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The Impact of Stress on Dysmenorrhea Among Adolescent Girls: A Cross-Sectional Study at Junior High School 1 Ngariboyo

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ABSTRACT Adolescence is a period of "storm and stress", a time when emotional tension increases due to physical and glandular changes that make adolescents very sensitive and prone to stress. Stress management is also one of the efforts to overcome dysmenorrhea because stress factors can reduce a person's pain resistance. The purpose of this study was to determine the effect of stress on the occurrence of dysmenorrhea. This research was an observational analytic using a cross-sectional study at Junior High School 1 Ngariboyo. Population was seventh and eighth grade students at Junior High School 1 Ngariboyo, totaling 179 female students. Sampling using the Slovin sample size formula, samples were taken using simple random sampling technique with a minimum sample size of 124 female students. The independent variable was stress, while the dependent variable was dysmenorrhea. Data were collected using the Depression Anxiety Stress Scale (DASS-42) questionnaire, and the Numerical Rating Scale (NRS). Data were processed and analyzed using Ordinal Regression test. The results showed that there were 49 female students who had moderate stress and 53 female students who experienced moderate dysmenorrhea pain. The results of the Ordinal Regression test showed the effect of stress on the occurrence of dysmenorrhea p -value = 0.017. Based on the description above, it can be concluded that there is a significant influence between stress and the occurrence of dysmenorrhea in seventh and eighth grade students of Junior High School 1 Ngariboyo. It is hoped that female students can increase their knowledge in managing themselves early on in stress management towards the occurrence of dysmenorrhea.

INDEX TERMS adolescence, stress, dysmenorrhea

I. INTRODUCTION

Adolescents are the population group aged between 10 and 19 years[1]. Stress is one of the physiological, psychological and behavioral responses in adapting to internal and external pressures[2]. Currently adolescents enter puberty which is characterized by menarche [3]. Menstruation sometimes causes pain. Dysmenorrhea is one of the complaints that is often experienced by most adolescent girls during menstruation[4]. An estimated 1.2 billion or 18% of the world's total population are adolescents. 90% of the world's 1,769,425 women experience dysmenorrhea, with 10-16% suffering from severe dysmenorrhea[1]. The occurrence of dysmenorrhea in the United States was found to be 60%-91%, while in Mexico as many as 64% of them experienced dysmenorrhea[5]. The occurrence of dysmenorrhea in Indonesia is 107,763 people or about 64.25%, which is

divided into 59,671 people (54.89%) primary dysmenorrhea and 9,496 people (9.36%) secondary dysmenorrhea[6]. The occurrence of dysmenorrhea in East Java was 57.2% of women experienced primary dysmenorrhea and 42.8% did not experience pain[7]. The occurrence of dysmenorrhea is still high, based on Herawati's research the occurrence of dysmenorrhea at State Madrasah Aliyah Pasir Pengaraian Riau showed data of 141 students (94%) experiencing dysmenorrhea and 9 students (6%) of whom did not experience dysmenorrhea[6]. Another study showed that 7%-15% of 30%-60% of adolescent girls who experienced dysmenorrhea did not go to school[8]. According to research Agustin said that dysmenorrhea in women with low stress levels was 22%, moderate stress was 29% and severe stress was 44%[9]. Based on the results of preliminary studies conducted on 8 grade students of Junior High School 1

Ngariboyo taken randomly as many as 10 students, 8 students experienced stress and experienced dysmenorrhea during menstruation and 2 students did not experience stress and did not experience dysmenorrhea during menstruation.

A lot of literature discusses the risk factors for dysmenorrhea, including research on the relationship between stress and dysmenorrhea conducted by Sari on students of the Faculty of Medicine, Andalas University, with the results of the study showing 94% of samples experienced primary dysmenorrhea after experiencing stress[2]. Another study conducted by Hartati revealed that dysmenorrhea is more common in women who experience moderate to high levels of stress compared to those with low stress levels[10]. Dysmenorrhea is not a life-threatening problem, but menstrual pain can have a negative impact on a person's quality of life[11]. The consequences of dysmenorrhea are not only pain, but also various other symptoms such as nausea, vomiting, headache, dizziness, fatigue, diarrhea, and unstable feelings during menstruation, even to fainting[12]. Dysmenorrhea causes psychological disorders, one of the psychological factors is stress. Each person's response to stress is different due to their health condition, personality, first experience with dysmenorrhea, knowledge, coping mechanism, education level, age, and ability to manage everyone's emotion, thus reducing daily activities or productivity[9].

