The Effect of Music Therapy on Psychological Status and Sleep Quality Among Pregnant Women: A randomized Control Trail.

Hanan Ibrahim Ibrahim[(1)], Nadia Waheed Elzohairy[(2)], Heba Mohamed Sami Mostafa[(3)], Violet Nicola Ghattas [(1)]

(1) Assistant Professor of Obstetric & Gynecologic Nursing, Faculty of Nursing, Damanhour University, Egypt.
(2) Lecturer of Psychiatric Nursing and Mental Health, Faculty of Nursing, Damnhour University, Egypt.
(3) Assistant Professor of Piano Music Education Department, Faculty of Specific Education, Alexandria University, Egypt

Abstract

Background: Pregnancy is a unique experience in a woman's existence that is accompanied by major physiological, biochemical, and psychological changes that may have an impact on mental health. Implementing complementary therapy (music therapy) throughout pregnancy enhance psychological status and sleep quality of pregnant women, hence improve postpartum and child wellbeing. **Aim of the study**: Investigate the effect of music therapy on psychological status, and quality of sleep among pregnant women. **Design**: A randomized controlled trial (RCT) used to carry out this study. **Setting**: This study was carried out at an outpatient Medical National Institute in Damanhur. **Subjects:** 80 pregnant women in third trimester, the pregnant women will be attributed to the music (n=40) and control groups (n=40). **Tools**: The researchers used three tools to obtain the data that was needed**;** tool I: Basic data structured interview schedule, tool II: Depression, Anxiety, and Stress Scale (DASS), tool III: Pittsburgh Sleep Quality Index (PSQI). **Results:** The difference in the level of anxiety, stress, depression and sleep quality between control and the study groups after the music therapy intervention was statistically significant. **Conclusion:** Music therapy can effectively improve psychological status and quality of sleep among pregnant women in third trimester.

Keywords: music therapy, psychological status, sleep quality, pregnant women

Introduction

The best emotional and pleasant time in a woman's life is during her pregnancy, although this time is frequently marked by stress, physical changes, and psychological shifts. In fact, because of the systemic changes brought on by hormonal, psychological, emotional, and physical elements that take place while a woman is pregnant, pregnant women may have some issues with the quality of their sleep **(Reshadat et al., 2018; Ali et al., 2020).** The gestational phase is vital for pregnant women as during this time a woman experiences substantial changes in her life, including changes to her look, mood, and health, which can cause an increase in stress, anxiety, depressive symptoms, and poor sleep **(Lucena et al., 2018; Nystrup et al., 2020).**

The National Sleep Foundation found that 78% of pregnant women experienced greater sleep disturbances than at any previous point in their lives. According to a meta-analysis, 44.5% of pregnant women experience inadequate quality of sleep, which is clarified by a Pittsburgh Sleep Quality Index (PSQI) global score of 5 or higher. Additionally several studies have linked irregular sleep patterns to a range of unfavorable pregnancy outcomes, such as low birthweight, preterm birth, intrauterine growth retardation, cesarean delivery, gestational hypertension, and gestational diabetes, as well as a lower quality of life and higher levels of depressive symptoms **(Yang e al.,2020; Sedov et al .,2018).**

Moreover, significant pregnancy complications like anxiety and depression have been found to affect 20 to 40 % of expectant mothers. Particularly in the reproductive years, mood and anxiety disorders impact women more than males, and mental health conditions frequently worsen or manifest themselves throughout pregnancy. With over 500,000 American women either having a history of mental illness or receiving a diagnosis of one during their pregnancy, this is a highly concerning area **(Araji et al., 2020).** likewise, **Gao et al., 2019** found that participants with poor sleep quality were more likely than those with high sleep quality to experience stress during pregnancy, prenatal depression, and postpartum depression.

Researchers and medical professionals have been interested in the connection between maternal stress and child outcomes for many

years. Numerous negative child outcomes, including slow cognitive development, autism, and schizophrenia, have been related to stress during pregnancy. Additionally, stress experienced later in pregnancy may have a more detrimental impact on motor development. This rising body of research emphasizes the need to investigate efficient methods for reducing stress during pregnancy and perhaps preventing detrimental effects for both mothers and their unborn children **(Corbijn et al., 2017).**

