

THE EFFECT OF COMPREHENSIVE SEXUAL EDUCATION ON ADOLESCENT BEHAVIOR IN USING CONTRACEPTION: A SYSTEMATIC REVIEW

Nurul Dzakiyyah¹ , Reny I'tishom² 

¹Midwifery Study Program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

²Department of Biomedical Science, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

ABSTRACT

Adolescence is a transition period from childhood to adulthood. This period is crucial because there are many physical and psychological changes. One issue that is quite rife in Indonesia is teenage pregnancy, which will ultimately lead teenagers to have abortions. The case above proves that it is essential to equip adolescents with the knowledge and skills to make responsible choices. Comprehensive Sexual Education (CSE) is believed to help solve this problem and achieve the Sustainable Development Goals (SDGs) by 2030, when CSE also conveys the importance of contraception and its benefits. The lack of systematic reviews of studies that highlight the effect of implementing Comprehensive Sexual Education on current contraceptive use makes researchers interested in conducting this systematic literature review. This research uses a Systematic Literature Review (SLR) using PICO (Population, Intervention/Issue, Comparison/Context, Outcome), and Boolean operators are used to facilitate searching studies. PRISMA flowcharts were used in this research until two studies were included in the analysis. Literature quality assessment was conducted using the quality assessment tool for quantitative studies from EPHPP (Effective Public Health Practice Project). Two cross-sectional studies were based in the United States. The sample sizes in studies range from 5000 to 7000. The results of this study show that comprehensive sexual education influences the use of contraceptives today, although it is not very significant. However, there are still many biases in this research. There is a need to conduct randomized controlled trials or multicenter cohort studies that use the same evaluation parameters to strengthen future systematic review research.

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Corresponding author

Reny I'tishom

✉ ritishom@fk.unair.ac.id

Department of Biomedical
Science, Faculty of
Medicine, Universitas
Airlangga, Surabaya,
Indonesia.

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Highlights:

1. Comprehensive sexual education has a positive influence on adolescent contraceptive use, though the effect is modest.
2. Comprehensive sexual education equips adolescents with the knowledge to make informed reproductive health decisions.
3. School-based sexual education programs can positively influence protective behaviors among students.

INTRODUCTION

Adolescence is a transition period from childhood to adulthood^{1,2}. This period is crucial because there are many physical and psychological changes³. These changes often cause many problems for teenagers, one of which is that too many teenagers receive information that is inaccurate, incomplete, or full of judgments that affect their physical, social, and emotional development both within and outside the scope of Sexual Reproductive Health (SRH)⁴. One issue that is quite widespread in Indonesia is teenage pregnancy. 2020 People's Welfare data shows that as many as 45.1% of Indonesian women aged ≤ 20 years have experienced their first pregnancy⁵. This will ultimately lead teenagers to have abortions. In many cases, due to insufficient preparedness from health, emotional, mental, educational, socio-economic, and reproductive aspects, adolescent girls are more likely to self-abort or seek unsafe abortion services⁶. Abortion cases in Indonesia are estimated to increase every year. Data from the 2017 Indonesian Demographic and Health Survey shows that the incidence of abortion in Indonesia reached 30% per 100 thousand live births⁷. Unsafe abortion globally, every year, approximately 3 million girls aged 15 to 19 years undergo hazardous abortion⁸.

The above case is evidence that it is essential to equip adolescents with the knowledge and skills to make responsible decisions in their lives, especially as they are increasingly exposed to sexually explicit material through the Internet and other media⁹⁻¹². Comprehensive Sexual Education (CSE) is believed to help solve these problems and achieve Sustainable Development Goals (SDGs) by 2030¹³⁻¹⁵.

Comprehensive Sexual Education (CSE) is a curriculum-based teaching and learning process about the cognitive, emotional, physical, and social aspects of sexuality^{2,16}. Comprehensive Sexual Education also conveys the importance of using contraception and its benefits^{4,17}.

Literature shows that contraceptive use among sexually active adolescents varies widely around the world, with behavioral, cultural, social, and health system factors playing a huge role in that¹⁸⁻²¹. For example, changes in adolescent behavior, such as increased use of contraceptives, are associated with a lower pregnancy risk among adolescents.

The lack of systematic reviews of studies that highlight the effect of implementing Comprehensive Sexual Education on current contraceptive use makes researchers interested in conducting this systematic literature review.

