Modeling Risk Factors of Dysmenorrhea in Adolescent

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ABSTRACT

Dysmenorrhoea is more widely experienced by adolescents due to stress, lack of rest, lack of exercise and balanced nutrition. Some impact on teenagers in schools is declining spirit of learning, impaired concentration, there are up to leave the activity. In Indonesia, the incidence of *dysmenorrhoea* in teenagers consists of 54.89%. This study wants to modeling the risk factor of *dysmenorrhoea* in an adolescent. This research uses the analytical method by using the cross-sectional study design. As many as 57 student populations with a large sampling of 51 adolescent girls at SMAN 1 Menganti. Simple random sampling was used as sampling techniques. With research tools such as hemoglobin examination, measurement of body weight and height using digital and microtoise scales, questionnaire to identify knowledge, physical activity, anemia and Mass Body Index in adolescents girls. The result obtained the adolescent who has less physical activity will 7,441 times greater to experience *dysmenorrhea* than good physical activity, the adolescent who has less knowledge 0.241 times more likely to experience *dysmenorrhea* than good knowledge and the adolescent who has anemic disease was 20,123 times more likely to experience dysmenorrhea than has not anemic disease. Healthy living behavior, adequate vitamin intake, reduced mind burden, adequate rest and regular exercise need to continue to be the main message in providing health education to adolescents. Included in it is a message to avoid an unbalanced diet.

I. Introduction

Dismenorrhea is menstrual pain that is found without abnormalities in the genitalia. *Dysmenorrhea* occurs sometime after menarche usually after 12 months or more, because the menstrual cycle in the first months after menarche is generally a type of *anovulatory* that is not accompanied by pain. Pain arises shortly before or together with the onset of menstruation and lasts for several hours, although in some cases it can last several days [1].

[2] classifying *dysmenorrhoea* into two namely primary and secondary. Primary *dysmenorrhea* occurs 6-12 months after menarche and continues until the age of 20 years, usually due to high levels of prostaglandin. While secondary *dysmenorrhoea* usually occurs at the age of 2533 years, caused by a pathological state of pelvic or uterus, it can occur at any time after *menarche.*

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[3] reported the results of his research through a review journal that the incidence of *dysmenorrhea* reached 34% in Egypt and reached 94% (Oman). In the world, it reaches more than 55% of women in each country. In the United States, it is estimated that nearly 90% of women experience *dysmenorrhea*, and 10-15% of them experience severe *dysmenorrhoea* which causes adolescents to be unable to carry out any activities. Very severe pain occurred in 0.9% of teenagers in Korea and around 59.8% in Bangladesh. In Indonesia, the incidence of *dysmenorrhoea* consists of 54.89%, namely primary and secondary *dysmenorrhoea*. Usually, the symptoms of primary *dysmenorrhea* occur in women of productive age 3 to 5 years after experiencing the first menstruation and women who have never been pregnant [4].

The results of previous studies state that there are several factors that influence the incidence of dysmenorrhea in adolescents. The Family history of *dysmenorrhoea*, physical activity, age, the habit of consuming fast food, exposure to cigarette smoke and anemia are thought to be factors that influence the incidence of *dysmenorrhea*. [5][6][7]. The incidence of anemia in adolescents is high, especially in developing countries like Indonesia. The prevalence of anemia in adolescents aged 15-24 years reached 18.4%, the proportion of anemia in Adolescent was higher than that of male adolescents which reached 23.9% and more prevalent in adolescents in rural areas (22.8%). While the percentage of anemia in pregnant women aged 15-24 years reaches a high enough value and dominates anemia in pregnant women which is 84.6%[8]. The results of the study analyzed the causes of *dysmenorrhoea* carried out by [9]. Stating that there is a relationship between the duration of menstruation and family history with the incidence of *dysmenorrhea*. Anemia can be one of the trigger factors for *dysmenorrhoea* because hemoglobin levels that can not cause the body's metabolism and nerve cells do not work optimally, causing a pattern of decreased acceleration of nerve impulses, disrupting the dopamine receptor system.

This *dysmenorrhea* in adolescents can interfere with teenagers' lives, which is lowering their enthusiasm for learning, decreasing concentration, and even leaving their activities and not going to school. The impact of long-term *dysmenorrhea* is thought to be the cause of the occurrence of endometriosis and the trigger for infertility in adolescents later.

