



Technology Acceptance Model: It's Application in the Jember Safety Centre in Reducing Maternal and Infant Mortality

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Abstract: This study posed two aims which were to evaluate the midwives' acceptance of the JSC and to investigate a theoretical framework of the TAM when applied to the JSC. Quantitative research was conducted to 50 midwives as active users of the JSC using multiple linear regression. Usability influenced perceived usefulness, but it did not influence perceived ease of use. Privacy significantly influenced both perceived usefulness and perceived ease of use. Furthermore, perceived usefulness significantly influenced behavioral intention to use. Meanwhile, perceived ease of use did not significantly influence behavioral intention to use of the JSC. Behavioral intention to use did not significantly influence actual system use, but perceived ease of use significantly influenced actual system use. The midwives had the intention to use the JSC, but various constraints e.g., low internet signal stopped them from inputting data of maternal and infant health statuses into the JSC.

Keywords: Technology Acceptance Model, Maternal Mortality, Jember Safety Center.

1. Introduction

The world has begun to achieve the Millennial Development Goals (MDGs) since 2015 and continued aims to reach the new goals proposed in the Sustainable Development Goals (SDGs) by 2030. One of these SDGs is enhancing the peaceful conditions of human existence. This paper focuses on enhancing maternal health and decreasing infant mortality. Besides, another SDG is to ensure a healthy life and to assist the welfare of all people at every age. For maternal and infant health, the SDG targets to decrease maternal mortality rate (MMR) to below 70/100,000 live births, preventable newborn mortality to below 12/1,000 live births, and under-five mortality to below 25/1,000 live births. Even though some achievements have been obtained, maternal and under-five mortalities still exist worldwide (Fenny, Crentsil and Ackah, 2018).

In 2017, the MMR rate in Indonesia was 177/100,000 live births. The MMR rate has reduced from year to year, but it is still lower than the desired target in the SDGs and has become a challenge for Indonesia which is trying to attain the SDGs by 2030. East Java specifically is one of the Indonesia provinces that has a growing MMR and Infant Mortality Rate (IMR). The MMR from 2015 to 2017 were sequentially 89.6/100,000 live births, 92/100,000 live births, and 91.92/100,000 live births (Santi and Deharja, 2019). Jember Regency is a district dominated by rural areas and is reported having the highest MMR among districts in East Java. The MMR in Jember Regency rose from 86.13/100,000 live births to 91.01/100,000 live births between 2014 to 2016. This indicates that programs implemented by the Jember District Health Office to decrease MMR were no longer running well. For example, the implementation of maternal referral health service was still ineffective and inefficient; maternal health recording was done manually and not integrated yet. Besides, early detection of high-risk pregnant women was not conducted optimally. Overall, these various factors contribute to the high risks of maternal mortality.

Data are an essential component for decision-making. Previous research conducted by (Fenny, Crentsil and Ackah, 2018) stated that the highest maternal and under-five mortalities in Nigeria, sub-Saharan Africa occurred due to a lack of reliable national data plan. When data are not recorded and reported well, foundations for decision-making, particularly in the health sector, will be lacking.

The Jember regional government along with the Jember District Health Office created an information system so-called the Jember Safety Center (JSC) to support reducing MMRs. The JSC mainly aims to support the surveillance of individuals with risk factors that may lead to maternal and infant mortality. It offers a complete electronic system for paperless primary healthcare centers to provide excellent quality health services. This is needed because Jember Regency has an extensive territory and has diverse terrain obstacles. For example, midwives still need to send maternal and infant cohort data to the Jember District Health Office, and it takes a very long distance to cover.

JSC is an android-based information system which adopts maternal and infant cohort data based on a continuum of care. It covers several phases of life e.g., pregnancy, the birth until the baby is born and grows up to be a toddler. All of the manually recorded data of pregnant women and babies have been modified electronically and integrated into the system. There are several advantages of the android-based information system as it adopts risk factor surveillance for the maternal and infant cohort based on a continuum of care. For instance, midwives as medical experts can document medical records of mothers and infants quickly by using the system; the recorded data can be recalled whenever required; midwives possibly can monitor the health status of a pregnant woman until she gives birth; using the system also allows medical experts to conduct early risk detection successfully and correctly to prevent risk factor of maternal and infant mortality. The JSC also facilitates midwives to receive warning signs if there are high-risk pregnant women in need of help in the radius of their work location. Previous studies performed by (De Grood *et al.*, 2016) supports the fact that electronic medical records (EMRs) were proven to noticeably bring down the incidence of treatment. Furthermore, point-of-care decision support equipment allows medical experts to proceed with caution immediately for contraindication.

