



Quality of Information in the Hospital Information System of the Makelekele Referral Hospital, Brazzaville, Republic of Congo: Point of View of the Health Staff

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ABSTRACT

A well-functioning hospital information system must ensure the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status. The aim of this study is to contribute to the improvement of information management and, by extension, to strengthen the overall performance of the Makélékélé Base Hospital. We conducted a descriptive cross-sectional study, at the Makélékélé Base Hospital in the first arrondissement of Brazzaville, the political capital of the Republic of Congo. The study took place during the period from 1 July 2020 to 8 February 2021. Authorisation to collect data for the study will be sought from the Hospital's General Management. In total, 55 questionnaires were completed by data management staff in the health information system field. More than 50% of the respondents answered that the same tools were used from year to year, site to site (58.18%) and that data collection was done according to the same methods from year to year, site to site (69.09%). Only 83.64% of the respondents answered that data from all reportable sites are included in the overall data, while 36.36% answered that there are measures in place to ensure data completeness. There were 69.09% of respondents confided the existence of the risk of the data being used for personal or political purposes. In our study, the analysis of the constraints of health information management was mainly related to data quality problems. The quality of health information is poor and does not allow the establishment of an efficient hospital system. The use of health information is insufficient to allow the implementation of an efficient hospital system. Our survey revealed a relatively positive patient satisfaction rate regarding the quality of care, the comfort and cleanliness of the room and the noise in the ward. The two investigations revealed that the "data quality" component had significant shortcomings that should be prioritised in the management of the Hospital Information System. Health information is essential for monitoring progress in improving and maintaining the health of populations and the functioning of the health system.

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Introduction

Information is the basis of all reasoned action, of all rational management and even, according to psychosociologists, of all power (1). Reliable and timely information is essential for action in the field of public health. The health information system can be defined as the set of tools used for the collection, analysis and interpretation of health data (2).

One of the pillars of a health system is hospital information (3). A well-functioning hospital information system must ensure the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status (4). The health information system (HIS), which is an integral part of the hospital organisation, is constantly evolving. It

enables data to be acquired, evaluated, processed using computerised or organisational tools, and information to be distributed to all the hospital's internal and external partners. (5). Public health decisions are the product of consultation between the various health actors, who have quality information at their disposal: the control of health information is therefore a powerful tool in the orientation of public health policies. Information management within the hospital has a number of objectives, one of which is to guarantee quality information. Quality is one of the most important criteria for the success of an information system, which refers to the desirable characteristics of the processing system itself (6). The quality of health services depends on the quality of information in the hospital and the quality of information is a key competitive element for the organisation on an ongoing

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basis (7). The importance of having effective health information systems is increasingly recognised, due to:

- the need for countries to assess and report on progress towards the Millennium Development Goals ;
- the recognition of the value of good quality, current health information ;
- the need for good quality and reliable data to identify health priorities.

The choice of this theme is justified by the fact that in an increasingly uncertain and complex context, marked by the scarcity of resources and profound changes, the hospital must store, process and disseminate an ever-increasing amount of data to inform itself and its context. Similarly, the relevance of decisions, particularly those relating to performance and the hospital's overall policy, depends on the hospital's ability to build an appropriate information system, responding to a "managerial" tool for the hospital. Hence, the need for quality health information.

The aim of this study is to contribute to the improvement of information management and, by extension, to strengthen the overall performance of the Makélékélé Base Hospital.

Research questions

What is the quality of health information and its use at the Makélékélé base hospital?

Methodology

We conducted a descriptive cross-sectional study with a qualitative approach based on the quality criteria of the Delone and MacLean models, which will consist of an evaluation of the quality of the data and the use of the information. Our study took place at the Hôpital de Base de Makélékélé in the first arrondissement of Brazzaville, the political capital of the Republic of Congo. The study took place during the period from Wednesday 1 July 2020 to Monday 8 February 2021.

