



Growing Up Too Soon: Body Mass Index, Maternal History, And Media Exposure as Determinants of Early Menarche Among Female Adolescents

Feling Polwandari^{1*}, Nurlaela Inayah²

¹Universitas Faletchan, Indonesia

(Corresponding author: greenfeling21@gmail.com)

Abstract Early menarche is a significant phenomenon, as it is associated with various physical and psychological health risks, including obesity, hormonal disorders, anxiety, and an increased risk of breast cancer. The decline in age at menarche is also influenced by several factors, such as nutritional status, maternal history of early menarche, exposure to adult mass media, and family economic status. This study aimed to analyze the factors influencing the occurrence of early menarche among seventh-grade female adolescents at SMPN 1 Kramatwatu in 2025. A quantitative approach with a cross-sectional design was employed. The study sample comprised the entire population meeting the inclusion and exclusion criteria. Data were collected through questionnaires and analyzed using univariate and bivariate analysis with the chi-square test. The results showed significant associations ($p < 0.05$) between early menarche and body mass index (BMI), nutrition, maternal menarche history, exposure to adult mass media, and economic status. This study concludes that the factors associated with early menarche include BMI, nutritional patterns, genetic factors, exposure to adult media, and economic status.

Keywords: Early Menarche, Nutritional Status, Body Mass Index, Adult Media, Economic Status

INTRODUCTION

Early menarche is one of the significant events in female adolescent development, marking the maturation of reproductive organs earlier than expected—that is, before the age of 11 years. Adolescents who experience early menarche tend to face various physical and psychological problems, such as an increased risk of obesity, hormonal disorders, anxiety, and susceptibility to diseases such as breast and uterine cancer due to elevated estrogen levels [1–3]. Early menarche is also frequently associated with feelings of fear, confusion, and even shame or guilt, owing to a limited understanding of the process being experienced [3].

Adolescence is a transitional phase toward adulthood, marked by substantial physical, psychological, and social changes. During this period, adolescents are strongly influenced by their environment, peer relationships, and lifestyle, making particular attention to their health essential for holistic well-being [4]. Menarche that occurs prematurely may affect adolescents' psychological well-being, including their self-perception, identity formation, and future planning.

Globally, the prevalence of early menarche ranges from 11% to 30% [5]. In Indonesia, a 2018 report from the Ministry of Health recorded an average age at menarche of 9–12 years. According to data from RISKESDAS [6], the national average age at menarche is 13 years; however, a considerable number of adolescents experience menarche before the age of 9. Indonesia has also been recorded as a country with a decline in age at menarche of 0.145 years per decade, ranking 15th among 67 countries. Meanwhile, data from the Health Office indicate that in 2021, 50% of female adolescents had experienced menarche before the age of 11, reflecting an increasing incidence of early menarche [7].

Numerous factors may influence the occurrence of early menarche among adolescents. Genetic factors, for instance, indicate that adolescents whose mothers experienced menarche at a young age tend to experience the same. Maternal age at childbirth is also influential, as a younger maternal age is associated with a greater likelihood of early menarche in offspring [8]. In addition, nutritional status plays an important role. High-fat food consumption can increase body fat levels, which in turn stimulates leptin production. Elevated leptin levels stimulate the hypothalamus to release gonadotropin-releasing hormone (GnRH), which subsequently stimulates the production of follicle-stimulating hormone (FSH) and luteinizing hormone (LH), accelerating ovulation and ultimately triggering early menarche [9].

Exposure to adult media is also a significant external factor. Adolescents exposed to pornographic content through the internet or mass media tend to experience visual and auditory stimulation, which can activate hormonal systems in the brain that accelerate reproductive maturation [10]. Such exposure often goes unnoticed yet has a direct impact on adolescents' biological readiness.

Family socioeconomic status also contributes to the age at menarche. Families with good economic status have easier access to high-quality food, such as animal protein and saturated fat, which, when consumed in excess during early life, can accelerate the onset of menarche [11]. Meanwhile, environmental factors, fast-food consumption, nutritional status, genetics, and exposure to adult media are common contributors to early menarche [12].

