



Original Article

Effect of Bach Classical Music Therapy on Dysmenorrhea Pain Intensity Among Women of Childbearing Age

Nur Cahyani Ari Lestari¹, Baharika Suci Dwi Aningsih²✉, Syahrída Wahyu Utami³, Frenta Helena Simaibang²

¹Midwifery Program, STIKES Bakti Utama Pati, Jawa Tengah, Indonesia

²Midwifery Program, STIK Sint Carolus, Jakarta, Indonesia

³Midwifery Program, STIKES Abdi Persada, Banjarmasin, Kalimantan Selatan, Indonesia

✉Corresponding author: baharika.suci@mail.com



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ABSTRACT

Background: Dysmenorrhea affects 45–95% of women of reproductive age and 50–70% of female employees in the Hanau Clinic working area, Seruyan Regency. Conventional management, including analgesics and menstrual leave, may provide limited benefits. Bach classical music therapy is a non-pharmacological approach that may reduce pain by promoting relaxation and modulating alpha-wave activity, although neurophysiological parameters were not directly measured.

Methods: This quantitative study used a one-group pretest-posttest quasi-experimental design without a control group. The study was conducted at Hanau Clinic, Seruyan Regency, Central Kalimantan, from January to March 2026. The population consisted of 52 women of childbearing age experiencing primary dysmenorrhea at Hanau Clinic; 20 participants meeting the inclusion criteria were selected using purposive sampling. The intervention consisted of Bach classical music therapy administered for 20–30 minutes per day on days 1–3 of menstruation. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after the intervention. Data were analyzed using the Wilcoxon Signed-Rank Test ($\alpha = 0.05$).

Results: The mean pain score decreased from 6.15 to 2.55. Before therapy, 13 (65.0%) respondents had moderate pain and 7 (35.0%) severe pain; afterward, 15 (75.0%) had mild pain and 5 (25.0%) moderate pain. The reduction was statistically significant ($p < 0.001$; $Z = -3.921$) with a large effect size ($r = -0.876$), while the median decreased from 6.00 (IQR: 5.00–7.00) to 2.50 (IQR: 2.00–3.00).

Conclusion: Bach classical music therapy may serve as a promising complementary intervention associated with reduced dysmenorrhea pain intensity in women of childbearing age; however, controlled studies are needed to confirm causal effectiveness. This therapy may support non-pharmacological menstrual pain management and improve women's quality of life.



INTRODUCTION

Dysmenorrhea, or menstrual pain, is one of the most common gynecological complaints experienced by women of childbearing age worldwide. It is often described as cramping pain in the lower abdomen occurring during menstruation, with severity ranging from mild to debilitating. Left inadequately managed, dysmenorrhea can trigger disturbances in mood, sleep quality, work productivity, and overall quality of life, and may increase absenteeism from academic and occupational activities. Therefore, effective and safe pain management for dysmenorrhea is an essential component of quality reproductive health care, particularly among women who are actively employed ([Juwita, Putri, & Rahayu, 2023](#)).

Menstrual pain management can be achieved through pharmacological and non-pharmacological approaches. Although pharmacological methods such as analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) are effective, their long-term use raises concerns regarding gastrointestinal side effects, dependency, and cost. Consequently, non-pharmacological methods—including heat therapy, exercise, aromatherapy, and music therapy—have gained increasing attention as safe complementary interventions ([Charla & Bingan, 2020](#)). Music therapy is a relaxation technique that combines auditory stimulation with a psychophysiological relaxation response, aiming to reduce muscle tension, anxiety, and the perception of pain ([Putri & Lestari, 2023](#)). Previous studies have provided evidence that music-based interventions may reduce pain intensity across various clinical conditions, including primary dysmenorrhea ([Heryani & Utari, 2023](#); [Ituga, Taqiyah, & Agustini, 2022](#)). However, specific evidence concerning Bach's classical compositions among adult women of reproductive age—as opposed to adolescents or postpartum populations—remains limited, and the mechanisms through which such interventions operate in this population have not been adequately characterized.

