



## **Review of Health Information in Hospitals` Reports - North Kordofan State- Sudan**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Authors EMARM and SAB designed the study protocol and conducted the data collection. Author SAB performed and managed the statistical analysis of the study and wrote the first draft of the manuscript. Authors AEME and TAEF revised the manuscript for literature searches. Author SAB revised the manuscript for intellectual content. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** Hospital as a health organization could have a reliable health information of high quality to assist in planning health interventions.

**Objective:** Objective of the study is to review the hospitals` reports for completeness and accuracy of health information with emphasis on five health indicators.

**Methods:** A descriptive study carried in five main hospitals in Shiekan locality, North Kordofan State - Sudan. The study population was monthly health information reports of year 2015. The health information reports of second quarter for 2015 (April, May, June) was selected randomly. A

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total of 15 monthly hospitals` reports were reviewed using standard review checklist derived from the national format of the hospital report book. Ethical clearance was obtained and data was managed by SPSS version 20 and Microsoft Excel sheet. Descriptive statistic was presented in two tables and one graph.

**Results:** Documentation of dates of receiving and sending reports was shown in 12 and 10 hospitals` reports respectively. All hospitals` reports showed recorded classification of patients by age and sex. Diseases were recorded according to international classification of diseases (ICD) in 12 hospitals` reports. Authorship of general directors of the hospitals was shown in 3 reports. One hospital report had five health indicators completely documented. The study health reports lack the accuracy of information.

**Conclusion:** The study hospitals` reports in North Kordofan State- Sudan were incomplete and inaccurate. Emphasis needed on periodic capacity building of hospital staff for improvement of quality of patients` information.

*Keywords: Information; report; hospital; accuracy; indicator; health; Sudan.*

## 1. INTRODUCTION

Hospital health organization could have reliable health information of high quality to assist in planning health interventions. Hospitals generate information that should be of adequate quality and scientifically sound to be used by health policy makers [1]. Incomplete hospital information with poor quality hospital records are a characteristic of health information system in developing countries [2]. Poorly recorded information underestimates the incidence of diseases and mortality data [3]. Mortality indicators derived from hospital data is supporting an evidence based strategic intervention to avert any preventable deaths [4]. The accurate hospital morbidity data is a strong tool for predicting the risk of adverse outcomes [5]. Mortality data at the hospitals could reflect the behaviour and ownership of staff to the measures of hospital safety where reliable health information is sensitive to the hospital values [6]. Failure of the hospitals to operate sensitive health information system could be due to poor revision and interpretation of the compiled hospital data and the lack of timely raise reports to hospital managers for auditing [6]. A limited literature of evidence is available regarding success and failure of health information in developing countries where health information studies confronted with the lack of supportive resources [7].

The aim of the study was to review the hospitals` reports for completeness and accuracy of health information with emphasis on five health indicators in North Kordofan State Sudan.

## 2. MATERIALS AND METHODS

This was a descriptive study aiming to review the health information recorded in the monthly reports of the hospitals. The study area was five main hospitals located in Shiekan locality, North Kordofan State - Sudan. Concerning the confidentiality and sensitivity of the review, the five hospitals were nominated as A, B, C, D and E. The study population was the monthly health reports of the hospitals for the year 2015. Usually these reports are compiled in quarters. The second quarter for 2015 (April, May, June) was selected randomly for the study. A total of 15 monthly reports were reviewed using standard review checklist derived from the national format of the hospital report book.

The information in the front pages of the reports was reviewed for the completeness of dates of receiving the reports from different departments in the hospitals and dates of sending the reports to State Ministry of Health. The review addressed the completeness of classification of diseases according to international classification of diseases (ICD) and patients` classification by age and sex. The study addressed also five sensitive health indicators for completeness. The indicators selected were total number of the patients, total number of malaria cases, top ten diseases in the hospital, total number of surgical operations and crude death rates. The total number of patients in the reports was selected purposively for identifying the accuracy of the reports by matching the total number of patients in the reports with the opposite registry books of the second quarter 2015. The back pages of the

reports were checked for the signature of the statisticians and managers to identify their authorship and responsibility. Ethical clearance was obtained from the Sudan Medical Specialization Board and permission was taken from the State Ministry of Health at North Kordofan State and the hospitals' authorities. Data was managed by SPSS version 20 and Microsoft Excel sheet. Descriptive statistics were presented in tables and one graph.

