

# The Effectiveness of Health Education on Premenstrual Syndrome toward Knowledge and Attitudes of Adolescent Girls at LKSA Panti Asuhan Aisyiyah Kudus

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Premenstrual syndrome (PMS) is a reproductive health problem commonly experienced by adolescent girls and can cause physical and emotional disturbances that affect daily activities and quality of life. Limited knowledge and inappropriate attitudes toward PMS are still frequently found, particularly among adolescent girls living in orphanages who have restricted access to health information. This study aimed to determine the effectiveness of health education on premenstrual syndrome in improving knowledge and attitudes of adolescent girls at LKSA Aisyiyah Kudus Orphanage. This study employed a quantitative approach with a pre-experimental one-group pretest–posttest design. The study population consisted of all adolescent girls at LKSA Aisyiyah Kudus Orphanage, totaling 34 respondents, with total sampling used as the sampling technique. Data were collected using knowledge and attitude questionnaires administered before and after the health education intervention, which was delivered through PowerPoint (PPT) media using an experience sharing technique. Data analysis was conducted using univariate and bivariate analyses, and the Wilcoxon Signed Rank Test was applied. The results showed a significant improvement in both knowledge and attitudes of adolescent girls after the health education intervention ( $p < 0.05$ ), indicating a meaningful difference between pretest and posttest measurements. These findings demonstrate that health education is effective in increasing knowledge and fostering positive attitudes among adolescent girls toward premenstrual syndrome.

**Keywords:** Adolescent Girls, Health Education, Premenstrual Syndrome.

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## 1. Introduction

Adolescent health has become a global concern, particularly for individuals aged 10–19 years who experience increased health risks related to reproductive health, psychological stress, anxiety, and mental well-being. The World Health Organization emphasizes that adolescents require strong and continuous support to navigate puberty in a healthy manner and to fully participate in their daily activities [1]. Adolescent girls, in particular, undergo complex developmental processes involving physical, emotional, and social changes that occur gradually. During this developmental phase, many adolescent girls experience discomfort prior to menstruation, which may manifest as mood changes and various physical symptoms. This condition is commonly referred to as Premenstrual Syndrome (PMS) and represents an important reproductive health issue due to its potential to disrupt daily functioning and quality of life.

Women experiencing PMS often show noticeable changes prior to menstruation. Emotional symptoms frequently include irritability, anxiety, and depressive feelings [2]. From a physical perspective, common complaints include abdominal bloating, lower abdominal pain or dysmenorrhea, breast tenderness, headaches, and migraines [3]. PMS has increasingly been recognized as a condition that may significantly impair women's ability to perform daily activities and maintain psychological well-being, as supported by

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Ayyub et al [4]. Medically, Al-Tarawneh & Al-Tarawneh explains that the physical and psychological impairments associated with PMS are related to decreased serotonin levels and hormonal fluctuations, particularly estrogen and progesterone, as well as other hormones such as aldosterone that regulate fluid balance in the body [5].

Empirical evidence indicates that PMS is highly prevalent among adolescent and young adult populations. A study involving 1,115 university students aged  $\geq 18$  years at the University of Rio Verde, Goiás, Brazil, reported a PMS prevalence of 46.9% [6]. In Indonesia, Salsabila, citing data from the Central Bureau of Statistics (BPS), reported that 218,338 adolescent girls, or 49.73% of the adolescent female population, experienced premenstrual syndrome [7]. Furthermore, the prevalence of PMS in 2020 was reported at 41.18%, with an observed increase from 2020 to 2021, indicating that reproductive health problems among adolescent girls remain substantial. This trend is largely attributed to low awareness and limited understanding among adolescent girls regarding premenstrual disorders.

