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# The Effect of Cat Stretch Exercise on Reducing Menstrual Pain in Female Students

## Effect of Cat Stretch Exercise on Reducing Dysmenorrhea in Students

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**Keyword:**
Cat stretch exercise; dysmenorrhea; endorphin; nonpharmacology; students.

**Abstract**
**Introduction:** Dysmenorrhea can reduce school productivity and quality of life in adolescent girls. Cat Stretch exercises can reduce pain but have never been taught to junior high school students at SMP Negeri 1 Gondangrejo Karanganyar. **Purpose:** The purpose of this research is to determine how giving stretch exercise paint reduces dysmenorrhoea in junior high school students. **Method:** The type of research used is quantitative with a Quasi-Experimental research design with pretest and posttest with group control. Researchers measured pain at the beginning, then provided intervention for one month and measured dysmenorrhea pain again during the next menstruation. The purposive sampling technique obtained a sample size of 50 junior high school female students, of which 25 were in the intervention group and 25 were in the control group. The data analysis technique used was the Independent T-Test. **Results:** The average pre-test intensity of menstrual pain in the intervention group was 4.04, decreasing to 2.72 during the post-test. There was a significant difference in students before and after the cat stretching intervention (p=0.000). In contrast, the control group showed an average pain intensity of 3.56 in the pre-test and almost did not decrease during the post-test, namely 3.52 with p=0.327. Testing for pain reduction in the intervention group was 1.32 while the control group was 0.04 with significant difference results (p-value 0.014). **Conclusion:** Providing cat stretch exercises can reduce dysmenorrhoea pain in female students. Therefore, young women can use stretch paint exercises to reduce dysmenorrhoea non-pharmacologically.

**Kata kunci:**
Cat stretch exercise; dysmenorrhea; endorphin; nonfarmakologi; siswa.

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**Abstrak**
**Latar Belakang:** Dismenorea dapat menurunkan produktivitas sekolah dan kualitas hidup pada remaja putri perempuan. Latihan Cat Stretch dapat menurunkan nyeri namun belum pernah diajakan pada siswa SMP di SMP Negeri 1 Gondangrejo Karanganyar. Penelitian ini bertujuan untuk mengetahui pengaruh dari pemberian cat stretch exercise terhadap pengurangan dismenorea pada siswi SMP **Metode:** Jenis penelitian yang digunakan kuantitatif dengan rancangan penelitian Quasi Eksperimen dengan pretest posttest with control gruop. Peneliti mengukur nyeri di awal kemudian diberikan intervensi selama satu bulan dan mengukur nyeri dismenore kembali saat menstruasi selanjutnya. Teknik pengambilan sampel purposive sampling, diperoleh jumlah sampel 50 responden siswiSmp, dimana 25 responden kelompok intervensi dan 25 responden kelompok kontrol. Teknik analisa data yang digunakan adalah Independent T Test **Hasil:** Rata-rata pre test intensitas dismenorea pada kelompok intervensi 4,04 menurun menjadi 2,72 saat posttest. Terdapat perbedaan bermakna pada siswa sebelum dan setelah intervensi cat stretching (p=0,000). Berbeda pada kelompok kontrol yang menunjukkan intensitas nyeri rata-rata pre test 3,56 dan hampir tidak turun saat post test yaitu 3,52 dengan p=0,327. Pengujian penurunan nyeri pada kelompok intervensi 1,32 sedangkan kelompok kontrol 0,04 dengan hasil perbedaan bermakna (p-value 0,014). **Simpulan:** Pemberian Latihan cat stretch mampu menurunkan nyeri disminorea pada siswi. Oleh karena itu, remaja putri dapat menjadikan latihan cat stretching sebagai upaya menurunkan disminorea secara nonfarmakologi secara mandiri.

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## Introduction

Primary dysmenorrhea is a cramping pain in the lower abdomen due to menstruation that lasts 1-3 days, and there are no particular complications. However, it interferes with daily activities (Stewart & Deb, 2018). It is one of the most common gynaecological symptoms among adolescents and young

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adults. The prevalence of dysmenorrhea in the world is very high, with an average of more than 50% of women in each country experiencing it. The presentation of dysmenorrhea in America is about 90%, and in Sweden, 72% (Deharnita, 2020). The prevalence of dysmenorrhea in Indonesia in women is 45-95% (Wirenvione & Riris, 2020).

