

Psychological and Social Determinants of HIV: Path Analysis Evidence from Jepara, Central Java

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ABSTRACT

Background: HIV/AIDS was a global problem as a challenge in health discipline and a very important burden of disease to be addressed. Moreover, it had high mortality. This study aimed to analyze the risk factors for HIV/AIDS infection.

Subjects and Method: This was a case control study conducted in Jepara, Central Java, from April to May 2019. A sample of 200 study subjects was selected by fixed disease sampling. The dependent variable was HIV/AIDS. The independent variables were age, gender, unsafe sex behavior, sexual orientation, frequency of intercourse, injection drug abuse, social capital, perceived susceptibility, perceived seriousness, perceived threat, self-efficacy, and geographical location. The data were obtained from medical record and questionnaire. The data were analyzed by path analysis.

Results: HIV / AIDS had a direct relationship with the frequency of sexual intercourse ($b= 1.23$; 95% CI= 0.27 to 2.19; $p= 0.012$), injecting drug use ($b = 2.19$; 95% CI= 0.01 to 4.37; $p= 0.049$), behavior unsafe sex ($b= 3.10$; 95% CI= 2.21 to 3.99; $p < 0.001$), and sexual orientation ($b= 3.69$; 95% CI= 1.35 to 6.04; $p= 0.002$). HIV / AIDS had an indirect relationship with perceptions of threats, gender, geographical location, social capital, perceptions of vulnerability, perception of seriousness, self-efficacy, and age.

Conclusions: HIV / AIDS has a direct relationship with the frequency of sexual relations, sexual orientation, unsafe sexual behavior, and injecting drug use. HIV / AIDS has an indirect relationship with age, gender, perception of vulnerability, perception of seriousness, perception of threats, self-efficacy, social capital, and geographical location.

Keywords: HIV / AIDS, sexual behavior, social capital, path analysis

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BACKGROUND

HIV / AIDS was a public health problem that required serious care all over the world. Globally 36.9 million people lived with HIV and 1.8 million with new HIV cases. Also 940,000 people died from AIDS and 35.4 million people have died from AIDS since the beginning of the epidemic. 14% of the 630,000 people with HIV in Indonesia have access to antiretroviral therapy (WHO, 2018).

Cases of HIV/AIDS in Jepara Regency from January to June 2017 reached 58 cases and in September 2017 the number of findings increased to 113 cases. This put Jepara Regency as the second city for the most new finding of HIV/AIDS in Central Java under the City of Semarang. The cases of HIV/AIDS in Jepara in 2016 were 118 cases. This number increased by 231 cases in September 2017 or 27.6% from 834 cases of findings from 1997 to September 2017. There were 169 new HIV cases from

January to December 2018 including 70 cases of housewives, 9 female sex workers, 20 workers cases, 57 cases of entrepreneurship, 3 cases of fishermen, 3 cases of drivers, and 7 cases of under-fives (Jepara District Health Office, 2018).

Behaviors and conditions that place individuals at greater risk of contracting HIV included unprotected anal or vaginal sex, having other sexually transmitted infections such as syphilis, herpes, chlamydia, gonorrhea, and bacterial vaginosis, sharing contaminated needles, syringes and other injection equipment, alternating injecting drug use, receiving unsafe injections, blood transfusions, tissue transplants, medical procedures involving non-sterile cuts or punctures, and accidental needling injuries, including among health workers (WHO, 2018).

Sionean et al. (2014) stated that HIV/AIDS infection risk factors included having unprotected vaginal sex with one or more opposite sex in the last 12 months before condom examination and anal sex with one or more opposite sex partners. The majority of respondents used non-injection drugs within 12 months before the interview and one in seven participants used cocaine.

Factors related to sexual behavior which were at risk for HIV infection among the 15-19 year age group included gender, single orphans, and employment. While the age of 20-24 years, factors related significantly included gender, education level, relationship with the head of the household, place of residence, and risk of pregnancy (Gon-zález et al., 2019).

Psychosocial factors were important as strategies to reduce the spread and risk behavior of HIV/AIDS. Psychosocial health problems were factors that have a significant relationship with risky behavior, such as depression damaging physical and cognitive functions. Therefore, it could inter-

fere the decision to conduct safe sexual behavior (Gemechu et al., 2013).

Social capital is a potential construct as an understanding of health inequalities based on individual and community level factors between health care facilities and health program outcomes (Cené et al., 2011).

