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EVALUATION OF MANAGEMENT INFORMATION SYSTEMS FOR PHARMACEUTICAL INVENTORY CONTROL AT THE HOSPITAL

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ABSTRACT

Hospital X is one of the hospitals in Lampung that has implemented management information systems for pharmacy since 2016, has not yet been evaluated, and there are several obstacles, such as the absence of warnings for out-of-stock drugs and drug procurement planning is still calculated manually. This research was a descriptive study with a cross sectional approach to the management information system of pharmaceutical inventory control. This research data comes from the distribution of the DeLone and McLean questionnaires and the results of structured interviews to support system development. Based on calculations used a predetermined formula, it is said that the level of respondents' satisfaction with management information systems drug inventory control is in the medium category, but is still very far from the high satisfaction category, so further interviews are needed. After developing a pharmaceutical inventory control management information systems, there were 18 participants from pharmacy participated in training and self-testing for eight days. Based on the research that has been done, it can be concluded that the level of the respondent's satisfaction category has increased its variables, the satisfaction variable has a perception of satisfaction in the medium category of 100% and the high category of 0%, but after developing a pharmaceutical inventory control system, the satisfaction level of respondents in the high category has increased was 27.78%, so the development of a control management information system needs to be done.

Keywords: DeLoan and McLean, Evaluation, Development of Management Information Systems Pharmacy Inventory Control

ABSTRAK

Rumah sakit X salah satu rumah sakit di Lampung yang sudah menerapkan SIM farmasi sejak tahun 2016, hingga saat ini belum dilakukan evaluasi, dan terdapat beberapa kendala seperti, belum adanya peringatan untuk stok obat yang habis dan perencanaan pengadaan obat masih dihitung secara manual. Penelitian ini merupakan penelitian deskriptif dengan pendekatan *cross sectional* pada sistem informasi manajemen pengendalian persediaan farmasi. Data penelitian ini berasal dari hasil pendistribusian kuesioner DeLone dan McLean serta hasil wawancara terstrukur untuk mendukung pengembangan sistem. Berdasarkan perhitungan menggunakan rumus yang telah ditentukan dikatakan bahwa tingkat kepuasan responden terhadap SIM pengendalian persediaan obat dalam kategori sedang, namun masih sangat jauh dari kategori kepuasan tinggi, sehingga perlu dilakukan wawancara lebih lanjut. Setelah dilakukan pengembangan SIM pengendalian persediaan farmasi kemudian dilakukan pelatihan yang diikiuti oleh 18 peserta dari farmasi dan uji coba mandiri selama delapan hari. Berdasarkan penelitian yang telah dilakukan dapat disimpulkan bahwa tingkat kategori kepuasan responden mengalami peningkatan pervariabelnya, pada variabel kepuasan memiliki persepsi kepuasan dalan kategori sedang sebesar 100% dan kategori tinggi 0%, namun setelah dilakukan pengembangan sistem pengendalian persediaan farmasi tingkat kepuasan responden pada kategori tinggi mengalami peningkatan sebesar 27,78%, sehingga pengembangan sistem informasi manajemen pengerdalian perlu dilakukan.

Kata kunci: **DeLoan dan McLean, Evaluasi, Pengembangan SIM Pengendalian Persediaan Farmasi**

INTRODUCTION

The hospital pharmacy installation where all pharmaceutical activities are carried out that play an active role in the patient's healing process, and play an important role in drug management, both direct services to patients, both outpatient and inpatient (Yulianti et al., 2015; Zaied, 2012) so that data management plays an important role in supporting pharmaceutical inventory control. Manual data management has many weaknesses, such as, it takes a long time, the accuracy is not acceptable, because the possibility of errors that occur is very large (Putri et al., 2020). Hospitals are required to provide fast, precise and quality services, to support pharmaceutical services requires an auxiliary device (Murnita et al., 2016), therefore management information system support is needed (Advistasari et al., 2015; Ngugi et al., 2020). The application of e-health has been widely used by health institutions such as hospital management information systems (Ackah, et al., 2017; Nugroho et al., 2019). Hospital management information systems of pharmacy is used to support the decision-making process, for example in the procurement of medicine stock which is run with the help of computer devices (Murnita et al., 2016).

Based on observations, hospital X has implemented hospital management information systems of pharmacy since 2016 and until now no evaluation has been carried out, there are still several obstacles such as, there is no warning for out-of-stock medicines and medicines procurement planning is still calculated manually so that it can increase the workload of employees and takes a long time to do it. Evaluation of information systems aims to identify the strengths and weaknesses of the application that is being used (Advistasari et al., 2015). Evaluation is carried out when the policy has been running long enough and there is no definite time limit for a policy to be evaluated The DeLone and Mclean methods can be used to evaluate a management information system (Delone, W.H.; McLean, 2003; Novalendo et al., 2018). The development of hospital management information systems of pharmacy must pay attention to several aspects, such as a plan that includes the classification of hospital goals, the required identity information based on the current situation or the results of the evaluation carried out.