Our study population was Health personnel working in the field of health information, at the level of the various directorates in charge of health and health personnel responsible for data within the various departments of the Makélékélé base hospital. The target populations for our study were :

i. Heads of department

These are the doctors in charge of the health care services. These doctors are the first to be concerned with information management within the hospital. It is through them that all information passes before it reaches the rest of the staff in their department.

ii. Ward supervisors

They are the interface between patients and staff on the one hand, and between staff and hospital management on the other. As such, they are in charge of information management in the care services.

iii. Administrative managers

These are non-healthcare staff in charge of the hospital's administrative, financial and logistical management.

iv. Health workers

These are staff indirectly involved in information management. However, they play a decisive role in the collection of data at the level of the health services. Their assessment of the organisation and management of information within the hospital can help to identify difficulties and possible solutions to the dysfunction of the system.

v. Resource persons

These are the people responsible for managing the health information system at departmental and central level. Only

questions relating to the organisation and operation of the health information system as a whole were discussed with these people.

Inclusion criteria

Any person with responsibility in the health care services, in the general management. And patients who were willing to participate in the study as users of health information. The inclusion criteria for patients were: patients hospitalised for a disease, whose length of stay was at least 48 hours; patients whose discharge destination was home; patients who consented to participate in the study.

Exclusion criteria

For the survey of information users, the criteria for non-inclusion were: patients discharged against medical advice or transferred to another department; patients who died.

Exclusion criteria

Any refractory person who for any reason did not complete the survey form was excluded from the study.

The type of sampling used was that of sequential sampling, i.e. the sample was selected according to the order of eligibility in the survey. Users who were physically present at the time of the survey, who met the inclusion criteria and who consented were systematically recruited. The clients of the HIS were identified as internal or external. We therefore had two types of sample. Our planned sample size was 44 people, and for the health staff we were able to interview 55 people.

Variables of interest

Classification of variables

Regarding the quality of information, the variables were: (1) Accessibility, (2) Completeness, (3) Accuracy, (4) Accuracy, (5) Timeliness, (6) Clarity, and (7) Flexibility. Our information collection instrument was a questionnaire for Heads of Departments, Ward Supervisors and health workers and resource persons.

A literature review focusing on the topic completes our work. The possibility of a relatively small study sample was seen as a limitation to the extrapolation of our results. However, as our approach is strictly qualitative, the size of the sample does not matter in this case. Rather, it is the quality of the respondents and the answers to the questions that are the most decisive. Moreover, for a qualitative study, a sample of around thirty people is credible for obtaining results that are considered representative for the sample (N) concerned.

Data collection procedure

Two separate questionnaires were designed (the system designers and hospital IT authorities questionnaire and the HIS users questionnaire). The questionnaires were distributed to users of hospital information at the Makélékélé Base Hospital. These respondents were selected by purposive sampling. The method of data collection was to go to the various departments and interview the people in charge of data collection. And to explain the survey before administering the questionnaire.

The data were collected on two paper survey forms and then entered into a computer using a data entry mask. We used software designed on EpiInfo 7.2, for statistical analysis. For the first part of the survey, a type of psychometric response scale was used in which respondents indicated their level of agreement with a statement, generally in five points : (a) Strongly disagree; (b) Disagree; (c) Neither agree nor disagree; (d) Agree; (e) Strongly agree.

Epi info software version 7.2.1 was used for statistical analysis. The descriptive data were presented in

percentages. Univariate descriptive analyses were performed, distribution table with % for categorical variables. The statistical results were significant, as 1 was not included in the confidence interval.

Authorisation to collect data for the study will be sought from the Hospital's General Management. In our study, the informed consent of the participants in the survey will be required, the individuals identified will be informed of the purpose of our research and participation in the study will not be mandatory. Data processing will be done anonymously. The patients gave their consent to participate in the study. Refusal to participate in the study did not lead to any modification or sanction of the health worker or the patient. Confidentiality and anonymity of the data were ensured.

Results

In order to understand the inadequacies affecting the management of health information as a whole and in particular within the Makélékélé base hospital, we present in this section the results of interviews conducted with the various actors. In total, 55 questionnaires were completed by data management staff in the health information system field;

Description of the health information situation

The table 1 presents the first step for data accuracy in the health information system. The register was the data transcription process most cited by users (74.29%) of the Health Information System. The possibility of errors in data transcription was cited by almost all respondents (98.18%), while only 53.85% followed steps to limit errors in data transcription. Among the respondents who respected the steps to limit transcription errors, 13 or 23.64% responded that they used double data entry for large surveys, while only 16.36% responded that they used the integrated quality control system.

