

Original Research

## User Satisfaction with Application for Postpartum Maternal Gymnastics (SIMPOR)



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Article Info	Abstract
Article history: Received: 03 October 2023 Accepted: 29 January 2024	<p><i>Introduction:</i> Bleeding is the main cause of 50%-60% morbidity and mortality in the postpartum period due to imperfect myometrial contraction. Postpartum exercise is one of the actions of maximizing uterine contractions. It accelerates uterine involution. Technology development is very fast today, and improvement of Android-based postpartum applications that are applicable, educative, and informative is needed. This study aims to develop a postpartum maternal exercise (SIMPOR) application for postpartum mothers using Android and carry out tests to obtain an overview of satisfaction with the SIMPOR application.</p> <p><i>Methods:</i> This study used a Research and Development (R&amp;D) method with 152 respondents taken using proportional stratified random sampling. Data analysis used Chi-square with univariate and bivariate analysis.</p> <p><i>Results:</i> The majority of participants were aged 20-40 years old (98%), the majority had higher education (59.9%), most of the respondents were housewives (65.8%), had more than one toddler (77.6%), and the average age of toddler was less than 2 years old (84.2%). Most respondents' satisfaction with the SIMPOR application was very satisfied (88.16%); 3) There was a relationship between the mother's work, parity, and the age of the youngest child on the satisfaction of using the SIMPOR application with a p-value&lt;0.05.</p> <p><i>Conclusion:</i> Participants were very satisfied with SIMPOR application. Based on that result, hopefully, postpartum mothers can use this application as postpartum exercise guidance and to monitor their involution process during the postpartum period.</p>
Keywords: application, postpartum maternal exercise, android	

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## INTRODUCTION

The high incidence of maternal mortality in Indonesia still really needs attention. In 2019 the maternal mortality rate in Indonesia was 305/100.000 live births with 28% caused by bleeding. The most common cause of labour bleeding is 50%-60% due to weakness or uterine contractions. Failure of the myometrium to contract completely can cause serious problems, resulting in heavy bleeding after giving birth. For this reason, it is important to provide postpartum services for mothers as one of the main pillars in the strategy to reduce MMR[1]. The postpartum period is the period after the placenta is born and ends when the uterine organs return to their pre-pregnancy state[2].

During pregnancy, some muscles experience lengthening, especially the uterine and abdominal muscles. After childbirth, the uterus does not quickly return to its original state, but a process is needed to restore it to its original condition, namely through exercise known as puerperal gymnastics[3].

Uterine involution is the process of the uterus returning to its pre-pregnancy condition, starting after the placenta is delivered until approximately 6 weeks. The involution process is an important basis for midwives in monitoring the physiological process of uterine return[4]. Uterine involution in postpartum mothers must go well, because if not, uterine subinvolution occurs or delays in the uterus returning to its normal size which results in bleeding, and diastasis recti abdominis or widening of the six-pack muscles or separation of the right and left sides of the rectus abdominis[2].

Puerperal gymnastics is a series of body movements performed by mothers after childbirth that aims to restore and maintain muscle strength associated with pregnancy and childbirth. Exercises on the pelvic floor muscles will stimulate nerve fibers in the uterine muscles, namely sympathetic and parasympathetic nerve fibers that go to the cervical ganglion of the frankenhauser located at the base of the uterine sacro ligament. The stimulation that occurs in this ganglion will increase the strength of uterine contractions. With the contraction and retraction of the uterus that is strong and continuous from the exercise of these muscles, it will increase the strength of the uterus in the process of involution so that the decrease in uterine fundus height takes place faster than those who do not exercise[5].

In addition, abdominal muscle exercises will cause the ligaments and fascia that support the uterus to tighten. The loose rotundum ligament will return so that the location of the uterus that was previously retroflected will return to its normal position, which is to become anteflexion[6]. This is supported by research by Suwanti & Kuswati (2014), namely that strong and continuous uterine contractions will further help the work of the uterus in compressing blood vessels and hemostatic processes. This process will help lower the height of the fundus uteri[7]. This is because one of the benefits of puerperal gymnastics is to accelerate uterine involution which can be measured by a decrease in uterine fundus height[5]

The results of research conducted by Kusumaningrum (2016) at Dr. RSUP. Soeradji

Tirtonegoro, Klaten concluded that postpartum exercise is effective in the uterine involution process in postpartum mothers[8]. Therefore, essential care is needed for postpartum mothers, in order to optimize uterine contractions to help the uterine involution process, one of which is by carrying out postpartum exercises[9]. The aim of the postpartum exercise is to speed up healing, prevent complications, and restore and strengthen the back muscles, pelvic floor muscles, and abdominal muscles[10].