The use of complementary and non-pharmacological techniques to lessen stress and anxiety is gaining popularity. One of these strategies is to listen to soothing, non-vocal music **(Khodabakhshi-Koolaee et al., 2018).** By systematically using music to lower heart rate, respiration rate, blood pressure, metabolic rate, oxygen consumption, muscular stiffness, and other physiological and behavioral problems, music therapy aims to improve people's lives. Numerous studies have revealed that pregnant women's blood pressure, psychological tension, and anxiety can all be decreased by listening to music **(Cao et al. 2016; Corbijn et al., 2017; Aisyah & Hardjanti., 2019).**

When someone is stressed, exhausted, or having trouble sleeping, music therapy is frequently used. In psychotherapy, music therapy is applied both actively through the use of instruments, singing, and movement as well as passively through the discussion and listening of music. According to neuroscientific studies, processing music involves the entire brain, and maintaining musical skills requires that both hemispheres function properly. It is thought that stimulating the right hemisphere throughout development promotes greater hemispheric integration, boosts memory, and fosters the growth of a comprehensive and more imaginative approach to problem-solving **(Perkovic ,2021).**

Significant of the study

Women's and fetuses' psychophysical conditions are positively impacted by music. Women experience an upsurge in energy and a sense of security after listening to music. Music eases mental and physical tension, enhancing women's moods in general. It has an impact on sleep quality **(Dombrowska et al., 2018).** There is a strong association between disruption of sleep and indications of stress, anxiety, and depression. However, in Egypt no research has looked into how better sleep for expectant mothers might be achieved by inexpensive, pleasurable, non-invasive music listening. Thus, the current study set out to investigate the relationship between music listening and pregnant women's psychological wellbeing and sleep quality.

Aim of the Study

The aim of this study was to investigate how music therapy affects pregnant women's psychological wellbeing and quality of sleep.

Research hypothesizes:

1. Pregnant women who receive the music therapy can exhibit a lower level of anxiety, stress, depression than the control group
2. Pregnant women who receive the music therapy can exhibit a good sleep quality than the control group

Subjects and method

Design

This study used a randomized controlled trial (RCT) design and adhered to the Consolidated Standards of Reporting Trials (CONSORT) guidelines. A study on music therapy was undertaken between the beginning of April and the end of July 2023. The research used a two-arm, single-blind design with a pretest and a posttest.

Setting

The study selected participants according to the total number of pregnant women using a simple random sampling technique in the outpatient Medical National Institute in Damanhour city,

Subjects

A purposive sample of eighty pregnant women with sleep disturbance was chosen based on the following inclusion criteria; in third trimester, 30-34th weeks of pregnancy, between the ages of 18 and 35, singleton pregnancy, willing to participate, and not having any physical or mental health disorders.

Sample size

The G*Power Windows 3.1.9.7 application was used to compute the sample size, with an alpha error probability of 0.05, a power of 0.88, and an effect size of 0.25.Based on the calculation, this study required an a priori sample size of 80 pregnant women .The study group consisted of 40 pregnant women, and the control group composed of 40 randomly selected from outpatient Medical National Institute in Damanhour using Research Randomizer version 4.0. Using a randomization list produced by a computer. Random assignments were made to place the individuals in the study or control groups in a 1:1 allocation ratio. The researchers withheld the allocation sequence from the participants until they were assigned to respective groups. Randomization methods were carried out by an independent statistician who was also one of the research authors. The statistician remained blind to the other authors until the intervention procedures were finished.

Tools:

Three tools were used by researchers to collect the necessary data:

Tool I: Sociodemographic and Reproductive History Profile: such as age, level of education, occupation, residence. Additionally, gravidity, parity, number of abortions, stillbirth, living children., inter- pregnancy interval, weeks of gestation, and number of antenatal visits**.**

Tool II: Depression, Anxiety, and Stress Scale (DASS)

It was developed by Lovibond (1995) to assess the stress, anxiety, and depressive emotional states. Each of the three DASS-21 scales' seven items is separated into subscales with comparable content. The depression scale is used to assess dysphoria, despair, life devaluation, self-deprecation, lack of interest or participation, anhedonia, and lethargy. The anxiety scale measures situational anxiety, skeletal muscle effects, autonomic arousal, and the subjective perception of anxious affect. The chronic non-specific arousal levels can be detected by the stress scale. It evaluates nervous arousal, inability to calm down, irritability / over-reactivity, impatience, and ease of getting upset or agitated. The responses of statements are rated on a four-point Likert scale that vary from 0 to 3 where 0 indicates " did not apply to me at all" and 3 indicates " applied to me very much". Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items. The current study's Cronbach's alpha reliability estimate was α=0.89, while the previous study's was α=.91

For DASS-21, the final score must be multiplied by two

Depression*:* Normal 0-9, Mild10-13, Moderate14-20, Severe 21-27.

