

# The Effects of Instrumental Marching and Cheerful Music on Women's Sense of Power, Self-Control, Fear of Childbirth, and Second-Stage Duration During Their Second Stage of Labor<sup>®</sup>

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## The Effects of Instrumental Marching and Cheerful Music on Women's Sense of Power, Self-Control, Fear of Childbirth, and Second-Stage Duration During Their Second Stage of Labor.

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### บทคัดย่อ:

**ความสำคัญ:** มีการศึกษาน้อยเกี่ยวกับการส่งเสริมประสบการณ์ทางบวกในระยะที่ 2 ของการคลอด (ระยะเบ่งคลอด) ดังนั้นการหาวิธีช่วยโดยใช้ดนตรีจังหวะมาร์ชและจังหวะรีนเรจแก้มารดาในระยะที่ 2 ของการคลอดจึงมีความสำคัญ

**วัตถุประสงค์:** เพื่อทดสอบผลของการฟังดนตรีจังหวะมาร์ชและจังหวะรีนเรจ ความรู้สึกมีพลัง การควบคุมตนเอง ความกลัวการคลอด และระยะเวลาของระยะที่ 2 ของการคลอด ในมารดาในระยะที่ 2 ของการคลอด

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**วัตถุประสงค์และวิธีการ:** ศึกษาแบบทดลองในมารดาจำนวน 145 ราย เป็นครรภ์แรก 67 ราย ครรภ์หลัง 78 ราย สุ่มเป็น 2 กลุ่ม คือ กลุ่มฟังดนตรีและกลุ่มควบคุมทั้งครรภ์แรกและครรภ์หลัง กลุ่มดนตรีฟังดนตรีในระยะที่ 2 ของการคลอด เก็บข้อมูลความรู้สึกมีพลัง การควบคุมตนเอง และความกลัวการคลอด ในระยะหลังคลอด 2 ชั่วโมง โดยใช้มาตรวัดด้วยสายตา (100 mm Visual Analogue Scale) ซึ่งมีความเที่ยงแบบทดสอบซ้ำ 0.81-0.98

**ผลการศึกษา:** จำนวนมารดา 141 ราย ใช้ในการวิเคราะห์ เนื่องจากอีก 4 ราย ไม่ได้คลอดปกติ ผลการศึกษาพบว่าไม่มีความแตกต่างของความรู้สึกมีพลัง การควบคุมตนเอง และความกลัวการคลอด (จากการวัดด้วย VAS) และระยะเวลาในระยะที่ 2 ของการคลอด ระหว่างกลุ่มดนตรีและกลุ่มควบคุมทั้งในครรภ์แรกและครรภ์หลัง แต่อย่างไรก็ตามจากการตอบแบบสอบถามมารดารับรู้ประโยชน์ของดนตรีที่ได้ฟังและดนตรีช่วยทำให้มีพลังในระดับปานกลางและระดับสูง

**สรุป:** ดนตรีจังหวะมาร์ชและจังหวะรีนเรจมีผลน้อยต่อความรู้สึกมีพลัง การควบคุมตนเอง ความรู้สึกกลัวการคลอด และระยะเวลาในระยะที่ 2 ของการคลอด อย่างไรก็ตามมารดารับรู้ถึงประโยชน์ของดนตรี ดังนั้นการได้ฟังดนตรีในเวลาที่นานขึ้นน่าจะมีประโยชน์แก่มารดา

**คำสำคัญ:** การคลอด, การควบคุมตนเอง, ความกลัว, ความรู้สึกมีพลัง, ดนตรีบำบัด

## Abstract:

**Background:** There are few studies regarding ways to promote positive feelings among women in labor. Thus, it would be useful to study the effects of marching music and cheerful music on women in the second stage of labor.

**Objectives:** To examine the effects of marching music and cheerful music on women's sense of power, self-control, fear of childbirth, and second-stage duration during their second stage of labor.

**Materials and methods:** Randomization was used to assign 145 pregnant women, both primiparous (67) and multiparous (78), to the control and experimental groups. The women in the experimental group heard marching songs and cheerful music during their second stage of labor. The levels of their sense of power, self-control, and fear of childbirth were measured within two hours after the women gave birth. Measurement was achieved by using the 100 mm Visual Analogue Scale (100 mm VAS), which had test-retest reliabilities of 0.81-0.98.