Based on a preliminary study conducted by the author among 10 seventh-grade female students at SMPN 1 Kramatwatu, it was found that 6 students experienced menarche at the age of 9 and 3 at the age of 10. In terms of media exposure, two students frequently accessed romance-themed content through television dramas, chatted with members of the opposite sex, and read novels with sexual themes. Regarding nutritional status, 6 adolescents had a normal BMI, 1 was overweight, and 3 had a low BMI. With respect to genetic factors, 6 students had mothers who experienced menarche at age 12. In terms of economic status, 6 students came from families with an income above the regional minimum wage (UMK). Based on these findings, 60% of the adolescents in this preliminary study were found to have experienced early menarche.

These findings underscore the importance of further research into the factors influencing early menarche among adolescents, given that the trend toward an earlier age at menarche has been observed over the past 100 years. The author was therefore motivated to conduct a study entitled "Factors Influencing the Occurrence of Early Menarche Among Seventh-Grade Female Adolescents at SMPN 1 Kramatwatu in 2025."

METHODS

This study employed a quantitative approach with a cross-sectional design, which allowed the researcher to observe the relationships among variables at a single point in time. The study was conducted at SMPN 1 Kramatwatu, Serang Regency, from March to June 2025.

The population in this study consisted of all seventh-grade female students enrolled at SMPN 1 Kramatwatu, totaling 133 students. Because the population was relatively small and homogeneous, total sampling was used, whereby all members of the population who met the inclusion criteria were included as the study sample. Accordingly, the sample comprised 133 female adolescents from classes VII A and C through I.

The inclusion criteria were female adolescents registered as seventh-grade students at SMPN 1 Kramatwatu, present at the time of data collection, willing to participate as respondents after receiving an explanation and providing consent, and who had already experienced menstruation. The exclusion criteria included female adolescents whose mothers had passed away and those who had previously participated in the preliminary study conducted by the researcher, in order to avoid potential bias in completing the main questionnaire.

Data were collected using a questionnaire distributed directly to respondents with the assistance of homeroom teachers. The researcher first explained the purpose and procedures of

the study, then obtained consent from each respondent through an informed consent form prior to questionnaire completion. The data collected included information on age at menarche, nutritional status, maternal menarche history, exposure to adult mass media, family economic status, and dietary and nutritional intake patterns.

The dependent variable in this study was early menarche, categorized into two groups (0 = normal menarche, age at menstruation >11–15 years; 1 = early menarche, age at menstruation ≤11 years). The independent variables included: nutritional status based on BMI, classified into five categories (0 = severely underweight, 1 = underweight, 2 = normal, 3 = overweight, 4 = obese); maternal menarche history (0 = normal menarche, >12 years; 1 = early menarche, ≤12 years); exposure to adult mass media (0 = not exposed, score <1; 1 = exposed, score >1); economic status (0 = income below the regional minimum wage [UMK]; 1 = income above UMK); and nutrition (0 = nutritional needs not met, score 0–2; 1 = nutritional needs met, score 3–9). All variables were measured on an ordinal scale.

Data processing was carried out through several stages: editing, to check the completeness and clarity of the data; coding, to assign codes to respondents' answers; scoring, to assign values to each response; processing, to analyze the data using statistical software; and cleaning, to ensure the absence of duplicate or invalid data. Once the data were ready, univariate analysis was performed to determine the frequency distribution and percentage of each variable, and bivariate analysis was performed using the chi-square test at a significance level of 0.05 to examine the relationships between the independent and dependent variables.

This study obtained ethical approval from the Health Research Ethics Committee of the Faculty of Health Sciences, Universitas Faletahan, under approval number 002430/KEPK.UF/VI/2025. The entire research process adhered to research ethics principles, including voluntary informed consent, confidentiality of respondents' identities and responses, avoidance of harm (non-maleficence), and the assurance of justice and equal treatment for all respondents before, during, and after the study.

