

Knowledge about menstruation with readiness to face menarche of elementary school students in the era of reproductive health education

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ABSTRACT

Introduction: Adolescence is a crucial period marked by various physical and psychological changes, including menarche, the first menstruation that often elicits mixed emotional responses. Adequate knowledge about menstruation can help mitigate feelings of fear, anxiety, and confusion, enhancing adolescents' readiness to face this natural developmental stage. This study aimed to investigate the correlation between the level of menstrual knowledge and the readiness to face menarche among female students.

Method: A quantitative research design with an analytical survey and cross-sectional approach was applied. The research was conducted in April 2025 with 40 female students from grades IV to VI, selected via accidental sampling. Data collection used a structured questionnaire, and analysis involved univariate and bivariate statistics using the non-parametric Kendall Tau correlation test.

Results: The results showed that 47.5% of respondents had good menstrual knowledge, and 95% were considered ready to face menarche. However, statistical analysis yielded a p-value of 0.281 with a significance level of 0.045 ($\alpha = 0.05$), indicating no significant correlation between menstrual knowledge and readiness to face menarche.

Conclusion: Despite most respondents demonstrating good knowledge and readiness, no statistically significant correlation was found. This suggests that other factors may influence menarche readiness beyond menstrual knowledge alone. These findings underscore the need for broader support systems in adolescent reproductive health education.

Keywords: Adolescents; Knowledge; Menarche; Menstruation; Readiness.



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INTRODUCTION

Adolescence represents a pivotal stage in human development, bridging the transition from childhood to adulthood. It is a time characterized by significant biological, cognitive, emotional, and social changes. Among adolescent girls, the most prominent biological event is the onset of menarche, the first menstruation, which signals reproductive maturity (Streur *et al.*, 2023). Adolescents are individuals between 10 and 19 years old, and globally, millions experience menarche during this stage. In Indonesia, the average age of menarche is approximately 12 years, with occurrences ranging from as early as 8 to as late as 16 years of age. Data from the Indonesian Ministry of Health reports that 5.2% of girls in 17 provinces experience menarche before age 12, and the average age has declined steadily over the last decades.

Despite its biological normalcy, menarche is often accompanied by a range of emotional and psychological reactions. These responses can be positive or negative depending on the adolescent's preparedness, which is influenced significantly by prior knowledge and support systems (Prabhu *et al.*, 2024). Without accurate information and adequate preparation, menarche can be perceived as frightening, confusing, or even traumatic (Bhoda *et al.*, 2024). Conversely, informed and supported girls embrace this stage with confidence and pride in entering womanhood. Menstrual knowledge is, therefore, critical. It includes understanding the menstrual cycle, personal hygiene, bodily changes, and emotional regulation (Silva *et al.*, 2024). However, in many regions, menstruation remains a culturally sensitive and taboo subject, especially within family and school environments. As a result, many girls face menarche with limited or incorrect knowledge. Found that lack of menstrual education leads to fear, misconceptions, and poor menstrual hygiene practices. Cultural norms, parental attitudes, and inadequate school-based education exacerbate this knowledge gap (Angelhoff and Grundström, 2023).

In Indonesia, although sexual and reproductive health education is gradually being introduced, it often lacks consistency, depth, and cultural relevance (Titisari, Mesman and Dewi, 2025). Many parents are reluctant to discuss menstruation with their daughters, perceiving it as an uncomfortable or inappropriate topic (Averina *et al.*, 2024). Teachers and healthcare workers may also be insufficiently trained or resourced to deliver comprehensive menstrual education. This situation contributes to the prevalence of misinformation and unpreparedness among adolescent girls (Kocabey, Oden Akman and Kasim, 2024). A girl's readiness for menarche goes beyond factual knowledge. It encompasses psychological and emotional readiness, social support, and resource access. Readiness manifests in a girl's ability to manage menstruation with proper hygiene, recognise normal and abnormal symptoms, and respond with emotional stability (Mejías-Blasco *et al.*, 2025). Unreadiness, on the other hand, may lead to anxiety, embarrassment, social withdrawal, and poor self-esteem, especially in school environments where peer interaction is crucial (Schreiber and Solebo, 2024).