The continuum of care model can be carried out using preventive techniques for reducing maternal and infant mortality. Maternal health conditions might be used as an outlook of the child's condition (Damayanti *et al.*, 2019). Whereas, low birth weight has been associated with underweight mothers and vice versa. The more youthful or older mothers are, the higher blood pressure and pregnancy problems (Vilcins *et al.*, 2020). As a result, older pregnant women had more risks of suffering from pregnancy risks. Low birth weight, for example, can be prevented through enough nutritional intake and monitoring during pregnancy. An underweight pregnant woman during pregnancy (upper arm circumference of < 23.5 cm) may have a higher chance of giving birth to a baby with a low birth weight (LBW). Moreover, babies with LBW have a higher risk of sickness or infection since it can affect their golden period. Thus, health interventions associated with the continuum of maternal and infant health care services are effective health approaches to address this distressing situation (Gandhi *et al.*, 2021).

The JSC has been implemented since December 2018, but it has not properly been operated. Two hundred and forty android cellular phones have been given to midwives in primary healthcare centers to operate the JSC. Furthermore, ambulances have been provided in each village to aid the referral service system of the JSC. If an emergency incident, e.g., the need for a quick referral, happens, the midwife will send a sign to the JSC center. Then, the JSC central officer will contact an ambulance driver to come to the incident location. The Jember District Health Office has recruited 3 employees to work in shifts to control the JSC server because it needs to be monitored continuously. Failed JSC operations cause midwives to become aggravated as they will need to input maternal and infant health data both manually and electronically. Moreover, the Jember District Health Office has troubles in acquiring data of maternal and infant health quickly, thereby resulting in a lack of reliable information and slowing efforts to decline MMR and IMR.

Technological innovation is considered prestigious by policymakers as it has been associated with advanced quality, effectiveness, performance, and protection of services (Greenhalgh *et al.*, 2015;

Damayanti *et al.*, 2019). However, established technology might also fail to attract consumers because of the consumers' failure in attaining its advantages or its application which does not fit the needs for implementation (Greenhalgh *et al.*, 2015). Patients and experts may also decide not to undertake a new technology and withstand the technology they are familiar with (Bentley *et al.*, 2014); a new technology might also clash with law systems and with routines and may be applied but fails to deliver the benefits offered (Greenhalgh *et al.*, 2015).

One of the evaluation methods for the usage of information technology is the Technology Acceptance Model (TAM). It was evolved by Davis in 1989 and could be defined as the acceptance of technology by users and when the technology will be used. Recently, TAM has been broadly used in previous studies, but it is commonly applied in information technology education, e.g., the M-learning context (Al-Emran, Mezhuyev and Kamaludin, 2018), digital education (Scherer, Siddiq and Tondeur, 2019), e-learning (Estriegana, Medina-Merodio and Barchino, 2019; Salloum *et al.*, 2019), and mobile library applications (Rafique *et al.*, 2020). Moreover, (Rahimi *et al.*, 2018) explained that none of the TAM models used in health services has been set up. Therefore, recent research attempts to evaluate the midwives' acceptance of the JSC and take a look at a theoretical framework empirically in determining main factors that affect the users' acceptance or actual use. This study also included external variables (usability and privacy) in particular settings of tech-based health records.

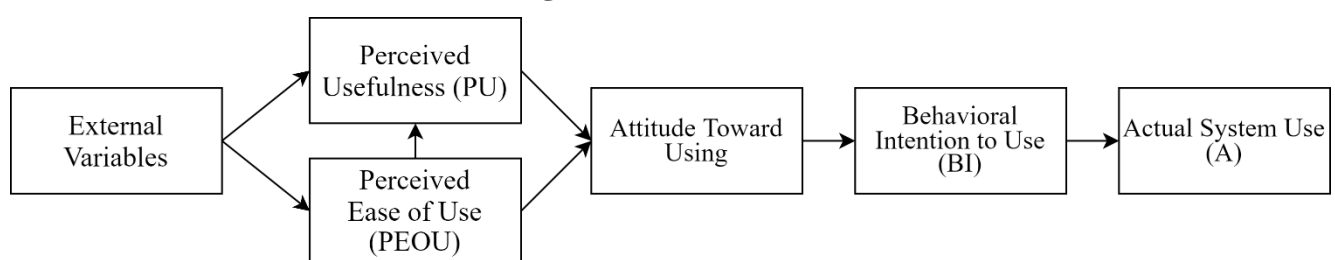
2. Methodology

2.1. Conceptual Model

(Davis, Bagozzi and Warshaw, 1989) introduced the adaptation of Theory of Reasoned Action (TRA) and Technology Acceptance Model (TAM) to explain computer utilization behavior. TAM uses TRA as a theoretical foundation to determine causality between two main views which are perceived usefulness and perceived ease of use. TAM is less well-known than the TRA as it is designed to identify computer usage behavior. Since TAM combines notions collected from over years of Information System (IS) studies, it is may be particularly well-suited for the computer acceptance model.

Recently, researchers have empirically assessed the capacity of the TAM to predict and explain user acceptance and rejection of computer. Figure 1 showed the TAM Model.

