



(REVIEW ARTICLE)



## Narrative review: The role of physical activity factors on dysmenorrhea in adolescents

Siti Komariah <sup>1,\*</sup>, Rize Budi Amalia <sup>2</sup> and Lilik Herawati <sup>3</sup>

<sup>1</sup> *Midwifery education program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.*

<sup>2</sup> *Department of Midwifery, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.*

<sup>3</sup> *Department of Physiology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.*

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### Abstract

**Background:** Dysmenorrhea is a menstrual disorder that can be experienced by some women, with complaints of cramps or pain in the lower abdomen during menstruation. Dysmenorrhea has a considerable impact on adolescent girls because it causes daily activities to be disrupted. Physical activity is one of the relaxation techniques to reduce menstrual pain.

**Research Objective:** to analyze the relationship between physical activity and dysmenorrhea in adolescents. Methods: this was a narrative review. The literature used in the last 5 years with searches obtained from Google Scholar.

**Results:** there were 8 articles that met the criteria.

**Conclusion:** There is a relationship between physical activity and dysmenorrhea. Endocrine such as endorphins, estrogen, dopamine, and other endogenous opiate peptides is the one of the underlying mechanisms of physical activity role to dysmenorrhea.

**Keywords:** Adolescent; Exercise; Dysmenorrhea; Healthy lifestyle

### 1. Introduction

Dysmenorrhea is a menstrual disorder that can be experienced by some women, with complaints of cramps or pain in the lower abdomen during menstruation. The onset of dysmenorrhea can affect physical activity for women, especially for adolescents [1]. Dysmenorrhea is caused by an imbalance of the blood hormone progesterone, prostaglandins and other factors that cause dysmenorrhea in some women [2]. Dysmenorrhea has a significant impact on adolescent girls as it disrupts daily activities [3]. If dysmenorrhea is not addressed, there are long-term effects, which can lead to polycystic ovary syndrome and endometriosis [4].

Based on data from the World Health Organization (WHO), a prevalence of 90% of women experience dysmenorrhea. The incidence of dysmenorrhea in every country in the world is reported to be more than 50%. The incidence of dysmenorrhea in the United States is 60%, the incidence of dysmenorrhea in Asia is 74.5%, while in Southeast Asia shows that dysmenorrhea is experienced by 84.2% of women. Indonesia has an average prevalence of dysmenorrhea of 45-95% which occurs in productive age. The data was taken from the results of primary dysmenorrhea as much as 54.89% and secondary dysmenorrhea as much as 9.36% [5].

\* Corresponding author: Siti Komariah

Physical activity is one of the relaxation techniques to reduce menstrual pain. When exercising, the brain and spinal cord structures release endorphins, hormones that function as natural sedatives that make a person feel comfortable. Lack of physical activity, on the other hand, can inhibit the circulation of blood and oxygen to the uterus. This inhibits the production of endorphins, which can lead to stress, increasing the incidence of dysmenorrhea [6].

## 2. Method

This research method is a narrative review by searching secondary data through google scholar. National and international journal searches were conducted by researchers in the range of 2018 to 2023. Articles obtained based on titles and abstracts were then selected based on the desired criteria, namely physical activity factors on dysmenorrhea in adolescents. The results of the literature search in the last 5 years obtained 18,130 articles on Google Scholar data. Selection of titles and abstracts obtained 13,530 articles. From this assessment, 13,523 articles were excluded. There are 8 articles for review, namely 4 national articles and 4 international articles.

## 3. Results and Discussion

**Table 1** Summary of studies

No	Researcher	Title	Method	Sampel	Result
1.	Tiyas Kusumaningr, Aria Aulia Nastiti, Lingga Curnia Dewi, and Aida lutfiani (2019)	The Correlation between Physical Activity and Primary Dysmenorrhea in Female Adolescents	Cross sectional	77 Responden	Spearman's results showed $p=0.033$ , thus stating that there is a relationship between physical activity and dysmenorrhea in adolescent girls.
2.	Ni Made Ayu Pratiwi Wedantari, Komang Trisna Sumadewi, and I Gusti Ngurah Suryantha (2023)	The Relationship between Physical Activity and Primary Dysmenorrhea Complaints in Students of the Faculty of Medicine and Health Sciences, Warmadewa University	Cross sectional	100 Responden	Chi Square results show the results of $p=0.000$ , it can be concluded that there is a significant relationship between physical activity and complaints of primary dysmenorrhea.
3.	Wahyuni and Habiibatusy Syaahidah (2021)	The Correlation Between Physical Activity Level And Pain Level In Primary Dysmenorrhea	Cross sectional	212 Students	Spearman's results show $p=0.450$ , stating that there is a relationship between physical activity and primary dysmenorrhea.
4.	Witri Dewi Mentari and Febri Nurwanti (2022)	Relationship Between Physical Activity and Diet with Dysmenorrhoea Degree on Students Of The Faculty Of Health Sciences Sebelas April University During Covid 19 Pandemic In 2022	Cross sectional	119 Students	Chi Square results show the results of $p=0.000$ , stating that there is a relationship between physical activity and the degree of dysmenorrhea.
5.	Yani Fidi Astuti, Siti Munawaroh, Dr. Sugeng Mashudi, Laily Isro'in, and Saiful Nurhidayat (2022)	Relationship between Daily Physical Activity and the Incidence of Dysmenorrhea in Adolescent Class VIII Students of SMPN 3 Ponorogo	Cross sectional	33 Responden	Fisher Exact results showed $p=0.398$ , stating that there was no relationship between physical activity and the incidence of dysmenorrhea.

