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Meta-analysis
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Meta-Analysis: Factors Related with Premarital Sexual Behavior in Adolescents

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ABSTRACT

Background: Premarital sexual behavior is a sexual activity carried out before marriage. Premarital sexual behavior is a health priority in adolescents because it causes unwanted pregnancies, abortions, STIs, HIV/AIDS and even death. Parents, peers, community environment, economic and cultural conditions influence premarital sexual behavior. This study aims to analyze the effect of peers, smoking behavior, alcohol consumption, exposure to pornography and rural areas on premarital sexual behavior in adolescents.
Subjects and Method: This was a systematic review and meta-analysis of study articles. Data obtained from databases including Google Schoolar, Pubmed and Science Direct. Article search was carried out by considering eligibility criteria with the PICO model. Population: adolescents. Intervention: high peer pressure, smoking behavior, alcohol consumption, exposure to pornography, and rural areas. Comparation: low peer pressure, non-smoking, no alcohol consumption, no exposure to pornography, and urban areas. Outcome: premarital sexual behavior. The articles were collected with keywords including "Peer Pressure" AND "Smoking" AND "Alcohol Compsumtion" AND "Pornography Exposure" AND "Rural" OR "Premarital Sexual Behavior" AND "Cross Sectional Study". Study articles were collected with PRISMA flow diagrams and analyzed using Review Manager 5.3 application.
Results: The results of the meta-analysis indicated that adolescents were influenced by premarital sexual behavior in the presence of high peer pressure (aOR= 3.57; CI95%= 1.38 to 9.26; p<0.001), smoking behavior (aOR= 1.17; CI95%= 0.63 to 2.16; p<0.001), alcohol consumption (aOR=2.11; CI95%=1.34 to 3.33; p<0.001), and exposure to pornography (aOR= 2.43; CI95%= 1.44 to 4.09; p<0.001).
Conclusion: Adolescent premarital sexual behavior increases with high peer pressure, smoking, alcohol consumption, and exposure to pornography.

Keywords: premarital sexual behavior, peer pressure, adolescent.

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BACKGROUND

Premarital sexual behavior is sexual activity between men and women carried out before marriage (Behulu, 2017). Premarital sexual activity is carried out by young people or adolescents (Regassa, 2016). Adolescence is a phase in which rapid physical growth and psychological development occur. At this period, adolescents have curiosity and drive to get new experiences, including premarital sexual behavior (Arega, 2019).

Premarital sexual behavior is a top health priority among adolescents as it causes school dropout, unemployment, abortion, and even death in the younger generation or adolescents (Sufyan, 2020). Shrestha (2019) stated that also states that premarital sexual behavior causes unwanted pregnancies, STIs, HIV/AIDS, regret, guilt, loss of self-esteem, and depression.

Several studies reveal premarital sexual behavior in adolescents is affected by the relationship between parents and children, community environment, cultural rules and customs and values, economic conditions, school environment, peer relationships, and communication(Shrestha, 2019).

Based on the description above, it is necessary to have more thorough study toward the results of previous studies. This study aims to analyze the effect of peers, smoking behavior, alcohol consumption, exposure to pornography, and rural areas on premarital sexual behavior in adolescents. Based on the results of previous studies, a meta-analysis was carried out to measure the effect size to obtain quantitative summary results.

SUBJECTS AND METHOD

1. Study Design

The study articles to be used in meta-analysis were collected with PRISMA flow diagrams. The study article data were obtained from various databases including Google Schoolar, PubMed, and Science Direct. The study articles were collected within 1 month with search keywords used including "Peer Pressure" AND "Smoking" AND "Alcohol Compsumtion" AND "Pornography Exposure" AND "Rural" OR "Premarital Sexual Behavior" AND "Cross Sectional Study.

2. Step of Meta-Analysis

The meta-analysis was carried out in five steps as follows:

1) Formulate research questions in the PICO.
2) Search for primary study articles from various electronic and non-electronic databases.
3) Conduct screening and critical assessment of primary research articles.
4) Perform data extraction and synthesize effect estimates into RevMan 5.3.
5) Interpret and conclude the results.

3. Inclusion Criteria

The study inclusion criteria were full text study articles with cross-sectional study methods. The selected study articles were articles that present the final results in the form of adjusted Odds Ratio (aOR); Articles featuring multivariate data analysis.

4. Exclusion Criteria

The study exclusion criteria were articles with case-control studies, surveys, and cohorts; articles published before 2013, articles featuring only bivariate analyses, and articles reporting the final result as OR, percentage, and mean difference.

5. Operational Definition of Variables

Smoking behavior is smoking behavior that encourages to engage or not in premarital sexual behavior.

Alcohol consumption is an alcohol consumption behavior that encourages to engage or not in premarital sexual behavior.

Exposure to pornography is a source of exposure to pornographic media that en-

courages to engage or not in premarital sexual behavior.

Rural area is residential environment that encourages to engage or not in premarital sexual behavior.

Premarital sexual behavior is an activity driven by sexual desire carried out to the opposite sex starting with holding hands, hugging, kissing, necking, touching sensitive parts, petting, oral sex, and intercourse.

6. Instruments

This review will be analyzed systematically using a meta-analysis guide, namely Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) and using a critical assessment checklist Critical Appraisal Checklist for Cross-sectional Study.

7. Data analysis

The study data analysis process was conducted using the Review Manager 5.3 application to determine the effect size and heterogeneity of high peer pressure, smoking behavior, alcohol consumption, pornography exposure, and rural areas on premarital sexual behavior.

RESULTS

Search articles in this research through databases including PubMed, Google Scholar, and Science Direct. Figure 1 showed the initial search process seen in Figure 1 displays a total of 2,651 articles. After the process of eliminating duplicate articles in more than one journal, 522 articles were obtained, 65 of which met the requirements for further full text review. Finally, there were 16 articles that met the requirements for full text review.