Social capital had been identified in Indonesia. Social capital produced several theoretical models as potential determinants that influence the prevention and transmission of Human Immunodeficiency Virus (HIV) at the individual and population level. However, the influence between social capital and HIV still gets limited attention (Ransome et al., 2018).

Impacts caused when a person has infected with HIV infection included income lost due to death or full inability to work, loss of income due to partial inability to work due to AIDS, additional care work in AIDS-affected households, additional work carried out by children in households affected by AIDS, impaired children's education children living in AIDS-affected households (International Labor Office, 2018).

Based on the description above, authors were interested in conducting a study on "Psychological and Social Determinants of HIV: Path Analysis Evidence from Jepara, Central Java".

SUBJECTS AND METHOD

a. Study Design

This study was conducted using analytic observational models with a case control approach carried out in the work area of Jepara District Health Office in April - May 2019.

b. Population and Samples

The target population of this study was all residents of Jepara Regency, Central Java who had conducted VCT examinations from

January to December 2018. A sample of 200 study subjects was selected by fixed disease sampling. The case group in this study was positive HIV/AIDS and the control group were who had undergone VCT examinations and negative HIV / AIDS.

c. Study Variables

The dependent variable was HIV/AIDS infection. The independent variables were age, gender, unsafe sex behavior, frequency of sexual relations, sexual orientation, geographic location, social capital, injection drug use, perceived susceptibility, perceived seriousness, perceived threat, and self-efficacy.

d. Operational Definition of Variables

HIV/AIDS infection. HIV/AIDS was an infection caused by Human Immuno deficiency virus. The data were obtained from Jepara district fealth office. The measurement scale was categorical.

Age. Age was the age of the subjects when first diagnosed with HIV. The data were collected by questionnaire. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Gender. Gender was adaptation or division of biologically determined two genders that were inherent in a particular gender. The data were collected by questionnaire. The measurement scale was categorical.

Geographical location. The geographical location was where a subject lives in a sub-district near the port or far from the port. The data were collected by questionnaire. The measurement scale was categorical.

Sexual orientation. Sexual orientation was emotional and sexual attraction to certain gender. The data were collected by questionnaire. The measurement scale was categorical (homosexual or heterosexual).

Social capital. Social capital was a characteristic of the community which included social organization, citizen participation, norms of reciprocity, and mutual trust

between community members that facilitate cooperation to achieve mutual benefits. The data were collected by questionnaire. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Injection drug use. Injecting drug use means that a subject that has used injecting drugs or not before being diagnosed with HIV/AIDS. The data were collected by questionnaire.. The data measurement scale was categorical.

Perceived susceptibility. Perceived susceptibility was a subjective perception of someone about the risk of contracting a disease, and the possibility that was felt refers to the risk of someone suffering from certain diseases or adverse health effects. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Perceived seriousness. Perceived seriousness was defined as perception of the severity of the disease or let it not be treated according to circumstances or actions that might occur. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Perceived threat. Perceived threat was a situation where individuals perceive a situation as a negative situation and feel the need to protect themselves. The data were collected by questionnaire. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Self-efficacy. Self-efficacy was the belief in the ability of the respondent's self about the risk of transmission or the risk of HIV / AIDS that they suffer. The data were collected by questionnaire. The measurement scale was continous, but for data analysis, it was transformed into dichotomous.

Unsafe sex behavior. Unsafe sex behavior referred to a behavior that arised because there was a sexual drive that was

done improperly without the use of safety. The data were collected by questionnaire. The measurement scale was continuous, but for data analysis, it was transformed into dichotomous.

e. Data Analysis

Univariate analysis aimed to explain each variable namely the independent variable and the dependent variable. Bivariate analysis was conducted using chi-square test. Path analysis was conducted to examine direct and indirect effects between independent and dependent variables. Stages of path analysis included model specification,

model identification, model fit, estimation, and model re-specification.

f. Research Ethics

Research ethics included anonymity, confidentiality, informed consent, and research ethics. Research ethics was obtained from Research Ethics Committee Dr. Moewardi hospital, Surakarta, Central Java, with the number: 446 / III / HREC / 2019.

RESULTS

1. Univariate Analysis

The results of the univariate analysis described in Table 1 and Table 2.