Anxiety*:* Normal 0-7*,* Mild 8-9*,* Moderate 10-14*,* Severe 15-19.

Stress*:* Normal 0-14*,* Mild15-18*,* Moderate 19-25*,* Severe26-33**.**

Tool III: **The Pittsburgh Sleep Quality Index (PSQI)**

This standardized self-report tool assesses the quantity and consistency of sleep over the last 30 days. Buysse et al. developed and verified it in 1989. There are nine questions on the scale. Ten subparts, numbered 5a through 5j, make up question number 5. The seven components are the sum of all the questions. Responses were graded from zero to three. A score of “0” indicates no difficulty, while “3” indicates severe difficulty. The seven component scores were then added to yield one global score, with a range of 0-21 points;0 indicating no difficulty and 21 indicating severe difficulties in all areas. Patients who scored from 0 to 5 were considered as having high-quality sleep, and those patients with a score from 6 to 21 were seen as having poor sleep quality. Although there are 5 questions that needed the evaluation of the patient’s bedmate or roommate, these questions are not included in the total score of the scale. These questions started from (question 10a to 10e). The PSQI was examined for internal consistency and a reliability coefficient by Buysse et al. (1989). It was proved that correlation coefficient was 0.83 and 0.87 respectively, and that for present study was (α=0.80).

Field Work:

Preparatory phase:

Approval was conducted from The Faculty of Nursing's ethical committee, Damanhour University in January, 2023. An officially requested written permission was taken from

the director of outpatient Medical National Institute in Damanhour city, Egypt to conduct the study. Written informed permission was obtained from each pregnant woman after giving an explanation to them the importance and aims of the study. Anonymity was respected and properly considered. During the study's implementation, data confidentiality was guaranteed. The client was encouraged and afforded respect for their right to decline or Leave the study at any moment. Before embarking on the actual study, a pilot study was carried out on 10% of pregnant women who were not included from the actual study.

Planning Phase

Based on prior research and recommendations for using music therapy with expectant mothers, the music intervention was created. For this study, four different kinds of prerecorded music were made. They each take about half an hour. It includes nature sounds (like Another Day, Friendly Natives, and Tropical Mystery), lullabies (like Brahms' lullaby, Twinkle-Twinkle Little Star, Gradle song), classical music (like Beethoven: for Elise, Debussy: Preludes I Livre VIII, La fille aux cheveux de lin, and Kreisler: Liebesfreud), or crystal music interpreting Chinese children's rhymes and songs (like Little Honey-Bee, Doll Country, Jasmine.The intervention focused on decrease stress, anxiety, depression and improve sleep quality. The selected music in this study was *Brahms' lullaby*, it was deemed relaxing by eight pregnant women during the pilot stage.

Implementation phase:

To build rapport, get written consent, and explain the rationale behind the study and the therapy being used. The study' questionnaires were provided to the intervention and control group pregnant women; each participant was interviewed individually for 15 to 20 min to complete all study tools. Following their agreement, the pregnant women in the intervention group were divided into groups at random, each one composed of 8-10 participants via WhatsApp. Music Therapy intervention was delivered through instructed participants to discharge their bladder and then spending half an hour in a quiet, dark room, listening to symphonic music while positioned in a semi-fowler's posture with their head and shoulders lifted thirty degrees (Brahms' Lullaby Johannes Brahms, Wiegenlied "Guten Abend, Gute Nacht" No.4 from 5 lieder Op.49) on the mobile phone via WhatsApp each day for two weeks prior to bedtime. (14 sessions). The researcher reminded each woman in intervention group daily to practice music therapy. The control group received only usual prenatal care.

Evaluation Phase:

To evaluate the success of the therapy, a post assessment survey was carried out utilizing the Depression, Anxiety, and Stress Scale (DASS) and The Pittsburgh Sleep Quality Index (PSQI) on both the study (n = 40) and control groups (n = 40) immediately after completing the music therapy.

Statistical analysis

The computer was given data, and IBM SPSS software package version 23.0 was chosen in the analysis. The normality of the variable distribution was confirmed using the Shapiro-Wilk test; group comparisons for categorical variables were evaluated using the Chi square test (Monte Carlo). For regularly distributed quantitative variables, the two groups were compared using the student t-test.

Marginal Homogeneity and McNemar Test Used to analyze the significance for ordinal data between before and after, while paired t test was used to analyze the significance between pre and post in each group for quantitative variables with a normal distribution. Significance of the obtained results was judged at the 5 level.

