

## The Effect Of Music Therapy On Psychological Conditions And Menstrual Pain In Adolescents

Esty Puji Rahayu<sup>1</sup>, Lailatul Khusnul Rizki<sup>2</sup>, Yati Isnaini Safitri<sup>3</sup>, Siska Nurul Abidah<sup>4</sup>

<sup>12</sup>Department of Midwifery Diploma, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, Indonesia

<sup>34</sup>Department of Midwifery Bachelor, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, Indonesia

Corresponding Author: [esty@unusa.ac.id](mailto:esty@unusa.ac.id)

---

Cite this paper: Esty Puji Rahayu, Lailatul Khusnul Rizki, Yati Isnaini Safitri, Siska Nurul Abidah(2024) The Effect Of Music Therapy On Psychological Conditions And Menstrual Pain In Adolescents. *Frontiers in Health Informatics*, 13 (3), 7056-7063

---

### Abstract

**Background:** In Indonesia, the incidence of dysmenorrhea is 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. Based on data from the 2021 East Java Province Adolescent Reproductive Health Survey, it was found that around 4,653 adolescents experienced dysmenorrhea. The incidence of primary dysmenorrhea was 4,297 (90.25%) and the others experienced secondary dysmenorrhea as many as 365 people (9.75%). **Aim:** To find out the influence of music combining natural sound and piano on psychological conditions and menstrual pain in adolescents. **Method:** this study uses a quasi-experimental with a comparative study type of research. The number of samples in this study is 60 respondents. The inclusion criteria in this study were adolescents aged 17-21 years who experienced dysminorea on days 1-3 and did not consume analgesic. Meanwhile, the exclusion criteria are adolescents who consume analgesic. **Result:** most (61.67%) adolescents experienced severe depression, almost all (86.67%) experienced very severe anxiety and almost some (46.67%) experienced moderate stress when experiencing menstrual pain. After being given combination music, the change in psychological condition was safe, almost all respondents had a normal psychological condition. Most adolescents experienced severe pain (56.7%) during menstruation, but after being given combination music therapy, the pain was reduced and most (56.1%) experienced mild pain. **Conclusion:** There is an effect of music therapy combining natural sound and piano on psychological conditions and menstrual pain in adolescents.

**Keywords:** *natural sound, piano, psychological condition, menstrual pain, adolescent*

### 1. Introduction

Dysmenorrhea is abdominal pain that comes from uterine cramps that occur during menstruation. The pain appears at the same time as the start of menstruation and lasts several hours to several days until it reaches peak pain. Primary dysmenorrhea is related to uterine muscle contractions (myometrium) and prostaglandin secretion, while secondary dysmenorrhea is caused by pathological problems in the pelvic cavity (Larasati, T. A. & Alatas, 2016). According to the World Health Organization (WHO), the number of dysmenorrhea in the world is very large, on average more than 50% of women in each country experience dysmenorrhea. In Sweden it is around 72%. In the United States, it is estimated that almost 90% of women experience dysmenorrhea,

and 10-15% of them experience severe dysmenorrhea, which makes them unable to carry out any activities (Lail, 2019). Meanwhile, in Indonesia the incidence of dysmenorrhea is 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (Tsamara et al., 2020). Based on data from the East Java Province Adolescent Reproductive Health Survey (SKRR) in 2021, it was found that around 4,653 teenagers experienced dysmenorrhea. The incidence of primary dysmenorrhea was 4,297 (90.25%) and 365 people (9.75%) experienced secondary dysmenorrhea (Meinawati & Malatuzzulfa2, 2021)

The key factors found to influence dysmenorrhea in adolescents in middle school are stress, followed by health conditions, onset of dysmenorrhea, duration of menstruation, and eating patterns. Jung and Kim's 2022 research shows that factors that influence dysmenorrhea in adolescents include blood count, family history, health conditions, age at which menstruation begins, and stress. This suggests that perceived health conditions worsen as stress levels increase and irregular eating patterns are associated with higher levels of dysmenorrhea (Jeon et al., 2014). The influence of stress on pain during menstruation can occur because stress involves the neuroendocrinological system as a system that plays a big role in female reproduction. In stressful situations, there is activation or release of the hormone corticotropic releasing hormone (CRH) from the hypothalamus, which will directly inhibit hypothalamic GnRH secretion. An increase in CRH will stimulate the release of endorphins and adrenocorticotrophic hormone (ACTH) into the blood. Endorphins themselves are known to be endogenous opiates whose role has been proven to reduce pain (Martini et al., 2014)