Effective non-pharmacological pain management for dysmenorrhea is essential, especially among working women where prolonged menstrual pain can affect occupational productivity and may lead to excessive reliance on menstrual leave. Uncontrolled dysmenorrhea can trigger physiological stress responses, heightened anxiety, and diminished daily functioning, which may adversely affect both personal well-being and workplace performance ([Fauzi, Ciptiasrini, & Darmi, 2024](#)). Although Bach classical music therapy is simple, inexpensive, and easy to apply, its implementation in routine reproductive health care is not yet standardized, and evidence regarding its effectiveness for dysmenorrhea remains inconsistent. This highlights the need for further research to support the integration of Bach classical music therapy into evidence-based midwifery practice ([Muttaqin, 2021](#)).

A review of previous studies indicates that most non-pharmacological dysmenorrhea management research has focused on classical music by Mozart, warm compresses, or progressive muscle relaxation. Bach's compositions—characterized by polyphonic structure, balanced harmonic texture, and moderate tempo—are hypothesized to elicit a more sustained relaxation response compared with Mozart's compositions, which tend toward faster tempos and higher frequency patterns. Despite this theoretical basis, studies specifically examining Bach's compositions in women of childbearing age remain limited. Existing studies often use pre-experimental designs without control groups, making it difficult to draw strong causal conclusions. Moreover, there is a lack of research conducted in real-world clinical settings, particularly among working women outside adolescent populations. Therefore, a clear research gap exists in three dimensions: (1) what is already known—several non-pharmacological interventions, particularly Mozart classical music and warm compresses, have demonstrated analgesic effects in primary dysmenorrhea; (2) what remains unknown—the specific analgesic potential of Bach's polyphonic compositions in working women of

childbearing age has not been established; and (3) how this study fills the gap—by evaluating changes in dysmenorrhea pain intensity before and after Bach classical music therapy among adult women of childbearing age in real-world clinical settings, as a structured, easily reproducible intervention among this underrepresented population.

This study is expected to contribute theoretically by strengthening the scientific evidence on the effectiveness of Bach classical music therapy as a non-pharmacological intervention for dysmenorrhea management. Practically, the findings may serve as a basis for midwives and health workers to incorporate Bach classical music therapy into routine reproductive health care as a safe, low-cost, and easily applicable intervention. This study aimed to determine the change in dysmenorrhea pain intensity before and after Bach classical music therapy among women of childbearing age at Hanau Clinic, Seruyan Regency. Based on the above data, the researchers were interested in examining the Effect of Bach classical music therapy on Dysmenorrhea Pain Intensity Among Women of Childbearing Age at Hanau Clinic in 2026.

METHODS

This study used a quantitative, quasi-experimental design with a one-group pretest-posttest approach. The study was conducted at Hanau Clinic, Seruyan Regency, Central Kalimantan Province, from January to March 2026. The population consisted of 52 women of childbearing age experiencing primary dysmenorrhea at Hanau Clinic. A total of 20 participants meeting the inclusion criteria were selected using purposive sampling. The sample size of 20 was determined based on the minimum recommended sample for quasi-experimental studies (≥ 10 per group) and practical considerations related to the limited number of women meeting the inclusion criteria at the study site. Although a formal power analysis was not conducted, this sample size is consistent with similar studies investigating non-pharmacological interventions for primary dysmenorrhea. However, the authors acknowledge that a larger sample with formal power calculation would strengthen future research. Inclusion criteria included women of childbearing age (18–45 years) experiencing primary dysmenorrhea—defined as recurrent cramping lower abdominal pain during menstruation without identifiable pelvic pathology—with a regular menstrual cycle (21–35 days), and experiencing moderate to severe menstrual pain (NRS score ≥ 4). Primary dysmenorrhea was identified based on participant self-report and clinical history review conducted by a midwife at Hanau Clinic. Participants with a known history of endometriosis, adenomyosis, pelvic inflammatory disease, uterine fibroids, or other gynecological disorders that could cause secondary dysmenorrhea were excluded. Exclusion criteria also included women who consumed analgesic medication, herbal remedies, warm compresses, massage, or other complementary therapies during the study period, to minimize confounding. Adherence to these exclusion criteria was monitored through self-report at each follow-up contact.

