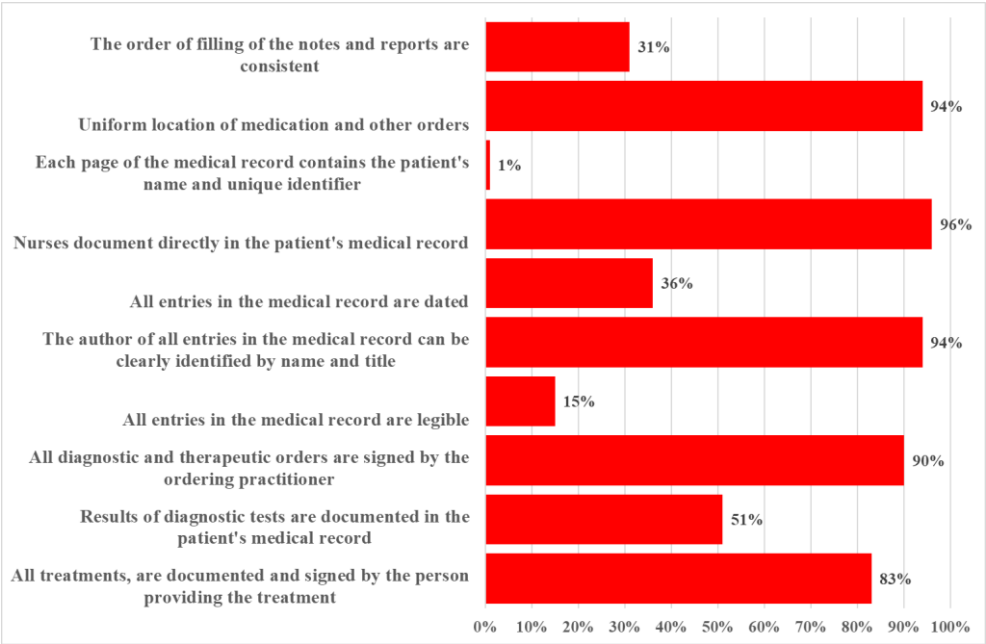


Figure 3:

Structure of the medical records in the OB/GYN inpatient wards

• **Medical records of patients receiving emergency care**

Among the studied medical records, it was found that 86% of the patients received emergency care in the OB/GYN hospital.

Figure 4 illustrates some of the contents of the medical records of emergency care patients. Recording the patient's condition at discharge was found in all studied medical records, 98% of records documented the patient's destination at discharge. However, follow-up care instructions were entirely absent (0%).

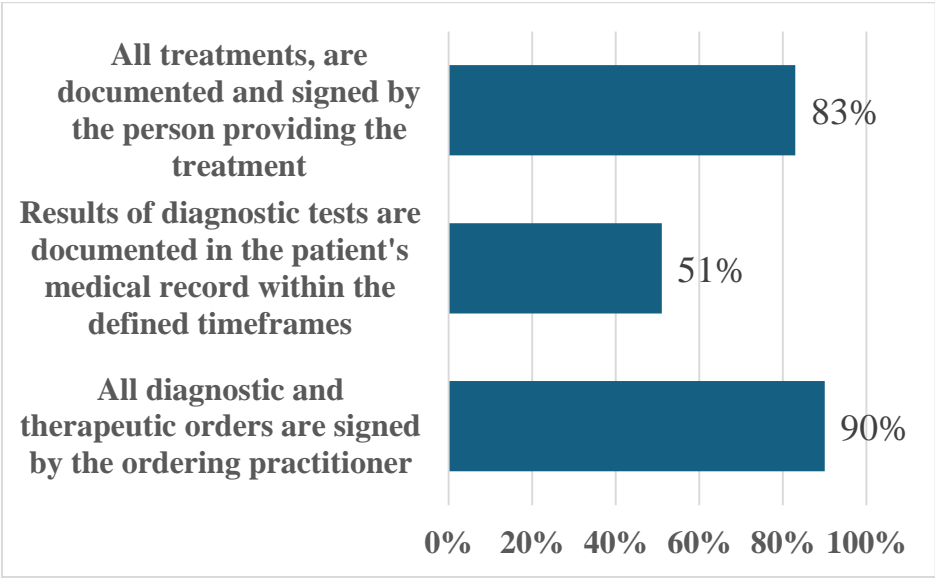


Figure 4:

Emergency care documentation in the medical records in the OB/GYN inpatient wards

• **Referral/transfer sheet in patient's medical records**

Among the studied medical records, only 22 patients experienced transfer/referral to different health facilities.