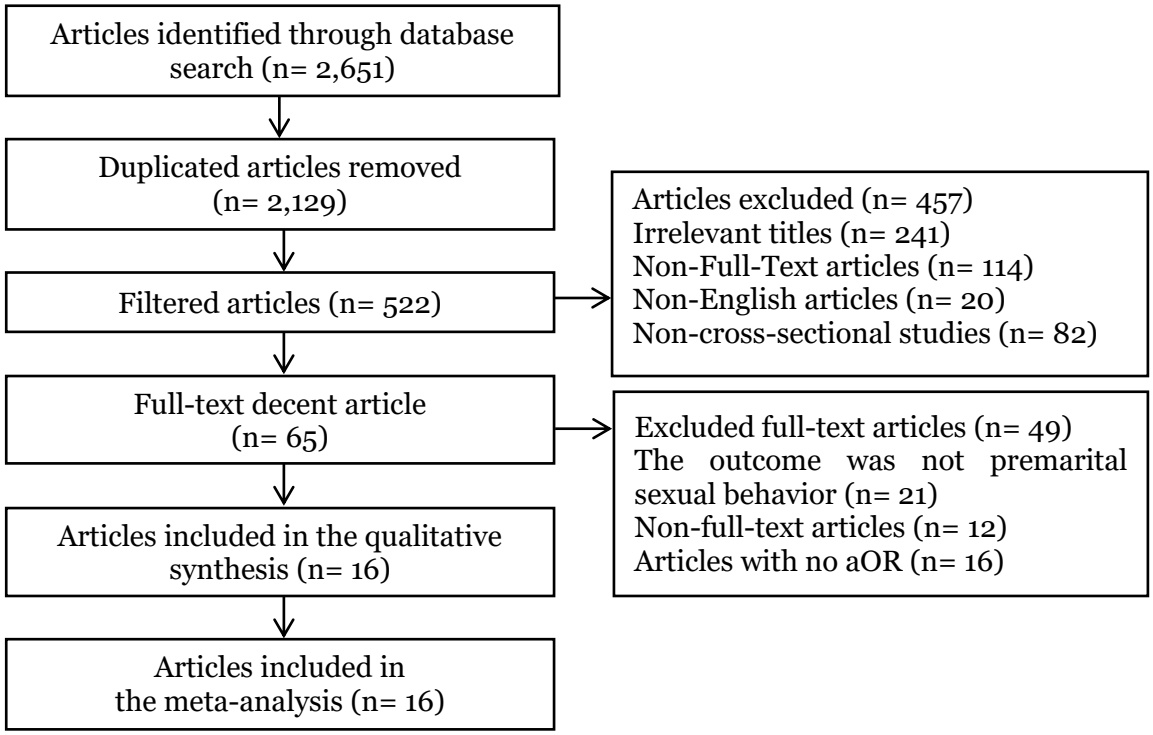

Figure 1. Results of PRISMA flow diagrams of factors related with premarital sexual behavior in adolescents

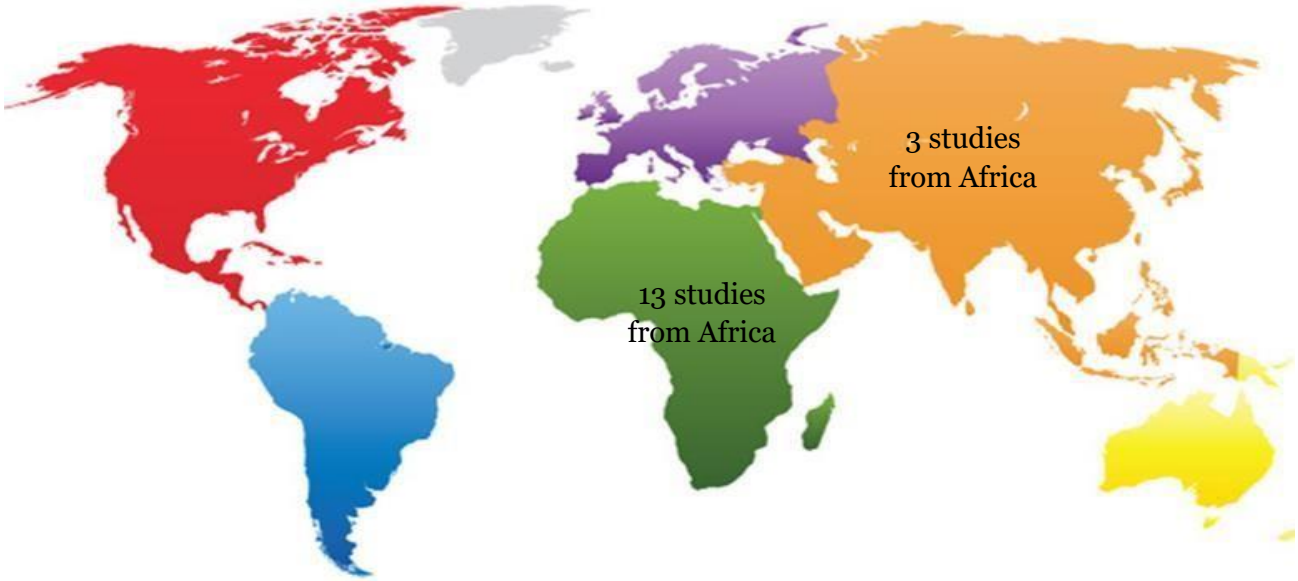

Figure 2. Research distribution map of factors related with premarital sexual behavior in adolescents

Figure 2 showed a map of factors related with premarital sexual behavior in adolescents s that will be included in the meta-analysis from 2 continents consisting of the Asian continent and the African continent. There were 13 articles from Africa, and 3 articles from Asia. Table 1 showed quality assessment result of articles with a cross-sectional study included in meta-analysis.

Table 1. The quality assessment result of factors related with premarital sexual behavior in adolescents with a cross-sectional study.

