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# External Factors that Cause Dysmenorrhea in Adolescent Girls: Literature Review

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**Abstract**

**Background:** Puberty is important for physical and reproductive changes. Menstruation in adolescent girls is a focus, with dysmenorrhea (painful menstruation) a serious issue. WHO notes the high prevalence of dysmenorrhea in Indonesia, especially in adolescent girls. The government has responded through adolescent reproductive health programs and the regulated role of midwives. External factors such as stress, nutritional status, and fast-food consumption play an important role in dysmenorrhea in adolescents. Further understanding of these factors is necessary for a holistic solution.

**Objective:** The aim of this study is to analyze research results related to external factors that cause dysmenorrhea in adolescent girls.

**Method:** This research uses a literature review method by examining several related studies. Article sources come from ScienceDirect, PubMed, and Google Scholar, with keywords including risk factors for dysmenorrhea, stress levels, nutritional status, fast food consumption, and risk factors for dysmenorrhea.

**Results:** From the search results, 8 national journals and 2 international journals were selected that were relevant to external factors causing dysmenorrhea in adolescent girls. All journals used were published in the last 5 years (2019–2021) and can be in Indonesian or English. Based on the results of a review of 3 international articles and 7 national articles, it was concluded that there are three external factors that contribute to the incidence of dysmenorrhea in adolescent girls, namely stress levels, nutritional status, and consumption of fast food.

**Conclusion:** Based on a review of 10 articles, dysmenorrhea in adolescent girls is influenced by external factors such as stress levels, nutritional status, and consumption of fast food. Prevention can be done by maintaining a healthy diet, exercising regularly, and avoiding stressful situations.

**Keywords:** Dysmenorrhea; External Factors; Teenager

## INTRODUCTION

According to Yatri Hilinti, 2023 (1) The period of sexual maturity or puberty is the period when a person begins to experience physical, hormonal and sexual changes and begins carrying out reproductive activities. For women, the most important event during puberty is menstruation. Meanwhile, according to Dewi (2) Menstruation is a natural process that occurs in women. Menstrual bleeding is common in women and occurs when the uterus is empty. A normal menstrual cycle lasts 22 to 35 days and lasts 2 to 7 days. Optimal menarche occurs between the ages of 12 - 14 years, and if it occurs before the age of 12 years it can be said to be early menarche (3).

Based on data from the World Health Organization (WHO), figures in 2017 show the incidence of dysmenorrhea in 1,769,425 (90%) of women suffering from dysmenorrhea, and 10-16% of women suffering from severe dysmenorrhea. Based on 2020 census figures, there are 67 teenagers (10-24 years) in each Indonesian population group. The prevalence of dysmenorrhea pain in Indonesian teenagers is 55% (4) . In Indonesia, health policy is managed by the government. Adolescents, especially those related to reproductive health, as regulated in Law Number 36 of 2009, Article 71 Paragraph 3, that reproductive health is carried out with promotive, preventive, curative and rehabilitative activities known as PKPR (Youth Care Health Services Program) (5) . BKKBN has created a program called PIK-R (Youth Information and Consultation Center) to promote adolescent reproductive health. PIK-R is adapted to certain regions or development institutions such as PIK-R schools, PIK-R mosques. PIK-R's main activity is the provision of health services related to adolescent reproductive health, sexually transmitted infections, HIV/AIDS, and drug risks (6).

The authority of midwives in the Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2017 concerning Licensing and Organizing Clinical Practices for Midwives Article 18, includes reproductive health in sections 18 and 24 that in providing women's reproductive health services, health workers, especially midwives, have the authority to provide reproductive health counseling and counseling. female (7) . Midwives play an important role in helping overcome dysmenorrhea by providing antenatal reproductive health services to adolescents, including improving their reproductive well-being, strengthening reproductive counseling, and strengthening support for active adolescent activities (8) . Midwives are directly involved in providing outreach to schools and other youth groups. Minister of Health Regulation No. 21 of 2021 (9) . Midwives can actively promote health to teenagers directly through youth posyandu activities, focusing on the topic of menstruation and menstrual disorders, including dysmenorrhoea (8).

According to Nugroho quoted from Fitria and Haqqattiba'ah, 2020 (10) In the process of stomach cramps during menstruation or dysmenorrhea, from the proliferation phase to the secretion phase, prostaglandin levels in the endometrium increase excessively, causing myometrial contractions and ischemia which is followed by prostaglandins, so that the levels progesterone decreases at the end of the luteal phase. This causes pain in the uterine muscles before, during and after menstruation.

