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The Effectiveness of Beethoven's Classical Music Therapy (Violin) in Reducing Anxiety in Pregnant Women

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Abstract:
Anxiety during pregnancy is a common psychological condition that can negatively affect maternal well-being and pregnancy outcomes. Safe and accessible non-pharmacological interventions are therefore needed to help manage maternal anxiety. Music therapy, particularly classical music, has been suggested as a potential method to promote relaxation and emotional regulation. This study aimed to examine the effectiveness of Beethoven's classical violin music in reducing anxiety levels among pregnant women. A pre-experimental study with a one-group pretest–posttest design was conducted among 30 pregnant women attending antenatal care at a community health center. Anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HARS) before and after a 15-minute intervention of listening to Beethoven's classical violin music. Differences in anxiety scores before and after the intervention were analyzed using a paired sample t-test. The findings demonstrated a significant reduction in anxiety levels following the music intervention. The mean anxiety score decreased significantly after participants listened to Beethoven's classical violin music ($t(29) = 12.819$, $p < 0.001$). Descriptive analysis indicated that most participants experienced a reduction in anxiety severity, shifting from moderate to mild anxiety levels. Listening to Beethoven's classical violin music significantly reduced anxiety among pregnant women. This intervention is simple, safe, inexpensive, and free from pharmacological side effects, making it a feasible complementary strategy to support psychological well-being in antenatal care settings.

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INTRODUCTION

Anxiety is a common psychological response characterized by feelings of worry, tension, and apprehension related to the anticipation of perceived or actual threats (Diezi et al., 2023). During pregnancy, women experience substantial physiological, psychological, and social changes that may increase emotional vulnerability (Amin et al., 2025). Many pregnant women perceive pregnancy and childbirth as uncertain events, which can lead to heightened anxiety (Fiskin, 2022). This emotional state may negatively affect maternal psychological well-being and is often accompanied by symptoms such as mood instability, sleep disturbances, and persistent concerns about fetal health (Pascal et al., 2022).

Maternal anxiety during pregnancy has been associated with a range of adverse health outcomes for both the mother and the fetus (Bilbul et al., 2022). High levels of anxiety may contribute to sleep and appetite disturbances, fluctuations in blood pressure, and reduced psychological readiness for childbirth (Liu et al., 2025). In addition, persistent anxiety has been linked to obstetric complications, including preterm birth and low birth weight (Matsas et al., 2022). Studies also

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suggest that elevated maternal anxiety in late pregnancy may influence neonatal outcomes, such as birth weight and chest circumference, highlighting the importance of early detection and management of anxiety during the antenatal period (Zhou et al., 2023).

Given the potential negative consequences of maternal anxiety, the development of effective and safe interventions is essential (Matvienko-Sikar et al., 2023). Pharmacological treatments are often limited during pregnancy due to potential risks to fetal development (Costa & Vale, 2023). Therefore, non-pharmacological approaches are increasingly recommended as complementary strategies for managing psychological distress among pregnant women (Zeng et al., 2024). These interventions are generally safe, accessible, and can be easily integrated into routine antenatal care services (Ladyman et al., 2022).

One promising non-pharmacological intervention is music therapy (Shafqat et al., 2024). Music therapy has been widely reported to reduce anxiety by promoting relaxation, lowering physiological stress responses, and diverting attention from distressing thoughts (Ji et al., 2024). Classical music, in particular, is recognized for its structured rhythm, harmonious melodies, and soothing tempo, which may help regulate emotional states and create a calming effect (Konsam et al., 2023). The music of Ludwig van Beethoven has frequently been used in therapeutic settings due to its balanced melodic patterns and emotional depth, which may contribute to psychological relaxation (Cheng et al., 2024).

This study aimed to examine the effectiveness of Beethoven's classical violin music therapy in reducing anxiety levels among pregnant women. The findings are expected to provide empirical evidence supporting the use of classical music therapy as a safe and cost-effective non-pharmacological intervention (Hunter et al., 2022). This approach may serve as a practical strategy that can be easily implemented in nursing and midwifery practice, particularly in antenatal care settings (Wang et al., 2025).

METHOD

Research Design

This study employed a pre-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of classical music therapy in reducing anxiety among pregnant women. The study was conducted at the Jatibanteng Community Health Center in Situbondo from October 1 to October 30, 2025.

