

Barriers of using Hospital Information System for Decision-Making: A Qualitative Study

Mussa Suliman Mohamed¹, Winny Setyonugroho², Firman Pribadi³

¹Master of Hospital Administration Program, University of Muhammadiyah Yogyakarta, Indonesia, ^{2,3}School of Medicine, Faculty of Medicine and Health Sciences, University of Muhammadiyah Yogyakarta, Indonesia,
^{1,2,3}Ring Road Barat, Tamantirto, Kasihan, Kota Daerah Istimewa Yogyakarta 55184.
Jl. Brawijaya, Geblagan, Bantul Daerah Istimewa Yogyakarta 55183
¹Email: mussamarie@gmail.com

Abstract. Information technology applications play a major role in improving the services provided to patients in healthcare settings. Hospital Information System (HIS) is expected to facilitate information management and decision making, thus enhancing patient services. Purpose of this study is to explore the barriers that healthcare practitioners in PKU Muhammadiyah Bantul Hospital faces during using HIS for decision making. Method: This research is a qualitative study. Depth-interviews were carried out with six respondents (Two Clinicians, Three Managers, and One Director), interviews were recorded and transcribed for analysis, a list of codes has produced representing themes identified in the textual data. Results: Data in the HIS were not optimal due to the insufficiency of the system in generating the necessary information for decision-making. Raw data, not real time data, and incomplete data between units were the most barriers that decision makers faced. Conclusion: One of the crucial keys of a good performance of healthcare providers is hospital information system that ensures the production, analysis, and providing a reliable and timely information, making it easy for managers and doctors to make managerial and clinical decisions more effectively.

Keywords: Hospital Information System, Barriers, Decision Making.

Abbreviations: HIS (Hospital Information System).

INTRODUCTION

Decision-making in the healthcare sector often complex and difficult because it is directly influencing the quality of life of patients (Mardani et al., 2019), where, decision makers in hospitals and health care organisations faces many difficulties and challenges, because amount of knowledge and information's, that they must handle has steadily grown, so, that, it has become difficult to deal with it traditionally, then it was necessary to use supporting tools that supports the intellectual capabilities, and to enhance the effectiveness of collection, sorting, storage and retrieve of information, and raising the analytical skills necessary to assessing and processing information's, thus that helps save time and effort required for decisions in a manner that takes into account the nature of the requirements of different management levels in the hospital where, the extent of using Hospital Information System (HIS) by decision makers usually varies from user to other, as the amount and type of information also vary.

HIS is a comprehensive, integrated information system intended to manage the administrative, financial, and clinical aspects of a hospital. In addition, it contributes decreasing medical errors, growing the efficiency, cost effectiveness, and improving the quality of healthcare services (Ahmadi et al., 2015). The goal of HIS is to allow decisions to be made in a clear manner, based on an evidence. It analyses data and validates its value, relevance, and timeliness, and converts data into information for health-related decision-making (Omole, 2015).

PKU Muhammadiyah Bantul Public Hospital is one of the largest hospitals in Bantul Regency in Yogyakarta Indonesia. PKU Muhammadiyah Bantul Hospital since 2015 has been collaborating with the Indonesian

government to become one of the referrals of general hospitals in Bantul Regency which naturally has an impact on increasing the number of patients in serving community medicine. The high number of services that must be provided makes the hospital use information systems to improve the performance of healthcare practitioners. Despite HIS is considered as a vital in collecting, analysing, and presenting data and providing the information required for decision making, decision makers in PKU Muhammadiyah Bantul still facing difficulties in using HIS in making decisions. The aim of this study is to explore the barriers of using HIS in decision making to support patient services in PKU Muhammadiyah Bantul Hospital.

MATERIALS AND METHODS

Interviews were recorded and transcribed for analysis. Depth-interviews were carried out with six respondents (Two Clinicians, Three Managers, and One Director) at PKU Muhammadiyah Bantul Hospital in Indonesia. Thematic analysis was applied to the interview's transcripts. Data were examined closely, common themes, ideas, and patterns of meaning that appeared frequently were identified.

RESULTS AND DISCUSSION

Respondents in this study are six staffs working in PKU Muhammadiyah Bantul Public Hospital. Demographic characteristics of respondents in this study include: Age, Gender, Occupation as shown in table 4.1 below:

Table 1. Characteristics of main interviewer informants in PKU Muhammadiyah Bantul Hospital.

