

Original Article

Determination of the Effect of Kangaroo Care Accompanied by Lullaby Hymns on Mother-Infant Attachment and Anxiety Levels of Mothers

Rukiye Turk Delibalta, PhD

Assistant Professor, Kafkas University, Faculty of Health Sciences Department of Nursing, Kars, Turkey

Zehra Coktay

Ministry of Health, Iskenderun State Hospital, Nurse, Hatay, Turkey, Iskenderun State Hospital, B block, 7nd floor, Internal Medicine Service, Iskenderun, Hatay, Turkey

Correspondence: Rukiye Turk Delibalta, PhD, Assistant Professor, Kafkas University, Faculty of Health Sciences Department of Nursing, Kars, Turkey e-mail rahsantur@gmail.com

The address where the study was done: Iskenderun State Hospital, B block, 1nd floor, Newborn Intensive Care Unit, Iskenderun, Hatay, Turkey.

Abstract

Background: Kangaroo care has a very special place in initiating a mother-infant attachment.

Objective: In this study, the effect of kangaroo care accompanied by lullaby hymns on the maternal-infant attachment and anxiety levels of mothers was investigated.

Methodology: This study was conducted with 1 control group and 2 experimental groups consisting of 60 randomly selected individuals in each group. The control group received standard hospital care, while one of the experimental groups applied kangaroo care, and the other applied kangaroo care accompanied by lullaby hymns. The Mother-to-Infant Bonding Scale (MIBS) and Spielberger's State-Trait Anxiety Inventory (STAI) was used to measure mother-infant attachment and the anxiety levels of the mothers.

Results: In our study, the pre-test (47.43 ± 10.46) - post-test (32.08 ± 6.78) state anxiety scores of the group with kangaroo care accompanied by lullaby hymns were statistically significantly higher than the pre-test (42.68 ± 14.14) - post-test (29.60 ± 6.03) scores of the group with only the kangaroo care. However, no statistically significant relationship was found in the mother-to-infant bonding score averages between the kangaroo care with lullaby hymns group (23.45 ± 1.10), kangaroo care-only group (23.80 ± 0.58), and the control group (23.45 ± 1.35) ($p > 0.05$). It was found that kangaroo care accompanied by lullaby hymns increases mothers' anxiety levels and has no different effect on mother-infant attachment. **Conclusions:** In order to understand the effects of lullaby hymns on mother-infant attachment and anxiety levels of mothers, it is recommended to conduct further studies in different religions/cultures.

Keywords: Kangaroo mother care, Mother-infant attachment, Skin-to-skin contact, Lullaby hymns, Maternal anxiety.

Introduction

Kangaroo care has a very special place in initiating a mother-infant attachment. The mother-infant attachment is a loving and unique relationship that occurs between a mother and a baby (Gurol, 2012). The type of mutual relationship between mother and baby has a decisive effect on the personality

development, social performance, cognitive development, and mental health of the baby in the future (Hajivand, 2009). Therefore, it is recommended that the mother and baby be brought together as soon as possible after childbirth (Hobek Akarsu ve ark., 2017, Dunne, 2021).

Research Questions and Hypothesis

The hypotheses of this study are as follows:

H0a: Kangaroo care does not affect maternal-fetal attachment.

H0b: Kangaroo care improves maternal-fetal attachment.

H1a: Kangaroo care does not affect mothers' anxiety level.

H1b: Kangaroo care lowers mothers' anxiety levels.

H1c: Kangaroo care increases mothers' anxiety levels.

Background

In the postpartum period, music therapy is applied as complementary care for the mother and baby (Heidari, 2013). Music is reported to be a way to provide support to newborns, strengthen parental feelings, and maintain an attachment relationship (Haslbeck and Bassler, 2020). In several studies where kangaroo care was applied with and without accompanying music, parents reported that the skin-to-skin contact applied together with music comforted both their babies and themselves (Jansson et al., 2011, Kostilainen et al., 2021). In another study, kangaroo care accompanied by live harp music was found to reduce maternal anxiety compared to only the kangaroo care group (Schlez et al., 2011).

In a study that investigated maternal anxiety in women by performing kangaroo care accompanied by music in the early postpartum period, the level of maternal anxiety of women in the experimental group was found to be lower than that of women in the control group (Norouzi et al., 2013). In another study, it was concluded that mothers' singing during skin-to-skin contact reduces maternal anxiety and helps maintain autonomic stability in premature infant (Arnon et al., 2014). In another study, maternal attachment scores of the group receiving kangaroo care accompanied by music were found to be significantly higher than the group receiving kangaroo care alone (Vahdati et al., 2017). It has also been reported that kangaroo care accompanied by lullaby music has an impact on the vital signs of newborns (Yusuf et al., 2017, Alidadyah

et al., 2021).

