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Overview of Acceptance Factors of the Hospital Management Information System (SIMRS) among Nurses at Meuraxa Regional Hospital Banda Aceh

¹ Farhan Saputra, ² Ardia Putra, ³ Budi Satria

¹ Master of Nursing Program, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

² Fundamentals and Management of Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

³ Community of Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

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Corresponding Author: **Ardia Putra**

Abstract

Digital transformation in healthcare begins with the implementation of the Hospital Management Information System (SIMRS), and its success depends heavily on how users accept it, especially nurses as the primary users. The purpose of this study was to evaluate the determinants of SIMRS acceptance among nurses at Meuraxa Regional General Hospital using the Technology Acceptance Model (TAM). This study used a cross-sectional approach. The sample was 271 nurses at Meuraxa Regional General Hospital selected using a purposive sampling technique. Data were collected through questionnaires and analyzed.

The results showed that all variables were in the high category. SIMRS acceptance was very high (99.3%). Leadership support reached 100%, while other variables were also high. However, user engagement was lower (57.9%) and thus requires attention. It can be concluded that individual, organizational, and technological factors play an important role in increasing SIMRS acceptance, with leadership support being the dominant factor. Therefore, increased training, strengthening management support, and developing an easy-to-use system are needed to increase SIMRS adoption by nurses.

Keywords: SIMRS, Technology Acceptance Model, System Acceptance, Nurses, Hospitals

1. Introduction

The rapid development of digital technology in the Society 5.0 era has driven the transformation of the healthcare system, including hospitals. As part of the healthcare system, hospitals are required to adapt by applying information technology to improve service quality, efficiency, and accountability [1, 2]. One form of implementation is the Hospital Management Information System (SIMRS), which functions to manage data for both internal and external purposes. In Indonesia, the implementation of SIMRS is a national priority, as regulated by the Ministry of Health, with the goal of integrating hospital data into the National Health Information System [3]. Although around 88% of hospitals in Indonesia have adopted SIMRS, there are still various challenges in optimizing its use [3].

Internationally, various studies have shown problems in implementing health information systems. For example, the implementation of an electronic documentation system in the UK faced interoperability issues and budget constraints, which resulted in poor data management and poor service quality [4]. In addition, research in Jordan showed that most nurses found the Electronic Health Record (EHR) system difficult to use even though they recognized its benefits for patient care [5]. This shows that the success of information system implementation does not only depend on the sophistication of the technology, but also on the level of user acceptance, especially health workers such as nurses who have an important role in the use of the system [6].

Although SIMRS adoption continues to increase, gaps remain in its implementation, particularly regarding user acceptance. Application variations and a lack of reporting system integration can lead to data duplication and increase administrative burdens [7]. In Indonesia, although SIMRS has contributed to improving service efficiency, challenges such as limited infrastructure, internet connectivity, and low user compliance remain obstacles [8, 9]. This condition shows the importance of analyzing factors that influence user acceptance in the implementation of SIMRS.

To answer this problem, the Technology Acceptance Model (TAM) is widely used as a theoretical framework in analyzing

user acceptance of information systems [10]. TAM explains that user acceptance is influenced by several main variables, namely perceived ease of use, perceived usefulness, attitude toward use, and actual usage [11]. Previous research shows that perceived ease and perceived usefulness have a significant influence on nurses' attitudes towards using electronic documentation systems, which ultimately influences their intention to adopt the system [12]. In addition, the success of SIMRS implementation is also influenced by three main dimensions, namely human, organizational, and technological factors [13, 14]. Organizational support, user involvement, and system quality also play an important role in shaping user satisfaction and trust [15].

A number of empirical studies have supported the relevance of TAM in the context of health services, but there are still limitations, particularly in terms of generalizability and specific research contexts [16]. Furthermore, research specifically examining SIMRS acceptance among nurses, particularly in regional hospitals, is still limited. Therefore, further research is needed to identify the determinants of SIMRS acceptance in various healthcare contexts, particularly in developing regions.

In the Aceh context, hospitals have implemented SIMRS, but research examining user acceptance, particularly among nurses, is limited. Meuraxa Regional General Hospital, a fully accredited referral hospital in Banda Aceh, has implemented SIMRS since 2015 and continues to develop the system independently. However, preliminary studies indicate that there are still challenges related to compliance and user acceptance, particularly among nurses.

