



An Analysis on the Risk Factor of HIV Transmission in Adolescents in DKI Jakarta

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Abstract— *Background: HIV is a big problem that until now has not been handled properly. Children and adolescents become victims of parental indifference to their children. This study aims to determine the risk factors for HIV transmission to adolescents in DKI Jakarta. Methods: This study uses an analytic observational design with case control. The location of this research was carried out in DKI Jakarta (Pelita Ilmu Foundation). Results: The study found risk factors that influenced the incidence of HIV transmission among adolescents in DKI Jakarta, namely a family history of HIV/AIDS ($p = 0.000$; $OR = 227.167$; $95\% CI = 28.495-1810.989$). Conclusion: Family history of HIV/AIDS is the most influential factor in the incidence of HIV transmission among adolescents in DKI Jakarta.*

Keywords— *HIV/AIDS, Adolescents, Risk Factors*



I. INTRODUCTION

Human Immunodeficiency Virus (HIV) is a RNA-class virus specifically attacking human immunity and later Acquired Immune Deficiency Syndrome (AIDS). An individual infected with HIV does not show sickness sign, but he can infect others. In some people, HIV infection will evolve into AIDS after some certain periods of time, from months to 15 years.¹

Data cited from UNAIDS reveals that 38,4 million people live with HIV in 2021, 1,5 of them are newly infected with HIV, and 650,000 people died due to AIDS-related disease. Since the beginning of epidemic, 84.2 million people have been infected with HIV, and 40.1 million people have died due to AIDS-related diseases. And about 28.7 million people also access antiretroviral therapy in 2021.^{2,3}

About 36.7 million adults (15 years old and more) and 1.7 million children (0-14 years old) live with HIV. Fifty four percent of those living with HIV are women and girls. About 4900 female adolescents aged 15-24 years are infected with HIV. About 5.9 million people are not aware that they live with HIV.^{2,3}

Cumulatively, there have been 329,581 HIV cases and 137,397 AIDS cases reported per March 2022. The highest percentage of HIV infection is reported in the 25-49 year-age group (70.5%), followed with the 20-24 year-age group (15.9%), and the ≥ 50 - year age group (7.2%). Five provinces with highest number of HIV cases in 2010-March 2022 are DKI Jakarta (76.103), East Java (71.909), West Java (52.970), Central Java (44.649), and Papua (41.286).⁴

Cumulatively, there are 137,397 AIDS cases in the period of 2009 – March 2022. Five provinces with highest number of AIDS cases are Papua (24,873), East Java (21,815), Central Java (14,617), DKI Jakarta (10,913), and Bali (9.728). The largest transmission risk through risky sexual intercourse is found in homosexual (30.2%), heterosexual (12.8%), and needle sharing (0.7%).⁴

The data obtained from Health Department of DKI Jakarta shows that there were 5,544 HIV/AIDS cases, the age group with the largest number of HIV cases is the 10-24 year-age group in which 5,544 HIV/ AIDS cases occur and the smallest number is found in 13-year age, and by sex, the largest number of cases is found in male (4.662 people) and then female (882 people).

Some studies have been conducted on the HIV transmitting risk factor. The HIV-transmitting risk factor in adolescents, according to Arfan et al, (2015), are: unsafe sex, TV and HP media use, internet media, parent communication, parent supervision, relationship to parent and peer, and sexual relation. The risk factors of HIV transmission in adolescents, according to Amelia, et al (2016), are: age, attitude, alcohol consumption, condom use, social culture, and access to illegal localization. The risk factors of HIV transmission in adolescents, according to Manalu, et al. (2018), are: sex, sexual behavior, and drug use behavior.⁶⁻⁸

DKI Jakarta is the province with the highest number of HIV cases since it was found for the first time in Indonesia until today. Similarly, in the case of AIDS, DKI Jakarta province is on the top 4 rank in Indonesia.

Considering the data revealed in the background section concerning the high number of HIV case in DKI Jakarta, the author needs to conduct a study to find out “the Risk Factor of HIV transmission in Adolescents in DKI Jakarta”. In addition, the studies investigating in detail the risk factor of HIV transmission in adolescents in DKI Jakarta are still rare in number. Thus, this topic gets inadequate attention from the related parties including universities, community (NGO), and government.

The objective of research is to find out the risk factor of HIV transmission in adolescents in DKI Jakarta.

II. METHOD

This research employed an analytical observational research type, with case control research design.

In this study, retrospective approach was used starting with collecting data of cases including the adolescents infected with HIV/AIDS in Jakarta and control, the adolescents not infected with HIV/AIDS in Jakarta. Then, the sample was selected using quota sampling technique to obtain case and control groups with equal probability of being exposed to risk factor, by means of lottery for either case or control group.

Data collection was conducted through interview using questionnaire aiming to find out the risk factor of HIV transmission in adolescents in DKI Jakarta.

The sample of research consisted of 108 adolescents divided into 59 in case and 59 in control groups, and then retrospective study was conducted on the risk factor of HIV transmission in adolescents.

The inclusive criterion of the case is PWHAs aged 10-24 years and domiciled in Jakarta. The exclusive criteria of the case are PWHAs aged <10 and > 24 years, declining to be

the respondents, incapable of communicating, and developing mental distress.

