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# Association of Age and Information History with Adolescent Girls' Knowledge of Preconception Health in Banjarmasin

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**Abstract**

**Background:** Preconception health needs to be introduced during adolescence because nutritional status, anemia prevention, reproductive health, mental health, and healthy lifestyle practices before pregnancy influence women's readiness for reproductive life. Previous studies on adolescent preconception health have mostly been descriptive, so analysis of related factors is needed. **Purpose:** This study aimed to analyze the association of age and history of receiving information with adolescent girls' knowledge of preconception health in Banjarmasin City. **Methods:** This analytical quantitative study used a cross-sectional approach. The sample consisted of 35 adolescent girls aged 19-21 years selected through accidental sampling. Data were collected in May 2026 using a Google Form questionnaire containing 20 true-false knowledge statements. Data were analyzed using univariate analysis and bivariate analysis with the Kruskal-Wallis and Mann-Whitney tests. **Results:** Most respondents were 19 years old (45.7%), almost all were college students (97.1%), and 51.4% had previously received preconception health information. Most respondents had good knowledge (91.4%). Bivariate analysis showed significant differences in knowledge scores by age (p=0.016) and history of receiving information (p=0.002). **Conclusion:** Adolescent girls' knowledge of preconception health was generally good. Age and information history were associated with knowledge scores, indicating the importance of equitable and continuous preconception education during adolescence.



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## 1. INTRODUCTION

Adolescence is a transitional period that influences health quality in later life. The World Health Organization defines adolescents as individuals aged 10-19 years, but young adults also require strengthened reproductive health literacy because behavioral choices during this period can influence future health (World Health Organization, 2024). For adolescent girls, understanding reproductive health, nutritional status, anemia prevention, mental health, and healthy lifestyle practices is an important foundation before entering pregnancy in the future.

Preconception health refers to health conditions before pregnancy and includes identifying and controlling risk factors that may affect the health of mothers, fetuses, and infants. Preparation before pregnancy is not only needed by married women, but should also be introduced from adolescence so that

girls understand the importance of adequate nutrition, folic acid intake, anemia prevention, immunization, health screening, and avoidance of smoking and alcohol (American College of Obstetricians and Gynecologists & American Society for Reproductive Medicine, 2019; Centers for Disease Control and Prevention, 2024; Office on Women's Health, 2025). The period around conception is also considered a critical window because maternal nutrition, metabolic health, and environmental exposures before and during early pregnancy may influence pregnancy outcomes and long-term health across the life course (Fleming et al., 2018).

Anemia and nutritional problems among adolescent girls remain important issues in maternal and child health. In Indonesia, anemia among adolescent girls may continue into reproductive age and pregnancy, increasing risks for mothers and children (Kementerian Kesehatan RI, 2022). The iron supplementation program for adolescent girls is one strategy to prevent anemia and support health before motherhood (Kementerian Kesehatan RI, 2020). A school-based multisectoral collaboration in Indonesia has also emphasized adolescent girls' nutrition and anemia prevention as an important strategy to improve health before women enter reproductive age (Roche et al., 2018). Global evidence also shows that nutrition and preconception health interventions among adolescents and young adults are important to prevent adverse maternal, perinatal, and child health outcomes (Barker et al., 2018; Hanson et al., 2015; Padhani et al., 2024; Stephenson et al., 2018).

Knowledge is an early factor that can influence awareness and health behavior. Adolescent girls with good knowledge of preconception health are expected to recognize the benefits of balanced nutrition, anemia prevention, health screening, reproductive hygiene, mental health, and healthy lifestyle practices. Previous research has often focused on describing knowledge levels, while analysis of age and history of receiving information in relation to preconception health knowledge scores among adolescent girls in Banjarmasin remains limited. Previous studies have largely focused on describing adolescent knowledge regarding preconception health or have examined women preparing for pregnancy. This study contributes by examining factors associated with preconception health knowledge among late adolescent girls in an Indonesian urban setting, providing evidence to support the development of earlier preconception education programs before marriage. This study aimed to analyze the association of age and history of receiving information with adolescent girls' knowledge of preconception health in Banjarmasin City.

## 2. METHOD

This study was an analytical quantitative study with a cross-sectional approach. The study was conducted in Banjarmasin City in May 2026. The target population was adolescent girls/college students living in Banjarmasin City. The sample consisted of 35 respondents who met the inclusion criteria: female sex, aged 19-21 years, willing to participate, able to read and understand the questionnaire, and completing the questionnaire in full. The sampling technique used was accidental sampling, in which respondents who were accessible to the researchers and met the criteria were included as study samples.

