



IJSRIS
journal
ISSN: 2820-7157

INTERNATIONAL JOURNAL OF

**SCIENTIFIC RESEARCH AND
INNOVATIVE STUDIES**

Advancing Knowledge, Inspiring Innovation

www.ijsrisjournal.com



**INDEXED
JOURNAL**

 **PEER REVIEWED**
Rigorous & Transparent

 **DOI: CROSSREF**
Member

 **OPEN ACCESS**
For Global Visibility

 **BI-MONTHLY**
Timely Publication

 **WIDE READERSHIP**
High Impact & Visibility

 **AUTHOR FRIENDLY**
Fast | Supportive | Reliable



RECEIVED
17 August 2026



ACCEPTED
09 September 2026



PUBLISHED
1 October 2026



October 2026



Volume 5



Number 5



Pages from:
559 to 567

**Impact evaluation of an information system on medical data management in a
military setting: A case study of the Type-A Operational Medical Centre of the 151st
Kinshasa Naval Base (OMC-A)**

**Dieu MBUNGU MASONUA¹, Nathalie KABEDI KALONJI¹, Eminent BAKONGO NKOY¹, Maguy LOFETE
MBOYO¹, Stéphane IPALA EGYUN¹**

¹Researcher, Centre for Research on Mathematics Education (CREM/DRC), Kinshasa, Democratic Republic of the Congo
(DRC), ORCID: 0009-0003-5395-6225, dieumbungudm5@gmail.com

LICENSE



This article is licensed under the
Creative Commons Attribution
4.0 International License (CC BY 4.0).

<https://creativecommons.org/licenses/by/4.0/>



PREFIX :

10.63883

IJSRIS JOURNAL

OPEN ACCESS



This is an open access article
distributed under the terms of
open access.

ABSTRACT

The effective management of medical data is a major challenge for military healthcare facilities, where the availability, reliability and confidentiality of information are

essential to the continuity of care. It is against this backdrop that this study was conducted to assess the impact of an information system on the management of medical data in a military setting. In particular, it aimed to examine its use, evaluate its potential effects on data accessibility and quality, and identify the challenges associated with its adoption.

To achieve these objectives, a mixed-methods approach, combining quantitative and qualitative methods, was employed. The study involved 53 participants from various professional categories. Data were collected through questionnaires, semi-structured interviews, observations and a literature review. This approach enabled an examination of users' practices and the difficulties encountered in managing medical information.

The results reveal low usage of the information system: 94.4 per cent of participants stated that they never used it, and a similar proportion indicated that they had not received any training in its use. Furthermore, a lack of understanding of its functionalities and performance limits the ability to objectively assess its impact on the speed of access to records, the quality of data and the security of medical information.

This study contributes to a better understanding of the barriers to the adoption of health information systems in the military. In particular, it highlights the importance of staff training, organisational support and the availability of technical resources. It also recommends future evaluations based on objective indicators in order to measure more accurately the effects of computerisation on the management of medical data.

Keywords: information system, medical data, military environment, computerisation, training, data management, quality of care.

Introduction

Assessing the impact of an information system on medical data management in a military setting is a process that involves scientifically measuring how the introduction of digital tools alters the effectiveness of care and the security of highly sensitive medical data. However, the digitisation of medical management presents particular challenges when patients are military personnel. Medical data may contain extremely sensitive information relating to personnel's state of health, physical fitness, treatment and any medical restrictions. With the digital transformation of healthcare organisations, traditional paper-based record-keeping is gradually being replaced by information systems that enable the collection, storage, processing, transmission and analysis of medical data. The military environment thus requires a balance between two demands that are sometimes difficult to reconcile: the availability of information to ensure the continuity and quality of care, and the protection of this information against unauthorised access. Armed forces personnel may be successively deployed to different units or theatres of operations. This mobility necessitates rapid access

to reliable and up-to-date medical information. The scientific literature emphasises that immediate access to patient data is particularly important in military and emergency contexts, notably to improve the diagnosis, treatment and follow-up of service personnel. This study therefore aims to assess the impact of an information system on the management of medical data in a military setting, by identifying its advantages, limitations and the factors likely to enhance its effectiveness. During our research, we identified several difficulties: administrative delays in the management of medical data, difficulty in retrieving data, loss of documents, and a lack of security for information relating to medical data management. In this context, the research question for our study is as follows: what is the impact of an information system on the management of medical data in a military setting?