According to research by Ida Kusumawati, 2020 (11) Dysmenorrhea can arise due to stress levels, exercise habits and influence nutritional status and eating patterns by frequently consuming fast food. According to research by Rita and Sari, 2021 (12) Stress can increase the possibility of teenagers experiencing primary dysmenorrhea because the hormones prostaglandin and estrogen are produced more during stress, thus causing excessive uterine contractions and the emergence of dysmenorrhea. According to research by Retno and Amalia, 2023 (13) nutritional status is a risk factor for dysmenorrhea. Poor or limited nutritional status increases the risk of dysmenorrhea because it can interfere with reproductive function. In the luteal phase, nutritional requirements increase, and negligence in fulfilling them can cause discomfort during menstruation. Women who are overweight are also at risk of experiencing primary dysmenorrhea due to excessive fat accumulation. According to research by Ida Kusumawati, 2020 (11) Fast food often has unbalanced nutrition, with high calorie, fat and sugar content, while low fiber. Fatty acids in fast food can affect the way the body processes progesterone during the luteal phase of menstruation. As a result, prostaglandin levels increase, which can then cause pain during dysmenorrhea.

Dysmenorrhea has a significant negative impact on various aspects of a person's quality of life, involving physical, social, psychological and emotional disorders. Over time, the accumulated impact of these ongoing challenges can hinder the achievement of a variety of individual goals, including achievement in education or career, interactions in social relationships, and family formation. These impacts include women's mental and physical well-being, with ongoing disruption potentially affecting quality of life, personal relationships, and educational and career attainment. Additionally, if dysmenorrhea is not treated properly, it can result in hyperalgesia, which predisposes to chronic pelvic pain (14).

Dysmenorrhea or stomach cramps during menstruation can be relieved pharmacologically and non-pharmacologically with non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, naproxen, diclofenac, hydrocodone and paracetamol. However, this drug is addictive and has contraindications, including hypersensitivity, peptic ulcer disease, gastrointestinal bleeding or perforation, and increased risk of bleeding. Meanwhile, non-drug

treatment can be done through relaxation, exercise, warm compresses, gymnastics, as well as administering tamarind decoction, turmeric, ginger and other herbal medicines (15) .

Dysmenorrhea in adolescent girls is influenced by various factors such as lifestyle, psychological factors, and daily eating habits. Several studies show that young women who are exposed to stress, have abnormal nutritional status and frequently consume fast food are more likely to experience dysmenorrhea. However, information regarding dysmenorrhea in Indonesia is still limited, so further research is needed to determine the factors that influence the occurrence of dysmenorrhea in adolescent girls in Indonesia. Mivanda, Follona and Aticeh, 2023 (6) . This research focuses on the relationship between external factors, namely stress levels, nutritional status and fast-food consumption habits with the incidence of dysmenorrhea, as well as providing a deeper understanding of the background of stress levels, nutritional status and fast-food eating habits which contribute to the occurrence of dysmenorrhea in teenage girl.

## METHOD

The method used in this research is the literature review method where researchers critically examine the ideas contained in several studies. Sources of research articles obtained through the ScienceDirect, PubMed, and Google Scholar search databases. In searching journals using keywords, namely risk factors for dysmenorrhea, stress levels and dysmenorrhea, nutritional status and dysmenorrhea, consumption of fast food and dysmenorrhea and risk factors for dysmenorrhea. From the results of article searches via Google Scholar, PubMedt. After that, articles based on the topics discussed were found in 8 national journals and 2 international journals which were included in the author's search criteria relating to external factors that cause dysmenorrhea in young women. The journal publication year used was published within the last 5 years (2019–202), with journals in Indonesian and English.

## RESULTS

Based on the results of a literature review, there are external factors that can cause dysmenorrhea in adolescent girls. External factors that can cause dysmenorrhea are: stress level, nutritional status and consuming fast food.

