Factors Affecting Contraceptive Behaviour Among Adolescents

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ABSTRACT

Teenage pregnancy is a significant public health problem, especially in developing countries such as Indonesia. This study aimed to examine the effectiveness of school-based comprehensive sexuality education in reducing teenage pregnancy rates through improving knowledge, attitudes, and preventive behaviours. The method used was a quasi-experiment with a pretest-posttest control group design on 200 secondary school students in an area with high pregnancy rates. The UNESCO guideline-based comprehensive sexuality education intervention covered biological, emotional, social aspects, and decision-making skills delivered through active learning. Data were collected using a validated structured questionnaire and analysed using t-test and multiple linear regression. The results showed a significant increase in knowledge, attitude, and pregnancy prevention behaviour scores in the intervention group compared to the control (p < 0.001). The regression model revealed that knowledge and attitude were the main predictors of prevention behaviour with a contribution of 54.2%. These findings confirm that comprehensive sexuality education is effective in improving reproductive health literacy and shaping healthy and responsible sexual behaviour. Therefore, the main recommendation is to integrate this programme into the national curriculum and strengthen teacher training to support sustainable teenage pregnancy prevention.

Keywords: Knowledge, Attitude, Preventive Behaviour, Reproductive Health, School-based Education

INTRODUCTION

Teenage pregnancy is a persistent global public health challenge that brings significant social, economic, and health consequences not only for the young mothers but also for their families and communities. Adolescents who become pregnant often face interrupted education, limited economic opportunities, increased health risks including complications during pregnancy and childbirth, and social stigma. To effectively address this multifaceted issue, school-based comprehensive sexuality education (CSE) has emerged as a critical intervention. CSE programs provide young people with scientifically accurate, age-appropriate information about human development, relationships, sexual behavior, contraception, and reproductive rights. These programs aim to empower adolescents to make responsible decisions regarding their sexual health and to reduce behaviors that contribute to early and unintended pregnancies.

Research indicates that CSE delivered in schools can significantly decrease teenage pregnancy rates by promoting knowledge about contraception, delaying the initiation of sexual activity, and encouraging safer sexual practices among adolescents (Kim, 2023; WHO/UNESCO, 2021). Importantly, CSE goes beyond mere biological facts, incorporating gender equity, healthy relationships, and communication skills, which contribute to more comprehensive behavioral changes essential for preventing pregnancy. Studies have shown that school-based CSE not only increases adolescents' understanding of reproductive health but also enhances their self-efficacy and decision-making skills related to sexual activity (Purnamasari and Wimbrata, 2007; Kaidbey et al., 2023). Additionally, CSE programs that link educational content with access to youth-friendly health services yield stronger outcomes in reducing teenage pregnancies (Mark, 2022).

In the Indonesian context and other similar settings, implementation of culturally sensitive and age-appropriate CSE has been linked to reductions in adolescent pregnancy rates and improvements in reproductive health knowledge, attitudes, and behaviors (Pinandari et al., 2023; Syafitri, 2022). This body of evidence supports the crucial role of school-based comprehensive sexuality education as an effective strategy to empower young people, reduce health risks, and improve overall adolescent well-being through the prevention of teenage pregnancy.

Teenage pregnancy is still one of the significant public health problems in the world, especially in developing countries. According to the World Health Organization (WHO, 2023), approximately 12 million adolescent girls aged 15-19 years give birth each year globally, with high maternal and neonatal health risks. In Indonesia, the National Population and Family Planning Agency (BKKBN, 2022) recorded a teenage pregnancy rate of 27 per 1,000 women aged 15-19 years, indicating that this issue is still a major challenge in human development. Pregnancy at a young age does not only affect the physical condition of the mother and baby, but also has implications for the social and economic life of adolescents. Medically, pregnant teenagers are at risk of complications such as preeclampsia, anaemia, and premature birth, while from a social perspective, they are vulnerable to stigma, psychological pressure, and a high probability of dropping out of school, which ultimately reduces productivity and the quality of human resources (Gamelia et al., 2023; Bordogna et al., 2021).