RESULTS AND DISCUSSION

1. Association Between Body Mass Index, Maternal Menarche History, Exposure to Adult Mass Media, Economic Status, and Nutrition with the Occurrence of Early Menarche Among Female Students at SMPN 1 Kramatwatu, 2025

Variable	n	%
Menarche		
Normal	35	25.5%
Early Menarche	102	74.5%
Body Mass Index		
Normal	71	51.8%
Severely Underweight	22	16.1%
Underweight	19	13.9%
Overweight	23	16.8%
Obese	2	1.5%
Maternal Menarche History		
Normal	45	32.8%
Early Menarche	92	67.2%
Exposure to Adult Mass Media		
Not Exposed	19	13.9%

Exposed	118	86.1%
Economic Status		
Below UMK	42	30.7%
Above UMK	95	69.3%
Nutrition		
Not Met	35	25.5%
Met	102	74.5%
Total	137	100%

Table 1. Distribution of Early Menarche, Body Mass Index, Maternal Menarche History, Exposure to Adult Mass Media, Economic Status, and Nutrition Among Female Students at SMPN 1 Kramatwatu 2025

Variable	Normal		Early Menarche		Total		P-value	OR
	n	%	n	%	n	%		
Body Mass Index								
Normal	13	18.3%	58	81.7%	71	100%	0.001	-
Severely Underweight	10	45.5%	12	54.5%	22	100%		
Underweight	10	52.6%	9	47.4%	19	100%		
Overweight	2	8.7%	21	91.3%	23	100%		
Obese	0	0%	2	100%	2	100%		
Maternal Menarche History								
Normal	17	37.8%	28	62.2%	45	100%	0.037	2.496
Early Menarche	18	19.6%	74	80.4%	92	100%		
Exposure to Adult Mass Media								
Not Exposed	10	52.6%	9	47.4%	19	100%	0.008	4.133
Exposed	25	21.2%	93	78.8%	118	100%		
Economic Status								
Below UMK	23	54.8%	19	45.2%	42	100%	0.000	8.373
Above UMK	12	12.6%	83	87.4%	95	100%		
Nutrition								
Not Met	17	48.6%	18	51.4%	35	100%	0.001	4.407
Met	18	17.6%	84	82.4%	102	100%		
Total	35	25.5%	102	74.5%	137	100%		

Table 2. Association Between Body Mass Index, Maternal Menarche History, Exposure to Adult Mass Media, and Nutrition with the Occurrence of Early Menarche Among Female Students at SMPN 1 Kramatwatu, 2025

The data presented in Table 1 show that, of the 137 respondents, the majority (102 respondents, 74.5%) experienced early menarche. A total of 23 respondents (16.8%) had excess nutritional status (overweight), 92 respondents (67.2%) had mothers with a history of early menarche, and 118 respondents (86.1%) were exposed to adult mass media. In addition, 95 respondents (69.3%)

came from families with an income above the regional minimum wage (UMK), and 102 respondents (74.5%) had adequate nutrition.

The data presented in Table 2 indicate significant associations between several variables and the occurrence of early menarche. Among respondents with excess nutritional status, 21 of 23 (91.3%) experienced early menarche ($p = 0.001$; OR = 6.333), indicating a 6.3-fold greater risk. Among respondents whose mothers had a history of early menarche, 74 of 92 (73.8%) also experienced early menarche ($p = 0.037$; OR = 2.496), indicating a 2.4-fold greater likelihood. Of the 118 respondents exposed to adult media, 93 (78.8%) experienced early menarche ($p = 0.008$; OR = 4.133), representing a 4.1-fold greater risk. Meanwhile, among the 102 respondents with adequate nutrition, 84 (82.4%) experienced early menarche ($p = 0.001$; OR = 4.407), indicating a 4.4-fold greater likelihood.