[10] said that around 70-90% of menstrual pain cases occur when adolescence has an impact on emotional conflict, tension, and anxiety. This condition will affect skills and skills including self-recognition skills, rational thinking, social skills, academic skills, and vocational skills. Therefore *dysmenorrhea* in adolescents needs to get attention from their respective parents such as providing appropriate treatment both pharmacologically and non-pharmacologically.

There are several recommendations for reducing complaints of *dysmenorrhoea* in adolescents, namely avoiding consuming coffee. In addition to reducing pain, adolescents are encouraged to consume nutritious foods, especially before menstruation (including fruits and vegetables), exercise regularly (such as walking, because this will circulate blood), compress the lower abdomen with warm water or take a bath with hot water, avoid alcohol and cigarettes because these habits can trigger primary *dysmenorrhoea* [11].

Giving analgesic drugs as therapy can also be done [12]. However [13] reported the results of his thesis that the handling of adolescents with severe dysmenorrhea disorders should not take anti-pain medication, but do an examination to health workers. Counseling and early detection and good prevention are expected to reduce the incidence of dysmenorrhea in adolescents.

Seeing the impact of dysmenorrhea on adolescents is very large, especially related to achievement and concentration of learning, it is necessary to study related risk factors for dysmenorrhoea, so the results of this study will enrich evidence base around the causes of dysmenorrhea and as a basis for determining the management of cases of dysmenorrhoea in women.

II. Method

This study aims to model risk factors for dysmenorrhea in Adolescent. This observational analytic study uses a cross-sectional design. The population in this study were all girls of class XI IPA 1 in SMAN 1 Menganti Gresik who had menstruated as many as 57 people. Sampling is done using a simple random sampling technique with a sample size of 51 people. Data obtained through direct observation/examination of Hemoglobin levels using digital Haemoglobine measuring devices, measurement of body weight and height using digital and microtoise scales and closed questionnaires were used to identify complaints of *dysmenorrhoea*, knowledge, physical activity. Before the examination is carried out, the researcher submits the consent form before the first examination to the respondent and encourages the respondent to sign the inform consent sheet if willing, if the respondent does not agree, it will be replaced with new respondents who are willing to comply with the specified sample size. The collected data were analyzed using binary logistic regression with alpha 0.05.

III. Results and Discussion

The results of this study describe the characteristics of respondents and the results of logistic regression tests for risk factors for *dysmenorrhoea* and modeling risk factors for *dysmenorrhoea* in SMAN 1 Menganti Gresik, which will be presented in tables 1, 2 and 3.

1. Characteristics of Adolescent in SMAN 1 Menganti

Complementary factors for dysmenorrhoea	Total	Percentage %
IMT :		
Thin	6	11,8
Normal	31	60,8
Fat & Overweight	14	27,5
	51	100
Physical Activity:		
Less	16	31,4
Good	35	68,6
	51	100
Knowledge :		
Less	15	29,4
Enough	23	45,1
Good	13	25,5
Total	51	100
Anemia :		
No	7	13,7
Yes	44	86,3
Total	51	100

Table 1 shows that most respondents had normal BMI (60.8%), had good physical activity (68.6%), had sufficient knowledge of *dysmenorrhoea* (45.1%), and (86.3%) had anemia (Hb levels <12 gr%).

2. The Incidence Of Adolescent *Dysmenorrhea* in SMAN 1 Menganti

The distribution incidence of Adolescent *dysmenorrhea* in SMAN 1 Menganti is explained in table 2.

Table 2: The incidence of Adolescent *dysmenorrhea* in SMAN 1 Menganti

Occurrence of *dysmenorrhea*	frequency	Percentage (%)
Yes	39	76.5
No	12	23.5
Total	51	100

Table 2 shows 76.5% of respondents experiencing *dysmenorrhea*.

3. Modeling Risk Factors for Adolescent *Dismenorrhea* in SMAN 1 Menganti

The bivariate results of risk factors for Adolescent *dysmenorrhea* in SMAN 1 Menganti are explained in table 3, while the analysis of the binary logistic regression test is explained in table 4.

Table 3. Bivariate test of risk factors for Adolescent *dysmenorrhea* in SMAN 1 Menganti

Variable	p-value	Information
Body Mass Index	,311	No significant
Physical Activity	,002	Significant
Knowledge	,014	Significant
Anemia	,001	Significant

Table 3 shows that the body mass index factors did not significantly affect the incidence of *dysmenorrhoea*, whereas the variables of physical activity, knowledge, and incidence of anemia significantly affected the incidence of *dysmenorrhea*.