We assume that the implementation of an information system significantly improves the management of medical data in a military context. Specifically: the use of an information system reduces the time required to search for and consult medical records; the information system improves the quality, completeness and reliability of medical data; and computerisation improves the security and confidentiality of medical information when accompanied by appropriate access control and measures. The overall objective of this research is to assess the impact of an information system on the management of medical data in a military setting.

Our specific objectives are to measure the system's effect on the time taken to access medical information; to assess the quality and completeness of the recorded data; to design a suitable and secure network architecture; to identify the technical and organisational difficulties encountered; to assess its influence on the speed of case processing; and to formulate recommendations for improving the system.

A number of authors have already conducted similar research: Bisama et al. (2020) studied the interoperability of health information systems in the Democratic Republic of the Congo. They identified difficulties in data exchange and integration. They propose the harmonisation of systems. However, their study does not specifically examine military health facilities. Our research explores this aspect in greater depth. Woldemariam and Jimma (2023), in a systematic review of the adoption of electronic health records in low-income countries, identified barriers relating to infrastructure, technical support and user skills. They recommend strengthening staff support. However, their analysis does not focus on the Congolese military context. Bostan et al. (2024) examined the barriers to the implementation of open-source electronic health records. They identified technological,

organisational and institutional constraints. They advocate a comprehensive approach integrating resources, governance and data security. Our study examines these factors within a military setting. The World Health Organisation (2024) emphasises the importance of integrated health systems, reliable data and capacity building. It recommends improving interoperability and the use of information. However, its general guidelines do not assess the actual use of such systems in a military context.

Gelchu et al. (2025) studied the readiness of healthcare professionals to use electronic health records in Ethiopia. They highlight the importance of IT skills and knowledge of the system. Our research examines these aspects amongst Congolese military professionals. Anian et al. (2025) emphasised the role of governance, standards and resources in hospital interoperability. Their study does not directly assess the practices of military users. Finally, Binagha (2026) analysed the implementation of DHIS2 in the DRC, noting difficulties relating to infrastructure, skills and data quality. Our research complements this work by studying the actual use of the medical information system in a military setting.

2. Methodology

2.1. Type of study

This study adopts a primarily evaluative approach using a mixed-methods design, combining quantitative and qualitative methods. The quantitative approach will enable us to measure changes in various indicators before and after the system's introduction. The qualitative approach will enable us to gather users' experiences and identify the factors explaining the observed results.

2.2. Study framework

The study was carried out at the Type A Operational Medical Centre (CMOA) of the 151st Naval Base in Kinshasa, comprising: a medical department; a consultation unit; a laboratory; an administrative department; and a unit responsible for managing medical records.

2.3. Study population

The study population consisted mainly of doctors, administrators, IT managers and staff involved in the management of medical records. They were working within a manual medical records system.

2.4. Sampling

A non-probability sampling method was used to select 53 participants. This approach was chosen due to the accessibility of those directly involved in medical data management. The participants included doctors, nurses, administrators/managers, laboratory technicians and IT managers.

Data were collected between 14 July and 11 September 2026.

2.5. Data collection techniques

Four main techniques were used: a structured questionnaire; semi-structured interviews; non-participant observation; and a literature review.

The questionnaire included, in particular, questions relating to the reality of the system under evaluation and the difficulties encountered.

The interviews enabled the collection of additional information on medical data management practices and institutional constraints.

2.6. Variable studied

Independent variables:

The medical information system, assessed in particular through:

- Its level of use;
- Its functionality;
- Its accessibility;
- Its ease of use;
- User training;
- Availability of equipment and the network.

Dependent variables:

The quality of medical data management, assessed through:

- Time taken to access the record;
- Error rate;
- Data availability and traceability;

- Security;
- User satisfaction;
- Productivity.

1. Evaluation indicators

The system's impact is assessed using the following table:

- Accessibility: average time taken to locate a file;
- Quality: proportion of complete files and error rate;
- Availability: percentage of files accessible when needed;
- Security: number of incidents or unauthorised access events;
- Frequency of system use;
- Level of user satisfaction;
- Speed of production of medical reports.

2. Data analysis

Quantitative data are analysed using statistical software such as R, SPSS or Python.

Descriptive statistics will include, in particular:

- Frequencies;
- Percentages;
- Means;
- Median values;
- Standard deviations.