Purposive sampling was chosen to ensure that participants met specific clinical criteria relevant to the study objectives, thereby increasing the internal validity of the intervention effect being measured. This approach allowed the researchers to focus on respondents who genuinely experienced dysmenorrhea symptoms consistent with the inclusion criteria, resulting in more objective research results relevant to the target population. Although this approach enhanced the relevance of findings to women with similar clinical characteristics, generalizations were still limited by the context of the clinical setting and the study's inclusion criteria.

The intervention consisted of Bach classical music therapy administered individually for 20–30 minutes per day on days 1–3 of menstruation. The specific composition used was Johann Sebastian Bach's "Air on the G String" (Suite No. 3 in D major, BWV 1068), delivered at a tempo of approximately

54 beats per minute (BPM), selected for its slow, harmonious, and repetitive structure conducive to relaxation. Music was provided via stereo headphones (impedance $\geq 16 \Omega$) connected to a participant's smartphone at a comfortable listening volume (approximately 60–70 dB). Participants were instructed to listen in a quiet, private setting (e.g., bedroom) while seated or lying comfortably, without performing other tasks during the session. The same composition and protocol were used for all participants. Adherence was monitored on days 2 and 3 through a dedicated WhatsApp group, in which participants confirmed session completion. Pain intensity was measured using the Numeric Rating Scale (NRS; 0 = no pain, 10 = worst pain imaginable) before and after the intervention. Data were analyzed using the Wilcoxon Signed-Rank Test with a significance level of $p < 0.05$. This study received ethical approval from the Health Research Ethics Committee of Sekolah Tinggi Ilmu Kesehatan Bakti Utama Pati (Approval No. 001/EC/STIKES-BUP/2026, issued on January 15, 2026). All participants provided written informed consent prior to study enrollment, and confidentiality of participant data was maintained throughout the study.

RESULTS

Descriptive Statistics

Table 1 summarizes the basic characteristics of the study participants. The baseline characteristics of the 20 participants are presented to enable assessment of sample representativeness. The mean age of participants was 28.4 ± 6.2 years (range: 18–42 years). All participants had a regular menstrual cycle and reported experiencing primary dysmenorrhea. The mean duration of dysmenorrhea was 2.3 ± 1.1 years. These characteristics suggest a relatively homogeneous sample, which supports internal validity, though they limit generalizability to women with different demographic or clinical profiles.

Primary Outcome Measures

Table 4 presents the main results based on the Wilcoxon Signed Ranks Test on pain scores before and after Bach classical music therapy, obtaining a significance value (Asymp. Sig. 2-tailed) of < 0.001 ; $Z = -3.921$. All respondents ($n = 20$) showed a decrease in pain levels after the intervention, indicated by a negative ranking of 20 respondents (100%). No respondents experienced an increase in pain or no change (positive ranking and tie = 0). This indicates that the reduction in dysmenorrhea pain was consistent across all respondents, suggesting that the intervention demonstrated a significant reduction in menstrual pain.

Secondary Outcome Measures

In addition to the primary outcomes, secondary analysis was conducted to examine changes in dysmenorrhea pain intensity before and after the intervention. Prior to the intervention, the median pain score was 6.00 (range 4–8; IQR: 5.00–7.00) and the mean was 6.15 ± 1.137 . After the intervention, the median pain score decreased to 2.50 (range 1–4; IQR: 2.00–3.00) and the mean was 2.55 ± 0.999 , reflecting a mean reduction of 3.60 points in pain intensity following Bach classical music therapy. The Wilcoxon signed-rank test further confirmed that this reduction was statistically significant ($p < 0.001$; $Z = -3.921$), indicating that Bach classical music therapy may serve as a promising complementary intervention for reducing perceived dysmenorrhea pain among women of childbearing age. The effect size, calculated using the r formula ($r = Z/\sqrt{N}$), was $r = -0.876$, indicating a large effect according to Cohen's convention ($r > 0.5$). The median difference in pain scores was 3.5 points (95% CI estimated: 3.0–4.0), reflecting a clinically meaningful reduction in pain intensity. This reduction also exceeds the commonly cited minimum clinically important difference (MCID) of 2.0 points, suggesting the change is clinically meaningful; however, this interpretation should be made cautiously in the absence of a control group.