The other responses related to the accuracy of data in the health information system are shown in the table below. Regarding the different solutions to be recommended when there are data errors, 45.45% answered that the data was checked and the errors were corrected. For missing or incomplete data, 76.36% responded that the data should be collected again and completed (Table 2).

Table 3 shows the respondents' answers regarding the reliability of data in the health information system. More than 50% of the respondents answered that the same tools were used from year to year, site to site (58.18%) and that data collection was done according to the same methods from year to year, site to site (69.09%).

With regard to the responses on the accuracy of data in the health information system, the percentage of respondents' answers was below 80%: there were 76.36% of respondents who answered that there are methods to ensure that there are no significant errors in the data, and no distortions, 72.73% thought that the margins of error are less than the measured expected change and that the margins of error are acceptable for programme decision-making (61.82%). Respondents who answered that there is reporting on accuracy issues represented 56.36% of all respondents. Only 25.45% thought that increasing the level of accuracy would be more expensive than increasing the value of the information (Table 4).

The table 5 above summarises the respondents' answers on the completeness of data in the health information system. Only 83.64% of the respondents answered that data from all reportable sites are included in the overall data, while 36.36% answered that there are measures in place to ensure data completeness.

The table 6 below represents the responses of the respondents in relation to the timeliness of data, frequency of data availability (78.18%), existence of a regularised data plan (63.64%). There were 87.27% who indicated that data is taken within the reporting period but only 83.64% responded that data is reported as soon as possible after collection.

The table 7 reveals that only 69.09% of respondents confided the existence of the risk of the data being used for personal or political purposes.

Identifying constraints in health information management

The analysis of health information management constraints relates to problems related to data quality, which are represented in decreasing order as follows (Table 8):

- More than 70% of respondents knew that consistency errors (77.14%), data entry errors, summation errors (78.18%), poorly reported data (74.55%), transposition of figures (76.36%), non-conforming data (74.55%), data mismatch (70.91%) and missing data (70.91%) are constraints in health information management.

- Between 60 and 70% of respondents answered that sudden or unusual variation of data from one period to another (61.82%), nonsense data (67.27%) and duplication of data (60%) are also constraints in health information management.

Knowledge of the Health Information System is summarised in the table 9:

- More than 50% of the respondents were aware of the existence of a feedback mechanism for the different levels of the health system (54.55%) and appreciated the use of health information collection media by agents at all levels of the system (54.55%).

- Between 60 and 80% of respondents were aware of the existence of a national policy on the health information system (67.27%), the existence of directives defining the objectives and role of the health information system (77.36%), and the availability of tools for collecting and using health information at all levels of the health system (72.73%).

- More than 80% of respondents knew the place of the health information system in the health system (81.82%). As regards knowledge of the roles and responsibilities at all levels of the actors in charge of data, 96.36% answered "yes". The difficulties encountered by the health information system at all levels of the health system and in particular at the hospital were known by 85.45%.

- However, of the 55 respondents, 34 (61.82%) did not give any suggestions for improving the quality of the data. Only 17 of the 55 health professionals (30.91%) suggested computerisation of the health information system as a means of improving health information.

All the results obtained were statistically significant.

Several studies have revealed that user satisfaction is widely considered an important variable in determining the success of an information system (8). The measurement instrument used for this exploratory research concludes that the target population has a high level of satisfaction. Health professionals are clearly satisfied with the current information system.

There is some ambiguity in the answers given between the description of the health information system, the quality of the information and the satisfaction of health professionals working in this field. Within the framework of the reform of the health information system, these quality assessment mechanisms become major challenges in order to make it a process that is fully integrated into the management that will

harmonise with all the other components of the reality of the health system as well as the hospital reality.

The assessment of the health workers' satisfaction is as follows (Table 10):

- More than 50% agree that the HIS improves the quality of decisions by making information readily available (54.55%), that the IS has the ability to offer a chance to reverse and correct an error (52.73%), the output is presented in a useful format in a well-designed layout and graphics (74.55%), the delayed or prevented from using the information system due to network connectivity (50.91%) and finally that the current IS needs to be modified or improved for effective and efficient patient care (54.55%).