Bivariate analysis using the chi-square test for the association between Body Mass Index and early menarche showed that the majority of respondents with excess nutritional status (overweight) experienced early menarche, namely 21 of 23 respondents (91.3%), with a p -value of 0.001 and an OR of 6.333. This indicates that adolescents with a higher BMI are 6.3 times more likely to experience early menarche. This finding is consistent with previous research indicating that excess body weight can accelerate hormonal maturation through increased leptin and estrogen levels [13]. Other studies further support that a high BMI triggers earlier ovarian follicle maturation and ovulation, thereby accelerating menarche [14, 15]. According to the researcher's assumption, a high BMI reflects excess body fat that stimulates leptin secretion. Leptin then stimulates the hypothalamus to release GnRH, which subsequently activates the anterior pituitary to produce FSH and LH, triggering estrogen production and accelerating menarche.

Furthermore, a significant association was found between maternal menarche history and early menarche among respondents. A total of 74 of 92 respondents (73.8%) whose mothers had a history of early menarche also experienced early menarche, with $p = 0.037$ and an OR of 2.496. This indicates that adolescents whose mothers experienced early menarche are 2.4 times more likely to experience the same. Previous studies have noted that genetic factors strongly influence age at menarche [16, 17]. Inherited hormonal patterns, such as GnRH, FSH, and LH, may enable earlier sexual maturation in offspring. The researcher's assumption supports this finding, suggesting that genetic factors may activate the hypothalamic-pituitary system earlier, thereby accelerating the maturation of reproductive organs and the onset of menarche.

Exposure to adult mass media also showed a significant association with early menarche. A total of 93 of 118 respondents (78.8%) exposed to adult content experienced early menarche. The analysis showed $p = 0.008$ and an OR of 4.133, indicating that adolescents exposed to adult mass media are 4.1 times more likely to experience early menarche. This is consistent with previous research explaining that exposure to adult media can stimulate GnRH release through the limbic system, subsequently triggering FSH and LH secretion, which accelerates estrogen production and reproductive organ maturation [4]. Other studies also support that exposure to sexual media content triggers early sexual stress, which increases cortisol and pubertal hormone levels [18, 10]. The researcher's assumption suggests that sexual content in media triggers emotional arousal through the limbic system and prefrontal cortex, thereby accelerating the release of reproductive hormones and early menarche.

Economic status also showed a significant association: 83 of 95 respondents (87.4%) whose parents had an economic status above the regional minimum wage (UMK) predominantly experienced early menarche. The analysis showed $p = 0.000$ and an OR of 8.373, indicating that adolescents whose family economic status was above the UMK are 8.3 times more likely to experience early menarche. This is consistent with previous research explaining that higher economic status provides greater access to highly nutritious food, thereby increasing leptin levels and stimulating the hypothalamus to release GnRH. This subsequently triggers the anterior pituitary to secrete FSH and LH, accelerating estrogen and progesterone maturation and resulting in early menarche [19]. The researcher assumes that an economic status above the UMK triggers increased estrogen and progesterone levels, thereby accelerating the onset of menarche.

In addition, of the 102 respondents with adequate nutrition, 84 (82.4%) experienced early menarche, with $p = 0.001$ and an OR of 4.407. This indicates that adolescents with adequate nutrition are 4.4 times more likely to experience early menarche. This finding is consistent with other studies explaining that excess nutrition—particularly from calories, protein, and fat—increases body fat and stimulates leptin production [20]. Leptin influences the hypothalamus to release GnRH, which in turn increases FSH and LH levels, accelerating estrogen production and triggering sexual maturation. Higher economic status supports optimal nutritional intake, thereby increasing the likelihood of early menarche [19]. The researcher assumes that adequate nutrition leads to increased energy reserves and leptin production, which accelerates the maturation of the reproductive system, causing menarche to occur earlier.