Preliminary observations conducted by the researcher on 27 November 2025 at LKSA Panti Asuhan Aisyiyah Kudus revealed limited knowledge and awareness among adolescent girls regarding PMS. Of the ten adolescent girls interviewed, most were only familiar with the terms menstrual pain and mood swings. None of the respondents understood that these symptoms were related to premenstrual syndrome, as they had never received specific education or information regarding PMS. When asked about how they managed the changes experienced before menstruation, respondents reported choosing to remain silent, rest, or continue daily activities as usual. None mentioned appropriate symptom management strategies, reflecting a lack of understanding of the physiological and psychological changes occurring before menstruation. These preliminary findings highlight the urgent need for targeted health education to improve adolescents' understanding of PMS.

Previous studies have demonstrated the effectiveness of health education in reducing the severity of premenstrual syndrome. Daneshvar et al., reported that structured health education programs significantly reduced PMS severity [8]. Nurdiansyah et al., emphasized that health literacy is a critical skill for guiding individuals toward healthy behaviors and improving overall quality of life [9]. Through health education, adolescent girls are expected to gain a better understanding of the causes, symptoms, and appropriate management of PMS, while also developing more positive attitudes and increased awareness of the importance of reproductive health.

The novelty of this study lies in the integration of health education with systematic evaluation through pretest and posttest assessments, combined with the use of an experience-sharing technique. This approach encourages respondents to actively participate by sharing personal experiences and complaints through two-way discussions, thereby enhancing engagement and comprehension.

This research is particularly important because adolescent girls living in orphanages have characteristics that differ from those living with their families, including limited parental roles in providing reproductive health education and restricted access to health information, such as limited use of mobile phones. These conditions place adolescent girls in orphanages at a higher risk of inadequate health knowledge. Therefore, this study aims to provide stronger empirical evidence regarding the effectiveness of health education in improving knowledge and attitudes toward premenstrual syndrome among adolescent girls.

## 2. Literature Review and Problem Statement

Premenstrual syndrome (PMS) is a multifactorial reproductive health condition characterized by a combination of physical, emotional, and behavioral symptoms occurring during the luteal phase of the menstrual cycle [10]. Previous studies have demonstrated that hormonal fluctuations particularly involving

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estrogen, progesterone, and serotonin play a central role in the manifestation of PMS symptoms, which may include abdominal pain, fatigue, mood instability, anxiety, and decreased concentration [11]. Among adolescent girls, PMS represents a critical health concern because it coincides with a developmental period marked by emotional vulnerability, cognitive maturation, and adaptation to bodily changes. According to World Health Organization, inadequate reproductive health knowledge during adolescence may contribute to maladaptive coping strategies and reduced quality of life, emphasizing the importance of early educational interventions.

Health education has been widely recognized as an effective strategy for improving adolescents' knowledge, attitudes, and health-related behaviors. Empirical evidence indicates that structured health education programs significantly enhance adolescents' understanding of reproductive health issues, including PMS, and foster more positive attitudes toward symptom management [12]. Educational interventions that employ interactive methods such as experience sharing, group discussion, and visual media have been shown to improve information retention and emotional engagement, thereby facilitating meaningful learning [13]. Prior research consistently reports that adolescents who receive targeted education demonstrate better awareness of PMS symptoms, greater acceptance of menstruation-related changes, and improved readiness to adopt healthy coping behaviors [14]. Nevertheless, most existing studies focus on school-based populations, while adolescents living in institutional settings remain underrepresented in the literature.

Despite the growing body of research on PMS and health education, a clear gap persists regarding adolescents residing in orphanages, who often face limited access to reproductive health information and lack consistent parental guidance. Preliminary observations at LKSA Panti Asuhan Aisyiyah Kudus revealed that adolescent girls possessed minimal understanding of PMS and tended to normalize symptoms without appropriate management strategies. This condition highlights a critical problem: insufficient knowledge may lead to negative attitudes, emotional distress, and unaddressed health complaints. Therefore, there is a need for empirical evidence examining whether structured health education can effectively improve both knowledge and attitudes toward PMS among adolescent girls in orphanage settings. Addressing this gap forms the basis of the present study, which seeks to evaluate the effectiveness of health education interventions in enhancing adolescents' preparedness to understand and manage premenstrual syndrome.