**Results:** Only 141 of the 145 women were involved in the analysis due to the fact that four women did not have a normal delivery. There were no differences found between the two groups for any of the attributes: sense of power, self-control, and fear of childbirth from data measuring with VAS and duration of second stage labor. However reporting by using questionnaires, most women found that listening to the music was helpful and increased their sense of power at a moderate to high level.

**Conclusions:** Listening to marching music and cheerful music may have little effect on a woman's sense of power, self-control, fear of childbirth, or second-stage duration. However, the women perceived that there is a benefit to music, and it may be substantial if the music is listened to for a longer period of time than it was in this study.

**Key words:** childbirth, fear, music therapy, self-control, sense of power

## Introduction

Pregnant women experience the greatest severity of pain during their second stage of labor.<sup>1</sup> For first-time (primiparous) mothers, the average time of the second stage of labor is 60 minutes, with a maximum time of two hours; for multiparous women, the average time for the second stage of labor is 30 minutes, with a maximum time of one hour.<sup>2</sup> However, there are some multiparous women for whom the second stage of labor lasts for four and a half hours.<sup>3</sup> Pregnant women encounter many problems in second-stage labor, such as stress from pain and movement limitations due to medical intervention.<sup>4</sup> Severe labor pain alters a laboring woman's perception of time. Many women reported that it seemed endless, and that their cognitive skills were limited during that time.<sup>5</sup> This phenomenon is supported by research conducted in Mexico, where it was found that women giving birth without a doula (a person who provides non-medical support during childbirth) experienced painful, seemingly endless labor which no medical treatment could assuage.<sup>4</sup> Furthermore, this feeling of endless labor pain leads many women to fear childbirth.<sup>6,7</sup> A study of 650 laboring women showed that 25% of them feared childbirth.<sup>8</sup> In a qualitative study of 22 laboring women who exhibited fear of childbirth, it was found that both social factors and individual factors had an effect on their fear. In addition, it was found that these women experienced fear of the unknown (in this case, the delivery outcome), fear of having an unhealthy fetus, fear of pain, and fear of loss of

self-control and power.<sup>9</sup> Other studies have shown that fear of childbirth is a factor that results in a higher rate of caesarean sections.<sup>10,11</sup> At present, there are a large number of women who desire and receive caesarean sections in many countries,<sup>12-14</sup> including Thailand.<sup>15</sup> According to research evidence, a Caesarean section increases the health risk to women and their infants in several ways: greater mortality rates; greater pain and postpartum depression rates; more infant respiratory problems; more breastfeeding difficulties; more postpartum hemorrhaging; a two-fold increase in dead, in-utero fetuses in later pregnancies; and more severe problems in the infant-mother relationship.<sup>16</sup>

Prolonged labor can lead mothers to feel that their lives are threatened, to need more support from others, and to feel endless pain, helplessness, futility, and a lack of control.<sup>17</sup> Negative labor experiences, such as severe pain, fear, unexpected events, and a loss of self-control, might lead women to experience post-traumatic stress disorder during the postpartum period.<sup>18,19</sup>

Research has shown that enhancing the self-esteem of laboring women can increase their sense of well-being, self-control, and sense of power.<sup>20</sup> However, few studies have examined methods that can increase the power and self-control of women during second-stage labor. Music is one method that could increase their sense of power and self-control. In a review of the literature, it was found that no study has yet explored the effect of music on women in the second stage of labor. However, music has been shown to lower the pain of women in the first

stage of labor.<sup>21-23</sup> It can reduce fear, increase a sense of calm, decrease stress, and increase the self-control of those who hear it.<sup>24</sup> One study showed that elderly women in Taiwan who listened to music for one hour per day for three months, and thereafter once every two weeks for a year, reported that the music made them feel stronger, increased their energy level, reduced their feelings of suffering, gave them greater motivation to exercise, confirmed their personal feelings of worth, and gave them greater life satisfaction.<sup>25</sup>

It is important to study which methods can be used to reduce a woman's fear, increase her sense of power, and aid her in relaxing during second-stage labor. Lessening the time of second-stage labor is also a goal. From a literature review on such methods used during second-stage labor and in other settings, it was found that no studies have been conducted in which music has been used in an attempt to increase a laboring woman's sense of power and self-control, and lower her fear of childbirth. Thus, a pilot study was conducted in which seven women in second-stage labor listened to instrumental music—mainly marching songs and cheerful melodies. The results showed that the women had a greater sense of power (71.4%), had more power in bearing down (71.4%), and had a lower fear of childbirth. These women reported that the music was useful and helped them to relax. Thus, it is important to study the effects of marching songs and cheerful music on both the duration of second-stage labor and on the sense of power, self-control, and fear of childbirth that women in the second stage of labor have.

