

STRESS AFFECT DYSMENORRHEA ON FEMALE ABDOMINAL OBESITYTri Agustina¹, Adelia Restuningtyas², Em Sutrisna³^{1,2&3} Faculty of Medicine, Universitas Muhammadiyah Surakarta**ABSTRACT**

Dysmenorrhea is pain caused by uterine cramps before and during menstruation. One of the causes of dysmenorrhea is stress which can interfere the work of the endocrine system. Excessive adipose tissue, especially in the middle of the body, is also a risk factor for dysmenorrhea which will disrupt the balance of steroid hormones because the increase in estrogen produced by adipose tissue will increase prostaglandin. The purpose of the study was to find out the relationship between stress levels and waist circumference with dysmenorrhea in female students of Nutrition Science Study Program Faculty of Medical Science Muhammadiyah University of Surakarta. This study used a cross-sectional study design and was held in the Surakarta. The research subjects were 97 respondents taken by purposive sampling technique. Collecting stress level data using the questionnaire Depression Anxiety Stress Scale (DASS), waist circumference data using mitline, data on dysmenorrhea using the Menstrual Symptoms Questionnaire (MSQ). Bivariate test analysis using Chi-Square test and multivariate test analysis using logistic regression test. The results of the chi square test showed significant relationship between stress levels and dysmenorrhea ($p=0.002$). The relationship between waist circumference and dysmenorrhea showed that there was no significant results ($p=0.872$). The results of the logistic regression test showed that there was a significant relationship between stress levels and dysmenorrhea ($p = 0.002$) and there was no significant relationship between waist circumference and dysmenorrhea ($p = 0.891$). Stress levels are significantly associated with dysmenorrhea and waist circumference is not significantly associated with dysmenorrhea.

Keywords: stress levels, waist circumference, dysmenorrhea**No: of Tables: 02****No: of References:16**

INTRODUCTION

Dysmenorrhea is pain caused by uterine cramps before and during menstruation (Kazama *et al.*, 2015). The characteristic of this pain is very distinctive because it appears regularly and periodically accompanying menstruation, namely discomfort in the lower abdomen before and during menstruation. This pain is sometimes accompanied by nausea that causes uterine contractions (Pratiwi & Rodiani, 2015). Primary dysmenorrhea affects more than 50% of women in the world who suffer from dysmenorrhea and 10-20% of cases with severe symptoms (Berkley, 2013). The incidence of dysmenorrhea in Indonesia is 64.25% which consists of 54.89% of primary dysmenorrhea and 9.36% of secondary dysmenorrhea (Larasati & Alatas, 2016). The prevalence of dysmenorrhea in adolescents in Surakarta is 87.7% (Handayani *et al.*, 2013).

Psychological factors become one of the causes of dysmenorrhea including stress. Stress is a subjective experience that is based on someone's perception of the situation they are facing. Events that are considered to oppose views of oneself and cannot be controlled tend to be felt as stress (Priyoto, 2014). Around 1.33 million people in Indonesia are estimated to experience stress (Legiran *et al.*, 2015). Stress can interfere with the work of the endocrine system so that it can cause irregular periods and pain during menstruation or dysmenorrhea (Ismail *et al.*, 2015). Research conducted by Sari (2015) shows that 94% of respondents experiencing stress also experience dysmenorrhea, whereas in

the study of Prabin *et al.* (2017) showed no significant relationship between stress and dysmenorrhea events with a value of $p > 0,05$. Overweight or overweight is also a risk factor for dysmenorrhea. High fat content around the stomach illustrates the risk of obesity. Waist circumference shows a person's stored fat. Weight gain, especially an increase in fat tissue in the central area of the body disrupts the balance of steroid hormones including androgens, estrogens, and Sex Hormone Binding Globulin (SHBG) which will increase estrogen release and increase prostaglandin levels so that it can cause dysmenorrhea (Rad *et al.*, 2018). Research conducted by Mostafa *et al.* (2018) found a significant relationship between abnormal waist circumference and dysmenorrhea. Research conducted by Pakniat *et al.* (2018) found that waist circumference did not have a significant relationship with dysmenorrhea with a value of $p = 0.938$.

This study aims to look at the effect of stress and waist circumference on dysmenorrhea in Surakarta City. Factors that are more influential on the incidence of dysmenorrhea are also examined in this study.

