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Preferred Music, Anxiety, and Pregnant Women

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Abstract. This research investigated the influence of preferred music on the anxiety of pregnant women from the 33rd week of pregnancy until delivery. 59 pregnant women were divided into experimental and control groups. The experimental group of 30 pregnant women attended the group meeting at the maternity centre and listened to preferred music at home. The control group of 29 pregnant women only attended the group meeting at the maternity centre. The results revealed that there were no significant differences between the experimental and control groups in the state and trait anxiety scores, gestational age, Apgar scores, and the baby's birth weight. However, there was significant difference in feelings from before to during, and from before to after listening to music in the experimental group ($p \leq 0.001$).

Keywords: music, anxiety, pregnant women

Abstrak. Penelitian ini ingin mengetahui pengaruh musik yang disukai terhadap kecemasan ibu hamil sejak usia kehamilan minggu ke-33 sampai dengan persalinan. 59 ibu hamil dibagi menjadi kelompok eksperimen dan kontrol. Kelompok eksperimen yang terdiri dari 30 ibu hamil menghadiri pertemuan kelompok di BKIA (Balai Kesehatan Ibu dan Anak) dan mendengarkan musik yang disukai di rumah. Kelompok kontrol yang terdiri dari 29 ibu hamil hanya menghadiri pertemuan kelompok di BKIA.Hasil penelitian menunjukkan bahwa tidak ada perbedaan yang signifikan pada usia persalinan, skor Apgar, berat lahir bayi, atau skor kecemasan sesaat dan dasar pada State-Trait Anxiety Inventory (Spielberger, 1977) antara kelompok eksperimen dan kontrol. Namun penelitian ini menemukan bahwa ada perbedaan perasaan yang signifikan antara sebelum dan selama, dan sebelum dan sesudah mendengarkan musik pada kelompok eksperimen ($p \leq 0.001$).

Kata kunci: musik, kecemasan, ibu hamil

Pregnancy is a natural phenomenon. Because it is an important phase in human life, much attention should be paid to this event. When a woman is pregnant, many changes happens, not only in her body, but also her psychological circumstances and role (Kasdu, Meiliasari, & Purwaningsih, 2004; Reading, 1983).

The body changes of pregnant women comprise an enlarging of the breasts, faster circulation of blood, more sensitivity of the senses, and the most observable change, the enlargement of the womb (Kasdu et al., 2004). Hanafiah (1981) explained that the entire body changes because of pregnancy and this change is caused by hormones, specifically somatomammotropin, estrogen, and progesterone.

In early pregnancy, a mother usually feels nauseous or vomits in the morning (morning sickness). During the first months of pregnancy, pressure is felt on the bladder which is constricted by the uterus expanding. Because of that, a pregnant woman urinates more frequently. This complaint reappears during the later pregnancy because of the force of the foetus's body as it descends (Hanafiah, 1981).

Psychology of Pregnancy

According to Sloane and Benedict (1993) and Grunfeld (1994), the main emotional changes experienced by pregnant women are outlined below:

The first trimester. Emotional changes in the

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first trimester are influenced by many factors, such as the experience of the pregnancy, relationship with the partner, a first pregnancy, age, economic situation and employment. The pregnant woman may feel less feminine, less attractive and this may affect her sense of security in her relationship with her partner. During this period, pregnant women may be reminded of the past, or think about unresolved problems, or their sad experiences. Sometimes they may feel ambivalent about their pregnancy, and these factors collectively influence her mood.

The second trimester. For pregnant women, the second trimester is usually the climax physically and psychologically. During this period they experience a new intensity in emotion. They feel themselves as "pregnant". Some of them feel proud, particularly when relatives and friends give them attention. On the other hand, they may be annoyed because of the continuation of such attention. In this period their anxieties are usually centered on the baby and the delivery. They may think about the face of the baby, the baby's health, the pain of delivery, and their role as a mother. These normal anxieties may appear in fantasies and in dreams.

The third trimester. In the third trimester the pregnant woman concludes employment, prepares for the arrival of the baby, chooses names and arranges the details of the delivery and beyond. Anxieties concerning the delivery and pain of childbirth are likely to increase.