Table 4. Multivariate Test of Risk Factors for Adolescent *Dysmenorrhoea* in SMAN 1 Menganti

Variable	B	Standard Error	Wald	df	Significant	Exp (B)
Body Mass Index	0.690	0.681	1.028	1	0.311	1.994
Physical Activity	2.007	0.925	4.710	1	0.030	7.441
Knowledge	-1.422	0.681	4.366	1	0.037	0.241
Anemia	3.002	1.253	5.737	1	0.017	20.123
Constanta	-2.294	2.043	1.261	1	0.262	0.101

Table 4 shows the results of the analysis using binary logistic regression known variables of physical activity, knowledge, and anemia affect the *dysmenorrhea*.

$$\frac{1}{1 + e^{-(-2.294 - 2.007(Aktifitas\ Fisik) + 1.422(pengetahuan) - 3.002(Anemia))}}$$

The results of the study state that the majority of Adolescent experience *dysmenorrhea*. This fact is in accordance with the opinion [14] which states that *dysmenorrhoea* occurs at a younger age, arises after the regular menstrual cycle, often in nulliparous, pain arises before menstruation and increases on the first or second day of menstruation, and often accompanied by nausea, vomiting, diarrhea, fatigue, and headache. *Dysmenorrhea* is a disturbing thing in adolescence. Many factors influence *dysmenorrhea* as in the results of the study.

The results showed that body mass index did not affect the incidence of *dysmenorrhea* in adolescents. The results of this study are in line with previous studies conducted by [15] that there was no correlation between body mass index and *dysmenorrhoea* in Adolescent. The absence of a correlation of body mass index to *dysmenorrhoea* in adolescents can be influenced by several things, namely because there are other factors that have a greater influence and can also be due to uneven dispersion of data causing the probability of groups of data to be smaller so that existing correlations cannot be proven statistics. But the results of this study contradict the study [16] which states that there is a relationship between body mass index, stress level and physical activity with *dysmenorrhea* levels, with the result that the lower body mass index results in more severe *dysmenorrhea* (p-value = 0.029 <α = 0, 05), the higher the level of stress, the higher the level of dysmenorrhea (p-value = 0.024 <α = 0.05), and the lower the physical activity, the higher the level of *dysmenorrhea* (p-value = 0.030 <α = 0.05).

Physical activity significantly affected the incidence of *dysmenorrhea* in Adolescent, the variable physical activity (poor physical activity) had a significance value of 0.030 (p <0.05) so

that there was an influence between physical activity and the occurrence of *dysmenorrhoea*. Exp (B) 7,441 means that it is possible for students who have physical activity that is less 7,441 times greater to experience *dysmenorrhea* than female students who have good physical activity, the results of this study are in line with the results of the study [17] 41 female students, where there was a correlation between the level of physical activity and *dysmenorrhea* (r = 0.016). However [18] reported the results of different studies on exercise habits with pain in primary *dysmenorrhea* in Adolescent, it has been reported that there was no association between exercise habits and primary *dysmenorrhea* (p = 0.275), where 50.0% of Adolescent exercised regularly has a moderate level of the pain scale.

Knowledge of Adolescent has a significant effect on the incidence of *dysmenorrhea*. Knowledge variables (poor knowledge) have a significance value of 0.037 (p <0.05) so that there is an influence between knowledge and the occurrence of dysmenorrhea. The value of Exp (B) is 0.241 which means it is possible for students who have knowledge that is less than 0.241 times more likely to experience *dysmenorrhea* than female students who have good knowledge. The results of this study are reinforced by research [19], which reports that knowledge and attitudes about reproductive health are related to the incidence of dysmenorrhoea. The higher the level of knowledge about reproduction, adolescents have an increasingly positive attitude in the face of *dysmenorrhea*. [20] also reported the results of his research that there was a relationship between knowledge and *dysmenorrhea* treatment behavior in Manado 7 Public High School (p = 0.00). The results of a similar study were presented by [20] shows that the level of knowledge of Adolescent about *dysmenorrhea* is in the sufficient category (71%), and girls who have sufficient behavior reach 56.49%. There is a correlation between the level of knowledge about *dysmenorrhea* and the behavior of handling *dysmenorrhea* in Adolescent (p = 0.00).