Moreover, religious music is expected to have effects on people such as mystical affections, comfort, tranquility, peace, and a sense of devotion (Ozturk et al., 2009). The most well-known of the lullaby hymns among Islamic religious music is reported as the hymns on the subject of Muhammad (sallallahu alayhi wassallam), the last prophet of the Islamic religion (Farsakoglu Eroglu, 2011).

Methodology

This semi-experimental study was conducted with the pre-test-post-test-control group research design at a hospital located in the province of Hatay, Turkey, between March and August 2019. The study population consisted of 743 term newborns admitted to the neonatal department of this hospital within a period of one year. The study sample, however, consisted of a total of 180 mothers and their newborns who received kangaroo care accompanied by lullaby hymns (60), received kangaroo care alone (180), and received standard hospital care (60). The mothers in the sample were selected randomly. Mothers were presented with three envelopes with options to receive kangaroo care accompanied by lullaby hymns, to receive kangaroo care only, and to receive standard hospital care. The distribution of mothers into groups was made according to their envelope choices.

Ethical Considerations: Ethical approval for the conduct of the study was obtained by the Non-Interventional Research Ethics Committee of the Faculty of Health Sciences of Kafkas University at the session number 03 on 28.12.2018. In addition, necessary permissions were obtained from the hospital where the research would be conducted. The mothers were informed about the study and their verbal/written consents were obtained. This study is registered of clinicaltrials. Gov Registered number: 0000000241164859

Data Collection Tools

Semi-structured Data Collection Tool: The 'Skin-to-Skin Contact Application Process Diagnostic Form' containing the sociodemographic characteristics of mothers (age, maternal and paternal education, maternal and paternal employment status, perceived income status, health insurance,

place of residence for the most of her life, family type, housing type, smoking/alcohol consumption, the mother's pregnancy, and birth-related characteristics) and the information of the newborn (indication for hospitalization, successful breastfeeding status, feeding type, gender, height, weight, and head circumference), as well as Spielberger's State-Trait Anxiety Inventory (STAI) and Mother-to-Infant Bonding Scale were used.

Spielberger's State and Trait Anxiety Inventory (STAI): The State-Trait Anxiety Inventory (STAI) was developed by Spielberger et al. and adapted for Turkish by Oner and LeCompte. STAI consists of 40 items and includes two separate scales. The "Trait Anxiety Scale" was developed as a means to identify how an individual felt in general. The reliability coefficient determined by the alpha correlation was between 0.83 and 0.87. The "State Anxiety Scale" is a scale that shows how an individual feels in a situation and in the particular conditions. The reliability coefficient was found between 0.94 and 0.96. Oner and Lecompte defined the normal anxiety level between 36 and 42. Higher scores indicate higher levels of anxiety and the lower scores lower levels of anxiety (Oner and LeCompte, 1998).

Mother-to-Infant Bonding Scale (MIBS): The Turkish adaptation study of the Mother-to-Infant Bonding Scale (MIBS) was conducted by Aydemir Karakulak and Alparslan in 2008. The necessary permissions for the use of the scale were obtained. The mother-to-infant bonding scale is filled out by the mother and consists of 8 items on the extent of the mother's feelings and moods towards her baby during the postpartum period (Taylor, 2008, Aydemir Karakulak and Alparslan, 2016). Each item in the 4-point Likert-type scale is scored in the range of 0 to 3 points. The items are responded in the form of 'Very much', 'A lot', 'A little' and 'Not at all'. Five items that indicate negative emotions are reverse coded, from 3 to 0. The internal reliability (Cronbach's alpha 0.71) of the scale has been reported as good, and higher scores indicate a problem in the mother-to-infant bonding (Yalcin et al., 2014).

Implementation of the Research: All participants were informed about the study

and their written and verbal consents were obtained before participating in the study. The pre-application questionnaire form was applied to the kangaroo care and the kangaroo care accompanied by lullaby hymns groups, and then the skin-to-skin contact was applied for 65 minutes five times on subsequent days. Spielberger's State-Trait Anxiety Inventory was applied before and after the fifth skin-to-skin contact. In addition, the questionnaire developed by the researcher and Spielberger's State-Trait Anxiety Inventory was applied to the group who was given standard hospital care on the fifth day after childbirth. Two months after the discharge of the mothers in all three groups, a home visit was made and the mother-to-infant bonding scale was applied by face-to-face interview method.