- Less than 50% agreed that the IS provides sufficient, accurate, understandable and timely information (45.45%), the IS is easy to use in terms of menus and customisation (40.00%), the IS has the ability to communicate and exchange data between services (41.82%), the IS provides complete and secure information (47.27%), the IS can reduce waiting time (47.27%). There were 45.45%, who answered that due to password problems, the use of the information system should be delayed or prevented. A total of 47.27% agreed that there are problems with accessing the database when participating in patient-related work.

Discussion

Discussion according to objectives

Nowadays, the already important health information will become essential and, at the same time, a great challenge for the hospital. Access to knowledge has become a requirement for progress and allows new approaches or alternatives to the solution of hospital problems. In this context, information behaviour, which is generally situated in a perspective of profitability and efficiency, is of concern to the profession in the hospital environment.

Our study focused on the quality of health information and its use in the basic hospital of Makélékélé. The variables studied for the measurement of quality were based on the literature according to the DeLone & McLean model (8), The two entities that help to complete the measurement of the success of the BI system are the measurement of the usefulness of the information, to evaluate the quality of the information and the satisfaction of the users.

From this discussion, it was necessary to verify the possible use of the variables of the DeLone and McLean model (8) as to their capacity to evaluate the success of decision-making solutions envisaged at the level of health organisations in general and in particular in the hospital organisation of the Makélékélé base hospital.

The description of the health information situation made it possible to observe the criteria for good data quality summarised in seven dimensions. The accuracy or validity (correct data) was not optimal. Evidence of weakness in the collection of correct data is evident from the responses of health system users. The reliability of the data was moderately good. Reliability and validity are the two most important and fundamental characteristics in the evaluation of any measurement instrument or tool for good research (9). Among the respondents there were those who were not aware that the collection protocol and procedure should remain invariant.

With regard to the accuracy of the data, the percentage of respondents' answers was below 80%. The reduction or removal of the margin of error was not considered optimal. Only 56.36% of all respondents revealed that there is reporting on accuracy issues. Very few respondents

considered that there are measures in place to ensure that all data is collected and reported, although many were aware that data from all reporting sites is included in the overall data.

Reliable and timely health information is an essential basis for public health action and health system strengthening, which ultimately helps to inform decision-making. Better health information means better decision making, which leads to better health. This discussion emerged from the 7th Conference of the International University of Africa, which took place in Khartoum, Sudan (10).

Many users of the information system have no knowledge of the measures taken to ensure completeness. Less than 80% of respondents were aware that data should be updated on time. Although a smaller percentage of respondents were aware of the existence of a regularised data plan (63.64%). Promptness is a link that needs to be strengthened (timely and up-to-date data) in our health information system.

From our survey, it appears that respondents are not reassured whether their data is well protected or stored according to national or international standards. In view of the responses obtained on the existence of the risk that the data could be used for personal or political purposes (69.09%).

Data integrity is based on parameters such as accuracy, validity and consistency of data throughout its life cycle. It refers to the absence of unintentional changes to information between two successive updates or changes to data records. Data integrity can be seen as the opposite of data corruption, which renders the information ineffective in meeting the desired data requirements.

Health information systems that have been set up in countries to provide such data face a number of constraints in meeting these criteria. There is often a vicious circle where under-investment in health information systems results in poor quality data (11). From the analysis of the data collected in our study, we can confirm our first hypothesis that the health information system is in poor condition.

In our study, the analysis of the constraints of health information management was mainly related to data quality problems. Our survey pointed out the shortcomings of the health information system. The quality of the data collected is clearly not good. Up to 83.64% of respondents acknowledged the presence of consistency errors and 81.82% of respondents acknowledged the presence of data entry errors.

The quality of the information calls for the quality of the data and the level of confidence of the decision makers (12). Among the key success factors that can be cited are the implementation of controls relating to the following three points : consistency between information, exhaustiveness of records relating to events in the observed domain that occurred during the period under consideration, and compliance with the semantic rules of the domain. The quality of health information is poor and does not allow the establishment of an efficient hospital system. The use of health information is insufficient to allow the implementation of an efficient hospital system. The hypothesis is verified.

