Clinical and Experimental Health Sciences

The Effect of Music on Pregnancy Complaints with Sleep and Quality of Life in Risky Pregnant Women

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ABSTRACT

Objective: This study aimed to examine the effect of music therapy on pregnancy complaints and quality of sleep and life in risky pregnant women.

Methods: This is a prospective randomized controlled study. The sample of the study consisted of a total of 112 pregnant women who referred to a hospital in a city in Turkey for pregnancy follow-up (56 in the experimental group, 56 in the control group). Risky pregnant women in the experimental group were listened to music for four weeks before going to sleep, and those in the control group received no intervention. The data were collected between July and October 2022, using an introductory information form (IIF), a risk assessment form (RAF), the Assessment Scale for Pregnancy Complaints and Their Impact on Life Quality (ASPCILQ), and the Richard-Campbell Sleep Questionnaire (RCSQ).

Results: Risky pregnant women in the experimental group had higher ASPCILQ and RCSQ post-test mean scores than those in the control group, and the difference between them was statistically significant (p<.001).

Conclusions: A music therapy reduced pregnancy complaints in risky pregnant women and increased their sleep and life quality.

Keywords: Risky pregnant women, pregnancy complaints, quality of life, sleep quality

1. INTRODUCTION

Pregnancy is one of the most significant physiological event women have throughout their life. A pathological event threatening maternal and fetal health occurs in 5%-20% of pregnancies, which are called risky pregnancy (1). Although the rate of risky pregnancy has decreased over time in Turkey, two out of every three pregnancies are still considered risky pregnancy (2, 3).

During pregnancy, women have several physiological, psychological, and biochemical changes in their bodies to ensure fetal growth and development and prepare for birth. Pregnancy-related physiological changes bring along pregnancy complaints such as nausea, vomiting, edema, low back pain, fatigue, and frequent urination. Pregnancy complaints can negatively affect the quality of life and sleep in pregnant woman (4-7). Pregnancy complaints affects the quality of life even in normal pregnancy, and can have dramatic effects in risky pregnancy, causing severe stress, fear, frequent pregnancy follow-ups, doctor check-ups, and limiting the ability of pregnant women to do their daily work (8). Erbaş and Demirel conducted a study with a total of 392 pregnant women and reported that the quality of life was affected more negatively in risky pregnant women than healthy ones (9).

Pregnancy-related physical changes not only affect the quality of life, but also cause significant changes in sleep and sleep quality of pregnant women. Studies have reported that during pregnancy, sleep quality is affected by several symptoms such as nausea, back pain, hormonal changes, fetal growth, frequent urination, leg cramps, restless legs syndrome, and snoring (10,11). Especially in the third trimester of pregnancy, 91% of pregnant women reported sleep disturbance (12, 13). During pregnancy, sleep problems and poor sleep quality may lead to increased fear and anxiety as well as inadequate care in pregnant women, increasing the incidence of glucose intolerance and gestational diabetes and causing preterm birth, low birth weight, and fetal developmental issues (14, 16). Therefore, a good sleep is important for a healthy pregnancy, but it is even more important for risky ones (17).

Music therapy is an organized and managed treatment method to optimize the psychological and physical effects of musical sounds and melodies to treat various mental

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disorders (18). Music therapy can relieve physical ailments by lowering heart rate, body temperature, blood pressure and respiratory rate. Music therapy aims to improve one's mood, reducing stress, pain, and anxiety. Therefore, music therapy can improve the quality of life and help people express themselves more freely (19). Although there is a limited number of studies on the effect of music therapy on sleep quality, these studies have shown that music therapy has a palliative effect on insomnia. One study was conducted with a total of 121 Taiwanese pregnant women to determine the efficacy of music in improving sleep quality and reported that listening to music reduced stress and anxiety and increased sleep quality in pregnant women with sleep disorders (20).

There are studies in which music therapy is used for the psychological care of pregnant women (21, 22). However, there are limited studies on the effects of music therapy on pregnancy complaints, quality of life and sleep in high-risk pregnant women. This study aimed to determine the effect of music therapy on pregnancy complaints and quality of life and sleep in pregnant women with risky pregnancy.

Research hypotheses included:

H1. A music therapy reduces pregnancy complaints and increases the quality of life in risky pregnant women.

H2. A music therapy increases the quality of sleep in risky pregnant women.

2. METHODS

2.1. Study Design

This randomized controlled study was carried out at Turgut Ozal Medical Center pregnant training class, Türkiye.

