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Gambaran Kejadian Dismenore dengan Aktivitas Fisik, Konsumsi Fast Food, dan Paparan Asap Rokok Pada Mahasiswi Jakarta

Description of Incidence Dysmenorrhea in Relation to Physical Activity, Fast Food, and Tobacco Smoke Exposure Among Jakarta Female Students

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Abstract

Dysmenorrhea is pain experienced during menstruation and can interfere with daily activities. A person's lifestyle such as physical activity and the habit of consuming fast food are factors that can affect the occurrence of dysmenorrhea. This study aims to determine the incidence of dysmenorrhea with physical activity, fast food consumption, and family smoking status in Public Health Students of UIN Jakarta. This study is a cross-sectional descriptive study with a sample of 212 female students. The prevalence of dysmenorrhea among Public Health students of UIN Syarif Hidayatullah Jakarta was 189 respondents (89.2%) out of 212 respondents. The level of dysmenorrhea suffered by many respondents was mild dysmenorrhea as many as 127 (59.9%). College students have a poor frequency of physical activity as many as 151 respondents (71.2%). College students have a habit of eating fast food as many as 203 respondents (95.8%). There were 104 family members who smoked (49.1%). Students who experience dysmenorrhea by consuming fast food were 181 respondents (89.2%), students who experience dysmenorrhea with poor physical activity were 134 respondents (88.7%) and students who experience dysmenorrhea with exposure to family members who smoke were 95 respondents (91.3%). Suggestions for female students to reduce the incidence of dysmenorrhea are, avoid fast food, increase real food consumption, exercise regularly to reduce menstrual pain and avoid cigarette smoke from various sources. Suggestions

for further researchers to further explore other factors that can affect the incidence of dysmenorrhea.

Keywords: *Dysmenorrhea, Physical Activity, Fast Food*

Abstrak

Dismenore adalah nyeri yang dirasakan selama menstruasi dan dapat mengganggu aktivitas sehari-hari. Gaya hidup seseorang, seperti aktivitas fisik dan kebiasaan mengonsumsi makanan cepat saji, merupakan faktor yang dapat mempengaruhi terjadinya Dismenore. Penelitian ini bertujuan untuk mengetahui gambaran kejadian dismenore dengan aktivitas fisik, konsumsi fast food, dan status merokok keluarga pada Mahasiswi Kesehatan Masyarakat UIN Jakarta. Penelitian ini merupakan studi deskriptif potong lintang dengan sampel 212 mahasiswa perempuan. Prevalensi Dismenore di kalangan mahasiswa Program Studi Kesehatan Masyarakat UIN Syarif Hidayatullah Jakarta adalah 189 responden (89,2%) dari 212 responden. Tingkat Dismenore yang dialami oleh banyak responden adalah dismenore ringan sebanyak 127 (59,9%). Mahasiswa memiliki frekuensi aktivitas fisik yang rendah sebanyak 151 responden (71,2%). Mahasiswa memiliki kebiasaan mengonsumsi makanan cepat saji sebanyak 203 responden (95,8%). Ada 104 anggota keluarga yang merokok (49,1%). Mahasiswa yang mengalami Dismenore akibat mengonsumsi makanan cepat saji sebanyak 181 responden (89,2%), mahasiswa yang mengalami dismenore akibat kurangnya aktivitas fisik sebanyak 134 responden (88,7%), dan mahasiswa yang mengalami Dismenore akibat terpapar asap rokok dari anggota keluarga sebanyak 95 responden (91,3%). Saran untuk mahasiswa perempuan untuk mengurangi insiden Dismenore adalah, hindari makanan cepat saji, tingkatkan konsumsi makanan sehat, berolahraga secara teratur untuk mengurangi nyeri menstruasi, dan hindari asap rokok dari berbagai sumber. Saran untuk peneliti selanjutnya untuk lebih menggali faktor-faktor lain yang dapat mempengaruhi kejadian Dismenore.

Kata kunci: Dismenore, Aktivitas Fisik, Fast Food

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Introduction

Dysmenorrhea is a common condition experienced by women during menstruation, characterized by pain or cramps in the lower abdomen, often accompanied by other symptoms such as sweating, headaches, diarrhea, and vomiting (1). Although generally non-pathological, dysmenorrhea can lead to a lack of productivity in daily activities (2). The prevalence of menstrual pain among adolescents and young adults ranges between 20% and 90%. The prevalence of dysmenorrhea among adolescents was recorded at 66.9% (89 respondents) (3). Similarly, it was reported that 63 respondents experienced

dysmenorrhea (65.1%) (4).