Subgroup Analysis

Table 1. Pain Level of Respondents Before Bach Classical Music Therapy at Hanau Clinic, 2026

Pain Level	f	%
No Pain	0	0.0
Mild Pain	0	0.0
Moderate Pain	13	65.0
Severe Pain	7	35.0
Very Severe Pain	0	0.0
Total	20	100

Based on Table 1 above, it is known that of the 20 respondents, 13 (65.0%) experienced moderate pain and 7 (35.0%) experienced severe pain before the intervention.

Table 2. Pain Level of Respondents After Bach Classical Music Therapy at Hanau Clinic, 2026

Pain Level	f	%
No Pain	0	0.0
Mild Pain	15	75.0
Moderate Pain	5	25.0
Severe Pain	0	0.0
Very Severe Pain	0	0.0
Total	20	100

Based on Table 2 above, it is known that after Bach classical music therapy, 15 respondents (75.0%) experienced mild pain and 5 respondents (25.0%) still experienced moderate pain. No respondents experienced severe pain or very severe pain after the intervention.

Table 3. Average Dysmenorrhea Pain Score Before and After Bach Classical Music Therapy at Hanau Clinic, 2026

Variable	Mean	SD	Min	Max
Before	6.15	1.137	4	8
After	2.55	0.999	1	4

Data Normality and Difference Test

Based on the Shapiro-Wilk test ($n < 50$), the significance value (Sig.) for the pretest and posttest scores was < 0.05 , indicating that the data were not normally distributed. Thus, for the bivariate analysis (difference test), the Wilcoxon Signed-Rank Test was used as the appropriate non-parametric test.

Table 4. Wilcoxon Signed-Rank Test Results of Dysmenorrhea Pain Score Before and After Bach Classical Music Therapy at Hanau Clinic, 2026

Variable	Median	Min-Max	Negative Ranks	Positive/Ties	P-Value
Pain Score					
Before	6.00	4-8	20	0/0	

Based on Table 4, the results of the Wilcoxon Signed Ranks Test on pain scores before and after Bach classical music therapy showed a significance value (Asymp. Sig. 2-tailed) of < 0.001 ; $Z = -3.921$. All respondents ($n = 20$) showed a decrease in pain levels after the intervention, indicated by a negative rank of 20 respondents (100%). No respondents experienced increased pain or no change (positive ranks and ties = 0). Because the significance value was less than 0.05 ($p < 0.05$), it can be concluded that there was a statistically significant reduction in dysmenorrhea pain intensity following Bach classical music therapy. In terms of clinical significance, the mean pain score decreased from 6.15 to 2.55 on a 0–10 NRS, a reduction of 3.60 points, which exceeds the minimum clinically important difference (MCID) of 2 points commonly reported for pain scales. Together, both statistical and clinical significance support the practical relevance of this intervention, although this must be interpreted cautiously given the absence of a control group.

DISCUSSION

Interpretation of Key Findings

The results showed that before the intervention, most respondents experienced moderate pain (65.0%) and severe pain (35.0%). This finding is consistent with the research of Handayanti et al. (2024), which found that the majority of adolescent respondents experienced moderate-scale menstrual pain (44%). The high prevalence of dysmenorrhea among working women of childbearing age reflects a multifactorial condition, encompassing biological factors such as excessive prostaglandin production, as well as psychosocial factors such as work-related stress. Psychological distress and anxiety may further influence the perception and severity of pain, indicating that dysmenorrhea should be understood as a condition involving both physiological and psychological dimensions (Valedi et al., 2025).

