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 Received
 24.01.2025

 Accepted
 13.08.2025

 Publication Date
 29.09.2025

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E-mail: drnerimancaglayan@gmail.com Cite this article: Ayten B., & Çağlayan Keleş, N. (2025). The Effect of Turkish Music on Maternal Anxiety and Breastfeeding Success in the Postpartum Period: A Randomized Controlled Experimental Study. Journal of Midwifery and Health Sciences, 8(3),223-228.



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The Effect of Turkish Music on Maternal Anxiety and Breastfeeding Success in the Postpartum Period: A Randomized Controlled Experimental Study

ABSTRACT

Objective: This study was conducted to evaluate the effect of Turkish music on maternal anxiety and breastfeeding success in the postpartum period.

Methods: The study was carried out between January and June 2023 at the neonatal intensive care unit (NICU) of a research and training hospital in Istanbul. Mothers were randomly assigned to the experimental group (n=34) and the control group (n=34). Data were collected using the Personal Information Form, the Spielberger State-Trait Anxiety Inventory, and the LATCH Breastfeeding assessment Scale. The experimental group listened to 30 minutes of 'Neva' makam, a mode from Turkish classical music, for 4 consecutive days, with 15 minutes before breastfeeding and 15 minutes during breastfeeding, twice a day. The control group received routine care without music.

Results: There were no significant differences in the pre-test anxiety and breastfeeding success scores between the experimental and control groups (p>.05). The post-test state anxiety scores in the experimental group were significantly lower compared to the control group (p<.001). The post-test breastfeeding success scores of the experimental group were significantly higher than the control group (p<.001).

Conclusion: This research found that Turkish music reduced maternal anxiety and increased breastfeeding success in the postpartum period. Integrating music interventions into postpartum care plans by both nurses and midwives can enhance maternal and infant health. It is recommended that music interventions be included in undergraduate curricula to facilitate their implementation in clinical practice.

Keywords: Anxiety, breastfeeding, maternal, music, postpartum period.

Introduction

The postpartum period is a unique process characterized by intense physiological and hormonal changes, often accompanied by pain and breastfeeding difficulties. These biological changes can significantly affect the mother's mood and anxiety levels (Ribeiro et al., 2018). Additionally, the infant's hospitalization in the NICU and the separation of the mother from her baby serve as additional stressors that increase anxiety (Bonacquisti et al., 2020; Kostilainen et al., 2021).

Pharmacological and non-pharmacological methods are used to alleviate pain and anxiety in the postpartum period. Pharmacological methods are not recommended during the postpartum period due to their potential to suppress hormones necessary for milk production, transfer of drugs through breast milk, side effects, and drug interactions (Hakimi et al., 2021). Music therapy, an effective nonpharmacological method, is a side-effect-free, costeffective, and easy-to-apply approach. Music affects the brain's alpha waves, causing relaxation and endorphin release (Varișoğlu & Güngör Satilmiş, 2020). Additionally, music therapy increases oxytocin release and suppresses cortisol levels, thereby promoting milk production (Düzgün & Özer, 2020). Music has served as a therapeutic method for centuries in both world and Turkish history. With a history spanning over 6,000 years, Turkish music has not only been an art form but also a significant tool for health and psychological recovery. During the Middle Ages, music therapy was implemented in Ottoman hospitals to aid in the mental and physical recovery of patients (Çoşar Çetin et al., 2017).

Music interventions, as a culturally tailored and personalized approach, allow participants to choose their preferred music type, either vocal or instrumental, making it a non-invasive application (Varişoğlu & Güngör Satilmiş, 2020). Music is not only an entertainment tool but also a stimulus that can have positive effects on individuals. When used as an intervention, music aims to promote healing through a controlled process. Elements such as rhythm, harmony, melody, and tempo support emotional and cognitive states (Bernatzky et al., 2011).

In nursing and midwifery, music is commonly used to relieve pain and anxiety during pregnancy and childbirth (Ji et al., 2024; Shimada et al., 2021). However, there are limited studies examining the effects of music on maternal anxiety levels and breastfeeding success in the postpartum period.

This study aimed to evaluate the effect of Turkish music on maternal anxiety and breastfeeding success during the postpartum period.

Journal of Midwifery and Health Sciences

Materials and Methods

Hypotheses of the Study

Listening to Turkish music before and during breastfeeding reduces maternal anxiety and positively affects breastfeeding success.

Study Design

This research was conducted as a randomized controlled experimental study, following the CONSORT guidelines (Figure 1).