Dysmenorrhea pain generally starts during puberty at the age of 12-14 years. Junior high school students in this cycle. The impact of dysmenorrhea on the school period is a decrease in school productivity, absenteeism, psychological disorders due to pain stress, social disorders and academic development problems. Adolescent girls who do not attend school during the period of dysmenorrhea range from 45% - 95%. (Wulandari et al., 2019). The results of a study on junior high school students who experienced dysmenorrhea had an impact on poor quality of life. In addition, students obtained lower average scores on physical health, psychological health, social relationships, and environmental health subscales. (Yilmaz & Sahin, 2020).

Some students practise the management of dysmenorrhea with pharmacological therapy. However, the effects of pharmacology may adversely affect the health dependence of adolescents. Strategies for various nonpharmacological interventions have gained evidence of effectively reducing dysmenorrhea pain, including the provision of warm compresses (Pangesti et al., 2017; Pangesti et al., 2017), yoga exercise massage, healthy diet management (Aboualsoltani et al., 2017). (Aboualsoltani et al., 2020), cupping (Maksum et al., 2019). However, junior high school students still have difficulty doing self-management to increase independence to do dysmenorrhea management strategies that are easy to do, such as massage (Suryantini & Ma'rifah, 2022; Suryantini & Ma'rifah, 2022), listening to al-qur'an therapy, endorphin massage (Lusiani & Stasia, 2022; Lusiani & Stasia, 2022; Nurlela et al., 2024), and cat stretching exercises (Apirda et al., 2023). These dysmenorrhea management strategies are easy and effective in overcoming dysmenorrhea pain and increasing student independence (Chen et al., 012019). The school program has collaborated with Puskesmas for adolescent reproductive health. However, the intervention in handling students who experience dysmenorrhea is only given health education, which has not been effective (Saputra et al., 2021; Saputra et al., 2021). This study focuses on nonpharmacological pain management strategies by providing cat stretching exercises with participants of junior high school students in Karanganyar, Central Java, Indonesia. The prevalence of dysmenorrhea amounted to 76.06%, higher than the world average (50%) in these junior high school students who had never been given cat stretching exercises to reduce or manage pain. Thus, the findings of this study can contribute to the independence of non-pharmacological treatments and prevention in students who experience dysmenorrhea. In addition, as an innovation in the school's reproductive health program, cat stretching exercises routinely prevent or reduce pain during menstruation. Therefore, this study aims to evaluate the effect of cat stretching exercises on reducing menstrual pain (dysmenorrhea) with participants of junior high school students in the Karanganyar district, Central Java Province, Indonesia.

## Methods

The research used a quasi-experiment study design with a pretest, nonequivalent, and a group control approach. This study was conducted on students of SMP Negeri 1 Karanganyar, Central Java Province, from June to August 2023. The research participants were adolescent girls who met the inclusion and exclusion criteria. The total population that met the research requirements was 83 people. Participants were selected using consecutive sampling techniques, with the inclusion criteria being adolescent girls at the junior high school and suffering from primary dysmenorrhea and exclusion or drop out on

participants who had pathological reproductive problems and did not complete the cat stretching exercise program as part of the research treatment. The minimum sample size was calculated using the unpaired t-test with a two-tailed t-test (Apirda et al., 2023), It was found that μ1 = 3.45 and μ2 = 5.17 with a sample size of 36, S1 = 2.14 and s2 = 1.35, with a power of 80% and Z1-α = 1.64. Twenty-two results were obtained, and 10% was added to anticipate lost follow-ups for 25 people in the experimental and control groups.

The research instruments used three sets, namely: 1) Questionnaires to obtain data on the age and age of participants, as well as diagnosing dysmenorrhea, including menstrual patterns; 2) Dysmenorrhea pain measurement tools using the Numeric Rating Scale (NRS) measuring instrument with a scale of 0-10; 3) The treatment group used the cat stretching exercise procedure adopting the SOP by Harwood (2020) with 2 stretching steps, namely doing the first stretch, which is like a dipped cat with steps: a) starting on all fours**,** hands under the shoulders and knees under the hips; b) Perform where the spine should feel supported by the spine. Do it where the spine should feel supported by the shoulder blades (i.e. not hanging or overworked and pushed up), and it is neutral); c) Lift our gaze so that the head feels like it is popping up and the sternum is sliding forward and up; and d) at the same time the pelvis tilts, so that the sit bones and tailbone are pointing up towards the ceiling. Followed by the second cat streathing exercise stretching like a curvy cat, including: a) Work back to a neutral spine with hands under shoulders, knees under hips; b) Next, do a moving gaze down the body and between your legs, imagining you are trying to look as far as possible at the wall behind you. The head can be bowed when you are at the extreme point; c) At the same time, the pelvis is tucked under, with the sit bones pointing more towards the floor; and d) finally, the spine should curve upwards towards the ceiling. This exercise is done for 10-20 minutes, occurring 3-4 times a week.