Several factors can trigger dysmenorrhea, including lifestyle, age of menarche, BMI, exposure to cigarette smoke, and physical activity. Regular physical activity reduces the likelihood of dysmenorrhea by increasing endorphin secretion. Regular physical activity reduces the likelihood of dysmenorrhea by increasing endorphin secretion. In contrast, a lack of physical activity reduces blood circulation, which impairs oxygen flow to the uterus and results in menstrual pain (5). Dysmenorrhea was significantly higher among individuals with poor physical activity 22 respondents (68.8%) (6). Similarly, 53.8% of respondents with low physical activity experienced dysmenorrhea, with the majority being those who did not engage in any exercise 32 respondents (56.1%) (7). Female students often avoid physical activities, including exercise, due to academic responsibilities (8).

The consumption of fast food, which is high in saturated and omega-6 fats, low in omega-3 fats, and high in sodium, is another trigger for dysmenorrhea. Additionally, trans fats, as free radicals, can damage cell membranes, disrupting prostaglandin synthesis. 65.7% of female students who frequently consumed fast food experienced dysmenorrhea (9). Similarly, identified a relationship between fast food consumption and dysmenorrhea, with 121 female students affected (68.7%) (10) also highlighted a connection between fast food consumption and dysmenorrhea among adolescent girls, with 27 respondents affected (42.9%) (4). Additionally, food delivery apps have made fast food more accessible, increasing consumption among students (11). The convenience and taste of fast-food appeal to students with busy schedules.

Exposure to cigarette smoke also influences dysmenorrhea. Constant exposure to second-hand smoke from family members who smoke increases the risk of passive smoking. In Indonesia, most households have at least one smoker (12). Women, as a vulnerable group, constitute the majority of those exposed to environmental cigarette smoke. A single cigarette contains approximately 4,000 chemical compounds, with nicotine, tar, and carbon monoxide being the primary components. Nicotine reduces blood flow to the endometrium, a factor contributing to dysmenorrhea (13). 87.1% of female students exposed to cigarette smoke from family members experienced dysmenorrhea (13). Similarly, 73 respondents (88%) exposed to cigarette smoke suffered from dysmenorrhea (14). Combined with second-hand smoke exposure from family members, these factors make female students more susceptible to dysmenorrhea. Students tend to have an unhealthy lifestyle, such as lack of exercise, high consumption of fast food, and exposure to cigarette smoke from the home or boarding house environment, all of which are risk factors for dysmenorrhea.

Although dysmenorrhea is generally non-pathological, it can lead to a lack of productivity in daily activities (2). The recurring nature of dysmenorrhea can negatively affect female students, interfering with academic activities such as class attendance due to their inability to endure the pain, making it difficult to perform daily tasks. This condition frequently leads to absenteeism from school, work, or other activities, particularly among adolescents and young adults (15). Dysmenorrhea can interfere with

learning activities, causing lecture absenteeism, decreased concentration, and inability to participate in academic activities optimally. In addition, many female students ignore the symptoms of dysmenorrhea, even though this condition can be an early indicator of more serious disorders such as endometriosis (11).

Based on these observations, female students belong to the age group of late adolescents and young adults who have a high prevalence of dysmenorrhea with incidence rates reaching 65% to almost 90%. Dysmenorrhea can interfere with learning activities, causing lecture absenteeism, decreased concentration, and inability to participate in academic activities optimally. Students tend to have an unhealthy lifestyle, such as lack of exercise, high consumption of fast food, and exposure to cigarette smoke from the home or boarding house environment, all of which are risk factors for dysmenorrhea. In addition, many female students ignore the symptoms of dysmenorrhea, even though this condition can be an early indicator of more serious disorders such as endometriosis. Therefore, this study seeks to describe the incidence of dysmenorrhea in relation to physical activity, exposure to cigarette smoke, and fast-food consumption among female students at UIN Jakarta.

Methods

This study employs a descriptive quantitative research type with a cross-sectional study design. The descriptive quantitative approach is useful for describing phenomena that occur in populations or samples systematically, as well as providing a clearer understanding of the relationship between the variables studied. The study population consists of all female students enrolled in the Public Health Study Program, Faculty of Health Sciences, UIN Syarif Hidayatullah Jakarta, from the 2017–2020, totaling 337 students. The sample size was determined using the two-proportion hypothesis testing formula, resulting in a total of 212 female students. The sampling method uses purposive sampling. Purposive sampling is a type of non-probability sampling that is characterized by considering inclusion and exclusion criteria in selecting samples from a population.

