# Smartphone-based prenatal attachment education application design improving maternal and fetal attachment to high-risk pregnant mothers at Putri Ayu Health Center Jambi City

Herinawati[1*], Yuli Suryati[1], Osvinarti[1], Melyana Nurul Widyawati[2], Iksaruddin[3]

[1] Jurusan Kebidanan, Poltekkes Kemenkes Jambi, Jambi, Indonesia
[2] Jurusan Kebidanan, Poltekkes Kemenkes Semarang, Semarang, Indonesia
[3] Jurusan Promosi Kesehatan, Poltekkes Kemenkes Jambi, Jambi, Indonesia
*Correspondence email: (Herinawati@poltekkesjambi.ac.id)

### Abstract

**Background**: The prevalence of high-risk pregnancies in the world is still relatively high, which is around 10-30%. Pregnant women with a high risk of 70-80% experience perinatal mortality and morbidity. The psychological impact of high-risk pregnancy is anxiety, stress, and the mother experiencing a crisis that can affect the relationship between mother and fetus. This condition can also continue in the relationship between mother and baby after birth. The purpose of this study was to determine the effect of Android-based Prenatal Attachment Education Applications on Mother and Fetus Attachment in High Risk Pregnant Women

**Methods**: This type of research is quantitative with a quasi-experimental design study that uses a one group pretest - posttest design without control group. The intervention provided was in the form of prenatal attachment education packaged in an application via mobile phones. The research sample was 40 pregnant women at Putri Ayu Public Health Center, Jambi City. The inclusion criteria in this study were pregnant women who could read and write. Exclusion criteria were respondents who were not willing to participate in the study.

**Results**: The results of the analysis using statistical tests obtained p-value = 0.000 so that there is a significant relationship between the application of prenatal attachment education and the attachment of the mother and fetus

**Conclusion**: maternal and fetal attachment can be improved with prenatal attachment education applications, for that it is expected that the puskesmas implement prenatal attachment education applications using mobile phones so that they can increase maternal and fetal attachment.

**Keywords:** Prenatal Attachment Education Application, Mother and fetus attachment

## BACKGROUND

The prevalence of high-risk pregnancies in the world is still relatively high. Approximately 10-30% of mothers who undergo routine antenatal care are diagnosed with a high-risk pregnancy and of these, 70-80% experience perinatal mortality and morbidity (1). According to WHO, there are about 800 pregnant women who die per day and 99% of these occur in developing countries. In general, the prevalence of high-risk pregnancies is 20% and 50% of deaths are caused by complications in pregnancy (2).

High-risk pregnancy conditions can affect the attachment of mother and fetus. This is because high-risk pregnant women may experience difficulties in fostering a relationship with the fetus because of the fear that pregnancy cannot be maintained or an anomaly occurs, in addition, high-risk pregnant women can also experience anxiety. The results showed that anxiety during pregnancy has a negative effect on maternal and fetal attachment (3).

Prenatal attachment is the bond between mother and fetus during pregnancy. This can be seen from the mother's

Herinawti, Yuli Suryati, Osvinarti, Melyana Nurul Widyawati, Iksaruddin

Smartphone-Based Prenatal Attachment Education Application Design Improving Maternal And fetal Attachment to High-Risk Pregnant Mothers at Putri Ayu Health center Jambi City

involvement in showing affection, care and commitment to take care of the fetus. Prenatal attachment plays an important role in maternal and fetal health and influences the mother's decision to behave in a healthy manner during pregnancy (4).

One method that can be used to increase maternal and fetal attachment is to provide health education to pregnant women. With the existence of health education is expected to increase the knowledge and skills of pregnant women. In addition, providing health education can motivate mothers to be involved in various activities carried out.

Nowadays it is easier to access information through smartphones, this is the main reason many people use smartphones. Support for smartphones is now growing very fast with various functions. Smartphones that are currently increasing sharply are Android. Android is a new breakthrough in the field of technology today, with its ease of use and being open source, making enthusiasts of this gadget more and more and has become a common thing.

The estimated number of high-risk pregnant women in Jambi City in 2020 was 1842 people (20% of the target pregnant women). conducted on April 22, 2021 at the Putri Ayu Health Center, Jambi City. The results of interviews with 10 high-risk pregnant women found that all pregnant women were anxious about their pregnancy, and did not know how to increase attachment during pregnancy (5).