Furthermore, early menarche has been associated with increased vulnerability to psychological distress, risky behaviors, and reproductive health issues if not accompanied by supportive interventions (Abni and Kasim, 2024). Therefore, promoting menstrual literacy and preparing girls adequately for menarche is not merely a health issue but a matter of educational equity, gender equality, and child rights (Nurhanifah and Sharil, 2024). In light of this, schools serve as strategic platforms for delivering age-appropriate, culturally sensitive, and scientifically accurate menstrual health education. Empowering

teachers, engaging parents, and involving health professionals can significantly enhance girls' preparedness and well-being. Integrating menstrual health into the school curriculum helps normalize the conversation and reduce stigma.

This study explores the relationship between menstrual knowledge and readiness to face menarche among female students at SD Katolik St. Fransiskus Xaverius Pineleng, located in North Sulawesi, Indonesia. Despite being in a formal educational setting, it is unclear whether the students possess sufficient knowledge and readiness to manage this important life event. Previous studies have shown mixed results regarding the correlation between learning and readiness, suggesting that other factors, such as emotional maturity, peer influence, and cultural background, may also play significant roles. By identifying the level of knowledge and the degree of readiness among this student population, the study aims to provide evidence that can inform future interventions in schools and communities. The findings are expected to serve as a reference for educators, parents, and health workers in designing targeted programs to support adolescent girls, particularly in areas where menstruation is still considered a taboo subject. Ultimately, equipping girls with the right knowledge and skills to face menarche is a fundamental step toward ensuring their health, dignity, and confidence during puberty and beyond

RESEARCH METHODOLOGY

Study Design. This research utilized a quantitative analytical survey design with a cross-sectional approach. The cross-sectional method was chosen to observe and analyze data simultaneously to determine the correlation between students' level of knowledge regarding menstruation and their readiness to face menarche: location and Duration. The study was conducted at SD Katolik St. Fransiskus Xaverius Pineleng, located in Minahasa Regency, North Sulawesi, Indonesia. The research was carried out in April 2025: **Population and Sample.** The study population comprised 48 female students from grades IV, V, and VI of the aforementioned school. A sample of 40 female students was selected from this population using an accidental sampling technique. This non-probability sampling method was employed based on the availability and willingness of students who happened to be present during data collection.

Data Collection Instrument. Data were collected using a structured questionnaire. The questionnaire was designed to gather information on two main variables: The level of knowledge about menstruation. The readiness to face menarche. The questionnaire included closed-ended and scaled questions to assess respondents' cognitive understanding and psychological preparedness. **Data analysis** was conducted in two stages: **Univariate Analysis:** This analysis was used to describe the frequency distribution of each variable, including age, grade level, knowledge level, and readiness for menarche. **Bivariate Analysis:** The relationship between the level of knowledge and readiness to face menarche was analyzed using the non-parametric Kendall's Tau correlation test. This test was chosen due to the ordinal nature of the data and the small sample size. A significance level (α) of 0.05 was used as the threshold for statistical inference. A p-value less than or equal to 0.05 indicated a statistically significant relationship between variables.

RESULT

Table 1. Univariate Analysis

Variable	Category	Frequency (n)	Percentage (%)
Age	9 years	4	10.0%
	10 years	10	25.0%
	11 years	11	27.5%
	12 years	13	32.5%
	13 years	2	5.0%
Grade Level	Grade IV	9	22.5%
	Grade V	11	27.5%
	Grade VI	20	50.0%
Knowledge of Menstruation	Poor	6	15.0%
	Fair	15	37.5%
	Good	19	47.5%
Readiness for Menarche	Not Ready	2	5.0%
	Ready	38	95.0%

The univariate analysis describes the distribution of respondents based on age, grade level, knowledge about menstruation, and readiness to face menarche.