Menstrual pain can also have a negative impact on daily activities, reduce educational performance during puberty, and cause poor sleep quality, as well as have a negative impact on mood, causing anxiety and depression (Petraglia et al., 2017). Menstrual conditions affect Hb levels as well as motivation to study. If a female student has low Hb levels, she will be weak, tired and often sleepy and will even lose her passion for studying. Disrupted learning activities will affect learning achievement (Rahayu, 2017). Various efforts have been made to reduce dysmenorrhoea experienced by adolescents. There are some who carry out pharmacological and non-pharmacological therapy. For non-pharmacological therapy, they do self-hypnosis and yoga. Hypnosis can increase endorphin levels in the body. This can be used to reduce pain and anxiety (Lestari & Putri, 2018).

Apart from this therapy, music can also reduce pain. Music therapy has been proven to show the effect of reducing anxiety and depression, eliminating pain, lowering blood pressure and lowering heart rate which can also have an impact on reducing menstrual pain. Music that can be used to reduce pain is soft and regular music, such as instrumental or Mozart classical music (Rangga et al., 2021). Apart from classical music therapy, natural sounds are also calming, for example the sound of splashing water, the sound of naging, or the sound of birds chirping. Apart from being useful for calming the mind, natural sound is also useful for improving sleep quality and reducing stress, depression and anxiety levels (Rahmavati, 2020). Meanwhile, piano music is not only useful in the process of healing pain and regulating hormones, but this music is also useful for increasing concentration and relieving fatigue in humans. The combination of these two types of music is expected to improve psychological conditions and reduce pain. Providing music with a slow rhythm will reduce the release of catecholamines into the blood vessels, so that the concentration of catecholamines in plasma becomes low. The benefits that can be felt after doing music therapy are feeling relaxed, the body is more energetic, and the mind is fresher. Apart from that, listening to music can produce endorphins (morphine-like substances supplied by the body which can reduce pain) which can inhibit the transmission of pain impulses in the central nervous system, so that the sensation of menstrual pain can be reduced. Music also works on the limbic system which will be transmitted. to the nervous system which regulates the contraction of the body's muscles, so that it can

reduce muscle contractions. (Rangga et al., 2021)

## 2. Materials and methods

### 2.1 Materials

This research design uses a quasi-experiment with a comparative study type of research, namely comparing the psychological conditions and levels of menstrual pain in teenagers before and after being given music therapy with a combination of natural sound and piano. The sampling technique uses simple random sampling. The number of samples in this research was 60 respondents. The inclusion criteria in this study were adolescents aged 17-21 years who experienced dysmenorrhea on days 1-3 and did not take analgesics. Meanwhile, the exclusion criteria are teenagers who consume analgesics. This research instrument is:

- a. Music therapy uses music created by Peder B. Helland through his personal label, namely "Soothing Relaxation" by combining piano music and natural sounds, given for 30 minutes once a day when experiencing dysmenorrhea days 1-2 in a supine and relaxed sleeping position. . Listen to music on your own gadget via YouTube streaming channels or other music applications.
- b. Psychological conditions can be measured with the DASS 21 (Depression Anxiety Stress Scales 21) instrument. This questionnaire consists of 21 questions to measure the level of depression, anxiety and stress in adolescents.
- c. Menstrual pain can be measured with the NRS (Numeric Rating Scale) instrument

### 2.2 Data collection procedures

The research was conducted at Campus A, Nahdlatul Ulama University, Surabaya. The researcher submitted an application for a research permit to the LPPM Nahdlatul Ulama University Surabaya to be addressed to the dean of the Faculty of Nursing and Midwifery. After obtaining permission, the researcher immediately coordinated and approached the class leaders of the D3 and S1 midwifery study program students. When conducting research, Providing *informed consent* about the respondent's willingness as the object of the research:

- a. provide DASS 21 and NRS questionnaires before combination music therapy is carried out.
- b. Providing music therapy in combination with Soothing Relaxation on the first and second days of menstruation, 1 time of music listening therapy for 30 minutes
- c. After being given music therapy, the researchers again measured psychological conditions with DASS 21 and menstrual pain with NRS (Numeric Rating Scale) on the first and second days.