The inclusive criteria of the control are adolescents aged 10-24 years and domiciled in Jakarta. The exclusive criteria of the control are declining to be respondents, incapable of communicating, and developing mental distress.

Data processing and analysis were conducted using SPSS program computer system for windows, consisting of univariate, bivariate, and multivariate analyses.

This research has been approved by the Semarang State University’s Ethical Commission for Health Research with the approval Number: 144/KEPK/EC/2023

III. RESULT

From the research conducted on 108 respondents in *Yayasan Pelita Ilmu Jakarta* (Pelita Ilmu Foundation of Jakarta) in December 2022 – May 2023, the results of univariate, bivariate, and multivariate analyses are elaborated as follows:

1.1. Result of Univariate Analysis

Univariate analysis is conducted to describe dependent variable (HIV transmission incidence) and independent variable using frequency distribution table as presented in Table 1.

1.1.1. General Description of Variable in case and control respondents

Table 1. Distribution of Respondents by Domicile among adolescents in DKI Jakarta

Variable	N	%
Domicile		
Jakarta Utara (North Jakarta)	7	5.9
Jakarta Selatan (South Jakarta)	45	38.1
Jakarta Barat (West Jakarta)	19	16.1
Jakarta Timur (East Jakarta)	39	33.1
Jakarta Pusat (Central Jakarta)	7	5.9
Kepulauan Seribu (Seribu Islands)	1	.8
Marital Status		
Married	6	5.1
Not Married	110	93.2
Ever Married	2	1.7
Working		
Yes	29	24.6
No	89	75.4
Total	118	100

Table 2. Statistic Values By Sex for Adolescents in DKI Jakarta

Mean	Median	Modus	Min	Max.
18,09	18	13	10	24

1.1.2. Frequency Distribution of Some Factors in Case and Control Respondents

The frequency distribution of some factors in both case and control respondents can be seen in Table 3.

1.2. Result of Bivariate Analysis

Bivariate analysis is conducted to see the effect of independent variable on independent variable through “p” value ($p < 0.05$) indicating the significance of variable. *Odds Ratio* (OR) value is intended to see whether or not the independent variable tested is the risk factor for the dependent variable.

Based on the result of *Chi-Square* test in bivariate analysis, it can be seen that there are five risk factors affecting the HIV transmission incidence in adolescents: education level ($p = 0.000$; OR = 1.313; 95% CI = 0.636-2.709), attitude ($p = 0.006$; OR = 0.328; 95% CI = 0.155-0.694), family history with HIV/AIDS ($p = 0.000$; OR = 227.167; 95% CI = 28.495-1810.989), role of coworker ($p = 0.017$; OR = 2.639; 95% CI = 1,254-5,554), and social cultural factor ($p = 0.027$; OR = 0.408; CI 95% = 0.194-0.855). For more detail information, see Table 6.

1.3. Result of Multivariate Analysis

Multivariate analysis is conducted to find out the independent variable mostly affecting the HIV transmission incidence in adolescents in DKI Jakarta and to determine the best equation. The analysis is conducted using Multiple Logistic Regression test.

Table 3. Summary of Univariate Test on the Analysis on the HIV Transmission Risk Factor in adolescents in Jakarta

Variable	Category	n	%
HIV	PWHA	59	50
	Non-PWHA	59	50
Sex	Male	39	33.1
	Female	79	66.9
Education Level	Low	42	35.6
	High	76	64.4
Knowledge level	Low	56	47.5
	High	62	52.5
Attitude	Poor	62	52.5
	Good	56	47.5
Sexual Behavior	Yes	13	11
	No	105	89
Alcohol Consumption	Yes	6	5.1
	No	112	94.9
Injection Drug Use Behavior	Yes	2	1.7
	No	116	98.3
Family with HIV/AIDS	Yes	48	40.7
	No	70	59.3
Internet Media Use	Poor	40	33.9
	Good	78	66.1
Access to Illegal Localization	Yes	1	0.8
	No	117	99.2

Role of Peer	Risky	56	47.5
	Not risky	62	52.5
Family	Present	18	15.3
	Absent	100	84.7
Social cultural factor	Negative	61	51.7
	Positive	57	48.3

Table 4. Distribution of Respondents by Knowledge and HIV incidence in adolescents in DKI Jakarta