Figure 1. TAM Model



2.2. Hypothesis Development

The conceptual framework used in this study was TAM by Davis that has been developed by (Reicht and Stocker, 2011); external variables i.e., usability and privacy were adopted from a conceptual framework by (Mohamamad and Yunus, 2017). It is an appropriate approach to predict and determine health worker's response to health information technology, particularly towards Electronic Health Record (EHR).

User acceptance is crucial as it ensures the success or failure of information system operation (Mohamamad and Yunus, 2017). Moreover, the acceptance of technology has been turned into a first target when people use an information and communication technology to evolve healthcare organizations (Rahimi *et al.*, 2018). The BI, in particular, has been rarely been explored in IS research. Several researchers have explored "attitude towards using" by using different assessment methods and observed a significant influence between "attitude towards using" and A (Davis,

Bagozzi and Warshaw, 1989). Therefore, this study used BI as a substitute for “attitude towards using” to measure a significant link to usage. In this study, effects between independent, mediating and dependent variables were conceived in the following conceptual framework shown in Figure 2. Main variables in the model are explained in Table 1.

Figure 2. Conceptual Framework

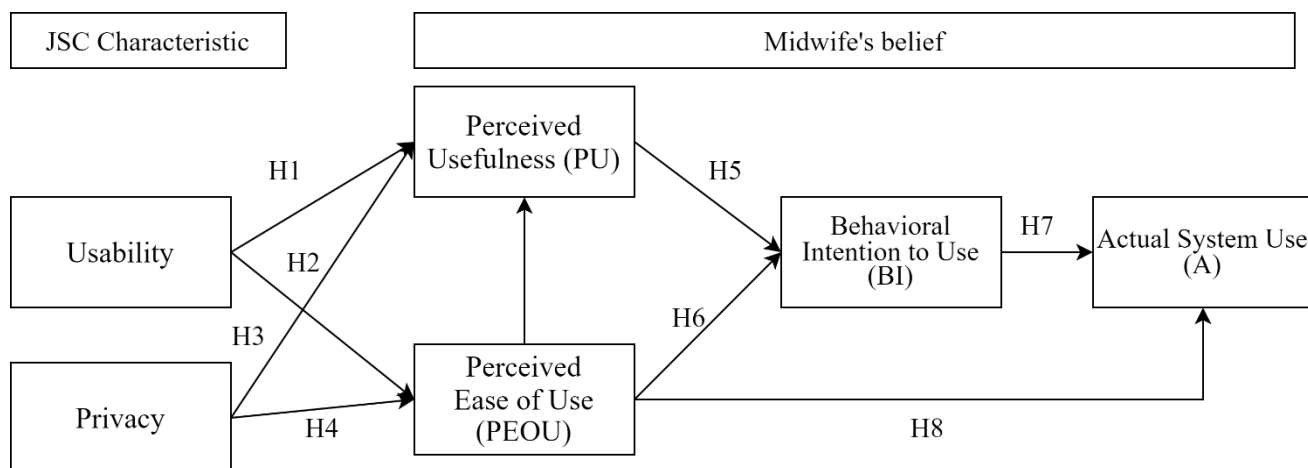


Table 1. Main Variables

Variable	Definition	Source
Usability	The extent to which a system interface can be used to achieve specified goals with effectiveness and efficiency	(Lin, 2013; Tao <i>et al.</i> , 2020)
Privacy	The sense that user will feel secure enough to share personal health information	(Kamal, Shafiq and Kakria, 2020)
Perceived Usefulness (PU)	The degree to which a person believes that using a particular system would enhance his or her job	(Davis, Bagozzi and Warshaw, 1989; Zhao, Ni and Zhou, 2018; Kamal, Shafiq and Kakria, 2020)
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a particular system would be free of effort	(Davis, Bagozzi and Warshaw, 1989; Zhao, Ni and Zhou, 2018; Asadi <i>et al.</i> , 2019; Ammenwerth, 2019)
Behavioral Intention to Use (BI)	An individual’s subjective probability that he/she will engage in a specified behavior	(Davis, Bagozzi and Warshaw, 1989; Swar, Hameed and Reyachav, 2017)
Actual System Use	Actual technology use behavior in the context of technology acceptance	(Tao, Wang, <i>et al.</i> , 2020)

Figure 2 shows effects between the variables of conceptual framework in this study. The model suggested that when users are served with particular information technology, various factors e.g., PU and PEOU influence their decision on how and when the technology will be used. An information system user might be much more likely to utilize e-health technology if more studies encourage its utility and usability similar to PU towards electronic commerce websites (de Groot *et al.*, 2016; Tao, *et al.*, 2020)