About 82% (18/22) of these files retained the referral sheets. Furthermore, the information provided during patient referrals or transfers was largely incomplete. Key details such as the condition of the patient at transfer, and the reason for referral were documented in 77% (17/22) and 68% (15/22) respectively. Transportation means and required monitoring were recorded in just 1/22 records (5%) (**Figure 5**).

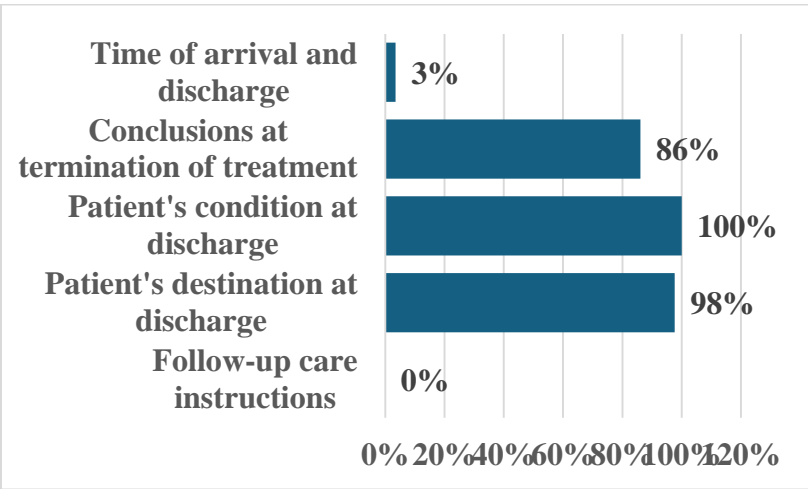


Figure 5:

Referral/transfer sheets in the medical records of patients experiencing referral to different health facilities

• Discharge summary in patient's medical records

Figure 6 demonstrates that all discharge summaries included patient condition and destination on discharge. However, other information such as reasons for admission, significant findings, investigations, diagnoses made, procedures performed medications or treatments were absent in more than 96% of records.

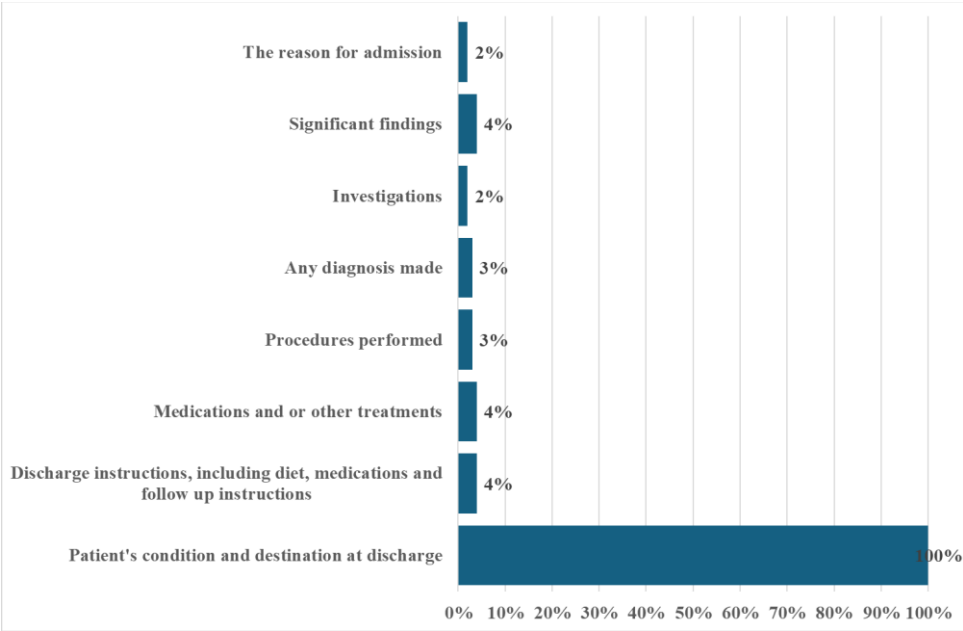


Figure 6:

Discharge summary in the medical records in the OB/GYN inpatient wards

Discussion

The study explored the state and management of medical records, being one of the essential hospital infrastructures (**Hovenga et al, 2024**). The evaluation of medical records in the OB/GYN department at Cairo University Hospital highlights substantial variability in documentation quality, with critical deficiencies in demographic data, continuity of care, treatment justification, and discharge planning. These gaps pose significant challenges to patient safety, clinical decision-making, and healthcare quality assurance. Our results on incomplete demographic and clinical documentation are consistent with studies from other low- and middle-income countries, which report similar gaps in patient identification and discharge summaries (**Abigail et al, 2023**).