Ethical considerations:

The following concerns were taken into account for every participant: obtaining the subjects' written informed consent after informing them of the purpose of the study; protecting their right to privacy and withdrawal any time. Additionally, the secret of their information was guarantee.

Results:

Table (1) According to pregnant women's socio-demographic data, table 1 indicated that **the mean age** was 29.38 ± 4.08 & 28.25 ± 5.78 years for the study and the control groups respectively.

Level of education also revealed that 20% & 17.5% of the study and the control groups respectively had basic level; 40% & 35% of them respectively had secondary or its equivalent level and 40% & 42.5% respectively had university level. In addition, **occupation** clarified that one-half and more (50% & 67.5%) of the study and the control groups respectively were housewives. Moreover, **current residence** showed that one-half and more (50% & 55%) of the study and the control groups respectively were rural residents. However, no statistically significant differences were found between the two groups' socio-demographic data, which were almost similar.

Table (2) Regarding pregnant women's reproductive history, table manifested **the mean gravidity** was 2.05±0.96 & 1.95±0.85 pregnancy for the study and the control groups respectively and **the mean parity** was 1.44 ± 0.64 & 1.46 ± 0.69 delivery for them respectively. **Number of abortion and stillbirth** also explicated that almost all of the study and the control groups (90% & 87.5%) respectively had no abortion and most of them (97.5% & 95%) respectively had no stillbirth. In addition, **type of previous delivery** was CS among almost three-fifths (59.3% & 57.1%) of the study and the control groups respectively. Moreover, **number of living children** elucidated that a sizeable proportion of the study and the control groups (70.4% & 60.7%) respectively had one living child. As a result. There was no statistically significant difference in the reproductive history of the two groups.

Table (3) Concerning pregnant women's profile of current pregnancy, the table presented that inter- pregnancy interval was 24 months or more among 55.6 % & 44.8% of the study and the control groups respectively. The mean weeks of gestation was also 30.70 ± 0.791 & 30.93 ± 1.047 for the study and the control groups respectively. In addition, number of antenatal visits demonstrated that most of the study and the control groups (90% & 95%) respectively had 4 or more visits. Nevertheless, no statistically significant differences were found between the two groups' profile of current pregnancy.

Table 4 displays pregnant women's emotional states of depression, anxiety and stress, using DASS. Respecting ***depression*** prior to the intervention, between the two groups, no statistically significant difference was found. But after the intervention, there was found to be a highly significant statistical difference between them. (P=0.000), in which the study group's rate of really severe depression dropped drastically from 42.5% to 0% while the control group's rate rose from 35% to 45%. As for ***anxiety*** prior to the intervention, there was no statistically significant relationship between the two groups. However, following the intervention, there was a significant statistical difference between them. (P=0.000), since extremely severe anxiety dropped markedly from 75% to 10% among the study group, while it elevated from 87.5 to 92.5 % among the control group.

In relation to ***stress,*** prior to the intervention comparing the two groups, no statistically significant difference was found. However, following the intervention, a very statistically significant difference was noted between them (P=0.000). Whereas extremely severe stress diminished dramatically from 60% to 0% among the study group, while it heightened from 52.5% to 57.5% among the control group. Nevertheless, before and after the intervention, the relationship within the study group was highly statistically significant. in terms of ***depression***, ***anxiety*** & ***stress*** (P=0.000), while it was not statistically significant among the control group with the same circumstances

Table 5 illustrates pregnant women's quality and patterns of sleep, using PSQI. No statistically significant difference was found between the two groups before intervention, where they were exactly similar. However, following the intervention, a statistically significant difference was observed between them. (P=0.006), as poor quality declined from 100% to 82.5% among the study group, but it stayed the same (100%) among the control group. The study group showed a statistically significant association before and after the intervention (P=0.000), but the control group did not show a statistically significant.

