



THE EFFECT OF INFORMATION SYSTEM USABILITY AND MIDWIFE INVOLVEMENT TOWARD PERCEIVED USEFULNESS OF JEMBER SAFETY CENTER (JSC) WITH FAI IN JEMBER REGENCY

M W Santi¹ and A Deharja²

^{1,2}Department of Health, Politeknik Negeri Jember, Mastrip Street, Po Box 164 Jember, East Java, Indonesia

E-mail: mayaweka@polije.ac.id

Abstract. Jember Safety Center (JSC) with Fokus Anak Ibu (FAI) is a health information system based on Android to optimize the implementation of pregnancy referral and childbirth women in Jember Regency. All the data of high-risk pregnant women will be integrated to this system, so midwife coordinator in Primary Healthcare can access this data with their Android smartphone. This system is one of efforts to decrease maternal and infant mortality rate in Jember Regency. Based on preliminary study, JSC with FAI was not running well. This study aims to analyze the effect of information system usability and midwife involvement in system design toward perceived of use of JSC with FAI in Jember Regency. This is an analytic research with cross sectional design. The sample of this research are midwife's coordinators in Primary Healthcare in Jember Regency (45 people). The variables in this study are information system usability, midwife involvement and perceived usefulness of JSC with FAI. The analysis is carried out through Multiple Linear Regression. The results showed that information system usability had an effect on the perceived usefulness of JSC with FAI ($\text{sig} = 0.000$; $\beta = 0,621$) while the involvement of midwife in information system design did not affect perceived usefulness of JSC with FAI ($\text{sig} = 0.164$; $\beta = 0,165$). It could be concluded that the usability of JSC with FAI system need to be improved in Jember Regency.

1. INTRODUCTION

Increasing maternal and infant health status is one of Sustainable Development Goals (SDGs) target. SDGs states the new target of Maternal Mortality Rate (MMR) is 70/ 100.000 living births in 2030. Moreover, the New-born Mortality Rate (< 1-year baby) is 12/ 1000 living births and Toddler Mortality Rate (< 5 years baby) is 25/ 1000 living births. The higher the target determined by SDGs, it could be a challenge for Indonesia to decrease Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR).

East Java is one of provinces in Indonesia with high MMR and IMR. Based on data from provincial health office of East Java, the MMR and IMR were increased. In 2017, the MMR in East Java was 91,92/ 100.000 living births. This figure has increased from 2016 which reached 91/ 100.000 living births and in 2015 reached 89,6/ 100.000 living births. The three highest causes of maternal mortality in East Java in 2017 were other causes, namely 29.11% or 154 people. Jember Regency is still in the top 10 regions with the highest MMR.

Furthermore, Jember District Health Office data showed an increase in MMR from 2014 to 2016. It showed that health office programs and activities to decrease MMR was still not going well. The increase in MMR occurred due to lack of officers' compliance in antenatal care and delivery process. Therefore, the handling and delivery of labor is a risk of maternal mortality problems. Hereafter, the referral implementation was not running well, so the handling of delivery process couldn't be done quickly. The government along with Jember District Health Office has sought to reduce MMR in Jember Regency through Jember Safety Center (JSC) with FAI (Fokus Anak Ibu) information system.

JSC with FAI is an android-based information system to optimize the implementation of pregnant and childbirth women referral in Jember Regency. The data about high risk pregnant women will be integrated into a system that can be accessed by midwives via Android/ Smartphone. Later, the midwives will get a warning signal if there is high-risk pregnant woman who needs help in their working area. The JSC with FAI information system has been implemented since December 2018. However, based on a preliminary study, the JSC with FAI information system was not working at all. The provision of 240 android smartphones for midwives in Public Health Center (PHC) had been done by Jember District Health Office. Besides that, because of this program was based on information technology, the Jember District Health Office had recruited 3 staffs to manage the JSC with FAI system server. They work in shifts due to the system server of JSC with FAI must stand by 24 hours.

The failure of JSC with FAI information system causes difficulties the Jember District Health Office in collecting health data of pregnant women, childbirth and infant. The rapid growth of information technology (IT) in organization had made user acceptance became implementation issue and the technology management became more critical [1]. Technology often described as an effort to empower "patients and staff", and it is associated with efforts to improve efficiency, quality and safety of care. But in fact, the application of information technology might fail [2].