2.2. Participants

Pregnant women attending the outpatient department of the Turgut Ozal Medical Center pregnant training class, Malatya, were randomly screened for eligibility to ensure that each pregnant women had an equal chance of being selected. The study inclusion criteria were: (1) being a pregnant women who had a risky pregnancy according to the risk assessment form, published by the Turkish Ministry of Health (this form consists of a total of 23 Yes/No questions about pregnant women's risks related to obstetric history, current pregnancy, general medical history, and medical diagnosis risk where any "yes" response suggests that the pregnant woman is at high risk and must be referred to a health institution with a gynecologist) (Ministry of Health, 2011); (2) Being at 20-36. weeks of pregnancy. Among the risky pregnant who participated in the study, those who did not use a smart phone, did not like listening to music and did not fully participate in the feedback received at the end of the study and the music application were excluded from the trial. Similarly, the study excluded pregnant women with mental illness couldn't speak, understand, and write in the national language and communication problems. All pregnant women were included in the study by simple random sampling method. The study sample consisted of pregnant women who referred to a hospital in eastern Turkey for prenatal follow-up. The sample was selected using the CONSORT criteria (Figure 1).

2.3. Sample Size

A web-based sample size calculation method was used to calculate the sample size for the study. The sample size was determined to include a total of 112 pregnant women (56 in experimental group, 56 in control group) with 5% error level, 95% confidence interval at bidirectional significance level and 80% representation power (23).

2.4. Randomization

Pregnant women were assigned randomly to the experimental and control groups, using the Random Integer Generator method, which is included in the Numbers sub-title at "random.org". The caregivers and researchers in the intervention group were not blinded.

2.5. Study Settings

This prospective randomized controlled study was conducted to examine the effect of music therapy on pregnancy complaints and quality of sleep and life in risky pregnant women.

2.6. Measures

The data were collected using an introductory information form (IIF), a risk assessment form (RAF), the Assessment Scale for Pregnancy Complaints and Their Impact on Life Quality (ASPCILQ), and the Richard-Campbell Sleep Questionnaire (RCSQ).

IIF: The form was prepared by the researchers in line with the literature. It consisted of questions about pregnant women's introductory (age, family type, marital status, educational level, etc.) and obstetric characteristics (week of gestation, parity, number of children, etc.).

ASPCILQ: The scale measures the effects of pregnancy complaints on quality of life. Its Turkish validity and reliability study was performed by Özorhan. The scale has 42 items and consists of two parts. The first part evaluates how often pregnant women have complaints in the last month of pregnancy, scoring "0=never", "1=rarely", "2=sometimes", and "3=often". If a score between 1-3 is received for each complaint in this part, the second part is applied. The second part measures how pregnancy complaints affect daily life activities of pregnant women, scoring "1=not limiting at all", "1= limiting little", "2=limiting a lot". The scale has no cut-off point. A higher total scale score indicates a lower quality of life. The Cronbach's alpha reliability coefficient of the scale

was 0.91 (24). In this study, the Cronbach's α value of the scale was found to be 0.90.

RCSQ: This scale, developed by Richards, is a 6-item scale to measure one's perception of their depth of night sleep, sleep onset latency (time to fall asleep), frequency of awakening, sleep onset latency after awakening, overall sleep quality, and level of noise in the environment. Each item is evaluated using a chart with numbers from 0 to 100. The 6th item, which evaluates the level of noise in the environment, is excluded from the total score evaluation, therefore the total score is evaluated over 5 items. A higher scale score indicates a higher sleep quality. The Turkish validity and reliability study of the scale was performed by Karaman Özlü and Özer where the Cronbach's alpha reliability coefficient of the scale was found as 0.91 (25). In this study, the Cronbach's α value of the scale was determined as 0.84.

2.7. Outcome Measures

The primary outcome introductory information form (IIF), a risk assessment form (RAF) was evaluated at the beginning the study by administering the NDI questionnaire to the participants and having them check the appropriate category. The secondary outcome was assessed at end visit by allowing the patient to mark an Assessment Scale for Pregnancy Complaints and Their Impact on Life Quality (ASPCILQ), and the Richard-Campbell Sleep Questionnaire (RCSQ).

2.8. Data Collection

The data were collected from July to October 2022. Pregnant women were informed about the study, and those with risky pregnancy (who obtained one (1) or higher according to the RAF) were invited to participate in the study. The introductory characteristics of pregnant women, such as age, educational level, employment status, income level, status of having pregnancy plan, and fetal gender were recorded in the IIF. IIF, ASPCILQ and RCSQ were applied to pregnant women before the intervention. Their pretest data were collected by the researchers using face-to-face interview method at the pregnant school in the hospital. Then, a 30-minute music of nature sounds (26) compiled by the researchers was sent to pregnant women in the experimental group via the WhatsApp program to the individual smart phones of the participants. Participants were asked to listen for at least 30 minutes a day before going to bed for four weeks. No intervention was applied to pregnant women in the control group. All participants were contacted by the researchers four week after the first interview, and ASPCILQ and RCSQ were administered as a posttest.