The increasingly rapid development of technology means that most people choose media that is simple, attractive, practical, and can be accessed anytime and anywhere. There are many various applications or online media that can meet all needs and help solve people's problems, especially in the health sector[11]. At this time the development of technology is very rapid, according to survey data from the Ministry of Communication and Information, most internet users are in the age range of 18-25 years as much as 49%, while the age of 26-35 years as much as 33.8%, women will more easily access various applications, including health applications[12].

Android is a subset of software for mobile devices that includes the operating system, middleware, and core applications released by Google. Android is a mobile operating system that is modified and adopts the Linux operating system. Android was taken over by Google in 2005 from Android, Inc. Google took over all of Android's work including the team that developed Android[13].

The Android operating system is an operating system developed by Google for the mobile platform. The presence of the Android operating system is accompanied by the rapid development of hardware. Android tablet is one of the mobile devices that implements the Android operating system. The price of this device is declining in line with the large production of Android tablets from China. Currently, Android tablets can be obtained at a price of less than one million rupiah[14]. Due to this, it is necessary to develop an Android-based postpartum exercise guide application that is informative, educative, and applicable for postpartum mothers.

The aim of this research is to determine satisfaction with using the Android-based Postpartum Mother's Gymnastics (SIMPOR) application as an alternative exercise guide for postpartum mothers.

## **METHODS**

This type of research is Research and Development (R&D) research. This research aims to develop a postpartum maternal exercise application (SIMPOR) for postpartum mothers using Android. R&D research is a research method to discover, develop, improve, and produce products, then test them until a standardized product is produced. Based on the research and development model by Borg and Gall which has been modified by Sugiyono, R&D describes the steps or flow of procedures descriptively to produce new products or develop existing products to increase effectiveness and efficiency. The resulting products can be in the form of modules, books,

applications, training, or learning videos[15].

Data analysis used univariable analysis to describe respondent characteristics (mother's age, education, occupation, and parity) as well as satisfaction dimension variables. The data normality test shows that the data is normally distributed. To assess the relationship between the independent variable and the dependent variable, the chi-squared test data analysis was used with a p-value <0.05.

This research has been reviewed by the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health Pangkalpinang with a statement of passing the Ethical Clearance No. 11/EC/KEPK-PKP/VI/2022.

## RESULTS

From the research results, it is known from Table 1 that the majority of respondents were in the 20-40 years age range, namely 98%. Meanwhile, based on educational

characteristics, most of the respondents were in the high category, namely 59.9%. Most of the respondents were housewives, namely 65.8%. Regarding parity characteristics, most respondents had more than one child (77.6%) and most respondents' children were more than two years old (84.2%).

In Table 2, it can be seen that in all dimensions of satisfaction, the majority of respondents are very satisfied with the SIMPOR application. Likewise, with the general satisfaction variable, the majority of respondents were in the very satisfied category (88.16).

Based on the results of data analysis shown in Table 3, it can be seen that the characteristics of the mother's age and education are not related to respondent satisfaction with the SIMPOR application with a p-value >0.05. Meanwhile, the characteristics of the mother's job, parity, and the age of the youngest child have a relationship with respondent satisfaction with a p-value of <0.05.

**Table 1**  
Respondent Characteristics (n=152)

Variable	Frequency	Percentage (%)
Age		
<20 yrs, >40 yrs	3	2
20-40 years	149	98
Education		
Low (< SMA)	61	40.1
High (> high school)	91	59.9
Work		
IRT	100	65.8
Work	52	34.2
Parity		
1 child	34	22.4
Children > 1 person	118	77.6
Age of youngest child		
> 2 years	24	15.8
< 2 years	128	84.2

**Table 2**

Respondents' Satisfaction with the SIMPOR Application (n=152)

<b>Dimensions of Satisfaction</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<i>Tangibles</i>		
Quite satisfied	5	3.30
Satisfied	23	15.10
Very satisfied	124	81.60
<i>Reliability</i>		
Quite satisfied	7	4.60
Satisfied	18	11.80
Very satisfied	127	83.60
<i>Responsiveness</i>		
Quite satisfied	4	2.63
Satisfied	23	15.13
Very satisfied	125	82.22
<i>Assurance</i>		
Quite satisfied	1	0.66
Satisfied	41	26.97
Very satisfied	110	72.37
<i>Empathy</i>		
Quite satisfied	6	3.95
Satisfied	23	15.13
Very satisfied	123	80.92
In general		
Satisfied	18	11.84
Very satisfied	134	88.16

**Table 3**

The Relationship between Respondent Characteristics and Satisfaction with Using the Postpartum Mother's Gymnastics Application (SIMPOR)

<b>Characteristics</b>	<b>p value*</b>
Mother's Age	0.317
Education	0.093
Work	0.022
Parity	0.031
Age of youngest child	0.041

**DISCUSSION**

The assessment of the development of an application is assessed by user satisfaction. User satisfaction or dissatisfaction is a response to an assessment of the discrepancy between expectations and effectiveness after use. There are 5 dimensions of satisfaction, namely tangible, reliability, responsiveness, assurance, and empathy[16].

