



THE RELATIONSHIP BETWEEN A SEDENTARY LIFESTYLE AND DYSMENORRHEA INTENSITY

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ABSTRACT

Background: Dysmenorrhea is a menstrual syndrome disorder that generally occurs in women of reproductive age before or during menstruation in a form of pain and discomfort around the pelvis, lower abdomen, and back. One of dysmenorrhea factors is the lack of daily physical activity (sedentary lifestyle). Sedentary lifestyle can cause ischemia that blocks the blood flow to the reproductive organs and the production of endorphins which help in reducing pain during menstruation.

Objectives: To find out the correlation between sedentary lifestyle and the dysmenorrhea intensity among midwifery students, Faculty of Medicine, Sebelas Maret University.

Method: This study used a quantitative method by applying a cross-sectional approach. The population of this study were 107 midwifery students. The sampling used a purposive sampling technique with the result of 85 respondents. The univariate data analysis used frequency distribution, while the bivariate analysis used Spearman Rank test with p -value < 0.05 .

Result: The result showed that the majority of midwifery students of Medical Faculty, Sebelas Maret University, with low sedentary lifestyle were 52 respondents (61.2%) and the majority of the students with low dysmenorrhea intensity were 53 respondents (63%). There was a significant and strong connection between sedentary lifestyle and dysmenorrhea intensity among midwifery students (p -value=0.000) and (r =0.930).

Conclusion: The positive value of the correlation showed a unidirectional relation between two variables where the higher sedentary lifestyle was, the higher dysmenorrhea intensity that would be experienced. There is a correlation between sedentary lifestyle and dysmenorrhea intensity.

Keywords: *Sedentary Lifestyle, Dysmenorrhea, Adolescent*

INTRODUCTION

Dysmenorrhea is a menstrual syndrome disorder. Generally this disorder occurs in women of childbearing age before or during menstruation. This disorder is in the form of pain and discomfort that interferes with daily activities and usually lasts 8-72 hours in the menstrual cycle. Pain can be felt in the pelvis, lower abdomen, until it feels like it is spreading to the thighs and back⁽¹⁾. Dysmenorrhea is classified into two types, namely primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is abdominal pain during menstruation which is not caused by gynecological disorders but due to normal natural processes during menstruation. Whereas secondary dysmenorrhea is menstrual pain which occurs due to gynecological disorders and is most commonly caused by adenomyosis and endometriosis⁽²⁾.

The World Health Organization (WHO) states that more than 50% of women in various countries in the world have dysmenorrhea disorders. Meanwhile, the prevalence of dysmenorrhea in Indonesia shows that 60-70% of women experience pain during menstruation. The incidence of primary dysmenorrhea was 54.89% and the incidence of secondary dysmenorrhea was 45.11%⁽³⁾. Several risk factors that cause dysmenorrhea include age at menarche, family history, menstrual cycle, and exercise or physical activity⁽⁴⁾.

Low physical activity or sedentary lifestyle can affect the incidence of dysmenorrhea, a study stated that around 78.2% of women who do not exercise regularly experience dysmenorrhea. There were only 21.8% of women who did not exercise regularly and did not experience dysmenorrhea, and as many as 44.3% of women who exercised regularly did not experience dysmenorrhea⁽⁵⁾. Sedentary lifestyle is a lifestyle of a person with a very low level of physical activity. Behaviors that show a sedentary lifestyle are sitting, leaning, and lying down with a sedentary or long period of time, starting

when you wake up for the whole day until it's bedtime again and again⁽⁵⁾. According to the Indonesian Ministry of Health, sedentary lifestyle is a physical activity carried out outside of one's sleep time with a sign of very minimal caloric expenditure, namely <1.5 METs (Metabolic Equivalent Of Task(S))⁽⁶⁾. Based on a preliminary study that was conducted by researchers on Sunday, March 13, 2022 with 10 Midwifery students at the Faculty of Medicine, Sebelas Maret University, it was found that 9 female students experienced dysmenorrhea during menstruation in the last three months with all female students having sedentary habits such as watching movies, dramas and spending time playing gadgets for more than 4 hours on average each day.