### 3. RESULTS

Twelve and 10 reports out of 15 had shown the documentation of dates of receiving and sending reports form the different departments in the hospitals and to State Ministry of Health respectively [Table 1]. Classification of patients by age and gender had been recorded in all reports, and diseases were written according to ICD in 12 reports [Table 1]. The general directors of the hospitals signed 3 reports only [Table 1]. The five health indicators were completely documented in one hospital report [Table 2]. Crude death rate, total number of malaria patients and surgical operations were recorded in two reports out of the fifteen [Table 2]. The total number of patients was complete and recorded in the 15 reports but it was accurately recorded

according to the opposite registry books in two reports only [Fig. 1].

### 4. DISCUSSION

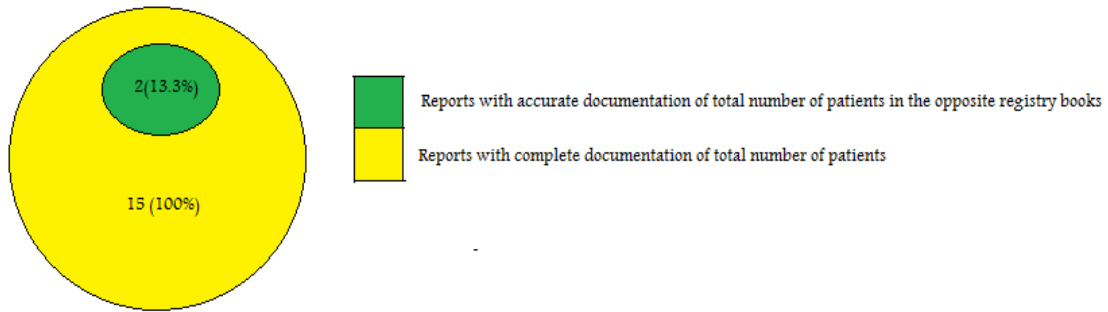
Health information system is one of building blocks in the health system that attracting policy maker to make use of cheap and ready-made information. Complete and accurate health information in this block provides health indicators for monitoring the track of health system performance in the country [8]. Review of hospital records is the feasible and cheap method of studying morbidity, mortality and medical errors, nevertheless, it has the limitations of incomplete, miss located or absent records [9]. In this study, the incomplete information in the hospitals' reports limited further review of information in the study reports. It has shown that the dates were not written in some of the reports. The missed dates on hospitals' reports contribute to inconsistency of information regarding occurrence of health events such as date of patients' deaths in comparison with dates of last treatment procedures [10]. Furthermore, absence of dates in the reports could be a cause of delay to the timely flow of hospital information and obstructs the pathway of utilization of information for improving hospital services.

**Table 1. Number of hospital health reports with documented basic information and the signatures of authorized persons in North Kordofan State - Sudan 2015 (n=15)**

Reviewed items in 15 reports		Number of reports / Hospitals					Total
		A	B	C	D	E	
Cover page of the reports	Written Date of receiving Reports from Different departments in the hospitals	3	3	1	3	2	12 (80%)
	Written Dates of sending reports to State Ministry of Health	2	0	3	2	3	10 (66.7%)
Classification	Classification of patients according to the age and sex	3	3	3	3	3	15(100%)
	Classification of disease according to the ICD	3	3	3	0	3	12(80%)
Authorized signatures on the reports	Signature of statistician of each department	3	0	1	0	3	7 (46.7%)
	Signature of the head statistician	3	3	1	0	3	10 (66.7%)
	Signature of the medical manager of the hospital	3	0	0	3	3	9 (60%)
	Signature of the general manager of the hospital	0	0	3	0	0	3 (20%)