Primary Study	Criteria													Total
	1				2		3		4	5	6		7	
	a	b	c	d	a	b	a	b			a	b		
Arega et al. 2019	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Abegaz et al. 2022	2	1	2	2	2	2	2	2	2	2	2	2	2	25
Ahmad et al. 2014	2	1	2	2	2	2	2	2	1	2	2	2	2	24
Akibu et al. 2017	2	1	2	2	2	2	2	2	1	2	2	2	2	24
Behulu et al. 2019	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Budu et al. 2023	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Bogale et al. 2014	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Biratu et al. 2022	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Gebreyesus et al. 2019	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Meleko et al. 2017	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Mulugeta et al. 2014	2	1	2	2	2	2	2	2	1	2	2	2	2	24
Manaf et al. 2014	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Regassa et al. 2016	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Sufyan et al. 2020	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Shitu et al. 2023	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Salih et al. 2015	2	2	2	2	2	2	2	2	2	2	2	2	2	26

Description of the question criteria:

1. Formulation of research questions in PICO acronym:
a. What is the population in the study primary is the same as the population in PICO meta-analysis?
b. What is the operational definition of intervention (intervention), namely the status of exposure (exposed) in primary studies is the same as that definition intended in meta-analysis?
c. What is the comparison (comparison), namely status not exposed (unexposed) is used Primary studies are the same as that definition intended in meta-analysis?
d. What is the outcome variable being studied? in primary studies is the same as that definition intended in meta-analysis?
2. Method for selecting research subjects:
a. Descriptive cross-sectional study (prevalence): Is the sample randomly selected?
b. Analytical cross-sectional study: Are samples randomly or purposively selected?
c. Methods for measuring comparisons (intervention) and outcome variables:
d. Are both exposure or intervention and outcome variables measured with the same instruments in all primary studies?
e. If variables are measured on a categorical scale, are the cut-offs used the same across primary studies?
3. Bias of the design:
a. How much is the response rate?
b. Is non-response related to outcomes?
4. Methods to control confounding:
a. Is there any confusion in the results or conclusions of the primary study?
b. Have primary study researchers used appropriate methods to control the effects of confusion?
5. Method of statistical analysis:
a. In the cross-sectional study, is multivariate analysis performed?
b. Multivariate analysis includes multiple linear regression analysis, multiple logistic regression analysis, Cox regression analysis.
6. Is there a conflict of interest with the research sponsor?

Description of scoring:

0= No; 1= Hesitate; 2= Yes.

Table 2 describes a summary of primary research of of the effect of high peer pressure toward premarital sexual behavior in adolescents, a meta-analysis was carried out on 5 articles originating from the country of Northwest Ethiopia, Northwest Ethiopia, Southwest Ethiopia, and Indonesia. The largest research population was found in a study conducted by Sufyan (2020), namely 11,299 adolescents aged 15-24 years, and the study with the smallest population, namely the study conducted by Meleko (2017) as many as 320 adolescents aged 15-24 years.

Table 2. Description of the primary studies of the effect of high peer pressure toward premarital sexual behavior in adolescents (cross-sectional study).

Author (years)	Country	Sample	P	I	C	O
Arega et al. (2019)	Northwest Ethiopia	497	Adolescents aged 15-24 years	High peer pressure	Low peer pressure	Premarital sexual behavior
Behulu et al. (2019)	Northwest Ethiopia	624	Adolescents aged 15-18 years	High peer pressure	Low peer pressure	Premarital sexual behavior

Author (years)	Country	Sample	P	I	C	O
Meleko et al. (2017)	Southwest Ethiopia	320	Adolescents aged 15-19 years	High peer pressure	Low peer pressure	Premarital sexual behavior
Mulugeta & Berhane (2014)	Ethiopia	1,123	Adolescents aged 15-24 years	High peer pressure	Low peer pressure	Premarital sexual behavior
Sufyan & Nurdiantami (2020)	Indonesia	11,299	Adolescents aged 15-24 years	High peer pressure	Low peer pressure	Premarital sexual behavior

Table 3. aOR and 95% CI data of the effect of high peer pressure toward premarital sexual behavior in adolescents.

(Author, year)	aOR	95% CI	
		Lower Limit	Upper Limit
Arega et al. (2019)	1.03	0.28	3.79
Behulu et al. (2019)	7.65	3.73	15.69
Meleko et al. (2017)	1.56	0.82	2.97
Mulugeta & Berhane (2014)	2.98	1.57	5.66
Sufyan & Nurdiantami (2020)	10.91	9.55	12.46

Table 3 showed the effect sizes of the primary studies used in the meta-analysis, with largest adjusted odd ratio (aOR) conducted by Sufyan & Nurdiantami (2020) is 10.91, and the lowest aOR conducted by Meleko et al. (2017) is 0.58.

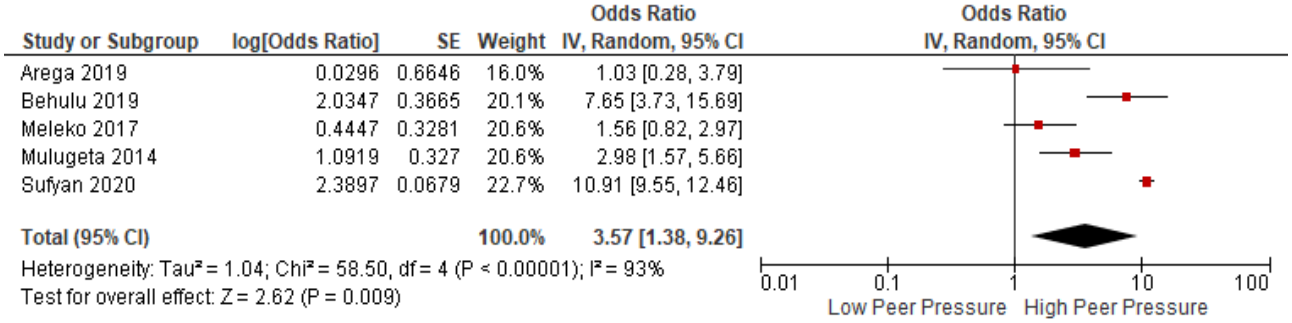

Figure 3. Forest plot of the effect of high peer pressure toward premarital sexual behavior in adolescents

The forest plot results in Figure 3 indicates that high peer pressure increased premarital sexual behavior by 3.57 times compared to low peer pressure, and it was statistically significant (aOR=3.57; 95% CI= 1.38 to 9.26; p< 0.001). The forest plot also indicates high heterogeneity of effect estimates across primary studies I^2= 93%; p= 0.001, which means that the effect estimates accross primary studies in this meta-analysis varied. Therefore, the calculation of the average effect estimates was carried out with a random effect model approach.

The funnel plot based on Figure 4 showed that the distributions of effect estimates were evenly distributed between the left and right sides of the average vertical line of effect estimates. Thus, this funnel plot indicates publication bias.

