

DESIGN OF THE “SOS BREASTFEEDING” APPLICATION FOR POST-PARTUM MOTHERS BASED ON ANDROID

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Abstract. The purpose of this study was to develop the "SOS (Stimulate Oxytocin & SEFT) breastfeeding" model of Oxytocin Stimulation therapy and Spiritual Emotional Freedom Therapy (SEFT), an android-based application for nursing mothers who experience anxiety, to increase maternal relaxation as preparedness for the Covid-19 pandemic. This project is aimed to design the "SOS breastfeeding" model for Oxytocin Stimulation therapy and SEFT, an android-based application for nursing mothers who experience anxiety as a preparedness for the COVID-19 pandemic. The research method used is the research and development (R&D) method. The research stages were a preliminary study by conducting a needs analysis/needs assessment. Using a draft model, the second stage of model development is developed through FGD by a team of experts, and then a limited initial test is carried out. After that, the product revision was carried out. Testing android-based application products through alpha tests and beta tests. The results showed that the application of SOS breastfeeding was effective in reducing anxiety and increasing the mother's milk production. The effects of alpha testing did not show any bugs or problems. The beta testing results show that the user accepts the "SOS breastfeeding" application well because of its usefulness, satisfaction, and ease of use.

Keywords: Android application, SEFT, SOS breastfeeding, oxytocin stimulation

INTRODUCTION

In March 2020, WHO declared the coronavirus outbreak a pandemic or global public health emergency (Cucinotta & Vanelli, 2020). The coronavirus disease 19 (COVID-19) is a highly contagious viral infection (WHO, 2020). The government has implemented “work from home” through Presidential Decree No. 7 of 2020a for all government and private employees (Pajarianto et al., 2020). This policy has resulted in people experiencing changes in their activities and travel during the COVID-19 pandemic (Irawan et al., 2021). Work from home is a call to stay home, including avoiding crowds, improving physical health, and preventing unnecessary travel. (Sumaedi et al., 2020; Utomo et al., 2020). The COVID-19 pandemic, which requires all residents, including breastfeeding mothers, to always be at home, makes mothers anxious (Ravaldi & Vannacci, 2020).

Disasters and emergencies can cause significant problems in infant nutrition. During the first six months post-partum, babies must be exclusively breastfed and must continue to be breastfed until they are one year old or more (DeYoung & Mangum, 2021; Utomo et al., 2020). Protecting the rights of breastfeeding mothers in emergencies is related to the hope of reducing infant mortality

under five in the post-disaster period due to diarrhea (Khajehaminian et al., 2019; MirMohamadaliie et al., 2019). Although breastfeeding is considered a natural physiological process, many post-partum mothers experience breastfeeding anxiety. Anxiety related to maternal stress reduces milk production by inhibiting the reflex for expressing milk, interfering with the release of oxytocin, and having detrimental physiological effects on breastfeeding, such as reducing the incidence of Early Breastfeeding Initiation (IMD), reducing the duration of breastfeeding, reducing the incidence of exclusive breastfeeding (Albra, 2021; Cardaci, 2017; Hoff et al., 2019; Meedya et al., 2021). Breastfeeding difficulties can also have an impact on mental health and depression (Coo et al., 2020). Because of that, accessible and effective treatment is essential. One of the innovative treatment approaches is through an android-based application, which can be done alone or with the support of a health care professional. During breastfeeding, a potential advantage of this approach is that the mother can access information and interventions anytime and does not require time-consuming or inconvenient face-to-face sessions (Ashford et al., 2017; Hamzehgardeshi et al., 2021).

Ways to deal with stress and anxiety while breastfeeding include relaxation meditation (relaxation exercises, guided imagery, music therapy, yoga, progressive muscle relaxation), music, lighting relaxation, and a combination of the three, which can increase milk production, cortisol levels, anxiety-related behaviors, and ease. And self-reported anxiety (Meedya et al., 2021; Yu et al., 2018). In addition, the Stimulation of Endorphin, Oxytocin, and Suggestive (SPEOS) method is the preferred intervention to stimulate the release of oxytocin through oxytocin and endorphin massage, providing comfort and growing confidence in mothers that milk must come out and mothers can breastfeed exclusively (Lestari et al., 2019).