**Table 1.** Research Results of Selected Articles

| No | Researcher (Year) | Country | Title | Types of research | Research result |
|---|---|---|---|---|---|
| 1. | Rohmawati and Wulandari (2019) | Indonesia | Factors Associated with Primary Dysmenorrhea Pain in Female Students at SMA Negeri 15 Semarang | Cross Sectional | There is a relationship between menarche and primary dysmenorrhea with a p value <0.001, there is a relationship between exercise habits and dysmenorrhea with a p value <0.001, there is a relationship between stress and dysmenorrhea with a p value <0.001. |
| 2. | Hayati, Agustin and Maidartati (2020) | Indonesia | Factors Associated with Dysmenorrhea in Adolescents at Banjaran Bandung Youth High School | Cross Sectional | There is a relationship between nutritional status and the incidence of primary dysmenorrhea with a p-value of 0.01. So it was concluded that factors related to the incidence of primary dysmenorrhea include nutritional status, family history and exercise habits. |
| 3. | Official (2020) | Indonesia | Physical Activity, Magnesium, Nutritional Status, and Allergy History as Determinant Factors for Dysmenorrhea | Cross Sectional | There is a significant relationship between physical activity, nutritional status, micronutrient intake (magnesium), and history of allergies and dysmenorrhea (p<0.05) |
| 4. | Ida Kusumawati (2020) | Indonesia | Consumption of Fast Food as a | Cross Sectional | There is a relationship between exercise habits and the |

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| | | | Dominant Factor in the Occurrence of Dysmenorrhea in Adolescents | | incidence of dysmenorrhea with p= 0.168 ≤ α (0.05), there is a relationship between stress levels and the incidence of dysmenorrhea with p= 0.070 ≤ α (0.05), there is a relationship between fast food consumption and incidence of dysmenorrhea with p= 0.001 ≤ α (0.05). The final result obtained that is most related to the incidence of dysmenorrhea is the consumption of fast food. |
| 5. | Hu et al (2020) | China | Prevalence and Risk Factors Associated with Primary Dysmenorrhea among Chinese Female University Students: A Cross-sectional Study | Cross Sectional | The research results found that the prevalence of primary dysmenorrhea in Chinese female students reached 41.7% of the total respondents (1921/4606). Multivariate binary logistic regression analysis identified several risk factors for primary dysmenorrhea, including: being a minority (OR 1.335; 95% CI 1.083-1.646), being underweight (OR 1.249; 95% CI 1.08-1.42), annual household income under 80,000 CNY (OR 1.169; 95% CI 1.018-1.342), history of maternal dysmenorrhea (OR 2.553; 95% CI 2.236-2.915), age at menarche under 12 years (OR 1.161; 95% CI 1.013-1.329), irregular menstrual cycles (OR 1.216; 95% CI 1.063-1.391), and the habit of skipping breakfast (OR 1.294; 95% CI 1.124-1.490). In conclusion, the prevalence of primary dysmenorrhea is high among Chinese female students, and identification of risk factors is important for further guidance in the management of this health problem. |
| 6. | Tang et al (2020) | China | Is body mass index associated with the incidence of endometriosis and the severity of dysmenorrhoea: A case-control study in China? | Case Control | The results of the study found that although there was no overall difference in BMI between endometriosis patients and controls, obese women had a higher risk of developing endometriosis (OR 1.979, p=0.0185) and severe dysmenorrhoea (OR 3.64, p=0.025) compared with normal body weight. Additional factors may influence the results. |
| 7. | Resty Hermawahyuni, Handayani and Alnur | Indonesia | Risk Factors for Primary | Cross Sectional | There is a significant relationship between age at |

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| | (2022) | | Dysmenorrhea in Female Students at SMK PGRI 1 East Jakarta | | menarche (p value = 0.002), family history (p value = 0.001) and fast food habits (p value = 0.000). |
| 8. | Oktaviani and Istianah (2022) | Indonesia | Nutritional Status, Menstrual Cycle and Stress with Primary Dysmenorrhea | Cross Sectional | There is a significant relationship between nutritional status and primary dysmenorrhea. The results of the Chi-square statistical test obtained p-value = 0.00. So it can be concluded that there is a significant relationship between nutritional status and the incidence of primary dysmenorrhea in class XI female students at Suluh High School, South Jakarta (p=<0.05). |
| 9. | Hernanto, Polim and Vetinly (2022) | Indonesia | Does Lifestyle Affect Dysmenorrhea Intensity? A Cross-Sectional Study | Cross Sectional | There is a significant relationship between fast food consumption and dysmenorrhea intensity with p = 0.017. |
| 10. | Lee and Kim (2024) | South Korea | Direct and Indirect Effects of Stress and Self-Esteem on Primary Dysmenorrhea in Korean Adolescent Girls: A Cross- Sectional Survey Study | Cross Sectional | Stress, depression, and anxiety were positively associated with menstrual pain and symptoms (all P<0.001) in female adolescents (n=519). |

## DISCUSSION

### External Factors

### Stress Level

Adolescence is considered a period of emotional instability. although teenagers may quickly feel happy, they may also quickly feel sad. Teenagers, especially those aged 12 to 15 years, are more susceptible to experiencing severe stress. Adolescent girls may be more susceptible to experiencing depressive moods than adolescent boys. Several studies show that mood changes in teenagers are caused by environmental and hormonal factors. The speed at which physical development influences emotions during adolescence is critical (6) .