MATERIALS AND METHODS

This study utilizes a systematic literature review (SLR). It is a research methodology that reviews multiple studies that identify, investigate, evaluate, and interpret all available research in a topic area of an interesting phenomenon with a specific related research question²². In systematic review research, research questions are compiled using Population, Intervention/ Issue, Comparison/ Context, outcome (PICO). PICO in this study is as follows:

Table 1. PICO Compilation

Population	Adolescent
Intervention/Issue	Comprehensive Sexual Education
Comparison/Context	Non-Comprehensive Sexual Education
Outcome	Current contraceptive use

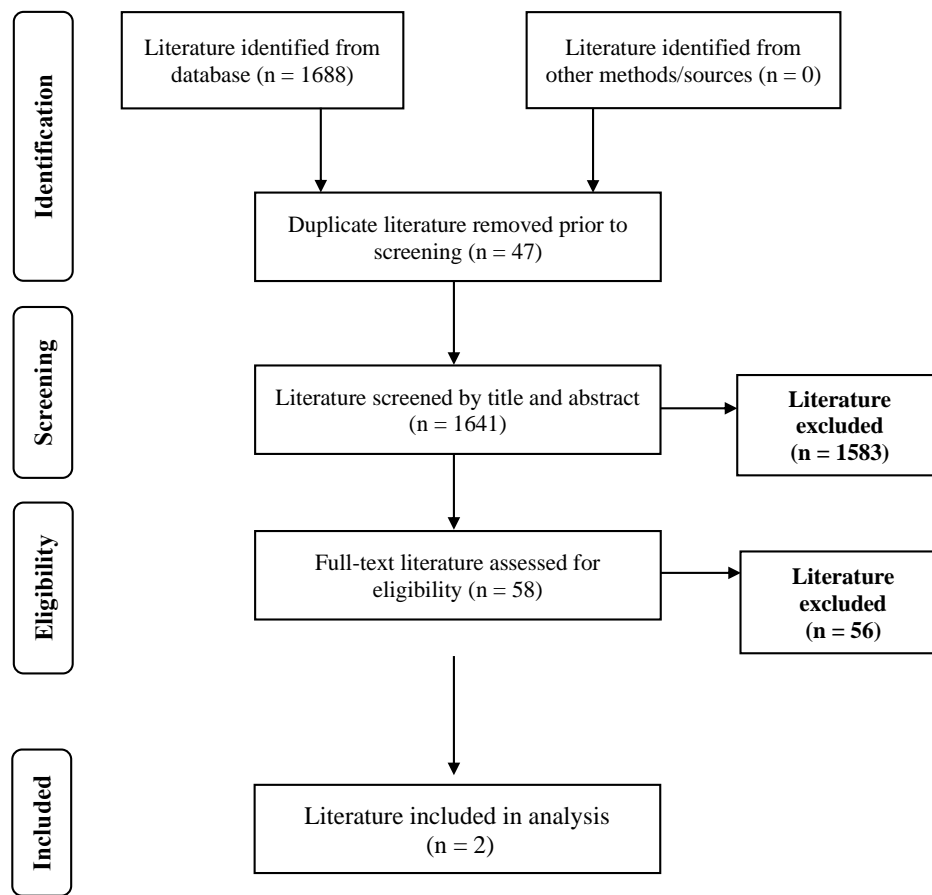


Figure 1. PRISMA flow chart

There are inclusion and exclusion criteria in determining studies, which are as follows:

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Studies/literature in English and/or Indonesian	Sources come from Non-Research Studies (conference papers, book chapters, reports)
Using studies from the last 10 years	The source is in the form of a systematic review/review article
Full text	

In this research literature search, electronic databases used ScienceDirect, Wiley Cochrane Library, PubMed, and Scopus to identify relevant studies. In this step, search for keywords (search terms) using Boolean Operators (search commands), including AND / OR / NOT.

The keywords (search terms) used are (Comprehensive Sexual Education OR Comprehensive Sexuality Education) AND practical AND effect AND contraception.

Based on search results using predetermined keywords, a total of 1688 studies were obtained. Then, 47 studies were eliminated due to duplication, leaving 1641 studies to be screened. At the screening stage, 1583 studies were excluded due to unmatched titles and abstracts, leaving 58 articles to be assessed for eligibility. In the eligibility assessment, 56 articles were excluded because PICO was unsuitable, did not meet the inclusion and exclusion criteria, did not provide complete data analysis, or did not meet the literature quality assessment criteria. Literature quality assessment was done using the quality assessment tool for

quantitative studies from the Effective Public Health Practice Project (EPHPP)²³. The results of the literature quality assessment are attached in Table 3.

