

The Effect of Fetal Stimulation on the Quality of Life of Pregnant Women and Fetal Heart Rate

Arista Apriani¹ *, Yunia Renny Andhikantias¹, Dheny Rohmatika¹, Ernawati¹,
Megayana Yessy Mareta¹, Wijayanti¹, Deny Eka Widyastuti¹

¹Faculty of Health Science, Department of Midwifery, Universitas Kusuma Husada Surakarta, Central Java, Indonesia

*E-mail: arista_apriani@ukh.ac.id

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ABSTRACT

Pregnancy can have a positive or negative effect on a woman's life in her reproductive cycle. Evaluation of the quality of life of pregnant women can aim to improve the effectiveness of health services. Stress in the form of high anxiety in pregnant women can affect the pattern of fetal heart rate. The aim is to describe the effect of fetal stimulation on the quality of life of pregnant women and fetal heart rate. The time for carrying out the research is September 2021 - May 2022 at the Puskesmas. This type of quasi-experimental research. The sample technique used purposive with a total of 30. Data analysis used ANACOVA and controlled for pretest scores and level of education. The experimental group got a quality of life score 22.99 points higher (b = 22.99; 95% CI; 20.56 to 25.41; p < 0.001). Adjusted R² = 95.2%. And the fetal heart rate score was 0.14 points higher (b = 0.14; 95% CI; -0.03 to 0.32; p < 0.001). Adjusted R² = 43.9%. In conclusion, there is an effect of fetal stimulation on the quality of life of pregnant women and fetal heart rate.

INTRODUCTION

Maternal, Infant and Under-five Mortality Rate is an indicator that describes the welfare of society in a country. Therefore, efforts to improve maternal health during the reproductive cycle and children must receive special attention. From pregnancy to 2 years of age, is the most rapid period of brain growth and development (Kemenkes RI, 2018).

Pregnancy is a period that can have a positive or negative impact on a woman's life in her reproductive cycle. Thus,

evaluating the quality of life of pregnant women can aim to increase the effectiveness of health services. The results showed that happiness at motherhood and body image had the greatest positive and negative effects on health-related quality of life (Calou *et al.*, 2018).

Mental health during pregnancy plays an important role in the psychological state and well-being of pregnant women (Giangiordano *et al.*, 2020; Ponting *et al.*, 2020). Quality of life during pregnancy is very influential with mental health during pregnancy because

pregnant women are vulnerable to emotional changes (Battulga *et al.*, 2021).

Pregnant women's subjective perception of quality of life is an important measure of the quality and effectiveness of health services for mothers and children. Assessment of QoL during pregnancy has become increasingly important in recent years to investigate the relative effectiveness of prevention and treatment programs in pregnant women in relation to reduced maternal mortality and morbidity. In order to satisfy clients, health workers in providing services aim not only on the basis of saving lives, but also improving the quality of life of clients (Mogos *et al.*, 2013).

Research on pregnancy has received little attention and some have examined quality of life and the factors that influence it during pregnancy (Lagadec *et al.*, 2018). It should be emphasized that the changes experienced by pregnant women are temporary, but can significantly change their quality of life. Health workers must know and implement effective health services by providing pregnant women with the knowledge and skills to deal with them (Narchi, 2010).

The results of previous studies indicate that providing early stimulation training for fetal growth and development

using video media and flash cards can increase knowledge and skills of mothers and affect the decrease in levels of anxiety and depression in pregnant women (Apriani *et al.*, 2021). The results of other studies show that stress in the form of high anxiety in pregnant women can affect the pattern of fetal heart rate (Makino *et al.*, 2009). There is an effect of mural classical music stimulation on increasing fetal heart rate and fetal movement in pregnant women in the second and third trimesters which is statistically significant (Fatmawati, 2013).

The formulation of the problem in this study is "Is there any influence of fetal stimulation using video media and flash cards on the quality of life of pregnant women and fetal heart rate?". Also, this study aims to statistically describe the results of the analysis of the effect of fetal stimulation on the quality of life of pregnant women and fetal heart rate.

METHODS AND MATERIALS

We received ethical approval for this research on September 9 2021 with letter number 83/UKH.L.02 /EC/1X/2021 from the ethics committee of UKH Surakarta. Furthermore, our research will be carried out from September 2021 – May 2022 in the city of Surakarta.