Table 1. Sample Characteristics (continuous data)

Variable	N	Mean	SD	Minimum	Maximum
Age (year)	200	35.38	8.77	19	55
Unsafe sex behavior	200	16.23	3.01	12	25
Social capital	200	35.38	4.88	18	44
Perceived susceptibility	200	33.81	2.90	27	40
Perceived severity	200	61.11	4.65	50	72
Perceived threat	200	94.91	5.90	80	109
Self-efficacy	200	38.04	3.63	27	49

Table 2. Sample Characteristics (categorical data)

Characteristics	(n)	(%)	
Age	< 36 years	102	51.0
	≥ 36 years	98	49.0
Gender	Male	88	44.0
	Female	112	56.0
HIV/AIDS Infection	No	117	58.5
	Yes	83	41.5
Unsafe Sex Behavior	Safe	99	49.5
	Unsafe	101	50.5
Frequency of having sex	1-3 times/week	157	78.5
	≥4 times/week	43	21.5
Sexual Orientation	Heterosexual	184	92.0
	Homosexual	16	8.0
Social Capital	High	120	60.0
	Low	80	40.0
Perceived susceptibility	High	129	64.5
	Low	71	35.5
Perceived severity	High	102	51.0
	Low	98	49.0
Perceived threat	High	105	52.5
	Low	95	47.5
Self-Efficacy	High	131	65.5
	Low	69	34.5
Injection drugs abuse	Yes	10	5.0
	No	190	95.0
Geographical Location	Close to the coast / port	30	15.0
	Far from the coast /port	170	85.0

Table 3. The results of bivariate analysis

Independent Variables	HIV/AIDS				Total		OR	p
	No		Yes		N	%		
	N	%	N	%				
Age								
< 36 years	64	62.7	38	37.3	102	100	1.43	0.214
≥ 36 years	53	54.1	45	45.9	98	100		
Gender								
Male	52	59.1	36	40.9	88	100	1.04	0.886
Female	65	58.0	47	42.0	112	100		
Frequency of having sex								
1-3 time/week	102	65.0	55	35.0	157	100	3.46	<0.001
4-everyday/week	15	34.9	28	65.1	43	100		
Sexual Orientation								
Heterosexual	116	63.0	68	37.0	184	100	25.58	0.001
Homosexual	1	6.3	15	93.7	16	100		
Unsafe Sex Behavior								
Safe	89	89.9	10	10.1	99	100	23.20	<0.001
Unsafe	28	27.7	73	72.3	101	100		
Use of drugs injection								
Yes	1	10.0	9	90.0	10	100	14.11	0.001
No	116	61.1	74	38.9	190	100		
Geographical Location								
Close to coast/port	7	23.3	23	76.7	30	100	6.02	<0.001
Far from coast/port	110	64.7	60	35.3	170	100		
Perceived susceptibility								
High	87	67.4	42	32.6	129	100	0.35	0.001
Low	30	42.3	41	57.7	71	100		
Perceived severity								
High	56	57.1	42	42.9	98	100	0.06	<0.001
Low	61	59.8	41	40.2	102	100		
Perceived threat								
High	66	62.9	39	37.1	105	100	0.68	0.189
Low	51	53.7	44	46.3	95	100		
Self-Efficacy								
High	33	16.5	36	18.0	69	100	1.95	0.026
Low	84	42.0	47	23.5	131	100		

2. Bivariate Analysis

Table 3 showed the results of bivariate analysis. Table 3 showed that the risk of HIV/AIDS increased with age ≥36 years (OR= 1.43; p= 0.214), female (OR= 1.04; p= 0.886), sexual frequency 4 times per day (OR= 3.46; p<0.001), homosexual (OR= 25.58; p= 0.001), unsafe sex behavior (OR= 23.20; p <0.001), injecting drug use (OR= 14.11; p= 0.001), residents near coastal (OR= 6.02; p<0.001), low perceived susceptibility (OR= 0.35; p= 0.001), high perceived severity (OR= 0.06; p <0.001), low

perceived threat (OR= 0.68; p= 0.189), and low self-efficacy (OR = 1.95; p = 0.026).

3. Path Analysis

a. Model Specification

Model specifications were used to describe the variables to be studied. Exogenous variables consisted of age, gender, social capital, and geographical location. Endogenous variables included perceived susceptibility, perceived severity, self-efficacy, perceived threat, frequency of sexual intercourse, sexual orientation, injection drug

abuse, unsafe sex behavior, and HIV infection.

b. Model Identification

The calculation of degree of freedom (df):

- 1) Measured variable : 13
 - 2) Endogenous variable : 9
 - 3) Exogenous Variable : 4
 - 4) Total of parameter : 13
- Df= (measured variable) x (total of measured variable + 1) / 2 – (endogenous variabel + exogenous variable + total of parameter) = (13x14)/2 – (9+4+13)
 = 91 – 26
 = 65

The result of the degree of freedom (df) was 65 meaning that over identified or path analysis can be done.