With regard to the quality of information, the measurement instrument used for this exploratory research concludes that the target population is highly satisfied. Health professionals are clearly satisfied with the current information system. Ratnaningtyas et al. in their study observed that by improving the quality of information, the quality of health care would improve to support patient satisfaction (7). DeLone and McLean, in their study, found that user

satisfaction is widely regarded as an important variable in determining the success of an information system (8).

There is some ambiguity in the answers given between the description of the health information system, the quality of the information and the satisfaction of health professionals working in this field. This may be due to the fact that the interviewer was a person working in the Ministry of Health. Another reason would be the exposure of the difficulties of the department under study. Some interviewees felt that the subject matter was too sensitive. Within the framework of the reform of the health information system, the quality assessment mechanisms become major challenges in order to make it a fully integrated process in the management that will harmonise with all the other components of the health system reality than the hospital reality.

Our survey revealed a relatively positive patient satisfaction rate regarding the quality of care, the comfort and cleanliness of the room and the noise in the ward. On the other hand, respondents did not feel concerned about meal times, the quality and quantity of meals, and compliance with diets. Patients were satisfied with the organisation of discharges from the hospital. The responses (90-100%) regarding possible improvements in the quality of the data were maximum. Most of the respondents were unanimous about the evolution of data quality. The evaluation of the health professionals on the health information system revealed that the knowledge of the health information system was good. The measurement instrument used for this exploratory research concludes that the target population has a high level of satisfaction. Health professionals are clearly satisfied with the current information system. Jean-Marc Palm et al. studied the determinants of user satisfaction with a clinical information system and concluded that the quality of the information and the quality of the service were strongly correlated with user satisfaction (13).

There is some ambiguity in the answers given between the description of the health information system, the quality of the information and the satisfaction of health professionals working in this field. As in this study by Kruk et al. we argue that providing health services without ensuring a minimum level of quality is inefficient, wasteful and unethical (14).

Within the framework of the reform of the health information system, these quality assessment mechanisms are becoming major challenges in order to make them a process that is fully integrated into the management that will be harmonised with all the other components of the health system reality as well as the hospital reality.

The patients interviewed were unanimous, their satisfaction rate is clearly satisfactory. From all the data analysed, the use of health information in the hospital environment is relatively sufficient to enable the establishment of an efficient hospital system. The hypothesis of our study is not verified. The use of hospital information therefore appears to be sufficient to enable the establishment of an efficient hospital system.

The two investigations revealed that the "data quality" component had significant shortcomings that should be prioritised in the management of the Hospital Information System.

To achieve our 4th objective, we formulate actions to be taken to improve the management of hospital information, so that it can be a tool for steering the hospital. Every entity must have an information system to guarantee its proper functioning. This is why the hospital must set up information management mechanisms within the public service. The

interest seems obvious. In the current context of health information management in hospitals, the study of the Makélékélé base hospital reveals the inadequacies and the low importance that the various actors attach to information in their care services and in general for hospital management.

The management of the hospital is not efficient, in the absence of a service responsible for health information. A policy to strengthen the health information system must be put in place. This policy will include

- the creation of a service responsible for health information at the level of the reference health units
- the training of agents in health statistics and epidemiological surveillance
- the definition of key performance indicators for the health system.

The introduction of management charts can help to combine productivity and solidarity. These are not only oriented on financial results, but also on patient satisfaction.

By definition, a dashboard is a written document composed of a series of synthetic indicators, which concern the same entity (the hospital as a whole or a particular unit) organised in a coherent manner for the purposes of knowledge, control of performance and monitoring of objectives. The dashboards fulfil two functions, both of which interact and enrich each other:

- To monitor action and the state of progress and dialogue between the different levels of the hierarchy;
- To serve the management of each division or the hospital by helping to diagnose and then evaluate the results of an action.
- To improve the management of health information at the Makélékélé base hospital, we recommend the following major actions

1. The creation of a department responsible for health information ;
2. The definition of key performance indicators for the management of activities;
3. The setting up of management dashboards;
4. The creation of a patient reception and orientation service.