Table 1: Distribution of pregnant women according to their sociodemographic data

Sociodemographic data	Study group (40)		Control group (40)		t-test (P) F / χ^2 (P) MC (P)
	No	%	No	%	
Age years: Mean ± SD	29.38 ± 4.08		28.25 ± 5.78		1.005 (0.318)
Level of education:					
Read & write	0	00.0	2	05.0	
Basic	8	20.0	7	17.5	MC 1.908
Secondary or its equivalent	16	40.0	14	35.0	(0.699)
University	16	40.0	17	42.5	
Occupation:					
Housewife	20	50.0	27	67.5	2.527
Working	20	50.0	13	32.5	(0.112)
Current residence:					
Rural	20	50.0	22	55.0	0.201
Urban	20	50.0	18	45.0	(0.654)

χ^2 (P): Chi-Square Test & P for χ^2 Test F (P): Fisher Exact test & P for F Test
MC (P): Monte Carlo test & P for MC test *: Significant at P ≤0.05

Table 2: Distribution of pregnant women according to their reproductive history

Reproductive history	Study group (40)		Control group (40)		t-test (P) F / χ^2 (P)
	No	%	No	%	
Gravidity: Mean ± SD	2.05 ± 0.96		1.95 ± 0.85		0.494 (0.622)
No. of abortion:					
0	36	90.0	35	87.5	0.125
1	4	10.0	5	12.5	(0.723)
Parity: Mean ± SD	1.44 ± 0.64		1.46 ± 0.69		0.110 (0.913)
Type of previous delivery:	**(n=27)**		**(n=28)**		
- Normal	11	40.7	12	42.9	0.025
- CS	16	59.3	16	57.1	(0.874)
Number of stillbirth:					
0	39	97.5	38	95.0	0.346
1	1	02.5	2	05.0	(0.556)
Number of living children:	**(n=27)**		**(n=28)**		
1	19	70.4	17	60.7	
2	8	29.6	8	28.6	3.094
3+	0	00.0	3	10.7	(0.213)

χ^2 (P):Chi-Square Test & P for χ^2 Test
F (P):Fisher Exact test & P for F Test
*: Significant at P ≤0.05

Table 3: Distribution of pregnant women according to their profile of current pregnancy

Profile of current pregnancy	Study group (40)		Control group (40)		t-test (P) F / χ^2 (P)
	No	%	No	%	
Inter-pregnancy interval (months):	(n=27)		(n=29)		
< 24	12	44.4	16	55.2	0.644
≥24	15	55.6	13	44.8	(0.422)
Weeks of gestation:					
Min-Max	30-34		30-34		1.1085
Mean & SD	30.70 ± 0.791		30.93 ± 1.047		(0.271)
No. of antenatal visits:					
<4	4	10.0	2	05.0	0.721
≥4	36	90.0	38	95.0	(0.396)

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05

Table 4: Distribution of pregnant women according to their emotional states of depression, anxiety and stress, using DASS

Emotional states of depression, anxiety and stress	Study group (40)				Control group (40)				F / χ^2 (P)
	Before intervention		After intervention		Before intervention		After intervention		
	No	%	No	%	No	%	No	%	
Depression:									Before: 3.4 (0.334)
Normal 0-9	0	00.0	28	70.0	0	00.0	0	00.0	
Mild 10-13	1	02.5	12	30.0	0	00.0	0	00.0	
Moderate 14-20	10	25.0	0	00.0	7	17.5	6	15.0	After: 80 (0.000)**
Severe 21-27	12	30.0	0	00.0	19	47.5	16	40.0	
Extremely severe 28+	17	42.5	0	00.0	14	35.0	18	45.0	
F / χ^2 (P)	76.308 (0.000)**				0.834 (0.659)				
Anxiety:									Before: 3.718 (0.156)
Normal 0-7	0	00.0	12	30.0	0	00.0	0	00.0	
Mild 8-9	0	00.0	4	10.0	0	00.0	0	00.0	
Moderate 10-14	3	07.5	20	50.0	0	00.0	1	02.5	After: 61.751 (0.000)**
Severe 15-19	7	17.5	0	00.0	5	12.5	2	05.0	
Extremely severe 20+	30	75.0	4	10.0	35	87.5	37	92.5	
F / χ^2 (P)	55.448 (0.000)**				2.341 (0.310)				
Stress:									Before: 0.914 (0.633)
Normal 0-14	0	00.0	24	60.0	0	00.0	0	00.0	
Mild 15-18	0	00.0	8	20.0	0	00.0	1	02.0	
Moderate 19-25	4	10.0	8	20.0	3	07.5	7	17.5	After: 61.511 (0.000)**
Severe 26-33	12	30.0	0	00.0	16	40.0	9	22.5	
Extremely severe 34+	24	60.0	0	00.0	21	52.5	23	57.5	
F / χ^2 (P)	69.333 (0.000)**				4.651 (0.199)				

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table 5: Distribution of pregnant women according to their quality & patterns of sleep, using PSQI