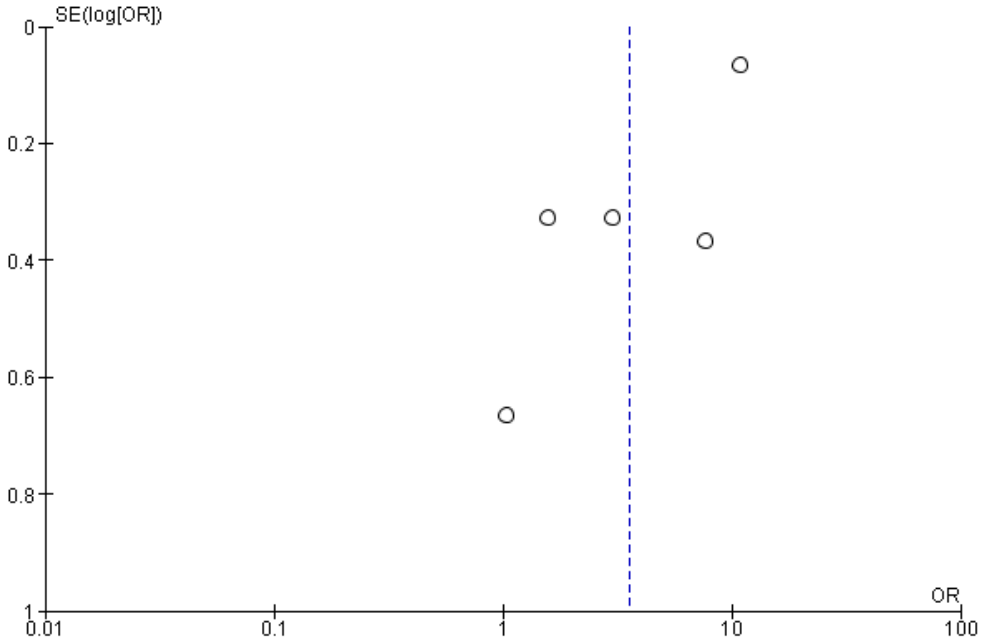

Figure 4. Funnel plot of of the effect of high peer pressure toward premarital sexual behavior in adolescents

Table 4. PICO description of the primary studies of the effect of smoking behavior toward premarital sexual behavior in adolescents (cross-sectional study).

Author (years)	Country	Sample	P	I	C	O
Ahmad et al. (2014)	Malaysia	645	Adolescents aged 12-17 years	Smoking behavior	Non-Smoking Behavior	Premarital sexual behavior
Biratu et al. (2022)	South-western Ethiopia	312	Adolescents aged 10-19 years	Smoking behavior	Non-Smoking Behavior	Premarital sexual behavior
Manaf et al. (2014)	Malaysia	1,328	Adolescents aged 15-18 years	Smoking behavior	Non-Smoking Behavior	Premarital sexual behavior
Meleko et al. (2017)	Southwest Ethiopia	320	Adolescents aged 15-19 years	Smoking behavior	Non-Smoking Behavior	Premarital sexual behavior
Shitu et al. (2023)	Ethiopia	7,389	Adolescents aged 15-24 years	Smoking behavior	Non-Smoking Behavior	Premarital sexual behavior

Table 5. aOR and 95% CI data of the primary studies of the effect of smoking behavior toward premarital sexual behavior in adolescents.

(Author, year)	aOR	95% CI	
		Lower Limit	Upper Limit
Ahmad et al. (2014)	1.83	1.62	2.07
Biratu et al. (2022)	0.06	0.01	0.36
Manaf et al. (2014)	1.60	0.80	3.20
Meleko et al. (2017)	1.05	0.41	2.69
Shitu et al. (2023)	1.60	0.70	3.66

From table 4 it can be seen the summary of primary research regarding the effect of smoking behavior toward premarital sexual behavior in adolescents, a meta-analysis

was carried out on 5 articles originating from the country of Malaysia and South-west Ethiopia. Table 5 showed the effect sizes of the primary studies used in the meta-analysis, with largest adjusted odd ratio conducted by Ahmad et al. (2014) is 1.83, and the lowest aOR conducted by Biratu et al. (2022) is 0.06

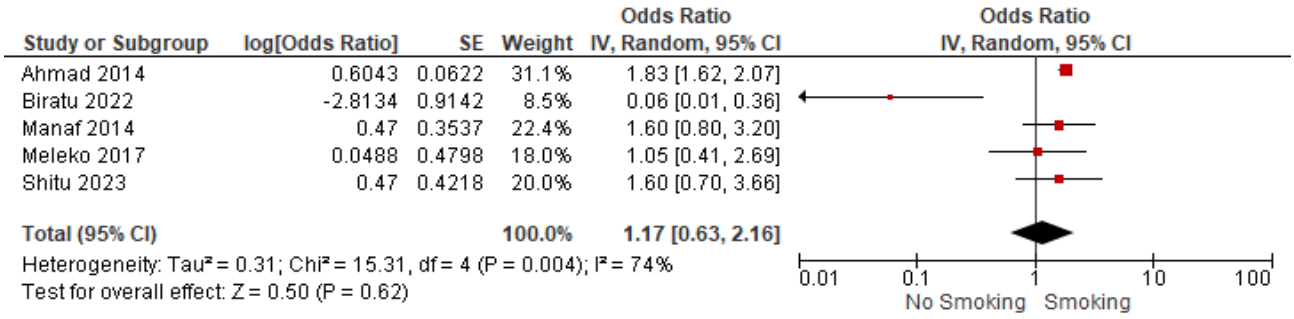

Figure 5. Forest plot of the effect of smoking toward premarital sexual behavior in adolescents.