Participants

Participants were recruited using a consecutive sampling technique. A total of 30 pregnant women who attended antenatal care services at the health center and met the eligibility criteria were included in the study. The inclusion criteria were pregnant women aged 20–36 years, experiencing mild to moderate anxiety, and without a history of psychiatric disorders or chronic illnesses. Participants were excluded if they had severe pregnancy complications, used sedative medications, or had hearing impairments that could interfere with the intervention.

Data Collection

Participants received a music therapy intervention consisting of Beethoven's classical violin compositions, including the Violin Concerto in D Major, Op. 61. The music was played for 15 minutes through headphones in a quiet and comfortable environment at a moderate volume of approximately 60–65 dB. Anxiety levels were measured before and immediately after the intervention using the

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Hamilton Anxiety Rating Scale (HARS). The HARS instrument consists of 14 items rated on a 5-point Likert scale (0–4) that categorize anxiety severity from mild to severe.

Data Analysis

Data analysis was performed using IBM SPSS Statistics version 26. Descriptive statistics were used to summarize participant characteristics and anxiety scores. Data normality was assessed prior to hypothesis testing. A paired-samples t-test was used to compare pretest and posttest anxiety scores for normally distributed data. In contrast, the Wilcoxon Signed-Rank Test was used for data that were not normally distributed. Statistical significance was set at $p < 0.05$.

Ethical Clearance

Ethical approval for this study was obtained from the Faculty of Health Sciences, Institute of Technology, Science and Health, Dr. Soepraoen Hospital. All participants provided written informed consent prior to participation. Participant confidentiality and privacy were strictly maintained throughout the study, and the intervention posed no physical or psychological risk to the participants.

RESULT

Table 1. Frequency Distribution of Respondents' Age

Characteristics	Frequency	Percent
Age		
21 - 24	7	23.3
25 - 28	10	33.3
29 -32	9	30.0
33-36	4	13.3
Education		
Senior high school	11	36.7
D3	5	16.7
S1	14	46.7
Occupation		
Housewife	18	60.0
Private sector employee	6	20.0
Civil servant	3	10.0
Self-employed	3	10.0

The age distribution of respondents showed a skew toward the 25–28 age group, with 10 participants (33.3%) in this range. Just below that, 9 individuals (30%) were in the 29–32 age group. Furthermore, 7 individuals (23.3%) were in the 21–24 age range, while the smallest age group was 33–36, with 4 individuals (13.3%). This composition illustrates that the majority of pregnant women who participated in the study were in their optimal reproductive age, ranging from 25 to their early 30s, leading to more stable psychological adaptation and reproductive readiness.

In terms of educational background, respondents were predominantly bachelor's degree (S1) graduates (14, 46.7%). High school graduates followed with 11 (36.7%), while only 5 (16.7%) had diplomas (D3). This proportion indicates a relatively strong knowledge base, making it easier for them to absorb health information, such as understanding the influence of classical music on anxiety management during pregnancy.

The occupational variable shows that the majority of respondents were housewives (18 individuals, 60%). Furthermore, six individuals (20%) held private-sector jobs, while civil servants and self-employed individuals each accounted for 3 individuals (10%). The dominance of homemakers suggests that many study participants had more flexible daily schedules, allowing them

to engage in Beethoven's classical music (violin) listening sessions without significant disruption from their formal work routines.

Table 2. Respondents' Anxiety Change

Anxiety Level	Pre-rest		Posttest	
	Frequency	Percent	Frequency	Percent
No Anxiety	0	0	1	3.3
Mild Anxiety	12	40.0	22	23.3
Moderate Anxiety	18	60.0	7	73.3

A comparison of anxiety levels before and after the intervention showed a significant shift. In the initial measurement (pretest), no respondent was in the "no anxiety" category. Instead, 12 (40%) experienced mild anxiety, and 18 (60%) were in the moderate anxiety category. After exposure to music therapy, the distribution pattern changed markedly, with one respondent (3.3%) no longer showing anxiety; the number of mildly anxious respondents jumped to 22 (73.3%), while the moderate anxiety category dropped dramatically to 7 (23.3%). This shift in behavior demonstrates that a classical music intervention reduces emotional stress in pregnant women.