Quality of sleep	Study group (40)				Control group (40)				F / χ^2 (P)
	Before intervention		After intervention		Before intervention		After intervention		
	No	%	No	%	No	%	No	%	
- Good (0-5)	0	00.0	7	17.5	0	00.0	0	00.0	Before: -
- Poor (6-21)	40	100.0	33	82.5	40	100.0	40	100.0	After: 7.671 (0.006)*
F / χ^2 (P)	7.671 (0.006)*				-				

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05

Discussion:

Pregnancy-related stress is common and has been linked to a number of worse outcomes for both the mother and the unborn child. Women who experience high stress and anxiety during pregnancy are more likely to have a preterm birth or miscarriage, according to research conducted over the previous three decades. High antenatal maternal stress, anxiety, and sleep disturbance are associated with cognitive, behavioural, and emotional regulation issues **(Seyed et al., 2015& Liu et al., 2016).** The effects of prenatal stress and anxiety on development of fetus, health, and even the infant's long-term effects until adulthood make them serious concerns in the medical profession. **(Chang et al.,2015; Dennis et al., 2017)**. As a result, there is a necessity to improve psychological status and sleep quality during pregnancy. As pharmacological treatments may pose substantial hazards to both the mom and the fetus, non-pharmacological intervention (music therapy) has been developed expressly for the care of pregnant women.

In contrast to the control group, the study group's depression levels significantly decreased, according to the study's findings. This finding indicate that using music therapy can be beneficial in improving severity of depression among pregnant women. This may support by since Florence Nightingale's practice, nurses have employed music to foster therapeutic environments that enhance patients' mental, physical, and spiritual health. Moreover, this could be because the right brain processes music's aesthetic pleasure first, which causes the pituitary gland to release endorphins, which heighten feelings of happiness by possibly lowering blood levels of adrenocorticotrophic hormone. According to **Liu et al. (2016)**, music also modifies the connection between the thalamus and the reticular activating system, which in turn influences emotions, body musculature, and autonomic systems. These results align with the research conducted by **Wu et al. (2020) and Zhu et al. (2021)** on the impact of music therapy on perinatal depression. However, the majority of other studies examined postpartum outcomes, neglecting to assess the intervention's effects during the prenatal period.

Stress can be brought on by physical and emotional changes that occur during pregnancy, worries about parenting, shifting dynamics in the family, labor, identifying as a mother, and the health of the unborn child **(Chen, 2015)**. The results of this study show that, as compared to the control group, listening to music can help pregnant women in the study group deal with this stress. This might be clarified by the fact that listening to music can help people relax, reduce stress, and take a "time out" from their hectic schedules. Therefore, a relaxed mother would result in a more relaxed child, and the infant would benefit from the mother's tranquilly. Heart rate, mean arterial pressure, and cortisol levels all drop when listening to relaxing music all signs of less perceived stress **(Burrai et al., 2016)**. These findings are consistent with earlier studies **(Corbijn et al., 2017& Aisyah &Hardjanti 2019)** that found moms who listened to music during their pregnancies reported decreased levels of psychosocial stress. According to a different study, music therapy can help increase the bond between the mother and the fetus and decrease stress and discomfort experienced by expectant mothers **(Shokri Shams et al., 2021).**

In addition, the study's findings show that music therapy helped the research group's anxiety levels to decrease more than it did for the control group. This is an intriguing discovery that aligns with earlier studies showing that music therapy improves heart rate variability (HRV) and, as a result, lowers anxiety levels in mothers just after intervention **(Teckenberg-Jansson et al., 2019).** In the same line, **Corbijn et al., (2017) & Garcia-Gonzalez et al., (2018)** concluded that using music intervention during the third trimester of pregnancy may be effective in avoiding the negative effects of prenatal anxiety on the mother and baby. On the contrary, there was no discernible impact of music listening on anxiety levels in preeclamptic pregnant women. **(Toker & Kömürcü, 2017).** According to the current findings, pregnant women who actively listened for a minimum of thirty minutes to music, a day experienced higher-quality sleep. This could be ascribed to the impact of music therapy, this is a fun and non-invasive treatment method that can create an atmosphere that enhances wellbeing, significantly lessens the severity of stress and anxiety, and enhances the quality of sleep. In addition to the psychoacoustic properties of lullabies music that may assist in relax the pregnant women. These outcomes are agree with previous studies that recommended the effectiveness of music intervention in improving sleep quality among pregnant women **(Amiri et al., 2019; Kavurmacı et al., 2020 & Sanlı et al., 2022).**

Lastly, it is critical to remember that a good delivery depends on the mother's relaxation throughout the latter portions of her pregnancy. Therefore, any method that can be applied to help these moms de-stress is both helpful and beneficial from a medical standpoint. Furthermore, it's possible that the women who had longer gestation periods were under more stress **(Dennis et al., 2017).** This intervention programme can be adjusted and promoted to improve maternal fetal bonding and relaxation **(Chang et al., 2015).** The study highlights the value of complementary therapy (music intervention) in lessening the detrimental effects of pregnancy on people's psychological well-being and quality of sleep.