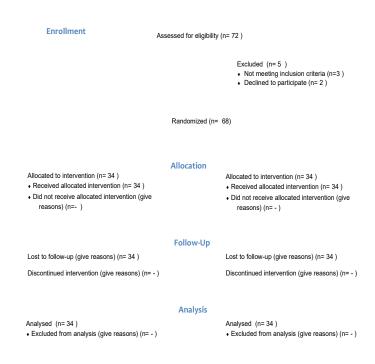


Figure 1.

Consort Flow Diagram

Sample

The study was conducted between January and June 2023 at a research and training hospital's level 1 neonatal intensive care unit in Istanbul. The sample size was determined based on a power analysis using G*Power (Version 3.1.9.6), which showed a moderate effect size of 0.20 based on relevant literature (Dağli & Çelik, 2022). The sample consisted of 68 participants, with 34 in the experimental group and 34 in the control group.

Randomization

Simple randomization was performed for a total of 68 participants using random number sequences generated by www.random.org. Participants who met the inclusion criteria were assigned to the experimental and control groups according to their order of enrollment. Due to

participant dropout, new participants were assigned to the respective groups based on the sequence. Blinding was not performed for participants and implementers due to the nature of the intervention. The statistical analysis of the study was conducted by independent experts blinded to group allocation.

Inclusion Criteria

Mothers of infants born at or after 37 weeks of gestation, weighing more than 2500 grams, and who had transitioned to full enteral feeding and were receiving breast milk were included. Additionally, infants without congenital anomalies or respiratory support requirements were eligible.

Exclusion Criteria

Exclusion criteria for the study included mothers with hearing impairments, refusal to breastfeed, or breastfeeding contraindications (e.g., HIV, chemotherapy, radiotherapy, breast problems)

Data Collection Tools

Data were collected using a demographic information form developed based on the literature, the Spielberger State-Trait Anxiety Inventory, and the LATCH Breastfeeding Assessment Scale. Prior to starting the study, informed consent was obtained from the participants.

Demographic Information Form: The survey form developed by the researchers, based on the literature, consists of three sections: the first addresses the mother's demographic characteristics, the second examines obstetric characteristics, and the third focuses on the newborn's characteristics. The form includes 22 questions in total.

Spielberger State-Trait Anxiety Inventory: The State-Trait Anxiety Inventory, developed by Spielberger and colleagues in 1964, was adapted into Turkish by Necla Öner and Ayhan Le Compte in 1983. The anxiety measurement tool used in this study includes 10 reverse-worded items: questions 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20. The score on the scale varies from 20 to 80, with higher scores indicating increased anxiety. According to validity and reliability studies, Cronbach's alpha has been reported to range from 0.94 to 0.96 (Oner & Le Compte, 1983). In this study, Cronbach's alpha was 0.90 for the pre-test and 0.91 for the post-test, showing high reliability.

LATCH Breastfeeding Assessment Scale: The LATCH scale, developed by Jensen and colleagues in 1994 to assess breastfeeding success, was validated in Turkish by Yenal and Okumuş. The scale is based on the APGAR score system and consists of five assessment criteria. Each item is scored between 0 and 2, with a maximum possible score of 10. Higher scores on the scale indicate better breastfeeding

success. In the original scale Cronbach's alpha was 0.93, and in the Turkish adaptation, it was 0.95 (Yenal et al., 2013). In this study, Cronbach's alpha for the scale was 0.71 for the pre-test and 0.70 for the post-test.

Implementation of the Study

Before starting the study, the demographic information State-Trait Anxiety Inventory, and Breastfeeding Assessment Scale were administered to the experimental and control groups. The mothers in the experimental group listened to Neva mode music for 30 minutes (15 minutes before and 15 minutes during breastfeeding) at 11:00 AM and 4:00 PM for 4 days, for a total of 8 sessions. The music selected for the study was determined through a pilot study conducted with 6 women at the hospital's breastfeeding clinic. Neva mode is known for its slow tempo, softness, and calming effect. All of the music pieces used were instrumental, and the music was accompanied by the sounds of water and instruments such as Ney, Rebab, Çeng, Ud, Dombra, and Rübab (Somakçı, 2003). The mothers chose the pieces they liked from Neva mode to participate in the study. The music was listened to through headphones, and the mothers adjusted the volume to a comfortable level. It was ensured that the volume did not exceed 85 decibels. The control group received routine care without music. The State-Trait Anxiety Inventory and LATCH Breastfeeding Assessment Scale administered on day 5.