- H1: Usability of the JSC significantly affects the midwives' Perceived Usefulness (PU). Another major variable in the TAM to describe system acceptance is PEOU. According to (Mohamamad and Yunus, 2017), usability affects users' PEOU in regard to the EHR system.
- H2: Usability of the JSC significantly affects the midwives' Perceived Ease of Use (PEOU).
- The privacy variable affects both PU and PEOU in the TAM. Furthermore, PU and PEOU are the predictors that might be significant to the application of health devices by users (Asadi *et al.*, 2019). (Mohamamad and Yunus, 2017) and (Tao, *et al.*, 2020) also showed that PU had a direct impact on BI.
- H3: Privacy of the JSC significantly affects the midwives' Perceived Usefulness (PU).
- H4: Privacy of the JSC significantly affects the midwives' Perceived Ease of Use (PEOU).
- H5: Midwives' perceived usefulness significantly affects their behavior intention to use the JSC.
- H6: Midwives' perceived ease of use significantly affects their behavior intention to use the JSC.

The TAM defines behavioral intention as the most proximal antecedent to actual technology use, which is now generally considered as the factor of acceptance (Tao, *et al.*, 2020). Aldosari *et al.* (2018) showed that an information system user has the willingness to learn the system and is less resistant to change it to another system due to its usefulness, ease of use, and acceptance.

- H7: Behavioral intention to use (BI) significantly affects the midwives' actual system use (A) of the JSC.
- H8: Midwives' perceived ease of use (PEOU) significantly affects actual system use (A) of the JSC.

2.3. Samples and Procedures

The research population was 240 midwives who had android mobile phones in primary healthcare centers of Jember Regency which have access to and directly use the JSC for services. Meanwhile, the number of the active users was 50 midwives as the final sample. The study design was cross-sectional. The survey questionnaires were sent via mobile phone to midwives, who then answered and returned the printed questions with answers to the Jember District Health Office. The complete survey consisted of 34 questions collected from the TAM model. Furthermore, the respondents had been asked for information about sociodemographic characteristics such as gender, age, education, profession, employment status, period of employment both in primary healthcare center and independent practice, total normal working hours in a week, and total overtime in a week.

The questionnaires were created by adopting questions from Mohamamad and Yunus (2017) and modifying the research object with the JSC. Four Likert scales were used to rate the objects with values (1 = "strongly disagree"; 2 = "disagree"; 3 = "agree" and 4 = "strongly agree"). After acquiring the questionnaires, data were analyzed quantitatively using SPSS software program to evaluate the effect of independent and dependent variables. Multiple linear regression was then used to assess the respondents' perception by comparing significance values with α -value of 0.05. The effect of the independent variable on the dependent variables become considered significant if it has α -value of < 0.05 . In addition to finding significance values, the β -value was used to determine the effect's size and direction.

3. Result

The research hypotheses were tested statistically using multiple linear regression. The results are presented in Table 2.

3.1. Usability to Perceived Usefulness (PU)

Usability is an attribute that describes the convenience when a human-computer interface is used. Tao, *et al.* (2020) stated that usability is determined by how a product utilization achieves specific objectives effectively and efficiently in a particular context when used by specific customers. It can

be differentiated into objective usability and subjective usability. Objective usability directs the technology evaluation based on the users' efforts to finish their work in relation to system effectiveness and efficiency. Whereas, subjective usability refers to users' opinions and perceptions of technology after they use the technology, or it is commonly known as perceived satisfaction. Effectiveness is described as the accuracy and completeness of users in achieving targeted purposes. While, efficiency is the speed of users in completing a task by using an application. To assess both indicators, task completion time would be the main factor. Meanwhile, satisfaction is described as the measurement of how pleased the users are with the system.

The JSC usability measures the system's effectiveness and ease when it is used. It further elaborates (1) the convenience of the information system, (2) the system's ability to store data into the server, (3) the ability of midwives to check and collect data or information of pregnant women in an appropriate time, and (4) the system's capacity of finding clinical problems in pregnant women. Moreover, it will scrutinize (5) the system's ability to provide information of general public health status in the working area of the primary healthcare centers and district health office; the last two aspects studied in the system usability were (6) its ability to provide evidence for legal evidence and (7) the system's flexibility to be upgraded according to the users' needs.

The results showed that 74% of the respondents perceived that the usability of the JSC was good. Meanwhile, 26% of the respondents considered that the JSC had poor usability. Thus, the researcher further explored the existing constraints related to effectiveness, efficiency, and satisfaction. Constraints regarding effectiveness are related to midwives facing frequent errors in operating the JSC due to low internet signal, especially in inputting the data into the system. So, all of the data that has been inputted is lost and JSC was currently unusable. Therefore, it affected work efficiency as the midwives could not record data of maternal and infant health statuses safely and obtain the data when needed. Regarding constraints related to satisfaction, the midwives preferred to record maternal and infant health in a cohort book (paper-based information system) than the JSC.