Role Changes in Pregnancy

Pregnancy also changes the structure of the family; the woman becomes a mother, the man becomes a father, the mother and father becomegrandmother and grandfather (Nichols & Humenick, 1988). These changes disrupt the homeostasis of the life (Spielberger, 1979). Homeostatis is the tendency of human beings to desire and sustain relative stable conditions in their life (Spielberger). Because there are many changes in the woman's life when she is pregnant, these changes break the homeostatic condition and this may cause anxiety, especially for those women who are experiencing their first pregnancy.

Anxiety and Pregnancy

A common anxiety of pregnant women is about the birth (Kitzinger, 1989). A pregnant woman's attitude to giving birth depends in part on her personality. Most pregnant women think about the pain they will face at the time of delivery, the loss of control, especially when the waters break, feeling vulnerable when giving birth, the management of delivery, losing autonomy at the time of childbearing, being afraid of hospitals, and a loss ofattractiveness aftergiving birth (Kitzinger).

Secondly, pregnant women are usually concerned about the baby. Many pregnant women will feel anxious about whether the baby is normal or if the baby will be born handicapped. This anxiety may be influenced by the "perfect" standard given by the pregnant woman's parents in the past (Kitzinger, 1989).

Finally, pregnant women also worry about the future. Many pregnant women fear the loneliness they may experience because pregnancy makes them stay at home more when they stop working in late pregnancy. They feel anxious about the changes they will experience in their relationships with their partner. In addition, many pregnant women are concerned about how good they will be as mothers (Kitzinger, 1989).

Music, Anxiety, and Pregnant Women

Liebman and MacLaren investigated the effects of music and relaxation on third trimester anxiety in adolescent pregnancy. This research found that the level of trait and state anxiety of the experimental group was less than the control group, suggesting that a music therapy intervention is effective in reducing anxiety during the third trimester in adolescent pregnancy (1991).

Federico and Whitwell (2001) suggested the following purposes of music therapy to enhance better relationships of the mothers and their unborn babies: a) to reduce the levels of anxiety, b) to prepare women for labor and birth with different psychomusical techniques, c) to obtain further relaxation during labor, and d) to allow and support expressions of pain whenever they surface.

Sutcliffe (2002) also suggested that in order to prepare herself to welcome her baby, a mother should relax her mind and body with music and exercise. Sutcliffe cited many studies that show the benefit of using music during pregnancy (Sutcliffe). The use of music during prenatal education classes has been found beneficial for the mother, although statistically insignificant (Durham & Collins, 1986). Di Franco's study (1988) has outlined suggestions for using music as a wellness technique during childbirth education classes.

Arabin (2002) also suggests investigating the effects of music that is chosen by the pregnant women. Arabin predicts this would give more positive effect which can reduce their anxiety. It will also have a positive influence on the unborn baby.

The Group Meeting

Prenatal classes should be made available for educating pregnant women. Such classes, besides giving education to pregnant women, can provide opportunity for pregnant women to express or discuss their feelings and hopes freely. It may also enhance their self-confidence (Stotland & Stewart, 2001).

Mental attitude influences how well pregnant women cope with stress. It is important therefore for pregnant women to have a positive mental attitude about pregnancy. By meeting with other pregnant women who have the same experience, a pregnant woman could broaden her knowledge about pregnancy and childbirth. She may be motivated to share her hopes with other pregnant women suffering from similar problems. The groups offer a safe environment for the expression of feelings. It allows her to focus her emotions on creating productive change within herself (Hershenson, Power, & Waldo, 1996)

The Present Study

Based on the studies above, this research investigate the influence of preferred music on the anxiety of pregnant women. Music was used to help the pregnant women relax and to create a positive milieu for the foetus. It was hoped that their psychological condition is as good as their physical condition, and that they can give birth to a healthy baby.

In addition to listening to the music, supportive group meetings will be held at the maternity centre, to enable the pregnant women to express feelings and discuss pregnancy.

Based on the literature review above, the hypotheses in this study were: (1) Preferred music and supportive group meetings will reduce the anxiety of pregnant women. (2) Preferred music and supportive group meetings will affect the gestational age of the baby at delivery. (3) Preferred music and supportive group meetings will affect the baby's Apgar Score. (4) Preferred music and supportive group meetings will affect the baby's birth weight. (5) There will be a positive effect of music on the mood of pregnant women.