The tangible dimension is the application's ability to show its existence to users. This tangible characteristic is very important because respondents need real experiences that their senses can feel for themselves. This means that the quality of the product can be felt in real terms. This includes the facilities or features provided in the application, as well as the appearance of the application. Display dimensions measure user

satisfaction in terms of the appearance of an application. This application has been made as attractive as possible and looks simple. The features provided include registration/filling in biodata, monitoring postpartum involution, explanations that provide health information for postpartum mothers, in the form of materials, guides and videos of postpartum exercise. Additionally, if there is anything you wish to discuss, Mothers are also facilitated in sharing via the About Us feature to contact the Development Team. Based on the research results, the majority of the tangible dimensions were in the very satisfied category with 124 out of 152 respondents (81.6%). So, it can be concluded that the SIMPOR application is considered tangible, that is, respondents can feel its quality both in terms of feature use and the appearance of the application.

Reliability, namely the ability of the application to provide benefits accurately and reliably. Performance that meets user expectations in terms of timeliness, providing services or information without errors, and providing a positive impact. Accuracy means that the information provided is right on target and on time. The information submitted must also be the latest/updated. Old information will no longer have value because the information is the basis for decision-making. This application has been designed to suit the current situation, namely providing information about the uterine involution process and how to monitor it for early detection of postpartum complications. Based on the research results, The reliability dimension is mostly in the very satisfied category, 127 out of 152 respondents

(83.6%). So, it can be concluded that the SIMPOR application is considered useful, namely that respondents can experience various benefits, both from online postpartum exercise and the health information provided.

Responsiveness, namely the ability to provide fast and accurate service, ease of use, and provide clear information delivery. Easy to use and access are important points in an information system, and try to design a system with a user-friendly interface so that users can easily use this application. The better the ease felt by users in using the application, the greater their satisfaction will be[17]. Based on the research results, the Responsiveness dimension was mostly in the very satisfied category with 125 out of 152 respondents (82.2%). So, it can be concluded that the SIMPOR application is considered responsive, that is, respondents can feel the ease of using SIMPOR features because the service provided is fast and precise. Respondents can communicate directly with the application owner through one of the About Us sharing features to contact the development team so that when problems arise in accessing the application or regarding the results of monitoring children's growth and development, respondents get a quick response.

Guarantee and certainty (assurance), namely an explanation of how to use the application, as well as the application's ability to foster trust and a sense of security for users. The SIMPOR application does not store user identity so it is safe from data leaks. Apart from that, using the SIMPOR application does not interfere with the use of the gadget or the use of other applications contained in

the gadget. Based on the research results, the dimensions of guarantee and certainty (assurance) were mostly in the very satisfied category with 110 out of 152 respondents (72.3%). So, it can be concluded that the SIMPOR application is considered safe from data leaks or interference when using it. Respondents are not worried about data leaks or problems with their gadgets when using the SIMPOR application. To make it easier to use, the respondent has been provided with an application user manual.

Empathy, namely according to user needs, helping users solve certain problems, understanding users' desires, and can be used at any time. If the mother does not have time to check her postpartum period with a midwife or community health center, then the uterine involution process can be monitored using this application. This monitoring has been designed according to the postpartum period. If problems or deviations are found in the uterine involution process, then there are suggestions or recommendations that the mother should take. Based on the research results, the majority of the empathy dimensions were in the very satisfied category with 123 out of 152 respondents (80.9%). So, it can be concluded that the SIMPOR application is considered empathetic, that is, respondents can use the SIMPOR application according to their needs and according to the child's age.

All respondents used all available application features during the 2 weeks of research. The features available in the application are designed in such a way as to meet the mother's needs, especially in monitoring the uterine involution process and

the mother's postpartum exercise movements. If the mother is unable to attend postpartum control at the public health centre, then this application can be used to monitor the uterine involution process. This application also provides postpartum exercise movements starting from warm-up, movements from the first day to the tenth day, as well as an About Us sharing feature.