No	Gender	Age	Occupation
R1	Female	36	Specialist of internal medicine
R2	Male	38	Pharmacy manager
R3	Male	39	Hospital Information System unit manager
R4	Female	42	Head Nurse
R5	Male	43	General Physician
R6	Female	41	Director of Finance & HIS unit

Data Analysis

Table 2 below shows results summarized of Thematic Analysis with interviews respondent users:

Table 2. Coding data on barriers to Using HIS in decision making.

Open Coding	Axial Coding	Selective Coding
Sometimes this data is still raw data. In certain cases, the system is not able to process data. Data processed into information upon request from administration.		Raw data
We cannot get the information in real time. we still face validation problems. Sometimes we cannot get real time information and sometimes it is still raw data Data validity is also a small issue.	Data is not in accordance with user needs	Invalid and not real time data
Data between units is different and incomplete. There are differences in data from each unit.	Data between units has not been well integrated	Incomplete data between units

Results

Interviews shows that data in HIS were not optimal due to the insufficiency of the system in generating the necessary information for decision-making. Raw data, invalid and not real time data, and incomplete data between units were the most obstacles that decision makers faced.

HIS sometimes still display a raw data, so users have to process it first, or has to ask staff in the IT unit to change the data display to meet their needs. This obstacle is faced by physicians as they stated: “Sometimes data is still raw data.” (R5), “Data in the system is still raw” (R1).

Users in each unit do not always update data immediately, where there are other more urgent tasks or the assumption that data input can be postponed for a while, during this delay, users in other units when retrieve data through information system will retrieve data which are not real-time data, which affects decision-making, users face difficulties, namely data that is sometimes inaccurate or not in accordance with user needs, these difficulties was faced by physicians and pharmacy department users, as stated by following respondents: “Sometimes we cannot get real time information (R6). This fact was stressed by the explanations of other informants as follow: “Data retrieved does not appear in the system even though the name needed is already inputted”, "Data is not in real time” R4, “we need software repair” (R5). “Data is invalid, we still face validation problems” (R2).

Users find invalid data because users in other units do not always input data immediately, or even they are missed to inputted. However, the system continues to function even though the data input process is incomplete. A system that continues to function or running even though the input is incomplete in accordance with the provisions of the system,

this shows that the system is not fully integrated. Respondent said: “The data submitted is incomplete between units” (R1).

Discussion

According to (Tayi & Ballou, 1998) data is defined as a raw material for the information age. Correspondingly, information is a useful data which has been processed in a manner as to enhance the person' knowledge who uses the data (McFadden Fred et al., 1994). Most respondent in this study indicated that data in HIS still in the form of raw data made it difficult for users who seek information's for making decision, where data are processed into information according to management request at top levels, while usually lower levels are ignored. Alfawaz & Alharthi, (2019) indicated that Information System does not produce statistical data and information requested by various departments and work units in hospitals without prior request. Furthermore, in PKU Muhammadiyah Bantul, this barrier does not erase the fact that HIS has made it easier for health workers and management to carry out their duties. However, HIS still needs to be improved, where users cannot process data by using HIS, as data processing is still carried out manually using Excel.

According to (Likourezos et al., 2004) source of all managerial activities, especially those related to the health domain, is comprehensive, relative, and up-to-date information. The data presented in HIS in PKU Muhammadiyah Bantul is sometimes not in real time. One of the reasons is that users in units which are directly related to the patients are prioritize serving the patient rather than inputting, recording, or documenting in the HIS, Meirianti et al., (2018) in his study, revealed that, indiscipline in data

entry in the system, is due to health workers prioritize services to patients, thus operators are late in entering data so that the information system will display data that is not real time.