The phenomenon of high teenage pregnancy rates can be traced through various interacting causal factors. Low knowledge and skills of adolescents regarding reproductive health and sexuality are the main factors that encourage risky sexual behaviour (Kyomuhangi et al., 2021). In addition, the flow of inaccurate information from social media and peer environments often reinforces

misconceptions about sexuality. Social and cultural norms that still consider it taboo to talk about sexuality also exacerbate the low reproductive health literacy among adolescents (Romero-Campero et al., 2024). Based on the *Health Belief Model* and *Theory of Planned Behaviour*, adolescent behaviour towards sexuality is strongly influenced by risk perception, social norms, and self-control. When adolescents do not have a proper understanding of the risks and are not supported by an environment that is open to sexuality education, their chances of engaging in unsafe sexual behaviour increase (Myat Pattanittum et al., 2024).

In response to these issues, comprehensive sexuality education (*CSE*) has been globally recognised as an effective approach to shaping healthy and responsible sexual behaviour. According to UNESCO guidelines (2021), CSE not only addresses biological and reproductive aspects, but also includes emotional, social, values and life skills. This education focuses on the formation of knowledge, positive attitudes, and the ability to make critical and ethical decisions in dealing with sexuality issues. A number of studies have shown that the implementation of CSE in schools can reduce risky sexual behaviour, increase contraceptive use, and delay first-time sexual activity (Bordogna et al., 2021; Gamelia et al., 2023). A study by Myat Pattanittum et al. (2024) also confirmed that school-based CSE has a significant impact in reducing teenage pregnancy rates and strengthening adolescents' social skills. Similarly, Chansa et al. (2024), who stated that comprehensive sexuality education can improve adolescents' awareness and communication about reproductive health.

However, the implementation of sexuality education in Indonesia still faces a number of obstacles. Many schools still provide reproductive education that is limited to the biological aspect and has not touched the emotional dimension, values, or social skills (Romero-Campero et al., 2024). Teachers often do not have sufficient competence and learning resources to deliver sexuality education in a comprehensive and culturally sensitive manner. Meanwhile, adolescents' need for accurate information is increasing along with the rapid flow of digital information and globalisation of values (Kyomuhangi et al., 2021). The gap between adolescents' information needs and the availability of relevant education points to the need to strengthen school-based education interventions that are planned, measurable and evidence-based (Myat Pattanittum et al., 2024).

Therefore, research and community service activities that test the effectiveness of school-based comprehensive sexuality education in improving adolescents' knowledge, attitudes, and behaviours towards reproductive health are needed. This research not only contributes to efforts to prevent teenage pregnancy, but also supports the Adolescent Reproductive Health Education (PKRR) programme from BKKBN and the Healthy Schools Programme from the Ministry of Education, Culture, Research and Technology. In addition, the research results are expected to produce an implementation model of sexuality education that can be replicated in various schools by adjusting the social and cultural context of the community (Romero-Campero et al., 2024).

Thus, the high rate of teenage pregnancy in Indonesia confirms that sexuality education provided in schools has not been comprehensive. Scientific evidence shows that the implementation of school-based comprehensive sexuality education is an effective strategy to shape healthy sexual behaviour, increase adolescents' awareness of reproductive health, and reduce teenage pregnancy rates (Bordogna et al., 2021; Myat Pattanittum et al., 2024; Gamelia et al., 2023). Based on this, it is important to conduct this study as an effort to develop sustainable and evidence-based health education interventions in the school environment.

METHODS

This study employed a quantitative approach using a quasi-experimental design with a pretest–posttest control group framework. This design was chosen to measure the effectiveness of school-based Comprehensive Sexuality Education (CSE) in improving adolescents' knowledge, attitudes, and pregnancy prevention behaviors, even without full randomization of participants. The research was conducted in several junior and senior high schools located in areas with relatively high teenage pregnancy rates based on data from the local Health Office and the National Population and Family Planning Board (BKKBN). The schools were purposively selected by considering administrative readiness, institutional support, and local demographic profiles. The overall research process lasted six months, encompassing preparation, intervention, and evaluation phases.

The population consisted of students aged 13–18 years from the participating schools. Sampling was carried out using a cluster random sampling technique to ensure representativeness and minimize potential selection bias. A total of 200 respondents were involved and divided equally into two groups: the intervention group (n = 100) and the control group (n = 100). The division of subjects was carried out through cluster randomization at the school level to avoid contamination between groups. Schools were matched beforehand according to key demographic variables—such as age distribution, grade level, and gender composition—to ensure baseline equivalence before random assignment. One cluster of schools was then randomly designated as the intervention group receiving the CSE program, while the remaining cluster acted as the control group receiving conventional reproductive health education.