A method for evaluating the information system use is Technology Acceptance Model (TAM). TAM was developed by Davis, Bagozzi and Warshaw in 1989, describing the acceptance of technology by users about how and when they will use technology. The variable which part of TAM model are information system usability, midwife involvement in system information design, and perceived usefulness. User acceptance is often an important factor that determines the success of failure of an information system [3; 4].

2. RESEARCH METHOD

The research deployed an analytic survey with cross sectional study. It was conducted at all of PHC in Jember Regency. Data were collected in May – June 2019. The research populations are midwives in PHC of Jember Regency as users of JSC with FAI information system. The populations of this research are coordinator midwives in all of PHC of Jember Regency (50 people). Sample was the selected part of population and represents the whole populations. The sampling method is proportionate stratified random sampling and 45 respondents were collected.

Data were collected by questionnaire. Three stages were conducted during the research: (1) design; (2) implementation; and (3) data analysis and discussion of the result. Data analysis was conducted by linier regression study using SPSS. It aims to analyze the influence of independent variables called information system usability and midwife involvement in system information design towards dependent variable called perceived usefulness of JSC with FAI information system. The sampling technique in this research was a simple random sampling, because the population (midwives coordinator of PHC) had the same characteristics.

3. RESULT AND ACHIEVED OUTPUTS

Technology Acceptance Model commonly referred as TAM was introduced by Davis to examine the acceptance of new technology by individual or user. It is an important theory within the context of information system adoption. The adoption of JSC with FAI information system in Jember District

had not running well. This research wanted to evaluate part of variables in TAM theory to see how much the acceptance of JSC with FAI midwives in PHC as users of information system.

The first independent variable was information system usability. It assessed information related to JSC with FAI ease of display to be understood; the ability of system to store data into computer directly; the possibility of midwives being able to access and retrieve data of pregnant women on time; the ability of system to inform about clinical problems of pregnant women; the ability of system to provide information related to community health status in PHC working area; the ability of system to provide data as evidence in court; and the system flexibility to be developed based on user needs. The second independent variable was midwife involvement in system information design. It assessed the midwife's involvement in design and develop information system to meet user needs. The dependent variable was perceived usefulness. It assessed the possibility of system user to get information faster; follow up the condition of pregnant women in the PHC or outside of PHC; take information and make decision for patient quickly; save the users working time; the increase of user productivity; and the use of JSC with FAI information system to midwives.

The results showed that information system usability had an effect on the perceived usefulness of JSC with FAI (sig = 0.000; β = 0,621). This result was supported by the result of study which conducted by Yusuf [3] that information system usability affects perceived usefulness. Based on the frequency distribution results, most of respondents stated that JSC with FAI had a high information system usability, but there were still 26% of respondents stated the JSC with FAI had a low information system usability. The 26% could be a problem because based on Pareto law, 20% of system defects cause 80% of problems. Or 80% of customer complaints arise from 20% of products and services. Therefore, Jember District Health Office needs to improve the usability of JSC with FAI information system in Jember Regency.

If an information system had a high usability, it would have good system quality. Lin [5] stated information system quality is an individual's apprehension about the information system quality, when she/ he wants to look for the update information in computer or internet. Rai [6] study assessed the effect of information system quality to end users' satisfaction of the accounting dry lab program showed that system quality was confirmed significantly affect perceived usefulness. Moreover, Lin [5] assessed the citizen adoption of e-Government initiatives in Gambia stated that the information system quality affects the perceived usefulness of user.

Another independent variable was midwife involvement in system information design. In the field of information system, user involvement is a significant aspect in the system development cycle because users know better about environment. If the system development is done by involving users, it could accommodate the user needs. Therefore, one widely understanding of user involvement is really helpful for defining system requirements in real world and ensuring system methodology implementation efficient [7]. Frequency distribution results of midwife involvement in system information design showed that most of respondents had a high involvement in JSC with FAI development (70%). But there were 30% respondents stated they had low and very low involvement in JSC with FAI development. The 30% could be a problem because based on Pareto law, 20% of system defects cause 80% of problems. Or 80% of customer complaints arise from 20% of products and services.

Moreover, the statistical analysis showed that the involvement of midwife in information system design did not affect perceived usefulness of JSC with FAI (sig = 0.164; β = 0,165). It might because most of midwives were not involved in designing JSC with FAI. So, the information system did not meet users need.