Data Analysis

Statistical analysis of the data was performed using the SPSS (IBM SPSS Statistics 27) program. Descriptive statistics and frequency tables were used in the interpretation of the findings. For measurement values that followed a normal distribution, Independent Sample t-tests and Paired Sample tests were applied. For measurement values that did not follow a normal distribution, the Mann-Whitney U test and Wilcoxon test were used. In examining the relationships between two categorical variables, Pearson $\chi 2$ crosstabulations were used. For variables that did not follow a normal distribution, the Spearman correlation coefficient was used to examine the relationships between two quantitative variables.

Ethical Approval

Ethical approval for the study was obtained from the Hamidiye Clinical Research Ethics Committee of the Health Sciences University (Date: 27.10.2022, No: 16/61). Written and verbal informed consent was obtained from the pregnant women who volunteered to participate before the study began. The study was conducted in accordance with the principles of the Helsinki Declaration.

Results

In both groups, age, education level, occupation, spouse's education level, monthly income level, and family type parameters were statistically similar (p>.05). The average age of mothers in the experimental group was 30.00±5.30, and in the control group, it was 28.91±5.79. In both groups, most participants were primary school graduates, unemployed, had an average income level, and were from nuclear family structures. Additionally, regular pregnancy check-ups, the type of delivery, whether the pregnancy was planned and desired, reasons for NICU admission, baby's gender, the mother's breastfeeding education status, and prenatal care status were similar between the groups (p>.05). The gestational week of the newborns was 37.85±2.98 in the experimental group and 38.03±2.14 in the control group (p>.05). The average birth weight of the babies in the experimental group was 3120±749 grams, while in the control group, it was 3361 \pm 558 grams (p>.05).

There was no significant difference between the pre-test anxiety scores of the mothers in the experimental and control groups (p>.05), but the post-test anxiety score was significantly lower in the experimental group compared to the control group (p<.001; Table 1).

Table 1
Findings of the State Anxiety Scale for Mothers in the Experimental and Control Groups

Experimental and control croups					
State	Experimental	Control group	Statistical		
Anxiety	group (n=34)	(n=34)	Analysis		
	X±SD	X±SD	·		
Pre-test	50.21±9.75	44.76±13.30	t=1.924		
			p=.05		
Post-test	32.21±6.94	45.09±10.84	Z=-4.793		
			<i>p</i> <.001		
Statistical	t=10.990	Z=-0.032			
Analysis	<i>p</i> <.001	p=.974			
*Independent Sample t test Daired Sample test Mann					

^{*}Independent Sample-t test, Paired Sample test, Mann-Whitney U, Wilcoxon test

There was no significant difference in the pre-test LATCH scores between the groups (p>.05), but the post-test LATCH scores of the mothers in the experimental group were significantly higher compared to the control group (p=.036; Table 2).

Discussion

The findings of this study indicate that music reduces anxiety levels in postpartum mothers and enhances breastfeeding success. The results of our study align with previous research that supports the therapeutic effects of music and its contribution to mothers' mental well-being (Kostilainen

et al., 2021; Ribeiro et al., 2018; Tseng et al., 2010; Yang et al., 2019). Many studies suggest that music affects the brain's opioid system, reducing pain, stimulating the hypothalamic-pituitary-adrenal axis to lower stress hormones, and effectively reducing anxiety (Ribeiro et al., 2018; Yang et al., 2019). The reduction of anxiety and pain can directly influence milk production and breastfeeding success (Karakoyunlu et al., 2019).

rable 2						
Findings of th	e LATCH Scale for	Mothers in the Exp	erimental and			
Control Groups						
	Experimental	Control group	Statistical			
LATCH	group (n=34)	(n=34)	Analysis			
C	VICE	VICE				

LATCH	group (n=34)	(n=34)	Analysis
Score	X±SD	X±SD	
Pre-test	7.88+1.41	8.44+1.33	Z=-1.595
	7.00II.41	0.44 <u>1</u> 1.33	p=.111
Post-test	9.18+0.83	8.64+1.17	t=2.139
	9.10±0.65	0.04±1.17	p=.036
Statistical	Z=-4.667	Z=-1.325	
Analysis	<i>p</i> <.001	p=0.185	

^{*}Independent Sample-t test, Mann-Whitney U, Wilcoxon test

One of the factors enhancing the therapeutic effect of music is that Turkish participants listened to Turkish music aligned with their cultural background. According to Midya et al. (2019), the cultural and emotional context of music can provide a more meaningful therapeutic effect, suggesting that selecting music consistent with participants' cultural backgrounds may be more effective in the treatment process. Turkish music supports both mental and emotional recovery while also strengthening maternal feelings and the sense of belonging.