Recent systematic reviews emphasize the importance of completeness, correctness, and plausibility as core dimensions of EHR data quality (**Lewis et al, 2023**), which were variably met in our setting. In examining the quality of existing patients' medical records at the OB/GYN Cairo University Hospital using a quality checklist, key findings highlight that the hospital's documentation system is largely paper based, with some digital processes in place.

The hospital demonstrates notable strengths in areas where manual processes are well-organized and strictly followed. For example, in 94% of records the author of all entries can be clearly identified by name, promoting accountability and trust. Data also shows that in 90% of records all diagnostic and treatment orders are signed by the ordering practitioner, highlighting a strong commitment to record management policies, similar to the UK's National Health Service (NHS), where clear author identification is essential for maintaining reliable patient records. According to the Royal College of Physicians, every entry in the medical record should be dated, timed (24-hour clock), legible, and signed by the person making the entry. The name and designation of the person making the entry should be legibly printed against their signature (**NEWS, 2017**).

Additionally, nearly all records demonstrated compliance in maintaining a uniform location for medications and other orders in their corresponding sheets (94%). However, the structure of medical records was inconsistent. Only 31% adhered to policies and procedures defining the order of filing notes and reports, and only 1% of records included patient names and unique identifiers on every page. Adhering to defined order of documentation is a notable strength, aligning with another research that showed that standardized documentation improved quality of data input by a significant score, and consequently improving the quality of care (**Ebbers et al, 2022**).

The study findings suggest that while patient admission and discharge data are digitally entered into a central index, most patient information, such as history, clinical examination, diagnostic and treatment records, is maintained manually. Several research studies indicate that paper-based systems can be slower and more prone to errors due to manual input. For instance, a study comparing manual and EMR systems found that manual systems often exceed the standard turn around time for record retrieval, whereas electronic systems retrieve most files within the standard time, thereby reducing patient waiting times and improving healthcare quality (**Parameshwari et al, 2022**).

Unlike some international centers that have successfully implemented standardized EHRs, our hospital's partial digitization has not yet translated into improved completeness or continuity of care, underscoring the need for full digital integration. Furthermore, EHR systems have been shown to improve the speed and accuracy of data retrieval, reduce errors, and enhance the legibility of patient

records. A study evaluating the use of EHR in out-of-hospital clinical research concluded that electronic methods could lead to cost savings and a reduction in source-to-database error rates (**Newgard et al, 2012**). The lack of integration of an advanced digital system in the OB/GYN Cairo University Hospital limits these advantages, leading to delays, especially in retrieving archived patient records.

The hospital's reliance on paper-based documentation creates considerable challenges. A primary concern is the legibility of records, with only 15% of records considered legible. This compromises patient safety by affecting communication between departments, leading to risks such as misinterpreted prescriptions or diagnostic notes. Illegible handwriting on prescriptions has been linked to dispensing errors, including the administration of incorrect medications, posing significant risks to patient safety (**Modi, et al, 2022**). The low rate of legible records (15%) aligns with findings from South African and Indian hospitals, where illegibility has been linked to increased medication errors and compromised patient safety (**Abigail, 2023**).

The inconsistent issuing of discharge summaries, with compliance rates between 2% and 4% for essential components, is a major problem. Clear discharge summaries are crucial for proper post-discharge care. Without comprehensive discharge summaries, patients and caregivers lack the necessary information for continuous patient care, which increases the risk of hospital readmissions and complications. This is consistent with research by Tremoulet et al. that found that variations in the content and structure of discharge summaries in the United States make them unnecessarily difficult to use, potentially increasing the risk of transition of care related adverse events (**Tremoulet et al, 2021**). A study in a Pakistani tertiary care hospital found major deficiencies in discharge summaries with only 3% documenting allergies and 13% noting medication changes before quality improvement efforts (**Fazal et al, 2024**).