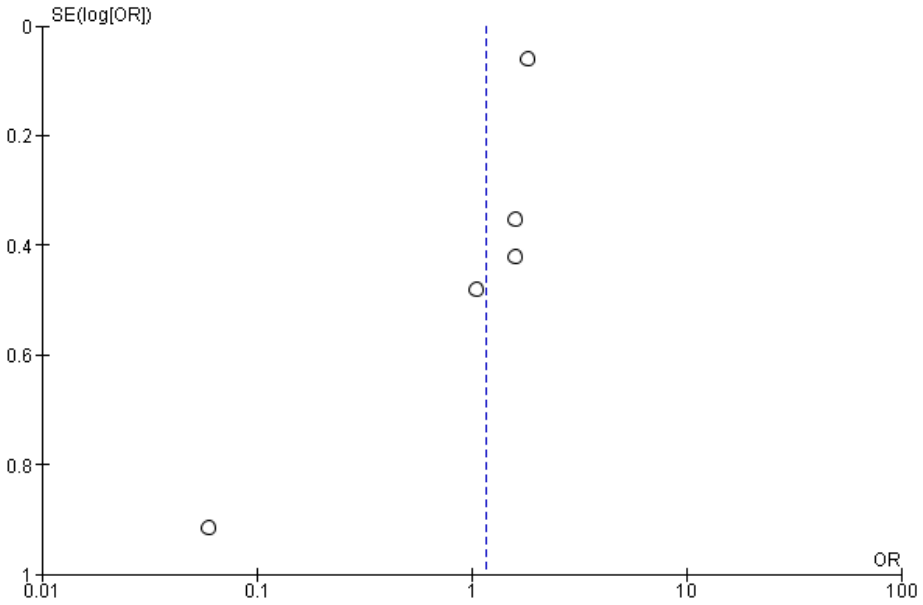

Figure 6. Funnel plot the effect of smoking toward premarital sexual behavior in adolescents

The forest plot result in figure 5 indicates that smoking increased premarital sexual behavior by 1.17 times compared to non-smoking, and it was statistically significant (aOR=1.17; 95% CI=0.63 to 2.16; p<0.001). The forest plot also indicates high heterogeneity of effect estimates across primary studies I^2= 74%; p=0.004, which means that the effect estimates across primary studies in this meta-analysis varied. Therefore, the calculation of the average effect estimates was carried out with a random effect model approach. The funnel plot in figure 6 indicates that the distributions of effect estimates were evenly distributed between the left and right sides of the average vertical line of effect estimates. Thus, this funnel plot indicates publication bias.

Table 6. PICO description of alcohol consumption behavior toward premarital sexual behavior in adolescents (cross-sectional study).

Author (years)	Country	Sample	P	I	C	O
Ahmad et al. (2014)	Malaysia	645	Adolescents aged 12-17 years	Alcohol Consumption Behavior	No Alcohol Consumption Behavior	Premarital sexual behavior
Arega et al. (2019)	Northwestern Ethiopia	497	Adolescents aged 15-24 years	Alcohol Consumption Behavior	No Alcohol Consumption Behavior	Premarital sexual behavior
Biratu et al. (2022)	Southwestern Ethiopia	312	Adolescents aged 10-19 years	Alcohol Consumption Behavior	No Alcohol Consumption Behavior	Premarital sexual behavior
Bogale et al. (2014)	Northwestern Ethiopia	826	Adolescents aged 15-24 years	Alcohol Consumption Behavior	No Alcohol Consumption Behavior	Premarital sexual behavior
Gebreyesus et al. (2019)	Northern Ethiopia	536	Adolescents aged 14-19 years	Alcohol Consumption Behavior	No Alcohol Consumption Behavior	Premarital sexual behavior

Table 7. aOR and 95% CI data of alcohol consumption behavior toward premarital sexual behavior in adolescents.

(Author, year)	aOR	95% CI	
		Lower Limit	Upper Limit
Ahmad et al. (2014)	1.33	1.15	1.54
Arega et al. (2019)	9.43	2.86	31.09
Biratu et al. (2022)	3.78	1.49	9.59
Bogale et al. (2014)	1.54	0.98	2.42
Gebreyesus et al. (2019)	1.99	1.20	3.30

Table 6 it can be seen the summary of primary research regarding alcohol consumption behavior toward premarital sexual behavior in adolescents, a meta-analysis was carried out on 5 articles originating from the country of Malaysia, Northwest Ethiopia, and Southwest Ethiopia. Table 7 showed the effect sizes of the primary studies used in the meta-analysis, with largest adjusted odd ratio conducted by Arega et al. (2019) is 9.43, and the lowest adjusted odd ratio conducted by Ahmad et al. (2014) is 1.33.

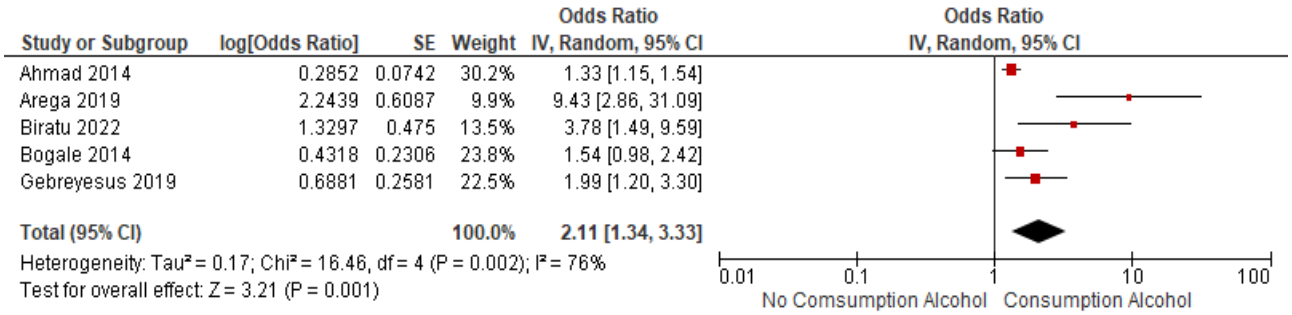

Figure 7. Forest plot of alcohol consumption behavior toward premarital sexual behavior in adolescents

The forest plot result in Figure 7 indicates that alcohol consumption increased premarital sexual behavior by 2.11 times compared to no alcohol consumption, and it was statistically significant (aOR= 2.11; 95% CI = 1.34 to 3.33; p<0.001). The forest plot also indicates high heterogeneity of effect estimates across primary studies I^2= 76%; p= 0.002, which means that the effect estimates across primary studies in this meta-analysis varied. Therefore, the calculation of the average effect estimates was carried out with a random effect model approach.

The funnel plot in Figure 8 indicates that the distributions of effect estimates were evenly distributed between the left and right of vertical lines of the average effect estimation. Thus, this funnel plot indicates publication bias).

