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DIMENSIONS OF MIDWIVES' SATISFACTION WITH THE MANUAL BOOK OF THE MATERNAL EMERGENCY REFERRAL SYSTEM IN THE ISLANDS (SIRUTAN)

By

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ABSTRACT

This study aims to evaluate the satisfaction of midwives with the manual book of the Maternal Emergency Referral System in the Islands (Si-RUTAN) in supporting effective maternal emergency care in remote island regions. A cross-sectional descriptive study was conducted involving 30 midwives from public health centers across the Riau Islands Province in 2024. In addition, the manual was evaluated by an obstetrics and gynecology expert (SpOG) using Nielsen's heuristic usability principles. The data were analyzed using univariate descriptive statistics. Most midwives reported high satisfaction with the manual: 83.3% were "very satisfied" and 16.7% "satisfied". Across all SERVQUAL dimensions, the majority rated their satisfaction as "very satisfied", particularly in Responsiveness (80%) and Assurance (80%). No respondents reported dissatisfaction. Heuristic evaluation by the expert yielded consistently high scores, especially in "Match with real-world scenarios" and "Help and documentation" (mean score = 4.8). The expert confirmed the manual's clarity, relevance, and usability in maternal emergency situations. Conclusion: The Si-RUTAN manual book is a wellreceived, context-appropriate resource for midwives working in island regions. Its effectiveness in facilitating maternal emergency referrals and high usability rating suggest it should be promoted and continuously refined through user and expert input.

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1. INTRODUCTION

Maternal mortality remains a pressing issue in Indonesia, particularly in remote island areas where access to emergency obstetric care is often delayed. The "three delays" model underscores the importance of timely decision-making and transportation in reducing maternal deaths. The first delay in referral that must be prevented immediately so as not to cause subsequent delays is the delay in making family decisions and the delay in recognizing danger signs in pregnancy, in addition to other determinants such as pregnancy examination factors and first aid factors for childbirth that are not carried out by health workers. Delays in detecting risk factors for pregnant women, inaccuracy in treatment due to lack of compliance by officers with Standard Operating Procedures (SOPs) for assisting with childbirth, and delays in referrals can result in mothers receiving appropriate services being even more delayed.

To address this, the Si-RUTAN (Maternity Referral System in the Islands) manual was developed as a standardized referral guideline specifically tailored to island settings. The main principle is to reduce panic and unnecessary commotion by preparing for childbirth (planned referral) for those who need it (pre-emptive strategy).

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Any intervention to improve access to health services requires consideration of multiple aspects, such as social, economic, and cultural aspects, as well as strengthening the referral system. Ensuring effective referrals for complications is one of the Ministry of Health's main programs in its action plan to accelerate maternal mortality reduction. The government must ensure the availability of personnel, facilities, equipment, and medicines to provide safe, high-quality, and affordable maternal health services. The results of research on referral systems in island areas such as Lingga Regency show that although a referral system already exists, referral services from primary health care facilities to advanced health care services have not yet taken into account the availability and completeness of the types of services at the designated health facilities, including the inadequacy of infrastructure and human resources.

This study aimed to evaluate midwives' satisfaction with the Si-RUTAN manual and explore its usability and effectiveness from both user and expert perspectives. Satisfaction with such tools is critical, as it reflects their practicality and likelihood of continued use by midwives in field conditions. Prior studies have shown that well-designed educational and operational manuals improve clinical confidence and response time [9]. However, most previous studies focus on digital or general maternal referral tools without specifically addressing the unique challenges of archipelagic contexts. Moreover, limited literature integrates both SERVQUAL dimensions satisfaction and heuristic usability principles in evaluating manual-based interventions for maternal health.

This study offers a dual-evaluation approach combining user satisfaction (SERVQUAL) and usability (Nielsen's Heuristics), applied to a manual designed explicitly for maternal emergency referrals in island settings. Unlike digital or app-based tools, this manual serves areas with low internet connectivity, making it a practical and innovative solution in under-resourced geographies.