Inclusion Criteria is participants who agreed to take part in the study, were active students in the Public Health Study Program at UIN Syarif Hidayatullah Jakarta, were at least 18 years old, and had experienced menstruation. Exclusion criteria are participants with pelvic disorders or diseases, a history of abdominal injury, or abnormal bleeding outside the menstrual cycle. The study includes independent and dependent variables.

The independent variables are physical activity and fast-food consumption, while the dependent variable is dysmenorrhea. Additional variables not tested in this study serve as supplementary variables. Daily physical activities, such as walking, running, and other forms of exercise. It was assessed through an online questionnaire and categorized as good: ≥30 minutes per day or 150 minutes per week and poor: <30 minutes per day or 150 minutes per week. Fast food was measured using a Food Frequency Questionnaire (FFQ) and defined as the consumption of ready-to-eat foods high in calories, fats, and low in fiber, such as fried chicken, instant sausages, French fries,

instant noodles, pasta, nuggets, and other types consumed in the past week. Dysmenorrhea was assessed via an online questionnaire and identified as lower abdominal pain during menstruation without pelvic abnormalities, disrupting daily activities.Respondents experiencing this were categorized as having dysmenorrhea.Data were collected using a Google Form. After the data was collected, the researcher used SPSS software to analyze the data with Chi-square test.

This study adhered to research ethics and received approval from the Faculty of Health Sciences, UIN Syarif Hidayatullah Jakarta, under the reference number Un.01/F.10/KP.01.1/KE.SP/03.08.012/2021. Consent for participation was included on the first page of the online questionnaire, and all respondents confirmed their agreement before completing the questionnaire.

Results

The study was conducted within the Public Health Study Program, UIN Syarif Hidayatullah Jakarta. The findings are as follows:

Table 1. Respondent Characteristics

Characteristics	n	%
Dysmenorrhea		
Yes	189	89,2
No	23	10,8
Level of dysmenorrhea		
Mild	127	59,9
Moderate	55	25,9
Severe	7	3,30
Not experience dysmenorrhea	23	10,3
Age (years)	19,67 ± 1,195*	
Menarche age (years)		
Upnormal (<12)	37	17,5
Normal (≥12)	175	82,5
BMI (kg/m^2)		
Underweight (<18.4)	39	18,4
Normal (18.5-24.9)	140	66,0
Overweight (≥25)	22	15,6
Generation		
2017	29	13,7
2018	72	34,0
2019	50	23,6
2020	61	28,8
Family Smoking Status		
Yes	104	49,1
No	108	50,9
Location of family members smoking		
Inside the house	49	23,1
Outside the house	55	25,9
Did not smoke	108	50,9

*Mean ± Standard Deviation

Based on Table 1, it was found that 189 respondents (89.2%) experienced

dysmenorrhea. The most common severity of dysmenorrhea was mild 127 respondents (59.9%). The average respondent age was 20 years old, with the majority 175 respondents (82.5%) experiencing menarche at the normal age (≥12 years).

Table 2. Physical Activity Habits in the Last Week

Physical Activity	n	%
Frequency of Physical Activity		
Poor <30 minutes per day or 150 minutes per week)	151	71,2
Good ≥30 minutes per day or 150 minutes per week)	61	28,8
Types of Physical Activity		
Watching television		
Yes	136	64,2
No	76	35,8
Writing and Typing		
Yes	209	98,6
No	3	1,40
Walking		
Yes	146	68,9
No	66	31,1
Jogging		
Yes	70	33,0
No	142	67,0
Cycling		
Yes	39	18,4
No	173	81,6
Running		
Yes	25	11,8
No	187	88,2
Rope jumping		
Yes	18	8,50
No	194	91,5

Table 2 shows that most female Public Health students at UIN Syarif Hidayatullah Jakarta had poor physical activity levels for 151 respondents (71.2%).