Conclusion

In the light of the present study findings, the research hypothesis is accepted and it can be concluded that, the music therapy was safe, low cost, useful and its implementation was highly significantly effective in improving psychological status (depression, anxiety and stress). It was also significantly effective in improving sleep quality.

Recommendations

1. Pregnant women should receive music therapy as part of their nursing care plan, since it is advised as an effective intervention.
2. Pregnant women who get both music therapy and brief psycho-educational intervention (BPI) may have a decrease in their negative psychological symptoms.
3. Music therapy should be contained in the basic and continuing nursing education curricula to help manage the psychological status of expectant mothers and enhance their quality of sleep during the pregnancy.
4. Future researches:
   a. A larger sample size from a wider geographic area should be used in a replication of the study to enable more generalization of the findings.
   b. Examining the consequence of music therapy on postpartum psychological status and sleep quality

References

Aisyah, A., & Hardjanti, T. (2019): The effect of music therapy for pregnant women: A literature review. Proceedings of the International Conference on Applied Science and Health, 4, 403-7.

Ali,S., Abd El-Fattah ,N. & Fawzy,H . (2020): The Effect of Sleep Disturbance during Pregnancy on Maternal and Fetal Outcomes and its Related Nursing Management, Egyptian Journal of Health Care, EJHC.11 (2), 170-184.

Amiri, S., Fard, A. P., Khaledi-Paveh, B., Foroughi, A., Bavafa, A., Bazani, M., ... & Sadeghi, K. (2019). The effectiveness of music therapy on insomnia using Persian traditional music. Journal of Kermanshah University of Medical Sciences, 23(2).

Araji, S., Griffin, A., Dixon, L., Spencer, S., Peavie ,C. &Wallace, K. (2020) :An Overview of Maternal Anxiety During Pregnancy and the Post-Partum Period. J Ment Health Clin Psychol;. 4 (4), 47-56.

Burrai, F., Hasan, W., Fancourt, D., Luppi, M., & DiSomma, S. (2016). A randomized controlled trial of listening to recorded music for heart failure patients: Study protocol. Holistic Nursing Practice, 30(2), 102–115.

Buysee, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). Pittsburgh sleep quality index. Journal of Clinical Psychology in Medical Settings.

Cao, S., et al., 2016. Music therapy improves pregnancy-induced hypertension treatment efficacy. International Journal of Clinical and Experimental Medicine, 9(5), pp. 8833-8. http:// www. ijcem. com/ files/ijcem0021741

Chang, H. C., Yu, C. H., Chen, S. Y., & Chen, C. H. (2015). The effects of music listening on psychosocial stress and maternal–fetal attachment during pregnancy. Complementary therapies in medicine, 23(4), 509-515.

Chen CH. Revision and validation of a scale to assess pregnancy stress. J Nurs Res 2015;23(1):25—32.

Corbijn van Willenswaard, K., Lynn, F., McNeill, J., McQueen, K., Dennis, C.-L., Lobel, M., & Alderdice, F. (2017). Music interventions to reduce stress and anxiety in pregnancy: A systematic review and meta-analysis. BMC Psychiatry, 17, 271. doi:10.1186/s12888-017-1432-x.

Dennis, C. L., Falah-Hassani, K., & Shiri, R. (2017). Prevalence of antenatal and postnatal anxiety: Systematic review and meta-analysis. The British Journal of Psychiatry, 210(5), 315–323. doi:10. 1192/ bjp. bp.116.187179.

Dombrowska,A., Gebuza,G,, Kaźmierczak,M, Gierszewska,M. & Mieczkowska, E. (2018): Music therapy – an alternative form supporting the quality of mother and baby care, polish journal of, pediatrics, 93 (4), 331–335.

Gao, M., Hu, J., Yang, L., Ding, N.,Wei, X., Li, L., Liu, L., Ma, Y. & Wen, D.(2019): Association of sleep quality during pregnancy with stress and depression: A prospective birth cohort study in China. BMC Pregnancy Childbirth, 19; 444.