Another way to calm down while breastfeeding is the Spiritual Emotional Freedom Technique (SEFT), a new EFT (Kustiawan, 2021). SEFT is a clinical procedure to relieve psychological stress such as anxiety and physical (Kalla et al., 2017; Karmiyati & Sari, 2018; Rancour, 2016). Following current technological developments, health services must be increasingly digital based. The purpose of this study was to design the "SOS breastfeeding" model for Oxytocin Stimulation therapy and SEFT, an android-based application for nursing mothers who experience anxiety as a preparedness for the COVID-19 pandemic.

Method

First Stages: Literature Study Stage

"The android-based "SOS breastfeeding" application begins with previous research, namely the Effectiveness of Oxytocin Stimulation Massage (PSO) and Emotional Freedom Therapy (EFT) Against Anxiety and Smooth Milk in Breastfeeding Mothers. This study aimed to produce an effective educational method to increase the smoothness of breastfeeding in nursing mothers with anxiety. This study's respondents were post-partum mothers with babies aged 0-6 months. The results showed that there was a difference in the average anxiety score of breastfeeding mothers after the intervention group therapy was 1.19 lower than the control group with a score $r = 0,432$ ($r > 0.05$), the average difference in the fluency of breastfeeding mothers after intervention group

therapy was 8.3 lower than the control group with a value $r = 0,129$ ($r > 0.05$). The relationship between anxiety and the smoothness of breastfeeding for breastfeeding mothers after therapy in the intervention group has a negative correlation with weak strength (Pearson correlation of -0.037. $r_{\text{count}} < r_{\text{table}}$ with a significance value of 0.854). The effectiveness of EFT on anxiety in breastfeeding mothers is tremendous (value *Cohen's d* 1,76), and the fluency of ASI in lactating mothers is excellent (value *Cohen's d* 1,51).

Second Stages: The design and Manufacture Stages

This research is a type of research and development known as Research and Development (R&D). Research and Development Methods are methods used to produce specific products and test the effectiveness of these products (Soltani et al., 2021). Steps in the Research & Development (R & D) method: A preliminary study by conducting a needs analysis/need assessment. A needs analysis was carried out to capture the wishes of the respondents required to support the formation of the draft model. A preliminary study will be conducted in 2021. Research members will conduct a preliminary study to test the effectiveness of oxytocin stimulation massage and anxiety EFT and smoothness of breast milk in nursing mothers. Respondents will be evaluated if the intervention is carried out independently using the Model Development application. The draft model that has been prepared is developed in a Focus Group Discussion (FGD). This FGD is a discussion forum attended by researchers, experts/experts, practitioners, representatives of respondents, and subjects involved in implementing product models. Researchers are assisted by IT to create applications. Prospective respondents entered through the Android-based "SOS breastfeeding" application. Prospective respondents measured their anxiety according to what they felt. After the anxiety results are known, the respondent will perform Oxytocin Stimulation and SEFT. After that, prospective respondents will be measured again about their anxiety and the smoothness of milk production. The researcher revised the validation. The next stage is the revised model validation results conducted in limited trials.

Third Stages: The Trial Phase

Application product testing goes through the alpha-testing and beta-testing stages. Alpha testing is a test that aims to ensure that the application is free from errors or bugs (Hai-Jew, 2022). Beta testing is often referred to as pre-release testing (Mohd & Shahbodin, 2015a). Beta testing is part of acceptance testing or User Acceptance Testing (UAT), an objective test carried out directly by application users.

Sample

We used a sample of 10 people. They tried using the "SOS breastfeeding" applications.

Ethical Clearance

This study was approved by the Research Ethics Committee, Poltekkes Kemenkes Tasikmalaya, No.KP-KEPK/0140/2022.