To compare the situation before and after the system was implemented, statistical tests are used depending on the nature of the data.

The rate of improvement is calculated as follows:

Improvement rate (%) = [(post-implementation value – pre-implementation value) / pre-implementation value] × 100

For qualitative variables, the chi-squared χ^2 test may be used where the conditions for its application are met. $P < 0.05$.

Hypotheses:

H0: the variables are independent (no link; the government does not help).

H1: the variables are dependent (yes, there is a strong link).

Practical formula for chi-squared (X^2) = $\sum \frac{(O-E)^2}{E}$, or alternatively $X^2 = \sum \frac{(vu - attendu)^2}{attendu}$

where:

O = observed frequency (observed)

E = expected frequency (expected)

The expected frequency is calculated as: $E = \frac{(\text{total ligne} \times \text{total colonne})}{\text{total général}}$

Decision rule:

If $p < 0.05$, then yes, there is a genuine association.

Table 1: Critical value.

Degrees of freedom (df)	Critical value χ^2
1	3.84
2	5.99
3	7.81
4	9.49
5	11.07
6	12.59
7	14.07
8	15.51

9	16.92
10	18.31

The qualitative data from the interviews may be analysed thematically.

3. Results

Table 2: Breakdown of respondents by job role.

Role	F	%
Doctor	25	47.2
Nurse	5	9.4
Administrator/manager	17	32
Laboratory technician	4	7.5
IT manager	2	3.7
Total	53	100

Source: field data

The table shows that doctors are the most represented category, with 25 people, or 47.2 per cent. They are followed by administrators/managers with 17 people (32 per cent), nurses with 5 people (9.4 per cent), laboratory technicians with 4 people (7.5 per cent) and IT managers with 2 people (3.7 per cent).

$$\chi^2 = 37.4$$

$$37.4 > 9.49$$

$$Ddl = 5 - 1 = 4$$

Table 3: Existence of a computerised system.

Department	f	%
Yes	3	5.6
No	50	94.3
Total	53	100

The results show that 50 out of 53 respondents (94.3 per cent) stated that they were unaware of the existence of a computerised system, compared with only 3 (5.6 per cent) who answered in the affirmative. These results reveal very low uptake or, at the very least, very low awareness of the computerised system within the organisation under study. This situation constitutes a major obstacle to improving the digital management of medical data.

Table 4: Age of the computerised system in the hospital.

Time	f	%
1–5 years	3	5.6
I don't know	50	94.4
Total	53	100

This table shows that 50 respondents (94.4 per cent) answered 'I don't know', whilst only 3 (5.6 per cent) indicated that the system had been in use for between 1 and 5 years. The vast majority of participants do not have sufficient information about how long the system has been in use. This confirms the low level of familiarity with the IT system.

Table 5: Frequency of use.

Frequency	F	%
Several times a day	3	5.6
Never	50	94.4
Total	53	100

The majority of respondents, namely 50 people (94.4 per cent), stated that they never use the system. Only 3 people (5.6 per cent) stated that they use it several times a day. The computerised system is used very infrequently within the organisation under study. This low level of usage is a factor likely to significantly limit its impact on the management of medical data.

Table 6: Training in the use of the system.

Training	F	%
Yes	3	5.6
No	50	94.4
Total	53	100

50 respondents (94.4 per cent) stated that they had not received any training, compared with only 3 (5.6 per cent) who stated that they had been trained. The lack of training is one of the main obstacles to the effective use of an information system. Even where an infrastructure exists, its effectiveness may remain limited if users do not understand how it works.

Table 7: The system easily retrieves medical information.

System	F	%
Always	3	5.6
I don't know	50	94.4

Total	53	100
--------------	-----------	------------

Only 3 respondents (5.6 per cent) stated that the system makes it easy to find information, whilst 50 (94.4 per cent) replied 'I don't know'.

It is impossible to conclude that the system actually improves access to records, as almost all participants are not familiar enough with the system to give an opinion.

Table 8: Facilitating transparency management.

Facilitation	F	%
Definitely	3	5.6
I don't know	50	94.4
Total	53	100

3 respondents (5.6 per cent) believe that the system greatly facilitates management and transparency, whilst 50 (94.4 per cent) answered 'I don't know'. The majority of participants do not have sufficient experience of the system to assess its impact on the transparency of data management.

Table 9: Reduction in search time and risks.

