

EMPOWERING ADOLESCENTS TO MAKE HEALTHY CHOICES: EFFECTS OF THE PRIMERO MODULE ON REPRODUCTIVE HEALTH LITERACY

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ABSTRACT

Adolescents are vulnerable to reproductive health problems due to rapid biological, psychological, and social changes, which may be exacerbated by low reproductive health literacy. This study aimed to examine the effect of the PRIMERO (Reproductive Education through Modules for Optimistic Youth Empowerment) module on adolescents' reproductive health literacy. A quasi-experimental study with a pretest–posttest control group design was conducted among 34 adolescents aged 15 years, who were equally divided into an intervention group (n = 17) and a control group (n = 17). The intervention group received reproductive health education using the PRIMERO module, while the control group received conventional health education. Reproductive health literacy was measured before and after the intervention and analyzed using paired t-tests and independent t-tests. Data were collected using a reproductive health literacy questionnaire administered to adolescents twice, namely before and after the intervention. The results showed that the mean literacy score in the intervention group significantly increased from 194.59 to 215.06 ($p = 0.032$), whereas the control group showed no significant improvement, with mean scores increasing from 172.88 to 173.76 ($p = 0.188$). Furthermore, a significant difference in post-intervention literacy scores was found between the intervention and control groups ($p = 0.001$). These findings indicate that the PRIMERO module is effective in improving adolescents' reproductive health literacy and can be used as an educational medium to support reproductive health promotion among adolescents.

Keywords: adolescents; empowerment; health education; PRIMERO module; reproductive health literacy

INTRODUCTION

Adolescence is a critical developmental stage characterized by rapid biological, psychological, and social changes that increase vulnerability to reproductive health problems (Wardiaty et al., 2023). During this period, adolescents are at increased risk of engaging in unhealthy reproductive behaviors, including early sexual activity, unintended pregnancy, and sexually transmitted infections (Irinericy et al., 2024). These risks are often exacerbated by limited access to accurate reproductive health information and inadequate guidance from reliable sources (Salafas et al., 2025).

Reproductive health literacy refers to an individual's ability to access, understand, evaluate, and apply reproductive health information to make appropriate health-related decisions (Kesehatan et al., 2025). Adequate reproductive health literacy enables adolescents to adopt positive reproductive health behaviors and to seek appropriate health services when needed (Choirunissa et al., 2025). However, recent studies have shown that adolescents' reproductive health literacy levels remain insufficient, particularly in school-based settings where structured reproductive health education is limited (Kustin, 2023).

Health education interventions play a crucial role in improving adolescents' reproductive health literacy (Choirunissa et al., 2025). Conventional reproductive health education methods often rely on passive information delivery and do not adequately engage adolescents in critical thinking and decision-making processes (Salafas et al., 2025). In contrast, empowerment-based educational approaches have been shown to be more effective in enhancing knowledge retention, self-efficacy, and health literacy outcomes among adolescents (Kesehatan et al., 2025).

The PRIMERO (Reproductive Education through Modules for Optimistic Youth Empowerment) module was developed as a structured and empowerment-oriented educational tool to address gaps in adolescent reproductive health education (Choirunissa et al., 2025). The module emphasizes active learning, age-appropriate content, and adolescent participation to foster optimism and informed reproductive health decision-making (Kesehatan et al., 2025). Despite its potential benefits, empirical evidence regarding the effectiveness of the PRIMERO module in improving adolescents' reproductive health literacy remains limited (Salafas et al., 2025). Therefore, this study aimed to examine the effects of the PRIMERO module on adolescents' reproductive health literacy (Wardiati et al., 2023). The general objective of this study was to determine the effect of the PRIMERO (Reproductive Education through Modules for Optimistic Youth Empowerment) module on adolescents' reproductive health literacy.

METHOD

This study was a quantitative study using a quasi-experimental design with a pretest–posttest control group approach. The sampling technique employed was purposive sampling. The respondents were adolescents aged 10–19 years who met the inclusion criteria, with a total of 34 adolescents divided into an intervention group (n = 17) and a control group (n = 17). The intervention group received reproductive health education using the PRIMERO (Reproductive Education through Modules for Optimistic Youth Empowerment) module, while the control group received conventional reproductive health education. The research instrument used was the Reproductive Health Literacy Questionnaire (RHL-Q), which was validated by Ma et al. (2021). The validity and reliability tests showed correlation coefficient values ranging from 0.49 to 0.77 ($r_{\text{calculated}} > r_{\text{table}} = 0.30$) and a Cronbach's alpha value of 0.91, indicating good reliability. Data collection was conducted before and after the intervention. Data analysis was performed using univariate analysis to describe respondents' characteristics and bivariate analysis using paired t-tests to examine changes in reproductive health literacy within each group and independent t-tests to compare post-intervention outcomes between the intervention and control groups, with a significance level set at $p < 0.05$. Ethical approval for this study was obtained from the Health Research Ethics Committee with reference number 734/KEP/EC/UNW/2025, and all respondents provided informed consent prior to participation.

