Attitudes Concerning Sexual Behavior towards Risky Sexual Behavior of Sexual Transmitted Infections among Male Adolescents in Indonesia

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Abstract

There has been an increase of sexually transmitted infections (STIs) such as HIV/AIDS worldwide, especially in Indonesia. Several studies on adolescent behavior, especially the male as the main predictor, reported increased in STIs' cases due to risky sexual behavior. This study aimed to show the relationship between attitudes, sexual behavior, and the risks of STIs among male adolescents in Indonesia based on the Indonesia Demographic and Health Survey (IDHS) data in 2017. This cross-sectional study involved 10,547 male adolescents using the total sampling method according to the inclusion and exclusion criteria. Data were analyzed using a complex sample logistic regression test. This study was found that the proportion of risky sexual behavior of STIs was 10% of which 29.8% agreeable attitude male adolescents. Agreeable attitude male adolescents were found able to improve the risk of engaging in risky sexual behaviors of STIs (p-value = 0.018; prevalence odd ratio (POR) = 1.135). The male adolescents who had an agreeable attitude towards sexual behavior could improve the risk of having risky sexual behavior of STIs 1,135 times; however, the attitude variable was not necessarily a major risk factor for the risky sexual behavior of STIs. Knowledge and education were not related to the risky sexual behavior of STIs.

Keywords: attitudes, Indonesia, male adolescents, risky sexual behavior, sexually transmitted infections

Introduction

Overcoming health problems is one of the main focus of many countries in reducing mortality rates. Currently, four out of ten ailments that leads to death originate from infectious diseases.[1] Furthermore, based on the Institute for Health Metrics and Evaluation (IHME) data, it was stated that during the Global Burden of Disease (GBD) in 2017 about 16.5 million people died due to infectious diseases continues to increase annually.[2] An example of an infectious disease that needs special attention is sexually transmitted infections (STIs). More than one million cases of this disease occur every day worldwide,[3] with an increasing number of both curable and incurable STIs.[4-6]

Sexually transmitted infection cases have become a major health problem in Indonesia. Based on the Integrated Biological and Behavioral Surveillance (IBBS) data in 2015, it was found that the prevalence rate of STIs has increased, especially for syphilis, which increased from 5 to 6% annually.[7] The human immunodeficiency virus (HIV) cases have also increased and are estimated to continue until 2025.[6]

Meanwhile, based on the age level, the highest number of HIV cases were experienced by age groups more than 30 years, followed by those between 15 to 24, and someone exposed to HIV would not show symptoms for an average of 8 years. Therefore, the age for first exposure is around 23 years.[7]

The increase in STI cases is inseparable from the result of risky sexual behavior. This behavior in adolescents initially started with premarital sex and can damage an individual's behavior, thereby leading to several adverse health consequences including an increase in cases of sexually transmitted infections.[8-11] There are factors that influence risky sexual behavior in adolescents, which ultimately results in sexually transmitted infections, namely age, gender, place of residence, attitudes, education, knowledge, media roles, lifestyle, and peer influence.[10]

Based on the description above, these factors are generally individual characteristics and an example is the attitude towards sexual behavior. Furthermore, several studies have shown a relationship between attitudes and risky sexual behavior of STIs. A study in Hong Kong recorded about 6.7 times the risk (95%CI = 4.10-10.96)

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of adolescents engaging in risky sexual behavior.[11] Another study conducted on male adolescents in Tehran, Iran, showed that the attitudes towards sexuality 1.97 (95%CI = 1.28-3.04) affected risky sexual behavior.[12] In addition, based on the data from the 2017 Indonesia Demographic and Health Survey (IDHS), it was reported that the attitudes of adolescents that undergo sexual intercourse before marriage increased from 7% to 8%.[13]

Various studies have reported several factors affecting risky STIs other than attitudes. For example, the survey by Maryatun stated that street children with a lack of knowledge have four times greater chance of engaging in risky premarital sexual behavior than those with good knowledge (OR = 4.42, 95%CI = 1.797-10.894).[14] A study in France reported that the influence from peers was 2.7 times effect on risky sexual behavior (95%CI = 1.42-5.50).[15] Education and the use of alcohol and drugs are also other factors associated with it.[16-20]

The involvement of male adolescents in risky sexual behavior has become a significant public health problem. Furthermore, negative consequences as a result of this behavior and the risk of contacting sexually transmitted infections are often associated with males as the main predictor.[18] The proportion of male adolescents having multiple sexual relationship is four times compared to females.[19] They also experienced a twofold increase in having relationships with different partners,[20] and with condom use, they are substantially lower than adult males.[21]

Based on the data and information above, and since STIs have a significant impact on the health sector. Therefore, this study aimed to know relationship between attitudes, sexual behaviors, and sexually transmitted diseases among male adolescents in Indonesia by measuring the data and performing multivariate analysis. It also aimed to know the interactions and its confounders.