## Material and methods

### Design

This randomized, controlled trial examined the effects of marching songs and cheerful music on second-stage labor duration and on the women's sense of power, self-control, and fear of childbirth.

### Instruments

#### Music

The first set of music consisted of instrumental marching music: 1) the U.S. national anthem, "The Star-Spangled Banner" (114 beats/min); 2) the "Marines' Hymn" (106 beats/min); 3) "The U.S. Field Artillery March" (119 beats/min); and 4) "The Stars and Stripes Forever" (113 beats/min). The latter two were composed by John Phillip Sousa. This was followed by cheerful instrumental music from "The Four Seasons" and other works by Vivaldi: 1) Spring Concerto No. 1 in E major (109 beats/min); 2) Summer Concerto No. 2 in G minor (107 beats/min); 3) Oboe Concerto in C major (100 beats/min); and 4) Piano Concerto in C Major (78 beats/min). It was hypothesized that initially the marching rhythm would help to stimulate the laboring women; this was to be followed by cheerful music which would help the mother to relax after giving birth. The duration of the music was 30 minutes and had to repeat after using for 30 minutes if the women were still in second-stage labor. The music was chosen by the principal investigator and the musician, and was pre-tested in a pilot study before being employed in the present study.

## Sample and data collection

### *Sample*

The sample was comprised of both primiparous and multiparous women in a regional hospital. Because of the positive results of the pilot study, a high effect size was expected; thus, an effect size of 0.60–0.70, with a power of 0.80, was used to calculate the sample size, based on a table (page 91) in Lipsey.<sup>26</sup> The calculated sample size was 25–35 subjects in each group. However, this study involved 67 primiparous women (music 32, control 35) and 78 multiparous women (music 38, control 40). The inclusion criteria for the sample were the following: being female, married, and aged 18–35 years; having a gestational age of 38–42 weeks; having a fetus with a heart rate ranging from 120–160 beats/min; having a fetus with an estimated weight of 2,500–4,000 grams; being in the latent phase for no more than 20 hours; having no health complications; and having begun to receive antenatal care no later than sometime during the second trimester. Among the multiparous women, the maximum parity (number of births) was three. Purposive sampling was initially used to recruit the subjects; the nurse screened for laboring women who met the criteria, and then asked them for permission to let a research assistant ask them to participate in the study. The assistant informed them about the study and their rights as human subjects. Then, subjects were assigned into groups by means of a random block design: 1) primiparous women were assigned to the music group, 2) primiparous women were assigned to the

control group, 3) multiparous women were assigned to the music group, and 4) multiparous women were assigned to the control group.

The study was conducted during the women's second stage of labor. The research assistant arranged for the participants in the music group to listen to music in the labor room throughout their second-stage labor. The research assistant stayed with each woman during labor to control for social desirability.

### *Data collection*

Demographic, obstetric, and infant data were collected from the participants' charts. The duration of each woman's second-stage labor was collected from the labor records of the nurses. The women's sense of power, self-control, and fear of childbirth was measured by the research assistant, using 100 mm visual analogue scales. The VAS consisted of horizontal lines, each 100 mm in length. The line measuring sense of power was anchored on the left side with the most negative phrase, "Not having power at all." On the right was the most positive phrase, "Having the most power." For self-control, the left side had the phrase, "Not having self-control at all," and the phrase on the right side was, "Having the most self-control." For fear of childbirth, the left phrase read, "No fear of childbirth at all," and the right phrase read, "The most fear of childbirth." Each participant was asked to place a slash mark (/) on the perspective line indicating her perception. The visual analogue scale is a single item which has a high validity and reliability, similar to multiple-item measurement.<sup>27</sup> The

test-retest reliability in this study was  $r=0.98$  for sense of having power,  $r=0.81$  for self control, and  $r=0.86$  for fear of childbirth. The research assistant asked the women two hours after giving birth to report their feelings regarding each variable. The women in the music groups filled out two short questionnaires after giving birth: 1) "Was the music that you listened to during labor useful? If so, to what degree?" and 2) "Did the music that you listened to during labor increase your power? If so, to what extent?"

