



## **Effect of Mozart Classical Music Therapy on Dysmenorrhea in Female Adolescents at SMA Negeri 3 Palangka Raya**

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### **ABSTRAK**

Dismenore adalah kram menyakitkan yang terjadi selama menstruasi akibat ketidakseimbangan hormon progesteron dan kontraksi rahim. Semakin tinggi kadar prostaglandin, semakin kuat kontraksi dan rasa sakit yang dirasakan. Menstruasi terjadi secara rutin setiap bulan pada wanita selama masa subur, kecuali saat kehamilan. Salah satu terapi untuk mengurangi dismenore adalah terapi musik klasik *Mozart*, yang merangsang produksi hormon endorfin dan memberikan efek relaksasi. Penelitian ini bertujuan untuk mengetahui pengaruh terapi musik klasik *Mozart* terhadap dismenore pada remaja putri di SMA Negeri 3 Palangka Raya. Desain penelitian ini adalah pra-eksperimen dengan rancangan *pretest-posttest*. Sampel 100 mahasiswi berusia 18-24 tahun yang mengalami dismenore, dipilih simple random sampling. Protokol intervensi melibatkan pemberian terapi musik klasik Mozart selama 30 menit setiap hari selama satu minggu. Pengumpulan data termasuk pretest yang dilakukan pada hari pertama intervensi dan posttest pada hari kedelapan dengan analisis uji Wilcoxon. Hasil menunjukkan adanya penurunan nyeri haid setelah pemberian terapi musik klasik *Mozart*, dengan nilai z pretest pada hari pertama dan posttest pada hari ketiga sebesar 5,00 – 8,00 dan 0,00 – 2,00, serta nilai  $p = 0,000$  ( $p < 0,05$ ). Terapi musik klasik Mozart secara signifikan mengurangi dismenore pada remaja perempuan di SMA Negeri 3 Palangka Raya, menunjukkan pilihan pengobatan non-farmakologis.

**Kata kunci: Dismenore, Terapi Musik, Mozart, Remaja**

### **ABSTRACT**

*Dysmenorrhea is defined as painful menstrual cramps caused by progesterone hormone imbalance and uterine contractions. The higher the prostaglandin level, the stronger the contractions and the more intense the pain. Menstruation is a regular monthly occurrence for women during their reproductive years, except during pregnancy. One of the therapies to reduce dysmenorrhea is Mozart classical music therapy, which stimulates endorphin production and provides a relaxation effect. This study aims to examine the effect of Mozart classical music therapy on dysmenorrhea in female students at SMA Negeri 3 Palangka Raya. The research design was a pre-experimental study with a pretest-posttest approach. The sample consisted of 100 female students aged 18-24 who experienced dysmenorrhea, selected through simple random sampling. The intervention protocol involved administering Mozart classical music therapy for 30 minutes daily over a period of one week. Data collection points included a pretest conducted on the first day of the intervention and a posttest on the eighth day. Data were analyzed using univariate and bivariate analysis with the Wilcoxon test. The results indicated a significant reduction in menstrual pain following the music therapy, with z-values of 5.00 to 8.00 for the pretest and 0.00 to 2.00 for the posttest, and a p-value of 0.000 ( $p < 0.05$ ). Mozart classical music therapy significantly reduces dysmenorrhea in female adolescents at SMA Negeri 3 Palangka Raya, suggesting its potential as a non-pharmacological treatment option.*

**Keywords: Dysmenorrhea, Music Therapy, Mozart, Adolescents**

## INTRODUCTION

Dysmenorrhea is defined as painful cramps during menstruation. Women generally experience abdominal pain or cramps before menstruation, which can last for 2-3 days, starting one day before menstruation (Motahari-Tabari et al., 2017). Globally, over 50% of women experience dysmenorrhea, with prevalence rates reaching 90% in some countries. Specifically, rates include 72% in Sweden, 85.7% in Saudi Arabia, 85.4% in Ethiopia, 64% in Mexico, 89.1% in Iran, and nearly 90% in the United States. (Hu et al., 2020; Santi, 2019). Globally, more than 50% of women experience dysmenorrhea, with prevalence rates reaching up to 90% in some countries, including the U.S. and Iran. In Indonesia, approximately 64.25% of women report experiencing this condition, with 54.89% having primary dysmenorrhea and 9.36% having secondary dysmenorrhea. (Rachmawati & Safriana, 2020).

