



The Impact of Using the Pregnancy and Baby Tracker Application on Anxiety Among Pregnant Mothers

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Article Info

Article History

Received: Jan 16, 2025

Revised: Jan 19, 2025

Accepted: Jan 24, 2025

Keywords:

Anxiety, application, pregnant women

ABSTRACT

In today's digital era, information technology has great potential to help reduce anxiety in pregnant women by providing accurate and easily accessible information. One of the innovations that has been developed is a mobile application specifically designed to support the health of pregnant women and babies. The purpose of this study was to analyze the effect of using the pregnancy and baby tracer application on the anxiety of pregnant women in the Pangkajene Health Center work area, Sidenreng Rappang Regency. The type of research used was a quasi-experimental study. The design used was a pretest-posttest with control group design. The population was all pregnant women who made pregnancy visits at the Pangkajene Health Center and a sample of 52 pregnant women with a classification of 26 pregnant women who were given pregnancy and baby tracer application intervention and 26 pregnant women only received ANC services. Anxiety was measured using the HARS questionnaire. Data analysis used Paired T-Test and Mann Whitney. The results of this study showed a decrease in anxiety scores after receiving pregnancy and baby tracer application intervention. The conclusion of the study is that there is an influence of the use of the pregnancy and baby tracer application on the anxiety of pregnant women in the Pangkajene Health Center work area.

INTRODUCTION

Maternal health is one of the critical aspects in efforts to improve the overall quality of public health. Good maternal health during pregnancy significantly impacts the health of the newborn. However, pregnancy is often accompanied by various worries and anxieties that can affect the well-being of expectant mothers. Studies show that approximately 20-30% of pregnant women experience at least one mental health disorder. The most common mental health issue during the perinatal period (pregnancy and postpartum) is anxiety. This anxiety may stem from various factors, including a lack of information about pregnancy, physical and hormonal changes, as well as concerns about the childbirth process and the baby's health (Maki, Pali and Opod, 2018; Syafrie, 2018; Yasin Zakiyah, Sumarni Sri, 2019). The level of anxiety among pregnant women varies depending on how well they prepare for their pregnancies. Not all expectant mothers are aware that physical and psychological aspects are interconnected and mutually influential (Andi Nurul Marifah, Masriadi and Sartika, 2022). If not addressed seriously, anxiety and worry during pregnancy can negatively affect the physical and

psychological well-being of both the mother and the fetus. Anxiety tends to escalate as the due date approaches, particularly during the third trimester, when mothers start to worry about the labor process and the baby's condition. Pregnant women experiencing stress and anxiety during the third trimester are at risk of elevated stress hormone levels, which can impair uterine blood flow and weaken uterine muscle contractions (Himawati, Hidayanti and ..., 2018; Latifah, 2019)

In the digital era, information technology holds significant potential for reducing maternal anxiety by providing accurate and easily accessible information. One notable innovation is mobile applications specifically designed to support maternal and child health. Applications such as Pregnancy and Baby Tracker offer various features to help pregnant women monitor their health and that of their fetus, as well as provide relevant information about pregnancy and childbirth preparation.

The working area of the Pangkajene Health Center in Sidenreng Rappang Regency is one of the regions with a relatively high level of maternal anxiety. Preliminary data from the health center indicate that many pregnant women experience anxiety due to a lack of information and support during pregnancy. This condition underscores the need for effective interventions to alleviate maternal anxiety. According to a study conducted by Sartika (2021), an alarming number of individuals at the Pangkajene Health Center were found to be suffering from various mental health disorders. Specifically, 35 individuals (29.9%) were diagnosed with depression, 52 individuals (44.4%) experienced anxiety, and 21 individuals (17.1%) were reported to be struggling with stress. These statistics highlight the substantial prevalence of mental health issues within this community (Sartika, Hikmah and Sani, 2021). This study aims to evaluate the impact of using the Pregnancy and Baby Tracker application on the anxiety levels of pregnant women in the Pangkajene Health Center working area. By understanding the effects of using this application, this research seeks to identify practical solutions to reduce maternal anxiety through the utilization of information technology.