### 3. Method

This study employed a quantitative research approach using a pre-experimental design with a one-group pretest–posttest model. This design was selected to evaluate the effectiveness of health education on premenstrual syndrome (PMS) by comparing participants' knowledge and attitudes before and after the intervention. The study was conducted at LKSA Panti Asuhan Aisyiyah Kudus. The population consisted of all adolescent girls residing at the orphanage, and a total sampling technique was applied, resulting in 34 respondents who met the inclusion criteria. Prior to the intervention, participants completed a pretest to assess baseline levels of knowledge and attitudes toward PMS. Subsequently, health education was delivered using PowerPoint (PPT) media combined with an experience-sharing technique, which encouraged two-way discussions and active participation. A posttest was administered one week after the intervention to evaluate changes in knowledge and attitudes.

Data were collected using structured questionnaires measuring knowledge and attitudes toward premenstrual syndrome. The knowledge questionnaire consisted of 10 items developed using a Guttman scale with dichotomous responses (true/false), covering definitions, symptoms, types, and management of PMS. Attitudes were measured using a 10-item Likert-scale questionnaire comprising both positive and

negative statements related to acceptance, symptom management, lifestyle modification, and health-seeking behavior during PMS. Prior to data collection, the instruments were tested for validity and reliability on 20 respondents outside the study setting. Validity testing showed that all items met the required correlation values, while reliability testing yielded Cronbach’s alpha values above 0.70 for both knowledge and attitude instruments, indicating good internal consistency.

Data analysis was conducted using descriptive and inferential statistical methods. Univariate analysis was used to describe respondents’ characteristics and to summarize knowledge and attitude scores using measures such as minimum, maximum, mean, and standard deviation. To examine the effect of the health education intervention, bivariate analysis was performed using the Wilcoxon Signed Rank Test, as the data were ordinal and derived from paired observations. This test was used to determine statistically significant differences between pretest and posttest scores for both knowledge and attitudes. A p-value of less than 0.05 was considered statistically significant, indicating that the health education intervention had a meaningful effect on improving adolescents’ knowledge and attitudes toward premenstrual syndrome.

#### 4. Results and Discussion

##### Result

##### Study Setting and Respondent Characteristics

This study was conducted at LKSA Panti Asuhan Aisyiyah Kudus under the title “The Effectiveness of Health Education on Premenstrual Syndrome (PMS) toward Knowledge and Attitudes of Adolescent Girls at LKSA Panti Asuhan Aisyiyah Kudus.” A total of 34 adolescent girls participated in the study, selected using a total sampling technique. The pretest was administered on 23–24 January 2026, followed by a health education intervention delivered through PowerPoint (PPT) media combined with an experience-sharing technique that facilitated two-way discussions, allowing participants to express personal experiences and complaints related to PMS. The posttest was conducted one week after the intervention, on 30–31 January 2026, to assess changes in knowledge and attitudes. Data were analyzed using the Wilcoxon Signed Rank Test.

Overall, the respondents demonstrated characteristics typical of early to middle adolescence, with most experiencing menarche within the normal age range and exhibiting relatively regular menstrual cycles. The majority were enrolled at the junior secondary school level and had resided in the orphanage for more than one year, indicating prolonged exposure to the same social and informational environment. These characteristics suggest that the respondents represent adolescent girls with ongoing reproductive development and relatively homogeneous living conditions, providing a suitable population for evaluating the impact of structured health education interventions.

**Table 1.** Sociodemographic and Menstrual Characteristics of Respondents

Variable	Category	n	%
Age at menarche (years)	10	3	8.8
	11	7	20.6
	12	9	26.5
	13	11	32.4
	14	2	5.9
	15	2	5.9
Current age (years)	11	3	8.8
	12	6	17.6

Variable	Category	n	%
		13	6 17.6
		14	7 20.6
		15	4 11.8
		16	5 14.7
		17	3 8.8
Educational level	Primary school	3	8.8
	Junior high school	20	58.8
	Senior high school	11	32.4
Menstrual cycle length	< 21 days	2	5.9
	21–35 days	27	79.4
	> 35 days	5	14.7
Length of stay at orphanage	< 1 year	6	17.6
	1–3 years	12	35.3
	4–6 years	9	26.5
	> 6 years	7	20.6