Table 3. Fast Food Consumption Habits in the Last Week

Fast Food Consumption Habits	n	%
Fast food consumption		
Yes	203	95,8
No	9	4,20
Fried chicken		
Rarely (0-2 times)	190	89,6
Rarely (3-7 times)	22	10,4
Burger		
Rarely (0-2 times)	211	99,5
Rarely (3-7 times)	1	0,50
French fries		
Rarely (0-2 times)	204	96,2

Rarely (3-7 times)	8	3,80
Pasta		
Rarely (0-2 times)	207	97,6
Rarely (3-7 times)	5	2,40
Instan noodles		
Rarely (0-2 times)	180	84,9
Rarely (3-7 times)	32	15,1
Sausage		
Rarely (0-2 times)	192	90,6
Rarely (3-7 times)	20	9,40
Nugget		
Rarely (0-2 times)	181	85,4
Rarely (3-7 times)	31	14,6
Time to fast food to consumption		
Breakfast	8	3,80
Lunchtime	104	49,1
Evening	28	13,2
Night	72	34,0

Table 3 shows that 203 respondentsconsumed fast food within the past week (95.8%). The most frequently consumed fast food item was instant noodles 32 respondents (15.1%), with most respondents eating fast food during lunchtime 104 respondents (49.1%).

Table 4 . Frequency and Distribution of Dysmenorrhea Incidence with Fast Food Consumption, Physical Activity, and Family Smoking Status

Variables	Dysmenorrhea	
	Yes	No
	n (%)	n (%)
Fast food consumption		
Yes	181 (89,2)	22 (10,8)
No	8 (88,9)	1 (11,1)
Frequency of Physical Activity		
Poor (<30 minutes per day or 150 minutes per week)	134 (88,7)	17 (11,3)
Good (≥30 minutes per day or 150 minutes per week)	55 (90,2)	6 (9,80)
Family Smoking Status		
Yes	95 (91,3)	9 (8,70)
No	94 (87,0)	14 (13,0)

Table 4 indicates that 181 respondents who consumed fast food in the past week experienced dysmenorrhea(89.2%). Among respondents with poor physical activity 134 experienced dysmenorrhea(88.7%). Additionally, 95 respondents with family members who smoked experienced dysmenorrhea(91.3%).

Discussion

Dysmenorrhea is lower abdominal pain caused by uterine contractions during menstruation. It is commonly experienced at varying severity levels (mild, moderate, or severe). Moderate and severe dysmenorrhea typically interferes with daily activities and may require medication or medical intervention. The prevalence of dysmenorrhea among Public Health students at UIN Syarif Hidayatullah Jakarta was 89.2%, with mild dysmenorrhea at 59.9%, moderate at 25.9%, and severe at 3.3%.

The results showed that the incidence of dysmenorrhea was more prevalent among students who consumed fast food, had low physical activity, and were exposed to cigarette smoke from family members. However, there was no statistically significant difference in proportions between the groups that had exposure to these risk factors and those that did not. A total of 89.2% of students who ate fast food experienced dysmenorrhea, compared to 88.9% of respondents who did not eat fast food. In the physical activity variable, 88.7% of students with low physical activity experienced dysmenorrhea. While in the group with good physical activity the incidence of dysmenorrhea was 90.2%. Similarly, the incidence of dysmenorrhea in students exposed to cigarette smoke from family was 91.3%, slightly higher than 87% in respondents who were not exposed to cigarette smoke. These small differences were not enough to show a significant association between these variables and the incidence of dysmenorrhea.

This phenomenon can be explained by several possibilities. First, there may be homogeneity in lifestyle among students.Most students in this study had similar behavioral characteristics, such as high consumption of fast food and low levels of physical activity, which made the variation between groups very minimal. This homogeneity resulted in the differences in impact caused by each factor not appearing statistically significant. Secondly, dysmenorrhea is a multifactorial condition that is not only influenced by environmental factors such as diet or physical activity, but also by internal factors such as hormonal balance, stress levels, age of menarche, menstrual cycle, genetic factors etc., that were not measured in this study. Thus, although the variables studied theoretically have an association with dysmenorrhea, their contribution may be relatively small compared to other more powerful factors. Third, the sample size in certain subgroups in this study tended to be small, especially in respondents who did not consume fast food (n=9) or had good physical activity (n=61), limiting the statistical power to detect significant differences. This limitation is important to consider as it may affect the validity of the results and the interpretation of the relationship between variables.

Although no statistically significant association was found, it is important to note that factors such as fast food consumption, physical activity and exposure to cigarette smoke remain relevant in the context of dysmenorrhea prevention. These findings suggest that unhealthy lifestyles are widespread among adolescent girls, and health interventions should not only focus on certain groups but target the entire student population. Education on the importance of maintaining a healthy diet, engaging in regular physical

activity, and creating a smoke-free home environment should be promoted. These interventions are expected to improve the lifestyle of adolescents in general and indirectly reduce the prevalence of dysmenorrhea among students.

