



The Differences in Menstrual Knowledge among Adolescents in Rural and Urban Areas

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Keywords:	Abstract
Menstruation Knowledge	Background: Menstruation is an important physiological process for young women who need adequate knowledge to maintain reproductive hygiene and health. This study aims to analyze the difference in the proportion of knowledge about menstruation between adolescent girls in rural and urban areas. Method: This comparative cross-sectional research was conducted at SMPN 1 Simo (urban) and SMPN 1 Kemusu (rural) by involving 150 students selected through clustered sampling techniques. Data was collected using a closed-ended questionnaire that had been tested for validity and reliability, with total scores categorized based on the mean value. Univariate analysis was used to describe respondent characteristics, while bivariate analysis used chi square test with continuity correction to compare the proportion of knowledge. Result : The results showed that 59.3% of respondents had good category knowledge, with the proportion of good knowledge higher in urban areas (75.3%) than rural areas (42.5%) and statistically significant differences ($p=0.001$; $OR = 4.1$). Implication: These findings show the important role of access to information, health literacy and social environment in shaping menstrual knowledge in rural and urban areas. Novelty: This study is one of the comparative studies that specifically compares the proportion of menstrual knowledge between adolescent girls in urban and rural areas in the SMPN 1 Simo and SMPN 1 Kemusu areas using clustered sampling techniques and chi square tests with continuity correction.
Adolescent	
Urban Region	
Rural region	

INTRODUCTION

Adolescence is a transition period from childhood to adulthood, which is characterized by biological, physical, emotional, social, and cognitive changes (Kemenkes RI, 2022). Adolescents is a population group with an age range of 10-19 years (WHO, 2025). For the adolescent girls, the main indicators of puberty is experiencing menstruation for the first time or menarche which indicates the maturation of the reproductive organs in adolescent girls (Solehati et al., 2018). Menarche generally occurs at the age of 12-18 years, although

age variation is still influenced by biological and environmental factors (Sundari et al., 2022). Menstruation is the process of bleeding from the lining of the uterus accompanied by periodic release of the endometrium and the cycle begins about 14 days after ovulation (Sadiman & Islamiyati, 2019). This change requires knowledge readiness and a good attitude so that adolescents are able to understand that menstruation is a normal physiological process.

At the empirical level, the primary practical problem is the widespread deficiency in menstrual health literacy among adolescent girls. Globally, menstrual literacy levels vary widely between regions, ranging from 2.2% in Northern India to 88.7% in Nepal (M et al., 2023). In Indonesia, national data reflect a similar inconsistency while in urban educational centers like Yogyakarta recorded good knowledge of up to 91.6%. In Boyolali, 83.3% of students in one school have good knowledge but need to improve personal hygiene practices. Nationally, up to 75% of adolescent girls report feel anxious about menarche and 70% have difficulty due to a lack of health education about pre menarche (Deade et al., 2022). This deficit in accurate knowledge generates negative emotional reactions, such as confusion, shame and fear which directly impede safe MHM practice (Intaniza et al., 2023). Furthermore, because adolescents heavily rely on unverified informal sources like peers and social media rather than structured medical guidance (Suyanti et al., 2022). This shows that knowledge of reproductive and menstrual health is still an important need for adolescents, because with adequate understanding it plays a role in shaping hygiene practices and proper menstrual handling (Msovela et al., 2025)

Several previous studies have shown that there is a difference in knowledge about menstruation between adolescents in rural and urban areas. Adolescents in rural areas usually find it difficult to get information about reproductive health due to limited health facilities, limited learning resources, and people who still view the topic of menstruation as a sensitive (Kistiana et al., 2023) A cross-sectional study in India, found that adolescents in rural areas face taboos and information limitations more often, as well as less hygienic practices and ignorance about menstruation are higher (Nimbhorkar et al., 2023) Similar findings were shown in Susanto's study, which reported that many adolescent girls have limited knowledge about menstruation before menarche and rely heavily on their mothers or peers as the main source of information, so the quality of understanding is often not optimal (Susanto et al., 2016)

However, existing literature presents a critical analytical gap regarding the rural and urban knowledge divide. Previous comparative studies have predominantly treated the rural and urban disparity as static, permanent condition, relying on board community level comparisons while overlooking two critical modern dynamics. Rapid globalizations of information, widespread digital media access, improved transportation networks and decentralized healthcare delivery in rural areas may have democratized health knowledge, raising the question of whether traditional regional inequalities still persist or have significantly narrowed. Most prior research evaluated rural and urban adolescent cohort. There is a lack of empirical evidence examining whether geographic knowledge disparities continue to manifest when adolescents from both regions are exposed to a health curriculum within their respective formal school environments.