2. RESEARCH METHOD

This research used a descriptive quantitative design with a cross-sectional approach. Data collection was conducted from September to October 2024 at several Puskesmas (Primary Health Centers) across the Riau Islands Province. The study population included all midwives providing antenatal care services in these centers. A total of 30 midwives were selected through simple random sampling. Each participant was provided with the Si-RUTAN manual book and received a short orientation on its contents and application. They were given two weeks to apply the manual during daily clinical practice.

A heuristic evaluation was conducted by an expert obstetrician-gynecologist (SpOG) using Nielsen's 9 usability principles. Each criterion was scored on a 5-point Likert scale namely Very Satisfied (5), Satisfied (4), Fair (3), Dissatisfied (2) and Very Dissatisfied (1), and qualitative feedback was collected.

Table 1. Heuristic Evaluation Indicators

	Table 1. Heuristic Evaluation indicators		
No	Indicator	Function	
1	System status visibility	The system should always be able to provide good feedback to inform the user about what is happening within a reasonable time.	
2	Fit between the system and the real world	The system should "speak" a language that the user understands. Use words, phrases, and concepts in the language the user understands instead of using the system's language.	
3	User control and freedom	If the user makes an unintentional mistake the user can find an easy way to exit easily and quickly without having to go through a long process.	
4	Consistency and standards	Users can easily understand and without any doubt know whether a different feature, situation or action has the same meaning.	
5	Prevention for errors	Notifications about errors are a good thing, but a better system is to prevent errors from occurring in the first place, and if an error occurs, the user can easily understand the error that occurred.	
6	Recognize rather than recall	The system is better designed to be easily recognized again so that users do not need to remember every step that must be taken every time the user uses the system again	
7	Flexibility and efficiency in use	This system offers flexibility by offering alternative actions suitable for both beginners and experienced users. Give each	





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		user category the flexibility to choose how they want to operate.
8	Aesthetic and minimalist design	The system should not contain irrelevant or rarely needed
		information. The design should be pleasing to the user's eye
		to avoid confusing them when using the system.
9	Help and documentation	If an error occurs, the system can provide an error message in
		easy-to-understand language and also provide the solution
		needed by the user to resolve the problem.

Satisfaction for Midwives was measured using an e-questionnaire based on the SERVQUAL framework (Tangible, Reliability, Responsiveness, Assurance, Empathy). Satisfaction responses were categorized into four levels: Very Satisfied, Satisfied, Dissatisfied, and Very Dissatisfied.

Table 2. Level of Satisfaction with the Use of the SI-RUTAN Manual Book

No	Satisfaction Level	Interval	
1	Very Dissatisfied	25 – 43.74	_
2	Not satisfied	43.75 - 62.49	
3	Satisfied	62.50 - 81.24	
4	Very satisfied	81.25 - 100	

The highest score	= (Number of statements x highest weight) x $2.5 = (10x4) \times 2.5 = 100$
Lowest Value	= (Number of statements x lowest weight) x $2.5 = (10x1)$ x $2.5 = 25$
Data Region	= Highest Value – Lowest Value = 100-25 = 75
Class	= There are 4 assessment classes, namely very dissatisfied (STP), dissatisfied
	(TP), satisfied (P), and very satisfied (SP).= Data Area/Number of Classes
	=75/4=18.75

Descriptive statistics (frequency and percentage) were used to summarize the data, processed using SPSS version 22. Ethical clearance was obtained from The Health Research Ethics Committee of Sekolah Tinggi Ilmu Kesehatan Bani Saleh (No: EC. 119/KEPK/STKBS/VII/2024).

3. RESULTS AND ANALYSIS

1. Display of the Si-RUTAN Manual Book (Maternity Referral System in the Islands)

The development of simplified Maternal Referral Guidelines will help expedite the referral process so that patients arrive as quickly as possible at adequate health care facilities and receive maximum care.

This research has produced an update of the old referral system that has been adapted to the demographic conditions of the island region. The resulting product is a recommended Manual Book for Referral Systems in Island Regions, called Si-RUTAN. The Manual Book System for reference in island areas is a guideline that is specifically created and based on KIA service standards that use the principle continuum of care with funding sources.