Data extraction was carried out using a modified data collection form from Cochrane. The data researchers collect from the articles reviewed includes author,

article title, research setting, research methods, year of publication, time of research implementation, research sample, independent variable, dependent variable, results, and article quality previously assessed. This data is attached in Tables 4, 5, and 6.

Table 3. Critical appraisal using EPHPP

Author	Component Ratings						Global rating
	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	
(Cheedalla, Moreau, and Burke, 2020) ²⁴	1	3	1	1	1	2	2
(Rasberry <i>et al.</i> , 2022) ²⁵	1	3	1	1	1	2	2

Table 4. Selection of studies used

No.	Author	Journal, Year, Volume, Page	Title	Place and Time of Research	Research Methods	Research Sample	Independent Variables	Dependent Variables
1.	(Cheedalla, Moreau, and Burke, 2020) ²⁴	Contraception: X, 2020, 2, 1000048	Sex education and contraceptive use of adolescent and young adult females in the United States: an analysis of the National Survey of Family Growth 2011–2017	U.S., N.A	cross-sectional	5445	Comprehensive sexual education	Contraceptive use at first intercourse and women's current contraceptive use
2.	(Rasberry <i>et al.</i> , 2022) ²⁵	Journal of Adolescent Health, 2022, 70, 588-597	Increases in Student Knowledge and Protective Behaviors Following Enhanced Supports for Sexual Health Education in a Large, Urban School District	urban district in the southern U.S., N.A	cross-sectional	7555	School-based sexual health education (SHE)	Knowledge, behaviors, and experiences among youth

Table 5. Overview of the research used

No.	Author	Sample size	Research result
1.	(Cheedalla, Moreau and Burke, 2020) ²⁴	The study consists of a multistage stratified national probability sample of respondents ages 15-44 living in U.S. households: 5,601 women in 2011-2013 and 5,601 women in 2013-2015. 5,699 in 2015-2017, and 5,554 in 2015-2017. These data were carefully selected from 5,628 female respondents aged 15-24 (2011-2013: 1,997, 2013-2015: 1,963, 2015-2017: 1,668). Table 1 shows the characteristics of the sample by period. Her average age is 19.5 years, with little change over time.	Comprehensive sex education was associated with increased odds of using contraceptives at first intercourse but not with current contraceptive use. Programs promoting comprehensive sex education may positively impact preventive sexual debut behavior
2.	(Rasberry <i>et al.</i> , 2022) ²⁵	Sexual behavior was assessed using county (2015 and 2017) and state (2017) Youth Risk Behavior Survey data. The analysis examined differences in the behavior of students in intervention districts in 2015 (n = 2,596) and 2017 (n = 3,371). It compared students in intervention districts (n = 3,371) with other students in the same state (n = 1,978).	Students in intervention districts are much more likely to use condom contraception during recent or current intercourse. The results suggest the potential impact of district SHE in increasing young people's knowledge and improving their behaviors and experiences.

Table 6. Correlation

No.	Author	Independent variables	Dependent variables	Statistical result
1.	(Cheedalla, Moreau, and Burke, 2020) ²⁴	Comprehensive sexual education	Contraceptive use at first intercourse and women's current contraceptive use	At first sex, women who received comprehensive sex education were more likely to have used any (aOR = 1.63; 95% CI: 1.18–2.25) and highly effective (aOR = 1.35; 95% CI: 1.04–1.75) contraceptives. Comprehensive sex education was unrelated to current contraceptive use (aOR = 0.87; 95% CI: 0.63–1.21). Eighty-seven percent of respondents who needed contraception were using it at the time of the survey, which did not change over time, and there were no differences between those who received comprehensive sex education and those who did not. (86.4% versus 87.7%, aOR = 0.87; 95% CI 0.63–1.21).
2.	(Rasberry <i>et al.</i> , 2022) ²⁵	School-based sexual health education (SHE)	Knowledge, behaviors, and experiences among youth	Students in intervention districts were significantly more likely to use a condom during their last intercourse than students in samples from states that did not receive DASH funding. (AOR = 1.36, 95% CI = 1.07 – 1.72)

RESULTS

This study examines whether comprehensive sexual education influences current contraceptive use. Due to limited study results, only two studies were found in this systematic review. Both studies used cross-sectional research methods. The data obtained in these two studies are included in secondary data, namely, from secondary sources. The secondary data obtained ranged from 2013 to 2017. Both studies were conducted in the United States, and the total sample size was 13000.

