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The Relationship Between Body Mass Index with Menstrual Pain Scale at Senior High School 9 Padang

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ABSTRACT

There are many changes that occur in adolescence. One of the most prominent is the occurrence of menstruation in adolescents. Menstruation is generally accompanied by pain in the lower abdomen and hips. At Senior High School (SHS) 9 Padang, it was found that 76.4% of young women experienced menstrual pain. The scale of menstrual pain varies in intensity for each person. One thing that influences menstrual pain is Body Mass Index (BMI). Therefore, it necessary to analyze there was a relationship between BMI and the menstrual pain scale. This research is a quantitative study with a cross sectional design. The population was all female adolescents at SHS 9 Padang with a total sample 79 people taken by multistage random sampling. Data analysis used the chi square test using SPSS. The results showed that 71.4% of adolescents with an underweight BMI had a moderate menstrual pain scale and 37.1% an overweight BMI had a heavy menstrual pain scale. There is a relationship between Body Mass Index (BMI) and the menstrual pain scale in adolescents at Senior High School 9 Padang (p=0.00).

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Introduction

Adolescence is a period where a person experiences a rapid process or change towards adulthood. Various changes that occur during adolescence include changes in physical, cognitive and psychosocial development (AIPGI & PERSAGI, 2016). A significant change between men and women is the occurrence of menstruation in women. One of the physiological processes in women, known as menstruation, is a natural event that occurs repeatedly in certain cycles which is influenced by reproductive hormones. When menstruation occurs, there is periodic bleeding that occurs due to the shedding of the uterine lining due to the absence of fertilization of the egg by sperm (Sinaga et al., 2017). Menstruation is often accompanied by significant pain or tenderness. Menstrual pain is called dysmenorrhea.

Dysmenorrhea or menstrual pain is a cramping feeling in the lower abdomen to the hips which can vary in intensity (Ammar, 2016). Menstrual pain or dysmenorrhea can be classified into two types, namely primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is menstrual pain that occurs without obvious abnormalities in the reproductive organs, while secondary dysmenorrhea is caused by gynecological problems (Sari et al., 2017).

Before menstruation there is a decrease in progesterone hormone levels which causes the endometrium to shed which causes menstruation (Ryan, 2017). Low progesterone hormone causes fatty acids that accumulate in phospholipids, such as omega-6 fatty acids and arachidonic acid, to be released, thereby producing prostaglandins. Prostaglandins cause vasoconstriction and increase uterine contractions, so this condition causes menstrual pain (Barcikowska et al., 2020).

The menstrual pain scale is classified into three levels. Mild pain is that which can be tolerated and lasts for a while and can still continue working, pain on a scale of 1-4, moderate pain is feeling pain with a groaning response, pressing on the painful part, painkillers are needed and you can still continue working, pain scale 5-6, and severe pain, namely feeling unbearable pain so that you are unable to work and need rest, generally accompanied by headaches, nausea, vomiting and fainting, pain scale 7-10 (Astrida Rakhma, 2012).

From World Health Organization (WHO) data, it is known that the incidence of menstrual pain or dysmenorrhea in women in the world is 1,769,425 people (90%) with 10 - 15% of them experiencing severe menstrual pain (Hailemeskel et al., 2016). In Indonesia, a study found that 64.25% of menstrual pain or dysmenorrhea problems occurred (Herdianti et al., 2019). A preliminary study conducted at SHS 9 Padang found that as many as 76.4% of female adolescents experienced menstrual pain.

Menstrual pain can be bad if it is allowed to continue. One of them is that adolescents who experience moderate to severe menstrual pain can cause 60 - 90% of them to interfere with their daily activities (Riyanti & Widia, 2019).

