

The Relationship Between Age and Level of Knowledge About Menstruation and Readiness for Menarche in Grade IV - VI Female Students at Kertajaya Elementary School

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ABSTRACT

Introduction: Menarche, the first menstruation, often elicits mixed reactions. Its occurrence is influenced by age and knowledge. Age shapes cognitive development and thinking patterns, while knowledge about menstruation affects perception. Limited knowledge and a decreasing age of menarche can hinder readiness for this milestone.

Objectives: The purpose of this study is to determine the relationship between age and the level of knowledge about menstruation with readiness for menarche among fourth to sixth-grade students at SDN Kertajaya, Surabaya.

Methods: This observational analytic study uses a cross-sectional design with 63 fourth to sixth-grade pre-menarche students from SDN Kertajaya, Surabaya, selected via total sampling. Data were analyzed using Spearman's rho.

Results: The study revealed a significant relationship between age and readiness for menarche ($p = 0.003$). The proportion of girls ready for menarche increased with age: 62.5% (9-<10 years), 73.1% (10-<11 years), and 100% (11-<12 years). The negative correlation ($r = -0.364$) indicated that readiness for menarche improved with increasing age. Knowledge level also significantly influenced readiness for menarche ($p < 0.01$). Most girls with good knowledge were ready (94.3%), while no readiness was observed among those with fair or poor knowledge. The strong positive correlation ($r = 0.850$) showed that better knowledge was associated with higher readiness for menarche.

Conclusions: There is a relationship between age and readiness for menarche, and between the level of knowledge about menstruation and readiness for menarche among fourth to sixth-grade students at SDN Kertajaya.

Introduction

Adolescence is the transition from childhood to adulthood, generally occurring between the ages of 10 and 19. According to the (World Health Organization, 2023), this stage is distinct and significant due to the substantial changes that take place, including physical growth, cognitive development, social transformations, and rapid psychosocial shifts. These changes influence how adolescents think, feel, make decisions, and interact with the world around them. Girls are considered to have entered puberty when they experience menarche. Menarche, the first menstruation, typically occurs between the ages of 10 and 16, representing the middle phase of puberty or the early part of adolescence before transitioning into the reproductive phase. Menarche indicates the activation of the reproductive organs and the endocrine system in girls (Meizela, 2020).

Understanding menarcheal age and its influencing factors is crucial due to its significant impact on adolescent health, reproductive outcomes, and psychosocial well-being. Early or late menarche is linked to various health risks, including polycystic ovary syndrome (PCOS), obesity, and mental health issues such as anxiety and depression (Yoo, 2016). Additionally, the global trend of decreasing menarcheal age due to changing lifestyle and environmental factors raises public health concerns. This research is urgent in providing evidence-based strategies for health



education, policy formulation, and intervention programs aimed at promoting adolescent well-being. It also helps in guiding parents, educators, and healthcare providers in offering better support for young girls undergoing pubertal transitions.

The age of menarche in adolescent girls has increasingly gained public attention. Several studies indicate a decline in the age of menarche in both developed and developing countries. A national study in the United States revealed a decrease in the age of menarche from 12.75 years to 12.5 years. In Northern European countries, the age of menarche has notably dropped from 16-17 years to 13 years (Kedang & Erna Febriyanti, 2018). In Indonesia, the age of menarche has also shown a declining trend over the past four years, dropping by 1.21 years. Indonesia ranks 15th out of 67 countries in terms of the reduction in menarche age (Lutfi, 2016). (Ramraj et al., 2021) found that the average age of menarche in adolescent girls was 12.5 (± 1.42) years, compared to 14 (± 1.10) years in their mothers. According to data from the Ministry of Health Research and Development in 2019, the average age of menarche in Indonesian women has reached 12.96 years. In East Java Province, the distribution of menarcheal age shows that 36.5% of girls experience menarche at 13-14 years old, 2.3% at 9-10 years old, and 0.1% as early as 6-8 years old. Several factors influence the age of menarche, including nutritional status, illness, physical abnormalities, audiovisual exposure, social environment, genetics, and psychological factors. Early menarche warrants special attention due to its potential negative effects in the future. Other studies have also shown that menarche tends to occur earlier in urban areas than in rural areas.

Knowledge about menstruation is crucial for adolescent girls. Good knowledge and attitudes towards the bodily changes that occur can be key aspects of readiness for menstruation. The knowledge adolescent girls have about menstruation influences their perception of menarche. If their perception is positive, it will support their readiness for menarche. On the other hand, if they are unprepared, the consequences may include poor personal hygiene, which can increase the risk of urinary tract infections, menstrual disorders, or other complications. Menstrual readiness indicates that an individual has reached physical maturity, marked by the onset of menstruation.