Table 2. Respondents' Anxiety Change

Variable	Mean Difference ± SD	t-value	df	p-value	Interpretation
Anxiety level (Pretest vs Posttest)	3.40 ± 1.45	12.819	29	<0.001	Significant reduction in anxiety after intervention

The results of the Paired Sample t-Test showed that the Difference in the mean anxiety level reached 3.40 ± 1.45, with a t-value of 12.819 (df = 29) and a significance of p = 0.000. Because the p-value is well below the 0.05 significance threshold ($p < 0.05$), the conclusion is that there is a very significant difference in anxiety before and after the intervention. In other words, exposure to Beethoven's classical music has been shown to reduce anxiety among pregnant women at the Jatibanteng Situbondo Community Health Center.

DISCUSSION

The present study demonstrated that exposure to classical violin music composed by Ludwig van Beethoven significantly reduced anxiety levels among pregnant women. Prior to the intervention, most participants reported moderate anxiety; however, following the 15-minute music session, most participants experienced a reduction in anxiety severity, with approximately 70% reporting mild anxiety and a small proportion reporting no anxiety symptoms. Statistical analysis confirmed a significant decrease in anxiety scores following the intervention (paired-samples t-test: $t(29) = 12.819$, $p < 0.001$). These findings indicate that classical music exposure may serve as an effective complementary approach for managing prenatal anxiety.

The results are consistent with previous studies reporting that music therapy can significantly reduce psychological distress during pregnancy. Systematic reviews have shown that music-based interventions reduce anxiety, stress, and physiological indicators of stress among pregnant women (Shafqat et al., 2024; Maul & Arabin, 2025). Music therapy has also been associated with improved emotional stability and relaxation during antenatal care, suggesting that auditory stimulation can support maternal mental health management. The current findings therefore reinforce growing evidence supporting the integration of non-pharmacological approaches into routine maternal health care.

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Several physiological and psychological mechanisms may explain the anxiolytic effects observed in this study. From a physiological perspective, relaxing music has been shown to decrease sympathetic nervous system activity, reduce cortisol levels, and promote parasympathetic responses associated with relaxation. These physiological changes contribute to reductions in heart rate, blood pressure, and perceived stress. From a psychological perspective, music serves as a cognitive distraction, shifting attention away from distressing thoughts and promoting emotional regulation (De Witte et al., 2025; Goel et al., 2024). Listening to structured and harmonious melodies may also enhance mood and create a calming environment that facilitates mental relaxation during pregnancy.

The therapeutic qualities of Beethoven's classical compositions may further enhance their calming effect. Classical music typically features balanced harmonic structures, slow tempos, and repetitive melodic sequences, which are associated with relaxation responses. Neurophysiological studies suggest that such musical elements can stimulate alpha brain wave activity, which is commonly associated with states of calmness and reduced mental tension. In addition, the principles of the Gate Control Theory provide a conceptual explanation for how auditory stimuli may influence emotional perception. According to this theory, non-nociceptive sensory input, such as soothing music, can modulate neural pathways within the limbic and hypothalamic systems, thereby reducing the transmission of stress-related signals and promoting psychological comfort (Sugiarti et al., 2025; Kartaatmaja et al., 2025).

Despite the promising findings, several limitations should be acknowledged. First, the use of a one-group pretest–posttest design without a control group limits the ability to attribute the observed effects solely to the intervention. Second, the relatively small sample size (n = 30) and recruitment from a single health center may limit the generalizability of the results to broader populations. Third, participant music preferences were not assessed, although previous research suggests that personally preferred music may enhance the anxiolytic effects of music therapy (Akelma et al., 2024). Finally, other potential factors influencing anxiety during pregnancy, such as social support, previous birth experiences, or socioeconomic conditions, were not controlled in this study.

Future research should address these limitations by employing randomized controlled trial designs with larger and more diverse participant samples. Investigations that compare different music genres or incorporate participant-selected music may provide further insight into optimizing music-based interventions for maternal mental health. Additionally, integrating physiological indicators, such as heart rate variability and cortisol levels, may help clarify the mechanisms by which music therapy influences psychological well-being during pregnancy.

CONCLUSION

This study demonstrates that exposure to classical violin music composed by Ludwig van Beethoven significantly reduces anxiety levels among pregnant women. Participants showed a meaningful decrease in anxiety scores following the intervention, with most shifting from moderate to mild anxiety after listening to the music session. These findings highlight the potential of classical music therapy as a safe, non-pharmacological, and cost-effective complementary intervention that can be integrated into routine antenatal care to support maternal emotional well-being. Further research is recommended to examine the long-term effectiveness of this intervention, determine optimal session duration and frequency, and explore its applicability across diverse cultural and clinical settings.