Menstrual pain is affected by several risk factors, one of which is an abnormal body mass index (BMI) (Larasati & Alatas, 2016). Based on research conducted by (Octorika et al., 2020), it is known that there is a significant relationship between body mass index and the dysmenorrhoea pain scale at SMA Negeri 2 Kampar. Apart from that, it was also found that there was a weak positive relationship between Body Mass Index (BMI) and menstrual pain in PSSKPN students class of 2017 at FK UNUD ($p < 0.05$) (Julianti et al., 2021). Differences in nutritional status can influence the dysmenorrhea pain felt. Women of childbearing age need good nutrition during menstruation, especially during the luteal phase. In this phase, there is an increase in nutritional needs (Pratiwi & Rodiani, 2015).

A preliminary study conducted at Senior Hight School (SHS) 9 Padang found that as many as 76.4% of female adolescents experienced menstrual pain. Based on this background and preliminary study, it is necessary to carry out research to determine whether there is a relationship between body mass index (BMI) and the menstrual pain scale in young women at Senior Hight School (SHS) 9 Padang.

Method

This research is a quantitative study with a cross sectional design. This study looked at the relationship between body mass index and the scale of menstrual pain experienced by young women. This research was carried out at Senior Hight School (SHS) 9 Padang from April to May 2021.

The population in this study were all female adolescents registered at Senior Hight School (SHS) 9 Padang. The sample consisted of 79 people taken by multistage random sampling. Inclusion criteria were being healthy, menstruating regularly for the last 6 months, having normal menstrual duration. Exclusion criteria were teenagers who took analgesic drugs during menstrual pain and experienced pain in the last 1 week from the day of the study. Body Mass Index (BMI) data was obtained by measuring body weight using a weight scale and measuring body height using a microscope directly on the sample. Data related to the menstrual pain scale was obtained by conducting a questionnaire interview using the Numeric Rating Scale (NRS). Next, the data was analyzed using the chi square test.

Results

Table 1. Frequency Distribution of Body Mass Index and Menstrual Pain Scale for Adolescents at Senior Hight School 9 Padang

Variabel	n	%
BMI		
Underweight	17	22.7
Normal	46	61.3
Overweight	12	16
Menstrual Pain Scale		
Mild Pain	20	26.7
Moderate Pain	28	37.3
Severe Pain	27	36
Amount	79	10

Based on table 1, it is known that 22.7% of respondents had an underweight body mass index and 16% had an overweight body mass index. The most menstrual pain scale experienced by respondents was moderate pain at 37.3%.

Table 2. Relationship between Body Mass Index and Menstrual Pain Scale at Senior High School 9 Padang

BMI	Menstrual Pain Scale						P
	Mild Pain		Rate Pain		Severe Pain		
	n	%	n	%	n	%	
Underweight	18	90	20	71.4	8	29.7	
Normal	2	10	6	21.4	9	33.3	0.000
Overweight	0	0	2	7.2	10	37.1	

Based on table 2, it can be seen that 71.4% of adolescents with an underweight BMI have a menstrual pain scale in the moderate category and 37.1% of adolescents with an overweight BMI have a menstrual pain scale in the heavy category. Based on the results of statistical tests, it was found that there was a relationship between body mass index and the menstrual pain scale in adolescents at Senior High School (SHS) 9 Padang ($p = 0.00$).

Discussion

Menstrual pain can disrupt daily activities. The negative impacts of menstrual pain include increased work absence, increased school absence, limited socialization and higher consumption of sedatives (Gulzar et al., 2015). In adolescents, disorders caused by menstrual pain in adolescents usually consist of not going to school, causing them to miss out on lessons which will have an impact on reducing achievement at school (Dhava, 2021).

Based on the results of this study, it was found that there was a relationship between body mass index (BMI) and the menstrual pain scale in female adolescents. These results are in line with research conducted by (Dhava, 2021) which states that adolescents with an abnormal BMI (underweight and overweight) tend to be at risk of experiencing more severe menstrual pain than adolescents who have a normal BMI. Research (Ju et al., 2015) states that women who have an underweight BMI have a 1.34 times risk and an overweight BMI have a 1.22 times risk of experiencing menstrual pain or dysmenorrhoea. Furthermore, research (Julianti et al., 2021) states that the higher the BMI, the more severe the scale of menstrual pain felt. Research conducted in India showed that as many as 80% of adolescent girls with moderate to severe pain scales had a BMI < 16.5 (Madhubala & Jyoti, 2012).