The diagnosis codes and case classifications listed in the Si-RUTAN manual have been discussed and agreed upon by the Si-RUTAN Manual Book development team, which includes representatives from the Tanjungpinang City and Bintan Regency Health Offices, obstetrician and gynecologist representatives, and community health center representatives. These codes will facilitate staff in sorting diagnoses and determining referral locations, ensuring patients receive treatment without delay. The following is a description of the codes Manual Book System reference in the island area that has been developed:

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a. Cover view



MANUAL BOOK SI-RUTAN (SISTEM RUJUKAN KEGAWATDARURATAN MATERNAL DI KEPULAUAN)

PEDOMAN BAGI TENAGA KESEHATAN

DISUSUN OLEH:

TIM PENELITI JURUSAN KEBIDANAN POLTEKKES KEMENKES TANJUNGPINANG TAHUN 2024



JALAN ARIF RAHMAN HAMIN NO.1 KEL. SEI JANG, KEC. BUJUT BESTARI KOTA TANIUNGPINANG, PROVINSK SEPULAUAN RAU
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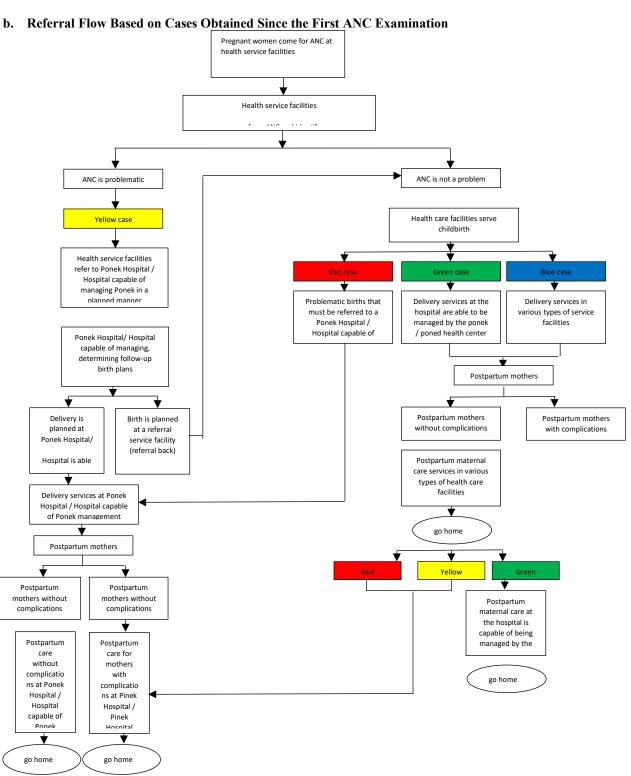


Diagram 1. Referral Flow Based on Case

Explanation

- 1. Pregnant women can obtain ANC services at various FKTP Health Service Facilities (BPJS network midwives, regular health centers, PONED health centers, and FKRTL (hospitals capable of administering PONEK or PONEK hospitals).
- 2. Health Service Facilities identify the type of pregnancy and estimated type of delivery of mothers who receive ANC services at each facility.
- 3. Health service facilities group types of pregnancy and types of childbirth into 4 groups.
 - a. The Red Group is mothers who had no problems at the start of ANC but during the course of their pregnancy and/or delivery and postpartum period experienced problems that required emergency referral to a PONEK Hospital/Capable Hospital (according to the case).
 - b. The Yellow Group is mothers who experienced pregnancy problems at the start of ANC, and are predicted to have problems during delivery and/or have problems during the postpartum period, which requires a planned referral to a PONEK Hospital/Capable Hospital.
 - c. The Green Group is mothers who had no problems at the start of ANC but experienced problems during the pregnancy, delivery, and postpartum period, which can still be handled at the PONED Community Health Center and/or Mampu Tata Laksana Hospital.
 - d. The White Group consists of mothers who had no problems at the start of ANC and are predicted to have a normal delivery and a smooth postpartum period at all health care facilities.
- 4. For the red group, referrals can be made during ANC, childbirth and the postpartum period where the Health Service Facility will refer pregnant women in the red group to the PONEK Hospital/Capable Hospital (unless the pregnant woman has been treated at the PONEK Hospital since ANC).
- 5. For the yellow group, referrals are made during ANC, where the Health Service Facility will refer pregnant women in the yellow group to the PONEK Hospital/Hospital capable of management (unless the pregnant woman has been treated at the PONEK Hospital/Hospital capable of management since ANC).
- 6. The role of the Community Health Center is to report pregnant women in the yellow group through monthly reports to the District Health Office.
- 7. The role of the Health Service is to facilitate pregnant women in the yellow group regarding financial guarantees (Independent/APBD), sending the names of pregnant women in the yellow group to the hospital.
- 8. Health service facilities handle deliveries of pregnant women in the green and blue groups.
- 9. During labor, health service facilities will identify the possibility of complications during labor using good processes and techniques (for example, using a partograph).
- 10. Mothers giving birth in the Green Group can be treated at PONED Community Health Centers and/or hospitals capable of PONEK management.
- 11. White Group mothers giving birth can be handled in all types of health/delivery service facilities (Community Health Centers, BPM, Hospitals).