Adolescent girls typically begin menstruating between the ages of 10 and 16, which is a monthly bleeding cycle during the reproductive years, except during pregnancy. Menstruation is often accompanied by menstrual pain or dysmenorrhea, caused by an imbalance in progesterone hormones and uterine contractions during the shedding of the endometrium. Prostaglandins, natural

chemicals produced by the cells of the uterine wall, stimulate uterine muscle contractions, and the higher the levels of prostaglandins, the more intense the pain felt. (Utami et al., 2024)

The data on dysmenorrhea in Indonesia shows a total of 109,657 cases, with 62,573 individuals experiencing primary dysmenorrhea and 9,596 individuals suffering from secondary dysmenorrhea. The incidence of dysmenorrhea among women of reproductive age ranges from 45% to 95%, with 60% to 75% of adolescents experiencing primary dysmenorrhea. It has been reported that 30% to 60% of adolescent girls with dysmenorrhea, 7% to 15% do not attend school (Maufiroh et al., 2023)).

The treatment of dysmenorrhea can be carried out using pharmacological and non-pharmacological therapies. Basic pharmacological therapy includes the administration of nonsteroidal anti-inflammatory drugs (Unnisa et al., 2022). Meanwhile, effective non-pharmacological therapies include warm compresses, acupuncture, acupressure, music therapy, and relaxation therapies such as Mozart classical music. These non-pharmacological approaches can be performed by the patients themselves without the assistance of a therapist, thereby reducing the level of menstrual pain experienced. Mozart classical music is

known to produce endorphins that provide a relaxing effect, stimulate alpha waves in the brain, and create a calming sensation with a tempo of around 60 beats per minute. This music also has advantages over other types of music, as its melody and high frequency can stimulate brain creativity and motivation (Dhian Sulistyowati et al., 2020)

Music has become a popular intervention because it is easily accessible and widely accepted by many people. Several systematic reviews suggest that music can help reduce pain. Music and pain share important similarities as sensory inputs and outputs, where the music heard and the pain felt send signals to the brain. If the vibrations of music can be synchronized with the vibrations of pain, the psychological perception of pain can change and decrease. Listening to classical music can produce endorphins that inhibit the transmission of pain impulses in the central nervous system, thereby reducing the sensation of dysmenorrhea. Music also affects the limbic system, which regulates muscle contractions, thus potentially reducing pain.

Classical music, especially soft piano music, is used as a music therapy to alleviate pain because its waves are suitable for everyone. Audiotherapy or interventions, such as listening to music, are effective in reducing pain. A study at

SMA Negeri 3 Palangka Raya involved 123 eleventh-grade science students who experienced menstrual pain or dysmenorrhea for 2-3 days after menstruation. Female students typically manage the pain by lying down or adopting a prone position. This study aims to investigate the effect of Mozart classical music therapy on dysmenorrhea at SMA Negeri 3 Palangka Raya, chosen for its accessibility and demographic suitability for the research sample.

## **METHOD**

The research method employed in this study is a pre-experimental design utilizing a pretest-posttest approach. The study was conducted at SMA Negeri 3 Palangka Raya from January to March 2024. The study population included all eleventh-grade female students enrolled in the science program who reported experiencing dysmenorrhea, totaling 123 students. To determine the sample size, the Slovin formula was applied, which incorporated a confidence level of 95% and a margin of error of 10%. This calculation resulted in a final sample of 95 respondents.

Data collection involved the use of an observation sheet and the Numeric Rating Scale (NRS) for assessing pain levels. The NRS was utilized to gauge pain intensity on a scale from 0 to 10, where participants were instructed to rate their pain before and

after the intervention. Specific instructions included identifying their pain level at the moment of assessment and marking the corresponding number on the scale.

Observations were conducted systematically, with trained researchers administering questionnaires to ensure reliability. This involved standardizing the procedures for both data collection methods, allowing for consistent application across all participants.

The intervention consisted of Mozart classical music therapy, delivered for 30 minutes each day over three consecutive days. The selection of music was carefully curated to include specific Mozart compositions known for their calming

a. Dismenore

**Table 1. Distribution of Dysmenorrhea Respondent Frequencies Before *Mozart* Classical Music Therapy in Adolescent Girls at SMA Negeri 3 Palangka Raya**

Dismenorea Pre	Frekuensi	Persentase (%)
Moderate pain	23	21,7
Severe pain	83	78,3
Total	106	100

Based on Table 1 above, it is known that before receiving *Mozart* classical music therapy, 23 respondents (21.7%)

effects. The volume levels were maintained at a moderate level to ensure clarity without overwhelming the participants. The sessions were conducted in a quiet, comfortable setting, further contributing to a consistent experience for all participants.