2.9. Intervention

Pregnant women in the experimental group were listened to music, consisting of 30 minutes of relaxing and peaceful nature sounds compiled by the researchers. The music was sent to their smartphones, and they were asked to listen to it for four weeks when appropriate before bed. No intervention was applied to pregnant women in the control group. A written consent was obtained from all pregnant women who agreed to participate in the study. They were informed about the study, explaining that their personal information would be protected. Pregnant women who participated in the study were informed about the purpose and duration of the study, how and where their data would be used. Necessary permissions for the study were taken from University Non-Interventional Clinical Research Ethical Board and the relevant units (Ethics committee no: 2022/3410). Besides, The Coordinator ship of Scientific Research Projects at Inonu University was applied for financial support for the design of this study (Project No: TSA-2022–3021).

2.10. Research Variables

Dependent variables: Pregnancy complaints quality of life and sleep qualty level

Independent variables: Music intervention applied to risky pregnant women

2.11. Statistical Methods

The data were evaluated using the SPSS 25.0 for Windows software (SPSS, Chicago, Il, USA). The chi-square test was used to compare the categorical independent variables. The Kolmogrow-Smirnov test was used to determine whether the data had normal distribution. As the data had normal distribution, the independent samples t-test was used for the comparisons of two groups, and the dependent sample t-test for the comparison of intragroup. A value of $p<.05$ was considered statistically significant.

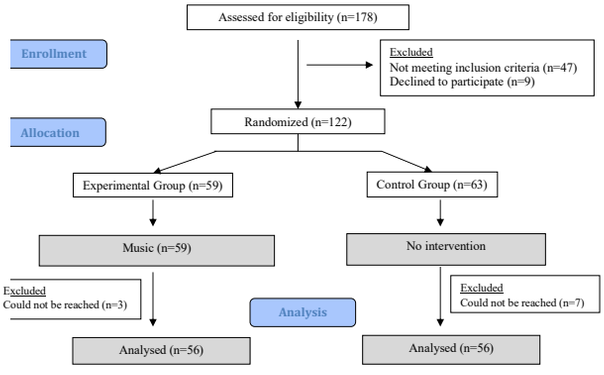

Figure 1. *Allocation of subjects according to the CONSORT 2010 flow diagram*

3. RESULTS

A total of 178 pregnant women were reached in this study. However, 47 pregnant women who did not meet the inclusion criteria were excluded from the study. Therefore, a total of 131 pregnant women were randomly assigned to the experimental and control groups. During the study, three

of those in the experimental group and seven of those in the control group were also excluded from the study as they could not be reached. Thus, the study was completed with a total of 122 pregnant women, 56 in the experimental group and 56 in the control group (Figure 1).

The characteristics of the participants (including, age, education status, employment status, social security, place of live, planned pregnancy, gender of fetus, number of pregnancy) in each of the groups were similar (p >.05) (Table 1).

Table 1. *Characteristics of the participants*

Variables	Experimental group (n=56)		Control group (n=56)		Test[a] and p value
	n	%	n	%	
Age (year)					
18-34	43	76.8	40	71.4	x^2=0.419
≥ 35	13	23.2	16	28.6	p=.518
Education status					
High school or below	37	66.1	41	73.2	x^2=0.676
University or above	19	33.9	15	26.8	p=.411
Employment status					
Yes	11	19.6	7	12.5	x^2=1.059
No	45	80.4	49	87.5	p=.303
Social security					
Yes	48	21.9	42	17.2	x^2=2.036
No	8	78.1	14	82.8	p=.154
Place of live					
Province	40	71.4	36	64.3	x^2=0.655
Villages/towns	16	28.6	20	35.7	p=.418
Planned pregnancy					
Yes	48	85.7	41	73.2	x^2=2.681
No	8	14.3	15	26.8	p=.102
Sex of fetus					
Girl	35	62.5	21	55.4	x^2=0.590
Boy	21	37.5	25	44.6	p=.442
Number of pregnancy					
1	16	28.6	12	21.4	x^2=2.971
2	21	37.5	16	28.6	p=.226
≥3	19	33.9	28	50.0	

[a]*Pearson's Chi-Squared Test.*

The comparison of the ASPCILQ and RCSQ pretest-posttest mean scores of the women in the experimental and control groups is given in Table 2. When the pretest mean scores of the pregnant women in the experimental and control groups were compared; It was determined that the difference between the groups was not statistically significant (p>.05). When the posttest ASPCILQ and RCSQ scores were compared after music therapy given to risky pregnant women, it was determined that music therapy reduced pregnancy complaints, increased the quality of life and sleep, and the difference between the groups was statistically significant in favor of the experimental group (p<.001).

