

## **THE INFLUENCE OF NUTRITIONAL STATUS ON MENARCHE AGE IN 6TH GRADE ELEMENTARY SCHOOL STUDENT**

**Katrin Li Utari\*, Feva Tridiyawati**

STIKES Abdi Nusantara, Jl. Swadaya No. 7, Jatibening, Pd. Gede, Bekasi, West Java 17412, Indonesia

[\\*chaterinelie@gmail.com](mailto:chaterinelie@gmail.com)

### **ABSTRACT**

The decrease in the age of menarche to a younger age (early menarche) occurs in children at the age of less than 12 years. Young women who are not prepared to face menarche will experience many fears and worries, one of which is pain experienced during the first menstruation. One of the factors that affect early menarche is nutritional status because it can trigger the formation of hormones that cause secondary sexual development. The purpose of this study was to analyze the relationship between nutritional status reflected in the comparison of body weight and age with the incidence of early menarche. This study is a type of observational study with a case-control type design. The location used for this research is at SDN Suradita (Suradita elementary school) in June 2023. The sample was based on the ideal proportion of cases and controls, which was 1:1 with 20 female students who had early menarche and 20 female students who had not menarche. The bivariate analysis used is the Chi-Square test. The results of the chi-square analysis resulted in an odds ratio value (OR: 4.3; 95% Confident Interval 1.15 – 16.32; p value 0.028) it can be concluded that a child suffering from obesity is more at risk of early menarche up to 4 times than adolescents who have ideal body weight and are statistically significant

Keywords: children; nutritional status; menarche; obese

### **INTRODUCTION**

One of the signs of puberty in women is menarche. Menarche is the first menstruation experienced by women, which is physically characterized by the discharge of blood from the vagina due to the decay of the endometrial lining. Menarche occurs in the mid-pubertal period or which usually occurs 6 months after reaching the peak of the growth spurt. The age of menarche varies from individual to individual and region of residence. The age of menarche can be said to be normal if it occurs at the age of 12-14 years (Ramulya, 2022). Menstruation is the most crucial event during puberty in women as a biological sign of sexual maturity, so that various events occur including hormonal reactions, biological reactions and psychological reactions that occur cyclically and there is a periodic repetition of menstrual events. Nutritional status, genetics, environmental conditions, socioeconomic status and education are factors that can affect the age of menarche (Dian, 2022).

Improved living standards have an impact on decreasing the age of menarche to a younger age (early menarche). This early menarche condition is associated with precocious puberty that occurs in children less than 12 years of age.5 Based on the results of Basic Health Research in 2010, 5.2% of children in 17 provinces in Indonesia have entered the age of menarche under the age of 12 years. Indonesia itself ranks 15th out of 67 countries with a decrease in the age of menarche reaching 0.145 years per decade (Alam, 2021). Currently, the age of menarche children tends to be younger, starting at the age between 8 - 12 years. Many children who experience menarche too early have perception problems and poor readiness related to menstruation. Most young women are confused when getting their first menstruation because of their own perceptions, do not know how to adjust to the new atmosphere and new routine, namely the presence of menstruation, besides that there are many experiences passed by young women during their first menstruation. Young

women who do not have readiness to face menarche will experience many fears and worries, one of which is pain experienced during the first menstruation (Larasati, 2019).

Previous research showed that in the UK the average age of menarche was 13.1 years and in the Bundi tribe in Papua New Guinea the average age of menarche was 18.8 years. The results of Riskesdas show that based on the reports of respondents who have experienced menstruation, the average age of menarche in Indonesia is 13 years (20.0%) with an earlier incidence at the age of less than 9 years and some are later to 20 years and 7.9% do not answer / forget. There were 7.8% who reported not having a period. Nationally, the average age of menarche 13-14 years occurs in 37.5% of Indonesian children (Alam, 2021). Menarche is influenced by genetic factors as well as external factors such as weather, chronic diseases, sunlight, while unhealthy dietary factors, stress or psychological factors also play a role. In particular, menarche age is obtained earlier in obese children (more than 30% above normal weight for age). Some studies also mention that the age of menarche under 12 years is associated with the risk of breast cancer, abdominal obesity, insulin resistance, fat accumulation in adipose tissue, the risk of cardiovascular disease and hypertension. Meanwhile, delayed menarche is often caused by severe malnutrition (Alam, 2021).

Previous studies have reported that there is a relationship between nutritional status and the incidence of early menarche in elementary school students in Pati District, Pati Regency. Nutritional status in girls can affect the age of menarche, where better nutritional status can accelerate the arrival of menarche. Nutritional status affects the formation of secondary sexual development-causing hormones produced by the hypothalamus, pituitary and ovarian glands (Tyas, 2019). The main indicator that causes early menarche is gonadotropin releasing hormone which arises due to genetic factors and consumption of various foods (Lante, 2019). According to research (Adam, 2022) in elementary school students at SD Muhammadiyah GKB 1 Gresik, it shows that there is a relationship between body fat percentage and menarche age in adolescents. In this study, it can be concluded that the higher the percentage of fat a person, the earlier the age of menarche.