WHO states that 1 in 4 adults and 80% of the world's adolescent population does not do enough physical activity in their daily lives. According to the 2018 Riskesdes, the proportion of the population in Indonesia who are less physically active over the age of 10 years continues to increase from 26.1% in 2013 to 33.5% in 2018⁽⁶⁾. A study at the Faculty of Public Health, University of Muhammadiyah Jakarta stated that the sedentary lifestyle portrait of students was quite high, reaching 50.2% or more than half of students. Sedentary lifestyle is most dominant in female students, namely 52.2% and in male students as much as 38.2%⁽⁷⁾. Sedentary lifestyle can cause various inconveniences and losses to the body. WHO estimates that sedentary lifestyle can cause 10-16% diabetes, 22% ischemic heart disease, up to 2 million deaths worldwide each year⁽⁸⁾. In other words, a sedentary lifestyle can increase the number of Non-Communicable Diseases (PTM). Research by Dhyana (2019) conducted at the Faculty of Medicine, Sebelas Maret University stated that young women who tend not to do activities, such as sitting, lying down, or standing for long periods of time

(sedentary habits) experience an increase in the intensity of menstrual pain during menstruation.

Although there has been no previous research showing a relationship between sedentary lifestyle and menstrual pain intensity, existing studies have proven that physical activity can affect the intensity of dysmenorrhea pain. Based on the explanation of the background above, the researcher is therefore interested in finding out whether there is a relationship between sedentary lifestyle and the intensity of dysmenorrhea in female midwifery students at the Faculty of Medicine, Sebelas Maret University.

METHODS

This study used a quantitative method with the type of analytic observational research. This study aims to determine the relationship between sedentary lifestyle and dysmenorrhea intensity. The approach used in this study is a cross-sectional study. This research was conducted at the Midwifery Study Program, Applied Bachelor Program, Faculty of Medicine, Sebelas Maret University, Surakarta, Central Java, in June 2022. The population in this study was all Midwifery female students at the Faculty of Medicine, Sebelas Maret University, 2022 as many as 107 students. The sample for this study were female midwifery students who experienced dysmenorrhea with a sedentary lifestyle or according to predetermined inclusion and exclusion criteria and used the slovin formula with the aim of being able to determine the sample size to be studied. The inclusion criteria are as follows: 1) Student of Applied Bachelor of Midwifery FK UNS in 2022. 2) Female student with regular menstruation for the last three months. 3) female students with dysmenorrhea.

Based on the results of calculations using the Slovin formula, a sample size of 85 people was obtained. The sample size was then added by 10%

of the total sample in order to avoid dropping out so that the total sample studied became 94 people. Determination of the sample by sorting the sample among the total population according to the criteria of the researcher, so that 85 people can represent the overall characteristics of the population.

The data collection technique used in this research is a questionnaire. The data used is in the form of primary data or data taken directly by researchers without intermediaries. In this study, questionnaires were distributed using the Google form to midwifery students at the Faculty of Medicine, Sebelas Maret University. Questionnaires were administered to measure the level of sedentary lifestyle and the intensity of dysmenorrhea in respondents. The questionnaire used to measure sedentary lifestyle is the Adolescent Sedentary Activity Questionnaire (ASAQ) which has been modified with a reliability of 0.57 – 0.86 and has good validity and consists of 11 questions. This ASAQ questionnaire has been translated into Indonesian by⁽⁹⁾. Respondents were asked to fill out the ASAQ questionnaire every day for 7 consecutive days. However, to overcome the forward and backward menstrual cycles in a person, respondents were asked to fill out the ASAQ questionnaire for 10 consecutive days. Respondents can fill out a questionnaire 10 days before menstruation⁽¹⁰⁾. The instrument used to measure the intensity of menstrual pain is called the Numerical Rating Scale (NRS) which is a standardized/international questionnaire that has been tested for validity and reliability. Based on research by Li, Liu and Herr in Nasution (2020) the results of the validity of the NRS pain scale are more than 0.95. Filling in this questionnaire can be done to coincide with menstruation, respondents can measure their menstrual pain themselves.