Fast food habits and physical inactivity among students may be linked to lifestyle changes during 2020-2021, the period affected by the COVID-19 pandemic. During this period, students spent more time at home, increasing their fast-food consumption and decreasing their physical activity levels. The availability of food delivery services also makes fast food more accessible, convenient and affordable, further contributing to this habit. Dysmenorrhea is more prevalent among students with poor physical activity levels (16), which found that 91.2% of students with low physical activity experienced dysmenorrhea. Similarly, 53.8% of respondents with poor physical activity experienced dysmenorrhea (56.1%) (7). Lack of physical activity can make the body less fit and blood flow throughout the body, including to the abdominal area and reproductive organs, becomes not smooth, reducing the distribution of oxygen in the blood and increasing dysmenorrhea. Conversely, physical activity can help the body relax, improve blood circulation and stimulate the production of endorphins, which act as natural pain relievers and improve blood circulation, helping to reduce dysmenorrhea (16-17).

Dysmenorrhea also occurs more in students who often eat fast food, where 65.7% of students who often eat fast food experience dysmenorrhea. Fast food contains saturated fat, omega-6 fatty acids, high sodium, low fiber and low essential nutrients that can interfere with hormone levels, especially progesterone, which causes increased prostaglandin production and uterine contractions that trigger dysmenorrhea (9,18). Omega-6 fatty acids interfere with progesterone metabolism, increasing the production of prostaglandins or compounds that trigger uterine contractions (19). Excessive prostaglandins cause excessive uterine contractions, ischemia, and dysmenorrhea (20).

In addition, dysmenorrhea is more common in students who have family members who smoke. 87.1% and 88% of respondents exposed to cigarette smoke experienced dysmenorrhea (13-14). Exposure to family cigarette smoke, or secondhand smoke, is an environmental factor that has the potential to exacerbate dysmenorrhea. The harmful chemicals in cigarette smoke can disrupt hormonal balance and increase inflammation in the body. Women exposed to secondhand smoke tend to have a higher risk of dysmenorrhea and more severe symptoms compared to those who are not exposed. Smoking can affect the production of estrogen, which regulates menstruation, while nicotine reduces blood flow to the endometrium and increases prostaglandin levels, thus exacerbating dysmenorrhea (13,21).

This study has several limitations that need to be considered. First, the research design used was cross-sectional so that it was only able to show associative relationships between variables at one time and could not prove a cause-and-effect relationship. Therefore, although there is an association between lifestyle and the incidence of dysmenorrhea, it cannot be concluded that these factors directly cause dysmenorrhea. Secondly, there is homogeneity in the characteristics of the respondents,

especially related to lifestyle such as fast food consumption and physical activity, which causes the differences between groups to be very small. This likely influenced the results of the statistical analysis, which showed no significant relationship between the variables studied. Thirdly, the sample size in some subgroups was very unbalanced. For example, the number of respondents who do not consume fast food or who have good physical activity is much less than other groups. This imbalance limits the power of statistical tests in detecting meaningful differences, so the results obtained may be less representative of actual conditions. Fourth, this study did not consider other factors that are scientifically known to influence dysmenorrhea, such as stress level, nutritional status, body mass index (BMI), age at menarche, family history of dysmenorrhea, hormonal disorders or certain gynecological conditions etc. The absence of these variables in the analysis may lead to bias due to possible confounding factors. Lastly, data were collected through self-administered questionnaires, which could potentially lead to information biases such as recall bias or social desirability bias (answering based on what is considered good by society). These limitations need to be taken into consideration in interpreting the results of the study and as input for future research to produce more robust and in-depth findings.

Conclusion

Based on the results of the study on the relationship between fast food consumption, physical activity, and exposure to family cigarette smoke with the incidence of dysmenorrhea in female students, it can be concluded that most respondents experienced dysmenorrhea, both in groups that consumed fast food, had low physical activity, and were exposed to family cigarette smoke. However, the analysis showed that there was no significant difference in the proportion of dysmenorrhea incidence between respondents who had exposure to these risk factors and those who did not. The incidence of high dysmenorrhea occurred equally in all groups, so there was no statistically significant relationship between fast food consumption, physical activity, and family cigarette smoke exposure with the incidence of dysmenorrhea in this study.

These findings suggest that lifestyle factors such as diet, physical activity, and family environment do have the potential to influence the incidence of dysmenorrhea, but it is likely that their contribution is not independent and is influenced by other internal factors such as hormones, stress, and menstrual history. Therefore, prevention of dysmenorrhea should be carried out thoroughly with a promotive and preventive approach that not only targets specific factors but also pays attention to the holistic health conditions of adolescents.

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Conflict of Interest

This research was without any conflict of interest.

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