Statistical Analysis: The study data was analyzed using Statistical Package for Social Sciences (SPSS) 20.0. The study data was analyzed using Statistical Package for Social Sciences (SPSS) 23.0. In the analysis of the data, percentage, numbers, mean, standard deviation, Pearson's chi-square, Fisher's chi-square, one-way analysis of variance (ANOVA), dependent sample t test and independent samples 't' test were used. "p < .05" was considered as significant.

Research Inclusion Criteria: Mothers who agreed to participate in the study, who had no communication problems, who did not have any health problems/physical disabilities for kangaroo care practice, who were in the postpartum 1st day, who agreed to practice kangaroo care for an average of 65 minutes for 5 days, mothers who provided written and oral consent, and the mothers whose vital signs, physiology were stable for kangaroo care practice on the postpartum term and the first day were included in the study.

5 days on average 65 minutes in accepting application for kangaroo care, postpartum mothers, mothers with term and received written and verbal consent on the first day, his vital signs were stable physiology practice kangaroo care for the babies included in the study.

Research Exclusion Criteria: Mothers who have not agreed to participate in the study, who have communication problems, who passed the postpartum 1st day, whose health are not suitable for kangaroo care practice,

and the mothers with a worsening general condition, unstable vital signs are physiology, who had preterm infants, who were discharged before the completion of the kangaroo care, who had an interruption in the provision of kangaroo care, and mothers who don't want to listen to lullaby hymns (five mothers) were excluded from the study.

Results

In this study, there was no significant difference in terms of the average height, weight, and head circumference of newborns between the kangaroo care accompanied by lullaby hymns, only the kangaroo care, and standard hospital care groups ($p > 0.05$). The rate of successful breastfeeding in the kangaroo care accompanied by lullaby hymns group was low by 85%, while the rate of successful breastfeeding in the kangaroo care only group was 98.3%, and the difference between them was significant ($p < 0.05$). However, the difference between the groups was not significant in terms of the type of feeding of newborns, ambient temperature, indication for hospitalization, maternal age, maternal education, maternal employment status, and income level ($p > 0.05$, Table 1).

The rate of lack of health insurance was in the group receiving standard hospital care (16.7%) was significantly higher than the rate of lack of health insurance in the kangaroo care accompanied by lullaby hymns (1.7%) and kangaroo care-only (3.3%) groups ($p < 0.05$). The rate of nuclear

family type in the kangaroo care-only group (98.3%) was significantly higher than the rates in the kangaroo care accompanied by lullaby hymns group (83.3%) ($p < 0.05$). It was found that there was no significant difference between the groups, receiving kangaroo care accompanied by lullaby hymns, only the kangaroo care, and standard hospital care, in terms of smoking and alcohol consumption (Table 2).

In the study, the pre-test trait anxiety average score of the group receiving kangaroo care accompanied by lullaby hymns (47.43 ± 10.46) was found to be significantly higher than the average score of the group receiving kangaroo care alone (42.68 ± 14.14) ($p < 0.05$). Moreover, the post-test state anxiety score average of the group receiving kangaroo care accompanied by lullaby hymns (32.08 ± 6.78) was found to be significantly higher than the score average of the group receiving kangaroo care alone (29.60 ± 6.03) ($p < 0.05$). In this study, the difference between trait anxiety scores of the kangaroo care accompanied by lullaby hymns (43.43 ± 9.07), only the kangaroo care group (46.12 ± 10.95), and standard hospital care group (43.97 ± 9.06) was found to be not significant ($p > 0.05$). In this study, the difference between mother-to-infant bonding score averages of the kangaroo care accompanied by lullaby hymns group (23.45 ± 1.10), only the kangaroo care group (23.80 ± 0.58), and standard hospital care group (23.45 ± 1.35) was not found to be significant ($p > 0.05$) (Table 3).

Table 1. Some Characteristics of Newborns and Hospitalization by Study Groups Distribution of Reasons for Stay

Features	Kangaroo Care with Lullaby Hymns (n=60)		Kangaroo Care (n=60)		Standard Hospital Care (n=60)		Statistical Analysis	
	Mean	SD	Mean	SD	Mean	SD	F	P
Size	50.08	1.23	49.45	1.48	49.73	1.60	2.895	0.058
Weight	3203.42	512.84	3220.72	456.46	3253.00	487.54	0.161	0.160
Head Circumference	33.07	1.15	32.85	0.99	33.23	1.14	1.850	0.160
Features	Number	%	Number	%	Number	%	X ²	P
Gender								