**RESULTS AND DISCUSSIONS**

**Result**

1. Univariate Analysis

Univariate analysis in this study yielded the frequency distribution and percentage of each independent and dependent variable. The dependent variable analyzed in this study is the level of menstrual pain, while the independent variable is classical music therapy.

experienced moderate pain, and 83 respondents (78.3%) experienced severe pain.

**Table 2. Sebaran Frekuensi Responden Dismenore Terapi Musik Klasik Pasca Mozart kepada Anak Remaja Perempuan di SMA Negeri 3 Palangka Raya**

Dismenorea post	Frequency	Persentase (%)
No pain	3	2,8
Mild pain	103	97,2
Total	106	100

In Table 2 above, it is shown that after being given *Mozart* classical music therapy, the respondents had a pain scale of no pain

with 3 respondents (2.8%) and a mild pain scale with 103 respondents (97.2%).

b. Karakteristik Responden

**Table 3. Frequency Distribution of Menarche Age Among Adolescent Girls at SMA Negeri 3 Palangka Raya**

Age of menarche	Frequency	Persentase (%)
≤12 years old	44	41,5
>12-14 t years old	62	58,5
Total	106	100

Based on Table 3, it is found that 44 respondents (41.5%) are adolescent girls with menarche age ≤12 years, and 62 respondents (58.5%) have menarche age >12-14 years.

**Table 4. Frequency Distribution of the Petitioner's Family History Among Adolescent Female Students at SMA Negeri 3 Palangka Raya**

Riwayat keluarga dismenore	Frequency	Persentase (%)
Ada	65	61,3
Tidak ada	41	38,7
Total	106	100

Based on Table 4, it is known that 65 respondents (61.3%) have a family history of dysmenorrhea, while 41 respondents (38.7%) do not have a family history of dysmenorrhea.

**Table 5. Distribusi Frekuensi Termohon Berdasarkan Siklus Menstruasi Anak Perempuan Remaja di SMA Negeri 3 Palangka Raya**

Siklus menstruasi	Frequency	Persentase (%)
Normal	89	84,0
Tidak normal	17	16,0
Total	106	100

Based on Table 5, it is known that 89 respondents (84.0%) are adolescent female respondents with normal menstrual cycles and 17 respondents (16.0%) are adolescent female respondents with abnormal menstrual cycles.

2. Analisis Bivariat

a. Tes Normalitas

**Table 6. Uji Normalitas Terapi Musik Klasik Mozart dengan Skala Nyeri Pretest dan Posttest pada Anak Perempuan Remaja di SMA Negeri 3 Palangka Raya**

Terapi Musik Klasik Mozart	Mean	Std. Deviation	P Value
Pretest	7.31	0.999	0,0001
Posttest	1.13	0,416	

Based on Table 6, it is known that the data before and after the treatment on the 1st day of the pretest and posttest on the 3rd day obtained a p value of

0.0001 < 0.05, which means that the data was distributed abnormally, so the Wilcoxon Test was used.

b. Average Before and After

**Table 7. Mean Scores of Mozart Classical Music Therapy with Pain Scale Pretest and Posttest in Female Adolescents at SMA Negeri 3 Palangka Raya**

Classical Music Therapy with Mozar	Mean	Std. Deviation	Min - Max
Pretest	7.31	0.99	5.00 – 8.00
Posttest	1.13	0,42	0.00 – 2.00

Based on the analysis of Table 7, in the pretest for Mozart classical music therapy, the average pain scale was 7.31 with a range of 5.00 to 8.00 and a standard deviation of 0.99. After the therapy was administered, the average pain scale decreased to 1.13 in the posttest, with a range of 0.00 to 2.00.

These results indicate a significant difference in pain scale before and after Mozart classical music therapy among female students at SMA Negeri 3 Palangka Raya. This therapy is effective in reducing the pain scale from 7-8 to 2 or even no pain, as well as from 6 to no menstrual pain.

c. Influence Test

**Table 8. Results of the Effect of Mozart Classical Music Therapy on Premenstrual and Postmenstrual Pain in Female Adolescents at SMA Negeri 3 Palangka Raya**

Classical Music Therapy with Mozar	Mean	Std. Deviation	Min - Max	Sig.
Pretest	7.31	0.99	5.00 – 8.00	0.0001
Posttest	1.13	0,42	0.00 – 2.00	

Based on Table 8, the analysis results from the pretest on day 1 and the posttest on day 3 showed a p-value of 0.000 (p<0.05). It can be concluded that the alternative hypothesis (Ha) is

accepted, indicating that there is an effect of *Mozart* classical music therapy on dysmenorrhea in female students at SMA Negeri 3 Palangka Raya.