The control group used the standard SOP for providing education with the lecture method of dysmenorrhea intervention developed by Cui & Xie (2016) containing materials: a) understanding the incidence of menstruation and dysmenorrhea in adolescent girls; b) maintaining an excellent psychological condition by not being anxious about menstruation; c) adequate rest and daily activities that can be done; d) maintaining a healthy or balanced diet; and e) maintaining personal hygiene regularly by changing pads.

Three competent researchers conducted the intervention and data collection in both the experimental and control groups after the adolescent girls agreed to become participants by signing informed consent. Treatment steps: 1) starting with measuring the pain scale (pretest) using the VAS tool (0-10 scale) of each group when reporting dysmenorrhea and recorded on the observation sheet; 2) providing intervention in the experimental group by training cat stretching until proficient; 3) then Participants do cat stretching every day for one month (until the next menstruation). Meanwhile, the control group was given a standard health education treatment with the lecture method of dysmenorrhea reduction intervention developed by Cui & Xie (2016); 4) Participants were then monitored for one month for healthy living behavior activities according to educational recommendations until one month (next menstruation). Participant monitoring to minimise bias was carried out using WhatsApp group discussions to monitor activities according to the treatment of each group; 5) The last step of each group (25 people) who obediently followed the treatment SOP, no one was lost to follow-up, 25 participants were measured again (posttest) on the pain scale using the same tool, namely VAS (scale 0-10) and recorded in the observation sheet (See research flow Figure 1).

Statistical analysis used the chi-square test to test the respondent's characteristic data and determine the data distribution in the experimental and control groups. Meanwhile, numerical data

used paired sample t-tests to prove the treatment effect on reducing menstrual pain pretest and post-tests and independent sample t-test to test the treatment difference between experimental and control groups because the data distribution was normally distributed (p> 0.05). This study applies research ethics by respecting the rights of respondents, maintaining their privacy, and being fair to each group. The research has passed the ethical test from KEPK Poltekkes Kemenkes Surakarta with number Nomor: LB.02.02/9782.4/2023.