2. Association Between Economic Status and Nutrition Among Female Students at SMPN 1 Kramatwatu, 2025

Economic Status	Not Met		Met		Total		P-value	OR
	n	%	n	%	n	%		
Below UMK	17	40.5%	25	59.5%	42	100%	0.014	2.909
Above UMK	18	18.9%	77	81.1%	95	100%		
Total	42	30.7%	102	74.5%	137	100%		

Table 3. Association Between Economic Status and Nutrition Among Female Students at SMPN 1 Kramatwatu, 2025

The data presented in Table 3 show that, of the 102 respondents with adequate nutrition, 77 (75.5%) came from families with an income above the UMK. Statistical testing showed $p = 0.014$ and an OR of 2.909 ($OR > 1$), indicating that adolescents from families with an income above the UMK had a 2.9-fold greater likelihood of having adequate nutrition.

Bivariate analysis using the chi-square test showed that, of the 102 respondents with adequate nutrition, the majority came from families with good economic status or an income above the UMK, namely 77 respondents (75.5%). Statistical testing showed $p = 0.014$ and an OR of 2.909, indicating that adolescents from families with good economic status are 2.9 times more likely to have adequate nutrition. This suggests that economic status may serve as an indirect factor influencing the occurrence of early menarche through the mechanism of nutritional fulfillment.

This finding is reinforced by previous research showing that the majority of respondents with normal nutritional status came from high-income families, whereas underweight nutritional status was more commonly found among low-income families. Sufficient and efficient nutrient intake results in optimal nutritional status, which, in the context of female adolescents, may trigger earlier menarche [21].

Other research has also found that children from families with high economic status tend to have adequate nutrition, which is associated with earlier sexual maturation. Good economic status provides access to nutritious food, health information, and medical services that support children's growth and development, including reproductive maturation. In that study, a p -value of 0.023 and an OR of 0.241 indicated that, although the OR was below 1, economic status remained an important factor through the pathway of nutritional adequacy [19].

According to the researcher's assumption, families with high economic status are able to provide nutritious food in sufficient portions and frequency, as well as access to health information and services. Increased nutrition leads to greater body fat mass, which subsequently increases leptin hormone production. Leptin signals the hypothalamus that the body's energy reserves are sufficient, thereby activating the hypothalamic–pituitary–ovarian (HPO) axis. Activation of this axis triggers GnRH secretion from the hypothalamus, which stimulates the release of FSH and LH from the pituitary gland. These hormones stimulate the ovaries to produce

estrogen, which accelerates the maturation of reproductive organs and ultimately triggers early menarche [19].

CONCLUSIONS

Based on the results of this study, the following conclusions were drawn:

The majority of seventh-grade female adolescents at SMPN 1 Kramatwatu in 2025 experienced early menarche. Most respondents also had a normal nutritional status, although a considerable proportion were overweight, had mothers with a history of early menarche, were exposed to adult mass media, had adequate nutritional intake, and came from families with an economic status above the regional minimum wage.

Body mass index, maternal menarche history, exposure to adult mass media, and nutritional adequacy were each found to be associated with the occurrence of early menarche. Adolescents with a higher BMI, a maternal history of early menarche, greater exposure to adult media, and adequate nutritional intake tended to experience menarche at an earlier age, suggesting that early menarche results from the interplay of nutritional, genetic, and environmental factors.

Economic status was associated with nutritional adequacy, in that adolescents from families with a better economic status more often had their nutritional needs met. This indicates that economic status influences the occurrence of early menarche indirectly, through its effect on the family's capacity to fulfill adolescents' nutritional needs.

Based on these findings, the following recommendations are proposed:

Schools, together with health care providers, are encouraged to provide reproductive health education to female adolescents and parents from an early age, particularly regarding nutrition, healthy body weight, and wise use of mass media, so that adolescents are better prepared to face menarche.

Parents are encouraged to monitor their children's nutritional intake and body weight, supervise their access to mass media and the internet, and openly discuss reproductive health topics, including the possibility of early menarche, especially for mothers with a history of early menarche themselves.

Local health authorities and schools are encouraged to develop and strengthen adolescent reproductive health promotion programs, including regular nutritional status screening, as a preventive measure against the adverse effects associated with early menarche.