Based on a preliminary study at Suradita State Elementary School (SDN), information was obtained that out of 60 grade 6 students, it was reported that around 20 female students had experienced menarche. However, no research and analysis has been conducted related to the relationship between nutritional status and early menarche age that occurs in SDN Suradita students. Therefore, the author is interested in analyzing the relationship between nutritional status reflected in the comparison of weight and age with the incidence of early menarche in SDN Suradita students in 2023.

## **METHOD**

This study is a type of observational study with a case-control type design. The location used for this research is at SDN Suradita in June 2023. The samples used in this study used purposive sampling. Based on the ideal proportion of cases and controls, which is 1:1. In this study, 40 samples will be taken to be divided into 20 female students who have menarche and 20 female students who have not menarche. The bivariate analysis used in this study was to determine whether there was a relationship between nutritional status and menarche age in Suradita Elementary School students, namely the Chi-Square test.

## RESULT AND DISCUSSION

Table 1.  
 Cross-tabulation of nutritional status (obesity) with age Menarche

Nutritional Status	Age of Menarche		Early menarche	Percentage (%)	Total	Percentage
	Usual	Percentage (%)				
Usual	13	32.5	6	15	19	47.5
Obesity	7	17.5	14	35	21	52.5

Based on the results of cross-tabulation, it can be seen that 14 people (35%) with excessive nutritional status (obesity) experience menarche at an early age. While 13 (32.5) respondents who experienced normal menarche or had not experienced menstruation had normal nutritional status (did not experience obesity).

Table 2.  
 Chi-Square Analysis of the Effect of Nutritional Status (Obesity) on the Incidence of Early Menarche

Risk Estimate	Value	95% Confident Interval		P Value
		Lower	Upper	
Menarche Age Odds Ratio	4.3	1.15	16.32	0.028

Based on the results of the chi-square analysis, the odds ratio value (OR: 4.3; 95% Confident Interval 1.15 – 16.32; p value 0.028) can be concluded that a child who suffers from obesity is more at risk of early menarche up to 4 times than adolescents who have ideal body weight and statistically significant. These results are in line with research that adolescent girls who experience early menarche have the opportunity to increase the risk of experiencing early menarche. This is because the consumption of high-fat foods will result in the accumulation of fat in adipose tissue which is positively correlated with increased leptin levels. This leptin will trigger hormone production (Rahmawati, 2020) *Gonadotropin Releasing hormone* GnRH which further affects expenditure *Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH)* in stimulating follicular maturation and estrogen formation. (Rahmananda, 2020)

Several factors associated with early menarche are identified based on host factors, agent factors, and environmental factors. Host factors consist of maternal age menarche (genetic), agent factors consist of nutritional status and food consumption (animal protein consumption, vegetable protein consumption, fat consumption, fiber consumption and calcium consumption), while environmental factors consist of adult media exposure (pornography), sexual behavior and lifestyle (exercise, fastfood consumption, soft drink consumption). (Wulandari, 2020) Menarche is also influenced by internal factors and external factors. Internal factors include: a) Hormones, where there is an increase in the hormone estrogen can accelerate the maturation of the genital organs and appear sex characteristics in children, b) Genetics, when the onset of menarche is also mostly determined by patterns in the family. The relationship between menarchesame siblings is closer than between mother and daughter. External factors include: a) Nutrition, the better nutrition accelerates the age of menarche. Research says girls with more fat tissue develop menarche faster than thin children, b) Socio-economic, high social status and stable economic conditions will make children well-off. All needs will be met, such as the need for nutritious food and eventually nutritional status will improve, c) Mass media, strong external stimuli, for example in the form of sex films, reading books and sex picture magazines, temptation and stimulation from men, direct observation of

sexual acts will accelerate the emergence of menarche.(Winasis, 2023)(Makarimah, 2017)(Nugroho, 2016)

The impact of obesity causes metabolic, endocrine, cardiovascular, gastrointestinal, respiratory, neurologic, hematological, psychic, orthopedic and cancer disorders. Metabolic disorders in obesity will increase the risk of insulin resistance, type 2 diabetes and cardiovascular disease. Obesity can also cause early menarche, late menopause and even polycystic ovary syndrome. In particular, central obesity is also a risk factor for obstructive sleep apnea. Psychosocial problems that often arise in obesity such as lack of confidence, isolation from association and depression (Kosim, 2019)(Handayani, 2023) Excessive nutrition due to the combination of increased food intake and decreased energy used can lead to the expansion of fat tissue, increased size and number of fat cells, and increased infiltration of macrophages will result in increased release of free fatty acids, dysregulation of adipokine secretion from fat cells including adiponectin, leptin, resistin, and retinol *Binding Protein-4* (RBP4), and increased release of inflammatory cytokines from macrophages, tumors *Necrosis factor  $\alpha$*  (TNF $\alpha$ ) and *Interleukin 6* (IL-6). This dysregulation of adipokine secretion can cause side effects in a number of tissues including the hypothalamus, liver, skeletal muscle, pancreas and blood vessels which can lead to systemic insulin resistance which can increase the risk of metabolic syndrome, type 2 diabetes and cardiovascular disease.(Pratiwi, 2021)