The psychological impact of high-risk pregnancy is anxiety, stress and the mother experiences a crisis that can affect the relationship between the mother and the fetus. This condition can also continue in the relationship between mother and baby after birth. Therefore, it is necessary to make efforts to increase the attachment of mother and fetus, one of which can be done by providing education. The specific purpose of this study was to determine the effect of Prenatal Attachment Education Applications on Maternal and Fetal Attachment to High Risk Pregnant Women at Putri Ayu Health Center Jambi City in 2022.

**METHOD**

This type of research is quantitative with a quasi-experimental design study that uses a one group pretest - posttest design without control group. Measurement of maternal and fetal attachment variables in high-risk pregnant women is carried out before being given an intervention, which will be observed at the beginning (pretest) after which the last observation (posttest) will test the changes that occur after the intervention. The intervention provided was in the form of prenatal attachment education packaged in an application via mobile phones.

The time of the study was January to October 2022. The population in this study were all high-risk pregnant women who were examined at the Putri Ayu Public Health Center in Jambi City. The sampling technique used is purposive sampling according to the inclusion criteria, namely pregnant women who are categorized as high risk according to medical diagnosis, the fetus does not have abnormalities, and physically and psychologically the mother is declared healthy, totaling 40 people. The variables measured in this study consisted of the independent variable, namely the application of prenatal attachment education. The dependent variable in this study is the attachment of the mother and fetus to high-risk pregnant women before being given a smartphone-based prenatal attachment education application and the attachment of mother and fetus to high-risk pregnant women after being given a smartphone-based prenatal attachment education application. Data was collected using a questionnaire to measure this study using a prenatal attachment inventory (PAI) questionnaire to measure prenatal attachment.

The inclusion criteria in this study were pregnant women who could read and write. Exclusion criteria were respondents who were not willing to participate in the study. The instrument used to measure prenatal attachment in this study is the Indonesian version of the Prenatal Attachment Inventory (PAI), which has been translated, adapted by researcher Suryaningsih (6) and has received approval from the original researcher of PAI.

Herinawti, Yuli Suryati, Osvinarti, Melyana Nurul Widyawati, Iksaruddin

Smartphone-Based Prenatal Attachment Education Application Design Improving Maternal And fetal Attachment to High-Risk Pregnant Mothers at Putri Ayu Health center Jambi City

The Indonesian version of PAI consists of 21 items referring to 4 Likert scales with scores ranging from 21 to 84. The higher the score, the higher the level of prenatal attachment (7).

Data collection techniques by way of interviews using a questionnaire. Questionnaires were given to pregnant women before being given education and after being given education. Education is given four times to pregnant women. The first education is given when the pregnant woman visits the puskesmas and the next education is given at the pregnant woman's home. Education is given in accordance with the agreement of pregnant women. Data Analysis In this study, data analysis was carried out using the help of computerized programs including: Prior to data analysis, a normality test was carried out. Data normally distributed using a parametric test, while the data is not normally distributed using a non-parametric test. Analysis of the characteristics of the respondents on research subjects including age, occupation, education and parity before treatment using paired t-test, effectiveness analysis using paired t-test application.

## RESULTS

Based on the results of the study, it was found that the average pretest was 58.78 and increased to 78.20. The results of statistical tests showed that there was a significant relationship between the application of prenatal attachment education and maternal and fetal attachment (p-value < 0.001)

**Table 1.** The Effect of Prenatal Attachment Education Applications With Maternal and Fetal Attachment

| Intervensi | Mean | N | p-value |
|---|---|---|---|
| Pre test | 58,78 | 40 | 0,000 |
| Post test | 78,20 | 40 | |

## DISCUSSION

The results showed that there was a significant relationship between the application of prenatal attachment education with maternal and fetal attachment. The average score of maternal and fetal attachment before being given education was 58.78 and increased to 78.20 after being given prenatal attachment education. The results of this study are in line with research conducted by Mariani, et al (2020) which showed that there was a significant difference in maternal and fetal attachment before and after intervention with p-value of 0.000 (p < 0.000) (8). Sastaad (2011) also stated that one way to increase maternal and fetal attachment is to provide prenatal attachment education. This attachment prenatal education trains the mother to feel the presence of the fetus by counting fetal movements (9). The research of Baghdari, Sahebzad, Kheirkhah, & Azmoude (2016) showed that there was a significant difference in maternal and fetal attachment scores between the intervention group and the control group. This shows that the education carried out can increase the interaction between mother and fetus (10).

Pregnant women were selected according to inclusion and exclusion criteria. four interventions were carried out when pregnant women visited health services. The intervention is carried out when the pregnant woman has finished carrying out the examination and the next intervention is carried out at the pregnant woman's home. Education is provided by providing counseling to pregnant women and also using smartphones.