Stressful events experienced by young women may be related to the occurrence of dysmenorrhea. In young women who experience stress, the sensory nerves that cause stress are transmitted to the limbic system, or neurotransmitters, which then transmit these impulses to the endocrine glands that regulate the immune system and related organs. This stimulation increases the production of the hormone adrenaline which enters the bloodstream and causes heart palpitations, high blood pressure, increased stomach acid, and loss of emotional control (25) .

According to Rejeki S quoted by Mivanda, Follona and Aticeh, 2023 (6) Disorders of the endocrine system also cause menstrual irregularities and dysmenorrhea. When teenage girls experience stress, their bodies produce too many hormones: adrenaline, estrogen, progesterone and prostaglandins. Increased estrogen levels increase uterine contractions. In addition, an increase in the hormone adrenaline makes the uterine muscles tense, causing excessive uterine contractions during menstruation, causing menstrual pain. Likewise, excess prostaglandin hormones cause uterine muscle contractions, resulting in uterine arteriole vasospasm and ischemia, thereby causing pain.

This is in line with research by Rohmawati and Wulandari, 2019 (16) There is a significant relationship between stress and primary dysmenorrhea in class X female students at SMAN 15 Semarang. With the results of the Chi-square test statistical test, the ρ-value <0.001 (ρ-value <0.05) was obtained. According to researchers quoted from previous research, when a person is stressed, a neuroendocrine response occurs, and CRH stimulates the secretion of ACTH, which increases the secretion of the adrenal cortex. These hormones inhibit the secretion of FSH

and LH, thereby interfering with the synthesis and release of progesterone. Low progesterone levels increase prostaglandin synthesis, which increases PGF2α activation and causes dysmenorrhea ( 16 ).

There is other research that also confirms the relationship between stress levels and the incidence of dysmenorrhea, namely research conducted on adolescent girls aged 15-18 years in metropolitan areas in South Korea in 2021 Lee and Kim, 2024 (24) Stress, depression and anxiety are positively related with menstrual pain and symptoms (all P<0.001) in female adolescents (n=519). According to researchers, levels of self-esteem, stress, depression and anxiety can influence the experience of dysmenorrhea in adolescents. Stress itself can make menstrual symptoms worse, and this can have an indirect impact through feelings of depression and anxiety regarding menstrual pain and symptoms.

**Nutritional Status**

According to Trimayasari and Kuswandi quoted by Hayati, Agustin and Maidartati, 2020 (17) Human health is greatly influenced by nutritional status, including its effect on the function of the body's organs, especially the reproductive system. It is important for adolescent girls to maintain adequate nutrition through a balanced diet. Adequate food intake plays a role in the regulation of hormones such as FSH (follicle-stimulating hormone), LH (luteinizing hormone), estrogen and progesterone, which have an important role in the menstrual cycle. FSH, LH, and estrogen work together to regulate the menstrual cycle, while progesterone works on the uterus to reduce contractions during menstruation.

According to Abbas et al quoted by Hayati, Agustin and Maidartati, 2020 (17) nutritional status is evaluated through the Body Mass Index (BMI), which is obtained by dividing a person's weight by their height in meters squared. Underweight and overweight conditions in the BMI category can have an impact on adolescent reproductive function. Adolescent girls with an underweight BMI category tend to have a higher prevalence of dysmenorrhea (17).

According to Green et al quoted by Ahliati, 2020 (18) An increase in Body Mass Index (BMI) is related to an increase in the production of the hormone estrogen, which occurs through the conversion of androgen hormones to estrogen in fat tissue. According to dysmenorrhea pathology, increased estrogen levels can be the cause of pain during menstruation. In addition, excess fat tissue in the body can cause the formation of more blood vessels in the female reproductive organs, disrupting blood flow during the menstrual process and producing the discomfort of dysmenorrhea. On the other hand, weight loss was significantly correlated with an increase in the prevalence of menstrual irregularities and menstrual pain. Lack of nutritional status causes a lack of nutritional stores, and this condition can result in physical weakness so that resistance to pain can decrease (18) .