Age Distribution The respondents ranged in age from 9 to 13 years. The highest proportion of respondents was 12 years old (32.5%), followed by those aged 11 (27.5%) and 10 years old (25%). Only a small portion was 9 (10%) and 13 (5%). This indicates that most respondents were within the early adolescent age range, a common stage for experiencing menarche. **Grade Level Distribution** Half of the respondents (50%) were in Grade VI, 27.5% were in Grade V, and 22.5% were in Grade IV. The distribution shows that most of the students were in upper elementary school, an educational stage typically associated with the onset of puberty. **Knowledge of Menstruation.**

Regarding knowledge, 47.5% of the respondents demonstrated good knowledge, 37.5% had fair knowledge, and 15% had poor knowledge about menstruation. While nearly half of the participants had a good understanding, a notable proportion still lacked sufficient knowledge, highlighting the need for improved education on reproductive health. **Readiness to Face Menarche** The analysis showed that most respondents (95%) were categorized as ready to face menarche, with only 5% being unprepared. This suggests that most students had reached a level of maturity and awareness that prepared them for this developmental milestone.

Table 2. The Relationship between Menstrual Knowledge and Menarche Readiness in Elementary School Students

Elementary School Students									
Knowledge	Readiness						C	P value	T
	Not Ready		Ready		Total				
	F	%	F	%	F	%			
Poor	1	0,5	5	13	6	13,5	0,045	0,281	0,407
Fair	0	0,0	15	39	15	39			
Good	1	0,5	18	47	19	47,5			
Total	2	5	38	95	40	100			

Based on Table 2. The results show that the p-value of 0.281 is greater than the significance level of 0.05, indicating no statistically significant relationship between the level of knowledge about menstruation and the readiness to face menarche. Consequently, the null hypothesis (H_0) is accepted, meaning that knowledge level does not significantly predict readiness. Although most respondents were classified as ready to face menarche, this readiness was not strongly correlated with their level of menstrual knowledge. The finding suggests that other factors, such as parental support, social influences, peer

communication, and cultural context, may play a more dominant role in shaping adolescent girls' readiness for menarche.

DISCUSSION

Knowledge of Menstruation among Respondents. This study revealed that a substantial portion of the respondents (47.5%) demonstrated good knowledge about menstruation, 37.5% exhibited fair understanding, and 15% had poor knowledge. These findings are relatively positive, suggesting that nearly half of the sample had been exposed to adequate information about menstruation. However, the significant proportion with only fair or poor knowledge still reflects ongoing deficiencies in menstrual education among pre-adolescent girls.

Adolescent girls often rely on a combination of sources to learn about menstruation, including mothers, peers, teachers, and, increasingly, digital media. The role of mothers and school teachers as primary informants is well established. However, their effectiveness can vary widely depending on their level of knowledge, communication comfort, and cultural attitudes toward menstruation. According to LeBlanc, et al (2024), in many communities, menstruation remains a culturally sensitive subject, often regarded as taboo, which can hinder open and accurate information transfer (Shah *et al.*, 2025). This lack of structured and culturally sensitive menstrual health education can leave girls vulnerable to misinformation, fear, and confusion during their first menstrual experience (Wijayanti *et al.*, 2025).

A study across several Indonesian provinces found that inadequate knowledge about menstruation and menstrual hygiene management (MHM) leads to poor preparedness during menarche, including a misunderstanding of menstrual physiology and mismanagement of sanitary waste. Moreover, when teachers or parents fail to provide proper guidance, girls often turn to peers or the internet, where the quality and accuracy of information can be inconsistent. This is consistent with the current study's finding that some students with poor knowledge were still classified as "ready" for menarche, suggesting that their understanding may be surface-level, situational, or borrowed from peer modelling rather than deeply internalized knowledge (Munro *et al.*, 2024).

Readiness to Face Menarche. Despite the variation in knowledge levels, an overwhelming majority of students (95%) in this study were categorized as ready to face menarche. This is an encouraging outcome, suggesting that many young girls today are gaining confidence and acceptance regarding this natural developmental process. Readiness here reflects not only informational awareness but also psychological and emotional acceptance of menstruation as a normal part of growing up. Both internal and external factors influence readiness to face menarche. Internally, it includes a girl's psychological maturity, openness to bodily changes, and self-confidence. It provides support systems such as parental involvement, school health education, and access to appropriate menstrual hygiene products (Hobbs *et al.*, 2023).