### 2.3 Data analysis

Data was obtained directly/primary data, data collection was carried out by filling in observation sheets and recapping them. The data is analyzed to determine the influence between variables with the Wilcoxon Signed Rank Test if the data is not normally distributed

## 3. Results and discussion

### 3.1 Adolescent Psychological Conditions

Psychological conditions in adolescents can be seen from their levels of depression, stress and anxiety. Details of the psychological conditions of teenagers can be seen in the table below:

Table 3.1 Frequency distribution of pre-test and post-test based on adolescent depression level

Depression Level	Pre Test		Post Test	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage(%)
Normal	6	10	54	90

Light	2	3,33	0	0
Keep	8	13,33	2	3,33
Severe	37	61,67	4	6,67
Very severe	7	11,67	0	0
Total	60	100	60	100

Table 3.2 Frequency distribution of pre-test and post-test based on adolescent anxiety levels

Anxiety Level	Pre Test		Post Test	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage(%)
Normal	4	6,67	50	83,34
Light	2	3,33	2	3,33
Keep	0	0	2	3,33
Severe	2	3,33	0	0
Very severe	52	86,67	6	10
Total	60	100	60	100

Table 3.3 Frequency distribution of pre-test and post-test based on adolescent stress levels

Stress Level	Pre Test		Post Test	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage(%)
Normal	6	10	52	86,67
Light	2	3,33	0	0
Keep	28	46,67	2	3,33
Severe	18	30	6	10
Very severe	6	10	0	0
Total	60	100	60	100

Based on the table of depression, anxiety and stress levels, it can be seen that most (61.67%) adolescents who experience severe depression, almost all (86.67%) experience very severe anxiety and almost some (46.67%) experience moderate stress when experiencing menstrual pain. The data shows that serious treatment is needed for adolescents who experience menstrual pain. Although menstrual pain (dysmenorrhea) is not a deadly thing, dysmenorrhea can cause disturbances in activities as well as have a physical, psychological, social and economic impact on women. Psychological responses can also be experienced during dysmenorrhea such as mood swings, anxiety, irritability are psychological responses that are often experienced during dysmenorrhea (Costa & Serlibrina W, Turwewi Maria Y, 2018)

Although psychosocial risk factors of primary dysmenorrhea have not been studied extensively, there is growing evidence of a psychologic etiology. Previous studies reported that women with dysmenorrhea tend to be more preoccupied with bodily sensations, tend to express greater negative attitudes toward illness, and have more negative attitude toward menstruation than do other women. Ambresin et al. found that patients with severe dysmenorrhea not only show a different profile from their peers in terms of their mental health, but are also more dissatisfied with their body appearance. Some psychologic factors such as high emotional disturbance, and psychologic symptoms were found to be associated with higher rates of dysmenorrhea. A study showed that dysmenorrhea intensity increased with the severity of depression, anxiety, and somatic complaints (Faramarzi

et al., 2014).

### 3.4 Menstrual pain in adolescents

Table 3.4 Distribution of pre-test and post test frequencies based on pain scale

Information	Pre Test		Post Test	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage(%)
No Pain	0	0	2	3.3
Mild Pain	2	3,3	34	56.7
Moderate Pain	24	40	24	40
Severe Pain	34	56,7	0	0
Total	60	100.0	60	100

Based on these data, it can be seen that the majority of teenagers experience severe pain (56.7%) during menstruation. The pain that is felt tends to spread, generally localized in the lower abdomen but can spread to the waist and thighs. Apart from that, pain symptoms can also be accompanied by nausea, vomiting, headaches and other symptoms. Several factors such as hormonal imbalances, genetics, and certain medical conditions can also influence the severity of menstrual pain experienced by women (Smith, 2022). Although menstrual pain is generally harmless, it can affect quality of life and daily productivity.

### 3.3 Effect of Music Therapy Combination of natural sound and piano on psychological conditions

The following is a table of data analysis results using the Wilcoxon Sign Rank Test about the influence of music therapy on the psychological condition of adolescents

Table 3.5 Results of Analysis of the Effect of Combination Music Therapy on Adolescent Psychological Conditions

Psychological Conditions		Level of Psychological Condition					P-Value
		Normal	Light	Keep	Severe	Very severe	
Depression	Pre-test	6	2	8	37	7	0,000
	Post-test	5	4	0	24	0	
Anxiety	Pre-test	4	2	0	2	52	0,000
	Post-test	50	2	2	0	6	
Stress	Pre-test	6	2	28	18	6	0,000
	Post-test	52	0	2	6	0	