Reduction in risks	F	%
Yes	3	5.6
I don't know	50	94.4
Total	53	100

3 people (5.6 per cent) answered 'Yes', compared with 50 (94.4 per cent) who answered 'I don't know'. The data do not allow us to conclude that the system actually reduces the time taken to search for records or the risks associated with managing them. The lack of use and training seems to prevent participants from making a reliable judgement.

Table 10: Does using the system improve the quality of medical care?

Improvement	F	%
Yes	3	5.6
Perhaps	15	28.3
I don't know	35	66.0
Total	53	100

$$\chi^2 = 29.58$$

$$29.58 > 5.90$$

$$Ddl = 3 - 1 = 2$$

Only 3 respondents (5.6 per cent) stated that the system improves the quality of medical care, whilst 50 (94.4 per cent) replied 'I don't know'.

It is impossible to conclude that the system actually improves access to medical records, as almost all participants are not sufficiently familiar with the system to give an opinion.

Table 11: Satisfaction with the system's access to medical data.

Satisfaction	F	%
Satisfied	3	5.6
ABR	50	94.4
Total	53	100

Only 3 respondents (5.6 per cent) stated they were satisfied, whilst 50 (94.4 per cent) were classified as 'ABR', as set out in the document. The table suggests a very low level of satisfaction or, more precisely, a very high concentration in the 'No Good Answer' category.

Table 12: Data security satisfaction.

Satisfaction	f	%
Somewhat yes	3	5.6
No correct answers	50	94.4
Total	53	100

3 respondents (5.6 per cent) answered 'Somewhat yes', compared with 50 (94.4 per cent) classified as 'ABR'. The data do not allow us to conclude that users are satisfied with data security. The very high proportion of 'ABR' responses instead reflects the lack of a sufficiently established assessment.

Verification of hypotheses:

Variable	Variable	E	(O-E) ² /E	χ^2
Existence of the system	Yes	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	No	50	20.83	
Age of the system	1-5 years	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	I don't know	50	20.83	
Frequency of use	Several times a day	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	Never	50	20.83	
User training	Yes	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	No	50	20.83	
System retrieves the information	Always	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	I don't know	50	20.83	
Facilitating transparency management	Absolutely	3	20.83	41.66 > 3.84 ddl = 2-1 = 1
	I don't know	50	20.83	

Reduced search time and reduced risks	Yes	3	20.83	$41.66 > 3.84$
	I don't know	50	20.83	$ddl = 2 - 1 = 1$
System satisfaction with access to medical data	Satisfied	3	20.83	$41.66 > 3.84$
	No correct answer	50	20.83	$ddl = 2 - 1 = 1$
Data security compliance	Somewhat yes	3	20.83	$41.66 > 3.84$
	No correct answer	50	20.83	$ddl = 2 - 1 = 1$

We therefore reject the null hypothesis that the observed frequencies are equal to the theoretical frequencies.

The qualitative data from the interviews and observations were subjected to a thematic analysis and were used to supplement the interpretation of the quantitative results.

4. Discussion of the results

This study assesses the impact of an information system on the management of medical data in a military context. Its originality lies in the analysis of the use of digital tools in an environment characterised by specific requirements regarding the confidentiality, security and availability of medical information.

The results obtained from 53 participants reveal a low level of adoption of the information system. Indeed, 94.4 per cent of respondents stated that they never use the system and have not received any training in its use. This situation suggests that a lack of familiarity with the tool and insufficient training could constitute significant barriers to its adoption. However, other factors, notably infrastructure, work organisation and technical support, may also play a role.

With regard to the accessibility of records, data quality, security and improvements in care, the large number of 'I don't know' responses limits an objective assessment of the system's performance. These results therefore demonstrate neither the system's ineffectiveness nor its actual effectiveness. Rather, they highlight the need to measure its effects using objective indicators, such as the time taken to retrieve records, the error rate and the completeness of information.

From a methodological perspective, the mixed-methods approach — combining questionnaires, interviews,

observations and literature review—is an asset in understanding the phenomenon under study. Nevertheless, the non-probability sampling and the absence of comparative measurements before and after the system's use limit the generalisability of the results and the establishment of a causal link.

The findings are consistent with previous studies that identify training, infrastructure and organisational support as key determinants of the adoption of health information systems.