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REFERENCES

Akelma, F. K., Altınsoy, S., Nalbant, B., Özkan, D., & Ergil, J. (2024). Comparison of classical and patient-preferred music on anxiety and recovery after inguinal hernia repair: A prospective randomized controlled study. *Perioperative Medicine, 13*(1). https://doi.org/10.1186/s13741-024-00434-3

Amin, S. M., El-Monshed, A. H., Khedr, M. A., Elsayed Awad, A. G., & Ramadan Atta, M. H. (2025). The Association between Emotional Responses to Climate Change, Antenatal Anxiety and Maternal–Fetal Attachment in Primigravida Women. *Journal of Advanced Nursing, 81*(12), 8242-8255. https://doi.org/10.1111/jan.16549

Bilbul, M., Caccese, C., Horsley, K., Gauvreau, A., Gavanski, I., Montreuil, T., Konci, R., Lai, J. K., Da Costa, D., Zelkowitz, P., Shen, H. C., Gryte, K. R., Larosa, A., Brown, R. N., Suarthana, E., & Nguyen, T. (2022). Maternal anxiety, depression and vascular function during pregnancy. *Journal of Psychosomatic Research, 154,* 110722. https://doi.org/10.1016/j.jpsychores.2022.110722

Cheng, H., Xie, H., Tang, Q., Yi, L., & Zhu, J. (2024). Light and classical music therapies attenuate chronic unpredictable mild stress-induced depression via BDNF signaling pathway in mice. *Heliyon, 10*(13), e34196. https://doi.org/10.1016/j.heliyon.2024.e34196

Costa, B., & Vale, N. (2023). Advances in Psychotropic Treatment for Pregnant Women: Efficacy, Adverse Outcomes, and Therapeutic Monitoring. *Journal of Clinical Medicine, 13*(15), 4398. https://doi.org/10.3390/jcm13154398

De Witte, M., Aalbers, S., Vink, A., Friederichs, S., Knapen, A., Pelgrim, T., … van Hooren, S. (2025). Music therapy for the treatment of anxiety: A systematic review with multilevel meta-analyses. *EClinicalMedicine, 84,* 103293. https://doi.org/10.1016/j.eclinm.2025.103293

Diezi, A. S., Vanetti, M., Robert, M., Schaad, B., Baud, D., & Horsch, A. (2023). Informing about childbirth without increasing anxiety: a qualitative study of first-time pregnant women and partners' perceptions and needs. *BMC pregnancy and childbirth, 23*(1), 797. https://doi.org/10.1186/s12884-023-06105-3

Fiskin, G. (2022). The relationship between perceived stress, uncertainty emotions and hopelessness regarding pandemics in pregnant women. *Journal of Community Psychology, 50*(8), 3809-3824. https://doi.org/10.1002/jcop.22635

Goel, S. K., Kim, V., Kearns, J., Sabo, D., Zoeller, L., Conboy, C., … Chelly, J. E. (2024). Music-based therapy for the treatment of perioperative anxiety and pain: A randomized, prospective clinical trial. *Journal of Clinical Medicine, 13*(20). https://doi.org/10.3390/jcm13206139

Hunter, A. R., Heiderscheit, A., Galbally, M., Gravina, D., Mutwalli, H., & Himmerich, H. (2022). The Effects of Music-Based Interventions for Pain and Anxiety Management during Vaginal Labour and Caesarean Delivery: A Systematic Review and Narrative Synthesis of Randomised Controlled Trials. *International Journal of Environmental Research and Public Health, 20*(23), 7120. https://doi.org/10.3390/ijerph20237120

Ji, C., Li, J., Nie, Q., & Wang, S. (2024). Effect of music therapy on anxiety in full-term pregnant women. *Frontiers in Psychiatry, 15,* 1429999. https://doi.org/10.3389/fpsyt.2024.1429999

Kartaatmaja, R. R., Azzahroh, P., & Tiara Carolin, B. (2025). The Effect of Classical Music Therapy on Anxiety of Pregnant Women in The Third Trimester. *Health and Technology Journal (HTechJ), 3*(3), 289–296. https://doi.org/10.53713/htechj.v3i3.332

Konsam, M., Praharaj, S. K., Nayak, B. S., Shetty, J., Bhat, S., Noronha, J. A., & Panda, S. (2023). Effectiveness of Music on Perinatal Anxiety Among Pregnant Women and Newborn Behaviors: A Systematic Review and Narrative Synthesis. *Indian Journal of Psychological Medicine.* https://doi.org/10.1177/02537176231167077