The role of health workers in dealing with this problem is as educators who provide information about dysmenorrhea through counseling or posters. Providing a proper explanation of the menstrual process can help stabilize emotions, which in turn prevents stress. By preventing stress, the chances of experiencing dysmenorrhea can also be minimized[13]. Management of menstrual pain can also be done pharmacological or non-pharmacological. Pharmacological treatments that can be used in menstrual pain include analgesics, hormonal therapy and therapy with nonsteroidal anti-prostaglandin drugs. While non-pharmacological treatment by means of exercise, warm compresses, drinking water, rest, massage, nutrition, aroma therapy, and relaxation music[14]. Based on Agustin's research, stress management is one of the efforts to overcome dysmenorrhea because stress factors can reduce a person's pain resistance. Stress is a common problem that is most often faced during adolescence. School activities that cause unavoidable stress due to the pressure obtained at school are one of the factors that trigger dysmenorrhea[9].

II. RESEARCH METHODS

The general objective of this study was to determine the effect of stress on the incidence of dysmenorrhea. The specific objectives were to identify stress in seventh and eighth grade students of Junior High School 1 Ngariboyo, identify the occurrence of dysmenorrhea in seventh and eighth grade students of SMPN 1 Ngariboyo and analyze the effect

of stress on the occurrence of dysmenorrhea in seventh and eighth grade students of Junior High School 1 Ngariboyo. Observational analytic research method with data processing classified as quantitative research. The research design used was cross sectional with the population of this study were seventh and eighth grade students of Junior High School 1 Ngariboyo totaling 179 students. The sampling technique used the Slovin sample size formula, the sample was taken by simple random sampling technique with a minimum sample size of 124 students and met the inclusion and exclusion criteria.

The independent variable is stress, while the dependent variable is dysmenorrhea. The data collection technique used primary data taken from respondents of seventh and eighth grade students of Junior High School 1 Ngariboyo by distributing the first questionnaire, namely the Depression Anxiety Stress Scale (DASS-42) questionnaire with 42 questions which were divided into 14 questions about the depression scale, 14 questions about the anxiety scale, and 14 questions about the stress scale. But this study only took 14 questions about the stress scale. Each question item was scored 0 to 3, then the scores for each category were summed up to give an interpretation of normal, mild, moderate, severe, and very severe, and the second measurement tool was the Numerical Rating Scale (NRS) which would be used to measure the level of dysmenorrhea pain, consisting of a scale of 0 to 10 which describes the level of dysmenorrhea pain where 0 means no pain, 1-3 means mild pain, 4-6 means moderate pain, and 7-10 means severe pain.

Data processing techniques with editing, coding, tabulating, cleaning data. Data analysis with Ordinal Regression test, If the p value is 0.05, it can be concluded that there is an effect of stress on the occurrence of dysmenorrhea and if the p value > 0.05, there is no effect of stress on the occurrence of dysmenorrhea. The ordinal regression test is used to analyze the relationship between one or more independent variables and the dependent variable with an ordinal scale.

III. RESULT

A. AGE DISTRIBUTION

TABLE 1
Age Distribution

Age (year)	Sum	Percentage
12	4	3.2
13	60	48.4
14	55	44.4
15	5	4.0
Summary	124	100

Based on the results in TABLE 1, the most students are 13 years old, namely 60 students (48.4%).

B. FREQUENCY DISTRIBUTION OF STRESS

TABLE 2
 Frequency Distribution of Stress

Stress	Sum	Percentage
Normal	38	30.6
Mild	32	25.9
Moderate	49	39.5
Severe	5	4.0
Very Severe	0	0
Summary	124	100

Based on the results in **TABLE 2**, most students experience moderate stress, namely 49 students (39.5%).

C. FREQUENCY DISTRIBUTION OF DYSMENORRHEA

TABLE 3
 Frequency Distribution of Dysmenorrhea

Dysmenorrhea	Sum	Percentage
No Pain	16	12.9
Mild Pain	51	41.1
Moderate Pain	53	42.7
Severe Pain	4	3.2
Summary	124	100

Based on the results in **TABLE 3**, the most students who experienced dysmenorrhea were 53 students (42.7%).