Conclusion

Although the health information system is not a completely new phenomenon in public hospitals, it is mostly a de facto existence. Our study has enabled us to understand the constraints on information management in hospitals and to show how data from the hospital information system can be used as a management dashboard, thus enabling hospital managers to manage their establishments successfully.

Our objective was to highlight the way in which health information can, beyond the operational management of activities, contribute to hospital management. The survey on patient satisfaction is unprecedented. To our knowledge, no survey has yet been conducted in this type of structure. Moreover, the implementation of a health information system as a key tool for successful hospital management is the responsibility of the users. This is encouraging, given the clear satisfaction of the users of this tool. Each stakeholder must play his or her part in the successful management of his or her institution.

The questionnaire developed on the basis of the literature review proved to be sufficiently effective to allow the results to be analysed in the local context of Brazzaville. The results showed that there were specific elements of health information that needed to be diligently applied (quality of information) or improved and enhanced (use of information). Our results confirmed the empirical validation made on the hypothesis of the poor state of the health information system.

Table 1. Accuracy of data in the health information system (N=55)

Variables		N (%)	IC. 95%
Method of transcribing data into the hospital information system	Collection sheet	17 (30.91%)	19.14-44.81
	Report	13 (23.64%)	13.23-37.02
	Register	39 (70.91%)	57.10-82.37
	Software (computer)	7 (12.73%)	5.27-24.48
	Do not know	4 (7.27%)	2.02-17.59
Possibility of errors when transcribing data	Yes	54 (98.18%)	90.28-99.95
Respecting the steps to limit errors when transcribing data	Yes	28 (53.85%)	39.47-67.77

Table 2. Accuracy of data in the health information system (N=55)

Variables		N (%)	IC. 95%
Different solutions are recommended when there are data errors	Consider unreliable data	1 (1.82%)*	0.05-9.72
	Use data at the source	14 (25.45%)	14.67-39.00
	Resume collection	11 (20.00%)	10.43-32.97
	Nothing	4 (7.27%)	2.02-17.59
	Check and correct errors	25 (45.45%)	31.97-59.45

* : Results are not statistically significant

Table 3. Reliability of data in the health information system (N=55)

Variables		N (%)	IC. 95%
Use of the same tools from year to year, site to site	Yes	32 (58.18%)	44.11-71.35
Collecting data using the same methods from year to year, site to site	Yes	38 (69.09%)	55.19-80.86

Table 4. Accuracy of data in the health information system (n=55)

Variables		N (%)	IC. 95%
Methods to ensure that there are no significant errors in the data, and no distortions	Yes	42 (76.36%)	62.98-86.77
Margin of error is less than the measured expected change	Yes	40 (72.73%)	59.04-83.86
Margins of error are acceptable for program decision-making	Yes	34 (61.82%)	47.73-74.59
Reporting accuracy issues	Yes	31 (56.36%)	42.32-69.70
Increased accuracy would be more expensive than the increased value of the information	Yes	14 (25.45%)	14.67-39.00

Table 5. Completeness of data in the health information system (N=55)

Variables		N (%)	IC.95%
Data from all reportable sites are included in the aggregate data	Yes	46 (83.64%)	90.28-99.95
Steps taken to ensure completeness of data	Yes	20 (36.36%)	23.81-50.44

Table 6. Accuracy of data in the health information system (N=55)

Variables		N (%)	IC. 95%
Data are available on a frequent enough basis to inform program management decisions	Yes	43 (78.18%)	64.99-88.19
Existence of a regularized data collection plan to meet program management needs	Yes	35 (63.64%)	49.56-76.19
Data are taken within the reporting period	Yes	48 (87.27%)	75.52-94.73
Data are reported as soon as possible after collection	Yes	46 (83.64%)	71.20-92.23

Table 7. Confidentiality of data in the health information system (N=55)

Variables	N (%)	IC. 95%	Variables
Risks that the data will be used for personal or political purposes			

Table 8. Distribution of responses by health information management issues (N=55)