2. Participant Characteristics

The 30 midwife respondents had an average age of 34 years, with 70% having more than 5 years of clinical experience. All participants had received prior training in maternal referral systems.

Table 3. Respondent Characteristics

Variable	Category	Frequency (n)	Percentage (%)
Age (year)	<30	10	33.3
	30-39	13	43.3
	≥40	7	23.3
Work Experience (years)	≤5	9	30
O ,	>5	21	70
Referral Training	Yes	30	100
	No	0	0

Table 1 presents the distribution of respondents based on age, years of work experience and referral training. The majority were in the 30–39 age group (43.3%), had more than 5 years of experience (70.0%) and all of them had received referral training.



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The majority of midwives participating in this study were aged between 30 and 39 years and had over five years of clinical experience. This demographic is consistent with previous research by Ameyaw et al (2020), suggests that experienced health workers are more adept at applying maternal referral protocols and are more likely to appreciate the value of practical tools such as manual books. The high percentage of midwives with emergency care and referral training further supports the validity of their feedback on the manual.

In a study byNkhwalumeet al. (2021), the experience of health workers was significantly associated with competence and responsiveness in maternal emergencies. Similarly, our findings reinforce that trained and experienced midwives are capable of evaluating tools like Si-RUTAN more critically, thereby validating the overall satisfaction levels presented in this study.

3. Level of Satisfaction with the Use of the Si-RUTAN Manual Based on SERVQUAL Dimensions Table 4. Level of Satisfaction with the Use of the SI-RUTAN Manual Book

Midwife Satisfaction	Frequency (n)	Information
Tangible	86.4	Very satisfied
Reliability	84.1	Very satisfied
Responsiveness	80.0	Satisfied
Assurance	76.7	Satisfied
Empathy	73.3	Satisfied

Data processing produces figures as in table 4. Each to determine the Midwife Satisfaction parameter with the Tangible variable indicator shows an average of 86.4, Reliability shows an average of 84. This shows that all indicators are above 81.25 (see table 2) which means that in these indicators the respondents feel very satisfied with the use of the SI-RUTAN Manual Book while for assurance shows an average of 76.7. Responsiveness shows an average of 80.0 and Empathy shows an average of 73.3. This shows the Satisfaction category at the Satisfaction Level (see table 2) where this means that for these indicators the Midwife feels Satisfied.

The analysis based on SERVQUAL dimensions showed that all aspects of service quality were rated highly by the midwives. Responsiveness and assurance dimensions received the most "very satisfied" responses, highlighting that the manual facilitates timely action and provides confidence in referral decisions. The dimension of empathy, which includes ease of understanding and perceived concern for user needs, also received favorable responses. These results are consistent with prior research indicating that clear, responsive, and empathetic health tools significantly improve user satisfaction and implementation rates.