This study used a quasi experiment (before and after with control experiment design). There are two groups that receive standard services for pregnant women from the puskesmas in the form of integrated ANC. The experimental group (applied 25 fetal stimulation movements with one exercise per day for 25 days), and the control group without additional treatment. The sampling technique was purposive at the Jaten I and Gambirsari Health Centers with a total of 30 respondents divided into two groups, then simple random sampling was carried out to determine which group would be the experiment or control. The inclusion criteria for research respondents included: normal pregnant women aged 20-25 years and gestational age >24 weeks. While the exclusion criteria were pregnant women experiencing health problems during the research process.

The variable in this study is fetal stimulation which is the independent variable. Quality of life of pregnant women and fetal heart rate is the dependent variable. We use the level of formal education as a covariate variable.

The instrument in this study used a questionnaire with a quality of life scale adopted from the World Health Organization (2004), namely WHOQOL-BREF. The results of filling out the scale are then given a score which is interpreted in the following criteria: 100-81 (very good), 80-61 (good), 60-41 (moderate), 40-21 (poor), 20-0 (very bad). The instrument measures the fetal heart rate using Fetal Doppler. So that the results of measuring the fetal heart rate are accurate and there are no errors in the examination, the fetal doppler used has been calibrated. The evaluation criteria are: normal DJJ: 120 x/minute to 160 x/minute. Abnormal FHR: <120 x/min or >160x/min.

Univariate data analysis techniques in this study used descriptive analysis, bivariate analysis used independent t tests, multivariate analysis used Analysis of Covarians.

RESULTS AND DISCUSSION

Table 1. Characteristics of subjects by level of formal education

Formal education level	Control group		Experimental group	
	n	%	n	%
< senior high school	0	0	1	7
≥ senior high school	15	100	14	93
Total	15	100	15	100

Table 2. Independent t-test statistical test results on the quality of life of the control and experimental groups

Skill variable	Groups	N	Mean	Std deviation	T	P
pretest	Control	15	50.67	8.389	0.024	0.981
	Experimental	15	50.60	6.663		
posttest	Control	15	53.53	8.823	-6.382	< 0,001
	Experimental	15	74.53	9.195		
Difference	Control	15	2.87	3.420	-14.849	< 0,001
	Experimental	15	23.93	4.301		

Table 1 shows the characteristics of the research respondents whose level of education is >90% senior high school. Table 2 shows the pretest-posttest bivariate analysis of the effect of video and flashcard fetal stimulation on the quality of pregnant women that we did with the result that the experimental group had a statistically significant mean higher than

the controls. The experimental group has a mean of 74.53 which is included in the good quality of life category and the control group is 53.53 which is included in the moderate quality of life category. The mean score difference between the pretest-posttest of the experimental group was 23.93 and the control was 2.87.

Table 3. Results of multiple linear regression analysis (ANACOVA) on the quality of life of pregnant women

Variable	Regression Coefficient B	Confidence Interval 95%		P
		Lower Bound	Upper Bound	
Constant	-4.279	-14.505	5.947	0.398
Pretest	1.072	0.908	1.235	< 0.001
Level of education	1.719	-5.080	8.518	0.608
Treatment	22.986	20.562	25.410	< 0,001

N = 30
Adjusted R² = 95.2%
P < 0,001

The results of multivariate analysis with ANACOVA are shown in table 3, namely fetal stimulation is statistically significant 95.2% can affect the quality of life of pregnant women by controlling for

education level and pretest scores (b = 22.99; 95% CI; 20.56 to 25, 41;p <0.001). Adjusted R2 = 95.2%.

Efforts to broaden the focus of health services aside from traditional

concepts are improving the quality of life through research and practice of health services. Thus interventions to promote psychological status or quality of life during pregnancy and the early postpartum period must be designed (Mortazavi *et al.*, 2014). The decline in maternal morbidity and mortality in recent years has led to other expectations in midwifery care such as improving the quality of life of mothers (James *et al.*, 2011).

During pregnancy a woman will experience various changes, such as physiology, biochemistry, and anatomy that cause anxiety, depression, and stress in pregnant women (Ghaffar *et al.*, 2017). In health services, quality of life gets the least attention, apart from administering standard medicines and vitamins for pregnant women, assessing the quality of life of pregnant women can provide a strong basis for providing health education or health promotion (Davidson *et al.*, 2013).