Lin (2013) mentioned several indicators of usability such as efficiency, effectiveness, learnability, and memorability that could be assessed. Learnability determines the ease of users in completing their tasks by using a system for the first time. It is an applicable indicator for amateur users. Before efficiency assessment, learnability should be examined first as it covers the user's experience in using a system. Therefore, this study took into account learnability in which some of the elderly midwives did not know about information technology and found it difficult to learn how to operate the JSC. Besides, they did not understand any features in the system and thus could not share responsibilities for inputting the data into system. However, the number of midwives experiencing problems related to learnability was only 2.6%.

Another attribute of essential usability is memorability. It determines the stage of ease in recalling how to use a system after users do not utilize it for some time. It is applicable for experienced users. The current results found that most of the midwives found no difficulties in recalling how to utilize the JSC. Most errors may have occurred not because of human factors, but inadequate equipment.

The analysis result showed that usability influenced perceived usefulness (PU) ($P = 0.000$; $\beta = 0.275$). Usability contributed to PU with a β -value of 0.275. The PU rate of the JSC at 27.5% could be caused by variations in usability. While, the rest of 72.5% was influenced by other factors beyond usability. This result is similar to the research of Green and Pearson (2011) cited in Tao, *et al.*, (2020), who found that subjective usability influenced PU of an electronic commerce website.

PU refers to the user's feeling about the use of technology will support his or her task. In relation to this idea, de Groot *et al.* (2016) suggested that doctors will be more interested to use e-health systems if research encourages its utility. The non-acceptance of the system can be due to first-time experience in using the system and is largely depicted by system usability. Like all client-oriented applications, the JSC depends intensely on usable interfaces to introduce data and takes into consideration cooperation's with the clients. It has been extensively shown that interface convenience fundamentally affects client execution and insights (Tao, *et al.*, 2020). Usability barriers

bring about disappointment, aggravation, and a high probability of technology abandonment (Lazard *et al.*, 2016). If individuals believe that they cannot perform their work with an application, they may not continue to use it.

Over time, more advances and studies that assess the utilization of technologies have emerged, and it is essential to refresh the current constraints and facilitators to their adoption and implementation (De Groot *et al.*, 2016). The recognition of such constraints and facilitators is a necessity because it facilitates the execution of an established strategy. The Jember District Health Office as an implementer needs to consider the health workers' perceptions and gain their acceptance by resolving the current constraints. Such constraints include the high cost associated with the implementation and maintenance of e-health system. However, good perceptions and acceptance would then help to build an environment where e-health system is implemented. To overcome these constraints, government impetuses might be required as well.

3.2. Usability to Perceived Ease of Use (PEOU)

The result of hypothesis usability to perceived ease of use (PEOU) showed that usability did not influence perceived ease of use (PEOU) ($p = 0.328$; $\beta 0.084$). PEOU is the degree to which an individual accepts that utilizing a system will be liberated from exertion. It is in line with usability attributes namely "memorability" and "learnability" (Tao, *et al.*, 2020). The correlation coefficient between the variables was not significant perhaps due to no constraints related to memorability and learnability. The midwives found no difficulties in reviewing how to utilize the application, and most of them knew how to operate the JSC. The Jember District Health Office has also conducted socialization and training for users.

3.3. Privacy to Perceived Usefulness (PU)

In general, privacy refers to the protection of personal information. Privacy can be defined as the feeling of building up user's faith in a system, for example having an adequate sense of safety to share personal health data. In the context of health care information systems, privacy stands out (Kamal, Shafiq, and Kakria, 2020). Privacy and security are essential in health technology because they are related to confidential personal medical record data which only patients and medical personnel are allowed to access. The concerns of privacy, when it comes to turning in health information in e-health, could not be denied. Past studies have acknowledged that privacy concerns are a key factor in technology acceptance (Purwanto and Budiman, 2020). According to Xu (2019), there are six perspectives in privacy, including privacy awareness (individual level), perceived informativeness (service level), information sensitivity (information contingency), privacy social norm (social-relational level), regulatory expectations (macro-environmental level), and importance of information transparency (organizational level).

The privacy of the JSC measures perceived informativeness (service level) because one of the system's goals is to help midwives to make decisions i.e., data-based clinical decisions. Moreover, information transparency (organizational level) was also measured in this study. Organizations usually provide health informatics that can be used by users on the cloud. Both the organizations' attributes and users' beliefs in privacy would generate information privacy risk (Xu, 2019). The other perspectives i.e., privacy awareness at the individual level, information sensitivity as information contingency, and regulatory expectations at the macro-environmental level were not discussed because they were related to patients and regulations. Meanwhile, the system users were midwives as health workers in primary healthcare centers and staff in the Jember Health Office as the center.