Anemia has a significant effect on *dysmenorrhea*. The anemia variable has a significance value of 0.017 (p <0.05) so that there is an influence between anemia and the occurrence of *dysmenorrhea*. Exp (B) value 20,123 which means that the possibility of students who have an anemic disease is 20,123 times more likely to experience dysmenorrhea than female students who do not have anemia. Anemia is caused by a lack of iron in food consumed and is a cause of *dysmenorrhea*. Anemia can cause a person's immune system to decline, and when the immune system decreases the patient will be susceptible to disease. Some theories explain the connection with the incidence of dysmenorrhea, that at the time of menstruation the female body produces a prostaglandin substance, and prostaglandin is a fat compound produced from fatty acids through an enzymatic process. One function of this substance is to make the uterine wall contract and surrounding blood vessels pinched. When prostaglandins in the body function while the immune system of women decreases due to anemia, this condition will increase the intensity of pain [5]. But anemia does not always cause *dysmenorrhoea*, this is shown from the results of the study that there were 7 respondents who experienced anemia but did not experience *dysmenorrhoea*. This can happen because the teenager does not have hereditary factors from his family, a stable psychological state and likes to exercise. So not all people who have anemia also experience *dysmenorrhea*. But the percentage of anemic Adolescent who experiences *dysmenorrhea* is greater than that of Adolescent who is not anemic.

Other conditions such as life patterns that change from regular to less regular, such as frequent late meals or lack of sleep and imbalances between nutritional intake and activities carried out can also cause anemia [21]. [14], argues that anemia can cause physical problems such as weakness, fatigue, pallor, and headaches. The cause of the high incidence of anemia in Adolescent is based on the results of interviews, because Adolescent deliberately limit eating because they want to be slim, teenagers prefer to consume instant foods such as noodles and sausages rather than green vegetables and a lot of physical activity in leisure time so that Adolescent forget about resting time . The results of the study [22] stated that adolescents who had anemia had a risk of 9.7 times experiencing *dysmenorrhea* compared to respondents who were not anemic with p-value 0,0001 <0,05. Research with similar subjects reported that 63.2% of adolescents had anemia and were associated with dismenorrhea, with OR = 5.400 [23]. [24] reported a relationship between menstrual pain (*dysmenorrhea*) and learning activities in Adolescent.

In addition to physical activity, knowledge, and incidence of anemia. There are other factors that affect *dysmenorrhea*. [5] stated in his research that the factor that caused *dysmenorrhea* was a

family history of dysmenorrhea while the age of menarche, menstrual cycle, duration of menstruation and nutritional status had no relationship with the incidence of *dysmenorrhea*. Research [6] states that other factors that can affect *dysmenorrhea* are physical activity and age, where a physical activity of heavy intensity and early menstrual age or early adolescents are at risk of developing *dysmenorrhea*, while research [7] mentions other factors that cause *dysmenorrhea* in adolescent girls. in consuming fast food and being exposed to cigarette smoke. An unmarried woman is also at high risk for *dysmenorrhea*, this is because sexual intercourse and sperm can inhibit an increase in prostaglandins that cause pain during menstruation [4].

IV. Conclusion

The adolescent girls who have less physical activity will 7,441 times greater to experience *dysmenorrhea* than good physical activity, adolescent girls who less knowledge 0.241 times more likely to experience *dysmenorrhea* than good knowledge and the adolescent girls who have anemic disease was 20,123 times more likely to experience dysmenorrhea than have no anemic. The modeling of logistic regression was below :

$$\frac{1}{1 + e^{-(-2.294 - 2.007(Physical\ Activity) + 1.422(Knowledge) - 3.002(Anemia))}}$$

V. Suggestion

Healthy living behavior, adequate vitamin intake, good diet, reduced mind burden, adequate rest and regular exercise still need to continue to be the main message in providing health education to adolescents. Included in it is a message to avoid an unbalanced diet.

References

[1] I. B. G. Manuaba, *Ilmu kebidanan, penyakit kandungan & keluarga berencana untuk pendidikan bidan*. EGC, 1998.

[2] N. S. Dewi, *Biologi reproduksi*. Yogyakarta: Pustaka Rihama, 2012.

[3] V. De Sanctis, A. T. Soliman, H. Elsedfy, N. A. Soliman, R. Elalaily, and M. El Kholy, "Dysmenorrhea in adolescents and young adults: A review in different countries," *Acta Biomed.*, vol. 87, no. 3, pp. 233–246, 2016.

[4] I. Novia and N. Puspitasari, "Faktor Risiko yang Mempengaruhi Kejadian Dismenore Primer," *Indones. J. Public Heal.*, vol. 4, no. 2, pp. 96–104, 2017.

[5] A. Utami, Andi Nurul Rifqah Jumriani and D. Sidik, "FAKTOR YANG BERHUBUNGAN DENGAN KEJADIAN DISMENOREA PADA REMAJA PUTRI DI SMAN 1 KAHU KABUPATEN BONE," pp. 1–12, 2013.