D. RESULT OF STRESS WITH DYSMENORRHEA

TABLE 4
 Result Of Stress with Dysmenorrhea

Stress	Dysmenorrhea								Sum mary	P valu e	
	No Pain		Mild Pain		Moderate Pain		Severe Pain				
	N	%	N	%	N	%	N	%			
Normal	6	15,8	23	60,5	8	21,1	1	2,6	38	10	0,017
Mild	2	6,3	14	43,8	16	50,0	0	0,0	32	10	0
Moderate	7	14,3	14	28,6	25	51,0	3	6,1	49	10	0
Severe	1	20,0	0	0,0	4	80,0	0	0,0	5	10	0
Summary	16	12,9	51	41,1	53	42,7	4	3,2	124	100	0

The results of data analysis using ordinal regression test showed a value of $p = 0.017$, so H_0 was rejected ($p < 0.05$). This shows that there is an effect of stress on the occurrence of dysmenorrhea

IV. DISCUSSION

Adolescence is the age period between 12-18 years[15]. Adolescence is a stage of human development with humans, adolescents often experience ambiguity and identity crisis. This causes adolescents to be unstable, unsteady, emotional and sensitive, aggressive, quick or rash in making extreme decisions, and conflicts occur regarding their attitudes and behavior[16]. Adolescent age

is related to a person's tolerance to stress. In adolescence, it is often vulnerable to stress and very strong emotions, but from the early adolescent stage to late adolescence there is an improvement in emotional behavior and more ability to control stress[17].

Stress is a condition in individuals that is unpleasant where it can cause physical and psychological pressure on individuals[18]. Factors that influence stress are physical condition, presence or absence of social support, self-esteem, dysmenorrhea, lifestyle and certain personality types[19]. Based on the results of this study, most of the seventh and eighth grade students at Junior High School 1 Ngariboyo experienced moderate stress as many as 49 students (39.5%). When a person experiences stress, his body will produce the hormone adrenaline which can cause tension of the uterine muscles, this condition makes excessive contractions so that it will cause pain during menstruation[20]. Under stressful conditions, the human body overproduces estrogen and prostaglandin hormones that cause excessive uterine contractions resulting in menstrual pain[21]. Stress triggers a neuroendocrine response, leading to the release of corticotropin-releasing hormone (CRH), which stimulates the secretion of adrenocorticotrophic hormone (ACTH), resulting in increased adrenal cortisol secretion[22]. These hormones cause a decrease in the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH), because of which progesterone release is impaired. Decreased progesterone levels lead to the synthesis of prostaglandins, especially $PGF2\alpha$ [22]. In addition to prostaglandins, the body also overproduces adrenal hormones and estrogen. High estrogen levels lead to excessive uterine contractions[23]. In addition, increased levels of the hormone adrenaline stimulate tension in the uterine muscles, leading to constriction of blood vessels by these muscles, thereby reducing oxygen supply and causing ischemia, which eventually results in pain[24]. This is in line with research conducted by Fitriana that most respondents experienced moderate stress[25]. According to Lazarus, there are various strategies for coping with stress which are divided into two types, namely problem focused and emotion focused. Problem-focused coping purpose to solve the problem or change the source of stress, while emotion-focused coping purpose to reduce or manage the emotional distress that arises from the situation[26]. Based on this, the researcher argues that the seventh and eighth grade students of Junior High School 1 Ngariboyo who experienced moderate stress were 49 students (39.5%), because students experience fatigue in daily activities when they are at school such as school assignments, tutoring outside of school or tutoring which makes it difficult to rest at home so that students become irritable, irritable and restless. Handling stress can do activities such as gymnastics done at least 2 times a week, relaxation, meditation, yoga, taking a walk every morning every day, getting enough sleep, and eating nutritious

foods.