Method

Variables

The independent variable of this research was the preferred music of pregnant women. The dependent variables of this research were (a) Level of anxiety of pregnant women; (b) Gestational age of the newborn at delivery; (c) Baby's Apgar Score; (d) Baby's birth weight; (e) Experience of pregnancy and music during pregnancy as recorded in a diary (including the rating of mood before, during, and after listening to preferred music).

To understand the variables of the research more clearly, each one is operationally defined as follows:

The preferred music of pregnant women. Thiswas the music which was chosen by the pregnant women and played at least 3 x 30 minutes per week from 33rd week of her pregnancy until delivery.

Supportive group meeting for the pregnant women. This was the group which comprised 4 – 5 pregnant women who had fortnightly meetings at the maternity centre (1 hour) from 33rd week of their pregnancy until delivery, to share and listen to their experience/feelings during pregnancy.

Level of anxiety of pregnant women. This was measured by State-Trait Anxiety Inventory (STAI) (Spielberger, 1977) which has been translated into the Indonesian language. The state and trait anxiety

inventory was given weekly at 33rd, 34th, 35th, 36th, 37th, 38th week of pregnancy (6 times) and at the group meetings (3 times).

Gestational age at delivery. This was the gestational age at delivery of the newborn as recorded in the medical report.

Baby's Apgar Score. This was a score given by the doctor/midwife for Activity (Muscle Tone), Pulse, Grimace (Reflex Irritability), Appearance (Skin Color), and Respiration at one minute and five minutes after the birth for measuring the baby's physical health. The baby's Apgar score was recorded in the medical report.

Baby's birth weight. This was the weight of the baby at birth recorded in the medical report.

Experience of pregnancy and music during pregnancy. This was recorded by the women in a log book and from the open questionnaire prepared by the researcher. Feelings, before, during, and after listening to music was described in one word.

Participants

Subjects (N = 59) were pregnant women who saw the midwives at the Maternity Centre of St. Vincentius a Paulo Catholic Hospital, Surabaya, Indonesia.

Design and Measurement

The design of this study was a randomized two groups pre-post test within subjects design including a comparison between groups. The data was analyzed using a*t*-test, ANOVA, and Sign Test.

Procedure

The subjects were at the 33rd week of their pregnancy, who were randomly assigned to either the (a) Experimental condition (n = 29) comprising preferred music (at least 3 times per week for 30 minutes from 33rd week) and supportive group meetings (fortnightly from 33rd week) or (b) Control condition (n = 30), comprising supportive group meetings only (fortnightly from 33rd week). The researcher gave information to the subjects by phone and invited them to come to the maternity centre on the expected date.

Group meetings. The women attended a group meeting twice a week. The meetings were timed to coincide with their visits to the midwives. The times selected for the groups were (a) Wednesday at 7.00 – 8.00 am for the control group. (b) Friday at 7.00 – 8.00 am for the experimental group. Each woman completed the State-Trait Anxiety Inventory (Spielberger, 1977) translated into the Indonesian language.

Results

Dependent Variables

Table 1 reports the findings of statistical analysis undertaken on the dependent variables

These results indicate that: (a) There is no significant difference in state anxiety between the experimental group and control group (p = 0.812, $p > 0.05$). (b) There is no significant difference in trait anxiety between the experimental group and control group (p = 0.069, $p >$ 0.05). (c) There is no significant difference in gestational age at delivery between the experimental group and control group (p = 0.568, $p >$ 0.05). (d) There is no significant difference in baby's Apgar Score between the experimental group and control group (p = 0.326, $p > 0.05$). (e) There is no significant difference in baby's birth weight between the experimental group and control group (p = 0.198, $p > 0.05$). Therefore the hypotheses of this research project were not supported.

State anxiety. There was no significant difference in state anxiety between the experimental and control groups ($p > 0.05$) (Table 1). Table 2 pre-sents data on the state anxiety for both groups using the ANOVA test.

State anxiety within the experimental group. There was no significant difference in state anxiety over the 6 weeks within the experimental group (p =0.644, $p > 0.05$). Figure 1 shows the graph of state anxiety of the experimental group over 6 weeks.