**Discussion**

1. Pain Scale

Menstrual pain is a common gynecological complaint among young

women, known as dysmenorrhea, which refers to lower abdominal pain due to prostaglandin activity during menstruation. This study indicates that

classical music therapy can reduce dysmenorrhea in adolescent girl (Jacob et al., 2023) Dysmenorrhea is classified into primary and secondary types; primary dysmenorrhea occurs without any abnormalities in the genital organs, whereas secondary dysmenorrhea occurs due to gynecological disorders (Eka Jayani et al., 2020). The previous research has shown that the menstrual pain scale before the intervention was in the moderate to severe range.

The study found that before the Mozart classical music therapy, there were 23 respondents (21.7%) with moderate pain and 83 respondents (78.3%) with severe pain. After the therapy, 3 respondents (2.8%) reported no pain, and 103 respondents (97.2%) experienced mild pain. This indicates that Mozart classical music therapy is effective in reducing pain levels to mild or even eliminating pain altogether. Research by Kinesti and Suyamto (2021) also shows that music therapy can address dysmenorrhea, with a pain scale measurement of 2.18 before therapy, and the pain scale for adolescents experiencing menstrual pain ranged from moderate to severe.

Factors such as stress, irregular eating patterns, and genetic predispositions can affect the pain scale on the first day of menstruation. If menstrual pain (dysmenorrhea) is left untreated, it can

lead to disruptions in daily activities, anxiety, depression, menstrual irregularities, infertility, ectopic rupture, and ruptured cysts (Amru & Selvia, 2022). Research indicates that after receiving Mozart classical music therapy, the pain scale decreased to mild or no pain at all. Other studies also found that nearly all respondents experienced a reduction in menstrual pain to mild or no pain following Mozart classical music therapy. (Ituga et al., 2022). The researchers assume that Mozart classical music therapy helps reduce the intensity of menstrual pain, allowing students to engage in their normal activities.

## 2. Characteristics of the Respondents

This study involved 106 female adolescents from various menarche ages: 44 respondents (41.5%) were  $\leq 12$  years old and 62 respondents (58.5%) were  $>12-14$  years old. Among the respondents with menarche  $\leq 12$  years old, 12 experienced moderate pain (scale 4-6) and 53 experienced severe pain (scale 7-9). Meanwhile, for those with menarche  $>12-14$  years old, 11 experienced moderate pain and 30 experienced severe pain. Factors contributing to early menarche include environment, lifestyle, and diet. Menarche typically occurs at ages 12-13, marking maturity and the onset of puberty. Several respondents cited the

consumption of junk food as a cause of early menarche. The 2018 Riskesdas results indicate that 37.5% of adolescents experienced menarche at the age of 13-14 years (Riskesdas, 2018). The ideal age for menarche is 12-14 years, while an age younger than 12 years is categorized as early menarche (Enggar et al., 2022) Early menarche is associated with dysmenorrhea because the reproductive organs are not fully developed and functional, leading to pain during menstruation. The normal age for menarche is between 12 and 14 years.

In this study, of the 106 respondents, 65 (61.3%) had a family history of dysmenorrhea, while 41 (38.7%) did not. Respondents with a family history of dysmenorrhea were divided into two pain scales: 15 had moderate pain (4-6) and 50 had severe pain (7-9). Meanwhile, respondents without a family history of dysmenorrhea were divided into 8 with moderate pain and 33 with severe pain. Dysmenorrhea was generally more severe in those with a family history, although some respondents without a family history also experienced severe pain. A family history is an important risk factor for primary dysmenorrhea, as evidenced by Zukhtina and Martina (2022) and other studie (Septiyani & Simamora, 2022)

which indicates a strong relationship between familial dysmenorrhea and primary dysmenorrhea.

This study involved 89 female adolescents with regular menstrual cycles (84.0%) and 17 adolescents with irregular cycles (16.0%). Of those with regular cycles, 23 experienced moderate pain (4-6) and 66 experienced severe pain (7-9), while all 17 with irregular cycles experienced severe pain. Dewi dan Siti (2023), Changes in the cycle are caused by psychological factors such as anxiety and stress. Other factors include psychological imbalances, environment, age, and hormones (Keith et al., 2022). Wardani (2021) It explains that a normal menstrual cycle occurs every 21-35 days, with a duration of 3-7 days and a volume of 30-80 ml, whereas an irregular cycle is either shorter than 24 days or longer than 38 days. (Hidayanti et al., 2021) Finding a relationship between the menstrual cycle and dysmenorrhea ( $p=0.043$ ). Female students with a normal cycle have a 0.3 times lower chance of experiencing dysmenorrhea compared to those with an abnormal cycle (PR = 0.27