Women with primary dysmenorrhea are susceptible to depressive disorders, which are a common form of psychotic disorders. Although dysmenorrhea is not life-threatening, it is an important factor that reduces quality of life, reduces social activities, and causes absenteeism from school or work among young women. And surprisingly, dysmenorrhea has received little scientific and clinical attention. Based on relevant research investigating the different impacts on life in women with and without dysmenorrhea, women with dysmenorrhea are prone to experiencing higher levels of depression, anxiety, somatization, negative self-perception, and hostility (Zhao et al., 2021). The results of Sukmiati's research, 2017, show that the higher the level of anxiety, the higher the severity of dysmenorrhea in adolescent girls. Dysmenorrhea also influences the occurrence of psychological disorders such as depression, anxiety and somatic disorders. Many women feel anxious when they feel menstrual discomfort during menstrual pain.

Table 3.5 shows that there is an influence of music combining natural sound and piano on the psychological condition of adolescents who experience dysmenorrhea with a p value of 0.000 ( $p < 0.05$ ). This occurs because giving music with a slow rhythm reduces the release of catecholamines into the blood vessels, so that the concentration of catecholamines in plasma becomes low. The benefits that can be felt after doing music therapy are feeling relaxed, the body is more energetic, and the mind is fresher. Music therapy provides an opportunity for the body and mind to experience complete relaxation.

In other research, classical music therapy can be used to overcome psychological conditions that are disturbed during menstruation. Anxiety can be reduced by listening to classical music. This therapy can be used as an approach to help students who are experiencing several obstacles such as physical, behavioral and psychological. And Mozart music therapy also has a positive influence on the healing process and provides a sense of comfort to clients (Rumbiak et al., 2023). Classical music can relieve anxiety because when listening to classical music, the harmonization of classical music received through the ear will pass through the inside of the ear and through the cochlear nerve to the brain, thereby providing changes in feelings (Purwaningsih et al., 2022)

3.4 Effect of Music Therapy Combination of natural sound and piano on menstrual pain

Table 3.6 Results of Analysis of the Effect of Combination Music Therapy on Dysmenorrhea in Adolescents

	Pain Level				P-Value
	No Pain	Mild Pain	Moderate Pain	Severe Pain	
Pre-test	-	1 (3,3%)	12 (40%)	17 (56,7%)	0,000
Post-test	1 (3,3%)	17 (56,7%)	12 (40%)	-	

Based on the table above, it can be seen that there is an influence of music combining natural sound and piano on menstrual pain with a p value of 0.000 ( $p < 0.05$ ). Providing music therapy can be used as an alternative to reduce the intensity of dysmenorrhea pain with an attention diversion process that influences alpha waves which act to calm and stimulate the limbic system of brain neuron tissue and does not cause side effects. According to Purwaningsih (2022) The slow rhythm of music can stimulate an increase in the hormones endorphins and oxytocin which will inhibit the release of the hormone ketolamine, thereby reducing pain.

On the other hand, providing nature sound intervention is not only beneficial for pain, but also for stress, anxiety, blood pressure and the patient's heart rate. Listening to nature sounds can provide feelings of comfort and peace, which can then reduce a person's perception of the intensity of pain. When listening to nature sounds, musical waves are transmitted from the ear to the part of the brain that handles auditory emotions resulting in the secretion of endophrins, which function to stop pain impulses (Salsabila et al., 2024)

4. Conclusion

From this study, it can be concluded that there is a significant influence of music combined with natural sound and piano on the psychological condition and menstrual pain of adolescents.

Acknowledgment

The authors would like to thank the Universitas Nahdlatul Ulama Surabaya for financial support of this experiment under Contract No: 388.98/UNUSA-LPPM/Adm-I/III/2024. We also thanks to KEPK Candle team

for issuing the ethical clearance number No.031/25/V/EC/KEP/LCBL/2024.