RESULT AND DISCUSSION

SOS Breastfeeding Application Database Relations

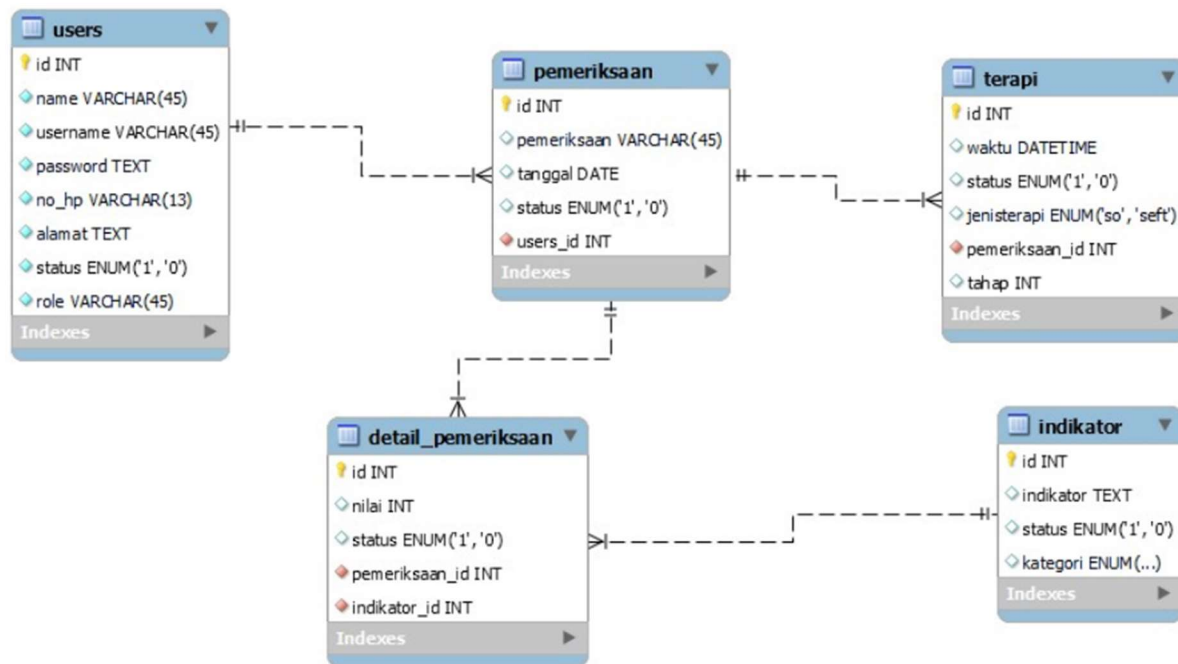


FIGURE 1. SOS Breastfeeding Application Databases Relations

This application contains five entities, as stated in **FIGURE1.**, namely: **Users**, which have user identity attributes such as username, username, and password to log into the application, user domicile address, role or user position in using the application (Test user, control user, and admin) as well as user id as a key attribute. **The examination** contains inspection attributes divided into three types: assessment of the baby's condition, the mother's disease, and the mother's anxiety level. There is also an attribute date or time the check was carried out to distinguish the user's initial and final assessments. **Examination Details** that contain attribute value. **Indicators** that have attribute indicators of each examination of the mother's condition, Baby's Condition, and Mother's Anxiety Level. **Therapy** that contains attributes of the type of therapy, namely Stimulation of Oxytocin (SO) and SEFT, and characteristics of date or time of medicine. Treatment time is divided into five stages, with a 24-hour delay from one therapy to the next.

Relations between entities: The user has a one-to-many relationship with Examination; The examination has a one-to-many relationship with Examination Details; The study has a one-to-many relationship with therapy; Examination Details have a many-to-one relationship with Indicators.