Based on a preliminary survey on reproductive health education in a number of junior high schools in Boyolali Regency, which is combined with regional classification according to the Central Statistics Agency (BPS), SMPN 1 Simo in urban areas and SMPN 1 Kemusu in rural areas have implemented reproductive health education in the curriculum. A systematic literature search across portal confirmed a complete absence of studies evaluating menstrual knowledge across these specific school and region. Therefore, the purpose of this study is to analyze the difference in the proportion of menstrual knowledge in adolescent girls in rural and urban areas.

METHOD

Type and Design

This study is a quantitative observational quantitative study with a cross-sectional approach that aims to compare two independent groups at a single point in time. This research was carried out at SMPN 1 Simo and SMPN 1 Kemusu, Both schools were selected based on UKS eligibility criteria and the application of reproductive health education in the learning curriculum so that the factors supporting knowledge in both regions are relatively similar.

Data and Data Sources

The research population is all female students who have experienced menstruation at selected schools. The sample criteria are divided into 2, namely inclusion is students in grades 7-9 who have experienced menstruation, were present at the time of data collection, and are willing to participate by signing informed consent. Exclusion criteria were students who are absent when data collection and questionnaires are incomplete.

The sample size was calculated using the formula for comparing two independent proportions. Based on reference proportions of 40% in rural group ($P_1 = 0.40$) and 67% ($P_2 = 0.67$), with a significance level (α) of 0.05 and statistic power of 80% ($\beta = 0.20$), a minimum requirement of 53 respondents per group, yielding a minimum total sample size of 106 respondents.

The selection process began by recording the number of eligible female students who had experienced menarche across all classrooms in grades 7–9. Each classroom was assigned a unique identifier, and random numbers were generated to select the final sample clusters. The randomly selected clusters included classes 7B, 7C, 8A, 8C, and 9E at SMPN 1 Simo, and classes 7A, 7B, 7C, 8A, 8C, 9A, and 9B at SMPN 1 Kemusu. Cluster sampling is a probability sampling design in which the population is divided into natural or geographical groups termed clusters, from which samples are drawn at the cluster level rather than directly from individual elements of the population (Wu & Thompson, 2020) The total number of respondents selected was 150 respondents.

Data collection technique

Primary data was obtained through a closed-ended questionnaire that measured menstrual knowledge. Data collection was carried out by distributing questionnaires in schools face-to-face with the assistance of researchers after obtaining permission from the school and respondents' consent. The data collection procedure includes the preparation of applying for permits to the Boyolali Regency Education Office, the school and the respondent's approval, the implementation of which is that the questionnaire is distributed directly to students who meet the inclusion with a working time of about 20-30 minutes, and the completed questionnaire is collected directly by the researcher and the completeness of the answers is checked.

Data Validity

The instrument was developed according to the research objectives with a total of 21 questions and has been tested for reliability validity before data collection. The results of the validity test showed a $> r$ calculation of the table (0.34) for all question items, while the reliability test showed a Cronbach's Alpha value of 0.86 which means it has a good reliability value. Knowledge score is calculated from the number of correct answers on the entire item. The total mean score value is used as a cut-off so that respondents with $\geq$ mean scores

are categorized as good, while respondents with < mean scores are categorized as poor (Mardhiati, 2022)

Data analysis

Data analysis included univariate analysis to describe respondent characteristics and knowledge distribution and bivariate analysis using chi square test to test the difference in the proportion of knowledge between adolescents in rural and urban areas with a significance of 0.05 ($\alpha = 0.05$). Prior to implementation, the researcher obtained ethical approval (1934/KEPK-FIK/I/2026) and relevant administration and followed the informed consent procedure.

