

The Effect Of Gendhing Gamelan Toward The Reducing Of Anxiety On Pregnancy

Djohan

Music Performance Department of Indonesia Institute of the Arts
Indonesia Institute of the Arts
Yogyakarta, Indonesia

Fortunata Tyasrinestu

Music Education Department of Indonesia Institute of the Arts
Indonesia Institute of the Arts
Yogyakarta, Indonesia

Indra K. Wardani

Graduate School of Indonesia Institute of the Arts
Indonesia Institute of the Arts
Yogyakarta, Indonesia

Abstract—listening to music will not only have a soothing and uplifting effects on someone but also a positive influence on the unborn baby. The positive vibes that will be acquired from listening to music will create a prenatal stimulation that will help pregnant mother to bond with their unborn baby. It will enable them to lower their stress and anxiety levels and also reduce any stress that the unborn baby may feel in the womb. Previous researches claimed the ability of music, especially western music, in reducing anxiety and stress toward pregnant woman. Instead of using western music, the present study investigated the effect of listening to gamelan music toward the reducing of anxiety on pregnancy. In a pilot experiment, 60 healthy volunteers (mean age = 29.0; SD = 5.0) evaluated their anxiety responses to a Javanese traditional musical pieces using a Slendro Sanga scale. The research shows significant effect ($p < 0.05$; $F = 5.340$) of Javanese traditional music to reduce anxiety in pregnant woman thus the hypotheses is accepted.

Keywords—stress reduction; anxiety; music listening

I. INTRODUCTION

In Indonesia, the death rate of mother and infant stay at a high level every year even it has reached 4000 deaths per year. Various efforts has been applied by government, health center, hospital and *posyandu* mainly to cope with the obstacles related to this case. Thus, the service towards pregnant woman is prioritize in many ways and strategies^[1]. The mentioned services can be applied earlier from the early until late pregnancy even postnatal period.

Pregnancy period requires woman to have preparation physically and mentally due to physical and hormonal change that prone to generate anxiety. Biologically, the increasing of progesterone and estrogen will lead into easily exhausted and nausea. Psychologically, some women even feel depressed of the change and try to neglect the fact of their pregnancy.

Most woman in pregnancy period experienced many distress mainly caused by the change of emotion, physic,

and environment^[2]. It involves the increasing of anxiety of fetus' health as well as different lifestyle^[3]. Transvaginal Ultrasound (TVUS) diagnosis showed the distress felt by woman include pain, fear, discomfort, and difficulties in emotion control as the effect of the anxiety^[4]. Another problem following pregnancy is libido issue that is need to be communicated between spouses. Even though some physical reactions during pregnancy, such as breast enlargement, is something common, most anxiety in pregnancy is caused by the mixture of happy and sad feeling, hesitation and conviction, and morning sickness. That is why we can assume that most of pregnant women experience psychological changes.

Physical changes, the anxiety because of physical changes, increasing of sexual desire but decreasing of libido, is need to be accepted by the environment^[5]. Unstable emotion is usually followed by mood changes such as being sensitive and overreacting with the result that the mental condition in vulnerable. This vulnerability might be caused by the gap between what is felt physically and what is understood mentally. Thus, pregnant woman tent to depend on other individual or being too demanding in this period. Another way to handle the discomfort during pregnancy is through the external factor that is one of human potency: music.

Many attempts and research be done to help woman in facing pregnancy period. Research oh Hye Sook Shin and Ju Hee Kim^[6] showed significant decrease of stress and anxiety to a group of mother that received 30-minutes music session out of health program. In another side, many transdisciplinary research in humanities (music), social science (role), and natural science

(medical) shows the role of music as media and way to enhance life quality. Further, music as a work of art or a product of internal and external experience is also representing human life empirically and contextually. Since music is inseparable from human life, its utilization need to be developed further through supports in many sector.

Thus, this research aim to identify the effect of Gendhing Gamelan toward stress and anxiety reduction in pregnant women to discover its specific effects on psychological issue which are expected to support mental health in pregnant women that will implicate in fetus' mental health. We hypotheses (1) pregnant women be intervened by music will have less anxiety compare to control group, (2) pregnant women be intervened by music will have less stress compare to control group.

In the perspective of anesthesia expert, music is claimed to be useful in C-section to strengthen anesthesia effect that is mostly without narcotics to make sure the infant won't be depressed. This labor preparation involving physical manipulation is prone to generate discomfort in mother thus music is believed to be effective in reducing the discomfort. In early pregnancy, stress overreacting create a negative effect during pregnancy. Most of the physiological stress is mediated by stress hormonal named catecholamine. In pregnant woman, level of stress can reduce uterine contraction effectiveness^[7] and over anxiety is associated to fetal death in third trimester^[8]. Music is able to control respiratory rate and reduce stress response thus music can help to shorten the labor process^[9]. Another research suggests that music reduce pain when it is heard^{[10][11]}.