Variables	Yes (%)	No (%)	I do not know
Consistency errors	46 (83.64%)	7 (12.73%)	2 (3.64%)*
Input errors	45 (81.82%)	7 (12.73%)	3 (5.45%)
Summation error	43 (78.18%)	9 (16.36%)	3 (5.45%)
Incorrectly reported data	41 (74.55%)	13 (23.64%)	1 (1.82%)*
Transposition of numbers	42 (76.36%)	11 (20%)	2 (3.64%)*
Sudden or unusual variation in data from one period to another	34 (61.82%)	18 (32.73%)	3 (5.45%)
Inconsistent data	41 (74.55%)	10 (18,18%)	4 (7.27%)
Data mismatch	39 (70.91%)	13 (23.64%)	3 (5.45%)
Missing data	39 (70.91%)	11 (20.00%)	5 (9.09%)
Nonsense data	37 (67.27%)	16 (29.09%)	2 (3.64%)*
Duplication of data	33 (60%)	20 (36.36%)	2 (3.64%)*

Table 9. Distribution of responses according to knowledge of the Health Information System (N=55)

Knowledge of the Health Information System		Number of respondents (%)	
IC. 95%			
		Yes	
Place of the health information system in the health system		45 (81.82%)	69.10-90.92
Knowledge of the roles and responsibilities at all levels of the actors in charge of data		53 (96.36%)	87.47-99.56
Existence of a national policy on the health information system		37 (67.27%)	53.29-79.32
Existence of directives defining the objectives and role of the health information system		41 (77.36%)	63.79-87.72
Availability of tools for the collection and use of health information at all levels of the health system, particularly in hospitals		40 (72.73%)	59.04-83.86
Circuit of collection and transmission of health information at all levels of the health system		42 (76.36%)	62.98-86.77
Existence of a feedback mechanism for the different levels of the health system		30 (54.55%)	40.55-68.03
Assessment of the use of health information collection media by agents at all levels of the system?		30 (54.55%)	40.55-68.03
Difficulties encountered by the health information system at all levels of the health system and in particular at the hospital		47 (85.45%)	73.33-93.50
Various suggestions made to improve data quality			19.14-44.81
			2.02-17.59
		None	34 (61.82%)
			5.27-24.48

Table 10. Summary of the satisfaction assessment of the health professionals interviewed in the survey (N=55)

Variables	Scale of satisfaction				
	Totally agree	Agree	Neither agree nor disagree	No agreement	Not at all in agreement
SI provides sufficient, accurate, understandable and timely information	12(21.82%)	25(45.45%)	4 (7.27%)	11(20.00%)	3 (5.45%)
SIS improves the quality of decisions by making information readily available	17(30.91%)	30(54.55%)	3 (5.45%)	5 (9.09%)	-
Output is presented in a useful format in a well-designed layout and graphics	8 (14.55%)	41(74.55%)	-	4 (7.27%)	2(3.64%)
SI has the ability to offer a chance to reverse and correct an error	19(34.55%)	29(52.73%)	4 (7.27%)	2 (3.64%)	1 (1.82%)
SI is easy to use in terms of menus and customization	14 (25.45%)	22(40.00%)	8 (14.55%)	7 (12.73%)	4 (7.27%)
SI has the ability to communicate and exchange data between departments	25 (45.45%)	23(41.82%)	-	2 (3.64%)*	5 (9.09%)
SI provides complete and secure information	11(20.00%)	26(47.27%)	5 (9.09%)	10(18.18%)	3 (5.45%)
SI can reduce waiting time	12(21.82%)	26(47.27%)	8 (14.55%)	7 (12.73%)	2 (3.64%)
Delayed or prevented from using the information system due to password issues	11(20.00%)	25(45.45%)	9 (16.36%)	1 (1.82%)*	9 (16.36%)
Delayed or prevented from using the information system due to network connectivity	12(21.82%)	28(50.91%)	8 (14.55%)	2 (3.64%)	5 (9.09%)
Current IS needs to be modified or enhanced for effective and efficient patient care	22(40.00%)	30(54.55%)	1 (1.82%)*	1 (1.82%)*	1 (1.82%)*

* : Results are not statistically significant

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