RESULT

Characteristic of respondents.

Based on Table 1, a total of 150 respondents participated in this study, with the majority being in the age range of 13–14 years. The composition of respondents based on regions is relatively balanced, namely 51.3% from urban areas and 48.7% from rural areas. The most commonly reported age of menarche was 11–12 years, which reflects that the study had a population with early adolescent characteristics. In the information sources section, respondents can choose more than one source of information (multiple responses), and some respondents obtained information from parents as much as 84.7%.

Table 1. Frequency Distribution Based on School Area, Age, Menarche Age and Information Source

Features	Frequency	
	n	%
School Area		
Rural	73	48,7
Urban	77	51,3
Total	150	100
Age		
11-12 years old	24	16,0
13-14 years old	106	70,6
15-16 years old	20	13,4
Total	150	100
Menarche Age		
9-10 years old	21	14,0
11-12 years old	106	70,6
13-14 years old	23	15,4
Total	150	100
Resources (multiple responses)		
Friends	38	25,3
Parents	127	84,7%
Teacher	53	35,3%
Health workers	41	27,3%
Book	10	6,7%
Internet	64	42,7%

Univariate Analysis

Based on Table 2, most of the respondents had a good level of menstrual knowledge, namely 89 female students (59.3%), while 61 female students (40.7%) were in the poor category. This shows that more than half of the respondents already have a good understanding of menstruation, although there is still a proportion of respondents with a level of knowledge that needs to be improved.

Table 2. Analysis of Young Women's Knowledge of Menstruation

Category	Frequency	
	n	%
Good	89	59,3
Not Good	61	40,7
Total	150	100%

Distribution of Questionnaire Answers

Graph 1 shows that question number 14 about knowledge of the duration of use of menstrual pad has the highest number of correct respondents, namely 77 respondents in urban areas and 70 in rural areas. On the other hand, question number 18 about myths and facts about exercise during menstruation has the least number of correct respondents, namely 28 in urban areas and 16 in rural areas. The knowledge of respondents in rural areas was the most about premenstrual syndrome at 73 respondents and respondents in rural areas had the least knowledge about the menstrual process, which was 13 respondents. The knowledge of respondents in urban areas regarding the knowledge of the duration of use of menstrual pads has the highest number of correct respondents at 77 respondents and the least knowledge of respondents in urban areas about myths and facts about sports during menstruation is 28 respondents.

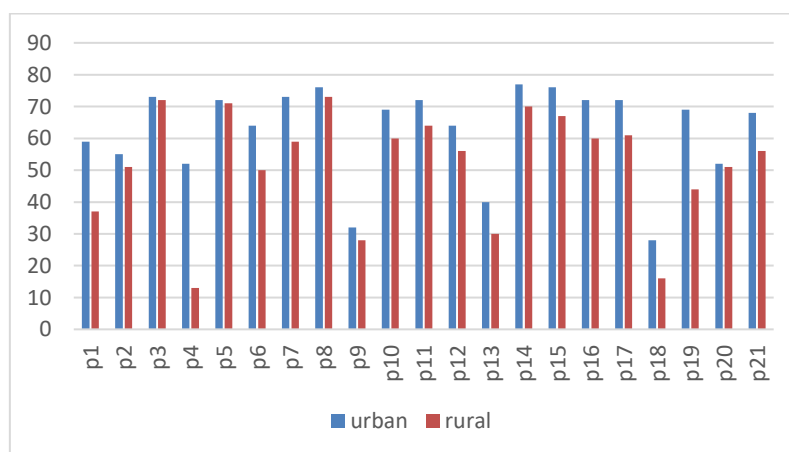


Figure 1. Distribution of correct answers by area

Bivariate Analysis (Chi-Square)

Table 3 shows that adolescents with a good level of menstrual knowledge in urban areas are 58 adolescents (75.3%) and adolescents with a poor level of knowledge are 19 (24.7%).

Meanwhile, adolescents with a good level of knowledge in rural areas were 31 (42.5%) and adolescents with a poor level of knowledge were 42 (57.5%). The results of data analysis using the continuity correction test obtained a value of $p < 0.05$ (0.01). So that it can be concluded that there is a difference in the proportion of menstrual knowledge in adolescents in rural and urban areas.