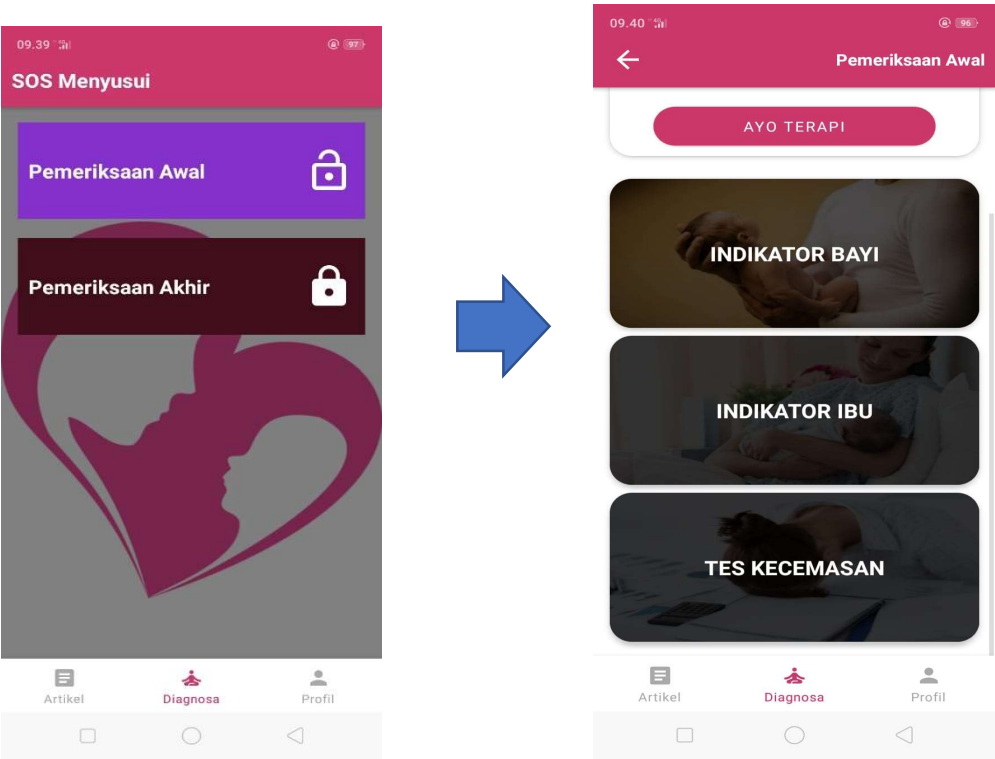


FIGURE 2. Initial Inspection Page



FIGURE 3. Initial Examination

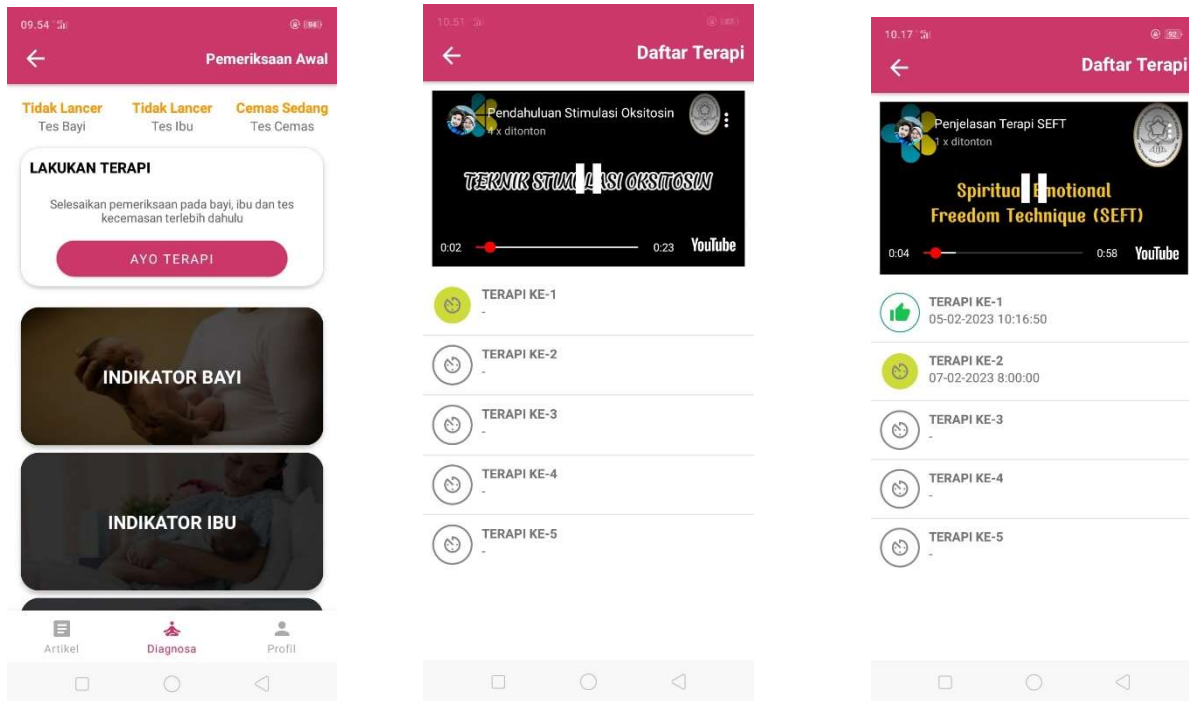


FIGURE 4. Starting Therapy Oxytocin Stimulation & SEFT

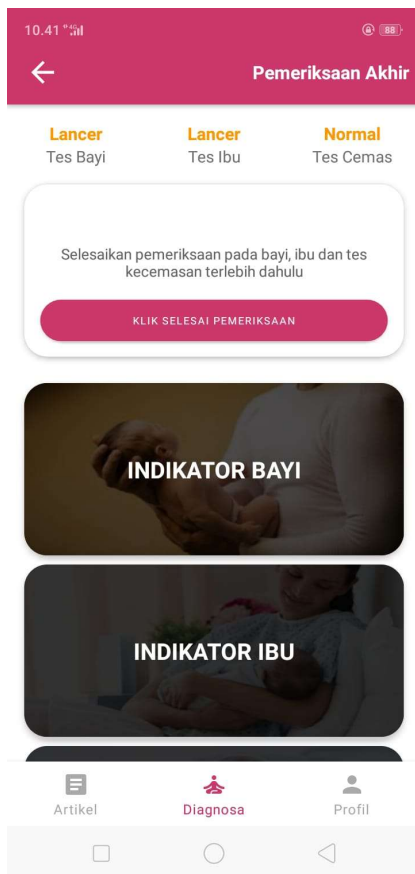


FIGURE 5. Last examination

The description contained in the application is shown in FIGURES 2, 3, 4, and 5. The initial inspection page is shown in FIGURE 2. The initial examination is shown in FIGURE 3. Starting therapy oxytocin stimulation and SEFT are shown in FIGURE 4. The last test is shown in FIGURE 5.

System Testing

This stage is the stage of system testing on the application being built and is the essential thing that aims to find errors or deficiencies in the application being made. This test intends to determine whether the application has met the design criteria. Testing of the application system will use a testing strategy, alpha testing, and beta testing.

Alpha testing. This testing stage is testing the system built to find errors, deficiencies, or other problems from the application system created to measure anxiety levels, breast milk production, and SEFT exercises, as stated in Table 1.

TABLE 1. Alpha Testing Results

Class Test	Points Testing	Types of Testing
Login	Data Login	Black Box
	Login Data Validation	Black Box