Perceived usefulness is the degree to which a person believes that using a specific application system will increase his or her job performance within an organization context (Chen et al, 2002). Based on the frequency distribution results, most of respondents had a high perceived usefulness (70%). On the other hand, 28% of respondents had low perceived usefulness. The 28% could be a problem because based on Pareto law, 20% of system defects cause 80% of problems. Or 80% of customer complaints arise from 20% of products and services. Although the involvement of midwives

in information system design had no effect on perceived usefulness, it still needs attention from Jember District Health Office to increase the involvement of midwives in information system design (maybe in the next information system development) because it has a fairly high amount of low and very low category. Therefore, Jember District Health Office can develop JSC with FAI information system according to user requirements and indirectly increase the perceived usefulness. Furthermore, user involvement helps system developers identify the current problems that might be neglected because lack of environment understanding. User involvement also can avoid the conflict between users and data services. Temporarily ignoring the conflict between the continuity of system development cycle and the limitation of the budget and time, user should be involved throughout the system development activities. In this way system developers can communicate with them at any time for meeting latest needs and improve the data service. The active participation from users in the information system design process will instill a sense of belonging in the final product. It also results several benefits such as increase the use of system by user, obtain a better system design and increase user's behavior to the information system [7].

4. CONCLUSION AND RECOMMENDATION

4.1 Conclusion

Based on the research result, it could be concluded that:

1. Information system usability had an effect on the perceived usefulness of JSC with FAI. If an information system had a high usability, it would have good system quality.

2. The involvement of midwife in information system design did not affect perceived usefulness of JSC with FAI. Although the involvement of midwives in information system design had no effect on perceived usefulness, it still needs attention from Jember District Health Office to increase the involvement of midwives in information system design (maybe in the next information system development) because it has a fairly high amount of low and very low category.

4.2 Recommendation

The research result and conclusion recommend that Jember District Health Office:

1. Needs to improve the usability of JSC with FAI information system in Jember Regency because if an information system had a high usability, it would have good system quality system quality was confirmed significantly affect perceived usefulness.

2. Needs to involve the active participation from users/ midwives in the information system design process. It will instill a sense of belonging in the final product. It also results several benefits such as increase the use of system by user, obtain a better system design and increase user's behavior to the information system.

5. ACKNOWLEDGEMENT

This paper entitled "The effect of information system usability and midwife involvement toward perceived usefulness of Jember Safety Center (JSC) with FAI in Jember Regency" is submitted to fulfill one of the requirements in accomplishing ICoFA. We sincerely thank to the Ministry of Research, Technology, Higher Education for the funding support (funds supported by PNPB 2019 Number 1065/PL.17.4/PL/2019), Jember District Health Office and Politeknik Negeri Jember that this script can be carried out well. This script would hopefully give a positive contribution to the educational development or those who are willing to conduct further research.

REFERENCES

- [1] Hu, P. J., Chau, P. Y., Sheng, O. R., & Tam, K. Y. (2015). Examining the Technology Acceptance Model Using Physician Acceptance of Telemedicine Technology. *Journal of Management Information System*, 91-112.
- [2] Lehoux, P., Miller, F., Daudelin, G., & Urbach, D. (2016). How venture capitalists decide which new medical technologies come to exist. *Sci Public Policy* , 375-385.
- [3] Yusuf, A. M. (2017). Technology Acceptance in Healthcare Service: A Case of Electronic Medical Records (ERM). *International Journal of Academic Research in Business and Social Sciences* , 863-877.
- [4] Gucin, N. O., & Berk, O. S. (2015). Technology Acceptance in Health Care: An Integrative Review of Predictive Factors and Intervention Programs. *Procedia - Social and Behavioral Sciences* , 1698 - 1704.
- [5] Lin, F., Fofanah, S. S., Liang,D. (2011). Assessing citizen adoption of e-Government initiatives in Gambia: A validation of the technology acceptance model in information system success. *Government Information Quarterly*. 271-279.
- [6] Rai, A., Lang, S. S., and Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information System Research*, Vol 13, No 1, pp 29-34
- [7] Sun, Z. (2013). User Involvement in System Development Process. *the 2nd International Conference on Computer Science and Electronics Engineering*