This aligns with the findings of Parasuraman et al. (1988), who first conceptualized the SERVQUAL model, emphasizing that health service tools with high responsiveness and assurance dimensions tend to increase user satisfaction and trust. The Si-RUTAN manual appears to meet these quality service benchmarks, particularly in providing accurate guidance during emergency referrals in remote settings.

a. General Satisfaction Level for the Use of the Si-RUTAN Manual

Table 5. General Level of Satisfaction with the Use of the SI-RUTAN Manual Book

Midwife Satisfaction	Frequency (n)	Percentage (%)	
Very satisfied	25	83.3	
Satisfied	5	16.7	
Not satisfied	0	0.0	
Very Dissatisfied	0	0.0	

Table 2 shows that the majority of respondents (83.3%) felt "very satisfied" with the use of the Si-RUTAN manual, while the remaining 16.7% reported being "satisfied." None of the midwives expressed dissatisfaction. This indicates that the manual has high acceptability and relevance to the needs of midwives working in island settings.

The finding that 83.3% of midwives reported being very satisfied with the manual, and the remaining 16.7% being satisfied, indicates a strong acceptance and usability of the Si-RUTAN manual. This high level of satisfaction can be attributed to the manual's user-friendly format, clarity in referral steps, and contextual suitability for maternal emergencies in island areas. It also reflects the midwives' confidence in the tool as a support mechanism in high-risk clinical settings.

A study by Otolorin et al. (2015) on maternal care in low-resource settings emphasizes that standardized guidance tools significantly enhance frontline healthcare workers' ability to provide timely and appropriate responses during emergencies. The high satisfaction shown in this study is therefore consistent with global evidence that structured and context-adapted manuals can positively impact health service delivery outcomes.

b. Heuristic Evaluation by Expert (SpOG)

The heuristic evaluation performed by a SpOG specialist revealed favorable usability assessments across all nine of Nielsen's usability principles. As seen in Table 5, the manual scored highest in "Match with real-world scenarios" and "Help and documentation" (mean = 4.8). All other dimensions also scored above 4.3, indicating excellent usability and applicability. The expert noted that simplifying visual elements and transitioning to a digital format could further enhance utility.

Table 6. Expert Heuristic Evaluation (Nielsen's Principles)

Heuristic Principle	Mean Score (1-5)	
System status visibility	4.7	
Fit between the system and the real world	4.8	
User control and freedom	4.6	
Consistency and standards	4.5	
Prevention for errors	4.4	
Recognize rather than recall	4.6	
Flexibility and efficiency in use	4.5	
Aesthetic and minimalist design	4.3	
Help and documentation	4.8	

The heuristic evaluation by an SpOG expert using Nielsen's principles provided objective validation of the manual's usability. High scores in "Match with real-world scenarios" and "Help and documentation" underscore the manual's practical relevance and clarity. These findings support the inclusion of specialist review in the development of clinical tools, ensuring alignment with both technical and user-centered design principles. Feedback suggests digital transformation aligns with current trends in digital health innovations and could further increase the manual's accessibility and usability.

In line with Nielsen (1992), expert-based usability testing—such as heuristic evaluation—remains one of the most efficient methods for identifying design improvements in health tools. The positive expert feedback in our study supports the value of involving clinical specialists in evaluating tool usability, especially when targeting high-stakes use cases like maternal emergencies.

4 CONCLUSION

This study demonstrated that the Si-RUTAN manual book is highly satisfactory among midwives in the Riau Islands Province. The Si-RUTAN manual book is a well-designed, highly usable tool that midwives find practical for maternal emergency referral in island settings. High satisfaction across all SERVQUAL dimensions and strong heuristic ratings by an expert support its continued use and further development.

The majority of respondents rated their experience as "very satisfied" across all SERVQUAL dimensions, particularly in terms of responsiveness, assurance, and reliability. Furthermore, expert heuristic evaluation confirmed that the manual aligns well with user needs, emergency contexts, and usability principles.

These findings highlight the manual's potential as an effective tool for improving maternal emergency referral services in geographically challenging island settings. To maximize its impact, further efforts should focus on continuous refinement based on user feedback and expert recommendations, including potential development of a digital or app-based version of the manual.

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