The table indicates that most respondents experienced menarche at 12–13 years, which is within the normal range of early adolescence. At the time of data collection, respondents were predominantly in early to middle adolescence, with the largest proportion aged 14 years. More than half of the participants were enrolled in junior high school, reflecting the dominant age structure of the sample. Most respondents reported menstrual cycles of 21–35 days, suggesting generally regular menstrual patterns, although a small proportion experienced shorter or longer cycles. In addition, the majority had lived in the orphanage for more than one year, indicating relatively stable living conditions and prolonged exposure to the same caregiving and health information environment. Overall, these characteristics suggest that the respondents represent adolescent girls with ongoing reproductive maturation and relatively homogeneous social settings, making them an appropriate population for assessing the effects of health education on premenstrual syndrome.

### Univariate Analysis

#### Knowledge of Premenstrual Syndrome

Univariate analysis of adolescents’ knowledge regarding premenstrual syndrome (PMS) was conducted to describe respondents’ level of understanding before and after the health education intervention. Knowledge assessment was carried out at two measurement points (pretest and posttest) to capture changes related to respondents’ comprehension of the definition, symptoms, and management of PMS. Descriptive statistical analysis was applied to summarize the distribution of knowledge scores at both measurements.

**Table 2.** Knowledge of Adolescent Girls about Premenstrual Syndrome  
 Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge pretest (total score)	34	1	9	3.91	2.050
Knowledge posttest (total score)	34	8	10	9.24	0.741
Valid N (listwise)	34				

The results show that prior to the intervention, respondents’ knowledge scores ranged from 1 to 9, with a mean score of 3.91 and a standard deviation of 2.050, indicating generally low and varied levels of

understanding. After the health education intervention, the minimum score increased substantially to 8 and the maximum score reached 10, with a mean of 9.24 and a smaller standard deviation of 0.741. This marked increase in the mean score, accompanied by a decrease in score variability, suggests a substantial improvement in respondents' knowledge and a more uniform level of understanding following the intervention.

**Table 3.** Distribution of Knowledge Levels at Pretest and Posttest

Category	Pretest score	n	%	Posttest score	n	%
High	≥ 6	6	17.6	≥ 10	14	41.2
Moderate	4–5	10	29.4	9	14	41.2
Low	≤ 3	18	52.9	8	6	17.6
Total		34	100		34	100

Based on the distribution, more than half of the respondents were classified in the low knowledge category at the pretest (52.9%). Following the intervention, there was a clear shift toward higher knowledge levels, with 41.2% of respondents classified in the high category and a substantial reduction in the low category to 17.6%. This distributional change further confirms the improvement in adolescents' knowledge after receiving health education on PMS.

#### Attitudes toward Premenstrual Syndrome

Univariate analysis was also conducted to describe adolescents' attitudes toward premenstrual syndrome before and after the health education intervention. This assessment aimed to capture respondents' perceptions, acceptance, and readiness to cope with physical and emotional changes occurring prior to menstruation. Changes in attitude were evaluated descriptively to illustrate shifts following the provision of accurate and structured health information.

**Table 4.** Attitudes of Adolescent Girls toward Premenstrual Syndrome  
 Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Attitude pretest (total score)	34	27	34	30.50	1.796
Attitude posttest (total score)	34	30	38	33.74	1.711
Valid N (listwise)	34				

Before the intervention, attitude scores ranged from 27 to 34, with a mean of 30.50 and a standard deviation of 1.796, indicating moderately positive but varied attitudes toward PMS. After the health education intervention, the minimum score increased to 30 and the maximum score to 38, while the mean score rose to 33.74 with a slightly lower standard deviation of 1.711. This increase in the mean score reflects a shift toward more positive attitudes, while the reduced variability suggests greater consistency in respondents' attitudes after the intervention.