METHODS

This study employed a quantitative approach with a pre-experimental design using a one-group pretest-posttest model. The study was conducted in the working area of the Pangkajene Health Center, Sidenreng Rappang Regency. The population consisted of pregnant women who were registered in the health center during the study period. The sample consisted of 52 pregnant women in their third trimester, divided equally into two groups: 26 participants in the control group and 26 in the intervention group. It was determined using purposive sampling based on specific inclusion criteria, including willingness to participate, ownership of a smartphone, and no history of mental health disorders.

Data were collected using a validated questionnaire to measure anxiety levels before and after the intervention. The intervention involved the use of the Pregnancy and Baby Tracker application for a period of four weeks. Participants were guided on how to install and use the application, which includes features such as pregnancy tracking, health tips, and relaxation techniques.

The collected data were analyzed using paired sample t-tests to compare pretest and posttest anxiety scores. Statistical analysis was conducted to determine the significance of

changes in anxiety levels after the intervention. A significance level of $p < 0.05$ was considered statistically significant. The study was conducted with approval from the relevant ethics committee (RK: 90/KEPK/STIK/XII/2024), and informed consent was obtained from all participants prior to the study. Participants were assured of the confidentiality of their data and were free to withdraw from the study at any time.

RESULTS

The study was conducted at the Pangkajene Health Center from October to December 2024. A total of 52 pregnant women who visited the health center during this period were successfully recruited as respondents. Data collection was performed using a questionnaire as the primary instrument for interviews. The collected data were then processed and analyzed using the SPSS software program.

The characteristics of the respondents in this study included distributions based on general characteristics such as maternal age, education level and parity. These characteristics were analyzed to provide an overview of the demographic and clinical background of the participants.

Table 1. Characteristics of Pregnant Women at Pangkajene Health Center, Sidenreng Rappang Regency

| Variable | Intervention | | Control | | |
|-----------------|------------------------------|----|---------|----|------|
| | n | % | n | % | |
| Age | ≤ 20 years | 3 | 11,5 | 0 | 0 |
| | 21-35 years | 23 | 88,5 | 26 | 100 |
| Education level | Completed Elementary School | 1 | 3,8 | 7 | 26,9 |
| | Completed Junior High School | 2 | 7,7 | 5 | 19,2 |
| | Completed Senior High School | 13 | 50 | 8 | 30,7 |
| | Completed Higher Education | 10 | 38,5 | 6 | 23,2 |
| Parity | Nullipara | 5 | 19,2 | 2 | 7,7 |
| | Primipara | 5 | 19,2 | 8 | 30,7 |
| | Multipara | 15 | 57,8 | 14 | 61,6 |
| | Grand Multipara | 1 | 3,8 | 0 | 0 |

Source: Primary Data, 2024

The table illustrates the characteristics of pregnant women in the intervention and control groups at the Pangkajene Health Center, Sidenreng Rappang Regency, in 2024. In terms of age, the majority of participants in both groups were aged 21–35 years. Specifically, 88.5% of respondents in the intervention group fell into this age range, while 11.5% were aged ≤ 20 years. In the control group, all participants (100%) were aged 21–35 years, with no respondents aged ≤ 20 years. Regarding education level, the highest percentage in the intervention group is for participants who completed senior high school (50%), while the lowest is for those who completed elementary school (3.8%). In the control group, the largest percentage is also for participants who completed senior high school (30.7%), whereas the smallest percentage is for those who completed higher education (23.2%).

For parity, the majority of participants in both groups are multiparous, comprising 57.8% in the intervention group and 61.6% in the control group. The lowest percentage in the intervention group is for grand multiparous women (3.8%), while in the control group, there are no grand multiparous participants (0%).