METHOD

This research is a descriptive study with a cross sectional approach to the management information system of pharmaceutical inventory control. The data in this research came from the distribution of questionnaires consisting of various statements from the DeLone and McLean models on management information systems. The research instrument used is a questionnaire adopted from the study (Advistasari et al., 2015) and has been tested for validity and reliability in ABL hospitals. The questionnaire consists of 53 statement items. The following parameters are used to determine the characteristics of respondent satisfaction:

Instrument Maximum Score : Number of questions x largest scale score
Instrument Minimum Score : Number of questions x smallest scale score
Theoretical mean (μ) : Number of questions x number of categories
Population Standard Deviation (σ) : 1/6 x (maximum score-minimum score)

Based on the calculations above, each respondent will be classified into four categories as follows (Azwar, 2012):

Table 1. Categorization Formula

Category	Formula
Low	$X < (\mu\text{-}1{,}0\sigma)$
Moderate	$(\mu\text{-}1{,}0\sigma) \leq X < (\mu\text{+}1{,}0\sigma)$
High	$X \geq (\mu\text{+}1{,}0\sigma)$

Note : X = Respondent's answer score

RESULTS AND DISCUSSION

Validity and reliability testing was carried out at ABL hospitals, this test consisted of 57 statement items from six variables and 20 indicators to 31 pharmaceutical respondents, data were analyzed using Statistical Package for the Social Sciences for Windows Version 21. Statement Valid if the value of *r* is calculated (Corrected Item-Total Correlation)) > *r* table (Prisgunanto, 2017) and in this research there were four invalid statements. This research was conducted at the hospital installation X with a total of 36 respondents who are pharmacy employees and have worked for six months or more. It is known that the majority of pharmacy staff at Mitra Husada Hospital are dominated by female employees (77.8%) and male employees (22.2%). Based on the characteristics

of the age of 18-30 years (77.8%) and the last education of associate degree's (D3) pharmacy (33.3%), associate degree's (D1) Pharmacy (30.6%). Judging from the length of work of the respondents, the majority of respondents have worked for >3 years (69.4%) and based on the position most of the respondents have served as Pharmaceutical Technician (47.2%).

Infographic of Respondents' Perception of the hospital installation on Management Information System of Pharmaceutical

Based on the results of the research that has been done, respondents' perceptions of these indicators are very varied, the more perceptions indicate the answers agree and strongly agree. The following is the perception of the Management Information System of pharmacy inventory control at hospital X given by the respondents:

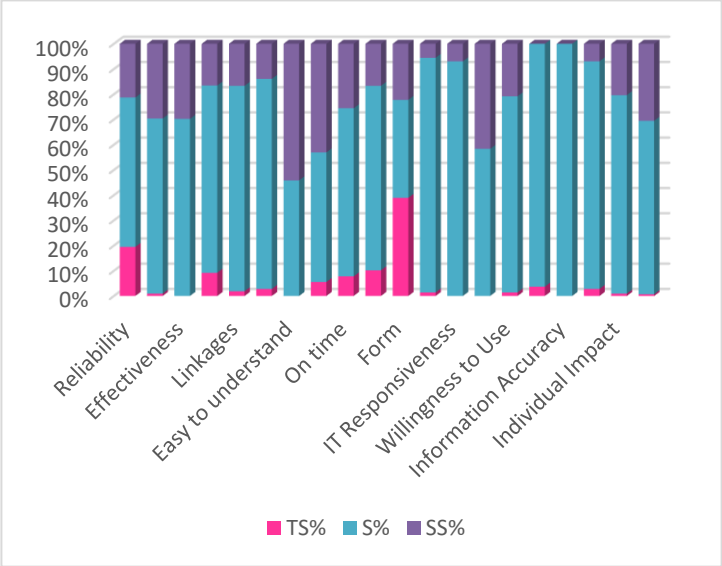

Figure II. Infographic of Respondents' Perception toward Management Information System of Pharmaceutical at the hospital X

Based on the Figure II, there are several indicators that have the perception that respondents do not agree with statements related to these indicators, such as on the reliability indicator, there are 21 respondents who disagree with the statement, especially on the statement "the pharmaceutical installation information system is reliable so that disturbances rarely occur" there are 15 respondents who disagree. Accordingly to the statement that reliability indicators need to be developed to increase the perception of respondents' satisfaction.

Evaluation of Respondent Satisfaction Level

This evaluation was conducted to determine the level of respondents' satisfaction with the Management Information System of pharmaceutical inventory control at the hospital installation X. The following are respondents' answers that have been calculated.