Table 3. Analysis of Differences in the Proportion of Adolescent Knowledge

Regional Origin	Knowledge						P- value	OR
	Good		Not Good		Total			
	n	%	n	%	n	%		
Urban	58	75,3	19	24,7	77	100	0.001	4,1 (95% CI2.0 – 8.2)
Rural	31	42,5	42	57,5	73	100		
Total	89	59,3	61	40,7	150	100		

DISCUSSION

Based on the results of the study, it was shown that there was a difference in the proportion of menstrual knowledge in adolescents from rural and urban areas. The proportion of good knowledge in urban areas (75.3%) is higher than in rural areas (42.5%) with an odds ratio (OR) of 4.1. This indicates that adolescents in urban areas tend to have a 4.1 times greater better knowledge of menstruation than adolescents in rural areas. cannot always be explained solely on the basis of geographic location. These findings are in line with research which explains that rural adolescent girls have a lower proportion of knowledge about menstrual hygiene management compared to urban adolescent girls (Manase et al., 2023). Ety also supports these results by stating that adolescent girls in rural areas tend to obtain information from their parents or traditional traditions, so the knowledge obtained is limited and less comprehensive (Ety et al., 2019). On the other hand, Amalia's research in Bekasi City shows that even though urban adolescents face various reproductive health problems, wider access to information through schools and social media still provides an advantage in increasing the proportion of their knowledge (Amalia & Amrullah, 2019). This is supported by Sambeang Putra's research which states that adolescents in Sukabumi City have good knowledge about menstruation and menstrual hygiene behaviors (Sambeang Putra et al., 2024). Overall, the findings of this study, alongside previous research, demonstrate that a disparity in menstrual knowledge persists between rural and urban areas. This difference is likely attributable to variations in access to information and the diversity of information sources available to adolescents.

The results of the study showed that question number 14 (Using sanitary napkins for too long without being replaced can cause...) had the highest number of respondents answering correctly. This indicates that the majority of adolescents already understand health risks such as skin irritation and bad odors, because the topic of menstrual hygiene is closer to everyday experience. Rahmi Wahyuna's research in North Sumatra also confirms that knowledge of the genital area during menstruation is relatively higher because it is often associated with direct practice by adolescents (Wahyuna & Siregar, 2024) In line with Andi Basniati's research, *personal hygiene education* is easier to accept because it is practical and applicative, thereby increasing the proportion of adolescents' understanding of *personal hygiene* (Basniati et al., 2023) On the other hand, Question number 18 (From

the statement below, which one includes the facts about menstruation?) has the least number of respondents answering correctly. This shows that there are still many teenagers who are trapped in the myth circulating in society, such as menstruation is dirty blood or drinking ice can stop bleeding. This misconception does not only occur in rural areas, but is also found in urban areas.

The difference in the proportion of menstrual knowledge in adolescents in rural and urban areas can be caused by several factors such as access to information, adolescent literacy levels and social environment. Access to information includes ease of information, available educational services and awareness of adolescents to seek knowledge. The ease of access to information is one of the factors that distinguish the knowledge of adolescents in rural and urban areas. Adolescents in urban areas have easier access to information through schools, health workers and digital media. A qualitative study in one of the cities in Bali stated that adolescents in urban areas more often find menstrual information through more diverse internet and media sources (Suttar et al., 2023) Meanwhile, adolescents in rural areas rely more on information from mothers, family and schoolmates (Nisman et al., 2019) Kristiana's research confirms that the implementation of health education in urban areas is more consistent than in rural areas, so that urban adolescents have a good understanding (Kistiana et al., 2023)

