

# Effects of Music during Multiple Cesarean Section Delivery

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## ABSTRACT

This experimental study was conducted to determine the level of anxiety in women undergoing multiple cesarean section. Sixty multiple cesarean section referrals were randomly assigned to either the experimental or control groups. Data was collected at the Karaman Public Health Hospital in Turkey, from June 2015 to June 2016. Songs chosen earlier by the patients were played during the cesarean section procedure for the experimental group. The control group was studied without music. Data was collected using a questionnaire form, and Visual Analogue Scale (VAS) was used to determine the anxiety levels. The t-test and chi-square test were used to analyse statistically significant differences between the groups. The VAS scores before and during the procedure showed significantly lower scores for the experimental group, compared to the control group ( $p < 0.05$ ). Music therapy reduces the physiological and cognitive responses of anxiety in patients undergoing multiple cesarean section, and can be used in the clinical practice.

**Key Words:** *Music. Anxiety. Cesarean delivery. Physiological parameter. Nursing.*

In women with multiple cesarean sections, anxiety and fear are often overlooked by health professionals due to the perception that a woman is already experienced; and that there is no anxiety about cesarean birth.

Nurses can use non-pharmacologic methods to deal with a patient's anxiety in collaboration with other members of the profession.<sup>1</sup> One of the non-pharmacological nursing interventions is the use of music as a therapeutic modality.<sup>2</sup> In the present study, therefore, the aim was to evaluate the effects of nursing intervention using the music therapy to relieve anxiety levels in pregnant women with multiple cesarean sections.

This experimental study included a total of 60 pregnant women, including 30 in the experimental group and 30 in the control group, who were admitted to a state hospital and met the inclusion criteria of this study between June 2015 and June 2016. Using the G.Power-3.1.7 software, the sample size was estimated with 0.95 power. Based on  $\alpha = 0.05$  and an effect size of 0.28, a total of 60 participants were required in the groups with 95% power. For this work, a 5% level of significance representing a

statistical power of 95% was adopted, an error tolerance of 0.5 was assumed as well as a standard deviation of 2 from a previously conducted pilot study.<sup>3</sup> Randomization of the sample was provided at the beginning of the study by accepting the birth to the first pregnant control group planned for the cesarean and the next pregnant experimental group. Inclusion criteria included having no communication and hearing problems, volunteering to participate the study, having cesarean indications, having less than 5 years between the first and the current cesarean section, having no obstetric problems, and having no known psychiatric diagnoses.

The study data were collected using a questionnaire form containing questions about personal details as well as details about the pregnancy process, certain vital findings produced immediately preoperatively and during suture tying.<sup>3</sup> Also, a 10-mm horizontal VAS from 0 (no anxiety) to 10 (total anxiety) was used to measure the anxiety levels of pregnant women preoperatively and during suture tying. The data were collected preoperatively by a researcher by a face-to-face interview method in about five minutes, and the vital findings were measured and recorded both pre- and postoperatively. During the implementation phase of the study, interviews with women who decided to undergo a planned cesarean section delivery were conducted during hospital admission and they were informed about the study. The date of planned operation and a list of their favourite songs were obtained to play during the operation from women who met the inclusion criteria, accepted to participate, and be in the experimental group. Some demographical data in the questionnaire form were collected by interview in the reception room, where women prepared for the operation before entering the surgery room. Immediately after the women were received into the surgery room, their heart rate, blood pressure, oxygen saturation values, and anxiety levels

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**Table I:** The sociodemographic, pregnancy and perinatal variables of included women.

	Experimental Group (n:30)		Control Group (n:30)		T	p
	Mean	±SD	Mean	±SD		
Age (years)	30,63	5,63	30,03	5,42	-0,420	,676
Age of marriage	21,07	3,25	19,97	2,58	1,450	,153
Marriage duration (months)	144,40	78,57	120,80	72,33	-0,328	,744
Number of pregnancies	1,87	1,04	2,07	1,08	-0,730	,468
Number of miscarriages	0,43	0,93	0,57	0,97	-0,942	,590
Gestation (wk)	38,40	1,03	38,62	0,84	-0,886	,379
Operation time (h)	1,13	0,90	1,38	2,55	-0,353	,733
	n	%	n	%	$\chi^2$	p
Education						
≥8 years	14	46,7	17	56,7	0,601	,438
<8 years	16	53,3	13	43,3		
Occupation						
Have	16	53,3	14	46,7	0,267	,606
Do not have	14	46,7	16	53,3		
Economic status						
High-Middle	26	86,7	22	73,3	1,667	,197
Low	4	13,3	8	26,7		
Wanted pregnancy						
Yes	25	83,3	23	76,7	0,417	,519
No	5	16,7	7	23,3		
Type of anesthesia						
Epidural	15	50,0	12	40,0	0,606	,436
Spinal	15	50,0	18	60,0		

$\chi^2$  = Ki-kare test; t = Student's t-test; SD = Standard deviation.