6.	Yuanita Syaiful and Siti Varyal Naftalin (2018)	Abdominal Stretching Exercise Lowers Intensity	Pra-eksperimental	30 Students	Wilcoxon results with $p = 0.000$ which means there is an effect of andominal stretching exercise on dysmenorrhea intensity in adolescent girls.
7.	Ida Nuriah and Siti Kamilah (2021)	The Effect of Low Impact Aerobic Gymnastics on Reducing Dysmenorrhea Pain Intensity in Adolescent Girls at SMK Bunga Persada Cianjur	Quasi-experimental	30 Students	T test shows the results of $p = 0.000$ , stating that there is an effect of low impact aerobic exercise on reducing the intensity of dysmenorrhea pain in adolescent girls at SMK Bunga Persada Cianjur.
8.	Elia Fernández-Martínez, María Dolores Onieva-Zafra and María Laura Parra-Fernández (2019)	The Impact of Dysmenorrhea on Quality of Life among Spanish Female University Students	Cross sectional	305 Students	Patients with dysmenorrhea showed significant differences on the pain/discomfort scale and the total score for perceived quality of life.

One of the most common menstrual disorders in women is dysmenorrhea, which is characterized by lower abdominal pain during menstruation without pelvic abnormalities. This pain may originate from contractions of the uterine muscles that are innervated by the sympathetic nervous system. Prostaglandins increase in the uterine muscles during menstruation, which control the contraction of the abdominal muscles to help expel the endometrium. This occurs between 2-4 days before the onset of menstruation [7]. Perceived dysmenorrhea in women, is considered the most inhibiting factor in decreased sociability, leading to school absenteeism and, consequently, poor academic achievement [8].

One of the factors of dysmenorrhea is the age of menarche. Menarche that is too early can cause dysmenorrhea. The longer the menstruation, the more frequent the contractions that occur in the uterus that cause an increase in prostaglandin so that pain occurs. Menarche can also occur due to FSH and LH, which can stimulate ovarian cells. Another factor that plays a role in dysmenorrhea is nutritional status. Inadequate nutritional status will interfere with the development of reproductive system functions, causing disturbances in the system. Meanwhile, excessive nutritional status can accelerate the accumulation of fat tissue, which results in hyperplasia of the blood vessels of the reproductive organs. Thus, menstrual blood that should flow smoothly will be obstructed, causing dysmenorrhea [5].

The most dominant factor that causes dysmenorrhea is physical activity. Someone with low physical activity has an 8.8 times greater risk of experiencing dysmenorrhea than someone who does moderate or heavy physical activity [9]. Physical activity can increase the release of several neurotransmitters, such as natural endorphins, estrogen, dopamine and endogenous opiate peptides. In addition, physical activity can change the way hormones are secreted, suppressing prostaglandins from being released and increasing the estrone-estradiol ratio. This reduces endometrial development and diverts blood flow out of the uterus [7].

The physical activity in question is physical activity done in specific amounts and with a purpose such as exercise. It can lower stress, reduce menstrual symptoms as it increases local metabolism. In addition, exercise also improves cardiovascular status, increases bone mineral content, and reduces dysmenorrhea and symptoms of premenstrual syndrome. It also helps reduce pain, relieve stress and improve mood and health. Therefore, daily physical activity alone is not enough to reduce dysmenorrhea [10]. Exercise can be one of the interventions to reduce the risk of dysmenorrhea because exercise can increase blood flow to the pelvis and increase the production of endorphins, which function as non-specific analgesics. Regular exercise can improve the vascular system, which means it can reduce pain complaints and improve physical fitness [11].

One way to reduce the intensity of dysmenorrhea is by doing abdominal stretching exercise by stretching the muscles in the abdomen. When someone performs abdominal stretching exercise techniques, the brain will produce endorphins. When peripheral pain neurons send signals to the synapse, synapses occur between peripheral pain neurons and neurons that go to the brain where substance P should conduct impulses. Endorphin will block the release of substance

P from sensory neurons, so that the transmission of pain impulses in the spinal cord becomes inhibited, so that dysmenorrhea will be reduced. Abdominal stretching can be done 3 days before menstruation every morning or evening, with a frequency of 3 times a week for 30 minutes. The results can show that the intensity of pain in dysmenorrhea sufferers is reduced. [1].

In addition, low impact aerobic exercise can also increase the secretion of beta-endorphins and maximize the delivery of oxygen to all organs so that organ function works better. Aerobic exercise also makes blood vessels smooth so that it can reduce pain during menstruation [12].

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#### 4. Conclusion

The results of research in 8 previous articles prove that there is a relationship between physical activity and dysmenorrhea, physical activity in question is like exercise. Physical activity can increase blood flow to the pelvis and increase endorphin production so that it can reduce dysmenorrhea and symptoms of premenstrual syndrome.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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