Pregnant women with high risk will affect the attachment of mother and fetus, this is because pregnant women with high risk can have difficulty in fostering a relationship between the fetus and the fetus due to a feeling of fear that pregnancy cannot be maintained or an anomaly occurs in the fetus, besides pregnant women with high risk experiencing anxiety (11). Cevirme, Ilcioglu, & Hamlaci (2017) conducted a study of 502 pregnant women and the results of the study found that anxiety during pregnancy has a negative effect on maternal and fetal attachment (12).

One method that can be used to increase the attachment between the mother and the fetus is to provide health education to pregnant women. Health education is expected to increase the knowledge and skills of pregnant women. In addition, providing

Herinawti, Yuli Suryati, Osvinarti, Melyana Nurul Widyawati, Iksaruddin

Smartphone-Based Prenatal Attachment Education Application Design Improving Maternal And fetal Attachment to High-Risk Pregnant Mothers at Putri Ayu Health center Jambi City

health education can motivate mothers to be involved in various activities carried out. Currently, it is increasingly easy to access information via smartphones, this is the main reason many people use smartphones. Smartphone support is now growing very fast with a variety of functions. The smartphone that is currently in demand is increasing sharply, namely Android. Android is a new breakthrough in today's technology field, with its ease of use and open source nature making more and more enthusiasts of this gadget and it has become a common thing.

To increase the attachment of mother and fetus, one way that can be done is to provide education to pregnant women. With the existence of health education is expected to increase the knowledge and skills of pregnant women. In addition, providing health education can motivate mothers to be involved in various activities carried out. The education that can be given is prenatal attachment. One of the prenatal attachment education interventions given in this study was to train the mother to feel the presence of the fetus by counting fetal movements. This is based on the emergence of attachment between mother and fetus when the fetus is getting bigger, especially during quickening. Pregnant women who can feel fetal activity show higher attachment.

## CONCLUSION

Based on the results of the study, it can be concluded that the attachment of the mother and fetus can be improved by building a smartphone-based prenatal attachment educational application.

## REFERENCES

1. Farajnezhad F, Shaahmadi F, Fashi Z, Daaylar L. Prevalence of High Risk Pregnancy and Some Relevant Factors in Referred Women to Health Centers. J Sci Achiev. 2017;2(12):4–7.
2. WHO. World Health statistics 2020: Monitoring Health for the SGDs. World Health Organization; 2020.
3. Çevirme A, Özdemir, Ilcioglu K, Hamlaci Y. Anxiety and Prenatal Attachment Levels in Pregnancy and Influencing Factors. New Trends Issues Proc Humanit Soc Sci. 2017;4(2):11–20.
4. Baro'ah R, Jannah M, Nurisa E, Setya D. The Relationship Between Anxiety Levels in Third Trimester Pregnant Women and Prenatal Attachment Scores in Rina's Independent Midwife Practice Malang. 2020.
5. Dinas Kesehatan Kota Jambi. 2020 Annual Report. Jambi: Dinas Kesehatan Kota Jambi; 2021.
6. Suryaningsih. Indonesian Version of Prenatal Attachment Inventory. National Taipei University of Nursing and Health Sciences; 2015.
7. Muller M. Development of the Prenatal Attachment Inventory. West J Nurs Res. 1993;15(2):199–215.
8. Mariani, Wahyusari S, Hikmawati N. Prenatal Attachment Education Improves The Level Of Prenatal Attachment In High Risk Pregnant Women. J Ilm Perawat Manad. 2020;8(1):34–51.
9. Saastad E, Israel P, Ahlborg T, Gunnes N, Frøen J. Fetal Movement Counting—Effects on Maternal-Fetal Attachment: A Multicenter Randomized Controlled Trial. Birth. 2011;38(4):282–93.
10. Baghdari N, Sahebzad ES, Kheirkhah M, Azmoude E. The Effects Of Pregnancy-Adaptation Training On Maternal-Fetal Attachment And Adaptation In Pregnant Women With A History Of Baby Loss. Nurs midwifery Stud. 2016;5(2).
11. Rifkin JB. Prenatal Attachment During Antepartum Hospitalization: Associations with Pregnancy Planning, Partner Relationship, and Postpartum Depression and Anxiety [Internet]. 2007. Available from: https://repositories.tdl.org/utswmedir/bitstream/handle/2152.5/535/rifkinjamie.pdf?sequence=3.
12. Çevirme A, Özdemir, Ilcioglu K, Hamlaci Y. Anxiety And Prenatal Attachment Levels In Pregnancy And Influencing Factors. New Trends Issues Proc Humanit Soc Sci. 2017;4(2):11–20.