Based on this description, this study aims to analyze the determinants of SIMRS acceptance among nurses at Meuraxa Regional Hospital. Using the Technology Acceptance Model (TAM) approach and considering human, organizational, and technological factors, this study is expected to provide a comprehensive understanding of user acceptance and contribute to improving the success of SIMRS implementation in hospitals.

2. Objective

The main objective of this study is to describe the factors that influence the acceptance of the Hospital Management Information System (SIMRS) among nurses at Meuraxa Regional General Hospital, Banda Aceh City. This study also aims to describe the demographic characteristics of nurses and analyze the distribution of levels (high and low) in each independent variable, namely self-efficacy, user involvement, information quality, information security, system quality, leadership support, social influence, and compatibility, as well as the dependent variable, namely SIMRS acceptance.

3. Materials and Methods

3.1 Design

This research is a quantitative descriptive study using a cross-sectional approach. This design was used because the study aims to describe the characteristics of respondents and the distribution of levels of research variables at a single measurement point. This study aims to describe the levels of each independent and dependent variable in the high and low categories. The study was conducted at Meuraxa Regional Hospital, Banda Aceh City.

3.2 Sample Size and Sampling Technique

Researchers used a sampling method to determine the respondents in this study. The sampling technique used was total sampling, where the entire population was used as the sample. The population in this study was 325 nurses working at Meuraxa Regional Hospital in Banda Aceh City. Sample selection was based on established inclusion and exclusion criteria. Inclusion criteria included nurses who had actively worked at Meuraxa Regional Hospital for at least the past three months and who actively used the SIMRS in carrying out their duties. Exclusion criteria included nurses on leave (whether sick, maternity, or other leave) during the data collection process, as well as nurses who only worked administratively and did not directly use the SIMRS.

Based on the sample selection process according to the established criteria, from a total population of 325 nurses, 271 nurses were obtained who met the criteria and were willing to participate as respondents in this study.

3.3 The Instruments for Data Collection

The research instrument was a questionnaire consisting of two parts: a demographic questionnaire and a SIMRS acceptance questionnaire. The demographic questionnaire was used to identify respondent characteristics, including gender, age, education, work unit, length of service, length of SIMRS use, employment status, position, functional level, and SIMRS training history.

The SIMRS acceptance questionnaire was adapted and modified from previous research, referring to the Handayani *et al.* (2017) [14] model, which includes human, organizational, and technological factors, with a total of 33 items covering self-efficacy, user engagement, information quality, information security, system quality, leadership support, social influence, and compatibility. In addition, an instrument based on the Technology Acceptance Model (TAM) from Pratama *et al.* (2022) was also used for the components of perceived usefulness, perceived ease of use, and SIMRS acceptance, totaling 12 items.

All items were measured using a 1–5 Likert scale, from strongly disagree to strongly agree, to assess respondents' perceptions and attitudes. The instrument has been tested for validity and reliability in previous studies, with Cronbach's alpha values of 0.703–0.984, AVE > 0.5, and factor loading > 0.7 in the Handayani *et al.* (2017) [14] instrument, and Cronbach's alpha and composite reliability > 0.70 and AVE > 0.50 in the TAM instrument by Pratama *et al.* (2022). Thus, the instrument is declared suitable for use.

3.4 Data Collection Process

Data collection in this study was conducted through preparation and implementation stages. During the preparation stage, the researcher coordinated with Meuraxa Regional General Hospital in Banda Aceh City to obtain research permits. This process began with a request for a permit from the Faculty of Nursing at Syiah Kuala University and ethical approval. The researcher also prepared an informed consent form containing information on the purpose, procedures, benefits, and respondents' rights. During the implementation phase, the researcher was assisted by two enumerators who had been briefed on the research procedures and completed the questionnaire. The researcher and enumerators approached the respondents,

explained the research objectives, and requested their consent by signing an informed consent form. Data were collected by distributing questionnaires to eligible respondents. The instruments used were described in the previous section and have been found to be valid and reliable.

After all the data was collected, the researcher confirmed with the relevant parties at Meuraxa Regional Hospital as proof that the data collection process had been completed.

3.5 Data Analysis

Data analysis in this study used descriptive (univariate) statistics to describe the characteristics of respondents and the distribution of each research variable. The descriptive statistics used included frequency distribution, percentage, mean, median, mode, standard deviation, minimum, and maximum values.