This type of culturally specific music may help mothers overcome feelings of loneliness and alienation, providing support. In this context, music is not only a therapeutic tool but also an important method that relaxes and encourages recovery in mothers. The compositional characteristics of music, such as rhythm, tempo, melodic contour, and harmonic structure, regulate breathing and emotions, evoke pleasant imagery, and positively influence physiological and psychological responses, potentially reducing anxiety (Robb et al., 2011). This study found that mothers who listened to the Neva makam of Turkish music experienced a reduction in anxiety levels. Several studies have shown that music reduces pain and anxiety during the postpartum period (Domínguez-Solís et al., 2021; Hakimi et al., 2021; Toker et al., 2021). A systematic review indicates that although music is effective in reducing postpartum depression, it does not have a significant impact on anxiety. The differences in study outcomes are attributed to factors such as sample size, the duration and frequency of music intervention (Yang et al.,

2019). Additionally, the cultural specificity of the music, the opportunity for participants to choose music according to their preferences, and the type of music (active/passive) can significantly influence the effectiveness of the intervention. Variations in music intervention protocols can explain the diversity in study results.

Passive and calming music is defined as slow, soft music with a repetitive tempo (60-80 beats per minute) that aligns with the listener's heart rate. The listening of instrumental, wordless music, preferably played on the piano or string instruments, in a calm environment, has been shown to reduce anxiety levels and positively impact breastfeeding success (Kohn, 2019).

In music intervention studies, the duration and frequency of the intervention typically ranged from one or two sessions per week, with a total of 1 to 14 sessions, and each session lasted between 11 and 60 minutes. In this study, music was administered for a total of 8 sessions over the course of 4 days within a one-week period, with 2 sessions per day. Consistent with the literature, each session lasted 30 minutes. It has been reported that longer durations and a greater number of sessions can enhance the effectiveness of the music intervention. Allowing participants to choose the type of music has been shown to increase the effectiveness of the intervention (Düzgün & Özer, 2020). In this study, participants were given the option to select pieces from Neva mode, a traditional Turkish musical scale. Allowing mothers to choose music, they enjoyed likely made them feel more engaged and active in the intervention. Involvement in decision-making regarding their care and development enhances individuals' self-efficacy skills. The development of self-efficacy fosters the mother's belief in her ability to care for her baby, supports breastfeeding success, and reduces maternal anxiety (Gerçek et al., 2017).

The literature includes numerous studies demonstrating that music is an effective method for increasing both the quantity and quality of breast milk (Jayamala. et al., 2015; Dağli & Çelik, 2022; Keith et al., 2012). However, no study has been found that specifically examines its effect on breastfeeding success. High breastfeeding success is associated with longer breastfeeding duration (Gerçek et al., 2017). Some of the parameters evaluated in the LATCH scale, which measures breastfeeding success, include the mother's comfort level and the amount of help she requires during breastfeeding. Music intervention, in addition to relaxing the mother, provides her with social support (Yang et al., 2019). Furthermore, due to its low cost, ease of accessibility, and the fact that it does not require continuous staff support, music interventions can be easily integrated into nursing and midwifery care.

Limitations

There are some limitations to this study. First, the study was conducted in a single hospital and within a specific cultural context. Research conducted in different geographic areas and cultural contexts could assess the universal effects of music. Additionally, the study focused only on short-term music intervention, highlighting the need for research that examines long-term effects. Expanding the variety of music styles based on participants' preferences could further enhance the impact of music. Future research should consider these limitations.

Conclusions

This study demonstrates that Turkish music has a positive impact on improving breastfeeding success and reducing anxiety during the postpartum period. As a low-cost, side-effect-free, and easily implementable intervention, music can be an effective addition to postpartum care, particularly in settings where midwives and nurses are involved. Future research should explore the effects of different music genres on both breastfeeding outcomes and maternal anxiety levels to better understand the broader potential of music-based interventions in postpartum care.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Hamidiye Health Sciences University (Date: 27.10.2022, No: 16/61).

Informed Consent: Written and verbal informed consent was obtained from the pregnant women who volunteered to participate before the study began. The study was conducted in accordance with the principles of the Helsinki Declaration.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept -BNA-NÇK; Design-BNA-NÇK; Supervision-NÇK; Resources-BNA-NÇK; Data Collection and/or Processing-BNA; Analysis and/or Interpretation-BNA-NÇK; Literature Search-BNA-NÇK; Writing Manuscript-NÇK; Critical Review-NÇK; Other-BNA-NÇK.

Conflict of Interest: The authors have no conflicts of interest to declare

Financial Disclosure: The authors declared that this study has received no financial support.

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