There is little research on quality of life during pregnancy. Quality of life during pregnancy has decreased compared to the period before pregnancy (Bennett and Culhane, 2013). Decreased quality of life of mothers during pregnancy caused by pregnancy complications, multigravida,

economic difficulties, unwanted pregnancies, employment, educational status, gestational age and mother's age (Abbaszadeh *et al.*, 2015); (Keshavarzi *et al.*, 2012); (Xia *et al.*, 2012). Health workers and the government must consider these factors to plan interventions and therapies related to efforts to improve the quality of life of pregnant women (Ishaq *et al.*, 2022).

In midwifery care, music is often used to stimulate fetal growth and development which is also useful for reducing stress and improving the health of pregnant women and the fetus (Dombrowska-pali *et al.*, 2018). Improves mood, supports medication and promotes health, quality of life and longevity (Therapies, 2012). Psychologically it is useful for strengthening bonding, reducing stress, causing relaxation, so that it can be physically beneficial as evidenced by smooth blood circulation, normal heart rate and oxygen saturation (Żychlińska *et al.*, 2008). Lowering arterial blood pressure in pregnant women (García González *et al.*, 2017). Music is also used for the treatment of pregnant women with preeclampsia (Toker *et al.*, 2017).

Table 4. The results of the independent t-test statistical test on the fetal heart rate of the control and experimental groups.

Variable	Groups	N	Mean	Std deviation	T	P
pretest	Control	15	0.87	0.352	0.000	1.000
	Experimental	15	0.87	0.352		
posttest	Control	15	0.87	0.352	-0.592	0.559
	Experimental	15	0.93	0.258		
difference	Control	15	0.07	0.258	-0.592	0.559
	Experimental	15	0.13	0.352		

The results of the bivariate analysis of the effectiveness of fetal stimulation on fetal heart rate are shown in Table 4, namely the experimental group has a statistically significant mean higher than the control group. The experimental group

had a mean of 0.93 and the control group had 0.87. The difference in the mean score of the pretest and posttest of the experimental group was 0.13 and that of the control group was 0.07.

Table 5. Results of multiple linear regression analysis (ANACOVA) on fetal heart rate

Variable	Regression Coefficient B	Confidence Interval 95%		P
		Lower Bound	Upper Bound	
constant	0.385	-0.151	0.922	0.152
Pretest	0.473	0.256	0.691	< 0,001
Level of education	0.068	-0.420	0.555	0.778
Treatment	0.141	-0.035	0.318	0.112

N = 30
Adjusted R² = 43,9%
P < 0,001

The results of the subsequent multivariate analysis with ANACOVA are shown in table 5, namely fetal stimulation is statistically significant 43.9% can affect fetal heart rate by controlling for education level and pretest score (b = 0.14; 95% CI; -0.03 to 0.32; p < 0.001). Adjusted R² = 43.9%.

Fetal heart rate monitoring is performed by healthcare providers during late pregnancy and labour. The average fetal heart rate is between 110 0 160 x/minute. Fetal responses such as oxygen adequacy can affect the fetal heart rate (Johns Hopkins medicine, 2022).

Fetal well-being and active fetal movement can be influenced by

stimulation by parents, either mother or father. Thus, it can significantly improve the quality of midwifery care for pregnant women (Dombrowska-pali *et al.*, 2018) (Gebuza *et al.*, 2018).

As long as the fetus lives in the womb, hearing is an organ or sense that develops first. Stimulation of the fetus in the womb with music and mother's voice is associated with fetal well-being by demonstrating increased fetal movement and normal fetal heart rate (Prace, 2015). Stimulation of the mother's voice and the tone of the heartbeat during pregnancy and after delivery affect the frequency of apnea in preterm newborns (Doheny *et al.*, 2012). Fetal stimulation with the mother's voice can be responded to by the fetus by increasing the fetal heart rate (Biela, 2009). Providing stimulation to the fetus from the ultrasound results shows an increase in facial movements on the lips (Reissland *et al.*, 2016). Fetal stimulation carried out by pregnant women will be memorized by the fetus and create memory in the fetus while in the womb (Granier-Deferre *et al.*, 2011).

CONCLUSIONS

Fetal stimulation can improve the quality of life for pregnant women for the better and maintain a stable fetal heart rate.

SUGGESTIONS

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It is hoped that the community, especially pregnant women, health workers, especially midwives, can apply fetal stimulation in midwifery care so that it can improve the quality of life of the mother and maintain a normal fetal heart rate.

It is hoped that other researchers can serve as a basis for evidence-based development of midwifery care by developing the variables that we studied.

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