Method

This study was conducted using secondary data obtained from the 2017 Indonesian Demographic and Health Survey (IDHS) and used a cross-sectional design. The 2017 IDHS used a two-stage sampling design with stratification into urban and rural areas. At stage one, the samples were selected based on the IDHS frame, while the second stage involved a complete listing of households in each selected cluster. This study was analyzed in March to July 2020 in Depok City, West Java. The sample in this study were all-male adolescents between the ages of 15 to 24, total population, and met the inclusion and exclusion criteria. The inclusion criteria were all male adolescents in Indonesia that were respondents in the 2017 IDHS between ages 15 to 24, not married, and had complete data. While the exclusion criteria were male adolescents without complete data and were married. The sampling flow started from a households

sample totaling 49,261 and from 13,860 respondents of unmarried male adolescents between ages 15 to 24. However, only 13,079 were successfully interviewed, while 10,574 male adolescents had complete data. Out of the total samples used from the data of IDHS, only 10,547 met the criteria.

The dependent variable of this study was male adolescents that had sexual intercourse before marriage.[22,23] The independent variable was their statement on risky sexual relations that was obtained from the answers agree or disagree of questions 718, 719, 720a-e, as well as several confounding variables including: 1) Age refers to the lifespan of the respondents from birth to the time 2017 IDHS data were collected and divided into two categories, namely "15-19" and "20-24"; 2) Education was defined as the last level that the respondent completed and was categorized into "Low" (primary and junior high school) and "High" (senior high school, diploma, and bachelor); 3) Residence refers to the dwelling place of the respondents' and was divided into "Urban" and "Rural" categories; 4) Knowledge refers to everything the respondents knew about STIs and risky sexual behavior that categorized into "Less" and "Good"; 5) Access to information refers to the use of the media in receiving information on reproductive health and STIs and was categorized into "Less" and "Good"; 6) Use of substances refer to the use of cigarettes/alcoholic drinks/drug, and was divided into "Yes" and "No"; and 7) Peer influence is the encouragement from friends that had sexual intercourse, which was used in shaping the respondents' sexual behavior. It was divided into "Take effect" and "No effect".

The analysis was carried out in stages starting from univariate, bivariate, and finally multivariate analysis. The univariate analysis displayed the percentage of each study variable based on its category. At the same time the bivariate was conducted to examine the relationship between the independent (attitude) and the dependent variables (sexual behavior), and also evaluated the confounding variables. A multivariate analysis was carried out using complex sample logistic regression based on the bivariate analysis' selection result. Furthermore, an interaction and confounding test was carried out by eliminating variable, starting with the one with the highest p-value.

Results

The total number of respondents was 10,547. Based on Table 1, it was found that 10.0% of male adolescents were at risk of contacting STIs and 29.8% had an agreeable attitude. Based on the results from the analysis in Table 2, statistically, there were differences in the sexual behavior among male adolescents that posses the attitude of agreeing and disagreeing (p-value = 0.016). Those who

have a consenting attitude towards sexual behavior had a risk of 1.127 (95%CI = 0.940-1.352) times engaging in risky sexual behavior and contacting STIs compared to male adolescents with a disagreeing attitude. When viewed from the p-value in Table 2, only the variable for age and education level had a p-value greater than 0.05. In contrast other variables, such as residence, knowledge, access to information media, use of the substance, and peer influence had a p-value that was greater than 0.05. However, the variables of age and level of education would still be included in the multivariate modeling because there was a substantial relationship.

The analysis in this study was carried out using the interaction and confounding test. The interaction test was carried out by compiling a model that includes all variables, including those involving interactions. When the p-value is less than 0.05, it is stated that the variable has interactions. However, based on Table 3, the results of the interaction tests carried out on each variable obtained a p-value that was more than 0.05. This means that statistically there were no interacting variables. In the full model (Table 4), the prevalence odd ratio (POR) attitude

value was 1.135 (95%CI = 0.944-1.364). It was used as the reference value in calculating the changes that occur

Table 1. Distribution of Respondents with the Risky Sexual Behavior of Sexually Transmitted Infections

Variable	Category	n	%
Sexual behavior	Risk of STIs	1,053	10.0
	No risk of STIs	9,494	90.0
Attitude	Agree	3,142	29.8
	Disagree	7,405	70.2
Age	15-19 years	6,165	61.0
	20-24 years	4,382	39.0
Education	Low	2,687	25.5
	High	7,860	74.5
Residence	Urban	6,165	58.4
	Rural	4,382	41.6
Knowledge	Less	6,578	62.4
	Good	3,969	37.6
Access to information media	Less	9,792	92.8
	Good	755	7.2
Use of substance	Yes	7,119	67.5
	No	3,428	32.5
Peer influence	Take effect	6,303	59.8
	No effect	4,244	40.2