### Ethics

Ethical approval to conduct the study was granted by the ethics committees of the Faculty of Nursing, Prince of Songkla University, and Hat Yai Hospital. Consent was obtained from every participant.

### Statistical analysis

The characteristics of the participants and the extraneous variables were analyzed with descriptive statistics, and the extraneous variables were compared by the use of chi-square and t-tests, as was appropriate. The differences in variables between the control and experimental groups were compared by use of t-tests.

## Results

### Characteristics of participants

One hundred and forty-five laboring women participated in the study. Of these, 141 women completed the study, as four women did not experience a normal delivery. Thus, 141

cases were used in the analysis. There were 65 primiparous women and 76 multiparous women.

For primiparous women, the average age was 22.95 years (SD=4.91 years). The majority were Buddhist (41 women, 63.1%), followed by Muslim (35.4%). In terms of educational level, the most common category was nine years (27.7%), then 12 years (high school) (23.1%), and then a bachelor's degree (21.5%). The average gestational age was 39.06 weeks (SD=1.14 weeks), the average family income was 10,153 baht (SD=5.791 baht [\$1=30.30 baht]), the average duration of first-stage labor was 8.24 hours (SD=4.35 h), and the average infant weight was 3,040.68 g (SD=356.81 g).

For multiparous women, the average age was 26.59 years (SD=4.59 years). The majority were Buddhist (55 women, 72.4%), followed by Muslim (25%). The most common educational level was nine years (32.9%), then 12 years (high school) (22.4%), and then a bachelor's degree (9.2%). The average gestational age was 39.28 weeks (SD=1.09 weeks), the average family income was 10,033 baht (SD=5,832 baht), the average duration of first-stage labor was 7.40 hours (SD=4.35 h), and the average infant weight was 3,197.78 g (SD=359.43 g).

### Extraneous variables

Differences in extraneous variables-age, education, religion, income, gestational age, duration of antenatal clinic attendance, infant weight, and the receipt of oxytocin-between the music group and the control group were tested by use of the chi-square test and Student's t-test.

The results showed no differences between the music and control groups. However, the average duration of first-stage labor of the primiparous women in the music group was significantly longer than it was for the primiparous women in the control group ( $t_{(70)}=2.26, p<0.05$ ). However, this variable was not different between the two groups of multiparous women.

**Music**

The average time the primiparous women listened to music was 23.04 minutes (SD=15.31 min), with a range of 5-75 minutes. For the multiparous women, the average time of exposure to music was 20.54 minutes (SD=15.87 min), with a range of 4-60 minutes. Three primiparous

women reported that they did not hear any music because their pain was too severe.

**Hypothesis testing**

The results showed that women in both groups (music and control) had a moderate level of sense of power, self-control, and fear of childbirth during the second stage of their labor. The t-test used in the analysis of the data indicated that there were no differences in the duration of second-stage labor, nor were there any regarding the women’s sense of power, self-control, or fear of childbirth. This was true between the music group and the control group either primiparous or multiparous women (Tables 1 and 2).

**Table 1** Comparisons of duration of second-stage labor, sense of power, self-control, and fear of childbirth which were made between the music and control groups for primiparous women.

Variables	Groups	Mean	SD	t (df=63)	p-value
Duration of second-stage labor <sup>a</sup>	Music	25.90	16.24	0.581	0.564
	Control	28.63	21.25		
Sense of power <sup>b</sup>	Music	62.78	21.48	0.610	0.544
	Control	59.33	24.00		
Self-control <sup>b</sup>	Music	55.25	21.19	0.068	0.946
	Control	54.87	22.52		
Fear of childbirth <sup>b</sup>	Music	48.31	27.04	1.419	0.161
	Control	58.69	31.70		

<sup>a</sup>=minutes, <sup>b</sup>=VAS range 0-100 mm

**Table 2** Comparisons of duration of second-stage labor, sense of power, self-control, and fear of childbirth which were made between the music and control groups for multiparous women.