Diagnostics	Examination	Black Box
	Validation Examination	Black Box
Articles	Viewing Article	Black Box
Profile	Displaying Profile	Black Box
	Exit Application	Black Box
Baby Indicator	Selecting Indicator	Black Box
	Verifying Diagnostic Results	Black Box
Mother Indicator	Selecting Indicator	Black Box
	Verifying Diagnostic Results	Black Box
Testing Anxiety	Selecting Indicator	Black Box
	Verifying Diagnostic Results	Black Box

Therapy	Validating Diagnostic Results Indicators of Infants, Indicators of Mothers, and Anxiety Tests	Black Box
	Displays Types of Therapy	Black Box
Oxytocin Stimulation	Selecting Stages of Therapy	Black Box
	Play Video of Therapeutic Movement Series	Black Box
	Displays Schedule of Next Therapy Stages	Black Box
	Validation of Therapy Stages	Black Box
SEFT	Selecting Therapy Stages	Black Box
	Plays Video of Therapeutic Movement Series	Black Box
	Displays Schedule of Next Therapy Stages	Black Box
	Validation of Therapy Stages	Black Box

Betha testing. Beta testing is a series of user acceptance tests conducted before the product is launched to the public. This test aims to find and identify as many bugs or problems as possible in the system and the use of the product. Beta testing is carried out by involving several users called beta testers. The result of Betha testing is stated in Table 2.