Dysmenorrhea is lower abdominal pain during menstruation[27]. The degree of pain during menstruation (dysmenorrhea) felt by a person varies depending on the pain threshold or pain resistance of everyone to something that is felt[28]. Factors that cause dysmenorrhea are long menstrual periods, family history of dysmenorrhea, stress and menarch at an early age[29]. Based on the results of this study, most of the seventh and eighth grade students at Junior High School 1 Ngariboyo who experienced dysmenorrhea with moderate pain category were 61 students (49.2%). Pain in dysmenorrhea is experienced because prostaglandin levels increase. The increase experienced by prostaglandins makes uterine contractions and vasoconstriction of blood vessels which makes blood flow decrease towards the uterus so that the supply of oxygen to the uterus is inadequate which makes the body feel pain[30]. This is in line with research conducted by Fitriana on 44 midwifery students of Aisyiyah University Yogyakarta, the number of students who experienced moderate dysmenorrhea was 29 people (65.9%), far more than students who experienced mild and severe dysmenorrhea[25]. The results of this analysis are also comparable to the analysis of Pialiari, in 110 female students of the Faculty of Medicine of the Islamic University of Bandung, female students who experienced moderate dysmenorrhea were 50 children (45.4%), far more than those who experienced mild and severe dysmenorrhea[31]. Research conducted by Eka Susanti showed that most of the samples experienced moderate dysmenorrhea, as many as 9 female students[32]. Based on this, the researcher argues that the seventh and eighth grade students of Junior High School 1 Ngariboyo who experienced moderate dysmenorrhea were 53 students (42.7%), because due to several things such as lower abdominal pain, back pain, lack of appetite, dizziness, inability to concentrate and inability to do activities. Dysmenorrhea can be caused by psychological factors. Someone who experiences psychological disorders such as stress in the body will increase the secretion of prostaglandin hormones which can cause dysmenorrhea. In addition, there are also activity factors that can cause dysmenorrhea. Dysmenorrhea can be treated with exercise, warm compresses, adequate rest, massage, nutrition, aroma therapy and relaxation music.

The results of the analysis of the effect of stress on the occurrence of dysmenorrhea using the ordinal regression test obtained a p value = 0.017 then H_0 is rejected ($p < 0.05$). This shows that there is an effect of stress on the incidence of dysmenorrhea in seventh and eighth grade students of Junior High School 1 Ngariboyo. During stress, the hormones released are adrenaline and cortisol that affect prostaglandin synthesis, which will indirectly relate to an increase in prostaglandin concentration in the myometrium and eventually dysmenorrhea occurs[30].

This is in line with research conducted by Meilina Saputri on female students of State Vocational High School 1 Karanganyar, which showed a strong and significant positive relationship between stress and the occurrence of dysmenorrhea[33]. Another similar study also conducted by Zhang et al found that psychological disorders such as stress have a two-way relationship with dysmenorrhea[34]. Another study also conducted by Sri Rejeki found that there was a relationship between stress levels and the occurrence of primary dysmenorrhea[21]. Another similar study also conducted by Prihardian Putri found that there was a relationship between stress level and dysmenorrhea in adolescent girls at the Health Polytechnic of the Ministry of Health Palembang South Sumatera Indonesian[35]. As for the community, especially women, it is hoped that they can increase knowledge about stress management towards the occurrence of dysmenorrhea and can provide support when there are adolescents who are experiencing dysmenorrhea.

V. CONCLUSION

Based on the result and discussion of research on the effect of stress on the occurrence of dysmenorrhea in seventh and eighth grade students of Junior High School Ngariboyo, it can be concluded that most students experience moderate stress, most students experience moderate dysmenorrhea. And there is an effect of stress on the occurrence of dysmenorrhea. The general objective of this study was to determine the effect of stress on the incidence of dysmenorrhea. The specific objectives were to identify stress in seventh and eighth grade students of Junior High School 1 Ngariboyo, identify the occurrence of dysmenorrhea in seventh and eighth grade students of Junior High School 1 Ngariboyo and analyze the effect of stress on the occurrence of dysmenorrhea in seventh and eighth grade students of Junior High School 1 Ngariboyo. This research has been carried out as well as possible and in accordance with research procedures. The limitations in this study are the difficulty in adjusting the school schedule with the schedule that will be carried out by researchers because the event changes suddenly. Then the difficulty of conditioning students during research because of the large number of seventh and eighth grade students at Junior High School 1 Ngariboyo. For midwifery science, it is hoped that the results of this study can develop midwifery theories in the field of community midwifery care about the effect of stress on the occurrence of dysmenorrhea in adolescent girls and further review how to prevent, reduce stress to reduce the risk of dysmenorrhea, and interventions used to overcome dysmenorrhea. It is expected that adolescents can apply stress management to the occurrence of dysmenorrhea. As for the community, especially women, it is hoped that they can increase knowledge about stress management towards the occurrence of dysmenorrhea and can provide support when there are adolescents who are

experiencing dysmenorrhea. And for other researchers as reference material for further research with more variables and better methods.

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