Nutritional status depends on the needs of each individual. Implementing the wrong diet generally causes adolescents to have nutritional problems, one of which is a low BMI or being underweight (Octavia & Iryawan, 2017). The condition of adolescents with BMI has less effect on ovarian function, where ovarian function is less than optimal, making them more susceptible to pain during menstruation (Ju et al., 2015). In general, people with an underweight BMI have a lower immune system due to a lack of intake to protect the body's health, so they tend to

feel sick more easily compared to people with a normal BMI (Manorek et al., 2014).

Furthermore, women who have an overweight BMI generally have excess fat stored in the body. High fat in the body will affect the production of the hormone estrogen so that it becomes more, which can cause hormonal imbalance. Imbalanced hormonal conditions in the body can affect the scale of menstrual pain (Karina et al., 2017). Furthermore, excess fat that accumulates in the body can also cause progesterone metabolism disorders which have the effect of increasing prostaglandin levels in the body. High levels of prostaglandins can cause increased contractions in the uterus, causing excessive pain during menstruation (Savitri et al., 2019).

Conclusion

Based on the results and discussion described above, it can be concluded that there is a relationship between body mass index (BMI) and the menstrual pain scale in adolescents at Senior High School 9 Padang ($p<0.05$). Therefore, researchers recommend that it needs to be done monitoring the nutritional status of adolescents and education about menstrual pain to reduce the incidence of menstrual pain which can have an impact on their learning achievement.

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Author Contribution and Competing Interest

The author's contribution to this research includes designing a research project, collecting data or analyzing results, and preparing or revising scientific papers.

References

AIPGI, & PERSAGI. (2016). *Ilmu Gizi Teori & Aplikasi* (M. Prof.Hardinsyah & M. I Dewa Nyoman Supariasa, Eds.). EGC.

Ammar, U. R. (2016). Faktor Risiko Dismenore Primer pada Wanita Usia Subur di Kelurahan Ploso Kecamatan Tambaksari Surabaya. *Jurnal Berkala Epidemiologi*, *4*(1), 37–49. https://doi.org/10.20473/jbe.v4i1.37-49

Astrida Rakhma. (2012). *Gambaran Derajat Nyeri Dismenore dan Upaya Penanganannya pada Siswi Sekolah Menengah Kejuruan Arjuna Depok Jawa Barat* [Skripsi]. Universitas Islam Negeri Syarif Hidayatullah.

Barcikowska, Z., Rajkowska-Labon, E., Grzybowska, M. E., Hansdorfer-Korzon, R., & Zorena, K. (2020). Inflammatory Markers in Dysmenorrhea and Therapeutic Options. In *International Journal of Environmental Research and Public Health* (Vol. 17, Issue 4). MDPI. https://doi.org/10.3390/ijerph17041191

Dhava, V. (2021). *Hubungan Indeks Massa Tubuh dengan Kejadian Dismenorea pada Mahasiswi di Prodi D-III Kebidanan Jurusan Kebidanan Poltekkes Kemenkes Kendari*.

Gulzar, S., Khan, S., Arif, S., Husain, S. S., Imran, H., & Sommer, J. (2015). Prevalence, Perceptions and Effects of Dysmenorrhea in School Going Female Adolescents of Karachi, Pakistan. *International Journal If Innovative Research & Development*, *4*(2), 236–240.