Note: STIs = Sexually Transmitted Infections

Table 2. Relationship between Variables with the Risky Sexual Behavior of Sexually Transmitted Infections

Variable	Category	Risk of STIs		No Risk of STIs		Total		POR	95%CI	p-value
		n	%	n	%	n	%			
Attitude	Agree	338	10.8	2,804	89.2	3,142	100	1.127	0.940-1.352	0.016
	Disagree	716	9.7	6,690	90.3	7,405	100			
Age	15-19 years	641	10.0	5,788	90.0	6,429	100	0.996	0.843-1.178	0.969
	20-24 years	412	10.0	4,118	90.0	4,118	100			
Education	Low	267	9.9	2,420	90.1	2,687	100	1.991	1.823-2.195	0.927
	High	787	10.0	7,073	90.0	7,860	100			
Residence	Urban	633	10.3	5,531	89.7	6,165	100	1.078	0.910-1.277	0.038
	Rural	420	9.6	3,962	90.4	4,382	100			
Knowledge	Less	613	11.1	5,965	88.9	6,578	100	1.826	1.704-2.986	0.018
	Good	440	9.3	3,529	90.7	3,969	100			
Access to information media	Less	982	10.0	8,809	90.0	9,792	100	1.176	0.799-1.450	0.028
	Good	71	9.1	684	90.9	755	100			
Use of substance	Yes	724	10.2	6,395	89.8	7,119	100	1.167	0.887-1.382	0.038
	No	329	9.6	3,098	90.4	3,428	100			
Peer influence	Take effect	658	10.4	5,645	89.6	6,303	100	1.133	0.952-1.349	0.038
	No effect	395	9.3	3,849	90.7	4,244	100			

Notes: POR = Prevalence Odds Ratio; CI = Confidence Interval; STIs = Sexually Transmitted Infections

Table 3. Interaction Assessment Results

Variable	p-value	Information
Early models + attitude * age	0.981	NI
Early models + attitude * residence	0.755	NI
Early models + attitude * education	0.136	NI
Early models + attitude * knowledge	0.823	NI
Early models + attitude * media access	0.483	NI
Early models + attitude * use of the substance	0.112	NI
Early models + attitude * peer influence	0.080	NI

Note: NI = Not Interaction

Table 4. Full Model

Variable	p-value	POR	95% CI
Attitude	0.018	1.135	0.944-1.364
Age	0.666	1.038	0.875-1.232
Residence	0.021	1.058	0.890-1.258
Education	0.669	2.043	1.860-1.266
Knowledge	0.016	1.819	1.696-1.963
Access to information media	0.037	1.146	0.847-1.550
Use of substance	0.048	1.068	0.890-1.281
Peer influence	0.048	1.122	0.943-1.334

Note: POR = Prevalence Odds Ratio; CI = Confidence Interval

Table 5. Confounding Assessment Results

Variables Excluded from the Model	POR Before	POR After	ΔPOR (%)	Information
Education (p-value = 0.669)	1.135	1.138	0.26	NC
Age (p-value = 0.666)	1.135	1.136	0.08	NC
Peer influence (p-value = 0.048)	1.135	1.136	0.08	NC
Use of the substance (p-value = 0.048)	1.135	1.128	0.62	NC
Access to media (p-value = 0.037)	1.135	1.127	0.70	NC
Residence (p-value = 0.021)	1.135	1.125	0.88	NC
Knowledge (p-value = 0.016)	1.135	1.127	0.70	NC

Notes: POR = Prevalence Odds Ratio; NC = Not Confounding

Table 6. Final Model

Variable	p-value	POR	95%CI
Attitude	0.018	1.135	0.944-1.364

Note: POR = Prevalence Odds Ratio; CI = Confidence Interval;

after the covariates were removed from the model. Further analysis was carried out to obtain the full model value, where the POR results from the full model would be used as a reference in the confounding test assessment (Table 5). Based on the changes in POR value (ΔPOR), there were no variables that had a change in POR>10%, which means that statistically, all covariate variables were not confounding. The confounding assessment was completed in order to obtain the final model of complex sample logistic regression analysis in Table 6.

Based on the whole process of multivariate analysis regarding the relationship between attitudes, sexual behavior, and the risk of STIs in male adolescents, the result showed insignificance between exposure and outcome, was possible due to the limited sample size. However, in epidemiology, male adolescents with an agreeable attitude towards sexual behavior have a 1.135 times risk of engaging in risky sexual behavior for STIs compared to those that disagree.