After Bach classical music therapy, the distribution of pain levels shifted significantly toward mild pain. The majority of respondents (75.0%) moved from the moderate/severe pain category to mild pain. This finding aligns with the study by Silviani, Karaman, and Septiana, in which most respondents who initially experienced moderate pain shifted to mild pain or no pain following a relaxation intervention. The present findings are also supported by recent evidence regarding non-pharmacological approaches to primary dysmenorrhea (Silviani, Karaman, & Septiana, 2019). A systematic review and Bayesian network meta-analysis demonstrated that several non-pharmacological interventions can effectively reduce primary dysmenorrhea pain, supporting the use of complementary approaches as part of comprehensive menstrual pain management (X. Li, Hao, Liu, & Huang, 2024).

Bach classical music therapy is proposed to reduce pain perception through psychological and cognitive mechanisms, including relaxation induction, attentional redirection, and emotional regulation (Heryani & Utari, 2023). It is important to note that outcomes such as endorphin release, serotonin, uterine blood flow, or oxygenation were not directly measured in the present study; therefore, causal physiological claims cannot be made. The perceived reduction in pain may reflect subjective coping improvements rather than objective physiological changes. During dysmenorrhea, the body often experiences tension due to uterine contractions and psychological stress. Listening to Bach's structured and harmonious compositions may gradually promote relaxation and provide a calming effect that increases comfort. The potential role of music in promoting relaxation and reducing anxiety is supported by evidence from systematic reviews (G. Li et al., 2024; Witte et al., 2025), though these were conducted in different clinical populations and should be interpreted with caution in the dysmenorrhea context.

The effects of music therapy may also be related to its ability to redirect attention away from painful sensations and promote emotional regulation. This process may contribute to relaxation and reduce the perceived intensity of pain. Music-based interventions may also influence the individual's response to pain through sensory and cognitive modulation, which is consistent with the principles of the gate control theory of pain (Deno, Bratajaya, & Hidayah, 2022). However, the exact physiological mechanisms underlying the analgesic effects of music remain complex and may involve multiple interacting pathways. Therefore, claims regarding increased uterine blood flow, oxygenation, or the release of specific neurotransmitters such as endorphins and serotonin should be interpreted cautiously unless these physiological parameters are directly measured. Nevertheless, the potential role of music in promoting relaxation and reducing anxiety is supported by recent evidence. A systematic review with multilevel meta-analyses by (Witte et al., 2025) demonstrated that music therapy can significantly reduce anxiety across various populations, suggesting that its psychological effects may contribute to improved pain coping.

The 20 respondents in this study received Bach classical music therapy for 20–30 minutes per day from the first to the third day of menstruation. Before the intervention, the mean pain score was 6.15 (SD 1.137; min–max 4–8). After the intervention, the mean pain score decreased to 2.55 (SD 0.999; min–max 1–4), with an average decrease of 3.60 points. These findings suggest that Bach classical music therapy has the potential to reduce the perception of dysmenorrhea pain. In terms of statistical significance, the Wilcoxon Signed-Rank Test yielded $p < 0.001$ ($Z = -3.921$), indicating a highly significant result. Regarding clinical significance, the mean pain score decreased by 3.60 points on a 0–10 NRS scale, exceeding the commonly reported minimum clinically important difference (MCID) of 2 points, which supports the practical relevance of this intervention. The effect size ($r = -0.876$) further indicates a large magnitude of change. Nevertheless, these interpretations must be made cautiously given the absence of a control group. These results are in line with the research of (Gustina, 2022; Ituga et al., 2022), which showed a decrease in pain levels after classical music interventions. The findings are also consistent with recent evidence demonstrating the effectiveness of non-pharmacological interventions for primary dysmenorrhea. (X. Li et al., 2024) reported that various non-pharmacological interventions can contribute to reductions in menstrual pain, while (Rodrigues et al., 2024) found that women commonly use self-management strategies, including heat therapy, massage, and other non-pharmacological approaches, to manage dysmenorrhea-related pain.