A study by Cheedalla, Moreau, and Burke in 2020 and a survey by Rasberry et al. in 2022 were conducted in the U.S.A. Although both were conducted in different states, this shows samples that are pretty homogeneous in terms of race, ethnicity, and culture. The data in Cheedalla, Moreau, and Burke's study were obtained from the National Survey of Family Growth (NSFG) starting in 2011-2013, 2013-2015, and 2015-2017, with a total of 30,715 respondents aged 15-44 years who lived in the U.S. The data taken were only data on women aged 15-24 years, as sex education questions were only asked of respondents in this age group, so a total of 5445 samples were obtained²⁴. In analyzing current contraceptive use, researchers only examined contraceptive use within the month of the interview, excluding individuals who were sterile for non-contraceptive reasons, pregnant, planning a pregnancy, postpartum up to 2 months, and/or not sexually active in the past 3 months. This study found that there was no difference between respondents who received comprehensive sexual education and those who did not. However, both groups had high rates of contraceptive use,

including the comprehensive sexual education group.

Data in the study of Rasberry et al., using the 2015 and 2017 datasets obtained from districts and states, were obtained from the YRBS (Youth Risk Behavior Survey)²⁵. The total sample in this study was 7555, with the majority being aged 15 - 17 years. The comprehensive sexual education intervention in this study began in August 2014, when education was most often given to teenagers in grade 9, and the 2015 YRBS data was obtained and collected in the spring of the same school year. The increase in education is carried out annually after initiation begins, so the 2017 YRBS data was collected in the third year of education provision. This study showed an increase in the use of contraceptives such as birth control pills, IUDs/implants, shots, patches, or birth control rings, and also condoms, although it is not very significant.

DISCUSSION

Both studies above provide the same results that comprehensive sexual education influences the use of current contraceptives, although it is not very significant. There are substantial differences between the two studies above, where in Cheedalla, Moreau, and Burke's study, the sexual education in question can be received by the sample not only in the school environment but can also be obtained outside the school (church, community school, etc.), although dominantly obtained from schools. In contrast, in Rasberry et al.'s study, all interventions provided were carried out within the scope of the school. Another difference is in the sex of the sample; in Cheedalla, Moreau, and Burke's study, the

entire sample was female, whereas in Rasberry et al.'s study, the sample was female and male in relatively equal proportions. This research also shows that it is crucial to create regulations to improve comprehensive sexual education curricula and further support them to cover topics regarding decision-making related to their sexual and reproductive health. The limitation of both studies is that, considering this study is cross-sectional, there is a reasonably high possibility of bias due to recall and social desirability biases. These studies are pretty challenging to find. Therefore, they show a lack of available literature.

Strengths and limitations

This study provides valuable insights into the impact of comprehensive sexual education on adolescent contraceptive use, highlighting its potential in shaping responsible reproductive health behaviors. The systematic literature review approach ensures a structured and evidence-based analysis, utilizing established frameworks like PICO, PRISMA flowcharts, and a quality assessment tool, EPHPP, to enhance research rigor. Additionally, including studies with large sample sizes strengthens the reliability of findings. However, the study is limited by the small number of eligible research articles, which restricts the generalizability of the results. The reliance on cross-sectional studies introduces potential biases, such as recall bias and social desirability bias, which may affect the accuracy of self-reported contraceptive use. Furthermore, variations in study settings, sample demographics, and intervention methods create inconsistencies that challenge direct comparisons. Future research should include randomized controlled trials or multicenter cohort

studies with standardized evaluation parameters to establish more conclusive evidence on the long-term effectiveness of comprehensive sexual education.

CONCLUSION

Comprehensive sexual education impacts contraceptive use, albeit modestly. While not conclusive, this research highlights the positive effects of such education in enhancing adolescents' awareness of contraception and indirectly reducing risky behaviors. However, the limited number of studies introduces biases, indicating a need for more randomized controlled trials or multicenter cohort studies with consistent evaluation parameters to reinforce future systematic reviews.

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CONFLICT OF INTEREST

All Authors have no conflict of interest.

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AUTHOR CONTRIBUTION

All authors have contributed separately to all research processes, including preparation, data gathering, and subsequent analysis, as well as drafting and approving this manuscript for publication.

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