**Table 5.** Distribution of Attitude Levels at Pretest and Posttest

Category	Pretest score	n	%	Posttest score	n	%
High	≥ 33	4	11.8	≥ 33	6	17.6
Moderate	30–32	22	64.7	30–32	6	17.6
Low	≤ 29	8	23.5	≤ 29	2	5.9
Total		34	100		34	100

The attitude distribution shows that at the pretest stage, most respondents were categorized as having moderate attitudes toward PMS (64.7%), while only a small proportion demonstrated high attitudes

(11.8%). After the intervention, a substantial shift occurred, with the majority of respondents classified in the high attitude category (76.5%) and a notable reduction in the low category to 5.9%. These findings indicate a clear positive change in adolescents' attitudes toward PMS following the health education intervention.

**Bivariate Analysis**

**Differences in Knowledge Before and After Health Education**

Bivariate analysis was conducted to examine differences in adolescents' knowledge of premenstrual syndrome before and after the health education intervention. The comparison of paired pretest and posttest scores was analyzed using the Wilcoxon Signed Rank Test to determine whether the observed changes were statistically significant.

**Table 6.** Wilcoxon Signed Rank Test for Knowledge

		Ranks		
Comparison	Ranks	N	Mean Rank	Sum of Ranks
Knowledge posttest – knowledge pretest	Negative ranks	0 <sup>a</sup>	0.00	0.00
	Positive ranks	34 <sup>b</sup>	17.50	595.00
	Ties	0 <sup>c</sup>		
	Total	34		

- a. Posttest knowledge score < pretest knowledge score
- b. Posttest knowledge score > pretest knowledge score
- c. Posttest knowledge score = pretest knowledge score

The results indicate that all respondents experienced an increase in knowledge scores following the health education intervention, as reflected by the presence of 34 positive ranks and the absence of negative ranks or ties. The mean rank of 17.50 with a total rank sum of 595.00 demonstrates that the improvement in knowledge occurred consistently across all participants, suggesting that the observed change was systematic rather than random.

**Table 7.** Test Statistics for Knowledge

Statistic	Value
Z	-5.106
Asymp. Sig. (2-tailed)	0.000

Based on the Wilcoxon Signed Rank Test, a Z value of -5.106 with a significance level of 0.000 indicates a statistically significant difference between knowledge scores before and after the intervention. As the p-value is far below the threshold of 0.05, the null hypothesis is rejected, confirming that the health education intervention had a significant effect on improving adolescents' knowledge of premenstrual syndrome. The uniform increase in scores among all respondents further underscores the effectiveness of the educational program in enhancing understanding of PMS.

**Differences in Attitudes Before and After Health Education**

Bivariate analysis was also performed to assess changes in adolescents' attitudes toward premenstrual syndrome following the health education intervention. Attitude scores obtained before and after the intervention from the same respondents were compared using the Wilcoxon Signed Rank Test to identify statistically significant differences.

**Table 8.** Wilcoxon Signed Rank Test for Attitudes

Comparison	Ranks		N	Mean Rank	Sum of Ranks
	Negative ranks	Positive ranks			
Attitude posttest – attitude pretest	Negative ranks	2 <sup>a</sup>	2	3.50	7.00
	Positive ranks	29 <sup>b</sup>	29	16.86	489.00
	Ties	3 <sup>c</sup>	3		
	Total		34		

- a. Posttest attitude score < pretest attitude score
- b. Posttest attitude score > pretest attitude score
- c. Posttest attitude score = pretest attitude score

The rank distribution shows that most respondents (n = 29) experienced an increase in attitude scores after the intervention, while only two respondents showed a decrease and three respondents exhibited no change. The mean rank for positive changes (16.86) and the substantially larger sum of ranks (489.00) compared with negative changes indicate that improvements in attitude predominated. This pattern suggests that the intervention was generally well received and effective in fostering more positive attitudes toward PMS.

**Table 9.** Test Statistics for Attitudes

Statistic	Value
Z	-4.738
Asymp. Sig. (2-tailed)	0.000

The Wilcoxon Signed Rank Test produced a Z value of -4.738 with a significance level of 0.000, indicating a statistically significant difference in attitude scores before and after the health education intervention. The very small p-value confirms that the observed changes were not due to chance. These findings demonstrate that the health education intervention exerted a strong positive effect on adolescents' attitudes toward understanding and managing premenstrual syndrome.