Based on bivariate data analysis, the results showed that the mother's job characteristics, parity, and the age of the youngest child had a significant relationship with respondents' satisfaction in using the SIMPOR application with a p-value  $< 0.05$ . Meanwhile, the characteristics of age and education do not have a significant relationship with respondent satisfaction with a p-value  $> 0.05$ .

Based on the research results, a p-value of 0.317, meaning  $p > 0.05$ , shows that there is no significant relationship between maternal age and respondent satisfaction in using the SIMPOR application. The results of this research are in line with research conducted by D. Susilawati & Nilakesuma (2021) which says that the age of the respondent is not related to satisfaction with a service, because everyone, both young and adult, wants to get the same information and health services. As for the results of this study, no relationship was found between age and respondent satisfaction [18]. This is possible because basically everyone needs health information both from health workers and from other media. The age range of 20-40 years is a productive age group who is not technologically illiterate and actively uses gadgets in everyday life. So, at this age, people

tend to use technological media as a source of information.

This is the same as the educational characteristics of respondents which also do not have a significant relationship with respondent satisfaction with a p-value of 0.093. The level of education is a stage of education that is determined based on the level of development. Education is one of the demographic factors that influences satisfaction. Higher education will make it easier to receive more and more varied information, so it will be easier to develop oneself, especially to seek health information and improve the health of oneself and one's family. Education influences a person's knowledge, including a person's behavior regarding lifestyle[19].

Someone who has a higher education tends to have good knowledge, so they will most likely be easy to use and understand this application. However, the results of the research that has been carried out show no relationship between the respondent's education and satisfaction with using the SIMPOR application. In line with research conducted by Munawir (2018), which states that a lower level of education is not related to satisfaction with health services. Satisfaction is not determined by education, but satisfaction is the hope of every application user[20]. According to Mar'at, the feeling of satisfaction is different for each individual, but the expression of satisfaction can be influenced by the environment and certain groups of society. As stated by Azrul Azwar, user satisfaction varies greatly so user satisfaction is not only influenced by

education but is influenced by other aspects [20].

The results of the analysis of employment variables differ from the mother's age and education. Maternal employment has a significant relationship with satisfaction in using the SIMPOR application with a p-value of 0.022 ( $p < 0.05$ ). The results of this research are in line with research conducted by Apsaryanthi & Lestari (2017). Working mothers tend to spend their time outside the home, so they have limited time with their children. This means that working mothers do not have much free time to monitor the process of uterine involution during the postpartum period and detect early danger signs during the postpartum period. This application can be used to monitor the involution process, postpartum mothers' exercise movements, and obtain health information, especially for working mothers who do not have time to control themselves during the postpartum period in the first 40 days[21].

The characteristics of parity and the age of the youngest child also have a significant relationship with satisfaction with a p-value of 0.031 for parity and 0.041 for the age of the youngest child. Parity is what shapes a mother's experience. Mothers who have more than one child will have more knowledge and experience than mothers who have one child. So, the experience that mothers have is very helpful in using the SIMPOR application, for example in the features for monitoring the uterine involution process such as checking postpartum bleeding, checking uterine contractions, and measuring the height of the uterine fundus.

Mothers who only have one child will have less knowledge and experience than mothers who have more than one child, especially in checking postpartum bleeding or uterine contractions. This is in line with research conducted by D. Susilawati & Nilakesuma (2021). From this research, it was concluded that parity has a significant relationship with satisfaction.

Overall, the respondent satisfaction category with this application is at the very satisfied level with a percentage of 88.16%. This means that the SIMPOR application is considered safe and easy to use, has an attractive and simple appearance, is very useful, and suits user needs and current conditions.

#### **LIMITATIONS**

In this research, details still need to be added to the information section about danger signs during the postpartum period and early detection of complications, audio music options need to be added so that users don't get bored when reading the health information/articles provided, and added integration with Play Store or App Store.

#### **NURSING IMPLICATION**

The SIMPOR application can provide benefits for its users, not only by enhancing knowledge about postpartum exercises but also by monitoring health during the postpartum period. Nurses can monitor the process of postpartum uterine involution using this application, enabling early detection of subinvolution disorders in postpartum mothers.

#### **CONCLUSION**

In general, satisfaction with the SIMPOR Application is in the very satisfied category, as well as with each dimension of satisfaction including the dimensions of functionality, reliability, usability, efficiency, maintainability, and portability. The SIMPOR application has provided benefits for its users, not only increasing knowledge about postpartum exercise but also monitoring health during the postpartum period.

#### **CONFLICT OF INTEREST**

No conflict of interest to disclose in this study.

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