TABLE 2. Mean Score According to Variable/Category

Variable	Mean Score	Description
Useful	91.6	Very feasible
Ease of use	91.75	Very feasible
Ease of Learning	87.3	Very feasible
Satisfaction	89.7	Very feasible
Average	90.09	Very feasible

Current technological advances allow everyone to maximize smartphone functions by downloading applications that facilitate various access to information (Kurniasih et al., 2022; Mayasari & Jayanti, 2020). The SOS breastfeeding application was designed to increase mothers' milk production and reduce post-partum anxiety through self-stimulating oxytocin and SEFT to make it easier for the community. This application has gone through various tests. The first test is alpha testing. Alpha testing uses a black box to see which application features and functionality can be executed according to user requests (Mohd & Shahbodin, 2015b; Ruhiawati et al., 2021).

The second test in making the Android-based application "SOS Breastfeeding" is beta testing. Beta testing is a series of user acceptance tests before the product is launched to the public (Hernández Bécares et al., 2017; Mohd & Shahbodin, 2015b). The purpose of this test is to find and identify as many bugs or problems as possible in the system and use of the "SOS breastfeeding" application. Beta testing is a type of closed beta testing; that is, the researcher only uses 15 respondents with certain conditions.

The next test is usability testing. The usability aspects tested on the product application 'SOS breastfeeding' include usefulness, satisfaction, and ease of use (Jeong et al., 2019; Weichbroth, 2020). These three aspects of testing are related to one another. If one part has a high yield, other elements are also high (Fuller-tyszkiewicz et al., 2018). This goes the other way around. Based on the analysis of data recapitulation, it can be seen that the application "SOS breastfeeding" is acceptable to users.

Trauma and natural and artificial disaster events can predict post-partum maternal psychological distress (Ostacoli et al., 2020). Since the COVID-19 health problem, all service arrangements in the world have changed, including health services due to the pandemic (Doğan & Aytaç, 2022; Dwivedi, L. K., Rai, B., Shukla, A., Dey, T., Ram, U., Shekhar, C., Dhillon, P., Yadav, S., & Unisa, 2020). Several hospitals worldwide have a policy that only patients with a certain level of disease can access the hospital (Birkmeyer et al., 2020). Some vulnerable groups cannot access health services in hospitals (Kartilah & Februanti, 2022). The powerless group includes post-partum mothers. People do this with certain diseases not infected by COVID-19 (Birkmeyer et al., 2020).

Supporting mothers to continue breastfeeding during the COVID-19 pandemic is a public health priority (Sakalidis et al., 2021). During the COVID-19 pandemic, breastfeeding women experienced limited access to support, placing them at increased risk of mental health problems and little breastfeeding assistance (Sakalidis et al., 2021). The COVID-19 pandemic can have a devastating impact on maternal mental well-being among postnatal women. Transition to motherhood is a period when women experience physical and psychological changes, adapt to new family relationships, and share various knowledge and skills of caring for children and breastfeeding their babies, making post-partum mothers vulnerable to anxiety and causing a decrease in the duration and quantity of breastfeeding (Ceulemans et al., 2021; Chen et al., 2022; Pacheco et al., 2021; Sakalidis et al., 2021). The results of Sakalidis et al. (2021) state that

professional lactation assistance that can be accessed during a pandemic is urgently needed so that exclusive breastfeeding is not interrupted due to breastfeeding mothers' anxiety (Sakalidis et al., 2021).

SEFT is a relaxation technique using a combination of body systems and spiritual healing techniques by pressing on specific points on the body. The SEFT technique, from various findings given to individuals in multiple fields, can reduce stress, depression, and anxiety (Fadli et al., 2020). Stimulation of acupuncture points in the EFT protocol breaks the sympathetic nervous system's hyperarousal cycle more quickly than other forms of desensitization, thereby allowing more rapid relief of symptoms and may also benefit physical health. This method can be safely applied to all age groups, including the elderly, pregnant women, and children, including post-partum mothers. EFT can treat various problems, such as anxiety, sadness, and self-confidence. EFT produces positive effects and has no side effects (Vural & Aslan, 2019).

CONCLUSIONS

The results of alpha testing did not show any bugs or problems. The beta testing results show that the user accepts the "SOS breastfeeding" application well because of its usefulness, satisfaction, and ease of use. The Android-based application "SOS Breastfeeding" effectively reduces anxiety and increases milk production for postpartum mothers as disaster preparedness.

We recommend that further research be carried out immediately in the form of a wide trial of the Android-based "SOS Breastfeeding" application.

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