Future researchers are encouraged to expand this study using a larger and more diverse sample, additional variables such as physical activity and family dietary patterns, and a longitudinal design, in order to gain a more comprehensive understanding of the factors influencing early menarche among adolescents.

ACKNOWLEDGMENTS

The authors would like to thank SMPN 1 Kramatwatu, Serang Regency, and all participating students for their cooperation during data collection, as well as Universitas Faletahan for its institutional and ethical support throughout this research.

REFERENCES

- [1] Arifin Ilham, M., Islamy, N., Hamidi, S., Dewi Puspita Sari, R., Lampung, U., Ir Soemantri Brojonegoro No, J., Meneng, G., & Rajabasa Kota Bandar Lampung, K. (2023). Gangguan Siklus Menstruasi Pada Remaja [Menstrual Cycle Disorders in Adolescents]. Retrieved from <http://jurnal.globalhealthsciencegroup.com/index.php/JPPP>.
- [2] Puspa Ningrum, Megawati, & Sri Ratna Rahayu, R. (2021). Determinan Kejadian Kanker Payudara pada Wanita Usia Subur (15–49 Tahun) [Determinants of Breast Cancer

Occurrence in Women of Reproductive Age (15–49 Years)]. IJPHN, 1(3). Retrieved from <http://journal.unnes.ac.id/sju/index.php/IJPHN>.

- [3]
- [4] Anita, S., Simanjuntak, Y. T., & Kebidanan Sari Mutiara Medan, A. (2018). The correlation between junk food consumption and age of menarche of elementary school student in Gedung Johor Medan. *Unnes Journal of Public Health*, 7(1). Retrieved from <http://journal.unnes.ac.id/sju/index.php/ujph>.
- [5] Eliza Trisnadewi, Irlah Rahma, Eka Putri Guslianan, Dasril Oktariyani, & Fernando Fenny. (2022). Faktor-Faktor Yang Berhubungan Dengan Kejadian Menarche Dini Pada Remaja Putri Di SMP Negeri 15 Padang [Factors Associated with the Occurrence of Early Menarche in Female Adolescents at SMP Negeri 15 Padang]. Retrieved from <https://jurnal.syedzasaintika.ac.id>.
- [6] WHO. (2023). Prevalensi Menarche Dini [Prevalence of Early Menarche].
- [7] RISKESDAS. (2021). Data Riskesdas [Basic Health Research Data].
- [8] Dinas Kesehatan [DINKES]. (2021). Data Dinkes [Health Office Data].
- [9] Mulyani, R. (2018). Hubungan Status Gizi Dan Riwayat Menarche Ibu Dengan Umur Menarche Pada Siswi SMP Di Bandar Lampung [The Relationship Between Nutritional Status and Maternal Menarche History with Age at Menarche in Female Junior High School Students in Bandar Lampung]. *Jurnal Ilmiah Keperawatan Sai Betik*, 14(2).
- [10] Nurhayati, R., & Purwandari, H. (2023). Frekuensi Konsumsi Junk Food Dengan Kejadian Menarche Dini Pada Remaja Putri [Frequency of Junk Food Consumption and the Occurrence of Early Menarche in Female Adolescents]. *Jurnal Kebidanan Midwifery*, 9(1), 51–62. <https://doi.org/10.21070/midwifery.v9i1.1674>
- [11] Velga Yazia. (2019). Hubungan Keterpaparan Media Massa Internet Dan Status Gizi Terhadap Usia Menarche Pada Siswi Kelas VII SMPN 22 Padang [The Relationship Between Internet Mass Media Exposure and Nutritional Status with Age at Menarche in Seventh-Grade Students of SMPN 22 Padang].
- [12] Rita, Mien, & Muh. Jasmin HKIB. (2022). Faktor-Faktor Yang Mempengaruhi Kejadian Early Menarche Di SDN 5 Oheo Kecamatan Oheo Kabupaten Konawe Utara [Factors Influencing the Occurrence of Early Menarche at SDN 5 Oheo, Oheo District, North Konawe Regency]. *Jurnal Kesehatan Marendeng*, 6(1), 65–79.
- [13] Larasati, N., Luh Desi Puspareni, N., Studi Ilmu Gizi, P., & Ilmu Kesehatan UPN, F. (2019). Faktor-Faktor Yang Berhubungan Dengan Kejadian Menarche Dini Pada Siswi SMP Setia Negara Depok Tahun 2018 [Factors Associated with the Occurrence of Early Menarche in Female Students of SMP Setia Negara Depok in 2018]. *Jurnal Medika Respati*, 14(2).
- [14] Amalia, S. H., Angraini, D. I., Mayasari, D., & Perdani, R. R. W. (2024). Faktor-faktor yang Memengaruhi Menarche Dini pada Remaja Perempuan [Factors Influencing Early Menarche in Adolescent Girls]. *Medula*, 14(12), 2236–2248.
- [15] Febriyanti, M. (2021). Hubungan Indeks Masa Tubuh dengan Usia Menarche di SDN 44 Kota Bima [The Relationship Between Body Mass Index and Age at Menarche at SDN 44 Bima City]. Retrieved from <http://journal.ahmareduc.or.id/index.php/AMHJ>.
- [16] Nurul Yuda Putra, R., & Amir, A. (2016). Hubungan Indeks Massa Tubuh (IMT) dengan Usia Menarche pada Siswi SMP Negeri 1 Padang [The Relationship Between Body Mass Index (BMI) and Age at Menarche in Female Students of SMP Negeri 1 Padang]. *Jurnal Kesehatan Andalas*, 5(3). Retrieved from <http://jurnal.fk.unand.ac.id>.
- [17] Kholifah, M. N. (2024). Faktor-Faktor Yang Berhubungan Dengan Kejadian Menarche Dini Pada Remaja Putri Di SMP Negeri 1 Winong [Factors Associated with the Occurrence of Early Menarche in Female Adolescents at SMP Negeri 1 Winong]. *NUTRIZIONE – Nutrition Research and Development Journal*, 4(1), 32–49. <https://doi.org/10.32807/jmu.v4i1.118>.
- [18] Yang, F.-F., Deng, B., Menarche, K., Wulandari, P., Aini, D. N., Astuti, S. W., Studi, P., Keperawatan, I., Widya, S., & Semarang, H. (2016). Faktor-Faktor Yang