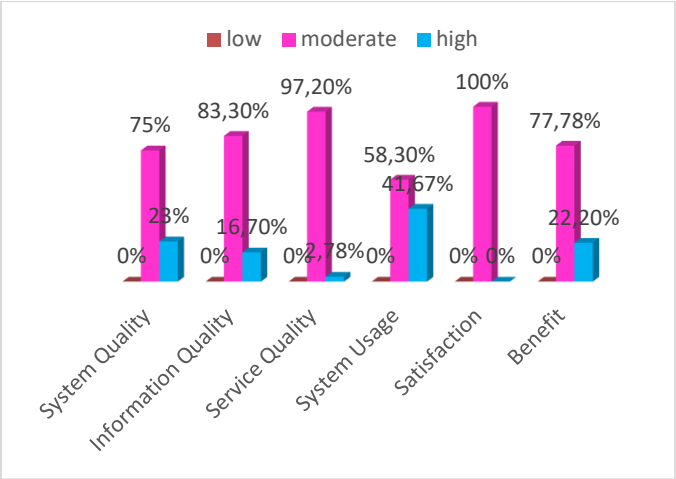

Figure III. Percentage of Respondent Statements

Satisfaction with the Quality of Pharmaceutical Inventory on Management Information System

Accordingly to the user satisfaction refers to the satisfaction that comes from the experience gained when operating a pharmaceutical information system (Sholistiyawati et al., 2020). Based on the initial data obtained, it can be stated that the level of respondents' satisfaction with the quality of the Management Information Systems pharmaceutical inventory control is in the medium category (75%) and there are no respondents who have a low level of satisfaction with the quality of the system, so it can be stated that the better the quality of the system, the higher the satisfaction. users of the current system. This is in accordance with previous research which states that the quality of the system can affect the level of user satisfaction (Rismayanti et al., 2021; Tam & Oliveira, 2017; Tarwoto & Kuncoro, 2019). The indicator "the existence of a pharmacy installation information system makes work more effective" can be interpreted that the statement on this indicator can affect respondents' satisfaction with the system quality variable, which has an average value of 3.33 with a standard deviation of 0.478.

Satisfaction with Information Quality of Pharmacy Inventory Control on Management Information System

The quality of information is the output generated from the technology system that can have a positive influence on the delivery of content. The criteria for assessing the quality of information are based on the characteristics of how accurate, complete, accessible, adequate, understandable, timely and in a good format are, all of which are important for the acceptance of information technology (Ghazal et al., 2018). It can be stated that the level of respondents' satisfaction with the quality of Management Information System of pharmaceutical inventory control is in the medium category (83.30%). Based on this, the better the quality of the information, the more user satisfaction with the system that is running (Mukred & Yusof, 2018).

Satisfaction with Service Quality of Pharmacy Inventory Control on Management Information System

Service quality is a characteristic of goods or services that shows the ability to provide satisfaction according to user needs and is a tool used in marketing and becomes important in the success of information systems (Salim et al., 2021). It can be stated that the respondent's level of satisfaction with the quality of Management Information System services for controlling pharmaceutical inventory is in the medium category (97.20%) and 0% at a low level of satisfaction, therefore it is necessary to extract more in-depth information using a structured interview method to

the officers concerned. This is in accordance with previous research which says that the quality of system services can affect the level of respondent satisfaction (Fathoni et al., 2017; Prayudi et al., 2020), so the better the services provided, the higher the respondent's satisfaction level.

Satisfaction with the Use of Pharmaceutical Inventory on Management Information Systems

The use of management information systems of pharmaceutical inventory control in this research is the intensity of use that can affect the level of user interest in using the system. The level of satisfaction of respondents to the use of management information systems of pharmaceutical inventory control is in the medium category (58.30%). Like the DeLone and McLean success models, user satisfaction can be used to influence actual use and behavioral interest, in accordance with previous research which says that respondents' satisfaction with use is influenced by user satisfaction in using applications (Yakubu et al., 2018).

Satisfaction with the Pharmaceutical Inventory Control on Management Information System

Satisfaction in this research is the response and feedback generated by users after using the system. The level of satisfaction of respondents to the management information systems of pharmaceutical inventory control is in the medium category with a percentage of 100%, therefore it is necessary to extract more in-depth information related to the satisfaction variable by using in-depth interviews with the officers concerned. Based on previous research, it is said that information quality, system quality, service quality can affect the level of user satisfaction (Fathoni et al., 2017).

Satisfaction with the Benefits of Pharmacy Inventory on Management Information Systems

Benefit is a positive impact that affects performance and success both individually and in groups that play an important role in contributing to the achievement of goals. The net benefits of an information system can be used to measure the success of an information system at the level of effectiveness (Meilani et al., 2020; Nugroho & Prasetyo, 2018). The level of satisfaction of respondents to the benefits of management information systems of pharmaceutical inventory control is in the medium category (77.78%) and 41.67% in the high satisfaction category. The efforts can be made to make users more satisfied and the number of them to increase, the appearance of the website should be updated, thus it is expected to be able to attract users and add real time information features (Rachmawati et al., 2019; Wulansari et al., 2021).

CONCLUSIONS AND SUGGESTIONS

Based on the research that has been done, it can be concluded that the level of the respondent's satisfaction category has increased its variables, the satisfaction variable has a perception of satisfaction in the medium category of 100% and the high category of 0%, but after developing a pharmaceutical inventory control system, the satisfaction level of respondents in the high category has increased was 27.78%, so the development of a control management information system needs to be done.

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