RESULT

Table 1
Distribution of Respondents by Gender

Gender	Control Group		Intervention Group	
	f	%	f	%
Female	15	88.2	17	100.0
Male	2	11.8	0	0

Table 1 shows that the majority of respondents were female. All 17 respondents (100%) in the intervention group were female, while the majority of respondents in the control group were female, with 15 respondents (88.2%) and 2 males (11.8%).

Table 2
Distribution of Respondents by Age

Age	Control Group		Intervention Group	
	f	%	f	%
15	9	52.9	11	64.7
16	7	41.2	6	35.3
17	0	0	0	0
18	0	0	0	0
19	1	5.9	0	0

Table 2 shows that the majority of respondents were 15 years old. In the intervention group, the majority were 15 years old (11 respondents (64.7%)), while in the control group, the majority were 15 years old (9 respondents (52.9%)).

Table 3
Distribution of Respondents by Economic Status

Category	Intervention		Control	
	f	%	f	%
Low	0	0	0	0
Medium	6	35.3	5	29.4
High	11	64.7	12	70.6

Table 3 shows that the majority of adolescents in the intervention group had a high economic status, with 11 respondents (64.7%). Meanwhile, in the control group, the majority of adolescents also had a high economic status, with 12 respondents (70.6%).

Table 4
Adolescent Reproductive Health Literacy Mean Before Treatment in the Control and Intervention Groups

Category	n	Mean	SD
Control	17	172.88	37.331
Intervention	17	194.59	37.913

Table 4 shows that the mean literacy before treatment showed that the control group (n=17) had a mean score of 172.88 with a standard deviation of 37.331. Meanwhile, the intervention group (n=17) had a slightly higher mean score of 194.59 with a standard deviation of 37.913. This indicates only a slight difference, thus concluding that there was no significant difference in reproductive health literacy between the control and intervention groups.

Table 5
Average Adolescent Reproductive Health Literacy After Treatment in the Intervention and Control Groups

Category	n	Mean	SD
Control	17	173.76	38.732
Intervention	17	215.06	28.195

Table 5 shows that the data regarding literacy scores shows that the control group (n=17) had an average literacy score of 173.76 and a standard deviation of 38.732, while the intervention group (n=17) had an average literacy score of 215.06 and a standard deviation of 28.195. This indicates only a slight difference, thus concluding that there is no significant difference in reproductive health literacy between the control and intervention groups.

Table 6
Differences in Adolescent Reproductive Health Literacy Before and After Treatment in the Intervention Group

Variable	n	Mean	SD	Confidence Interval		t	p value
				95%			
				Lower	Upper		
Intervention							
Pretest	17	194.59	37.913	38.917	2.024	2.353	0.032
Posttest	17	215.06					

Table 6 shows that the results of data analysis using the Dependent T-Test in the intervention group showed that the calculated t-value (2.353) was greater than the t-table (2.120), and the p-value (0.032) was less than α (0.05). Therefore, it can be concluded that there was a significant difference in literacy before and after treatment in the intervention group.

Table 7
Differences in Adolescent Reproductive Health Literacy Before and After Treatment in the Control Group

Variable	n	Mean	SD	Confidence Interval		t	p value
				95%			
				Lower	Upper		
Control							
Pretest	17	172.88	37.331	2.241	0.477	1.376	0.188
Posttest	17	173.76					

Table 7 shows that the results of data analysis using the Dependent T-Test in the control group showed that the calculated t-value (0.477) was $<t_{\text{table}}$ (2.120) and the p-value (0.188) was $>\alpha$ (0.05). Therefore, it can be concluded that there was no significant difference in literacy before and after health education regarding reproductive health for adolescents.

Table 8
The Effect of Health Education Using the PRIMERO Module on Literacy in Adolescents

Variable	n	Mean	SD	T	p value
Intervention	17	215.06	28.195	3.554	0,001
Control	17	173.76	38.732		

Table 8 shows that the results of the literacy data analysis using the Independent T-Test obtained a calculated t-value (3.554) $>t_{\text{table}}$ (2.037) and a p-value (0.001) $<\alpha$ (0.05). Therefore, it can be concluded that there is a significant effect of the health education intervention using the PRIMERO module on literacy in adolescents.

DISCUSSION

Respondent Characteristics

The majority of respondents in this study were female adolescents, with 100% of participants in the intervention group and 88.2% in the control group being female (Meherali et al., 2022). This demographic composition suggests that the findings primarily reflect reproductive health literacy among adolescent girls, who generally have greater informational needs related to reproductive health due to biological and physiological changes during puberty (Mbizvo et al., 2023). Female adolescents tend to be more responsive to reproductive health education programs, which may contribute to higher literacy gains following structured interventions (Wahyuningsih et al., 2024). However, the dominance of female respondents should be considered when interpreting the results, as limited male participation may restrict the generalizability of reproductive health literacy outcomes across genders (Saparini et al., 2023).