- Berhubungan Dengan Kejadian Menarche Siswi Di SMPN 31 Semarang [Factors Associated with the Occurrence of Menarche in Female Students of SMPN 31 Semarang].
- [19] Lilis Yuliasari. (2016). Hubungan Paparan Media Dengan Usia Menarche Pada Siswi Kelas V Dan VI Di SD Muhammadiyah Wirobrajan 3 Yogyakarta [The Relationship Between Media Exposure and Age at Menarche in Fifth- and Sixth-Grade Students at SD Muhammadiyah Wirobrajan 3 Yogyakarta].
- [20] Hartatik, S., Rohaya, R., & Turiyani, T. (2022). Hubungan Status Gizi, Status Ekonomi dan Akses Media Informasi dengan Status Menarche pada Remaja di SMPN 8 OKU Tahun 2021 [The Relationship Between Nutritional Status, Economic Status, and Access to Information Media with Menarche Status in Adolescents at SMPN 8 OKU in 2021]. *Jurnal Ilmiah Universitas Batanghari Jambi*, 22(1), 55. <https://doi.org/10.33087/jiubj.v22i1.1741>.
- [21] Chandra, F., & Aisah, A. (2023). Hubungan Sosial Ekonomi Terhadap Status Gizi Remaja Putri di SMA Negeri 11 Kota Jambi [The Relationship Between Socioeconomic Status and Nutritional Status of Female Adolescents at SMA Negeri 11 Jambi City]. *Jurnal Akademika Baiturrahim Jambi*, 12(1), 188. <https://doi.org/10.36565/jab.v12i1.683>.