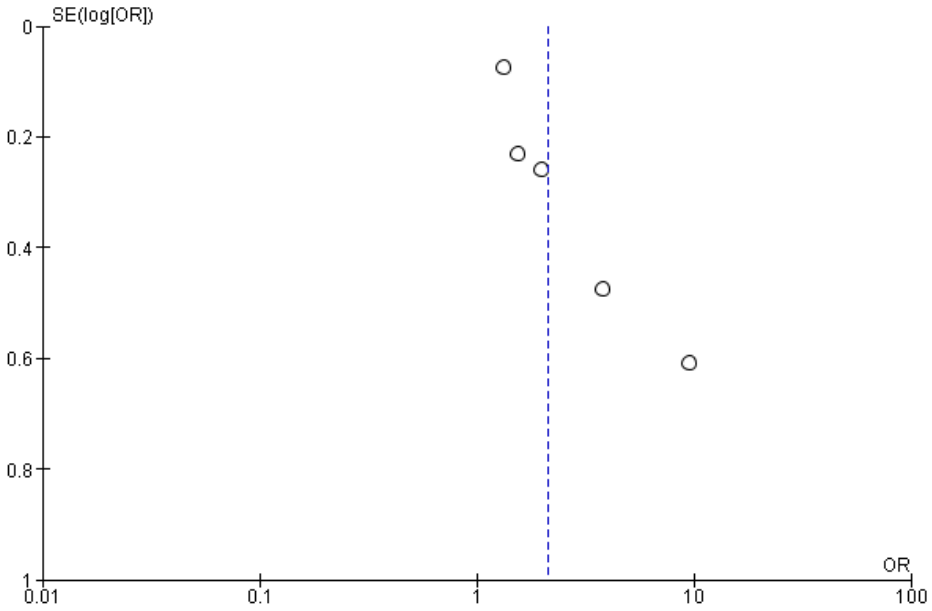

Figure 8. Funnel plot of alcohol consumption behavior toward premarital sexual behavior in adolescents

Table 8. PICO description of pornography exposure toward premarital sexual behavior in adolescents (cross-sectional study).

Author (years)	Country	Sample	P	I	C	O
Arega et al. (2019)	Northwest Ethiopia	497	Adolescents aged 15-24 years	Exposed to pornography	No exposure to pornography	Premarital sexual behavior
Bogale & Seme (2014)	Northwestern Ethiopia	826	Adolescents aged 15-24 years	Exposed to pornography	No exposure to pornography	Premarital sexual behavior
Manaf et al. (2014)	Malaysia	1,328	Adolescents aged 15-18 years	Exposed to pornography	No exposure to pornography	Premarital sexual behavior
Meleko et al. (2017)	Southwest Ethiopia	320	Adolescents aged 15-19 years	Exposed to pornography	No exposure to pornography	Premarital sexual behavior
Regassa et al. (2016)	Ethiopia	704	Adolescents aged 15-24 years	Exposed to pornography	No exposure to pornography	Premarital sexual behavior

Table 9. aOR and 95% CI data of pornography exposure toward premarital sexual behavior in adolescents.

(Author, year)	aOR	95% CI	
		Lower Limit	Upper Limit
Arega et al. (2019)	5.15	2.56	10.36
Bogale & Seme (2014)	1.74	1.19	2.54
Manaf et al. (2014)	4.10	1.80	9.34
Meleko et al. (2017)	2.78	1.45	5.33
Regassa et al. (2016)	1.20	0.83	1.73

Table 8 it can be seen the summary of primary research regarding pornography exposure toward premarital sexual behavior in adolescents, a meta-analysis was carried out on 5 articles originating from the country of Malaysia, Northwest Ethiopia, and Southwest Ethiopia. Table 9 showed the effect sizes of the primary studies used in the meta-analysis, with largest adjusted odd ratio conducted by Arega et al. (2019) is 5.15, and the lowest adjusted odd ratio conducted by Bogale & Seme (2014) is 1.74.

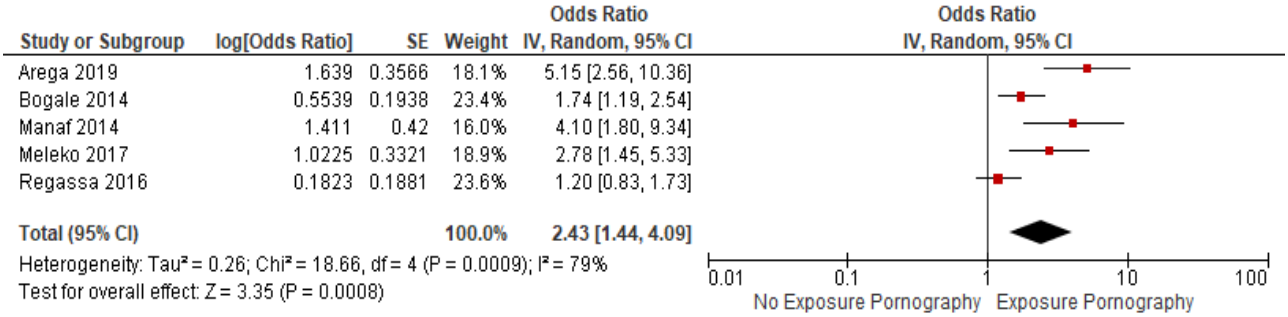

Figure 8. Forest plot of pornography exposure toward premarital sexual behavior in adolescents

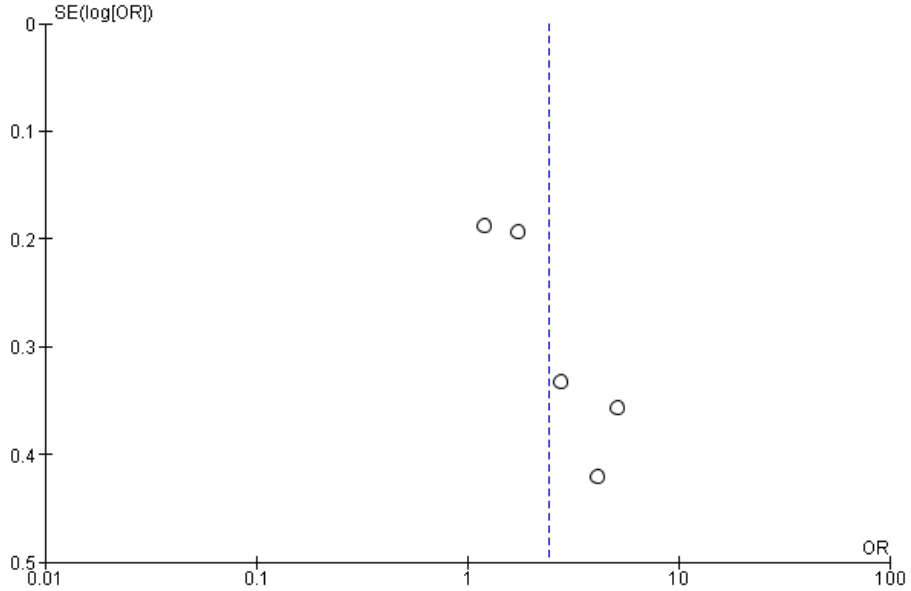

Figure 8. Funnel plot of pornography exposure toward premarital sexual behavior in adolescents