Mechanistically, Bach classical music therapy integrates auditory stimulation, attentional distraction, relaxation, and emotional regulation. The intervention may contribute to pain modulation through sensory and cognitive pathways consistent with the gate control concept (Deno et al., 2022). This is further supported by evidence from Celenay et al., who found that relaxation-based physical interventions—including connective tissue and classic massage—significantly reduced pain intensity among women with primary dysmenorrhea, suggesting that diverse sensory and relaxation modalities may share common analgesic pathways involving attention and pain perception modulation (Celenay, Barut, Karakus, & Alkan, 2024).

The variation in pain reduction between respondents was influenced by internal factors such as the ability to relax, anxiety levels, and individual physiological conditions during menstruation (Meštrović, Bilić, Buhin Lončar, Mičković, & Lončar, 2015). Psychological factors may be particularly important because distress and anxiety can affect pain perception and coping responses. A randomized controlled trial by (Valedi et al., 2025) demonstrated that a psychological intervention significantly reduced the intensity of primary dysmenorrhea, further supporting the importance of psychological dimensions in menstrual pain management. External factors include the listening

environment, headphone quality, privacy, and freedom from workplace interruptions (Meyer, Lee, George, & Kearney, 2024). Therefore, to increase effectiveness, this technique should be introduced early in the menstrual cycle, applied consistently, and adjusted to the respondent's emotional condition and environmental circumstances. Overall, these findings suggest that Bach classical music therapy was associated with a meaningful pre-post reduction in dysmenorrhea pain scores, although the magnitude of benefit varied among individuals. Personalization of the intervention and early application during the menstrual cycle may optimize outcomes; however, controlled studies are needed to establish causal effectiveness.

Five respondents (25.0%) still experienced moderate pain after the intervention. This finding is consistent with previous research suggesting that without complete resolution of underlying psychological or lifestyle factors, pain reduction may be limited. Unresolved pain can trigger a systemic stress response, heightened anxiety, and reduced daily productivity (Melaku, 2022). Psychological factors such as stress, anxiety, low emotional support, and lifestyle habits including insufficient rest, excessive physical activity, and caffeine consumption may exacerbate the perception of pain and reduce the effectiveness of relaxation-based interventions (Chairani, Intasir, & Sari, 2025). The findings of (Valedi et al., 2025) further emphasize the relevance of psychological factors in the experience of primary dysmenorrhea. Similarly, the evidence from (Witte et al., 2025) indicates that music therapy may reduce anxiety, suggesting that the psychological benefits of music could potentially enhance pain coping, although individual responses may vary.

Based on these results, non-pharmacological interventions such as Bach classical music therapy are important to integrate into reproductive health care to help women manage dysmenorrhea effectively without excessive reliance on analgesic medication or menstrual leave (Cecagno, 2021). This approach is also consistent with findings from (Rodrigues et al., 2024), who reported that women with primary dysmenorrhea commonly use self-management strategies to relieve pain. However, the authors also emphasized that the level of scientific evidence supporting individual self-management strategies varies. Therefore, Bach classical music therapy should be considered a complementary intervention that may be used alongside other evidence-based approaches rather than as a complete substitute for medical treatment.

Comparison with Previous Studies

The Wilcoxon Signed-Rank Test demonstrated a statistically significant pre-post reduction in dysmenorrhea pain ($p < 0.001$; $Z = -3.921$; $r = -0.876$), consistent with the primary findings. All respondents experienced a decrease in pain scores, supporting findings from previous studies. Physiologically and psychologically, music therapy may reduce muscle tension, promote relaxation, redirect attention away from pain, and modulate emotional responses to painful sensations. Recent evidence supports this interpretation, as music therapy has been associated with reductions in both pain and anxiety in different clinical settings (Hakimi, Hajizadeh, Hasanzade, & Ranjbar, 2021; G. Li et al., 2024). Furthermore, a systematic review and multilevel meta-analysis by (Witte et al., 2025) found significant benefits of music therapy for anxiety reduction, providing further support for the potential psychological pathway through which music may influence the pain experience.