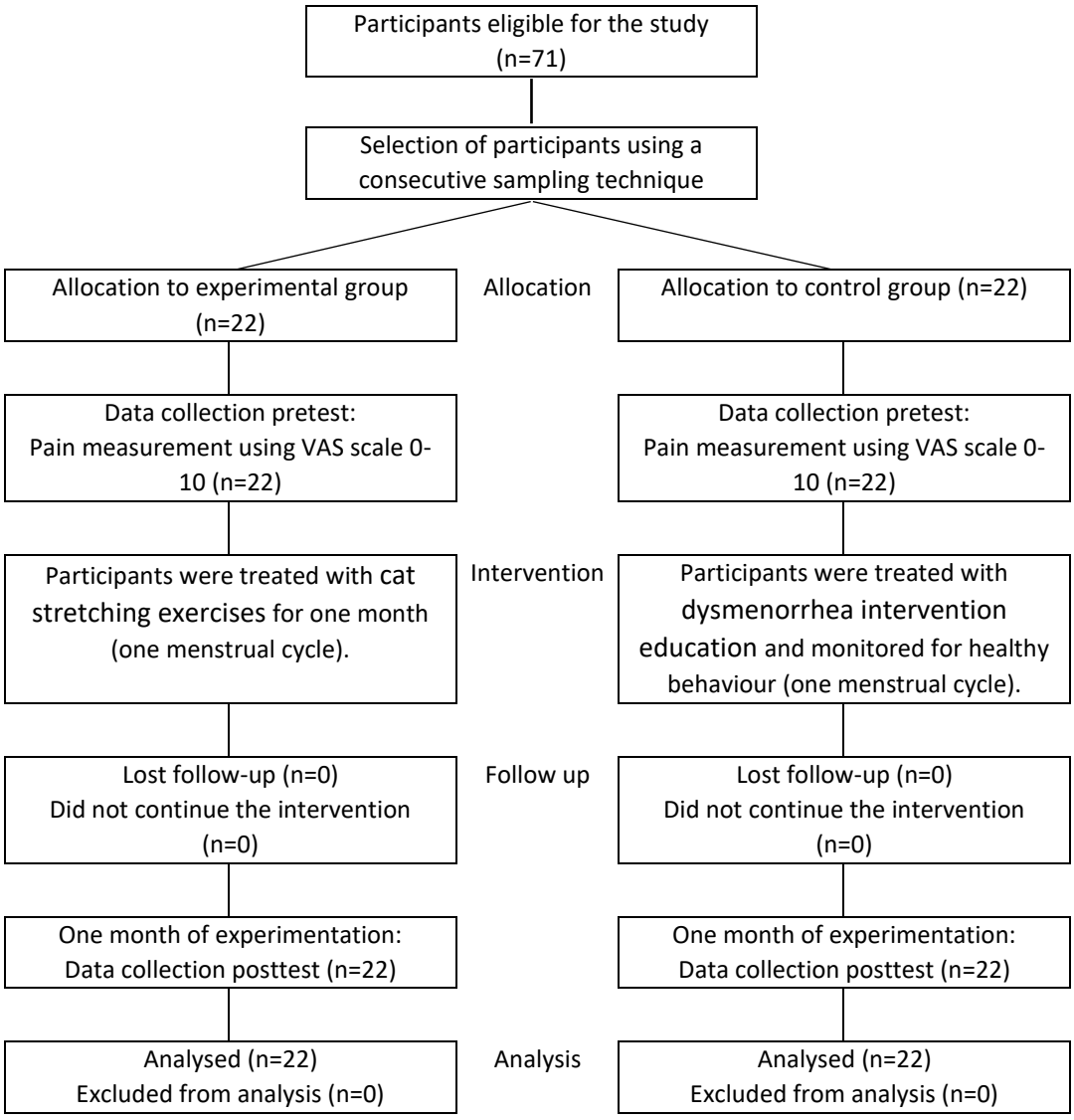


Figure 1. Flowchart of research between experimental and control groups

## Results

### Respondent Characteristics

The characteristics of the respondents showed that most respondents were at the age of 13 years in both the intervention and control groups (60%; 40%). Based on the age of menarche, most respondents were at the age of 12 years both in the intervention group and control group (40%; 56%). Based on the results of statistical tests of age characteristics and age of menarche, there were no significant differences in the two groups (p-value > 0.05), meaning that respondents in the intervention and control groups were evenly distributed so that bias could be minimised (Table 1).

**Table 1.**
Respondent characteristics

| Characteristics | Intervention (n=25) | | Control (n=25) | | P-value |
|---|---|---|---|---|---|
| | f | % | f | % | |
| Age | | | | | |
| 11 years | 0 | 0 | 1 | 4 | 0,521 |
| 12 years | 9 | 36 | 13 | 52 | |
| 13 years | 15 | 60 | 10 | 40 | |
| 14 years | 1 | 4 | 2 | 4 | |
| Age of *menarche* | | | | | |
| 10 years | 5 | 29 | 4 | 4 | 0,645 |
| 11 years | 9 | 36 | 6 | 24 | |
| 12 years | 10 | 40 | 14 | 56 | |
| 13 years | 1 | 4 | 1 | 4 | |

## Analysis Result

The findings in Table 2 show that the average pain intensity of dysmenorrhea in the intervention group during the pre-test was 4.04, then decreased during the post-test 2.72. The paired sample t-test analysis results obtained a value of p = 0.0001 where (p < 0.05), which means there is a decrease in the intensity of dysmenorrhea in junior high school students who are given cat stretch exercises. In the control group, it is known that the average intensity of dysmenorrhea pain during the pre-test was 3.56, and during the post-test, it was 3.52, so it can be said that there was almost no decrease. The paired sample t-test analysis results obtained a value of p = 0.327, where there was no decrease in the intensity of dysmenorrhea in female students who were not given cat stretch exercises.

The findings in Table 3 show an average decrease in pain intensity in the intervention group given cat stretch exercise of 1.32, which is more when compared to the control group, which has almost no decrease (p-value 0.04). The results of the analysis independent sample t-test obtained a p-value of 0.014 (α = 0.05), meaning that there is an effect of cat stretch exercise on reducing dysmenorrhea in female students.