Univariate analysis in this study aims to describe the description of the frequency distribution of the independent

variable (sedentary lifestyle) and the dependent variable (dysmenorrhea intensity). Bivariate analysis in this study aims to analyze the correlation between the dependent variable and the independent variable. From the research data that has been collected and processed, it will then be analyzed using the Spearman Rank test. This test aims to find the closeness of the two variables. The Spearman Rank test can statistically measure the strength of the correlation between variables, look for positive or negative correlation directions, and find out whether the correlation is significant or not. To carry out this test the data does not have to contribute normally and the scale is measured on an ordinal scale⁽¹¹⁾.

Researchers have carried out Ethical Clearance (EC) at the Health Research Ethics Committee (KEPK) FK UNS to test the feasibility of the research and have been declared ethically feasible with No: 66/UN27.06.11/KEP/EC/2022.

RESULT

This research was conducted on 85 Midwifery female students at the Faculty of Medicine, Sebelas Maret University from 1-18 June 2022 by taking data online via the Google form. The results of this study include an overview of the research location, characteristics of the respondents, univariate analysis and bivariate analysis as presented below.

Table 1. Respondent Characteristics Data

Sample	Frequency (n)	Percentage (%)
Menarche age		
early menarche < 12 years	9	10,5
menarche 13-14 years	64	75,2
old menarche > 15 years	12	14,3
Age		
19 years	25	28,4
20 years	14	16,4
≥20 years	46	54,2
Duration of		

menstruation		
Short(< 4 days)	0	0
Normally (4-8 days)	82	96,4
Long (>8 days)	3	3,6

Based on table 1, the characteristics of the respondents show that the majority of midwifery students at the Faculty of Medicine, Sebelas Maret University, have a normal menarche age of 75.2% (64 female students). Most of the respondents were aged ≥21 years, namely 54.2% (46 female students), and the majority of respondents had normal menstrual periods of 96.4% (82 female students).

Characteristics of respondents based on the age of menarche showed that the majority of midwifery female students of FK UNS had normal menarche, namely 75.2% (64 respondents). Menarche age is the age at which a person experiences menstruation for the first time followed by changes in the body, especially in the reproductive organs. Menarche age is categorized into three classifications, namely early or early menarche, normal menarche, and old menarche. Normally a woman has her first menarche at the age of 13-14 years⁽¹²⁾. This is similar to the results of this study that the majority of female midwifery students have normal menarche age. This study also analyzed the length of menstruation factor. The duration of menstruation can be divided into 3 categories, namely short (<4 days), normal (4-8 days), and long (> 8 days). Based on the analysis of the respondent's data, it is known that the majority of midwifery female students' menstrual periods are normal, between 4-8 days in each month.

Table 2. Frequency distribution of respondents according to sedentary lifestyle habits

Sedentary lifestyle	Frequency (n)	Percentage (%)
Low	52	61,2
Currently	31	36,4
Tall	2	2,4
Total	85	100

Based on table 2, it shows that the majority of midwifery students at the Faculty of Medicine, Sebelas Maret University, have a low category sedentary lifestyle, namely 61.2% (52 female students).

Sedentary lifestyle based on the Adolescent Sedentary Activity Questionnaire (ASAQ) questionnaire is categorized into 3 categories namely low (<120 minutes/day), moderate (120-240 minutes/day), and high (240-360 minutes/day)⁽¹³⁾. The results of analysis of research data from 85 female students found that the majority of respondents had sedentary lifestyle habits with a low category of 61.4% (52 female students). It can be concluded that the majority of FK UNS Midwifery students have low sedentary lifestyle habits in their daily life.

Research by Sofiany & Setyawati (2021) supports the results of this study, namely stating that a portrait of a high sedentary lifestyle among health students where this habit is more common among female students than male students. Research by Farradika et al (2019) also states that almost half of the health students at the UHAMKA Faculty of Health Sciences of 47.8% (404 students) have a moderate sedentary lifestyle in their daily lives. This is due to the lack of facilities for sports activities and a family environment and friends who are less supportive in motivating to exercise. Health students tend to have a high sedentary lifestyle due to the shift from offline to online learning due to the Covid-19 pandemic in the last two years,

so that students are more interested in spending part of their time in front of the computer. This research is supported by research by Adhyputri et al (2021) which states that the Covid-19 pandemic has had a major impact on increasing sedentary lifestyle behavior in Bandung Islamic University Medical students by 77.5%.