METHODS

This study uses an observational analytic research design with a cross sectional study approach. The study was conducted in the city of Surakarta involving 97 female respondents aged between 18-22 years. The research subjects were unmarried students. The instruments used in this study were

informed consent sheets, Menstrual Symptom Questionnaire (MSQ) which contained 25 questions and Depression Anxiety Stress Scale (DASS) which

contained 42 questions to measure stress levels. Measurement of waist circumference was carried out by researchers in accordance with the guidelines using a mitline measurement tool. Waist circumference is noted as obesity if more than 80 cm.

The analysis used in this study was Chi-Square to test the two variables and the logistic regression test was used to look at multivariate variables.

RESULT

The results of the study of 97 subjects are shown in table 1. This study shows that the level of stress affects the incidence of dysmenorrhoea with a value of $p = 0.003$. While waist circumference had no effect on dysmenorrhoea occurrence ($p = 0.872$). Subjects who experienced stress were recorded 64 people, 30 people experienced mild stress and the rest moderate to severe stress. Subjects who had obese waist circumference were recorded 25 people and the rest did not experience abdominal obesity. Data showed the results of data analysis of 97 respondents studied.



Table 1. Dysmenorrhea in Stress Level and Abdominal Obesity

	Dysmenorrhea		<i>p value</i>
	Yes	No	
	n (%)	n (%)	
Stress level			0,003
No stress	6 (18,2%)	27 (81,8%)	
Mild stress	2 (6,7%)	28 (93,3%)	
Average Severe Stress	14 (41,2%)	20 (58,8%)	
Waist Circle			0,872
No abdominal obesity	16 (21,6%)	58 (78,4%)	
Abdominal obesity	6 (26,1%)	17 (73,9%)	

The logistic regression test results show that stress is more influential on the incidence of dysmenorrhea. People who experience stress have 4.8 times more chance of suffering from dysmenorrhea than those without stress. Waist circumference also has a role in the

incidence of dysmenorrhea seen from statistical trends. People who have abdominal obesity have 1,084 times the potential to suffer from dysmenorrhea compared to those who are not obese. Logistic regression test results can be seen in table 2.

Table 2. Result of Regression Logistic Test

Variable	Dysmenorrhea				<i>p value</i>	OR	95% CI		
	Dysmenorrhea		No dysmenorrhea				Lower	Upper	
	n	%	n	%					
Waist Circle	No abdominal obesity	16	21,6%	58	78,4%	0,891	1,084	0,343	3,424
	Abdominal obesity	6	26,1%	17	73,9%				
Stress	Mild	8	12,7%	55	87,3%	0,002	4,813	1,756	13,190
	Severe	14	41,2%	20	58,8%				

DISCUSSION

Stress can reduce resistance to pain. The body will produce excessive hormones estrogen and prostaglandin in people who experience stress. These estrogens and prostaglandins can cause excessive increase in uterine contractions resulting in menstrual pain. The hormone adrenaline also increases and causes the muscles of the body to tense up including

the uterine muscles and cause pain during menstruation. An increase in stress level can increase sympathetic nerve

activity which causes an increase in menstrual pain with an increase in uterine contractions (Sari, 2015). Stress causes Corticotrophin Releasing Hormone (CRH) which is the main hypothalamic regulator to stimulate the secretion of

Adrenocorticotrophic Hormone (ACTH). ACTH increases adrenal cortisol secretion. These hormones cause the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH) are inhibited so that the development of follicles is disrupted. This causes the disruption of progesterone synthesis and release. Low progesterone levels increase prostaglandin F2a and E2 synthesis which cause menstrual pain (Sherwood, 2012).

The results of this study are consistent with research conducted by Sari (2015) which states there is a relationship between stress levels and the incidence of dysmenorrhea, which is 94% of respondents who experience stress also experience primary dysmenorrhea. Pramanik *et al.* (2010) also stated that there was a relationship between psychological stress and dysmenorrhea and the same results were obtained in the study of Maryam *et al.* (2016) which states the level of stress can cause the occurrence of dysmenorrhea with a value of $p = 0.033$.

Waist circumference is not statistically related to the incidence of dysmenorrhea. Trends in research results indicate a relationship between waist circumference and the incidence of dysmenorrhea, but not significant. The greater the waist circumference, the higher the risk of dysmenorrhea.