The privacy indicators of this study involved the system's capacity of ensuring that maternal information is kept confidential and cannot be manipulated to secure patient identities and the user's perception of the system's privacy and confidentiality. The result showed that most of the respondents expressed that the JSC had high privacy and confidentiality (96%). Very few respondents stated that the JSC had low privacy and confidentiality (4%). The results are supported by the need for logging in with a security key such as a username and password whenever to operate the JSC. Each primary healthcare center only received one username and password, making it

difficult to access the data of maternal and infant health status. Moreover, the midwives could only access maternal and infant health status in their work area. These results are similar to Xu (2019), who stated in the current climate of medical services digitalization, users, healthcare organizations, and policymakers all endeavor to assure wellbeing data protection.

This study found that privacy had significantly influenced perceived usefulness ($P = 0.040$; $\beta = 0.324$). Privacy contributed to PU with a β -value of 0.324. This suggested that the PU rate of the JSC was 32.4% which was affected by variations in privacy variable. While, the remaining 67.6% was affected by other factors beyond privacy. The result of this study supports research conducted by Mohamad and Yunus (2017) who stated that privacy affected PU of the system.

Privacy is important when it comes to turning in medical information within the e-health system. The midwives also have the responsibility to report data and information of maternal and infant health status (if necessary). When a pregnant woman or baby requires a referral to another health service provider, the midwives must send the results of the maternal and infant health examination to a referral health service provider to give a basic reference for clinical decision-making. Thus, privacy is important to ensure that the data provided for other health service providers are not widely spread.

According to the Regulation of the Indonesian Ministry of Health No 269/MENKES/PER/III/2008 in Chapter 10 regarding Medical Records related to privacy, all patient identity, diagnosis, medical history, examination history, and medical health status must be kept secretly by physicians, dentists, health workers, managing officers and leaders of health service facilities. However, the information can be disclosed for several reasons, one of which is for the purpose of the patient's health. Any request for such data must be informed in a letter to the head of health service facilities. Therefore, if the privacy of the JSC data can be used as needed, the midwives as the users will have good PU and PEOU of the JSC. The quality and characteristics of medical care administration by users in turn influences their privacy perception (Xu, 2019).

3.4. Privacy to Perceived Ease of Use (PEOU)

The results showed that privacy significantly influenced PEOU ($P = 0.023$; $\beta = 0.084$). From the β -value, the PEOU rate of the JSC affected by variations in privacy variable was at 8.4%. While the remaining 91.6% was affected by other factors beyond privacy. This result is consistent with a previous study conducted by Faqih and Jaradat (2015) who examined mobile healthcare adoption among patients in a developing country. They found that privacy was one factor that empirically influenced PEOU for users in the developing country to accept the implemented health technology. Moreover, Peek *et al.* (2014), who conducted a systematic review on factors impacting the acceptance of electronic technologies by community-dwelling older adults, stated that privacy was a factor that could significantly influence PEOU. In addition to health, it turns out that privacy affected the PU of e-government application in South Africa (Bayaga and Ophoff, 2019).

3.5. Perceived Usefulness (PU) to Behavioral Intention (BI)

Perceived usefulness (PU) is generally described as someone's discernment that the utilization of new technologies will improve their work productivity (Deng *et al.*, 2018; Kamal, Shafiq, and Kakria, 2020). Moreover, Zhao, Ni, and Zhou (2018) defined PU as to which degree an individual accepts the use of a particular system to improve their work. With regards to this study, PU had to be redefined because of the system usefulness for the midwives who had somewhat altered the meaning of PU from the previous definitions. The midwives considered that adopting the JSC would be useful only if it would lead to improved documentation, faster delivery of getting information about maternal and infant health status, and faster follow-up on conditions of pregnant women in the work area of each primary healthcare center. Furthermore, they counted for the system's ability to obtain patient information, help them make clinical decisions quickly, reduce service time of health care efficiently and increase productivity, and ultimately improve the general medical service quality. In the TAM hypothesis, PU was predicted to affect one's attitude and adoption intention (Deng *et al.*, 2018).

The results of this study showed that PU significantly influenced BI to use ($P = 0.000$; $\beta = 0.311$). It indicated 31.1% of BI-to-use rate was affected by variations in PU. The remaining 69.9% was influenced by different elements beyond PU. Information regarding BI to use in this study included the user's willingness and plan to utilize the JSC in managing their job in a couple of next months. When the respondents had a good perception, they immediately had the intention to adopt the information system in completing their work.

The effect of PU on BI has been investigated in numerous studies and is believed to be the main predictor of technology acceptance (Cajita *et al.*, 2017). This current study figured out BI to use was resulted from the extent to which one perceived a given technology as useful as well as put affection for using the technology. The results are in accordance with a study led by Cajita *et al.* (2017), who analyzed variables that could impact intention to use m-Health among older adults with heart failure. They found that perceived usefulness (PU) was significantly associated with the intention to use m-Health even after possible confounders such as age, gender, race, education, income, and smartphone use were controlled.