The decreasing age of menarche among adolescent girls in Indonesia, which could have potential health implications, is a matter that warrants greater attention. Moreover, the insufficient knowledge about menstruation among these girls also influences their preparedness for menarche. Given this context, it is important to conduct research on the relationship between age, knowledge of menstruation, and readiness to experience menarche in adolescent girls. Therefore, this study aims to analyze the correlation between age, knowledge of menstruation, and readiness for menarche among adolescent girls in Indonesia. By examining these factors, the research seeks to identify how menstrual awareness influences preparedness for menarche and whether age plays a significant role in this process. The findings are expected to provide insights for developing effective health education programs and policy interventions to enhance menstrual literacy and ensure better support for young girls undergoing pubertal transitions.

Methods

This research employed a quantitative approach with a cross-sectional design to examine the relationship between age, menstruation knowledge, and readiness for menarche among adolescent girls at SDN Kertajaya, Surabaya. The study was conducted from July to August 2024, with a population of 109 female students and a sample of 63 female students from grades IV to VI who had not yet experienced menarche, selected through a total sampling method.



The data collection for this research was carried out over two months, from July to August 2024. The process involved administering surveys to the selected students to assess their knowledge of menstruation and their readiness for menarche. In addition, demographic information, including age, was collected to examine its relationship with the other variables. The students were informed about the study's purpose, and consent was obtained from both the school and the students' guardians before the data collection began. After the data was gathered, it was analyzed using both univariate and bivariate statistical methods. Univariate analysis focused on describing the distribution and percentages of each variable, while bivariate analysis explored the relationships between the independent variables (age and menstruation knowledge) and the dependent variable (readiness for menarche). The Spearman's rho test, supported by SPSS version 25.0, was used to measure the strength and direction of these relationships, with a significance level set at 0.05.

There are 2 questionnaires adapted from (Astuti, 2010), namely the knowledge level questionnaire, which shows that 23 items out of 23 questions regarding menstruation knowledge were valid because each item had a value greater than the r-table (0.361). The reliability test results for the questionnaire showed a value of 0.853, which is greater than 0.60. Then, the menarche readiness questionnaire indicated that 16 items out of 16 questions were valid because each item had a value greater than the r-table (0.361). The reliability test results for this questionnaire showed a value of 0.718, which is greater than 0.60.

Results

This study was conducted from July to August 2024 at SD Kertajaya (PUJA) Surabaya, located at Jl. Pucang Jajar No. 4-6, Kertajaya, Gubeng District, Surabaya City, East Java Province. The current principal of the school is Mr. Sutrisno. The school consists of 393 male students, 357 female students, 18 classrooms, 1 laboratory, 1 library, and 2 sanitation facilities.

Characteristics and General Data

This study was conducted on 63 fourth, fifth, and sixth-grade students of Kertajaya Elementary School who met the inclusion criteria. The research results yielded the following data.

Table 1 Frequency distribution of respondent characteristics based on class, information exposure, information sources, and parents' occupations.

| Karakteristik | Kategori | Frekuensi (N) | Persentase (%) |
|--------------------|--------------------|------------------|-------------------|
| Kelas | IV | 33 | 52,4 |
| | V | 25 | 39,7 |
| | VI | 5 | 7,9 |
| Paparan Informasi | Sudah | 32 | 50,8 |
| | Belum | 31 | 49,2 |
| Sumber Informasi | TV | 1 | 1,6 |
| | Koran/Majalah/Buku | 2 | 3,2 |
| | Orang Tua | 23 | 36,5 |
| | Guru | 3 | 4,8 |
| | Media Sosia | 3 | 4,8 |
| Pekerjaan Orangtua | Wiraswasta | 28 | 44,4 |
| | IRT | 21 | 33,3 |
| | Wirausaha | 6 | 9,5 |
| | ASN | 5 | 7,9 |
| | Dokter | 2 | 3,2 |
| | Bidan | 1 | 1,6 |



| | | |
|---------------|-----------|------------|
| Jumlah | 63 | 100 |
|---------------|-----------|------------|

Table 1 shows that the majority of respondents, 33 (52.4%), were fourth-grade students, followed by 25 (39.7%) fifth-grade students and 5 (7.9%) sixth-grade students. Exposure to information about menstruation/preparation for menarche was categorized into two groups: those who had received information and those who had not. A portion of the respondents, 32 (50.8%), had received information about menstruation/preparation for menarche, while 31 (49.2%) had not. Among the 32 respondents who had received information, the majority, 23 (36.5%), received it from their parents. Regarding parental occupations, the majority of respondents' parents, 28 (44.4%), were self-employed, followed by 21 (33.3%) who were homemakers, 6 (9.5%) who were entrepreneurs, 5 (7.9%) who were civil servants, 2 (3.2%) who were doctors, and 1 (1.6%) who was a midwife.