Table 1
Results of the Data Analysis (t-test)

Indicator	Experimental group	Control group	*t*	*p* (2-tail)
State anxiety	37.9307	38.1422	- 0.238	0.812
Trait anxiety	43.8652	42.6789	1.823	0.069
Gestational age at delivery	39.6333	39.8800	-0.574	0.568
Baby's Apgar Score I	7.9655	8.000	-1.000	0.326
Baby's birth weight	2945.0000	3088.4615	-1.304	0.198

Table 2
Results of the Data Analysis of the State Anxiety (ANOVA)

Indicator	*F*	*p*
Experimental group	0.753	0.644
Control group	0.472	0.875

Figure 1 shows that state anxiety was lowest at each group meeting time (1st Group meeting, 2nd Group meeting, and 3rd Group meeting).

State anxiety within the control group. There was no significant difference in state anxiety over the 6 weeks within the control group ($p = 0.875$, $p > 0.05$).

Figure 2 shows that state anxiety was lowest at each group meeting time (1st Group meeting, 2nd Group meeting, and 3rd Group meeting).

Trait anxiety. There was no significant difference in trait anxiety between experimental and control groups ($p > 0.05$). Table 3 presents data on the trait anxiety for both groups using the ANOVA test.

Trait anxiety within the experimental group. There was no significant difference in trait anxiety over the 6 weeks within the experimental group ($p = 0.880$, $p > 0.05$). Figure 3 shows the graph of trait anxiety of the experimental group over 6 weeks.

Figure 3 shows that trait anxiety was lower at each group meeting time (1st Group meeting, 2nd Group meeting, and 3rd Group meeting).

Trait anxiety within the control group. There was no significant difference in trait anxiety over 6 weeks within the control group ($p = 0.998$, $p > 0.05$).Figure 4 shows the graph of trait anxiety of the experimental group over 6 weeks.

Figure 4 shows that trait anxiety was lower at each group meeting time (1st Group meeting, 2nd Group meeting, and 3rd Group meeting).

Reports on the women's response to music. The sign test is used to see if there is a difference between two conditions when quantitative data cannot be interpreted (Siegel & Castellan, 1988). Pregnant women in the experimental group kept a weekly log of their feelings before, during, and after listening to music. The adjectives used to describe their feelings were rated as positive, negative, and neutral and the difference was calculated using the sign test.

Table 4 indicates results of the sign test for the experimental group in response to the music.

There was significant difference in feelings before-during and before-after listening to music in the experimental group ($p \leq 0.001$). Most of the pregnant women had positive responses to the music before-during (27 subjects) and before-after (26 subjects) listening to the music. 3 subjects felt neutral before-during listening to the music and 4 subjects also felt neutral before-after listening to the music.

Discussion

Level of Anxiety of Pregnant Women

Data analysis shows that there was no significant difference in state and trait anxiety between pregnant women in the experimental and control group (Table 1). There was no significant difference in state anxiety within the experimental and the control group (Table 2). It is interesting that the graphs of state anxiety of the two groups have similar shapes, with the 1st, 4th, and 7th measurements reporting

the lowest scores (Figure 1 and Figure 2).These points correspond with the days of the group meetings which may indicate that sharing and listening to the experience of others has diminished anxiety. They may have felt support from other pregnant women in the group, and therefore felt less alone in their pregnancy which may have reduced their anxiety. In contrast, when alone (and without support) they may have felt more anxious.

There was no significant difference in trait anxiety within the experimental and the control group (Table 3). However, it is noteworthy that the level of trait anxiety of the experimental group was higher overall than the same measure in the control group (Figure 3 & Figure 4). This indicates that the pregnant women in the experimental group tended to have more anxious personalities.

Kitzinger (1989) said that the attitude towards pregnancy/childbirth depends on the pregnant woman's personality. Each woman may have different attitude towards it. Some women may enjoy pregnancy/childbirth while others may find this experi-