Discussion

In the 2017 IDHS study, the prevalence of male adolescents having risky sexual behavior was 8%, while those that had risky sexual behaviors for STIs in the 2012 IDHS data were 4.5%. Furthermore, this situation has increased almost two times from the previous data. Risky sexual behavior of STIs in this case, was male adolescents who engaged in premarital sex.[13] It was different from the case size and the IDHS study in 2017 involving male adolescents with risky STIs. The number of cases of male adolescents that engaged in premarital sex was 10%. This difference was presumably because there were many missing data from some of the variables resulting in the different results between the IDHS data and this study. The prevalence of risky STIs among male adolescents has increased due to social changes, which include increased

peer influence and adolescents having sexual thoughts. Besides, there were changes, especially in current technology, that makes it easier for them to access negative sites that could lead to premarital sex.[24]

The variables that were proven to be related in the bivariate analysis with risky sexual behavior for STIs were residence, knowledge, access to information media, substance use, and peer influence. Meanwhile, age and education did not have a significant relationship with sexual risk behaviors for STIs. This occurred because the two groups of respondents were not representative. However, this was different from several studies which stated that there was a relationship between age and the level of education with risky sexual behaviors for STIs.[16,17,25-27]

Attitudes toward sexual behavior in several studies reported that it was a factor that influences the behavior of various individuals.[28,29] Based on the results of the bivariate analysis, there was a statistical relationship between attitudes, sexual behavior, and STIs. The result showed that male adolescents with an agreeable attitude had 1.127 times the risk of contacting risky STIs compared to those with a disagreeing attitude (p-value = 0.016, 95%CI = 0.940-1.352). The results of this study is in line with that of Yip, *et al.*,[11] in Hong Kong, which reported that adolescents' consent attitude was 6.7 times (95%CI = 4.10-10.96) engaging in risky sexual behaviors. Another study by Mohammadi, *et al.*,[30] on male adolescents in Tehran, Iran, showed that negative attitudes towards sexuality were 1.97 times (95%CI = 1.28-3.04) affected risky sexual behavior.

There were no interacting or confounding variables in the multivariate analysis between attitudes towards sexual behavior and STIs. Therefore, in the final modeling, only attitudes that influenced risky sexual behavior of STIs were found (p-value 0.018, POR = 1.135 (95%CI = 0.944-1.364)). Attitude is a behavioral mediator, meaning that everything whether knowledge, media access, use of alcohol/smoking/drugs, and others influences an individual's behavior. According to Azwar S,[31] when people are aware of a particular situation. It influences their behavior towards it and is mediated by an attitude. This means that no matter how much knowledge one has,

when a positive attitude does not support it, the effect on the behavior would be insufficient.

Although no interactions and confounders were found in this study, other studies reported that in addition to attitudes there are factors that influence risky sexual behaviors for STIs, including substance use such as alcohol/drugs.[32,33] The perception that using substances, in this case, alcohol to narcotics, has a disinhibiting effect (behavior that is not following with prevailing social norms due to disruption or loss of self-control function) on an individual's decision to engage in risky sexual behavior.

Adolescents usually make decisions that are more influenced by emotions than reason. Therefore, substance use could increase the likelihood of engaging in risky sexual behaviors.[34] A study has has shown that peer group influence has an effect on the sexual behaviors of adolescents.[15] Male adolescents would encourage their peer group to be sexually active even though they are not ready or interested. They are only challenged with courage and mostly do not know about safe sex.[35]

Conclusion and Recommendation

It can be concluded that male adolescents who had an agreeable attitude towards sexual behavior could improve the risk of having risky sexual behavior of STIs 1,135 times; however, the attitude variable was not necessarily a major risk factor for the risky sexual behavior of STIs. Knowledge and education were not related to the risky sexual behavior of STIs.

The agencies and policymakers need to add questionnaires relating to the exposure to pornography and create a parent education program that involves parents and their male teenagers in forming positive attitudes.

Abbreviations

STIs: Sexually Transmitted Infections; HIV/AIDS: (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome); GDB: Global Burden of Disease; IHME: Institute for Health Metrics and Evaluation; IBBS: Integrated Biological and Behavioral Surveillance; POR: Prevalence Odds Ratio; CI: Confidence Interval; NI: Not Interaction; NC: Not Confounding.

Ethics Approval and Consent to Participate

Ethics approval was obtained by the Ethics Committee of the Faculty of Public Health Universitas Indonesia (Ethical Approval: 233/UN2.F10.D11/PPM.00.02/2020).

Competing Interest

The author declares that there is no significant competing financial, professional, or personal interest that might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

The original data was made public in https://dhsprogram.com/

Authors' Contribution

H and NM conceptualized this study, H created the methodology and joined NM in editing, reviewing, and writing the manuscript. In addition, they wrote the original draft.

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