The independent variables were age and history of receiving information about preconception health. The dependent variables were the score and category of adolescent girls' knowledge of preconception health. Educational status was presented descriptively but was not tested inferentially because the comparison category consisted of only one respondent. Data were collected online using a Google Form consisting of respondent characteristics and 20 true-false knowledge statements. Correct answers were scored 1 and incorrect answers were scored 0, then converted to a percentage score. Knowledge was categorized as good if the score was 76-100%, sufficient if the score was 56-75%, and poor if the score was less than 56%.

Data were analyzed using univariate analysis in the form of frequencies, percentages, means, medians, and ranges. Bivariate analysis was performed using the Kruskal-Wallis test to compare knowledge scores by age and the Mann-Whitney test to compare knowledge scores by history of receiving information. The significance level was set at $p<0.05$. The study was conducted by applying informed consent, anonymity, confidentiality, and voluntary participation principles.

## 3. RESULTS AND DISCUSSION

The study included 35 adolescent girls. Respondent characteristics by age, current educational status, and history of receiving information about preconception health are presented in Table 1.

**Table 1.** Characteristics of adolescent girls in Banjarmasin City

| Characteristics | Frequency | Percent (%) |
|---|---|---|
| **Age** | | |
| 19 years | 16 | 45.7 |

| | | |
|---|---|---|
| 20 years | 11 | 31.4 |
| 21 years | 8 | 22.9 |
| **Current education** | | |
| College student | 34 | 97.1 |
| Other | 1 | 2.9 |
| **Received preconception information** | | |
| Ever | 18 | 51.4 |
| Never | 17 | 48.6 |

**Source:** Primary data, 2026.

Table 1 shows that the largest age group was 19 years, consisting of 16 respondents (45.7%). Based on current education, almost all respondents were college students, with 34 respondents (97.1%). Based on information exposure, 18 respondents (51.4%) had received information about preconception health, while 17 respondents (48.6%) had never received such information.

**Table 2.** Knowledge level of adolescent girls about preconception health

| Knowledge level | Frequency | Percent (%) |
|---|---|---|
| Good | 32 | 91.4 |
| Sufficient | 3 | 8.6 |
| Poor | 0 | 0.0 |
| Total | 35 | 100.0 |

**Source:** Primary data, 2026.

Table 2 shows that most adolescent girls had good knowledge of preconception health, with 32 respondents (91.4%). Three respondents (8.6%) had sufficient knowledge, and no respondent was in the poor knowledge category. The mean knowledge score was 90, with the lowest score of 65 and the highest score of 95.

**Table 3.** Bivariate analysis of knowledge scores

| Variable/category | Median (min-max) | p-value |
|---|---|---|
| Age | | 0.016 |
| 19 years (n=16) | 95 (75-95) | |
| 20 years (n=11) | 90 (75-95) | |
| 21 years (n=8) | 90 (65-95) | |
| Current education | | Not tested |
| College student (n=34) | 92.5 (65-95) | |
| Other (n=1) | 90 (90-90) | |
| Information history | | 0.002 |
| Ever received (n=18) | 95 (85-95) | |
| Never received (n=17) | 90 (65-95) | |

**Source:** Primary data, 2026. Kruskal-Wallis test was used for age, and Mann-Whitney test was used for information history. Education was not tested because the comparison category had only one respondent.

Bivariate analysis showed a significant difference in knowledge scores by age (p=0.016). Respondents aged 19 years had a median score of 95, while respondents aged 20 and 21 years had median scores of 90. This finding indicates that the younger age group in this sample had higher knowledge scores. The difference may be influenced by variation in information exposure, academic activity, digital media use, or participation in reproductive health education among age groups.

History of receiving information about preconception health was also significantly associated with knowledge scores (p=0.002). Respondents who had received information had a median score of 95 with a range of 85-95, while respondents who had never received information had a median score of 90 with a range of 65-95. This result supports the importance of information exposure in shaping adolescent girls' knowledge. Information about preconception health can be obtained through formal learning, digital media, campus environments, health workers, and reproductive health education activities.