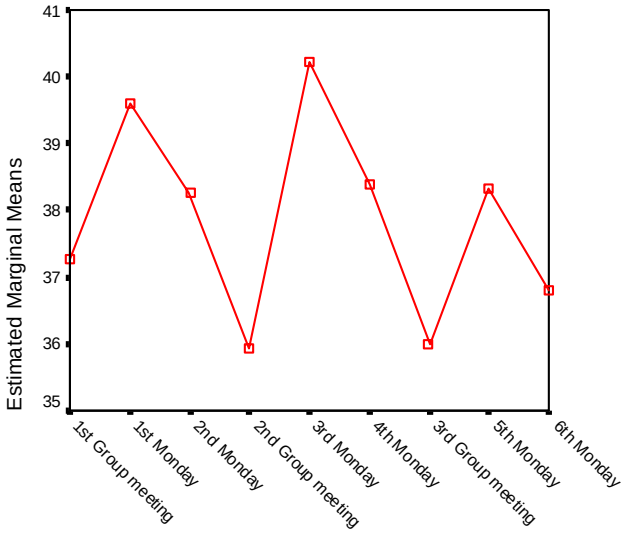

Figure 1. Estimated marginal means of state anxiety of experimental group

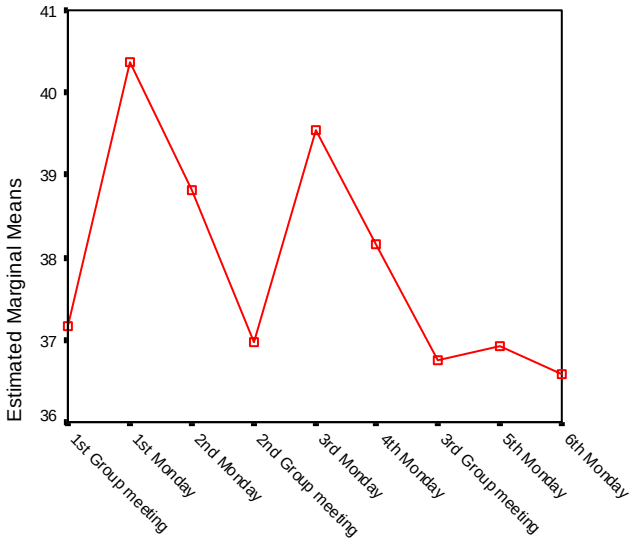

Figure 2. Shows the graph of state anxiety of the control group over 6 weeks.

Table 3
Results of the Data Analysis of the Trait Anxiety (ANOVA)

Indicator	*F*	*p*
Experimental group	0.465	0.880
Control group	0.126	0.998

ence anxiety inducing. Anxiety can cause an increased heart rate, high blood pressure, and other physiological changes that impact negatively on the foetus and the birthing process.

was no significant difference in gestational age of the newborn at delivery between the experimental group and the control group (Table 1). Given the relatively low level of anxiety of both groups this

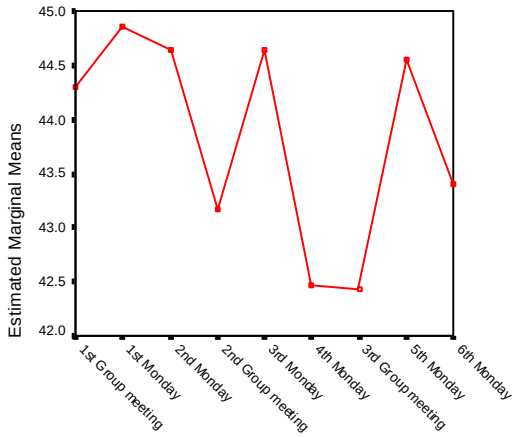

Figure 3. Estimated marginal means of trait anxiety of experimental group

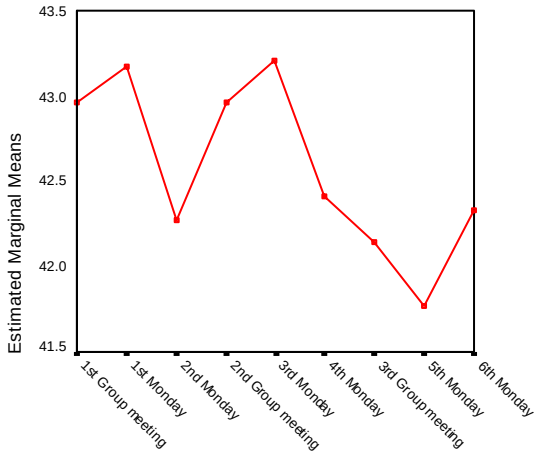

Figure 4. Estimated marginal means of trait anxiety of control group

Gestational Age of the Newborn at Delivery

Although Dunkel-Schetter (Azar, 1999) found that anxiety during pregnancy may cause early delivery, 96 % of babies in this current study were carried to full term. Data analysis shows that there

result is not surprising because there was also no significant difference in the anxiety score between the experimental group and the control group (Table 1). In addition, many other factors affect the gestational age of the baby, including the physical health of the pregnant women.

should betaken into account in further research in order to control for this extraneous variable.