Table 3. Frequency distribution of respondents according to Dysmenorrhea intensity

Sedentary lifestyle	Frequency (n)	Percentage (%)
Low	52	61,2
Currently	31	36,4
Tall	2	2,4
Total	85	100

Table 3 above shows that the majority of female midwifery students at the Faculty of Medicine, Sebelas Maret University, had dysmenorrhea intensity in the mild category, namely 63% (54 female students).

Measuring the intensity of dysmenorrhea using the Numerical Rating Scale (NRS) questionnaire was divided into 4 categories, namely mild pain (scale 1-3), moderate pain (scale 4-6), severe pain (scale 7-9), and very severe pain (scale 10).)⁽⁵⁾. Data analysis for this variable showed that the majority of female students of Midwifery students UNS had dysmenorrhea intensity in the mild category. The results of this study are in line with the results of a study by Jayanti et al (2022) which stated that the incidence of dysmenorrhea was high among midwifery female students at a Bogor city university with a total of 110 out of 153 female students (71.9%). One of the two factors causing increased intensity of dysmenorrhea namely age at menarche and duration of menstruation. Research by Aditiara (2016) states that there is a correlation between the age of menarche and primary dysmenorrhea in 2015 undergraduate nursing students at the Muhammadiyah University of Surakarta. Early or early menarche age

will have a risk of experiencing dysmenorrhea with severe intensity compared to people who have sufficient menarche age. When someone has an earlier menarche, the reproductive organs are still immature in undergoing changes and narrowing of the cervix occurs which will cause pain during menstruation⁽¹⁴⁾. Then the length of menstruation is also one of the risk factors causing the

increased intensity of dysmenorrhea, this is due to the longer menstruation, the more it increases and contracts the uterine muscles. This increase causes the sensitivity of prostaglandin hormones to increase in the endometrium, which is undergoing a phase of secretion⁽¹⁵⁾.

Table 4. Spearman Rank Test Results

<i>Dysmenorrhea</i>	<i>Sedentary Lifestyle</i>						Statistical Test Results	
	Low		Currently		Tall		<i>ρ-value</i>	<i>r</i>
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>		
Light	51	98,1	2	6,5	0	0	0,000	0,930
Currently	1	1,9	29	93,5	0	0		
Heavy	0	0	0	0	2	100		
Very heavy	0	0	0	0	0	0		
Total	52	100	31	100	2	100		

Table 4 shows the results of 52 respondents who had low sedentary lifestyle habits, 51 respondents (98.1%) had mild dysmenorrhea intensity, 1 respondent (1.9%) had moderate dysmenorrhea intensity, and no respondent had sedentary habits. Low lifestyle with severe or very severe dysmenorrhea intensity. Of the 31 respondents with moderate sedentary lifestyle habits, 2 respondents (6.5%) had mild dysmenorrhea intensity, 29 respondents (93.5%) had moderate dysmenorrhea intensity, and there were no obtained are $r = 0.930$ where if ($r = 0.76-0.99$) it can be said that the strength of the correlation between variables is very strong. The direction of the correlation is positive where it can be concluded that the higher the sedentary lifestyle, the more severe the intensity of dysmenorrhea felt by midwifery students at the Faculty of Medicine, Sebelas Maret University.

The results of the bivariate analysis using the Spearman Rank test showed that there was a significant or significant correlation between sedentary

respondents with moderate sedentary lifestyle habits who had dysmenorrhea intensity heavy or very heavy. Meanwhile, respondents with high sedentary lifestyle habits with a total of 2 respondents (100%) all had high dysmenorrhea intensity.

The results of statistical analysis using the Spearman Rank test obtained ρ -value = 0.000 (ρ -value < 0.05) so it can be said that there is a correlation or relationship between sedentary lifestyle and the intensity of dysmenorrhea. These results support the hypothesis that H_a is accepted and H_0 is rejected. Then the results lifestyle and the intensity of dysmenorrhea in midwifery female students of the Faculty of Medicine UNS in 2022 (ρ -value = 0.000). It can be concluded that H_a is accepted and H_0 is rejected. This study is in line with research by Prazeres et al (2018) which states that there is a correlation between sedentary lifestyle and physical activity with dysmenorrhea and premenstrual syndrome (ρ -value = 0.004).