## Discussion

The findings of this study demonstrate a substantial improvement in adolescent girls' knowledge regarding premenstrual syndrome (PMS) following the health education intervention. Prior to the intervention, knowledge scores ranged from a minimum of 1 to a maximum of 9, with a mean of 3.91 and a standard deviation of 2.050, indicating low to moderate levels of understanding and considerable variability among respondents. After the intervention, knowledge scores increased markedly, with a minimum score of 8 and a maximum of 10, a mean of 9.24, and a reduced standard deviation of 0.741. The mean increase of 5.33 points reflects a pronounced enhancement in comprehension among nearly all participants, while the reduced variability suggests a more homogeneous distribution of high knowledge levels. This finding supports the role of health education as an effective learning process that enables individuals to better understand health-related information [15].

The observed improvement reflects a progression in respondents' cognitive levels, shifting from mere awareness toward comprehension and application. Initially, many adolescent girls were only familiar with the term PMS without a clear understanding of its causes, symptoms, or management strategies. Following the educational intervention, respondents demonstrated the ability to explain PMS symptoms, recognize physical and emotional changes, and understand simple measures to alleviate discomfort. This progression aligns with the six levels of knowledge described by Asadi et al., which emphasize that meaningful understanding develops gradually from recall to evaluation [16]. The health education provided in this study

facilitated higher levels of cognitive processing, ensuring that information was not only memorized but also understood in a more comprehensive manner.

Bivariate analysis using the Wilcoxon test further confirmed the effectiveness of the intervention, yielding a Z value of  $-5.106$  with a significance level of  $0.000$ . All 34 respondents experienced an increase in knowledge scores, with no cases of decreased or unchanged scores, a mean rank of  $17.50$ , and a total rank of  $595.00$ . This consistent improvement across all participants indicates that the educational intervention exerted a uniform effect on the target group. These results reinforce previous evidence that structured health education interventions can significantly enhance knowledge levels within adolescent populations [17], while also supporting the assertion that increased understanding enables individuals to make more informed health-related decisions [18].

Several factors may have contributed to the observed knowledge gains, including age, educational environment, prior experience, and accessibility of information. Adolescents in school settings are more likely to receive repeated exposure to health-related information through teachers, healthcare professionals, and educational media. Recurrent exposure and personal experience strengthen memory retention and deepen understanding of educational content [19]. The consistency of knowledge improvement among all respondents suggests that these contextual factors synergized effectively with the educational intervention.

The findings of this study are consistent with previous research. Tri Yuli Ernawati reported a significant increase in adolescent girls' knowledge following health education, with a p-value of  $0.000$ . Similarly, Kokiwar & Nikitha, found a statistically significant improvement in knowledge among 120 adolescent girls in the intervention group ( $p < 0.05$ ) [20]. Babapour et al., further demonstrated strong educational effects on PMS knowledge, with partial eta squared values of  $0.67$  and  $0.82$  [21]. Collectively, these studies corroborate the conclusion that health education interventions consistently and effectively improve adolescents' understanding of PMS across different research contexts.

The substantial increase in mean knowledge scores from  $3.91$  to  $9.24$ , accompanied by a significance value of  $0.000$ , confirms the tangible impact of health education on adolescent girls' knowledge of PMS. The universal improvement among respondents indicates that the educational material was well understood and effectively delivered. This outcome supports the objectives of health promotion, which emphasize knowledge enhancement as a foundational element in the development of healthy behaviors [22]. Quartile analysis further reinforces this conclusion, as pretest results indicated low to moderate knowledge levels ( $Q1 < 3$ ,  $Q2 = 4-5$ ,  $Q3 \geq 6$ ), while posttest results showed a clear shift toward higher knowledge levels ( $Q1 > 8$ ,  $Q2 = 9$ ,  $Q3 < 10$ ), reflecting a marked improvement in overall comprehension.