### Conflict of interest

I have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

### References

- Costa, J. Da, & Serlibrina W, Turwewi Maria Y, G. (2018). GAMBARAN RESPON FISIK DAN PSIKOLOGIS DISMENORE PADA REMAJA PUTRI USIA 13 -15 TAHUN DI SMPN 5 KOTA KUPANG. *CHMK MIDWIFERY SCIENTIFIC JOURNAL*, 2(3).
- Faramarzi, M., Salmalian, ; Hajar, & Salmalian, H. (2014). Association of Psychologic and Nonpsychologic Factors With Primary Dysmenorrhea. *Iran Red Crescent Med J*, 16(8), 16307. <https://doi.org/10.5812/ircmj.16307>
- Jeon, G. E., Cha, N. H., & Sok, S. R. (2014). Factors Influencing the Dysmenorrhea among Korean Adolescents in MiddleSchool. *Journal of Physical Therapy Science*, 26(9), 1337. <https://doi.org/10.1589/JPTS.26.1337>
- Lail, N. H. (2019). Hubungan Status Gizi, Usia Menarche dengan Dismenorea pada Remaja Putri Di SMK K Tahun 2017. *Jurnal Ilmiah Kebidanan Indonesia*, 9(02), 88–95. <https://doi.org/10.33221/JIKI.V9I02.225>
- Larasati, T. A., A., & Alatas, F. (2016). Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja. *Majority*, 5(3), 79–84.
- Lestari, P., & Putri, R. A. (2018). Kombinasi Self Hypnosis dan Senam Yoga Terhadap Tingkat Nyeri dan Kecemasan Saat Menstruasi. *Indonesian Journal of Midwifery (IJM)*, 1(2). <https://doi.org/10.35473/IJM.V1I2.105>
- Martini, R., Mulyati, S., & Fratidhina, Y. (2014). Pengaruh Stres Terhadap Disminore Primer Pada Mahasiswa Kebidanan Di Jakarta. *Jurnal Ilmu Dan Teknologi Kesehatan*, 1(2), 135–140.
- Meinawati, L., & Malatuzulfa2, N. I. (2021). Kompres Hangat pada Remaja Putri yang Mengalami Dismenorhea di Lingkungan Pondok Pesantren Hamalatul Qur'an Putri Pare - Kediri. *Hamalatul Qur'an : Jurnal Ilmu Ilmu Alqur'an*, 2(1), 30–35. <https://doi.org/10.37985/hq.v2i1.20>
- Petraglia, F., Bernardi, M., Lazzeri, L., Perelli, F., & Reis, F. M. (2017). Dysmenorrhea and related disorders. *F1000Research*, 6. <https://doi.org/10.12688/F1000RESEARCH.11682.1>
- Purwaningsih, N. K., Putu, D., Purnama, M., Studi, P., & Keperawatan, S. (2022). Endorphine massage dan terapi musik klasik ( mozart ) efektif menurunkan dismenore pada remaja putri Endorphine massage and classical music therapy ( mozart ) are effective in reducing dysmenorrhea in young women. *Bali Medika Jurnal*, 9(3), 267–276.
- Rahayu, E. P. (2017). Hubungan Menstruasi dan Kadar Hemoglobin dengan Motivasi Belajar pada Mahasiswi D3 Kebidanan. *Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery)*, 4(2), 115–119. <https://doi.org/10.26699/jnk.v4i2.ART.p115-119>
- Rahmawati, A. (2020). *Pengaruh Nature Sound Terhadap Kualitas Tidur*.
- Rangga, Y. B., Trishinta, S. M., & Ka'arayeno, A. J. (2021). Efektivitas Penerapan Terapi Musik Mozart (Violin Concerto) Terhadap Nyeri Haid Primer. *Nursing News : Jurnal Ilmiah Keperawatan*, 5(2), 63–74. <https://doi.org/10.33366/nn.v5i2.2283>

- Rumbiak, J. A. M. B., Hetharia, B. T., Juita, T. O., Putri, C. M. A. L., Nico, & Yudiarso, A. (2023). Pengaruh Musik Klasik Terhadap Kecemasan. *Calyptra*, 11(2), 1–8.
- Salsabila, A., Windiarti, S. E., & Arwani, A. (2024). Nature sound for pain, how effective will it be? a literature review. *Media Keperawatan Indonesia*, 7(1), 62. <https://doi.org/10.26714/mki.7.1.2024.62-70>
- Smith RP. (2022). *Dysmenorrhea in adult women: Clinical features and diagnosis*.
- Tsamara, G., Raharjo, W., & Putri, E. A. (2020). Hubungan Gaya Hidup Dengan Kejadian Dismenore Primer Pada Mahasiswi Program Studi Pendidikan Dokter Fakultas Kedokteran Universitas Tanjungpura. *Jurnal Nasional Ilmu Kesehatan (JNIK)*, 2(3), 130–140.
- Zhao, S., Wu, W., Kang, R., & Wang, X. (2021). Significant Increase in Depression in Women With Primary Dysmenorrhea: A Systematic Review and Cumulative Analysis. *Frontiers in Psychiatry*, 12(August), 1–11. <https://doi.org/10.3389/fpsy.2021.686514>