Female	29	48.3	35	58.3	32	53.3	1.205	0.547
Male	31	51.7	25	41.7	28	46.7		
Successful Breastfeeding								
Yes	51 _a	85.0	59 _b	98.3	58 _{a,b}	96.7	9.740	0.008*
No	9 _a	15.0	1 _b	1.7	2 _{a,b}	3.3		
Type of Nutrition								
Breast milk	58	96.7	57	95.0	54	90.0	2.436	0.296
Breast milk+ Supplementary food	2	3.3	3	5.0	6	10.0		
Ambient Temperature								
20-24 °C	51	85.0	44	73.3	32	70.0	4.094	0.129
25-30 °C	9	15.0	16	26.7	28	30.0		
Hospitalization Indication								
Respiratory Distress	8	13.3	7	11.7	12	20.0	13.307	0.207
Sepsis	10	16.7	5	8.3	7	11.7		
Jaundice	24	40.0	20	33.3	25	41.7		
Urinary Tract Infection/ Infection	6	10.0	14	23.3	11	18.3		
Difficulty Breastfeeding	6	10.0	4	6.7	1	1.7		
Other (Bronchitis, Vomiting, ypoglycemia)	6	10.0	10	16.7	4	6.7		

*:statistically significant $p < 0,05$ F: One-Way Analysis of Variance (ANOVA)

Table 2. Distribution of Some Characteristics of Mothers by Groups

	Kangaroo Care with Lullaby Hymns (n=60)		Kangaroo Care (n=60)		Standard Hospital Care (n=60)		X ²	P
	Number	%	Number	%	Number	%		
Age	Mean:28.42		Mean:28.37		Mean:28.93		0.511	0.972
18-24	21	35.0	22	36.7	20	33.3		
25-31	19	31.7	21	35.0	20	33.3		
32 over	20	33.3	17	28.3	20	33.3		
Education							17.007	0.074
Illiterate	0	0.0	5	8.3	1	1.7		
Literate	2	3.3	0	0.0	0	0.0		
Primary School	15	25.0	16	26.7	25	41.7		

Middle School	18	30.0	17	28.3	16	26.7		
High School	19	31.7	16	26.7	12	20.0		
University	6	10.0	6	10.0	6	10.0		
Working Status								
Employed	9	15.0	7	11.7	6	10.0	0.725	0.696
Unemployed	51	85.0	53	88.3	54	90.0		
Income rate								
Income Less Than Expenses	29	48.3	17	28.3	28	46.7	6.578	0.168
Income Covers Expenses	29	48.3	39	65.0	30	50.0		
Income More Than Expenses	2	3.3	4	6.7	2	3.3		
Health Insurance								
Yes	59 _a	98.3	58 _a	96.7	50 _b	83.3	12.105	0.002*
No	1 _a	1.7	2 _a	3.3	10 _b	16.7		
Family Type								
Nuclear family	50 _a	83.3	59 _b	98.3	54 _{a,b}	90.0	7.925	0.019*
Extended family	10 _a	16.7	1 _b	1.7	6 _{a,b}	10.0		
Smoking								
Does not smoke	54	90.0	52	86.7	50	83.3	7.144	0.128
Quit smoking	1	1.7	6	10.0	7	11.7		
Smokes	5	8.3	2	3.3	3	5.0		
Alcohol use								
Yes	1	1.7	1	1.7	1	1.7	0.000	1.000
No	59	98.3	59	98.3	59	98.3		

*:statistically significant p<0,05

Table 3. Scores of Anxiety and Mother-Infant Attachment Scales by Groups Distribution of Means

	Kangaroo Care with Lullaby Hymns (n=60)		Kangaroo Care (n=60)		Standard Hospital Care (n=60)		Test	P
	Mean	SD	Mean	SD	Mean	SD		
Pre-Test State Anxiety	47.43	10.46	42.68	14.14	-	-	t=2.092	0.039*
Post-Test State Anxiety	32.08	6.78	29.60	6.03	-	-	t=2.120	0.036*

Constant anxiety	43.43	9.07	46.12	10.95	43.97	9.06	F=1.278	0.281
Maternal-Fetal Attachment	23.45	1.10	23.80	0.58	23.45	1.35	F=2.198	0.114

*:statistically significant $p < 0,05$ F: One-Way Analysis of Variance (ANOVA) t:Independent Sample T-Test