Additionally, the unnecessary complexity of transporting paper records between departments significantly increases the risk of record loss or damage. As Popoola points out, the absence of potentially life-saving health information due to damaged or lost records presents a considerable risk. Therefore, full implementation of electronic recordkeeping is recommended, to keep up with modern standards and improve quality of service in the 21st century (**Popoola et al, 2021**). Additionally, the hospital struggles with limited physical space for archiving, which increases the difficulty of record retrieval and the risk of data loss or damage. This is a common issue in many hospitals, particularly in older facilities or those in low-resource settings, where proper storage infrastructure is lacking (**Thomas et al, 2009**). Research conducted in Jordanian private hospital found that the implementation of electronic archiving systems significantly reduces physical space requirements while enhancing data retrieval times, contributing to greater efficiency and productivity within healthcare organizations (**Mohammad et al, 2024**).

Conclusion

The study evaluation revealed significant deficiencies in the completeness and structure of OB/GYN inpatient medical records at Cairo University Hospital, particularly in demographic documentation, continuity of care, and discharge planning. To address these gaps, we recommend urgent adoption of standardized EHR systems, targeted staff training, and routine audits to enhance documentation quality and support digital health transformation.

Limitations

The study was limited to a single hospital and may not be generalizable to all Egyptian healthcare settings. Furthermore, the cross-sectional design precludes assessment of trends over time or the impact of recent interventions. We suggest that future studies include multicenter designs and longitudinal assessments to address these limitations.

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تقييم جودة السجلات الطبية وإمكانية دمج تقنيات الصحة الرقمية في قسم التوليد وأمراض النساء بمستشفى جامعة القاهرة

علا مصطفى ، يارا مصطفى محمد ، نادية شريف ، دعاء صالح

الملخص العربي

المقدمة:

تُعد الوثائق السريرية عالية الجودة ضرورية لإدارة فعالة للمرضى، خاصة في قسم التوليد وأمراض النساء، حيث تؤثر المعلومات الدقيقة وفي الوقت المناسب على نتائج الأم والموليد. على الرغم من فوائد السجلات الصحية الإلكترونية، تواجه العديد من المؤسسات الصحية، بما في ذلك في مصر، تحديات في الحفاظ على توثيق شامل وموحد، مما قد يعيق جهود التحول الرقمي.

الهدف:

تقييم جودة واكتمال والالتزام بمعايير التوثيق في سجلات المرضى الداخليين في قسم التوليد وأمراض النساء بمستشفى جامعة القاهرة، لتحديد الفجوات التي قد تؤثر على دمج تقنيات الصحة الرقمية.

الطرق: أجريت دراسة وصفية مستعرضة على عينة مناسبة من 100 سجل طبي من وحدات مرضى القسم الداخلي في قسم التوليد وأمراض النساء بمستشفى جامعة القاهرة بين ديسمبر 2024 ويناير 2025. تم استخدام قائمة مراجعة منظمة، مستمدة من الهيئة العامة للاعتماد والرقابة الصحية وإرشادات وزارة الصحة، لتقييم جودة التوثيق واكتماله وتوقيته والامتثال التنظيمي. تم تحليل البيانات باستخدام برنامج IBM SPSS Statistics 27.

النتائج:

أظهرت النتائج التزاماً متغيراً بمعايير التوثيق. بينما تم تسجيل تعريف المريض باستمرار، كانت البيانات الحيوية مثل عنوان المريض (57%) وتاريخ الميلاد (2%) غالباً مفقودة. احتوى 2% فقط من السجلات على معلومات كافية لتعزيز استمرارية الرعاية، وكانت ملخصات الخروج تفقر تماماً إلى تعليمات المتابعة. كانت وثائق الرعاية الطارئة موجودة في 86% من الحالات لكنها غالباً ما كانت غير مكتملة. كانت وثائق الإحالة غير متسقة، مع حذف تفاصيل النقل الرئيسية بشكل متكرر.

الاستنتاج:

توجد فجوات كبيرة في جودة التوثيق السريري في سجلات المرضى في القسم الداخلي للتوليد وأمراض النساء بمستشفى جامعة القاهرة. إن معالجة هذه النواقص من خلال اعتماد سجلات صحية إلكترونية موحدة أمر حاسم لدعم التحول الرقمي وتحسين رعاية المرضى وسلامتهم.

الكلمات المفتاحية:

السجلات الصحية الإلكترونية، جودة التوثيق، تقنيات الصحة الرقمية.