Another study conducted by Pai and Huang (2011) examined the implementation of healthcare information system and demonstrated a positive and direct impact of PU on BI to use the system. A review conducted by Or and Karsh (2009) also confirmed the critical role played by perceived usefulness in altering consumers' intent to use health information technology. Kim *et al.* (2021) who investigated the implementation of GPS tracking in dementia caregiving showed that the caregivers' perceived usefulness of GPS tracking technology impacted their intention to use it. Their study showed that caregivers intended to use GPS tracking technology for providing care to persons with dementia only when they believed in its usefulness in helping them achieve the goal. Moreover, Rho, Choi and Lee (2014) who examined the predictive factors of telemedicine service acceptance and the BI of doctors showed that the PU of telemedicine directly affected the BI to use it. They found that doctors would use the technology when they considered it viable and prompting great medical service results. These results implied that PU of user's affected BI to use information system in the health field.

Based on the current results, most of the respondents (72%) had high perceived usefulness of the JSC, but still 28% of them expressed the opposite. The opposing respondents could be analyzed based on the Pareto law. In other words, 20% of the system surrenders caused 80% of issues, or 80% of the client objections emerged from 20% of products and services. Consequently, efforts need to be taken to escalate the PU of the JSC in Jember Regency. Almost all of the respondents had high BI to use the system (90%), but few respondents had low BI to use it (10%). Therefore, developers need to improve the JSC according to the user's needs.

As explained by Kim *et al.* (2021), technology developers will understand the users' attitudes toward a technology when they can consider how to reflect users' needs in their designs. Nevertheless, the researchers suggest considering the midwives' characteristics for different attitude and behavior of novice users and late ones while creating solution programs to increase the JSC usage. Novice users view innovations easier to use and more beneficial; whereas, late users have more negative feelings towards technological innovations (De Grood *et al.*, 2016).

3.6. Perceived Ease of Use (PEOU) to Behavioral Intention (BI)

Perceived ease of use has been described as how much an individual accepts that utilizing a specific technology will be free from both physical and mental efforts (Zhao, Ni, and Zhou, 2018; Deng *et al.*, 2018). Information related to PEOU of the JSC users includes the ease with which users learn to operate, access, remember how to operate the JSC, and fix errors that occur during the use of the JSC; moreover, it also conveys the user's perception of the complexity of JSC, skills in operating the system, availability of a manual book for operating the system, and user's perception on the ease of the system usage as a whole.

The results showed that 26% of the respondents had low PEOU, while 74% of them had high PEOU. The results contradict previous studies which suggested that PEOU was likely to affect the user's BI

to use. However, the current results showed that PEOU did not significantly influence BI of using the JSC ($P = 0.247$; $\beta = 0.137$). This was not beyond the expectation as Cajita *et al.* (2017) stated the association of PEOU to BI in several studies was not as consistent as PU. Moreover, Gücin and Berk (2015) and Ammenwerth (2019) stated the compelling factors on technology acceptance for medical care experts and patients may contrast. For example, the impression of convenience is not an indicator variable for medical services experts despite being a solid indicator of innovation reception for patients. This might be because midwives as both healthcare professionals and users of the JSC usually had higher intelligence levels and more professional experience with information technologies. Therefore, they found it easier to learn how to use the system.

In line with the explanation of Ammenwerth (2019), PEOU may not be that important for technology acceptance and usage when users sufficiently experience with the system or when they have sufficient IT support. Furthermore, Tao, *et al.* (2020) explained that PEOU only exerted effects in the pre-implementation stage, rather than in the post-implementation stage in technology acceptance. As the present research was conducted in the post-implementation of the JSC, PEOU was less likely to be an issue influencing user acceptance.

3.7. Behavioral Intention (BI) to Actual System Use (A)

Briefly, Swar, Hameed, and Reychav (2017) stated BI is a person's emotional likelihood where he/she will take part in a predefined activity. The recent result showed that BI did not significantly influence actual system use (A) ($P = 0.071$; $\beta = 0.215$). This showed that even though the midwives had the intention to use the JSC, it did not mean that they would access the system to complete their work. The results in this study are contrary to previous studies which mostly stated that BI was widely used to demonstrate the acceptance and continuance of information systems use (Deng, Liu, and Hinz, 2015; Swar, Hameed and Reychav, 2017). However, it should be noted that A depends not only on PU, PEOU, and BI to use, but also how well the device's usefulness coordinates with the necessities of the main job.

As explained by Swar, Hameed, and Reychav (2017), health-related information over-burden has become a far-reaching issue with patients just as doctors. Likewise, in the implementation of the JSC, the midwives found difficulties in inputting the maternal and infant health data into the system. They often complained when inputting data into the system due to unsupportive internet signal. Thus, the data that have been filled were not stored well. Moreover, the midwives would still need to provide high-quality healthcare services to patients at the same time. The JSC, which was supposed to have made their work easier, was deemed as another task that they had to do as they would need to enter data into the cohort book manually and into the system. When the health information system functionality is low, it may increase the user's psychological ill-being (Swar, Hameed, and Reychav, 2017).