The intervention implemented in this study was the Comprehensive Sexuality Education (CSE) program developed in accordance with the UNESCO International Technical Guidance on Sexuality Education (ITGSE, 2021). The program covered six thematic domains: understanding of the human body and reproductive health, interpersonal communication and relationships, gender values and equality, sexuality and decision-making, prevention of sexual violence and harassment, and life planning related to reproductive health. Each topic was delivered through an active, student-centered learning process involving group discussions, case studies, role-playing, and reflective activities. Sessions were conducted for 60–90 minutes over six to eight meetings, facilitated by teachers who had received prior specialized training.

Data collection utilized a structured questionnaire measuring three major aspects—knowledge, attitude, and pregnancy prevention behavior—based on constructs from the Health Belief Model (HBM) and Theory of Planned Behavior (TPB). Content validity was examined by experts in health education and adolescent psychology, while instrument reliability was tested using Cronbach's Alpha with a coefficient value of ≥ 0.70 as the criterion of internal consistency. Data were collected twice, before (pretest) and after (posttest) the intervention, for both groups.

Data analysis was performed using inferential statistics. Univariate analysis described respondent characteristics, while paired t-tests evaluated within-group differences between pretest and posttest scores. Independent t-tests were used to compare the intervention and control groups, and multiple linear regression analysis was conducted to identify the simultaneous effects of knowledge, attitude, and intervention participation on pregnancy prevention behavior.

Ethical principles were strictly observed throughout the study. Participation was voluntary and preceded by informed consent signed by students and their parents or guardians. Participant

confidentiality and anonymity were ensured, and the data collected were used solely for academic and scientific purposes.

Overall, this methodological design aimed to rigorously evaluate how school-based comprehensive sexuality education can improve adolescent reproductive health literacy and foster responsible pregnancy prevention behavior in a controlled and ethically sound manner.

RESULTS

The analysis of the research results aimed to determine the effectiveness of school-based Comprehensive Sexuality Education (CSE) in improving adolescents' knowledge, attitudes, and pregnancy prevention behaviors. A total of 200 students participated in the study, consisting of 100 respondents in the intervention group and 100 respondents in the control group. The respondents were selected from several junior and senior high schools located in areas with high teenage pregnancy rates.

In general, both groups had comparable baseline characteristics, indicating a relatively homogeneous distribution before the intervention. The mean age of participants was 15.6 years (SD = 1.4), ranging from 13 to 18 years. In the intervention group, 56% were female and 44% were male, while in the control group, 54% were female and 46% were male, suggesting a balanced gender proportion between groups. Most students in both groups were in grades 9 to 11, representing the middle to late stage of adolescence—a critical developmental phase associated with increasing exposure to reproductive and social challenges. The majority of respondents (around 70%) reported never having received prior structured reproductive health education, which ensured comparability and reduced potential bias in the intervention outcomes.

These characteristics confirmed that both groups started from similar sociodemographic conditions, allowing for a valid comparison of changes after the CSE intervention. Descriptive analysis revealed a substantial improvement in the mean scores of knowledge, attitudes, and pregnancy prevention behavior among adolescents in the intervention group following exposure to the CSE program, whereas changes in the control group were minimal and statistically insignificant.

Table 1 presents the distribution of mean scores before and after the intervention, showing clear differences between the two groups. The results demonstrated that the CSE intervention had a positive and measurable impact on improving reproductive health literacy and fostering safer behavioral intentions among adolescents.

Table 1. Average Distribution of Knowledge, Attitude, and Behaviour Scores of Adolescents Before and After the Intervention (n = 200)

Variable	Group	Pretest (Mean ± SD)	Posttest (Mean ± SD)	Δ Change	p-value
Knowledge	Intervention (n=100)	56,8 ± 8,4	82,3 ± 7,6	+25,5	< 0,001
	Control (n=100)	55,9 ± 8,1	59,2 ± 7,9	+3,3	0.072 (ns)
Attitude	Intervention (n=100)	60,5 ± 9,2	79,6 ± 8,1	+19,1	< 0,001
	Control (n=100)	61,2 ± 8,7	63,0 ± 8,5	+1,8	0.081 (ns)

Pregnancy Prevention Behaviour	Intervention (n=100)	58,7 ± 7,5	76,8 ± 8,3	+18,1	< 0,001
	Control (n=100)	57,9 ± 8,0	59,0 ± 7,8	+1,1	0.145 (ns)

Notes: Paired t-test, SD = standard deviation, ns = not significant.