Excess adipose tissue, especially in the abdomen can affect the metabolism of steroid hormones including estrogen which will increase prostaglandin levels. Increased prostaglandin levels will increase contractions and pressure in the uterus which causes a lack of blood flow

in the uterus and causes dysmenorrhea. The more adipose tissue, the more steroid hormones produced, so the more obese a person, the greater the risk of dysmenorrhea.

CONCLUSION

Stress levels are statistically proven to cause dysmenorrhea in Surakarta. The higher the level of stress a person has, the higher the risk of dysmenorrhea. While waist circumference is not statistically proven to be associated with the incidence of dysmenorrhea, but the trend data in this study indicate that people with central obesity are at greater risk of the incidence of dysmenorrhea.

REFERENCES

- Berkley, K. J.**, 2013. Primary Dysmenorrhea: An Urgent Mandate. *International Association for the Study of Pain*, pp. 1-8.
- Handayani, Gamayanti, I. L. & Julia, M.**, 2013. Dismenore dan Kecemasan pada Remaja. *Sari Pediatri*, 15(1), pp. 27-31.
- Ismail, I. F., Kundre, R. & Lolong, J.**, 2015. Hubungan Tingkat Stres Dengan Kejadian Dismenorea pada Mahasiswi Semester VIII Program Studi Ilmu Keperawatan Fakultas Kedokteran Universitas Sam Ratulangi Manado. *ejournal Keperawatan*, 3(2).
- Kazama, M., Maruyama, K. & Nakamura, K.**, 2015. Prevalence of Dysmenorrhea and Its Correlating Lifestyle Factors in Japanese Female Junior High School Students. *Tohoku J. Exp. Med.*, 236(2), pp. 107-113.

Larasati, T. A. & Alatas, F., 2016. Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja. *Majority*, Volume 5, pp. 79-84.

Legiran, Azis, M. Z. & Bellinawati, N., 2015. Faktor Risiko Stres dan Perbedaannya pada Mahasiswa Berbagai Angkatan di Fakultas Kedokteran Universitas Muhammadiyah Palembang. *Jurnal Kedokteran dan Kesehatan*, 2(2), pp. 197-202.

Mostafa, R., Torkamannejed, MS., Rastaghi, S., Mohebbi, ZD. 2018. The Relationship between Anthropometric Index and Primary Dysmenoehea in Female High School Students. *Journal of Education and Health Promotion*. Vol.7:34.

Maryam., Amarullah MR., Istriati. 2016. Relationship between Menstrual Profile and Psychological Stress with Dysmenorrhea. *Atthea Medical Journal*. Vol.3:3. P: 382-7

Pakniat, H., Jahanian, S., Hemmati, N. & Ranjkesh, F., 2018. The Association of Anthropometric Indices with Dysmenorrhea in High School Students: A Cross-Sectional Study. *International Journal of School Health*, 6(1), pp. 1-6.

Pramanik, T., Shrestha, R., Sherpa, MT., Adhikari, P. 2010. Incidence of

Dysmenorrhoea Associated with High Stress Scores among The Undergraduate Nepalese Medical Students. *Journal of Institute of Medicine*, Vol 32:3, P: 2-4

Pratiwi, H. & Rodiani, 2015. Obesitas sebagai Resiko Pemberat Dismenore pada Remaja. *Majority*, 4(9), pp. 93-97.

Priyoto, 2014. *Konsep Manajemen Stress*. 1 ed. Yogyakarta: Nuha Medika.

Prabin, KK., Chandra, RK., Sushil, K., Gita, K. 2017. Dysmenorrhea and its association with stress among female students of Kathmandu Medical College. *Indian Journal of Basic and Applied Medical Research*, Vol.6, Issue-3, P.554-8

Rad, M., Sabzevari, M. T., Rastaghi, S. & Dehnavi, Z. M., 2018. The Relationship Between Anthropometric Index and Primary Dysmenorehea in Female High School Students. *Journal of Education and Health Promotion*, Volume 7, pp. 1-6.

Sari, D., Nurdin, A. E. & Defrin, 2015. Hubungan Stres dengan Kejadian Dismenore Primer pada Mahasiswi Pendidikan Dokter Fakultas Kedokteran Universitas Andalas. *Jurnal Kesehatan Andalas*, 4(2), pp. 567-570.

Sherwood, L., 2012. *Fisiologi Manusia Dari Sel ke Sistem*. 8 ed. Jakarta: EGC.