Garcia-Gonzalez, J., Ventura-Miranda, M. I., Requena-Mullor, M., Parron-Carreño, T., & Alarcon-Rodriguez, R. (2018). State-trait anxiety levels during pregnancy and foetal parameters following intervention with music therapy. Journal of Affective Disorders, 232, 17-22

Kavurmacı, M., Dayapoğlu, N., & Tan, M. (2020). Effect of music therapy on sleep quality. Alternative therapies in health and medicine, 26(4).

Khodabakhshi-Koolaee, A., Zahmatkesh, M. & Barzeghar Khezri, R. (2018): The effect of relaxation and instrumental music by Arnd Stein on quality of sleep and happiness among ageing women (Persian)]. Journal of Torbat Heydariyeh Universityof Medical Sciences, 5(4), 46-53.

Liu YH, Lee CS, Yu CH, Chen CH. Effects of music listening on stress, anxiety, and sleep quality for sleep-disturbed pregnant women. Women Health. 2016; 56 (03): 296–311. doi: 10. 1080/ 03630242. 2015. 1088116

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.)Sydney: Psychology Foundation.

Lucena, L., Frange, C., Tufk ,S. & Hachul, H.(2018): Sleeping for two The importance of good sleep during pregnancy. Women and Birth.;31: 142–3.

Nystrup,H., Nygaard,I. & Paaske,S.(2020): Music to improve sleep quality in adults with depression-related insomnia MUSTAFI): study protocol for a randomized BMC 305(21) ,2-10.

Perkovic,R., Tustonja, M., Devic ,K. & Kristo, B.(2021) :Music Therapy And Mental Health In Pregnancy Psychiatria Danubina,; 33(4), 786-789.

Reshadat, S., Zakiei, A., Karami, J. & Ahmadi, E. (2018): A study of the psychological and family factors associated with sleep quality

among pregnant women. Sleep and Hypnosis, 20(1), 17-24.

Sanlı, Y., Goke Arslan, G., Aypar Akbag, N. N., Canbulat Sahiner, N., Yılmaz, D., & Yucel, S. C. (2022). Effects of music on sleep quality and comfort levels of pregnant women. Journal of Perinatal Medicine, 50(4), 467-475.

Sedov, I., Cameron, E., Madigan, S. & Tomfohr-Madsen, L. (2018): Sleep Quality during Pregnancy: A Meta-analysis. Sleep Med. Rev., 38, 168–176.

Seyed, FS, Golmakani, N, Asghari Pour, N, Shakeri, MT. Investigation of Sleep quality during the third trimester of pregnancy and some related factors in primigravida women referred to health care centers in Mashhad. Sci J Hamadan Nurs Midwifery Fac 2015;22:53–60.

Shokri Shams, M., Khodabakhshi-Koolaee, A., & Falsafinejad, M. R. (2021). The effects of relaxing music on life distress and maternal-fetal attachment in pregnant women. Journal of Client-Centered Nursing Care, 7(1), 1-8.

Teckenberg-Jansson, P., Turunen, S., Pölkki, T., Lauri-Haikala, M. J., Lipsanen, J., Henelius, A., ... & Huotilainen, M. (2019). Effects of live music therapy on heart rate variability and self-reported stress and anxiety among hospitalized pregnant women: A randomized controlled trial. Nordic Journal of Music Therapy, 28(1), 7-26.

Toker, E., & Kömürcü, N. (2017). Effect of Turkish classical music on prenatal anxiety and satisfaction: A randomized controlled trial in pregnant women with pre-eclampsia. Complementary Therapies in Medicine, 30, 1–9.

Wu, Q., Liu, Z., Pang, X., & Cheng, L. (2020). Efficacy of five-element music interventions in perinatal mental health and labor pain: A meta-analysis. Complementary Therapies in Clinical Practice, 40, 101217.

Yang, Y., Li, W., Ma, T., Zhang, L., Hall, B., Ungvari, G. & Xiang, Y. (2020): Prevalence of Poor Sleep Quality in Perinatal and Postnatal Women. A Comprehensive Meta-analysis of Observational Studies. Front. Psychiatry, 161(11), 12.

Zhu, Y., Wang, R., Tang, X., Li, Q., Xu, G., & Zhang, A. (2021). The effect of music, massage, yoga and exercise on antenatal depression: A meta-analysis. Journal of affective disorders, 292, 592-602.