The forest plot result in figure 9 indicates that pornography exposure increased premarital sexual behavior by 2.43 times compared to no pornography exposure, and it was statistically significant (aOR= 2.43; 95% CI= 1.44 to 4.09; p<0.001). The forest plot also indicates a high heterogeneity of effect estimates across primary studies I^2= 79%; p=0.001, which means that effect estimates across primary studies in this meta-analysis varied. Therefore, the calculation of the average effect estimates was carried out with a random effect model approach.

The funnel plot in figure 10 indicates that the distributions of effect estimates were evenly distributed between the left and right sides of the average vertical line of effect estimates. Thus, this funnel plot shows publication bias.

Table 10. PICO description of the effect of rural areas toward premarital sexual behavior in adolescents (cross-sectional study).

Author (years)	Country	Sample	P	I	C	O
Abegaz (2022)	Northeastern Ethiopia	324	Adolescents aged 15-26 years	Rural	Urban	Premarital sexual behavior
Akibu et al. (2017)	Ethiopia	604	Adolescents aged 18-25 years	Rural	Urban	Premarital sexual behavior
Biratu et al. (2022)	Southwestern Ethiopia	312	Adolescents aged 10-19 years	Rural	Urban	Premarital sexual behavior
Budu et al. (2023)	Sub-Sahara Afrika	87,924	Adolescents aged 15-24 years	Rural	Urban	Premarital sexual behavior
Salih et al. (2015)	Northern Ethiopia	624	Adolescents aged 15-20 years	Rural	Urban	Premarital sexual behavior

Table 11. aOR and 95% CI data of the effect of rural areas toward premarital sexual behavior in adolescents.

(Author, year)	aOR	95% CI	
		Lower Limit	Upper Limit
Abegaz (2022)	1.80	0.71	4.56
Akibu et al. (2017)	0.83	0.57	1.21
Biratu et al. (2022)	0.15	0.03	0.75
Budu et al. (2023)	0.73	0.70	0.76
Salih et al. (2015)	1.92	1.28	2.88

Table 10 it can be seen the summary of primary research regarding the effect of rural areas toward premarital sexual behavior in adolescents, a meta-analysis was carried out on 5 articles originating from the country of Malaysia, Northwest Ethiopia, and Southwest Ethiopia. Table 9 showed the effect sizes of the primary studies used in the meta-analysis, with largest adjusted odd ratio conducted by Salih et al. (2015) is 1.92, and the lowest adjusted odd ratio conducted by Biratu et al. (2022) is 0.15.

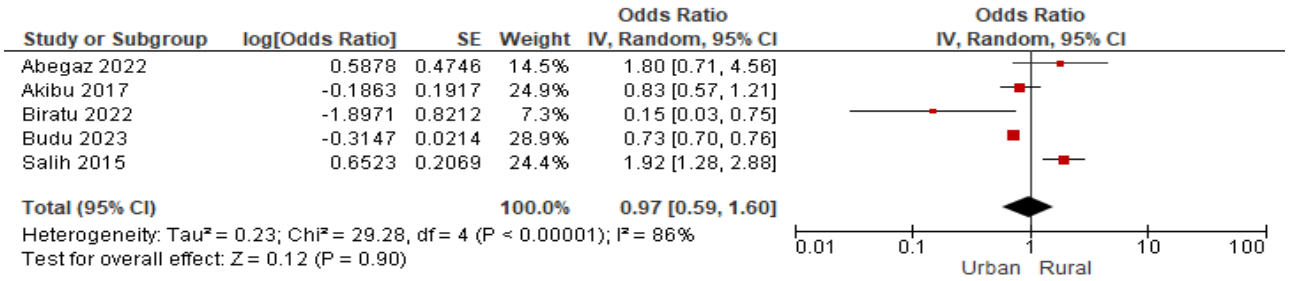

Figure 11. Forest plot of rural areas toward premarital sexual behavior in adolescents

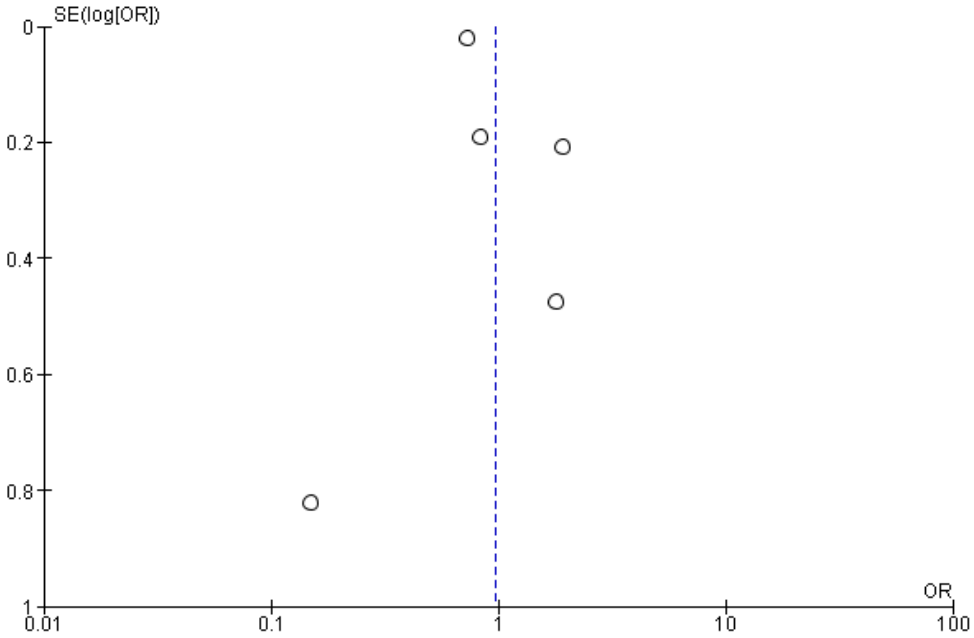

Figure 12. Funnel plot of rural areas toward premarital sexual behavior in adolescents

The forest plot result in figure 11 indicates that rural areas decreased premarital sexual behavior by 0.97 times compared to urban areas, and it was statistically significant (aOR= 0.97; 95% CI=1.38 to 9.26; p< 0.001). The forest plot also indicates high heterogeneity of effect estimates across primary studies I^2= 93%; p= 0.001, which means that the effect estimates across primary studies in this meta-analysis varied. Therefore, the calculation of the average effect estimates was carried out with a random effect model approach. The funnel plot in figure 12 indicates that the distributions of effect estimates were evenly distributed between the left and right sides of the average vertical line of effect estimates. Thus, this funnel plot shows publication bias.