A literature review conducted by Murtola et al., (2013) which aimed at describing the information systems available to nursing managers in hospitals to support their decision making, indicated that information systems in hospitals mostly focus on levels of strategic and tactical decision making without supporting information in real time. Information provided in HIS in PKU Muhammadiyah Bantul does not provide support, especially for clinicians in clinical decision making. On other hand, data which is not properly validated and analysed will therefore result in poor data quality, which results in incomplete, inaccurate, inconsistent data and accumulated data, thus hampering the ability to share data, and increasing operational inefficiency or complexity of analysis and decision-making (Omole, 2015). Furthermore, it seems the same issue persists for several years, where, Haryadi & Solikhah, (2013) indicated in a study his conducted in the same hospital to evaluate the implementation of the outpatient registration information system, where stated that data produced are not accurate, not relevant, and not real time data. Although HIS is seen as providing support for decision making, many users, including users at the top administrative level, admit that there is invalid data, and it is not real time. Users who deal directly with patients such as doctors need clinical data or medical information to provide support in patient decision making (Mendonça, 2004). The process of collecting, analysing, and presenting health data is too troublesome to the extent that by the time the report is prepared and ready for use, the data is outdated, leading to decisions without relying on input of information (Omole, 2015). As a result, there is no match between manual reports, HIS reports, and duplicate data recording in paper and computer forms (Keshvari et al., 2018). Users in PKU Muhammadiyah Bantul find incomplete data in HIS because users in other units do not complete inputting data, or for some reason delayed occurs in data input. In other words, there is no discipline or coordinate between units about data input, where, indiscipline in data input lead to incomplete, inaccurate, inconsistent and, accumulated data, thus hindering the ability to share data (Meirianti et al., 2018), thereby increasing operational inefficiency or complexity of analysis and decision-making (Omole, 2015).

CONCLUSIONS

One of the crucial keys of a good performance of healthcare providers is hospital information system that ensures the production, analysis, and providing a reliable and timely information, making it easy for managers and doctors to make managerial and clinical decisions more effectively.

Discipline in providing input to medical record unit, monitoring, and evaluating the process of completeness of medical records in order to reach outputs expected.

REFERENCES

- Ahmadi, H., Nilashi, M., & Ibrahim, O. 2015. Organizational decision to adopt hospital information system: An empirical investigation in the case of Malaysian public hospitals. *International Journal of Medical Informatics*, 84(3), 166–188. <https://doi.org/10.1016/j.ijmedinf.2014.12.004>
- Alfawaz, K., & Alharthi, S. 2019. The Role of MIS in Enhancing the Decision-making Process in Hospitals and Health Care Sectors: Case Study of AL-HADA Military Hospital in AL Taif, KSA. *Egyptian Computer Science Journal*, 43(2).
- Haryadi, D., & Solikhah, S. 2013. Evaluasi Sistem Informasi Pendaftaran Pasien Rawat Jalan di Rumah Sakit Umum PKU Muhammadiyah Bantul. *Kes Mas: Jurnal Fakultas Kesehatan Masyarakat*, 7(2), 55–66. <https://doi.org/10.12928/kesmas.v7i2.1013>
- Keshvari, M., Yusefi, A. R., Homauni, A., Omidifar, R., & Nobakht, S. 2018. Barriers for the using of information systems in hospitals: A qualitative study. *Shiraz E-Medical Journal*, 19(8).
- Likourezos, A., Chalfin, D. B., Murphy, D. G., Sommer, B., Darcy, K., & Davidson, S. J. 2004. Physician and nurse satisfaction with an electronic medical record system. *The Journal of Emergency Medicine*, 27(4), 419–424.
- Mardani, A., Hooker, R. E., Ozkul, S., Yifan, S., Nilashi, M., Sabzi, H. Z., & Fei, G. C. 2019. Application of decision making and fuzzy sets theory to evaluate the healthcare and medical problems: a review of three decades of research with recent developments. *Expert Systems with Applications*, 137, 202-231. McFadden Fred, R., Hoffer, J. A., & Prescott, M. B. 1994. *Modern Database Management*.
- Meirianti, W., Palu, B., & Samsualam, S. 2018. Information on Quality Management Information System in the Ministry of Health Coverage. *Window of Health: Jurnal Kesehatan*, 286–296.
- Mendonça, E. A. 2004. Clinical Decision Support Systems: Perspectives in Dentistry. *Journal of Dental Education*, 68(6), 589–597. <https://doi.org/10.1002/j.0022-0337.2004.68.6.tb03777.x>
- Murtola, L.-M., Lundgrén-Laine, H., & Salanterä, S. 2013. Information systems in hospitals: A review article from a nursing management perspective. *International Journal of Networking and Virtual Organisations* 4, 13(1), 81–100.
- Omole, G. 2015. Health management information system for decision-making in Nigeria: Challenges and resolutions. *Int J Sci Res*, 4, 2968–2974.
- Tayi, G. K., & Ballou, D. P. 1998. Examining data quality. *Communications of the ACM*, 41(2), 54–57.