Most respondents were aged 15 years, representing middle adolescence, a developmental stage characterized by significant physical, cognitive, and psychosocial changes (Santrock & Nugraha, 2022). Adolescents at this age demonstrate improved abstract thinking and increased curiosity about bodily changes, making them an appropriate target group for reproductive health education interventions (Pratiwi et al., 2023). Nevertheless, differences in developmental stages indicate that reproductive health education should be adapted to adolescents' age-specific cognitive capacities to maximize literacy outcomes (Kurniawati et al., 2024). The majority of respondents were also from higher socioeconomic backgrounds, which may facilitate access to health information, educational resources, and digital media (Widiyastuti et al., 2021). Despite this advantage, structured reproductive health education remains essential to ensure accurate understanding and to reduce disparities in health literacy regardless of socioeconomic status (Wahyuningsih et al., 2024).

Baseline Reproductive Health Literacy Before Intervention

Before the intervention, reproductive health literacy scores in the control and intervention groups were relatively comparable, with mean scores of 172.88 (SD = 37.331) and 194.59 (SD = 37.913), respectively (Polit & Beck, 2021). The absence of a statistically significant difference at baseline indicates that both groups had similar initial literacy levels prior to receiving any educational intervention (Pratiwi et al., 2022). This baseline equivalence strengthens the internal validity of the study and supports the attribution of post-intervention changes to the PRIMERO module (Polit & Beck, 2021). The moderate baseline literacy levels observed suggest that adolescents still have limited understanding of reproductive health concepts such as puberty, reproductive functions, and sexual health risks (Meherali et al., 2022). Such limitations are often influenced by adolescents' reliance on informal information sources, including peers and social media, which may provide incomplete or inaccurate information (Saparini et al., 2023).

Reproductive Health Literacy After the PRIMERO Intervention

Following the intervention, adolescents in the PRIMERO group demonstrated a substantial increase in reproductive health literacy, with mean scores rising from 194.59 to 215.06 (SD = 28.195) (Wardiati et al., 2023). In contrast, the control group showed only a minimal increase in literacy scores, from 172.88 to 173.76 (SD = 38.732), indicating limited improvement (Sugiyono 2017, n.d.). These findings suggest that adolescents who received structured education using the PRIMERO module achieved higher literacy outcomes compared to those receiving conventional education (Pratiwi et al., 2022). The limited change observed in the control group indicates that conventional reproductive health education methods may be insufficient to produce meaningful improvements in adolescent health literacy (Hidayat & Lestari, 2023).

Within-Group Differences in the Intervention and Control Groups

Paired t-test analysis revealed a statistically significant improvement in reproductive health literacy within the intervention group ($t = 2.353$; $p = 0.032 < 0.05$), confirming the effectiveness of the PRIMERO module (Wardiati et al., 2023). This increase reflects enhanced understanding and processing of reproductive health information following module-based education (Meherali et al., 2022). In contrast, the control group did not experience a statistically significant change in literacy scores ($t = 0.477$; $p = 0.188 > 0.05$), indicating that conventional education alone was insufficient to improve literacy outcomes (Rahmawati et al., 2022). These results reinforce previous findings that passive learning approaches have limited impact on adolescent reproductive health literacy (Govender et al., 2020).

Between-Group Differences and Overall Effect of the PRIMERO Module

Independent t-test analysis demonstrated a significant difference in post-intervention reproductive health literacy scores between the intervention and control groups ($t = 3.554$; $p = 0.001 < 0.05$) (Pratiwi et al., 2022). The higher posttest mean score in the intervention group (215.06) compared to the control group (173.76) indicates the superior effectiveness of the PRIMERO module over conventional education methods (Lestari et al., 2023). These findings confirm that structured, module-based reproductive health education has a stronger impact on adolescent literacy than unstructured or lecture-based approaches (Mbizvo et al., 2023).

Implications of Findings

The significant improvement in reproductive health literacy among adolescents receiving the PRIMERO module highlights the importance of empowerment-based educational strategies in adolescent health promotion (WHO, 2021). Module-based learning supports self-paced study, repetition, and deeper engagement with sensitive reproductive health topics, which contributes to better knowledge retention and comprehension (Wahyuningsih et al., 2024). Integrating the PRIMERO module into school-based health education programs may enhance adolescents' capacity to make informed and healthy reproductive health decisions (Mbizvo et al., 2023).

CONCLUSION

The PRIMERO module significantly improved adolescents' reproductive health literacy, with mean scores increasing from 194.59 to 215.06 in the intervention group ($p = 0.001$), while no significant change was observed in the control group. These findings indicate that PRIMERO-based education is an effective approach to strengthening adolescents' reproductive health literacy.

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