Table 4
Results of the Data Analysis for Response to the Music (Sign test)

Indicator	Response to the music			*p*
	+	0	-	
Before – During (listen to the music)	27 subjects	3 subjects	0	$p \leq 0.001$
Before – After (listen to the music)	26 subjects	4 subjects	0	$p \leq 0.001$

Baby's Apgar Score

Gutteling et al. (2005) stated that stress during pregnancy may cause slower mental and motor development in the newborn infant. The indicator of the baby's health is measured by Activity (muscle tone), Pulse, Grimace (reflex irritability), appearance (skin color), and Respiration at one minute and five minutes after the birth. A score ranging bet-ween 0 and 2 is given to each of the 5 signs one and five minutes after birth. A normal Apgar score is between 7 to 10 points (Craig, 1989).

Data analysis shows that there was no significant difference in the babies' Apgar Score (Table 1) indicating that the level of anxiety of the experimental group was not significantly different from the control group (Table 1) and that the level of anxiety indicated on the questionnaire, did not adversely affect the baby's physical measures.

Baby's Birth Weight

It is known that anxiety can have a negative effect on the birth weight of the baby (Dunkel-Schetter, as cited in Azar, 1999) but in this study, data analysis shows that there was no significant difference in babies' birth weight (Table 1) between the experimental group and the control group. The baby's birth weight also depends on pre-pregnancy weight of the women. Women who weigh less before pregnancy tend to have babies who weigh less and women who weigh more before pregnancy tend to have babies who weigh more (Health Canada, 2002; Nettip et al., 2003; UAB Health System, 2004). The pre-pregnancy weight of subjects that may influence the baby's birth weight was not recorded in this research. Because it may influence baby's weight, pre-pregnancy weight

Experience of Pregnancy and Music during Pregnancy as Recorded in a Log Book

Table 4 shows how the pregnant women in the experimental group experienced music during pregnancy. The data analysis indicated that there was significant difference in the pregnant women's feeling before and during listening to the music. Also, there was significant difference in feeling before and after listening to the music. The experimental group therefore experienced benefit from listening to the music.

Anxiety in General

In general, most of pregnant women in both two groups felt anxious during their pregnancy. There are eighth possible reasons to account for the moderate to very low level of anxiety of the pregnant women in this study.

First, it may be because the pregnant women in this study were young, they mostly lived with their extended families and received support from them (more than 75 % are living with their family). Because this was their first pregnancy, the family may have given a great deal of attention to them. Their father also played a significant role in supporting them (22 % of the experimental group and 30 % of the control group). Because of this high level of social support, pregnant women in this study may have felt more secure and less anxious. They perceived themselves as having social support from their spouse (70 %) and relatives or some friends, neigbours, and even God. Therefore, the support from significant others in the family may have reduced their anxiety. Bielawska-Batorowicz (2001) also suggested in her research

(conducted in Poland) that support from the relatives played an important role in reducing the pregnant women's anxiety. Feldman, Dunkel-Schetter, Sandman, & Wadhwa (2000) found similar results in their study with the majority of Latina and European American women.

Second, most of Indonesian people have strong beliefs in traditional values that are reflected in traditional ceremonies such as the *Tingkeban*. This ceremony is conducted for pregnant women when their pregnancy is at the 7th month. Because the majority of the experimental group and the control group were Javanese (96 % for the experimental group and 92 % for the control group), most of the pregnant women may have taken part in the *Tingkeban* ceremony. Javanese people believe that if they do it, they can bear their baby normally. The effects of this supportive ceremony may have helped the pregnant women to feel secure and less anxious.

Third, there is a philosophy in Javanese culture that people should be "*nrimo/pasrah*", meaning to surrender, to acquiesce to God's fate (Echols & Shadily, 2002). *Pasrah sumarah* philosophy in Javanese culture means that one should totally submit one's life to God (Hariwijaya, 2004). This philosophy was evident in the attitudes of the pregnant women in the experimental and the control group of this study also. A large number of the experimental group (50 %) and the control group (48 %) submitted their pregnancy to God's will as their way of coping with anxiety. The act of offering their pregnancy to God may have reduced their anxiety.