3. The Effect of *Mozart* Classical Music Therapy on Dysmenorrhea in Adolescent Girls at SMA Negeri 3 Palangka Raya

Menstrual pain can be alleviated through pharmacological treatments with pain-relief medication and non-pharmacological methods such as *Mozart* classical music therapy (Sabilla & Nurfadhilah, 2020). Dysmenorrhea is caused by elevated levels of prostaglandins, which lead to uterine muscle contractions, resulting in varying intensities of pain (Djimbula et al., 2022). Dysmenorrhea commonly occurs in adolescents and tends to decrease with age or after childbirth. (Safriana et al., 2020). Djimbula's (2022) study shows that *Mozart* classical music therapy can reduce dysmenorrhea pain from moderate to mild, with a p-value of 0.000. Music therapy is effective in improving physical and mental well-being through distraction, comfort, and relaxation. (Gustina dan Arifarahmi, 2023). Therefore, music therapy is an effective method for reducing menstrual pain in adolescents (Wulandari, 2021). Based on the research conducted by Safriana and Sandra (2022), which indicates a significant relationship between the menstrual cycle and the incidence of dysmenorrhea ( $p=0.023$ ,  $p\text{-value} < 0.05$ ), it means that the administration of classical Mozart therapy has an impact or difference before and after the therapy.

Based on the study conducted by Safriana and Sandra (2022), there is a significant relationship between the menstrual cycle and the occurrence of dysmenorrhea, with a p-value of 0.023 ( $p < 0.05$ ), indicating that Mozart classical music therapy has an impact or difference before and after the therapy.

In this study, Mozart classical music therapy was applied progressively to alleviate pain. Before the therapy, 21.7% of respondents experienced moderate pain, and 78.3% experienced severe pain. After the therapy, 97.2% of respondents reported mild pain or no pain at all. According to Erfandi (2009) in Ituga (2020), distraction techniques, such as listening to music, divert attention from pain and can reduce it. Classical music, such as Mozart's works, is known to produce endorphins that reduce pain by affecting the central and limbic nervous systems (Tasri, 2023). This therapy has proven effective in reducing the intensity of dysmenorrhea pain, with a significant difference in pain levels before and after the therapy. With a longer duration of therapy, the pain intensity decreases (Sulistiyarini, 2021).

In the experimental test conducted by Heryani and Mona (2017), the results showed  $p=0.00 < 0.05$   $p = 0.00 < 0.05$   $p=0.00 < 0.05$  for the control group.

This indicates that there is effectiveness in administering Mozart music therapy and back exercises for dysmenorrhea. This is because Mozart classical music leads to increased calmness, relaxation, and reduced anxiety.

According to the study by Jamil et al. (2017), there is a significant effect of back exercise techniques and music therapy on reducing menstrual pain (dysmenorrhea) among students at STIKES Widya Husada Semarang, with a p-value of less than 0.05, thus the alternative hypothesis is accepted. The study also demonstrated that the Wilcoxon test results for normally non-distributed data before and after treatment showed a p-value of less than 0.05 for Mozart classical music therapy, indicating a significant effect in reducing menstrual pain among adolescent girls at SMA Negeri 3 Palangka Raya.

## CONCLUSION

This study examined the impact of Mozart classical music therapy on dysmenorrhea among female students at SMA Negeri 3 Palangka Raya, conducted over one month in March 2024 with a sample of 106 respondents. The findings revealed a substantial transition in pain levels: prior to

therapy, 78.3% of respondents experienced severe pain, which dramatically decreased to only 2.8% after the intervention. Conversely, the proportion of respondents reporting mild pain rose significantly to 97.2%.

Regarding key respondent characteristics, the distribution of menarche age indicated that 41.5% were  $\leq 12$  years old, while 58.5% were aged  $>12-14$  years. Notably, 61.3% of respondents had a family history of menarche at or below 12 years, and the majority (84.0%) reported regular menstrual cycles.

Statistical analysis using the Wilcoxon test yielded a significant result ( $p < 0.0001$ ), confirming the efficacy of Mozart classical music therapy in alleviating dysmenorrhea among the participants. The average pain levels showed a marked difference pre- and post-therapy, with pretest values ranging from 5.00 to 8.00, and posttest values from 0.00 to 2.00.

These findings have important implications for clinical practice, suggesting that music therapy could be an effective, non-invasive intervention for managing dysmenorrhea. Future research should explore the long-term effects of music therapy on menstrual pain and its potential incorporation into broader pain management strategies.

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