Table 2. Differences in Pre-Test and Post-Test Anxiety Scores in the Intervention and Control Groups

| | Group | Anxiety Score | |
|--------------|------------|---------------|----------------|
| | | Mean | <i>p-Value</i> |
| Control | Pre-test | 25,96 | 0,000 |
| | Post -test | 22,35 | |
| Intervention | Pre-test | 21,85 | 0,000 |
| | Post -test | 18,92 | |

Source: Primary Data, 2024

Table 2 presents the results of the test comparing the pre-test and post-test anxiety scores in the intervention and control groups. There is a significant difference in the pre-test and post-test anxiety scores of pregnant women in the intervention group ($p=0.000$).

DISCUSSION

The majority of respondents in both the control and intervention groups were aged between 20 and 35 years, an ideal and safe age range for pregnancy. This finding aligns with Wahyudi's study, which states that maternal age can influence the level of knowledge. As individuals age, their thinking and decision-making abilities mature, enhancing their capability to perform tasks (Lisarsa and Handayani, 2022)

Most respondents in the intervention group had completed senior high school as their highest education level. Similarly, the majority of respondents in the control group also had senior high school education. Homogeneity tests showed that both groups had significantly similar characteristics. A study by Sukesih revealed that women with higher education levels are 8.1 times more likely to understand the warning signs of pregnancy compared to those with lower education levels. Education is really important to maintain information for pregnant women (Derakhshanpour et al., 2020; Shirabe et al., 2023)

The test comparing anxiety scores between the control and intervention groups showed a significant difference between the two groups. This indicates that the use of the Pregnancy and Baby Tracker application is proven to be more effective in reducing anxiety during pregnancy compared to the group that did not use the application. In this study, the Pregnancy and Baby Tracker application was utilized as an educational tool. The application provided materials not only in text format but also supported by visual content. Sundari's research demonstrated that media with visual content can enhance engagement and learning motivation. The use of the Pregnancy and Baby Tracker application was carried out for 30 days without specific frequency or duration guidelines (Mancinelli et al., 2022; Konsam et al., 2024)

According to Guilbert, as cited in Nursalam & Efendi, the success of health education depends on individual conditions, the subject matter, and the tools used. This emphasizes that

applications with structured usage schedules, adequate duration, and specified timeframes are more effective in improving health education outcomes (Uytsel et al., 2024)

CONCLUSION

This study demonstrates that the use of the Pregnancy and Baby Tracker application significantly reduces anxiety levels among pregnant women in the intervention group compared to the control group. The findings suggest that educational tools, such as mobile applications, can effectively provide pregnant women with essential information, enhance their preparedness for childbirth, and alleviate anxiety. The application proved to be an accessible and practical tool for supporting maternal health during pregnancy. Further studies should be conducted to explore the long-term impact of using mobile health applications on maternal and neonatal outcomes. Additionally, structured usage guidelines, including frequency and duration, should be developed to optimize the effectiveness of such applications.

ACKNOWLEDGMENTS

The authors would like to express their deepest gratitude to all those who contributed to the success of this research. Special thanks are extended to the Pangkajene Health Center, Sidenreng Rappang Regency, for their support and cooperation during data collection. We also extend our heartfelt appreciation to all the pregnant women who participated in this study for their time and willingness to be part of this research.

We are deeply grateful to LP2S Universitas Muslim Indonesia for providing the research grant that made this study possible. Our sincere thanks also go to the Dean of the Faculty of Public Health, Universitas Muslim Indonesia, for granting permission to conduct this research. Lastly, we acknowledge the support from our families and institutions, whose encouragement and assistance were invaluable throughout the research process