Variables	Groups	Mean	SD	t (df=74)	p-value
Duration of second-stage labor <sup>a</sup>	Music	16.47	18.84	0.593	0.555
	Control	14.34	11.63		
Sense of power <sup>b</sup>	Music	66.73	23.44	0.100	0.921
	Control	67.28	24.83		
Self-control <sup>b</sup>	Music	51.68	25.28	0.694	0.490
	Control	55.55	23.25		
Fear of childbirth <sup>b</sup>	Music	52.47	30.66	0.189	0.850
	Control	51.07	32.31		

<sup>a</sup>=minutes, <sup>b</sup>=VAS range 0-100 mm

**Table 3** Levels of feeling among primiparous and multiparous women regarding the usefulness of music and increasing feelings of power

Effects of music	Level of feeling			
	None at all	Little	Moderate	Strong
<b>Primiparous</b>				
Useful	2 (6.3%)	-	15 (46.9%)	15 (46.9%)
Increased power	3 (9.4%)	2 (6.3%)	19 (59.4%)	8 (25%)
<b>Multiparous</b>				
Useful	-	-	17 (47.2%)	19 (52.6%)
Increased power	-	1 (2.8%)	20 (55.6%)	15 (41.7%)

Using questionnaires in data collection in the music group both primiparous and multiparous women, primiparous women reported that music was moderately useful (47%) or highly useful (47%). Multiparous women rated music as either highly useful (53%) or moderately useful (47%). The participants also reported that music

gave them a greater sense of power during their second stage of labor; this was at the moderate (59.4%) and high (25%) levels for primiparous women and was also at the moderate (55.6%) and high (41.7%) levels for multiparous women (Table 3).

## Discussion

There were no differences in sense of power, self-control, or fear of childbirth as measured by using VAS among any of the women in the study. This may be because the women experienced high levels of pain and could not hear the music very well. In fact, three women reported that they could not hear the music at all because of their pain. Another reason for the results could be due to the fact that the women were exposed to the music for a period of time which was too short for it to provide them with any beneficial effects. This idea is supported by previous studies showing that music therapy must be used for at least 20–30 minutes to achieve beneficial results among persons with normal health status.<sup>28,29</sup> Another reason could be the fact that the research assistant stayed with each woman in the study during her labor; this may have increased the positive feelings of the women to a greater degree than the music did, thus overshadowing its effects. This concept of having a supporter present during labor was shown to be useful in two studies in which women reported that having a nurse or husband nearby was useful to them.<sup>30,31</sup> Although the results showed that music had no effect on the sense of power, self-control, or fear of childbirth of women in second-stage labor as measured by using VAS, the women reported that the music was useful and increased their sense of power at least moderately, in some cases as reporting by using questionnaires. This implies that stimulating music may be useful if it is heard by a woman for a longer period of time during her labor than occurred in this study.

The music caused no difference in the duration (length of time) of the participants' second stage of labor. Since the music had little effect on the feelings of the women, it is not unexpected that it did not have an effect on duration. This conclusion is supported by a study by Phumdoung and colleagues<sup>32</sup> which involved laboring women who were in the Prince of Songkla University Cat (PSU Cat) position with alternatively used high-head position. These women listened to soft, soothing instrumental music, and it was found that they had a shorter active phase of labor compared to women in the supine position.

## Limitations

After the women were in the second stage of labor, they had to be moved to the labor room before listening to the music. Therefore, the time they listened to the music was shorter than the total time of their second stage of labor. This may have lessened the effect that this stimulating music had on their sense of power, self-control, fear of childbirth, and duration of second-stage labor.

The average time of second-stage labor in both groups of primiparous and multiparous women was quite low when compared to the general population (average in primiparous women: 60 min; in multiparous women: 30 min).<sup>2</sup> This, together with the small sample size, may limit the degree to which the results of this study can be generalized.

Thus, further controlled studies should be performed with larger sample sizes and the playing of music should be extended to include

the beginning of the transition phase of labor. Such studies may show a noticeable effect from the stimulating music on the women's sense of power, self-control, fear of childbirth, and/or second-stage duration.

## Conclusions

**The results showed that stimulating (marching) music and cheerful music have little or no effect on women's sense of power, self-control, fear of childbirth, and duration of second-stage labor. This may be due to an insufficient duration of time for which the music is played. However, the questionnaire responses implied that stimulating music may be useful for laboring women if it is heard for a longer period of time, beginning in the transition phase of labor.**

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