Item-level analysis of the pretest revealed several misconceptions, particularly regarding the definition of PMS, its physical and emotional symptoms, hormonal causes, PMS subtypes, and stress management strategies. A substantial proportion of respondents demonstrated incorrect understanding of key concepts, indicating limited baseline knowledge. Following the intervention, the proportion of incorrect responses decreased markedly across nearly all items, although a small number of respondents continued to exhibit misunderstandings, particularly regarding hormonal causes and specific PMS subtypes. This residual gap highlights the need for ongoing reinforcement and more targeted educational strategies to address complex or less intuitive aspects of PMS.

In addition to knowledge, the study also demonstrated a positive shift in attitudes toward PMS following health education. Before the intervention, attitude scores ranged from  $27$  to  $34$ , with a mean of  $30.50$  and a standard deviation of  $1.796$ , indicating moderate attitudes with some variability. After the intervention, scores increased to a range of  $30-38$ , with a mean of  $33.74$  and a standard deviation of  $1.711$ , reflecting a

mean increase of 3.24 points and a trend toward more positive and uniform attitudes. This change underscores the role of health education in shaping more constructive perceptions of PMS [22].

The observed attitude change can be explained through the cognitive, affective, and conative components of attitude formation [23]. Improved knowledge (cognitive) influenced respondents' emotional responses (affective), leading to greater calmness and acceptance, and ultimately enhanced their readiness to act appropriately (conative) when experiencing PMS symptoms. This interrelationship highlights the close linkage between knowledge acquisition and attitude development. Wilcoxon test results further confirmed these findings, with a Z value of  $-4.738$  and a significance of  $0.000$ . Most respondents (29 out of 34) showed improved attitude scores, while only a small number exhibited decreases or unchanged scores, indicating that positive changes predominated.

These results are consistent with previous studies. Khalilzadeh et al., reported significant improvements in adolescent girls' attitudes toward PMS following health education ( $p < 0.05$ ) [24], while Betsu et al., found strong effects of educational interventions on adolescents' responses to PMS [25]. Similarly, Setyowati et al., demonstrated meaningful attitude changes after PMS-related health education, reinforcing the conclusion that education plays a critical role in fostering positive attitudes toward reproductive health [26].

Overall, the increase in mean attitude scores from 30.50 to 33.74, together with a significance value of  $0.000$ , indicates that health education had a measurable impact on adolescents' readiness to understand, accept, and manage PMS. The majority of respondents demonstrated improved emotional regulation, greater acceptance of PMS as a natural biological process, and increased willingness to adopt healthy coping strategies. Although some misconceptions and less favorable attitudes persisted in a small proportion of respondents, the general trend toward improvement confirms that health education effectively influences cognitive, affective, and behavioral components of attitude formation [27]. These findings emphasize the importance of structured reproductive health education in empowering adolescent girls to face menstrual-related changes with greater confidence and resilience.

## 5. Conclusion

Based on the results of the study conducted at Aisyiyah Kudus Orphanage on the effectiveness of health education regarding premenstrual syndrome, it can be concluded that health education had a significant impact on both knowledge and attitudes of adolescent girls. The Wilcoxon Signed Rank Test demonstrated a statistically significant effect of the intervention on knowledge, with a Z value of  $-5.106$  and a p-value of  $0.000$  ( $p \leq 0.05$ ). The mean knowledge score increased substantially from 3.91 before the intervention to 9.24 after the intervention, and all 34 respondents experienced an improvement in their scores, indicating that health education was highly effective in enhancing adolescents' understanding of the definition, symptoms, and management of premenstrual syndrome. Furthermore, the intervention also had a significant effect on attitudes, as evidenced by a Z value of  $-4.738$  and a p-value of  $0.000$  ( $p \leq 0.05$ ). The mean attitude score increased from 30.50 prior to the intervention to 33.74 after the intervention, with 29 out of 34 respondents showing improved scores. These findings indicate that health education not only increases knowledge but also contributes to the development of more positive, calm, and prepared attitudes among adolescent girls in facing premenstrual syndrome.

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