Fourth, there was a strong religious atmosphere in Indonesia. Most Indonesian people, including the pregnant women in this research, have a strong belief in God. If they face a problem and cannot solve it, most of them rely on God. When the time to pray arrives, a beautiful Call to Prayer from many mosques throughout the region reverberates everywhere. It reminds all people to pray, to remember, or to think of God. By doing this, the anxiety of pregnant women may have been reduced.

Fifth, Kitzinger (1989) stated that the attitude towards pregnancy/childbirth also influences how women experience their pregnancy/childbirth. All the pregnant women in this study, both of the experimental group (100 %) and the control group (100%), had a positive attitude toward their pregnancy/childbirth even though some of them did not plan to be pregnant (37 % of the experimental group and 30 % of the control group). In fact, most of them were only recently married. This may help them to enjoy their experience and not to be anxious during their pregnancy.

Sixth, the common educational background of most of the experimental and control group was senior high school (65.5 % for the experimental group and 65.4 % for the control group). In not continuing their education, these women may not have considered the logistical complexities that lay ahead, such as financial implications of raising a family. The majority of the experimental group and control group thought about the pregnancy only, specifically, the issues that they were facing at that time. Most of them rarely considered other issues related to the pregnancy and the future life of the baby. Many people from this population have a higher number of children than those with higher education.

Seventh, another factor that may have influenced the results was that the control group may have also listened to music without the researcher's knowledge. This possibility could not be controlled by the researcher. When the researcher asked these subjects randomly they sometimes answered that they did listen to music.

Eighth, almost half the number (42 %) in the control group worked, while the majority of the experimental group (77 %) did not work. This means that the experimental group had less activity and had more spare time. In having spare time, the experimental group may have tended to think about their pregnancy more frequently. This may have resulted in a higher level of anxiety.

The Music

Even though there were no statistically significant differences between the two groups, the experimental group showed a significantly positive response when listening to the music ($p \leq 0.001$).

Music helped them to feel relaxed, and promoted positive feelings while they were anxious, sad, exhausted, or had negative feelings. This suggests that listening to preferred music was beneficial to pregnant

women during their pregnancy.

The Group Meetings

It seems very important that the low points on the scale of anxiety (1st, 4th, 7th) occurred on days when there was a group meeting (Figure 1, Figure 2, Figure 3, Figure 4). The group meetings' times may have made the pregnant women feel more comfortable because they had shared their anxiety and experience, as well as seen the midwives. The group may have provided an opportunity to explain their problems to other pregnant women who have similar experiences, therefore having the opportunity to release their emotions and reduce their anxiety (Stotland & Stewart, 2001; Hershenson et al.,1996).

Limitations of this study

The researcher is able to identify many limitations of this study. They are (a) The researcher could not control the environment of the experimental group while listening to the music, or the activities they were doing while listening to music; (b) The effect of listening to the music was measured by log book only. Because of the limited measurement, it may be considered less convincing data to this study; (c) The required duration of music listening in a relaxed state may not be suitable to the experiences of pregnant women. They may be required to complete other tasks while listening to the music and as a result, a state of relaxation may not be attained.

Recommendations for Further Studies

Based on this study, especially the learning that has been made possible through the many limitations of the study, further research should attempt greater control over the nature of the music selected by the experimental group. It may be better to hold the music group at the maternity centre where the researcher can guide the pregnant women in relaxation.

References

Arabin, B. (2002). Music during pregnancy. *Ultrasound in Obstetrics & Gynecology, 20*(5), 425-430.

Azar, B. (1999, October). *Mom's stress may affect early child development. APA Monitor Online*. Retrieved May 26 at 10.44 am, 2005, from http://www.apa.org/ monitor/ oct99/cf4.html

Bielawska-Batorowicz, E., & Machala, M. (2001). *State trait anxiety and fear of labour in first and subsequent pregnancy*. Retrieved April 20, 2005, from http://www.mapi-research-inst.com/pdf/art /qol26_10pdf

Craig, G. J. (1989). *Human development* (5th ed.). New Jersey: Prenctice Hall.