1. Interpretation of Results

The results showed a significant increase in knowledge scores, attitudes, and pregnancy prevention behaviour in the intervention group (p < 0.001). The mean score of knowledge increased from 56.8 to 82.3; attitude increased from 60.5 to 79.6; and behaviour increased from 58.7 to 76.8. In contrast, in the control group, the increase in scores was relatively small and not statistically significant.

The significant increase in scores in the intervention group reflects the effectiveness of comprehensive sexuality education (CSE) in improving adolescent reproductive health literacy. This intervention not only expands knowledge, but also shapes positive attitudes and encourages better preventive behaviour. This finding is in line with the results of Myat Pattanittum et al. (2024) and Gamelia et al. (2023) which showed that school-based CSE has a significant impact in preventing teenage pregnancy through increased awareness and self-control of sexual behaviour.

Thus, CSE programme can be one of the effective strategies that can be integrated in the reproductive health education curriculum in schools to reduce teenage pregnancy rates in a sustainable manner.

Table 2. Results of Bivariate Analysis (Independent t-test) between Intervention and Control Groups on Changes in Adolescent Knowledge, Attitude, and Behaviour Scores

Variable	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)	Mean Difference	t	p-value
Knowledge	25,5 ± 7,2	3,3 ± 6,8	22,2	19,84	< 0,001
Attitude	19,1 ± 8,1	1,8 ± 7,9	17,3	16,52	< 0,001
Preventive Behaviour	18,1 ± 7,5	1,1 ± 7,8	17,0	15,76	< 0,001

Notes: Independent t-test, SD = standard deviation, p < 0.05 indicates significant difference.

2. Interpretation of Bivariate Analysis

The results of the *independent t-test* showed that there was a significant difference between the intervention group and the control group on the improvement of knowledge scores, attitudes, and behaviours of teenage pregnancy prevention (p < 0.001 for all variables). The high *mean difference* value indicates that school-based comprehensive sexuality education (CSE) has a substantial impact on improving adolescent reproductive health literacy and behaviour compared to conventional learning methods.

This result supports the findings from the studies of Myat Pattanittum et al. (2024) and Gamelia et al. (2023), which stated that CSE programmes are effective in fostering risk awareness,

strengthening self-control, and improving adolescents' ability to make safe and responsible decisions related to sexuality.

Table 3. Multivariate Analysis (Multiple Linear Regression) of Factors Influencing Adolescent Pregnancy Prevention Behaviour

Predictor Variable	Coefficient β	SE	t	p-value	Description
Knowledge (posttest)	0,324	0,058	5,59	< 0,001	Significant
Attitude (posttest)	0,472	0,063	7,49	< 0,001	Significant
Intervention Group (dummy: 1=intervention, 0=control)	0,286	0,072	3,97	< 0,001	Significant
Gender (dummy: 1=female, 0=male)	0,091	0,052	1,75	0,081	Not significant
Age	0,038	0,041	0,93	0,354	Not significant

Model Summary: R = 0.742 R² = 0.551 Adjusted R² = 0.542 F(5,194) = 45.22 p < 0.001

3. Interpretation of Multivariate Analysis

The results of multiple linear regression analysis showed that knowledge, attitude, and participation in CSE programmes were significant predictors of teenage pregnancy prevention behaviour ($p < 0.001$). The *Adjusted R²* value of 0.542 indicates that about 54.2% of the variation in pregnancy prevention behaviour can be explained by these three variables.

This implies that adolescents' pregnancy prevention behavior improves with increased knowledge, favorable attitudes concerning reproductive health, and active participation in CSE programs. The Health Belief Model and Theory of Planned Behavior, which emphasize the significance of cognitive (knowledge) and affective (attitude) components in determining health behavior, are supported by this finding. Furthermore, demographic variables including age and gender did not significantly affect this model, indicating that the efficacy of CSE interventions was comparatively uniform among various adolescent groups.

DISCUSSION

1. Effect of Comprehensive Sexuality Education on Adolescents' Knowledge, Attitude, and Behaviour

The results in Table 1 show that school-based comprehensive sexuality education (CSE) has a significant effect on improving adolescents' pregnancy prevention knowledge, attitude, and behaviour ($p < 0.001$). The increase in knowledge score by 25.5 points, attitude by 19.1 points, and behaviour by 18.1 points indicates that this intervention is effective in strengthening reproductive health literacy and safe behaviour awareness among adolescents. Theoretically, this is consistent with the Health Belief Model (HBM) and Theory of Planned Behaviour (TPB), which explain that health behaviour change is influenced by increased risk perception, social norms, and positive self-control.