Prior to analysis, the data underwent a processing process, including editing, coding, and tabulation, to ensure completeness and consistency. The analysis was conducted without inferential hypothesis testing because this study aimed to describe the levels of variables, not to examine the relationships or influences between them.

Each variable in this study was categorized into high and low levels based on predetermined cut-off values. The analysis results were then presented in the form of frequency distribution tables and measures of central tendency to provide a clear picture of the level of SIMRS acceptance among nurses.

3.6 Ethical Consideration

This research has received research permission from the Faculty of Nursing, Syiah Kuala University and obtained ethical approval from the Faculty of Nursing, Syiah Kuala University with Ethical Registration No. 11203105082.

4. Results

This study involved 271 nurses at Meuraxa Regional General Hospital in Banda Aceh. The results are presented based on the research objectives, namely to describe the characteristics of the respondents and the distribution of the SIMRS acceptance variable levels.

4.1 Respondent Characteristics

Based on Table 4.1, the majority of respondents were female (81.2%), while 18.8% were male. The majority of respondents were in the 30–40 age group (55.0%), followed by those aged <30 (39.9%) and >40 (5.2%).

In terms of education, the majority of respondents had a Diploma III (66.8%), followed by a Bachelor's degree (32.5%) and a Master's degree (0.7%). Respondents were spread across various work units with a relatively even distribution. Based on length of service, the majority of respondents had worked for 1–5 years (62.0%), and the majority had used SIMRS for 1–5 years (75.3%).

In terms of employment status, the majority of respondents were P3K (52.8%), followed by contract workers (38.0%) and civil servants (9.2%). Based on job title, the majority were nurses (93.0%). Furthermore, the majority of respondents had never participated in SIMRS training (88.6%).

4.2 Overview of SIMRS Acceptance Variables

Based on Table 4.2, the analysis results show that all variables are generally in the high category. Acceptance of SIMRS, as the dependent variable, showed a very high level, with 99.3% of respondents in the high category.

Of the independent variables, leadership support showed the most optimal results, with all respondents (100%) in the high category. Other variables, such as information quality (98.9%), system quality (95.9%), compatibility (94.5%), social influence (93.7%), information security (93.4%), and self-efficacy (91.9%), also showed a dominance in the high category.

However, the user engagement variable had a relatively lower proportion of respondents in the high category compared to the other variables, at 57.9%, with 42.1% of respondents in the low category. This indicates that user engagement remains an aspect that requires attention in SIMRS implementation.

Overall, the results of this study indicate that the acceptance of SIMRS among nurses at Meuraxa Regional Hospital is in the very good category and is supported by individual, organizational, and technological factors which are generally also in the high category.

Table 4.1: Distribution of respondent characteristics

No	Demographic Data	f	Mean	SD	Min	Max	%
1	Gender						
	a. Man	51					18.8
	b. Woman	220					81.2
2	Age		1.65	0.575	1	3	
	a. <30 Years	108					39.9
	b. 30-40 Years	149					55.0
	c. >40 Years	14					5.2
3	Last education						
	a. Diploma III (D3)	181					66.8
	b. Bachelor degree	88					32.5
	c. Masters (S2)	2					0.7
4	Room Name						
	a. Senarai	14					5.2
	b. ICU	13					4.8
	c. Arafah	12					4.4
	d. PICU	14					5.2
	e. Raudhah	14					5.2
	f. Marwah	13					4.8
	g. Safa	13					4.8
	h. Al-Bayan 2	16					5.9
	i. Al-Bayan 3	14					5.2
	j. Humaira	13					4.8
	k. IICU	13					4.8
	l. Al-Huda Paru	13					4.8
	m. Al-Huda Jantung	14					5.2
	n. Az-Zahra 1	14					5.2
	o. Mina	15					5.5
	p. ICU 2	14					5.2
	q. Az-Zahra 3	12					4.4
	r. Az-Zahra 2	14					5.2
	s. NICU	12					4.4
	t. Ar-Rahman	14					5.2
4	Length of work		1.47	0.660	1	3	
	a. 1-5 Years	168					62.0
	b. 6-10 Years	78					28.8
	c. > 10 Years	25					9.2
6	Length of Use of SIMRS		1.27	0.492	1	3	
	a. 1-5 Years	204					75.3
	b. 6-10 Years	61					22.5
	c. > 10 Years	6					2.2
7	Employee Status						
	a. Civil Servant	25					9.2
	b. P3KContract	143					52.8
		103					38.0
8	Job Title						
	a. Team Leader	19					7.0
	b. Implementing Nurse	252					93.0
9	Functional Level						
	a. PK 1	151					55.7
	b. PK 2	66					24.4
	c. PK 3	53					19.6
	d. PK 4	1					0.4
10	SIMRS Training						
	a. Once	31					11.4
	b. Never	240					88.6
11	If so, what year?						
	a. 2013	1					3.2
	b. 2016	3					9.7
	c. 2019	13					41.9
	d. 2020	2					6.5
	e. 2022	1					3.2
	f. 2023	11					35.5