Variations in outcomes were influenced by individual pain thresholds, anxiety levels, lifestyle factors, previous experiences with dysmenorrhea, and listening environment. These findings suggest that the effectiveness of music therapy may depend not only on the characteristics of the music but also on individual and contextual factors. Overall, Bach classical music therapy may be considered a safe, simple, and potentially side-effect-free non-pharmacological approach that can be explored for integration into dysmenorrhea management through workplace health programs, midwifery counseling, and self-directed application. However, it should be viewed as a complementary strategy,

particularly for women who require additional medical assessment or pharmacological treatment due to severe or persistent symptoms.

This finding is also consistent with the study of (Sulistiyowati, Rahayu, & Dewi, 2020), which reported that Mozart classical music therapy reduced dysmenorrhea pain scores from a mean of 7.42 to 5.00, a decrease of 2.42 points—smaller than the 3.60-point reduction found in this study using Bach's compositions. Although the reduction observed in the present study was numerically greater, this difference should be interpreted cautiously because the two studies may have differed in sample characteristics, baseline pain intensity, intervention duration, study design, and other contextual factors. Therefore, it cannot be concluded that Bach classical music is inherently more effective than Mozart classical music based solely on these findings. Further comparative studies are needed to determine whether musical characteristics, such as tempo, rhythm, harmony, and polyphonic structure, influence the magnitude of the analgesic effect.

Similarly, (Ituga et al., 2022) reported a significant effect of classical music therapy on primary dysmenorrhea among adolescent girls with $p < 0.001$, aligning closely with the results of the present study. The findings are also supported by broader evidence on non-pharmacological interventions for dysmenorrhea. (X. Li et al., 2024) demonstrated that various non-pharmacological interventions can reduce primary dysmenorrhea pain, while (Celenay et al., 2024) found that massage-based interventions significantly improved pain outcomes among women with primary dysmenorrhea. Together, these findings suggest that complementary interventions involving relaxation, sensory stimulation, and modulation of pain perception may have an important role in dysmenorrhea management.

Nevertheless, the specific evidence supporting Bach classical music therapy for dysmenorrhea remains relatively limited compared with the broader literature on non-pharmacological interventions and music therapy for pain and anxiety. Therefore, the present study contributes to the emerging evidence base by specifically evaluating Bach classical music therapy among women experiencing dysmenorrhea. Future research should compare Bach classical music with other classical music compositions, alternative music genres, standard care, and other non-pharmacological interventions to determine the relative effectiveness of different approaches.

Implications for Public Health

The implications of this study extend to public health and occupational health settings. By reducing dysmenorrhea pain, women of childbearing age may be better able to maintain daily productivity and reduce absenteeism from work due to menstrual pain. In addition to pain reduction, this technique may also help reduce anxiety and stress that often accompany dysmenorrhea. Evidence from music therapy research indicates that music-based interventions may reduce both pain and anxiety, although the available evidence is largely derived from clinical populations other than women with dysmenorrhea (Hakimi et al., 2021). The findings of (Witte et al., 2025) further support the potential of music therapy to reduce anxiety, which may indirectly improve women's ability to cope with menstrual pain. However, it must be emphasized that analgesic consumption, absenteeism, productivity, quality of life, anxiety, and stress were not directly measured in the present study; these should therefore be regarded as potential implications rather than demonstrated outcomes, and future studies should incorporate validated measures of these variables.

The application of Bach classical music therapy may reduce reliance on analgesic medication for some women, thus supporting a complementary and non-pharmacological approach to menstrual pain management; however, analgesic consumption was not directly measured in this study, and this should be regarded as a potential—not demonstrated—benefit. It should not be interpreted as eliminating the need for pharmacological treatment when clinically indicated. The integration of

music therapy with other evidence-based non-pharmacological strategies may provide a more comprehensive approach to dysmenorrhea management (X. Li et al., 2024; Rodrigues et al., 2024).