This finding is supported by various recent studies. The study by Pinandari et al. (2023) showed that CSE interventions in Indonesia improved healthy sexual competence, including

understanding of pregnancy and gender equality (Pinandari et al., 2023). Similarly, research by George et al. (2022) in South Africa found that students exposed to CSE were less likely to experience pregnancy and risky sexual behaviour (George et al., 2022). Akmala et al. (2021) through a meta-analysis also proved that school-based sexual education increased pregnancy prevention behaviour by 1.04 times compared to non-school learning (Akmala et al., 2021).

Thus, the significant increase found in this table strengthens the evidence that rights-based, participatory, and student-centred comprehensive sexuality education is effective in instilling awareness and preventive behaviour towards teenage pregnancy.

2. Comparison of Effectiveness between Intervention and Control Groups

Table 2 shows significant differences between the intervention and control groups on all variables ($p < 0.001$). The large mean difference values indicate that CSE has a much stronger effect than conventional reproductive education in improving knowledge, attitudes, and behaviours of pregnancy prevention.

This finding is consistent with the results of Bordogna et al. (2021) who through meta-analysis showed that CSE is more effective in reducing teenage pregnancy rates than abstinence education or learning without intervention (Bordogna et al., 2022). Fluin's study (2023) also confirmed that implementing CSE as part of the national curriculum in Ecuador significantly reduced teenage pregnancy rates through the mechanism of increasing knowledge and risk awareness (Fluin, 2023).

From a theoretical standpoint, these findings support the notion that interventions based on knowledge and values, rather than only cognitive development, are necessary to modify teenage behavior. Adolescents who participate in CSE programs that incorporate social contact, modeling, and open discussion are better able to internalize the value of responsibility and acquire sound decision-making abilities. The usefulness of CSE as a public health education policy technique that can be incorporated into the secondary school curriculum is thus reinforced by the notable difference between the intervention and control groups.

3. Analysis of Factors Influencing Pregnancy Prevention Behaviour

Multiple linear regression analysis (Table 3) showed that knowledge, attitude, and participation in CSE programmes were significant predictors of pregnancy prevention behaviour ($p < 0.001$) with an Adjusted R^2 of 0.542. This means that 54.2% of the variation in adolescent behaviour can be explained by these three factors. Age and gender were not significant, indicating that the CSE programme was effective for all groups of adolescents without significant demographic differences.

This result is in line with the findings of Myat Pattanittum et al. (2024) who showed that CSE programmes designed following UNESCO's ITGSE guidelines contributed significantly to increased contraceptive awareness and prevention of unintended pregnancies in various school contexts (Myat et al., 2024). Similar results were also found in Chitondo & Chishala's (2022) study in Zambia, which showed that implementation quality and teacher capacity were important factors mediating the success of preventive behaviours (Chitondo & Chishala, 2022).

Conceptually, the positive relationship between knowledge and attitude towards behaviour is consistent with the TPB model, where intention to behave healthily is influenced by beliefs and perceptions of self-control. The researcher's assumption from these results is that the success of CSE

is not only determined by the materials, but also by interactive learning methods and cultural sensitivity applied in the school environment.

CONCLUSIONS

The results of this study empirically prove that school-based comprehensive sexuality education (CSE) has a significant influence on improving adolescents' knowledge, attitudes and behaviour in pregnancy prevention. Through active, participatory, and contextual learning approaches, the CSE program proved to be able to strengthen reproductive health literacy, form positive attitudes towards responsible sexual behaviour, and encourage more rational and safe decision-making among adolescents. Bivariate and multivariate analyses showed that increased knowledge and attitudes of adolescents played an important role as the main predictors of pregnancy prevention behaviour, with a variable contribution of 54.2% to the behaviour change that occurred.

Thus, it can be concluded that the implementation of school-based comprehensive sexuality education is an effective, relevant and evidence-based strategy to reduce adolescent pregnancy rates. This program not only contributes to the improvement of students' cognitive capacity, but also shapes affective and behavioural dimensions that support long-term reproductive health. Therefore, the integration of CSE into the national curriculum and teacher training is a strategic step that needs to be strengthened to build a generation of adolescents who are knowledgeable, empowered, and responsible in dealing with sexuality issues in the modern era.

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