## CONCLUSION

A child who is obese is more at risk of experiencing early menarche up to 4 times compared to a teenager who has an ideal weight and is statistically significant. This is because the accumulation of fat in obese children can trigger the maturation of follicular cells and trigger menstruation.

## REFERENCES

- Ramulya, A. M. (2022). Gambaran Pengalaman, Persepsi Dan Kesiapan Anak Dalam Menghadapi Menarche Dini Di Sd Min Banta-Bantaeng Kota Makassar. *Jimpk: Jurnal Ilmiah Mahasiswa & Penelitian Keperawatan*, 2(3), 302-308.
- Dian, R. (2022). Hubungan Status Gizi Dengan Kejadian Menarche Dini Pada Siswi Sekolah Dasar Di Wilayah Kerja Puskesmas Lubuk Kilangan Kota Padang . (Doctoral dissertation, Universitas Andalas).
- Alam, S. S. (2021). Hubungan Status Gizi dengan Usia Menarche pada Remaja Putri. *Jurnal Ilmu Kesehatan Masyarakat*, 10(03), 200-207.
- Larasati, N. S. (2019). Faktor-Faktor Yang Berhubungan Dengan Kejadian Menarche Dini Pada Siswi Smp Setia Negara Depok Tahun 2018. *Medika Respati: Jurnal Ilmiah Kesehatan*, 14(2), 143-149.
- Tyas, A. D. (2019). Hubungan Status Gizi Dengan Kejadian Menarche Dini Pada Siswi Sekolah Dasar Di Kecamatan Pati, Kabupaten Pati. *Jurnal Kesehatan Masyarakat (Undip)*, 7(4), 28-33.

- Adam, F. I. (2022). Relationship Between Body Mass Index (Bmi) And Age Of Menarche In Adolescent Girls At Mts Negeri 3 Gorontalo Regency. *Journal Health & Science: Gorontalo Journal Health and Science Community*, 6(3), 272-283.
- Rahmawati, L. (2020). Hubungan Obesitas Dan Pola Makan Dengan Kejadian Menarche Pada Remaja Putri Kelas 2 Di Sma Khadijah Surabaya . (Doctoral dissertation, Universitas Ciputra Surabaya).
- Rahmananda, T. &. (2020). Hubungan antara Indeks Massa Tubuh dengan Menarche dini pada Siswi SMPN 1 Sumber Kabupaten Cirebon usia 12-15 tahun. *Tarumanagara Medical Journal*, 2(1), 160-166.
- Wulandari, M. A. (2020). Hubungan Obesitas Sentral Terhadap Menarche Dini Pada Remaja Putri di SMP Negeri 3 Abiansemal: Relationship Between Central Obesity And Early Menarche in Teenagers at SMP Negeri 3 Abiansema. *Bali Medika Jurnal*, 7(2), 165-173.
- Nugroho, A. B. (2016). Hubungan Antara Asupan Zat Gizi Dan Status Gizi Dengan Kejadian Menarche Dini Pada Siswi Sd Negeri 2 Di Kota Bandar Lampung. *Jurnal Kesehatan*, 6(1).
- Makarimah, A. &. (2017). Status Gizi Dan Persen Lemak Tubuh Berhubungan Dengan Usia Menarche Anak Sekolah Dasar Di SD Muhammadiyah GKB 1 Gresik. *Media Gizi Indonesia*, 12(2), 191-198.
- Winasis, A. &. (2023). Obesitas dan Kanker Payudara: Literature Review. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 6(8), 1501-1508.
- Kosim, R. H. (2019). Status Gizi Dan Usia Menarche Sebagai Faktor Risiko Dismenorea Pada Remaja Putri Sman 19 Surabaya. *Indonesian Midwifery and Health Sciences Journal*, 3(3), 204-212.
- Handayani, A. M. (2023). Hubungan Usia Menarche Dengan Mioma Uteri Di Rs Sungai Kambang. *Midwifery Health Journal*, 8(1).
- Pratiwi, C. (2021). Analisis Kadar Interleukin 18 Serum Dan Laju Filtrasi Glomerulus Pada Obesitas Sentral Dan Non Obesitas Sentral . (Doctoral dissertation, Universitas Hasanuddin).