1. Age

Table 2 Frequency distribution of respondent characteristics by age.

| Usia | Frekuensi (N) | Persentase (%) |
|-----------------|---------------|----------------|
| 9 - < 10 Tahun | 16 | 25,4% |
| 10 - < 11 Tahun | 26 | 41,3% |
| 11 - < 12 Tahun | 21 | 33,3% |
| Jumlah | 63 | 100% |

Tabel 5.6 menunjukkan bahwa sebagian besar responden 16 (25,4%) berusia 9 - < 10 Tahun, 26 (25,4%) berusia 10 - < 11 tahun dan 21 (33,3%) berusia 11 - < 12 tahun.

2. Level of Knowledge About Menstruation

Table 3 Frequency distribution of of knowledge levels about menstruation

| Pengetahuan | Frekuensi (N) | Persentase (%) |
|-------------|---------------|----------------|
| Baik | 53 | 84,1% |
| Cukup | 8 | 12,7% |
| Kurang | 2 | 3,2% |
| Jumlah | 63 | 100% |

Table 3 shows that out of 63 respondents, consisting of 4th, 5th, and 6th-grade students, the majority have a good level of knowledge about menstruation, with 53 respondents (84.1%). Eight respondents (12.7%) have a moderate level of knowledge, and two respondents (3.2%) have a low level of knowledge.

3. Readiness for menarche

Table 4 Frequency distribution of readiness for menarche

| Kesiapan | Frekuensi (N) | Persentase (%) |
|------------|---------------|----------------|
| Siap | 50 | 79,4% |
| Tidak Siap | 13 | 20,6% |
| Jumlah | 63 | 100% |



Table 4 shows that the majority of respondents, 50 (79.4%), are prepared for menarche, while 13 (20.6%) are not prepared for menarche.

Discussion

The study shows that most respondents (41.3%) were 10 years old, which falls into the early adolescent category. Early adolescence is marked by rapid bodily changes that often cause difficulties in adjustment and the search for self-identity (Tim Penulis Poltekkes Depkes Jakarta, 2010). Age is a factor that influences a person's knowledge. A study in Sidoarjo found that age affects comprehension and thinking patterns, where older age leads to improved cognitive abilities and better knowledge (Agus Sulistyowati et al., 2017).

Class level plays an important role in supporting the success of the learning process. (Ridwan, 2021) study shows that the higher the class level, the more complex the learning materials, which helps enhance students' cognitive abilities. Conversely, students in lower grade levels generally use simpler and more structured learning methods. Therefore, advancing class levels significantly improves students' cognitive abilities.

Information, whether from mass media, books, or electronic media, provides valuable additional knowledge. (Notoatmodjo, 2011) stated that electronic media, such as television, radio, and video, can serve as effective sources of information on various issues, including reproductive and environmental health. This study found that 49.2% of respondents had not received information about menstruation, while 50.8% had received information, primarily from parents (36.5%). The more information sources one has, the better the knowledge acquired.

Parents' occupations influence the socio-economic aspects of the family, impacting access to education and health information. This study showed that most respondents' parents worked as entrepreneurs (44.4%) or housewives (33.3%). (Suharyati, 2017) found that socio-economic status, influenced by parents' occupations, significantly affects access to health information. Parents working in professional or managerial sectors tend to have better access to information resources, which supports their children in gaining knowledge about menstruation.

The Relationship Between Age and Readiness for Menarche

Age is closely related to reproductive potential and changes within an individual, such as entering puberty. Puberty is a period marked by specific developmental changes. On average, females enter puberty at the age of 12.5 years, while males begin at 14.5 years. Research shows that the majority of adolescent girls aged 9–11 years have not yet entered puberty. As a person ages, they experience more mature stages of physical growth and acquire more knowledge. Adolescents are more likely to absorb information from others, which can enhance their understanding (Putra et al., 2016).

Age influences the development of cognitive abilities and thinking patterns. As age increases, thinking patterns and problem-solving abilities mature. At this age, females will soon experience puberty and menarche (Blakemore & Mills, 2014). Technology and mass media also influence adolescents' knowledge, and the more experiences they have, the more knowledge they gain (Fathimi & Yenni Sasmita, 2020).