**Table 2. Number of hospital health reports with complete documentation of five health indicators in North Kordofan State- Sudan 2015 (n=15)**

Complete documentation of 5 selected indicators in 15 reports	Number of reports / Hospitals					Total
	A	B	C	D	E	
Total number of the patients	3	3	3	3	3	15 (100%)
Total number of malaria cases	1	0	0	0	1	2(13.3%)
Top ten disease in the hospital	3	3	0	0	0	6(40.0%)
Total number of surgical operations	1	1	0	0	0	2(13.3%)
Crude death rates	1	0	0	0	1	2(13.3%)



**Fig. 1. Number of health reports that accurately matched in the opposite registry books in North Kordofan State- Sudan 2015**

Age and sex classification was completely recorded in the study hospitals' reports. Age and sex are used in ranking deaths in the country and to identify the demographic features of population for tuning health policy [11]. However, ranking of deaths by age and sex could be affected by the inherent limitations of coding the diseases according to ICD [11]. Coding with ICD in this study was not reported in three hospitals' reports. International classification of diseases in hospitals' reports is a method on which the causes of deaths could rely. Nevertheless, deaths due to care provider and health system errors are not associated with ICD in death certificates [12].

Almost half to one quarter of study reports had shown the signatures of the departmental statisticians and the general directors of the hospitals respectively. The hospital and management components are playing a crucial role in implementation of hospital services including management of health information system [13]. The authorship of statisticians and managers is contributing to the quality improvement, patients' safety; hospital culture and preventing prolong dispatch of reports to hospital planners [13,14].

Three health indicators were poorly recorded in the study hospitals' reports: total number of malaria cases, total number of surgical operations and crude death rates. Malaria indicator is the most sensitive health indicator as far as malaria is an endemic disease in Sudan [15]. Under recording of patients diagnosed with malaria is also shown in inpatients information received from hospitals in different states of Sudan [16]. Complete and accurate recording of diagnosed malaria could avail a surveillance data that help in adjusting the malaria control strategies over time [17,18].

Two hospitals' reports in this study had the documentation of total number of surgical operations and crude death rates. A study had shown that surgeons are usually reluctant to record surgical information including intraoperative and postoperative complications and considering it as routine work [19, 20]. Writing detailed procedures of surgical operation is of value and it is fundamental practice that important in medico legal events [21]. Recording the total number of surgical operations could be the easiest variable to maintain the availability of surgical operation information in hospitals' reports.

Crude death rate was not recorded in most of study reports in this study. Under recording of crude death rate in hospitals' reports underestimates the deaths associated with communicable and non-communicable diseases in developing countries [22-25]. The top common ten diseases were shown in less than half of the study hospitals' reports in the five hospitals. The recording of common diseases in hospitals' reports is sometimes very poor [26]. Recording common diseases in hospitals' reports will adjust the performance metrics of the hospitals and assess the effectiveness and efficiency of hospital services [26].

The total number of patients was recorded completely in the study reports, but it was inaccurate when matched with the total number of patients in the opposite registry books for the same months. Compared to the developed countries, the quality of hospital information is reliable, accurate and provides useful information of disease outcomes [6,27]. Checking accuracy of patients' information and provide feedback conclusion to hospital staff are improving hospital's strategies [28]. It is common that the health information system has varied levels of under documentation at different stages of recording health data [29,30]. The hospital managers should have significant role in the quality and accuracy of patients' health information that seems to be of low capacity in the study area.

## 5. CONCLUSION

The study hospitals' reports in North Kordofan State- Sudan were poorly having complete information and had poor accuracy regarding authorship of hospitals' managers and the health indicators. Emphasis needed on capacity building of hospital staff on governance and stewardship regarding health information system.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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