Previous research also suggest on how majority young mother tent to hold their baby on their left chest, near by the heart. This intercultural phenomena is assumed because the hearing ability the infants have since in the womb that it be the basic of musical potency in human. The research also suggests some similarities in music rhythm and rhythm infants hear in womb^[12]. The environment of prenatal period is also has its own impact toward fetus. Many physical stress and emotion during pregnancy will influence the abnormality in baby and inhibit the development of motoric function^{[13][14]}. In later pregnancy, most of fetus is able to listen their

mother voice^[15] and some research stated that music is able to influence development of biological system^{[16][17]}. Further, listening to music is can improve learning ability^[18], reduce bold pressure, improve the epilepsy symptoms, Parkinson disease, and dementia^{[19][20]}.

In contrast, noise generate a harmful environment and affect to animal pregnancy and its fetus. Noise is also associated to generate psychological and psychosomatic disease^[21], such as, weight decreasing in newborn that lead to death, teratogens in fetus, as well as abortion^[22]. Likewise the exposure of noise during pregnancy, it can disturb the brain development in baby and harm the cognitive function^[23].

To maintain the balance of chemical in pregnant woman, the there are four main hormone that mostly works; endorphin, dopamine, serotonin, and oxytocin that are contributing in positive feeling as a dimension of happy feeling. Dopamine and endorphin work as selfish chemical that is produced when someone is struggling to achieve something. Endorphin works by manipulate pain through happiness of euphoria. It happens for example when someone win a competition. Later, dopamine works by affecting the blood and generate a satisfaction. Meanwhile, serotonin and oxytocin is more external chemical that is generate a proud feeling because of being loved by a group or relatives such us parents, spouse, or children. Oxytocin works to promote empathy and trust, strengthen the bond between human to create a harmonious relationship. The more someone is being trusted or loved, the more oxytocin produced. Here, the trust toward pregnant woman is important to be built because it can be the foundation of self-confidence and preventing stress. That is why, external situation is important since it has impact in internal situation.

II. MATERIALS AND METHODS

The design used in this research in non-equivalent control group non-synchronized as an attempt to discover the influence of gending galeman listening to stress and anxiety reduction.

Group	Pretest	Posttest	Pretest	Experiment	Postes
Experiment			Ya1	X	Ya2
Control	Yb1	Yb2			
X= music; Ya1, Yb1: KDO, STAI, and BDI; Ya2, Yb2: STAI and BDI					
KDO= Karakter Demografi Obstetrik, STAI= <i>State Trait Anxiety Inventory</i> ; BDI=Beck Depression Index; X = gending gamelan					

A. Subjects

The subject in this research was determined incidentally. It consists of 60 woman (experiment = 30; control = 30; mean age = 29.0; SD = 5.0) in *Puskesmas Kotagede Yogyakarta*.

B. Instruments

a. STAI

State Trait Anxiety Inventory is a quick and short measurement of state and trait of anxiety to acquire high result for technical use^[24]. State anxiety is a temporary condition of fear or anxiety mainly experience in a particular event. Trait anxiety is a relatively stable tendency of a human to respond a stimuli in anxious way and prone to generate distress. Those two aspect seems different yet interrelated to one another. The level of trait anxiety reflects the inclination to show anxiety in human.

STAI consists of 40 items to measure the two types of anxiety in separable way. STAI item is simple and descriptive consist of 20 state anxiety items measured on 4 intensity scale: “not at all”, “sometimes”, “kind of”, and “very anxious”. It also consist of 20 trait anxiety items measured on 4 intensity scale: “never”, “seldom”, “often”, and “always”.

b. BDI

Beck-Depression Inventory is a self-report rating inventory consisting of 21 items to measure

characteristic attitude and symptoms of depression^[25]. This instrument is used as a control to strengthen the first instrument, STAI. Not only anxiety, previous research reported prevalence of depression among pregnant women^[26]. We assume high level of anxiety will lead into depression. Thus, if the BDI index shows a decrease level, it might be assume that the anxiety level is also decrease.

BDI consist of 21 items on scale of 0-3 indicating the symptoms of depression such as hopelessness and irritability, weight loss, appetite, interest in sex, fatigue, and even cognitive aspect such as guilt of feeling of being punished. Each number consist of four statements of a topic in a different scale and respondent will answer the most suitable scale to define their condition.

C. Auditori Stimuli

The audio stimuli of this research is 15 minutes gending gamelan in *slendro sanga* scale that is heard by the subject through a wireless headset in a medium volume to make sure that the audio can be heard clearly but not too loud for the hearing.

D. Procedure

All subject are informed about the research and have consent to participate in this data collecting. After filling the pretest questionnaire, subjects are directed to the listening room. The experimenter need to make sure the subjects are relax and comfortable during listening section thus the subjects are allowed to sit or nap on their own choice. The headset is installed under the consent of the subject considering their comfort. After listening the music for 15 minutes, we asked the subjects to fill the post test questionnaire.