Discussion

Music and religion are known to be in a close relationship since the most ancient times. In addition to its use as a means of praying to and devoting to the sacred being in an individual context, music has functions that gather individuals around a common feeling, thought, and behavior in various religious rituals in the group context (Turabi et al., 2021). Therefore, this study was conducted with the aim of determining the effect of kangaroo care accompanied by lullaby hymns on mother-infant attachment and anxiety levels of mothers. Studies in the literature state that providing kangaroo care in the early postpartum period is important for successful breastfeeding (Korkut and Inal, 2017, Moore et al., 2012, Kose et al., 2013, Simsek and Karahan, 2017, Coktay and Turk, 2020, Koc and Kaya, 2015). In another study, there was no statistically significant difference between the breastfeeding self-efficacy of mothers who performed kangaroo care and those who did not (Sarican and Tuna Oran, 2014). In our study, it was found that the successful breastfeeding rate in the kangaroo care group was significantly higher than the successful breastfeeding rate of the kangaroo care accompanied by the lullaby hymns group (Table 1). It is believed that this may be related to the fact that women who listen to lullaby hymns focus on religious music rather than focusing on breastfeeding.

Various studies have reported that maternal singing during kangaroo care reduces maternal anxiety (Lai et al., 2006, Tuomi, 2014, Kostilainen et al., 2021, Haslbeck and Bassler, 2020). In a study conducted in Iran, the maternal anxiety score of the kangaroo care group with music was found to be lower than that of the control group (Norouzi et al., 2013). In a systematic review study, it was reported that skin-to-skin contact, music, and multimodal interventions reduced maternal stress, but the results between studies were inconsistent (Pineda et al., 2017). In a

different study, mothers who sang during kangaroo care had a statistically significant decrease in their state and trait anxiety levels compared to mothers in the control group, and 95% of the mothers stated that it became easier to bond emotionally with their babies (Kostilainen et al., 2021). In this study, it was found that the state anxiety levels of the pre-test and post-test kangaroo care accompanied by lullaby hymns group were statistically significantly higher than the pre-test and post-test anxiety scores of the kangaroo care-only group (Table 3). Individuals communicate more comfortably with the music of their own culture and are more influenced by their own music (Gencel, 2006). Therefore, in our study, it is believed that the reason why women who listen to lullaby hymns have higher pre- and post-test state anxiety levels may be related to the fact that the religious music they listen to culturally affects them more emotionally during the postpartum process.

It is reported that the baby's skin-to-skin contact with the mother, her smell, and temperature provide a stimulus to the mother, creating relaxation and antistress effect (Annagur and Annagur, 2012). In a study on kangaroo care with music, parents stated that the application can comfort both their babies and themselves (Jansson et al., 2011). In another study, it was concluded that kangaroo care applied using live harp music is useful in reducing maternal anxiety (Schlez et al., 2011). In a kangaroo care study that was applied by allowing mothers to sing, maternal anxiety was measured low during the singing (Arnon et al., 2014). In our study, the trait anxiety score average of the group kangaroo care only group was higher than the trait anxiety score averages kangaroo care accompanied by lullaby hymns and standard hospital care groups, but the difference was not statistically significant ($p > 0,05$, Table 3). In this respect, our study differs from the other studies.

The effects of music on parent-infant

bonding have been proven in the literature (Tuomi, 2014, Martin, 2014). It is noted that music helps mothers to relax and positively affects the maternal-infant attachment (Varioglu and Gungor Satilmis, 2019). It has been stated that interaction with music encourages parents to interact more deeply with their babies (Kehl et al., 2021). In one study, it was found that the kangaroo care accompanied by music group had higher mother-to-infant bonding scores compared to the kangaroo care-only group (Vahdati et al., 2017). In another study, it was reported that there were statistically significant increases in the mother-infant attachment in the music therapy group compared to the control group (Kehl et al., 2021). A study of family-centered music therapy, applied in neonatal intensive care units, has reported an increase in bonding scores of both parents, but this increase was not statistically significant (Ettenberger et al., 2017). In this study, there was no statistically significant relationship between the groups in terms of mother-to-infant bonding score averages. Our study differs from the other studies. It is believed that this may be related to the type of music used in the study.

Challenges and Limitations of the Study

The challenges of the study include the choice of term infants and mothers on the first postpartum day, application of skin-to-skin contact for 65 minutes five times a day on consecutive days, and the coverage of expenses of the study by the researchers. As a limitation, the study cannot be generalized since it was conducted only in the province of Hatay, Turkey.

As a result, in this study, it was found that kangaroo care accompanied by lullaby hymns increases mothers' anxiety levels and has no different effect on mother-infant attachment. In order to determine the effects of lullaby hymns on maternal attachment and anxiety, it is believed that further research using religious music in different religions and cultures will help to understand the effects of religious music.

It is recommended to conduct different research to investigate the effects of music preferred by mothers and appropriate for their socio-cultural and individual characteristics, on kangaroo care and the

level of maternal anxiety.

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