Variable	HIV				OR (95%CI)	Pvalue
	PWHA		Non-PWHA			
	n	%	n	%		
Sex						
Male	25	42.4	14	33.1	2.363 (1.071-5.215)	0.050
Female	34	57.6	45	66.9		
Education Level						
Low	32	54.2	10	16.9	5.807 (2.479-13.606)	0.000
High	27	45.8	49	64.4		
Type of Knowledge						
Low	30	50.8	26	44.1	1.313 (0.636-2.709)	0.580
High	29	49.2	33	55.9		
Attitude						
Poor	23	39.0	39	66.1	0.328 (0.155-0.694)	0.006
Good	36	61.0	20	33.9		
Sexual Behavior						
Risky	10	16.9	3	11.0	3.810 (0.992-14.636)	0.078
Not Risky	49	83.1	56	89.0		
Alcohol Consumption						
Yes	3	5.1	3	5.1	1.000 (0.193-5.169)	1.000
No	56	94.9	56	94.9		
Injection Drug Use Behavior						
Yes	1	1.7	1	1.7	1.000 (0.061-16.372)	1.000
No	58	98.3	58	98.3		
History of Family with HIV/AIDS disease						
Yes	47	79.7	1	40.7	227.167 (28.495-1810.989)	0.000
No	12	20.3	58	59.3		
Internet Media Use						
Poor	43	72.9	35	66.1	1.843 (0.850-3.997)	0.173
Good	16	27.1	24	33.9		
Access to illegal localization						
Yes	0	0	1	0.8	2.017 (1.680-2.422)	1.000
No	59	100	58	99.2		

Role of Peer						
Risky	35	59.3	21	47.5	2.639	0,017
Not Risky	24	40.7	38	52.5	(1.254-5.554)	
Family						
Absent	6	10.2	12	20.3	0.443	0.200
Present	53	89.8	47	79.7	(0.154-1.274)	
Social Cultural factor						
Negative	24	40.7	37	62,7	0.408	0.027
					(0.194-0.855)	

Table 5. Final Model

Variable	Pvalue	OR
Education Level	0.701	1.400
Attitude	0.003	0.069
History of Family with HIV/AIDS disease	0.000	459.473
Role of Peer	0.300	2.246
Social cultural	0.101	0.319

The scoring criteria are important to be used in selecting variable to put the independent variable into multivariate analysis by calculating p value <0.25 . There are 5 variables belonging to the criteria: education level, attitude, history of family with HIV/AIDS disease, role of peer, and social-cultural. Then, interactive analysis is conducted simultaneously to see the probability of interaction between variables. The best model equation is considered with significance value $p < 0.05$.

This result of multivariate analysis shows that the analysis on important independent variables simultaneously indicated that the 5 (five) variables evidently affect significantly the HIV/AIDS transmission incidence among adolescents in DKI Jakarta. The most dominant variable is the history of family with HIV/AIDS disease, in which respondents having the history of family with HIV/AIDS disease is risky 459.473 folds to be infected with HIV. The detailed result of multivariate analysis can be seen in Table 7.

IV. DISCUSSION

The result of multivariate analysis shows that out of 5 (five) variables analyzed simultaneously (education level, attitude, history of family with HIV/AIDS disease, role of peer, and social-cultural), only 2 (two) do belong to the strong risk factor of HIV transmission incidence in adolescents in DKI Jakarta.

The result of logistic regression test on the final model shows that the history of family with HIV/AIDS disease is evidently the factor statistically affecting significantly the HIV transmission incidence in adolescents in DKI Jakarta ($p: 0.000$) with adjusted OR of 459.473 and 95% CI (36.295-5.816.725). It means that adolescents having the history of family with HIV/AIDS have risk of being infected with HIV 459.473 folds more than those not having history of family with HIV/AIDS.

This result is in line with the study conducted by Musyarofah, et al. (2017) finding a relationship between the history of family with HIV/AIDS disease and the HIV transmission (Pvalue 0.001). This finding is also in line with Sitepu (2018) finding that there is a relationship between the history of family with HIV/AIDS disease and the HIV transmission (Pvalue 0.002).

Attitude factor also affects the HIV transmission incidence in adolescents in DKI Jakarta, with p 0.003 and OR 0.069 at CI: 0.012-0.398. It means that the adolescents with poor attitude has risk of being infected with HIV 0.069 fold more than those with good attitude.

This result is in line with Amelia et al (2016) finding that there is a relationship between attitude and HIV transmission (Pvalue 0.001). This is also in line with Yuliza, et al (2019) finding that there is a relationship between attitude and HIV transmission (Pvalue 0.001).

The limitation of current study lies on the use of questionnaire completed by respondents, in which the result is dependent on the respondents' honesty. The respondents may be not honest about themselves and their habit. To minimize the error, the respondents can be assisted in completing the questionnaire.

Limited space and time. This research used online G-Form questionnaire because the author was on duty on the Republic of Indonesia's border. To solve this problem, the author asked his friend's help to coordinate and to communicate with PWhA.

Limitation of data collection. Some respondents selected to be the sample using sampling technique randomly declined to participate in the study and to see the author. This problem is solved by substituting other respondents for these respondents by considering the criteria of research sample.

In this research, the author studied only sex, education level, knowledge level, attitude, sexual behavior, alcohol consumption, injection drug use behavior, history of family with HIV/AIDS, internet media use, access to illegal localization, role of peer, family, and social cultural factor. Thus, many other potential factors have not been studied yet in HIV transmission incidence in adolescents in DKI Jakarta.

V. CONCLUSION

Considering the result of research, it can be concluded that the factors evidently affecting the HIV transmission incidence in adolescents in DKI Jakarta are education level with 1.400 folds risk of HIV transmission, attitude with 0.069 fold, history of family with HIV/AIDS disease with 459.473 folds, role of peer with 2.246 folds, and social cultural factor with 0.319 fold.

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