The findings of our study are consistent with several previous studies on the adoption of health information systems in resource-constrained countries. Woldemariam and Jimma (2023), in their systematic review on the adoption of electronic health records, highlight that their use is hampered in particular by a lack of training, inadequate infrastructure and limited organisational support. These observations are consistent with our findings, according to which 94.4 per cent of participants reported not having received any training, and a similar proportion stated that they never use the system. This consistency suggests that training and user support are important prerequisites for promoting the adoption of digital health tools.

Similarly, the systematic review published in **Health Policy and Planning** in 2016 on the barriers and enablers to the exchange of health information in low- and middle-income countries highlights the importance of infrastructure, staff skills, leadership and institutional support. These factors may also help to explain the low uptake observed in our study, even though their specific influence was not directly measured.

Furthermore, Bostan and colleagues (2024) emphasise that the implementation of electronic health records depends on several factors, including financial resources, governance, technical infrastructure and data protection. These observations are particularly relevant in a military context, where the confidentiality and availability of medical information are of particular importance.

However, unlike studies that directly assess the performance of computerised systems, our research primarily highlights a low level of adoption of the tool. The available data therefore do not allow us to confirm an actual improvement in the speed of access to records or in the quality of care. Our study thus complements previous work by emphasising the need to strengthen training and the integration of the system into professional practice before objectively measuring its effects.

Conclusion

The overall objective of this study was to assess the impact of an information system on the management of medical data in a military setting. More specifically, it aimed to examine the conditions under which the system is used, to evaluate its influence on the accessibility, quality and reliability of medical data, and to identify the difficulties likely to limit its effectiveness.

The results obtained from 53 participants highlight low usage of the medical information system. Indeed, 94.4 per cent of respondents stated that they never use the system, whilst 94.4 per cent indicated that they had not received any training in its use. Furthermore, the numerous responses indicating a lack of awareness of the system's performance make it impossible to establish with certainty its actual impact on the speed of access to records, data quality, information security and improvements in care. These results nevertheless underscore the importance of user training, organisational support and the availability of technical resources in promoting the adoption of the system.

From a scientific perspective, this study helps to document the difficulties associated with the adoption of health information systems in a military context. It highlights the need to distinguish between the availability of an IT tool and its actual use, as well as its measurable effects on professional practices. It thus provides useful insights for discussions on the modernisation of medical data management, whilst emphasising the specific requirements for confidentiality and security inherent to the military environment.

However, certain limitations – notably the non-probability sampling and the absence of objective comparative measures before and after the system's use – mean that the results should be interpreted with caution. They also open up avenues for future research.

In particular, it would be worthwhile to conduct studies across several military healthcare facilities, to assess staff's digital skills, and to compare the performance of paper-based and electronic records using objective indicators, such as search time, error rates and the completeness of records. Longitudinal studies would also enable the measurement of changes in the system's usage following the implementation of appropriate training programmes.

Ultimately, improving the management of medical data in a military context requires not only suitable IT tools, but also ongoing training, institutional support and regular evaluation of their performance. These conditions are essential drivers

for promoting more efficient, reliable and secure management of medical information for the benefit of healthcare professionals.

References

1. Anian, S., et al. (2025). A multi-country review of the governance of hospital information systems interoperability. *Eastern Mediterranean Health Journal*.
2. Barriers and facilitators to health information exchange in low- and middle-income country settings: A systematic review. (2016). *Health Policy and Planning*, 31(9), 1310–1325.
3. Binagha, E. P. M. (2026). A scoping review of DHIS2 implementation in the National Health Management Information System of the Democratic Republic of the Congo. *Discover Public Health*.
4. Bisama, G., et al. (2020). The role of interoperable health information systems in improving health outcomes: The case of the Democratic Republic of Congo. *Journal of Health Informatics in Africa*.
5. Bostan, S. et al. (2024). Contextual Barriers to Implementing Open-Source Electronic Health Record Systems for Low- and Lower-Middle-Income Countries: Scoping Review. *Journal of Medical Internet Research*, 26, e45242
6. Gelchu, M. M., et al. (2025). Health professionals' readiness for and factors influencing the implementation of electronic medical record systems in Southern Oromia, Ethiopia. *Frontiers in Digital Health*.
7. World Health Organisation. (2024). Strategy for optimising national routine health information systems. WHO.
8. Woldemariam, M. T., & Jimma, W. (2023). Adoption of electronic health record systems to enhance the quality of healthcare in low-income countries: A systematic review. *BMJ Health & Care Informatics*, 30(1), e100704.