Furthermore, women who receive education and training in this technique may feel more empowered to manage their own reproductive health, potentially reducing excessive reliance on menstrual leave; however, empowerment and reliance on menstrual leave were not directly measured in this study (Anuhgera, Apriyanti, & Lushinta, 2025), and future studies should include validated measures of these outcomes. From a public health perspective, Bach classical music therapy may be incorporated into reproductive health education, midwifery counseling, workplace health promotion, and self-management programs. Its simplicity, accessibility, and potential for self-directed application make it a feasible complementary strategy, particularly in settings where access to health services or pharmacological treatment may be limited.

Nevertheless, women experiencing severe, persistent, or worsening dysmenorrhea should receive appropriate clinical assessment to exclude secondary causes of menstrual pain. Therefore, Bach classical music therapy should be positioned as a complementary intervention within a comprehensive model of reproductive health care rather than as a replacement for clinical evaluation or medically indicated treatment. Overall, the findings indicate that Bach classical music therapy has potential as a safe, accessible, and self-directed complementary strategy for reducing dysmenorrhea pain, promoting relaxation, and supporting women's autonomy in managing their reproductive health.

Limitations and Cautions

The findings of this study must be interpreted within the context of several methodological limitations. The absence of a control group is the most critical limitation, as it prevents causal attribution of the observed pain reduction to the intervention alone. Natural symptom fluctuation across the menstrual cycle, placebo/expectancy effects, regression to the mean, and individual variability may all have contributed to the observed reduction in pain scores. Its effectiveness varies among individuals, as some respondents experienced significant benefits while others showed minimal improvement. Additionally, the absence of randomization and blinding means that selection bias and performance bias cannot be excluded. Bach classical music therapy is a non-pharmacological method and cannot replace medical pain management for secondary dysmenorrhea or other underlying gynecological conditions, serving only as a complementary intervention. Additionally, variability in participant characteristics, baseline psychological conditions, listening environment, and adherence to the recommended duration limits standardization. Potential confounding factors, such as workplace conditions, lifestyle habits, and concurrent self-care practices, may also influence outcomes. Further limitations include: a small sample size ($n = 20$) limiting statistical power; use of purposive sampling from a single clinical setting, limiting external validity and generalizability; absence of a formal a priori sample-size calculation; a short intervention period (three days); potential measurement/reporting bias due to self-reported outcomes; no assessment of adherence beyond self-report via WhatsApp; no objective physiological outcome measures; and identification of primary dysmenorrhea by clinical history rather than diagnostic imaging, which may introduce misclassification. Together, these limitations substantially affect the generalizability of the findings beyond the study setting and population.

Recommendations for Future Research

Recommendations for future research will focus on improving understanding of the mechanisms, effectiveness, and implementation of Bach classical music therapy in reproductive health care. Future studies should utilize randomized controlled trial (RCT) designs with a control group and larger sample sizes to reduce the risk of bias and improve the quality of evidence,

especially since existing studies on music therapy for dysmenorrhea remain limited in methodological rigor.

CONCLUSION

This study demonstrated a statistically significant pre-post reduction in dysmenorrhea pain scores following Bach classical music therapy among women of childbearing age at Hanau Clinic, Seruyan Regency ($p < 0.001$; $Z = -3.921$; $r = -0.876$). The median NRS score decreased from 6.00 to 2.50, a clinically meaningful change exceeding the MCID of 2.0 points. However, given the one-group pretest-posttest design without a control group, a definitive causal conclusion cannot be drawn. Bach classical music therapy may be considered for introduction from the onset of menstruation through workplace health education, audio guidance, or support from health workers, as it may support women's ability to manage menstrual pain more independently. This therapy functions not only as an auditory relaxation technique but also as a self-directed, non-pharmacological pain management strategy. Its effectiveness depends on physical relaxation, consistency of application, and a conducive listening environment. Future randomized controlled trials with larger, diverse samples are needed to confirm causal effectiveness, optimize the intervention protocol, and evaluate broader outcomes including analgesic use, absenteeism, and quality of life.

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