Based on the results of the statistical test presented in the table, a (p-value of 0.003) was obtained. This allows us to conclude that the p-value from the Contingency Coefficient is less than 0.05, indicating a relationship between age and readiness for menarche, research found that older age is positively correlated with readiness for menarche. Older children tend to be more prepared because they have received more information, while younger children are often less psychologically prepared. Umami Annisyah Nasution, (2022) study found a relationship between



age and readiness for menarche at SD Negeri Siabu. Among 11-12-year-olds, 5.3% were ready, while 72% of 12-13-year-olds were ready.

Kasim's (2022) study at SMP 1 Enrekang also showed that age is related to readiness for menarche, with 59% of 10-11-year-olds ready and 85% of 12-13-year-olds ready. (Fathimi & Yenni Sasmita, 2020) found that age influences readiness for menarche, with 94.1% of 11-12-year-olds being prepared. Older adolescents have more access to information, improving readiness. Theoretically, this research aligns with the theory stating that the younger a student is, the less prepared they are for menstruation. The first menstruation (menarche) is often seen as surprising for younger children, while those who are more mature and have received information about menarche are generally more prepared and do not perceive it as something to be feared (Acharya, 2018).

The Relationship Between Knowledge Level About Menstruation and Readiness for Menarche

The study shows that the majority of respondents have good knowledge about menstruation (94.3%). This knowledge is obtained through the five senses and plays an important role in shaping a person's actions (Notoatmodjo & Soekidjo, 2012). Most respondents (79.4%) are ready to face menarche, but 20.6% are not ready. Although most have good knowledge, some respondents are not ready due to environmental factors that consider menstruation a taboo. Age also affects readiness for menarche, as stated in the research by Jayanti & Purwanti, (2012). Adolescents with limited knowledge about menstruation often feel panicked, scared, and embarrassed when experiencing menarche. Mental readiness is crucial in facing menarche, and good knowledge can lead to a positive response to it (Simon et al., 2021). Formal education, social support, and access to information influence adolescents' readiness (Hennegan et al., 2022).

Statistical tests show a significant relationship between the level of knowledge about menstruation and readiness for menarche, with a (p-value < 0.01). The majority of respondents who are ready have good knowledge. Based on the questionnaire responses, respondents with adequate or poor knowledge held misconceptions about menstruation, such as reducing physical activity or avoiding medication when menstruation is painful. Adequate knowledge, when supported by experience, influences readiness in facing menarche.

The study aligns with (Afifah & Hastuti, 2016) who found a significant relationship between knowledge and readiness for menarche (p-value = 0.015), with 61.8% of respondents possessing good knowledge being ready, while all with poor knowledge were not. Similarly, Yusuf et al., (2014) observed a comparable relationship (p-value = 0.017), with 34.3% of respondents with good knowledge being ready, though most with moderate or poor knowledge were unprepared. (Sobaria & Lestari, 2024) also identified a link between knowledge and readiness for menarche ($\rho = 0.438$, p-value = 0.005), where 52.5% had good knowledge, yet 57.5% were still unprepared.

Darvill & Powell, (2002) highlighted that knowledge can provide individuals with a sense of security. A lack of understanding about menstruation among adolescent girls often leads to feelings of confusion when they experience their first menstruation. This lack of knowledge can hinder their ability to accept menarche (Budiati & Anita Apriastuti, 2012). In other words, having a thorough understanding of the menstrual process can help girls prepare for and embrace menarche as a natural part of life (Fajri & Khairani, 2010). Thus, the study concludes that knowledge about menarche is closely linked to one's readiness to face it.

Research Limitations



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This study was conducted during school hours, limited by the schedule, which restricted the researcher's time for data collection. During data collection, the questionnaires were distributed offline and completed at home, as parental consent was required. Consequently, the researcher could not verify whether the respondents answered honestly or sought answers from the internet, parents, older sisters, or friends. Additionally, most respondents forgot to submit their questionnaires, prompting the researcher to extend the study period.

Conclusion

Most of the female students in grades four to six at SD Kertajaya are aged 10 to 11 years (41.3%) and possess a good understanding of menstruation (84.1%). Additionally, 79.4% of the students are ready for menarche. The study revealed a significant correlation between age and readiness for menarche, as well as between the level of knowledge about menstruation and preparedness for menarche. Students who are older and have a better understanding of menstruation are generally more prepared for their first menstruation. Early education and environmental support play a vital role in improving students' readiness for menarche.

Ethics approval and consent to participate

The study has been reviewed and approved by the Health Research Ethics Committee of the Faculty of Medicine, Universitas Airlangga, with approval number 08/EC/KEPK/FKUA/2024.

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It is hoped that the findings of this research will benefit readers and contribute positively to the relevant field.

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