DISCUSSION

1. The effect of peer pressure toward premarital sexual behavior in adolescents

Peers are individuals who are in the same age group. Peers have a role in social, emotional, and cognitive development during childhood and adolescence (Selvam, 2018). Adolescents experience rapid physical growth and psychosocial development so

that they have a high curiosity and drive to try new things as their peers do, including premarital sexual behavior. Behulu (2016), states that adolescent premarital sexual activity is increasing in sub-Saharan Africa. According to EDHS (2016), 13% of women aged 15-19 years in Ethiopia have started childbearing. In the Amhara region, the age of marriage is reported to be between 12 and 13 years old.

The meta-analysis of 5 cross-sectional study articles with adolescent populations who engaged in premarital sexual behavior showed that adolescents with high peer pressure were 3.57 times more likely to engage in premarital sexual behavior than those with low peer pressure and this result was statistically significant (aOR= 3.57; 95% CI= 1.38 to 9.26; p<0.001). This study is in line with a study by Mulugeta (2014), which states peer pressure is associated with premarital sexual debut. Adolescents under peer pressure are 3 times more likely to make their premarital sexual debut than their peers (aOR=2.98; 95% CI= 1.57, 5.67).

2. The effect of smoking behavior toward premarital sexual behavior in adolescents

Smoking is common in late adolescence to young adulthood. Smoking can result in poor physical health and can have an impact on overall quality of life, including sexual health. In addition, some studies reveal that the occurrence of nicotine dependence and the psychological impact of smoking habits can affect levels of anxiety, depression, or stress, which can affect an individual ‘s sexual behavior (Fluharty et al., 2017).

A meta-analysis of 5 cross-sectional study articles with adolescent populations who engaged in premarital sexual behavior indicated that adolescents who smoked were 1.17 times more likely to engage in premarital sexual behavior compared to adolescents who did not smoke and it was statistically significant (aOR= 1.17; 95% CI= 0.63 to 2.16; p< 0.001). This study is in line with a study by Ahmad (2014), which states that ever-had sex has the most significant association with ever had smoked (aOR = 1.83; 95% CI = 1.62-2.07).

3. The effect of alcohol consumption behavior toward premarital sexual behavior in adolescents

Alcohol consumption behavior can have a complex impact on an individual’s sexual behavior. Alcohol can affect an individual’s self-control which can lead to sexual behaviors that may not occur in a conscious state or without the influence of alcohol (Rehm et al., 2017).

Adolescents who consume alcoholic beverages are 4 times more likely to have premarital sex, because consuming alcoholic beverages can reduce self-control and are vulnerable to risky sexual behaviors such as unplanned and unsafe sexual relations, including premarital sex (Biratu, 2018).

A meta-analysis of 5 cross-sectional study articles with populations of adolescents who engaged in premarital sexual behavior indicated that adolescents who consumed alcohol were 2.11 times more likely to engage in premarital sexual behavior compared to adolescents who did not consume alcohol and it was statistically significant (aOR=2.11; 95% CI= 1.34 to 3.33; p< 0.001). This study is in line with a study by Mumdhiro (2021) which states that adolescents who consume alcohol and get drunk are 20 times more likely to be at risk of having premarital sex (aOR= 19.88; 95% CI= 16.12 to 24.53) compared with adolescents who do not consume alcohol.

4. The effect of pornography exposure toward premarital sexual behavior in adolescents

Pornography is a medium that plays a role in shaping perceptions and understandings of sexuality. The role of pornography shapes narratives about sexual desire and representations of sexual satisfaction (Tarrant, 2013). According to Akibu (2017), porn movies encourage non-normative sexual practices and adolescents are subjected to diverse sexual behaviors. Therefore, pornography can influence adolescents in psychological and biological perspectives in having sexual relations, making them more likely to engage in premarital sexual practices.

A meta-analysis of 5 cross-sectional study articles with adolescent populations who engaged in premarital sexual behavior indicated that adolescents exposed to pornography were 1.44 times more likely to engage in premarital sexual behavior compared to adolescents who were not exposed to pornography and it was statistically significant (aOR= 2.43; 95% CI= 1.44 to 4.09; p<0.001). This study is in line with a study by Meleko A (2017), which states that adolescents who watch pornography are reported to engaged in premarital sexual practices compared to students who do not watch (aOR= 2.78; 95% CI=1.45-5.3).

5. The effect of rural area toward premarital sexual behavior in adolescents

Residence is another factor associated with premarital sexual intercourse among unmarried adolescents. Adolescents living in rural areas are less likely to have premarital sexual relations in contrast to urban areas. Urban adolescents have more opportunities to socialize with their peers and entertainment activities and are at higher risk of various risky behaviors, which may encourage them to initiate sexual relationships (Mai et al, 2019).

A meta-analysis of 5 cross-sectional study articles with adolescent populations who engaged in premarital sexual behavior indicated that adolescents living in rural areas were 0.97 times less likely to engage in premarital sexual behavior compared to adolescents living in urban areas and it was statistically significant (aOR= 0.97; 95% CI =1.38 to 9.26; p<0.001). This study is in line with a study by Biratu (2022), which states that urban population are more likely to have premarital sex than rural population (aOR= 0.15; 95% CI= 0.03 to 0.51).

AUTHOR CONTRIBUTION

Active Cahyaning Tyas as the first author determined the topic of study, conducted data collection and analysis. Hallisa'tu Zahro and Putri Fortuna Salsabila conducted data analysis and review of study documents.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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