DISCUSSION

During menstruation, the body produces prostaglandins, especially PGF2 (a hormone whose job is to stimulate the uterus) and PGE2 prostaglandin fibers so that production continues to increase. The higher the prostaglandin hormone produced, the higher the pain felt⁽¹⁶⁾. This will cause a vasoconstrictive effect where the effect will increase the contractility of the muscles in the uterus. This vasoconstrictive effect will also cause reduced blood flow to the uterine muscles so that this causes ischemic endometrium which is the main cause of dysmenorrhea⁽¹⁷⁾. The condition of the body that is less mobile during menstruation can also cause ischemia so that this will cause obstruction of endorphins which are responsible for reducing pain during menstruation⁽¹⁶⁾.

The incidence of dysmenorrhea tends to increase in women who have less physical activity, such as not doing regular exercise. The effect of vasoconstriction caused by a sedentary lifestyle can reduce oxygen levels to the blood vessels by up to two times per minute, this can increase menstrual pain during menstruation⁽¹²⁾. Research from Putri et al (2021) also says that physical activity affects dysmenorrhea. Minimal physical activity (sedentary) is one of the causes of dysmenorrhea. Meanwhile, sufficient and regular physical activity can stimulate the production of endorphins and vasodilation of blood vessels which can reduce the intensity of dysmenorrhea.

Sedentary lifestyle is one activity that can affect the intensity of dysmenorrhea. When a person has a habit of lacking physical activity, vasoconstriction occurs which causes oxygen flow to not be channeled optimally into the blood vessels in the reproductive organs or can be called ischemia/hypertonia. Muscle and joint performance is affected by physical activity so that blood is pumped throughout the body properly and causes

heart contractions to increase. In a body that is less active, it will cause the work efficiency of the heart and lungs to decrease in pumping blood to the reproductive organs. This will trigger the occurrence of ischemic endometrium which is one of the main causes of triggering increased pain sensitivity in the endometrium. So it can be concluded that the intensity of dysmenorrhea can increase due to prolonged uterine contractions and ischemic endometrium caused by a sedentary lifestyle⁽¹⁸⁾.

In the data analysis of this study, it was found that the correlation coefficient (r) was 0.930, which means that there is a very strong correlation or relationship between sedentary lifestyle and dysmenorrhea intensity. It can be concluded that if female students have a sedentary lifestyle with a low category, the intensity of dysmenorrhea that is felt is also light. If female students have a moderate sedentary lifestyle, the intensity of dysmenorrhea that is felt is also moderate, so if female students have a sedentary lifestyle, the intensity of dysmenorrhea that is also felt is severe.

In the analysis of this research data, it was found that the correlation coefficient (r) was 0.930 (positive). This can show that there is a positive relationship between sedentary lifestyle and the intensity of dysmenorrhea. The higher the habit of sedentary lifestyle in a person, the greater the perceived intensity of dysmenorrhea. This research is in line with research conducted by Dhyana (2019) that the intensity of dysmenorrhea or menstrual pain will tend to increase if a person is not doing any activities or such as sitting and standing for a long time (sedentary lifestyle). Research by Sermoati & Zuhdy (2017) on female adolescents in Bantul also stated that the lower the physical activity performed, the higher the intensity of menstrual pain or dysmenorrhea felt, and vice versa.

CONCLUSION

The results of the research that has been done show that the majority of female midwifery students at FK UNS are over 21 years old, the average age of the respondents is normal menarche with normal menstrual duration. In this study it was concluded that there was a significant or significant relationship between sedentary lifestyle and the intensity of dysmenorrhea. The majority of Midwifery Students at the Faculty of Medicine, Sebelas Maret University have low sedentary lifestyle habits and mild dysmenorrhea intensity. The strength of the correlation between sedentary lifestyle and the intensity of dysmenorrhea is very strong and the direction of the correlation between sedentary lifestyle and the intensity of dysmenorrhea is positive, which means that the higher a person's sedentary lifestyle, the higher the perceived intensity of dysmenorrhea.

Based on the research results, discussion and benefits to be achieved in this study, the researchers provide advice to female students in order to minimize sedentary lifestyle habits as an effort to reduce menstrual pain (dysmenorrhea) during menstruation by having a lifestyle such as diligently exercising at least 30 minutes a day and not being lazy.

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