This is in line with research by Oktaviani and Istianah, 2022 (22) where the results of the Chi-square statistical test obtained a p-value = 0.00. So it can be concluded that there is a significant relationship between nutritional status and the incidence of primary dysmenorrhea in class XI female students at Suluh High School, South Jakarta (p=<0.05). There is other research that also strengthens the relationship between nutritional status and the incidence of dysmenorrhea, namely research conducted on all teenagers in Chinese cities with respondents as many as 4606 female students. Hu et al., 2020 (19) The results of the c2 test show a statistically significant difference in distribution of age, ethnicity, Body Mass Index (BMI), annual household attendance, maternal history of dysmenorrhea, age at menarche, and cycle regularity between those with and without Dysmenorrhea (PD) (all P < 0.05). The results showed that female students who were underweight were associated with an increased risk of dysmenorrhea compared with those who had a normal BMI.

**Fast Food**

Most teenage girls have a tendency to rarely consume vegetables and prefer fast food, this is influenced by the lifestyle they follow (6) . The incidence of dysmenorrhea can be influenced by a person's diet, especially if they adopt an unhealthy diet, such as frequently consuming fast food. Fast food is defined as a type of food that is easy to serve, packaged conveniently, and can be prepared in a simple way. Despite being easily accessible, fast food tends to be high in fat, salt, sugar, and calories, while being low in nutrients, vitamins, minerals, and fiber (26) .

High fat content, excess calories, and nutritional imbalances are found in fast food. Fatty acids present in fast food can interfere with progesterone metabolism during the luteal phase of menstruation, causing an increase in prostaglandins that contribute to menstrual pain or dysmenorrhea (27) .

According to Setyanarayana quoted by Aulya, Kundaryanti and Rena, 2021 (28) the risk of menstrual pain can be increased by consuming fast food due to the high content of saturated fatty acids and omega-6 unsaturated fatty acids, low levels of omega-3 fatty acids, as well as increased levels of sodium. Omega-6 fatty acids are thought to trigger the release of prostaglandins, hormones linked to dysmenorrhea. Fast food is characterized by high levels of saturated and omega-6 fatty acids, low levels of omega-3 fatty acids, excess salt, and excessive sugar levels. Intake of n-6 fatty acids in the diet is thought to trigger the release of prostaglandins which can cause dysmenorrhea. Apart from that, fast food also contains trans fatty acids, which can be a source of free radicals. The impact of free radicals

includes damage to cell membranes, so excessive consumption of fast food can increase prostaglandin levels in the body and potentially cause dysmenorrhea.

This is in line with research by Ida Kusumawati, 2020 (11). The results of the Chi Square (Continuity Correction) test showed that the p-value was 0.001. Because the p-value < α (0.05), it is concluded that there is a significant relationship between fast food consumption and the incidence of dysmenorrhea in adolescents at MTs Assalafi Susukan. According to researchers, fast food has a higher content of trans fatty acids, which are a type of free radical. The result of exposure to free radicals is damage to cell membranes.

There is other research that also confirms the relationship between consuming fast food and the incidence of dysmenorrhea, namely research involving at least 196 FKIK Atma Jaya students class 2017-2019 Hernanto, Polim and Vetinly, 2022 (23) . The results of this study show that there is a significant relationship between fast food consumption and the intensity of dysmenorrhea with p = 0.017. According to this research, the significant relationship between the level of fast-food consumption and the severity of dysmenorrhea, as found in this study, is thought to be caused by the high content of saturated fatty acids in fast food. These fatty acids are believed to influence progesterone metabolism during the menstrual cycle, which in turn increases prostaglandin production. Phospholipids, as one of the cell membrane elements, have an important role in prostaglandin synthesis. Prostaglandins help regulate uterine contractions and shedding of the endometrial lining during menstruation. Increased prostaglandin concentrations commonly occur in women who experience painful menstruation or dysmenorrhea (23) .

## CONCLUSION

From the results of the literature review obtained from 10 articles, it can be concluded that there are external factors that cause dysmenorrhea. The external factors are stress levels, nutritional status, and fast food. Efforts to prevent dysmenorrhea can be done by eating healthy foods, exercising regularly, and avoiding situations that cause stress.

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