**Table II:** Comparison of variables during cesarean delivery for experimental and control groups (n=60).

	Experimental Group, mean ±SD		Control Group, mean ±SD		Experimental		Control		Experimental / Control			
	BO	AO	BO	AO	BO/AO <sup>1</sup>		BO/AO <sup>1</sup>		BO <sup>2</sup>		AO <sup>2</sup>	
	t	p	t	p	t	p	t	p	t	p		
Body temperature	36,32 ±0,33	35,95 ±0,46	36,34 ±0,27	36,08 ±0,15	5,486	,000*	7,407	,000*	-0,336	,738	-1,494	,144
Saturation	98,57 ±1,45	99,10 ±0,84	98,70 ±1,51	98,03 ±1,82	2,525	,017*	-2,112	,043*	0,348	,729	-2,900	,006*
VAS	7,23 ±2,38	6,03 ±2,88	7,23 ±2,38	6,50 ±2,19	3,363	,002*	-0,082	,905	1,211	,231	-0,713	,479
Respiration rate	20,60 ±4,17	20,73 ±5,91	19,83 ±3,28	19,67 ±2,85	-0,107	,916	0,306	,762	0,791	,432	0,890	,377
Hearth rate	84,57 ±16,07	83,33 ±13,07	77,20 ±12,21	78,47 ±14,22	-0,901	,375	-0,610	,547	1,999	0,05*	1,379	,173
SBP	123,40 ±14,10	115,67 ±11,64	118,13 ±11,83	115,77 ±11,88	3,213	,003*	1,035	,309	1,567	,123	-0,033	,974
DBP	72,07 ±16,93	62,80 ±11,74	66,43 ±10,37	63,20 ±8,62	2,709	,011*	2,176	,038*	1,554	,127	-0,150	,881

\*P<0,05; BO = Before operation; AO = After operation; SBP = Systolic blood pressure; DBP = Diastolic blood pressure; 1 = Paired student's t-test; 2 = Independent student's t-test; SD = Standard deviation.

were measured and recorded. Then, the cesarean section started after anesthesia was administered by the anesthesia specialist. Songs prepared preoperatively were played at each patient's desired volume throughout the operation using a stereo player. Physiological parameters and anxiety levels in the questionnaire form were recorded at suture tying, too. Data in the questionnaire form were collected from control group women by face-to-face interview method; their vital findings were recorded before and after the anesthesia procedures, with no intervention made throughout the operation.

The study received ethical approval from the Ethics Committee of Selcuk University (IRB No: 2014/179 Date: 10.06.2014). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical analyses were performed using the SPSS 21.0 software package (IBM Corp., Armonk, NY, USA) and chi-square test, student's t-test, paired student's t-test, and independent student's test were used to analyse the obtained data. Descriptive data were expressed in mean and standard deviation (SD), number and percentage. A p-value of <0.05 was considered statistically significant.

There was no significant differences (p>0.05) between the demographic variables of the control and experimental groups (Table I). A statistically significant decrease in body temperature (p=0,00), anxiety score (p=0.002), systolic (p=0.003) and diastolic (p=0.011) blood pressure both pre- and postoperatively, and an increase in oxygen saturation level (p=0.017) was found in the experimental group. There was a significant decrease in the diastolic pressure (p=0.038), body

temperature ( $p < 0.001$ ), and oxygen saturation ( $p = 0.043$ ) in the control group both pre- and postoperatively (Table II). Although the heart rates of women in the control group were higher postoperatively than preoperatively; heart rates of women in the experimental group were found to be lower ( $p < 0.05$ ) postoperatively than preoperatively.

In the present study, the physiological indicators of anxiety and blood pressure were reduced from the baseline values in the experimental group, compared to the control group. The literature also contains several studies supporting this finding.<sup>3,4</sup> The ability of music to affect certain physiological indicators of state anxiety is based on the psychophysiological theory, as suggested by O'Callaghan.<sup>5</sup>

The study found a decrease in the heart rates of women who received music therapy postoperatively, with an increase in women in the control group. The study by Sarkar *et al.* also found that the heart rates decreased towards the end of the operation in the experimental group, with an opposite effect in the control group.<sup>3</sup> This might suggest that music distracts the attention and decreases the level of anxiety to offer relaxation.

This study found a significant increase in the oxygen saturation levels of women in the experimental group. Studies investigating the effects of music throughout the cesarean procedure also reveal that it increases oxygen saturation level.<sup>6,7</sup> This may suggest that women feel themselves better and have better respiratory qualities as a result of the decrease of the anxiety level and heart rate with music, which is rather a desirable outcome.

Furthermore, it has been shown that music exerts its effect by decreasing the body temperature, one of the physiological parameters, as in this study. The operation room temperature of 23°C may lead to loss of temperature in patients undergoing anesthesia.

In the present study, anxiety scores significantly reduced in the experimental group, compared to the control group ( $p < 0.05$ ). This concomitant reduction of anxiety levels with the physiological indicators confirms the holistic nature of man. Liu and Petrini reported similar results in postoperative patients whose anxiety levels were significantly reduced by music therapy, compared to the controls.<sup>8</sup>

The preference for the music may be an important factor in choosing what music to listen to as part of a relaxation experience or regimen. In some studies, including this study as the researcher did not follow the participants' level of satisfaction with the music, it is not known

whether all participants really enjoyed the music that they selected?<sup>6,8</sup>

Nonetheless, there are few limitations to this study. The physiological parameters planned for collection preoperatively, perioperatively, during mother-baby contact, and postoperatively were not analysed during the operation, since ensuring the mother to hold the baby as soon as it is born was not possible at the hospital where the study was conducted. Playing different genres of music to pregnant women, the fact that cesarean section is a surgical procedure under anesthesia and no pain assessment based on the opinion that it will not reflect objective data, were among the limitations of the study results.

In conclusion, in the present study, we found that music therapy increased oxygen saturation levels and decreased anxiety levels. Based on these results, as an easy-to-use and inexpensive approach, this method is recommended before, during, and after the cesarean section.

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