Although most respondents were categorized as having good knowledge, the score-based analysis provides a more meaningful interpretation because broad knowledge categories may conceal important differences among respondents. In this study, respondents aged 19 years had the highest median knowledge score compared with respondents aged 20 and 21 years. This pattern may indicate that younger late adolescents have more recent exposure to health information obtained from school, early university activities, peer discussions, social media, and digital health content. At this stage, adolescents are often

still actively connected to formal learning environments and health promotion messages related to nutrition, anemia prevention, reproductive hygiene, mental health, and healthy lifestyle practices. Therefore, the higher score among the younger age group may reflect the importance of timely and continuous health information exposure during late adolescence.

The high proportion of respondents with good knowledge should also be interpreted as an important finding. Almost all respondents were college students, which may have contributed to better knowledge through greater access to academic information, digital resources, seminars, peer learning, and campus-based health promotion (Delgado, 2013). This suggests that higher education settings may play a strategic role in strengthening preconception health literacy before women enter marriage or pregnancy planning. Although this study did not directly evaluate the effectiveness of university health education programs, the dominance of good knowledge among college students indicates that educational environments can become effective entry points for earlier preconception education if the content is delivered in a structured and equitable manner.

History of receiving preconception health information was significantly associated with knowledge scores. Respondents who had previously received information had higher scores, while all respondents in the sufficient knowledge category came from the group that had never received preconception health information. This finding strengthens the argument that information exposure is not only related to awareness, but also to the depth of understanding among adolescent girls (Priani et al., 2019). It also shows that good knowledge is not automatically distributed among all adolescents, even in an urban setting. Adolescents who have not been reached by preconception health information may remain at risk of having lower understanding about nutrition, anemia prevention, reproductive health, and healthy behaviors before pregnancy (Padhani, 2024).

These findings have important implications for preconception care programs in Indonesia. Preconception care should not be positioned only as counseling for married women or women who are already planning pregnancy. Instead, it needs to be introduced earlier as part of adolescent health promotion (Priani et al., 2019; Kurniawati et al., 2023). Late adolescence is a strategic period because knowledge formed at this stage can influence future health behavior, preparation for pregnancy, and maternal and child health outcomes (Stephenson, 2018). The results of this study support the need to shift preconception education from a reactive approach before pregnancy to a preventive approach beginning in adolescence.

In practice, preconception education can be integrated into school and university health promotion, adolescent reproductive health services, iron supplementation programs, youth counseling, and digital health education. Educational content should emphasize balanced nutrition, folic acid, anemia prevention, adherence to iron supplementation when provided, reproductive hygiene, physical activity, mental health, avoidance of smoking and alcohol, and the ability to seek information from reliable sources. The involvement of midwives, educational institutions, and youth health programs is important to ensure that preconception messages reach adolescent girls consistently and not only those who already have access to health information. This is in line with evidence from Indonesia showing that adolescent girls' nutrition and anemia prevention require school-based and multisectoral collaboration (Roche et al., 2018).

Thus, the contribution of this study lies in showing that age and information history are associated with preconception health knowledge among late adolescent girls in an Indonesian urban setting. These findings provide practical evidence that preconception education should be started earlier, targeted more equitably, and delivered through settings that are close to adolescents' daily lives, especially schools, universities, health services, and digital platforms.

This study has several limitations. The number of respondents was relatively small and the sampling technique used accidental sampling, so the findings cannot be generalized to all adolescent girls in Banjarmasin City. The distribution of educational status was also unequal because almost all respondents were college students, making it difficult to analyze the association between education and knowledge. In addition, the cross-sectional design cannot explain causality, and online data collection may allow different interpretations of questionnaire statements. Nevertheless, these limitations do not reduce the relevance of the findings. This study provides initial evidence that can support the development of earlier, more equitable, and more targeted preconception education programs for adolescent girls before marriage and pregnancy planning.

## 4. CONCLUSION

Adolescent girls' knowledge of preconception health in Banjarmasin City was mostly in the good category, with 32 respondents (91.4%), while 3 respondents (8.6%) had sufficient knowledge and none had poor knowledge. Bivariate analysis showed that age and history of receiving information were associated with adolescent girls' knowledge scores about preconception health. Respondents who had received information had higher knowledge scores than those who had never received information.

Therefore, health workers, educational institutions, and related stakeholders are advised to strengthen education about balanced nutrition, anemia prevention, folic acid, reproductive health, mental health, and healthy lifestyle practices from adolescence. Future researchers are recommended to use a larger sample size, more representative sampling techniques, and additional attitude or behavior variables so that adolescent girls' preconception readiness can be analyzed more comprehensively.

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