DiFranco, J. (1988). Relaxation: music. In F. H. Nichols & S. S. Humenick (Eds.), *Childbirth education: Practice, research, and theory* (pp. 201-215). Philadelphia: W. B. Saunders Company.

Durham, L., & Collins, M. (1986). The effect of music as a conditioning aid in prepared childbirth education. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN, 15*(3), 268-270.

Federico, G. F., & Whitwell, G. E. (2001). Music therapy and pregnancy. *Journal of Prenatal and Perinatal Psychology & Health, 15*(4), 299-311.

Feldman, P. J., Dunkel-Schetter, C., Sandman, C. A., & Wadhwa, P. D. (2000). Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine, 62*, 715-724.

Grunfeld, N. (1994). *Pregnancy: Week by week*. Hong Kong: Conran Octopus.

Gutteling, B. M., Weerth, C. D., Willemsen-Swin-kels, S. H. N., Huizink, A. C., Mulder, E. J. H., A.Visser, G. H., et al. (2005). The effects of prenatal stress on temperament and problem behavior of 27-month-old toddlers. *European Child & Adolescent Psychiatry, 14*(1), 41-51.

Hanafiah, M. J.(1981). Fisiologi reproduksi wanita dan hormon-hormon yang berperan. Dalam H.Effendi (Ed.), *Fisiologi sistem*

hormona reproduksi dengan pathofisiologinya. Bandung: Penerbit alumni.

Hariwijaya, M. (2004). *Filsafat Jawa ajaran luhur warisan leluhur* (1st. ed.). Jogjakarta: Gelombang Pasang.

Health Canada. (2002, October 24). *Gestational weight gain*. Retrieved August 9, 2005, from http://www.hc-sc.gc.ca/hpfbdgpsa/onppbppn/national_guidelines_06b_e.html

Hershenson, D. B., Power, P. W., & Waldo, M. (1996). *Community counseling: Contemporary theory and practice*. Boston: Allyn and Bacon.

Kasdu, D., Meiliasari, M., & Purwaningsih, R
. (2004). *Info lengkap kehamilan & persalinan bacaan bagi calon ayah & ibu*. Jakarta: 3G Publisher.

Kitzinger, S. (1989). *Pregnancy and childbirth*. Sydney: Doubleday.

Liebman, S. S., & MacLaren, A. (1991). The effects of music and relaxation on third trimester anxiety in adolescent pregnancy. *Journal of Music Therapy, 28*(2), 89-100. Retrieved from Music Therapy Research: Quantitative and Qualitative Foundations (American Music Therapy Association, CD-ROM, 1999 release).

Nettip, N., Flick, L. H., Cook, C. A. L., Homan, S. M., McSweeney, M., Campbell, C., et al. (2003). *Caloric intake and pre-pregnancy weight (BMI) as predictors of infant birth weight in pregnant women with and without mental illness [Abstract]*. Retrieved August 10, 2005, 2005, from http://apha.confex.com/apha/131am/techprogrm/paper_65909.htm

Nichols, F. H., & Humenick, S. S. (1988). *Childbirth education: Practice, research, & theory*. Philadelphia: W.B. Saunders Company.

Reading, A. (1983). *Psychological aspects of pregnancy*. New York: Longman.

Siegel, S., & Castellan, N. J. (1988). *Nonparametric statistics for the behavioral science*. New York: McGraw-Hill.

Sloane, P. D., & Benedict, S. (1993). *Petunjuk leng-kap kehamilan* (A. Adiwiyoto, Trans.). Jakarta: Penerbit Mitra Utama.

Spielberger, C. (1979). *Understanding stress & anxiety*. Melbourne: Multimedia Publications Inc.

Stotland, N. L., & Stewart, D. E. (Eds.). (2001). *Psychological aspects of women's health care: The interface between Psychiatry and Obstetrics and Gynecology* (2nd ed.). Washington, DC: American Psychiatric Press, Inc.

Sutcliffe, J. (2002). *Baby bonding: Berikan permulaan yang aman untuk kehidupan anak anda* (R. Nalsya, Pengalih bhs.). Jakarta-Indonesia: Taramedia & Restu Agung.

UAB Health System. (2004). *Pre-pregnancy weight*. Retrieved August 10, 2005, from http://www.health.uab.edu/show.asp?durki=65521