A study by Swar, Hameed, and Reychav (2017) examined information overload, psychological ill-being, and behavioral intention to continue the study on Online Health Information (OHI) which stated that the over-burden of health information could trigger psychological ill-being among those who searched the data. The study stated that the over-burden of data in the OHI caused psychological ill-being that impacted online search and drove the users to stop searching. Psychological ill-being is often conceptualized as negative experience and explicit psychological malfunction, such as emotional and physical exhaustion. In relation to JSC, the psychological ill-being of the midwives occurred when they accessed online information on the JSC. They thought that there was too much information about maternal and infant health status, making them burdened in handling it. Moreover, the midwives also felt inconvenient because the JSC was not digitally ready enough to use due to a lack of technical infrastructure. The abundance of information threatens an individual's control of the situation rather than improving it. Thus, the midwives who had high BI did not adopt the system. This is supported by the fact that 90% of the midwives had high BI to use, but only 64% had high actual system use.

As explained by Dishaw and Strong (1999), chiefs of programming, particularly managers of software maintenance tool users, ought to know that low use of help instruments might arise because of the mismatch between device capacities and undertaking requests, instead of basing them on the overall value and convenience of the devices. The Jember District Health Office needs to increase the actual system use by strengthening the system infrastructure that can support the use of the JSC.

A study by Bayaga and Ophoff (2019) featured various difficulties from e-taxpayer driven organizations, especially e-casting a ballot, electronic expenses (e-tax and e-filing), e-health (m-health), e-banking to e-education due to the lack of adequate adoption in South Africa. These applications have been recommended by scientists who stated that using e-government systems and ventures is compelling and requires responsibility for certain contributing elements. For example, a lack of education and provincial territory issues are problems that may manifest a feeble foundation for advancing satisfaction with access to e-government systems. Consequently, it very well may be contended that non-industrial nations can realize their full potential if infrastructure and adequate access methods are improved not only in urban areas, but also rural areas.

3.8. Perceived Ease of Use (PEOU) to Actual System Use (A)

As defined by Ammenwerth (2019), PEOU is an individual's perception of easier use of information technology system. Meanwhile, actual system use (A) is attention performed by people concerning some information technology systems. Contradictory to some previous studies showing A was significantly influenced by BI to use, this current study revealed that PEOU significantly influenced actual system use ($P = 0.001$; $\beta = 0.196$). PEOU contributed to A with a β -value of 0.196, meaning the A rate of the JSC affected by variations in PEOU was 19.6%. The results are similar to research conducted by Aldosari *et al.*, (2018) who showed nursing staff at a Saudi Arabia hospital could become familiar with the system and less impervious to change if the system was considered helpful and convenient. Therefore, it contributed to higher acceptance level of electronic medical records (EMR) by introducing a more user-friendly system. Moreover, Tao, *et al.* (2020) explained that PEOU only used the effects of acceptance model in the pre-implementation stage, which was not an issue impacting user acceptance in the post-implementation. It was assumed PEOU only affected the respondents when they received training from Jember District Health Office and just started using JSC, but the system gradually fell out of use due to the mismatch between instrument capacities and errand requests. The researchers have recognized that top management and technology support are the best indicators for PEOU.

4. Conclusion and Recommendations

This study assessed the midwives' acceptance of the JSC and investigated the primary factors that influenced the JSC users' acceptance or actual use through a hypothetical structure. The results showed that the midwife's actual system use (A) was influenced by PEOU, but BI to use did not influence A. It was assumed that the PEOU applied when the respondents received training from Jember District Health Office and just started using the system, but the system gradually fell out of use due to the mismatch between tool functions and task demands. The midwives had the intention to use the JSC, but there were constraints that blocked their actual system use. For example, due to low internet signal, they had difficulties in inputting data into the system. Therefore, they could not input the data properly into the system, and thus this challenge required them to input them both manually and electronically.

This study suggests the Jember District Health Office as the implementer of the JSC should be aware of the constraints and take action to overcome them. Moreover, they need to notice the midwives' viewpoints and gain their help to build an environment that fits to the implementation of e-health technology. Such hindrances also result in significant expenses to improve acceptance and support of e-health technology. Nevertheless, like all previous studies, this current study had its limitations. A huge benefit of this study is that the information was gathered from the midwives who daily worked in primary healthcare centers in Jember and thus used the system ordinarily. The drawback of this benefit was in relation to a relatively low sample size which only involved 50 midwives. Although

this study had obtained practical information and fit model, further studies with an integrated model should be further tested in different circumstances and with different objects. This paper will ideally provide a positive contribution to the Jember District Health Office, serve as educational development for the health sector, and be useful for those who are willing to lead further exploration in declining maternal and infant mortality rates.

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