Table 4 showed the results of path analysis. HIV/AIDS was directly and positively associated with frequency of sexual intercourse, sexual behavior, sexual orientation, and injection drug abuse.

Sexual intercourse >4 times per day had logodd to experience HIV/AIDS 1.23 higher than sexual intercourse <3 times per day (b= 1.23; 95% CI = 0.27 to 2.19; p= 0.012).

Injection drug use increased logodd HIV/AIDS infection 2.19 units (b= 2.19; 95% CI= 0.01 to 4.37; p = 0.049).

Unsafe sex behavior increased logodd HIV/AIDS infection 3.10 units and it was statistically significant (b= 3.10; 95% CI= 2.21 to 3.99; p <0.001).

Homosexual increased logodd HIV/AIDS infection 3.69 units and it was statistically significant (b = 3.69; CI95% = 1.35 to 6.04; p = 0.002).

HIV/ AIDS infection was indirectly affected by perceived threat, social capital, residence, perceived susceptibility, perceived severity, self-efficacy, and age.

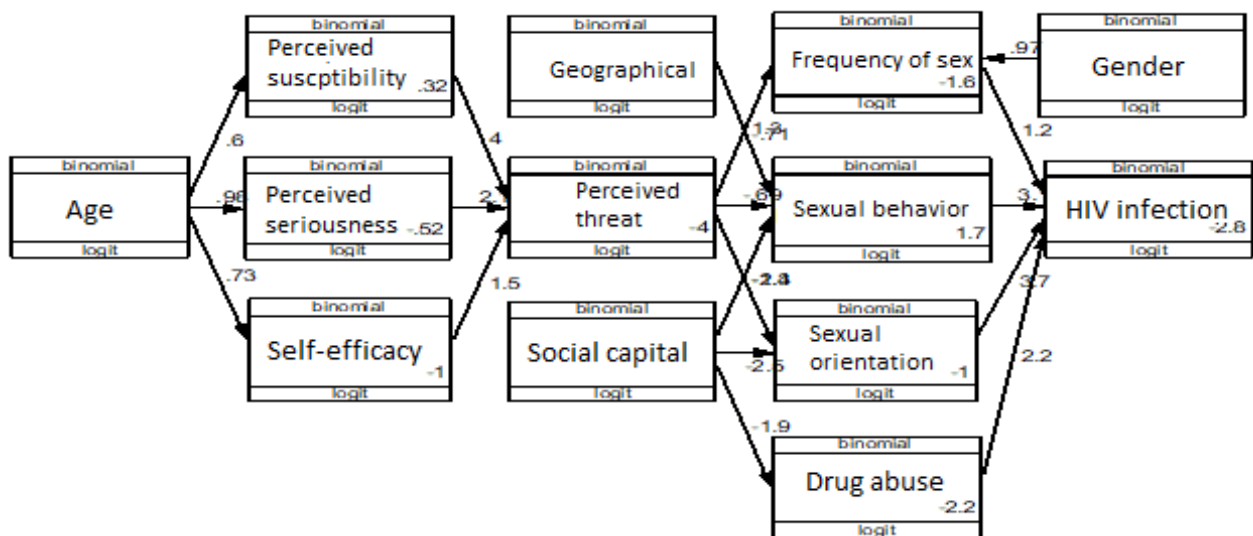


Figure 1. Path analysis model with estimation

DISCUSSION

1. The effect of age on HIV / AIDS

The results of the analysis showed that there was an indirect positive influence between the age variables with HIV / AIDS infection and statistically significant. The results of this study are in line with the

research of Amelia et al. (2016) which states that the age group is statistically a factor associated with the incidence of HIV / AIDS. Subjects aged 28-44 years had a 3.9 times greater risk of HIV / AIDS compared with respondents aged 25-27 years.

Other studies have shown similar results that research subjects aged ≥ 24 years increased 4.33 times for HIV positive. The older a person will have behavior,

lifestyle, and social interaction with many people. This can affect the increased risk of HIV infection (Subaeti et al., 2018).