Ladyman, C., Sweeney, B., Sharkey, K., Bei, B., Wright, T., Mooney, H., ... & Signal, T. L. (2022). A scoping review of non-pharmacological perinatal interventions impacting maternal sleep and maternal mental health. *BMC Pregnancy and Childbirth, 22*(1), 659. https://doi.org/10.1186/s12884-022-04844-3

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p-ISSN: 2986-5662
e-ISSN: 2985-959X

Liu, C. H., Zhang, H. Y., Wang, F., Mu, S. S., & Wen, F. Y. (2025). Anxiety and hypertensive disorders of pregnancy: Epidemiology, mechanisms, and management strategies. *World Journal of Psychiatry, 15*(6), 105944. https://doi.org/10.5498/wjp.v15.i6.105944

Matsas, A., Panopoulou, P., Antoniou, N., Bargiota, A., Gryparis, A., Vrachnis, N., Mastorakos, G., Kalantaridou, S. N., Panoskaltsis, T., Vlahos, N. F., & Valsamakis, G. (2022). Chronic Stress in Pregnancy Is Associated with Low Birth Weight: A Meta-Analysis. *Journal of Clinical Medicine, 12*(24), 7686. https://doi.org/10.3390/jcm12247686

Matvienko-Sikar, K., Redsell, S., & Flannery, C. (2023). Effects of maternal stress and/or anxiety interventions in the first 1000 days: Systematic review of reviews. *Journal of Reproductive and Infant Psychology, 41*(2), 114–151. https://doi.org/10.1080/02646838.2021.1976400

Maul, J., & Arabin, B. (2025). Reply to the letter regarding “Systematic review on music interventions during pregnancy in favor of the well-being of mothers and eventually their offspring.” *American Journal of Obstetrics and Gynecology MFM, 7*(3), 101588. https://doi.org/10.1016/j.ajogmf.2024.101588

Pascal, R., Casas, I., Genero, M., Nakaki, A., Youssef, L., Larroya, M., Benitez, L., Gomez, Y., Martinez-Aran, A., Morilla, I., Oller-Guzmán, T. M., Martín-Asuero, A., Vieta, E., Crispi, F., Gratacos, E., Gomez-Roig, M. D., & Crovetto, F. (2022). Maternal Stress, Anxiety, Well-Being, and Sleep Quality in Pregnant Women throughout Gestation. *Journal of Clinical Medicine, 12*(23), 7333. https://doi.org/10.3390/jcm12237333

Shafqat, N., Agrawal, A., Pushpalatha, K., Singh, B., Verma, R., Podder, L., Das, S., & Sutar, R. F. (2024). Effect of Music Therapy on Anxiety in Pregnancy: A Systematic Review of Randomized Controlled Trials. *Cureus, 16*(9), e69066. https://doi.org/10.7759/cureus.69066

Sugiarti, N., kundarti, F. isti, & Martiningsih, W. (2025). The Effect of Classical Lullaby Music Therapy on Anxiety in Primigravida Mothers in Labor. *Health and Technology Journal (HTechJ), 3*(6), 747–756. https://doi.org/10.53713/htechj.v3i6.471

Wang, M., Zhu, Y., Yan, X., Wang, F., Lin, Y., & Li, L. (2025). Research on the effects of combined application of one-to-one midwifery and music therapy on nursing care of natural childbirth mothers. *The Journal of Maternal-Fetal & Neonatal Medicine, 38*(1). https://doi.org/10.1080/14767058.2025.2495685

Zeng, G., Niu, J., Zhu, K., Li, F., Li, L., Gao, K., Zhuang, Y., Zhang, B., Han, X., Ye, G., Gao, Z., & Li, H. (2024). Effects of non-pharmacological interventions on depressive and anxiety symptoms in pregnant women: A systematic review and network meta-analysis. *EClinicalMedicine, 79,* 103011. https://doi.org/10.1016/j.eclinm.2024.103011

Zhou, J., Zhang, S., Teng, Y., Lu, J., Guo, Y., Yan, S., ... & Huang, K. (2023). Maternal pregnancy-related anxiety and children’s physical growth: the Ma’anshan birth cohort study. *BMC pregnancy and childbirth, 23*(1), 384. https://doi.org/10.1186/s12884-023-05711-5