III. RESULTS

Before go to further analysis of the experiment, we present the comparison data of both control and experiment group in pre and posttest.

Variabel	Kelompok Kontrol		Kelompok Eksperimen	
	Skor Pretest	Skor Posttest	Skor Pretest	Skor Posttest
N	30	30	30	30
Minimum	3	5	3	3
Maximum	62	55	64	97
Mean	26,83	27,33	26,77	37,80

The table above shows the minimum score of control group is 3 with maximum score 62, meanwhile experiment group's minimum score is 3 with maximum score 64. Mean value of control group is 26.83 and mean value of experiment is 26.77. Here we can see the higher mean of experiment group 0.06. To examine if both groups are similar to each other we applied a t test.

Based on the t-test, both groups are considered homogenous if the significance coefficient > 0.05 . In contrast, if the significance < 0.05 the sample of both group is not homogenous. The result of t-test on Equal Variances Assumed column showed significance as big as 0.987. Thus, both subject in control and experiment groups are homogenous and have similar anxiety level before the experiment.

On posttest data the minimal score of control group is 5 and the maximum score is 55. Meanwhile experiment group have minimal score of 3 and maximum score of 97. The mean value of control group is 27.33 and mean value of experiment group is 37.80. The comparison above shows that experiment groups that listening to Gendhing Gamelan have better performance in reducing anxiety. This can be seen from the mean value increasing. The control group's mean increase 0.5 from 26.83 to 27.33 meanwhile the experiment group's mean increase 11.03 from 26.77 to 37.80. To do a different test using independent sample t-test, we need prerequisite

test that are normality and homogeneity test. Normality test is needed to ascertain data distribution, whether it is normal or it isn't. Homogeneity test is needed to ascertain data homogeneity. Normality test is done with Shapiro-Wilk test on SPSS. The data is normally distributed if the significance coefficient > 0.05 .

Kolmogorov-Smirnov result showed that the posttest score of control group sig. 0.166 meanwhile experiment group sig. 0.200. Both significance coefficient is > 0.05 thus can be assumed that data in both group is distributed normally.

Homogeneity test is done by Levene Statistic test. The data is claimed to be homogeny if sig. > 0.05 . The result of homogeneity test with SPSS showed sig. value 0.378 > 0.05 thus the posttest data is homogenous.

Independent sample t-test is used to ascribe the different on anxiety level between control and experiment group. These two group is considered different if the sig t-test for Equality of means < 0.05 . In contrast, if the value of sig. t-test for Equality of Means > 0.05 , both groups are assumed to be similar. Based on the result, t-test for Equality of Means on df 58 sig 0.024 < 0.05 . It can be considered that there is different level of anxiety of control and experiment group. The experiment group have lower anxiety level than control

group. Here we can conclude that gamelan is enable to reduce anxiety in pregnant woman.

Further, to ascribe the effect of gamelan in reducing anxiety level in pregnant woman, we use One Way ANOVA. Through this analysis, we will examine the effect of independent variable, gamelan, in reducing

ANOVA

Skor Posttest Kecemasan Psikologis dan Psikiatris Ibu Hamil

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1643.267	1	1643.267	5.340	.024
Within Groups	17847.467	58	307.715		
Total	19490.733	59			

The table above showed F 12.404 with sig. 0.001. In F table with df 58 sig. 0.05 we get F table 4.01. The value of F 5.340 is bigger than F table 4.01. Moreover, the significance 0.024<0.05. Thus, we can conclude there is significant effect of listening to gendhing gamelan towards anxiety reduction in pregnant woman.

IV. DISCUSSION

Statistical analysis above showed the relation of listening to Gamelan Jawa and anxiety reduction in pregnant women. The result of homogeneity test showed that subject in experiment group tent to receive same effect from listening gamelan Jawa. Based on what happened in the data collection process, we found some respondent in experiment group that was not really focus and pay attention during music listening. Some of them broke the procedure of listening by playing their cellphone for a minute or two during the listening session. Another respondent came with their children and tent to less focus compared to the respondent without children because they had need to pay attention to their children. Some respondent seemed less enthusiast in answering posttest questionnaire and tent to answer fast without really try to make it sure. When the statistical analysis stated the homogeneity in experimental group in terms of listening and its ability to reduce anxiety, we need to discuss this result under the

anxiety as the dependent variable. In this analysis, independent variable is considered to take effect on dependent variable if it fulfilled two criteria: (1) F is bigger than F table and (2) sig. value <0.05

The ONE way ANOVA result can be seen in table below:

consideration of respondent different intention in doing the task. If in fact music listening need a proper focus and attention to gain the benefit, then what define the less focus respondents should be a rationale in criticize the instrument used to measure the anxiety or to reconsider whether self-report is proper enough to prevent random answer put by respondent in order to show difference before and after listening without really fell the difference in real. In other side, if the instrument can be confirmed effective to be used in this research design, we need to identify on how different listening attitude could lead into homogeny result.

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