**Table 2.**
Differences in dysmenorrhea pain intensity before and after intervention in both groups

| Treatment Group | Mean Score According to VAS | | t | P-value |
|---|---|---|---|---|
| | Mean (SD) | Mean Difference | | |
| Intervention Group | | | | |
| Pre Test | 4,04 (0,76) | | | |
| Post-test | 2,72(0,35) | 1,32 | 10,947 | 0,0001 |
| Control group | | | | |
| Pre Test | 3,56 (0,64) | | | |
| Post-test | 3,52 (1,09) | 0,04 | 1,445 | 0,327 |

**Table 3.**
Effect of cat stretch exercise on reducing dysmenorrhea in junior high school students

| Treatment Group | Mean | Mean Difference | t | P-value |
|---|---|---|---|---|
| Intervention group | 1,32 (0,31) | -0,800 | -2,545 | 0,014 |
| Control group | 0,04 (0,01) | | | |

## Discussion

This study obtained the results of a decrease in average pain from a VAS score of 4.04 to 2.72 after cat stretch exercise. The results proved a significant decrease in dysmenorrhea pain intensity with cat stretch exercise treatment (p=0.000), and the control group showed no significant (p=0.327). Further

analysis showed that decreased dysmenorrhea pain was more effective in the cat stretching group than in the control group, which was given a health education intervention (p=0.014) to female students.

Pre-test dysmenorrhea pain in the moderate level category and decreased to mild. Moderate dysmenorrhea pain can still disrupt the activities of adolescent girls in daily activities. The impacts range from absenteeism to disrupting quality of life. (Dogan, 2020). Cat stretching exercise is part of a yoga pose that emphasises the stretching process in the exercise. Muscle stretching benefits smoother blood circulation (Zanada et al., 2020; Zanada et al., 2024). Smooth blood circulation caused by stretching the abdomen increases the vasodilator response so that painful contractions during menstruation can be reduced. (Puji Lestari et al., 2023)..

This research is consistent with studies Deharnita (2020), which show that giving cat stretching exercises to female students can reduce dysmenorrhea pain from an average of 6.21 to 3.24. The cat stretching exercise technique is one of the nonmedical actions with muscle relaxation techniques that emphasise the muscles of the abdominal region so that pain can be felt after giving cat stretching exercises. By strengthening the lower abdomen, blood circulation becomes smooth. In addition, strengthening the abdomen can produce endorphin hormones and cause a sense of comfort. Research by Aprilina et al. (2020) that shows that menstrual complaints in adolescent girls can decrease compared to only being given with pain medication and traditional ointments. Supported by research (Bachtiar et al., 2019; Bachtiar et al., 2019) showed that the provision of stretching can reduce dysmenorrhea pain in adolescent girls compared to warm compresses alone. However, both can reduce dysmenorrhea pain. Using paint stretching exercises can increase blood flow in the uterine muscles, which causes a decrease in pain. Research results by (Setiawan et al., 2021). The results showed that pain before cat stretching, with an average of 3.47, could decrease to 1.20. Giving cat stretching can increase analgesic responses from within the body, such as endorphins release, which can close the pain gate control. Cat Stretch exercise effectively reduces menstrual pain (Wulandari et al., 2020). When pain is felt, someone who does cat stretch exercises five times in a row can relax the uterine muscles and increase blood flow to the uterus, preventing anaerobic metabolism that produces lactic acid. This situation results in pain impulses received by type C pain fibres becoming less adequate (Rahmasari et al., 2023), and the release of substance P is inhibited, causing the substantia gelatinosa gate (SG Gate) to close and reducing the transmission of pain information to the cerebral cortex, decreasing pain intensity (Khairunnisa et al., 2022).

Cat stretching exercises in adolescent girls have been proven effective in reducing dysmenorrhea pain. Cat stretching exercises can improve blood circulation so that circulation in the uterine muscles becomes smooth, which results in pelvic muscles turning more relaxed. This relaxation controls pain during dysmenorrhea. Cat stretching exercises are more accessible to memorise and easy to implement for adolescent girls. This intervention can contribute an alternative in the management of dysmenorrhea pain in adolescents that is proven to be effective. This study only controls participants through WhatsApp groups that have done cat stretching, so there are limitations to compliance in implementing cat stretching.

## Conclusion

This study proves that giving cat stretching exercises to female students reduces dysmenorrhea pain. Cat stretching exercises can be a recommendation in the management of dysmenorrhea in adolescent girls in the puberty phase. They are easy to do and increase independence. Midwives, as health

workers in the community, can work with high schools to intervene to prevent dysmenorrhea since early adolescence with cat stretching exercises. Efforts to increase evidence-based practice must be made by conducting research using randomised controlled trial studies to minimise bias.

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