Table 2. *Comparison of the ASPCILQ and RCSQ pretest–posttest mean scores of the women in the experimental and control groups (n=112)*

	Experimental group (n=56)	Control group (n=56)	Test[a] and p value
	Mean ± SD	Mean ± SD	
ASPCILQ			
Pretest	79.41±24.69	71.48±20.82	t=-1.837, p=.069
Posttest	65.64±19.26	73.80±19.49	t=-2.228, **p=.028**
Test[b] and p value	t= – 4.513, **p<.000**	t=-0.670, p=.505	
RCSQ			
Pretest	32.23±6.22	32.64±6.40	t=-0.344, p=.732
Posttest	35.07±4.18	31.14±4.30	t=4.897, **p<.001**
Test[b] and p value	t= – 2.809, **p=.007**	t=1.504, p=.138	

ASPCILQ: Assessment Scale for Pregnancy Complaints and Their Impact on Life Quality
RCSQ: Richard Campbell Sleep Questionnaire
[a]*Independent samples t-test*
[b]*Dependent samples t-test*

4. DISCUSSION

The number of studies on the effect of music therapy on psychological health in pregnant women is increasing day by day. However, there is no definite evidence in the literature about the effect of music therapy on pregnancy complaints and quality of life and sleep. This study revealed that music therapy had a significant effect on pregnancy complaints and quality of life and sleep in pregnant women with risky pregnancy. Accordingly, after music therapy was applied to risky pregnant women, their pregnancy complaints decreased, and their quality of life and sleep increased significantly (p<.001). Although there is no study which used music therapy to reduce pregnancy complaints and increase quality of life and sleep in risky pregnant women, there is several studies on the effect of music therapy on quality of life and sleep quality separately (10,11,27).

Literature has reported that music has a positive effect on relaxation, reducing stress (18, 20, 27). KS and Kisilevsky et al. have stated that a classical music played to expectant mothers makes them happy and directly affects their emotional state (27-29). This finding shows that music genres can have positive effects even if they are different.

One study was conducted to determine the effect of music preferences of university students on their quality of life and determined that music increased their quality of life. In addition, several studies on the benefits of music therapy support our results, suggesting that a music therapy increases comfort and has several positive effects on physical and psychological health, reducing nausea, vomiting and need for medication and relieving pain, anxiety and stress (30-32). Our study determined that music therapy reduced

pregnancy complaints such as nausea, low back pain, fatigue, heartburn and increased the quality of life.

The present study determined that pregnant women in the experimental group had higher sleep quality than those in the control group, and the difference between the groups was statistically significant (p<.001). Lafçı and Öztunç evaluated the effect of music therapy on sleep quality in breast cancer patients and found that music therapy improved sleep quality, whereby patients in the experimental group had higher subjective sleep quality than those in the control group (33). Another study was conducted with a total of 160 risky pregnant women to determine the effect of music therapy on anxiety and sleep quality in risky pregnant women during hospital bed rest and found that music therapy increased their sleep quality (34). A total of 121 Taiwanese pregnant women were listened to music for two weeks to determine the efficacy of listening to music at home in improving sleep quality. As a result, their anxiety levels decreased and their sleep quality increased (35).

Considering these results, which support the results of our study, a music therapy administered to women with risky pregnancy can reduce their pregnancy complaints and increase their quality of life and sleep.

5. CONCLUSION

This study revealed that music therapy reduced pregnancy complaints and increased quality of life and sleep in risky pregnant women. Therefore, pregnant women with risky pregnancy should be informed about and encouraged to receive a music therapy during their pregnancy by midwives and other health professionals, thus they can have a better quality of life and sleep. In the future, alternative methods should be introduced for risky pregnant women to have a better quality of life and be paid more attention in health institutions that provide preventive health services for risky pregnant women.

This study has some limitations. In this study, no evaluation was made according to the type and severity of risky pregnancy. It did not evaluate the long-term effect of music therapy (in postnatal period). Only risky pregnant women were included in the study, but those with healthy pregnancy were not included. As pregnant women in the experimental group did not listen to music under the supervision of the researchers, the time they listened to music could not be controlled. Another limitation of the study is that only natural sound type music is played and there is no different types of music.

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