In contemporary settings, digital exposure plays a growing role. Many adolescents, even in semi-urban or rural areas, have access to smartphones and can explore information on platforms like YouTube, TikTok, and Instagram, where health educators and influencers discuss puberty and menstruation in approachable formats. While this can be empowering, it also poses risks of misinformation, highlighting the need for schools and health institutions to offer validated and age-appropriate resources. Additionally, peer-to-peer sharing is highly influential during adolescence. Girls often discuss puberty-related changes among themselves, helping to demystify menstruation. Such informal

peer support networks can significantly boost readiness, even without structured formal education (Appel and Rothman, 2025). As highlighted in this study, it is possible for girls with limited formal knowledge to still feel psychologically prepared if they have social support and have observed peers going through the same experience (Harley *et al.*, 2024).

Lack of Significant Correlation Between Knowledge and Readiness. A key finding from this study was the absence of a statistically significant relationship between knowledge level and readiness for menarche ($p = 0.281$). This result challenges the assumption that better knowledge automatically translates into higher preparedness. While some previous studies have indicated a significant positive correlation between the two variables, this study aligns more closely with the findings of those who also reported no such relationship. This discrepancy may be attributed to the multifaceted nature of “readiness.” Readiness involves cognitive awareness, emotional maturity, prior exposure, and sociocultural influences (Gao *et al.*, 2025). For instance, in some cases, girls with low knowledge may still be emotionally ready due to normalized exposure to menstruation within their homes or communities. Conversely, girls with high knowledge might still feel unprepared due to anxiety, embarrassment, or lack of emotional support (Minahan, 2023).

Furthermore, despite a mixed level of knowledge, the high readiness rate underscores the importance of examining broader determinants (Kalbarczyk, Rao and Alonge, 2024), such as Cultural context: In some cultures, menstruation is openly discussed and even celebrated as a rite of passage. In others, it is shrouded in secrecy and shame, leading to emotional unpreparedness regardless of factual knowledge. Parental involvement: Girls whose mothers or older sisters have openly discussed menstruation with them tend to be more confident and emotionally stable when menarche occurs. School environment: Institutions that provide health education programs and safe sanitation facilities are better positioned to support girls through this transition. Peer influence: This study shows that many girls may emulate their peers' attitudes toward menstruation, which can positively or negatively affect readiness regardless of their knowledge level.

Thus, educational strategies focusing solely on increasing knowledge may be insufficient to foster genuine readiness. A more holistic approach is needed, including emotional counseling, open dialogue with caregivers, safe school environments, and culturally sensitive education that respects local norms while promoting scientific understanding.

Implications for Health Education

This study highlights a critical gap between knowledge and behavioural or emotional outcomes. Policymakers and educators must recognize that increasing knowledge alone does not ensure preparedness for physiological milestones such as menarche. Effective programs should integrate cognitive, emotional, and practical components of menstrual health education. Some promising approaches include School-based reproductive health modules starting from Grade IV, with age-appropriate and culturally adapted content. Mother-daughter health workshops that encourage intergenerational conversations about puberty. Digital campaigns utilize relatable influencers to communicate health messages in a youth-friendly manner. Teacher training programs that equip educators with the skills to deliver sensitive topics effectively. Additionally, collaboration with religious and community leaders can help break down cultural taboos and foster a more open and supportive environment for discussing

menstruation. Involving fathers and male siblings in awareness campaigns may reduce stigma and promote empathy.

CONCLUSION

The study highlights that students' readiness to face menarche is not solely influenced by their level of knowledge about menstruation. While knowledge plays an important role, it is evident that other aspects, such as emotional development, parental involvement, peer support, and the surrounding cultural environment, significantly impact how well young girls adapt to this important puberty stage. Most students demonstrated a positive attitude and preparedness toward experiencing their first menstruation, suggesting that readiness is a multidimensional condition shaped by personal and social experiences. This reinforces the need for comprehensive menstrual education beyond factual information to foster emotional confidence, communication skills, and a supportive atmosphere at home and school. In essence, preparing girls for menarche requires more than just teaching biological facts; it calls for a nurturing and inclusive approach that empowers them emotionally, socially, and practically to navigate the changes of adolescence with confidence and dignity.

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Conflict of Interest

There are no potential conflicts of interest relevant to this article.

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