REFERENCES

- Andi Nurul Marifah, Masriadi and Sartika (2022) 'Pengaruh Dukungan Keluarga, Manajemen Diri, Kecemasan, dan Usia Kehamilan terhadap Kejadian Hipertensi Kehamilan di Puskesmas Majauleng', *Window of Public Health Journal*, 2(6), pp. 1507-1515. doi: 10.33096/woph.v2i4.809.
- Derakhshanpour, F. et al. (2020) 'Effect of a Psychoeducation Intervention on Postpartum Health', 4(4), pp. 8-16. doi: 10.52547/JCBR.4.4.8.
- Himawati, L., Hidayanti, A. N. and ... (2018) 'Hubungan Dukungan Suami Dengan Tingkat Kecemasan Ibu Menghadapi Persalinan Di Kabupaten Grobogan', *The Shine Cahaya Dunia Kebidanan*, 2(2).
- Konsam, M. et al. (2024) 'Effectiveness of Comprehensive Health-literacy And Relaxing Music (CHARM) intervention on pregnancy-related anxiety among low-risk primigravid women: A randomized controlled trial', *Psychology of Music*. doi: 10.1177/03057356241258958.
- Latifah, D. (2019) 'Pengaruh Konseling Terhadap Tingkat Kecemasan Ibu Primigravida Dalam Menghadapi Persalinan Di Bpm Hj . Sri Lumintu Effect of Counseling on Primigravida

- Mothers' Anxiety Level in Delivery at Hj . Sri Lumintu Independent Midwifery Practice', 7(1).
- Lisarsa, W. and Handayani, H. (2022) 'Determinan Kecemasan Ibu Hamil Selama Masa Pandemi Covid-19: Literatur Review', *Oksitosin : Jurnal Ilmiah Kebidanan*, 9(2), pp. 159-165. doi: 10.35316/oksitosin.v9i2.1673.
- Maki, F. P., Pali, C. and Opod, H. (2018) 'Gambaran Tingkat Kecemasan Ibu Hamil Primigravida Trimester III di Klinik Bersalin Sutra Minahasa Selatan', *Jurnal e-Biomedik*, 6(2), pp. 103-110. doi: 10.35790/ebm.6.2.2018.21889.
- Mancinelli, E. et al. (2022) 'The Efficacy of Digital Cognitive-Behavioral Interventions in Supporting the Psychological Adjustment and Sleep Quality of Pregnant Women with Sub-Clinical Symptoms: A Systematic Review and Meta-Analysis', *International Journal of Environmental Research and Public Health*, 19(15), p. 9549. doi: 10.3390/ijerph19159549.
- Sartika, Hikmah, N. and Sani, A. (2021) 'Gambaran Kesehatan Mental Ibu', *Kampurui Jurnal Kesehatan Masyarakat*, 3(2), pp. 61-68.
- Shirabe, R. et al. (2023) 'Support Needs for Anxiety among Pregnant Women in Japan: A Qualitative Pilot Study', *Women*, 3(1), pp. 95-106. doi: 10.3390/women3010008.
- Syafrie, I. R. (2018) 'Gambaran Pengetahuan Dan Kecemasan Ibu Hamil Trimester Iii Dalam Menghadapi Persalinan Di Wilayah Kerja Puskesmas Muara Aman Kecamatan Lebongâ Utara, Kabupaten Lebong Tahun 2016', *Journal Of Midwifery*, 5(1), pp. 1-8. doi: 10.37676/jm.v5i1.564.
- Uytsel, H. Van et al. (2024) 'Psychosocial interventions before conception and the impact on perinatal depression, anxiety and stress: A scoping review (Embase).', *searchRxiv*. doi: 10.1079/searchrxiv.2024.00572.
- Yasin Zakiyah, Sumarni Sri, M. N. D. (2019) 'Hubungan Usia Ibu dan Usia Kehamilan dengan Kecemasan Ibu Hamil dalam Menghadapi Persalunan di Polindes Masaran Kecamran Bluto', in *Prosiding 1st Seminar Nasional 'Arah Kebijakan dan Optimalisasi Tenaga Kesehatan Menghadapi Revolusi Industri 4.0'*, pp. 162-168.