5. Discussion

The results of the study showed that the acceptance of SIMRS among nurses at Meuraxa Regional Hospital was very high (99.3%). This finding aligns with TAM, which states that technology acceptance is influenced by perceptions of usefulness and ease of use, which shape attitudes and actual use [10].

This high level of acceptance is supported by the characteristics of respondents, most of whom are of productive age (30–40 years old), have 1–5 years of work experience and SIMRS usage, and are predominantly nurses. This indicates that experience and the ability to adapt to technology play a role in increasing self-efficacy and acceptance of the system [5, 17]. Although most respondents had never attended SIMRS training, the high level of acceptance indicates that the system is relatively easy to use, although training is still required for optimal use [18].

From the acceptance factor aspect, all independent variables are generally in the high category, with leadership support being the most dominant factor. This confirms that organizational support plays a significant role in encouraging the use of information systems [14, 15]. In addition, high system quality and information quality indicate that SIMRS is able to provide accurate, relevant, and easily accessible information, thereby increasing user satisfaction and perceived usefulness [13].

Table 4.2: Central Tendency and Distribution of Variables

Variables	Mean	Median	Mode	SD	Min	Max	Category f (%)
Self-Efficacy	11.44	11.00	10	2.12	8	15	High : 249 (91.9) Low : 22 (8.1)
User Engagement	11.49	12.00	12	2.64	4	19	High : 157 (57.9) Low : 114 (42.1)
Information Quality	16.45	16.00	20	2.84	9	20	High : 268 (98.90) Low : 3 (1.1)
Information Security	16.44	17.00	20	3.19	9	20	High : 253 (93.4) Low : 18(6.6)
System Quality	16.30	16.00	16	3.62	8	20	High : 260 (95.9) Low : 11 (4.1)
Leadership Support	16.30	16.00	16	2.22	12	20	Height: 271 (100)Low: 0
Social Influence	11.29	11.00	12	1.95	6	15	High : 254 (93.7) Low : 17 (6.3)
Compatibility	11.65	12.00	12	2.09	5	15	High : 256 (94.5) Low : 15 (5.5)
SIMRS Acceptance	53.41	56.00	60	6.32	35	60	High : 269 (99.3) Low : 2 (0.7)

The compatibility, social influence, and information security variables generally scored high, indicating that the system met work needs, was supported by the social environment, and provided a sense of security for users. These conditions contributed to increased system acceptance because users perceived the system as relevant, adaptable, and reliable in supporting their work [13, 19, 20]. However, user engagement remains relatively low compared to other variables. This indicates that user participation in system development and evaluation is not optimal. User engagement is known to play a crucial role in improving the system's suitability to user needs [18].

Overall, nurses' acceptance of SIMRS is influenced by a combination of individual, organizational, and technological factors. From a TAM perspective, this high level of acceptance indicates that SIMRS meets the requirements for ease and usability, which are reinforced by organizational

support and user characteristics that are adaptive to technology [10, 13, 14].

6. Conclusion

This study shows that nurses at Meuraxa Regional Hospital (RSUD) have a very high level of acceptance of the SIMRS (Symmetrical Information System) (99.3%), reflecting the fulfillment of the ease and usability aspects of the TAM. This acceptance is supported by individual, organizational, and technological factors, with leadership support being the most dominant factor, along with good system and information quality. However, user engagement still needs to be improved to optimize system development and utilization.

7. Recommendations

Hospitals need to improve the regular implementation of SIMRS training to optimize nurses' use of the system. The existing strong leadership support needs to be maintained and enhanced through policies that encourage consistent system use. Furthermore, it is crucial to increase user involvement in the SIMRS development and evaluation process to ensure the system's continued suitability to their needs. Continuous improvements to system quality and information security are also necessary to maintain user trust and comfort in using SIMRS.

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