Although access to information is an crucial factor, the quality of comprehension depends not only on how much information is available, but also on the adolescents ability to filter, interpret and apply effectively. Consequently, the level of health digital literacy directly impact on the level of adolescents health comprehension. he findings of this study reveal that secondary school students in urban areas possess more adequate health literacy levels compared to those in rural areas. The alignment between these findings and previous studies is logically driven by systemic disparities in information ecosystems and educational infrastructure. Urban adolescents tend to demonstrate more critical source evaluation skills compared to their rural peers, who face constraints in information literacy despite having access to digital devices (Chang et al., 2023). This gap exists because urban environments generally offer higher exposure to verified health information, stable internet infrastructure, and better integration of digital technology into school curricula. Conversely, the lack of media literacy programs and structured guidance in rural areas means that ownership of digital devices does not automatically translate into critical health understanding (Moudy J & Syakurah R, 2020). his geographic disparity is further corroborated by other empirical studies. During the pandemic, 74.7% of rural female adolescents were classified as having inadequate health literacy, compared to 62.1% in urban areas (Astriningrum et al. 2024). Similarly, regarding specific health topics such as HIV, only 5.5% of rural adolescents demonstrated good health literacy, compared to 9.5% of urban adolescents (Murti et al., 2024). Overall, the consistency across these studies logically confirms that the health literacy gap is not merely a matter of device ownership, but rather a direct outcome of unequal access to quality educational support and digital resources.

In addition to access to information, the social and cultural environment also plays a role in differences in menstrual knowledge levels. Rural areas are still thick with cultural norms that limit the conversation about menstruation. According to research conducted by Ratnawati, many people in rural areas are still influenced by myths and view menstruation as a very personal thing and even taboo to be informed to teenagers openly (Ratnawati, 2018) Traditionally, parents in rural areas have assumed that the changes of puberty,

including menstruation, are something that must be kept secret from adolescents before they experience physical and psychological changes (Sari & Wahyono, 2024). A study in Semarang found that many parents consider reproductive education unnecessary, taboo and awkward, and show that mothers play a more frequent role in menstrual hygiene management practices (Wiendijarti, 2020). In addition to still being considered taboo by local culture, limited parental knowledge can also reduce the quality of education delivered to adolescents, thus directly contributing to the low level of menstrual knowledge in adolescents in rural areas (Nurachmah et al., 2018). It is different in urban environments which usually have a parenting style that is open to providing reproductive health information so as to increase the understanding and awareness of adolescent girls in urban (Nurhayati et al., 2024).

These findings could have an important impact on public health. Good knowledge of menstruation can be related to good hygiene behavior, which can reduce the risk of reproductive tract infections and improve the quality of life of adolescents. However, this study also has limitations that need to be considered, namely the research design that uses a cross-sectional design only provides an overview of the relationship at one point in time. The research instrument used a closed-ended questionnaire that allowed for social bias because respondents may answer according to norms that are considered correct, not based on actual understanding. The scope of the study site was limited to 1 rural and urban area, so the results could not be generalized to the entire adolescent population in Indonesia who have different cultural diversity and access to information. However, these limitations can be overcome in future research through a mixed-methods approach, a larger and representative sample.

CONCLUSION

This study demonstrates that a significant geographic gap in menstrual health knowledge continues to persist between rural and urban adolescent, with student at SMPN 1 Simo (urban) exhibiting a substantially higher proportion of adequate knowledge compared to those at SMPN 1 Kemusu (rural). This finding explicitly confirms that rural-urban disparities in adolescent reproductive health knowledge have not diminished, underscoring the ongoing inequality in information access and educational resources. The novel contribution of this work lies in providing localized, empirical evidence from targeted rural-urban school pairings in Indonesia, highlighting that device ownership alone does not bridge the functional literacy gap regarding safe menstrual hygiene management (MHM). Scientifically, these insights advance our understanding of how regional socio-environmental factors shape health literacy, while policy-wise, they provide actionable evidence to justify targeted budgetary and educational interventions in rural schools. To operationalize these findings, local education and health authorities must immediately integrate standardized MHM modules into the mandatory school health services (UKS) curriculum, upgrade rural school sanitation infrastructure, lockable toilets and free disposal/product kits and establish joint Puskesmas outreach programs. Policy framework should actively engage community leaders and families through routine school-parent workshops to dismantle cultural taboos and foster supportive home environments. Although constrained by a cross-sectional design, a limited sample of two schools, and a focus on knowledge rather than observed practices, these findings serve as a crucial foundation for future longitudinal studies measuring behavioral compliance.

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