[6] O. Sianipar *et al.*, "Prevalensi Gangguan Menstruasi dan Faktor-Faktor yang Berhubungan pada Siswi SMU di Kecamatan Pulo Gadung Jakarta Timur," *Maj. Kedokt. Indones.*, vol. 59, no. 7, pp. 308–313, 2009.

[7] T. A. Larasati and A. Faridah, "Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja," *J. Major.*, vol. 5, no. September, pp. 79–84, 2016.

[8] Riskesdas, "Hasil Utama Riskesdas Tentang Prevalensi Diabetes Mellitus di Indonesia 2018," Jakarta, 2018.

[9] S. Sadiman, "Analisis Faktor yang Berhubungan dengan Kejadian Dismenorhea," *J. Kesehat.*, vol. 8, no. 1, p. 41, 2018.

[10] L. Ni Made Sri Dewi, "Pengaruh dismenorea pada remaja," *Semin. Nas. Fmipa Undiksa*, pp. 323–329, 2013.

[11] L. Badriah, *Gizi dalam Kesehatan Reproduksi*. Bandung: PT Refika Aditama, 2011.

[12] D. Winknjosastro, *Ilmu Kebidanan*. Jakarta: YBP-SP.

[13] R. Astrida, "GAMBARAN DERAJAT DISMENORE DAN UPAYA PENANGANANNYA PADA

SISWI SEKOLAH MENENGAH KEJURUAN ARJUNA DEPOK JAWA BARAT," UNIVERSITAS ISLAM NEGERI SYARIF HIDAYATULLAH JAKARTA, 2012.

[14] Mansjoer, *Kapita Selekta Kedokteran*, Jilid 1 ed. Jakarta: Media Aesculapius FKUI. 2000, 2001.

[15] R. S. Wahyuni and W. Oktaviani, "Hubungan Indeks Massa Tubuh dengan Dismenore pada Remaja Putri SMP PGRI Pekanbaru," *J. Endur.*, vol. 3, no. 3, p. 618, 2018.

[16] Y. Andriani and L. Khusnul, "Hubungan Indeks Massa Tubuh, Tingkat Stress, Dan Aktivitas Fisik Dengan Tingkat Dismenore Pada Mahasiswa Diii Kebidanan Semester Ii Stikes 'Aisyiyah Yogyakarta," 2015.

[17] S. Saadah, "Hubungan Aktivitas Fisik dengan Dismenore pada Mahasiswi Program Studi Ilmu Keolahragaan," Universitas Pendidikan Indonesia, 2014.

[18] N. Fajaryati, "Hubungan Kebiasaan Olahraga Dengan Dismenore Primer Remaja Putri Di Smp N 2 Mirit Kebumen," vol. 3, p. 1, 2012.

[19] R. Irmawati, "HUBUNGAN ANTARA PENGETAHUAN DAN SIKAP TENTANG KESEHATAN REPRODUKSI DENGAN KEJADIAN DISMENORE PADA REMAJA PUTRI (DI SMK MUHAMADIYAH I KAB. SRAGEN)," 2010.

[20] E. P. N. Purba, S. Rompas, and M. Karundeng, "Hubungan Pengetahuan Dengan Perilaku Penanganan Dismenore Di Sma Negeri 7 Manado," *J. Keperawatan*, vol. Vol 2, no. No 2, pp. 17–17, 2014.

[21] P. Hamilton, *Dasar-dasar keperawatan maternitas*. EGC, 1995.

[22] M. Azrida, A. S. Suchi, and T. Halida, "Kejadian Dismenorhoe Pada Mahasiswi Dengan Anemia," vol. 1, no. 3, pp. 179–185, 2018.

[23] N. Aziza and N. Nurlaila, "Dismenorhea Pada Mahasiswa Anemia Di Prodi Kebidanan Poltekkes Kemenkes Tanjungkarang," *J. Ilm. Keperawatan Sai Betik*, vol. 9, no. 1, pp. 1–4, 2017.

[24] R. D. Susanti, N. W. Utami, and L. Lasri, "HUBUNGAN NYERI HAID (DYSMENORRHEA) DENGAN AKTIVITAS BELAJAR PADA REMAJA PUTRI MTs MUHAMMADIYAH 2 MALANG Rosi," *Nurs. News (Meriden).*, vol. 4, no. Volume 3, Nomor 1, pp. 144–152, 2019.