Hailemeskel, S., Demissie, A., & Assefa, N. (2016). Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: Evidence from female university students in Ethiopia. *International Journal of Women's Health*, *8*, 489–496. https://doi.org/10.2147/IJWH.S112768

Herdianti, K. A., Wardana, N. G., & Karmaya, I. N. M. (2019). Hubungan antara kebiasaan olahraga dengan dismenore primer pada mahasiswi pre-klinik Program Studi Pendidikan Dokter Fakultas Kedokteran Universitas Udayana tahun ajaran 2017. *Bali Anatomy Journal*, *2*(1), 25–29. https://doi.org/10.36675/baj.v2i1.23

Ju, H., Jones, M., & Mishra, G. D. (2015). A U-Shaped Relationship Between Body Mass Index and Dysmenorrhea: A Longitudinal Study. *PLOS ONE*, *10*(7), 1–12. https://doi.org/10.1371/journal.pone.0134187

Julianti, K. T. O., Devi, N. L. P. S., & Damayanti, M. R. (2021). Hubungan Indeks Masa Tubuh (IMT) Terhadap Nyeri Dismenore pada Mahasiswi Program Studi Sarjana Keperawatan dan Profesi Ners FK UNUD. *Community of Publishing In Nursing (COPING)*, *9*(6), 735–741.

Karina, E. S., Nuryanto, & Candra, A. (2017). Hubungan Obesitas Sentral dengan Siklus Menstruasi dan Dysmenorrhea Primer pada Remaja. *Journal of Nutrition College*, *6*(4), 319–325.

Larasati, T., & Alatas, F. (2016). Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja. *Majority*, *5*(3), 79–84.

Madhubala, C., & Jyoti, K. (2012). Relation between dysmenorrhea and body mass index in adolescents with rural versus urban variation. *Journal of Obstetrics and Gynecology of India*, *62*(4), 442–445. https://doi.org/10.1007/s13224-012-0171-7

Manorek, R., B.Purba, R., & Malonda, N. (2014). *Hubungan antara status gizi dengan kejadian dismenore pada siswi kelas XI SMA Negeri 1 Kawangkoan* [Karya Tulis Ilmiah]. Universitas Sam Ratulangi.

Octavia, G., & Iryawan, A. (2017). Relationship between Underweight and Primary Dysmenorrhea Occurrence in Senior High School Students in Surakarta. *Nexus Kedokteran Komunitas*, *6*(1), 12–23.

Oktorika, P., Indrawati, & Sudiarti, P. E. (2020). Hubungan Index Masa Tubuh (IMT) dengan Skala Nyeri Dismenorea pada Remaja Putri di SMA Negeri 2 Kampar. *Jurnal Ners*, *4*(2), 122–129.

Pratiwi, H., & Rodiani. (2015). Hani Pratiwi dan Rodiani | Obesitas sebagai Resiko Pemberat Disminore pada Remaja Majority. *Majority*, *4*(9), 93–97.

Riyanti, N., & Widia, A. (2019). Kejadian Dismenorea Berdasarkan Usia Menarche dan Riwayat Ibu Dismenorea pada Siswi Kelas X. *Babul Ilmi : Jurnal Ilmiah Multi Science Kesehatan* , *11*(1), 136–144.

Ryan, S. A. (2017). The Treatment of Dysmenorrhea. *Pediatric Clinics of North America*, *64*(2), 331–342. https://doi.org/10.1016/j.pcl.2016.11.004.

Sari, I. E. P., Rumini, & Mukarromah, S. B. (2017). Pengaruh Latihan Senam dan Daya Tahan Tubuh terhadap Respon Nyeri Haid (Dysmenorrhea). *Journal of Physical Education and Sports*, *6*(2), 165–171.

Savitri, N. P. W., Citrawathi, D. M., & Dewi, N. P. S. R. (2019). Hubungan Status Gizi dan Usia Menarche dengan Kejadian Dismenore Siswi SMP Negeri 2 Sawan. *Jurnal Pendidikan Biologi Undiksha*, *6*(2), 93–102.

Sinaga, E., Saribanon, N., Suprihatin, Sa'adah Nailus, Salamah, U., Murti, Y. A., Trisnamiati, A., & Lorita, S. (2017). *Manajemen Kesehatan Menstruasi*. Universitas Nasional.

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