Table 4. The results of path analysis

Dependent Variables	Independent Variable	b	CI (95%)		p
			Lower Limit	Upper Limit	
Direct Effect					
HIV/AIDS infection	← Frequency of having sex (>4 times per day)	1.23	0.27	2.19	0.012
	← Injection drug use	2.19	0.01	4.37	0.049
	← Unsafe sex behavior	3.10	2.21	3.99	<0.001
	← Homosexual	3.69	1.35	6.04	0.002
Indirect Effect					
Frequency of having sex (>4 times per day)	← Perceived threat (high)	-0.71	-1.42	-0.01	0.049
	← Gender female)	0.97	0.20	1.73	0.013
Unsafe sex behavior	← Perception of threat (high)	-0.69	-1.35	-0.02	0.043
	← Residence near port	1.32	0.35	2.29	0.008
	← Social capital (high)	-2.38	-3.08	-1.67	<0.001
Homosexual	← Perceived threat (high)	-1.31	-2.52	-0.09	0.034
Homosexual	← Social capital (tinggi)	-2.53	-4.06	-1.01	0.001
Perceived threat (high)	← Perceived severity (high)	2.05	1.09	3.00	<0.001
Perceived threat (high)	← Perceived susceptibility (high)	4.00	2.87	5.12	<0.001
Perceived threat	← Self-Efficacy (high)	1.48	0.52	2.43	0.002
Injection drug use	← Social capital (high)	-189	-3.46	-0.30	0.019
Perceived severity	← Age (≥ 36 years)	0.98	0.41	1.55	0.001
Perceived susceptibility	← Age (≥ 36 years)	0.60	0.01	1.19	0.046
Self-Efficacy (high)	← Age (≥ 36 years)	0.73	0.14	1.33	0.016
N Observation = 200					
Log likelihood = -827.5					
AIC = 1709.0					
BIC = 1798.1					

2. The effect of gender on HIV / AIDS

The results of the analysis showed that there was an indirect positive influence between gender and HIV / AIDS infection through the frequency of sexual relations.

The results of the study found that men aged 20-34 years were more likely to carry out higher-risk behaviors than women. Men, especially those aged 20-34 years, are more likely to have more than one partner and inconsistent use of condoms compared to women. Men are often unaware of HIV positive, making it easier to transmit HIV to many women who are partners (Huerga et al., 2017).

The results of other studies showed that the pattern of sexual relations in women as housewives had an effect on HIV/AIDS status, subjects with sexual relations patterns of multiple sex partners had a greater vulnerability compared to subjects with single sex partners (Laksana et al., 2017).

3. The effect of frequency of sexual intercourse on HIV/AIDS

The results of the analysis showed that there was a direct positive influence between the frequency of sex with the risk of HIV/AIDS infection. The frequency of sexual intercourse 4 times - every day /

week had a higher risk of HIV / AIDS infection than the frequency of sexual intercourse 1-3 times / week.

The high frequency of sexual intercourse at risk of HIV was caused by the lack of consistent use of condoms and having more than one sexual partner. This is consistent with the results of study showing that HIV was obtained during receptive anal sex compared to vaginal sex and can increase the high burden of HIV for female sex workers. 15.9% of all sexual relations are anal. WPS generally have sex that is inconsistent in using condoms to facilitate transmission of HIV (Owen et al., 2019).

4. The effect of sexual orientation on HIV / AIDS

The results of the analysis showed that there was a direct positive influence between sexual orientation and the risk of HIV / AIDS.

Men who act as receptors during sexual intercourse with other men had a greater risk of being infected with HIV / AIDS. Men with an insertor role would penetrate with extreme actions that cause injury, inflammation, infection of the digestive tract, anal receptive partner, then continued anal sex without using a condom (Sidjabat et al., 2017).

Other research results suggest that homosexual HIV risk factors include contact with partner blood during sexual intercourse 3.7 more at risk of HIV infection, alcohol intake when sexual activity and condom use are inconsistent in receptive anal sex (Silva et al., 2014).

5. The effect of unsafe sex behavior on HIV / AIDS

The results of the analysis showed that there was a direct positive effect between unsafe sexual behavior and the risk of HIV / AIDS infection and was statistically significant.

A study by Murtono et al. (2018) states that combined sexual activity had 4.32 times the risk of HIV / AIDS compared to sexual activity without only oral, anal or vaginal. The use of condoms did not consistently have 5.34 risk of HIV / AIDS than consistent condom use and STI patients had a risk of 2.92 times.

A study by Wati et al. (2019) shows that the number of sexual partners increases the risk of HIV / AIDS is higher than those who have one sexual partner and do not use condoms.

6. The effect of social capital on the risk of HIV / AIDS

The results of the analysis showed that there was an indirect negative influence between social capital and HIV / AIDS infection through unsafe sexual behavior, injecting drug use and sexual orientation.

Individuals who had access to low levels of social capital were four times more likely to be HIV positive compared to people who have access to high social capital (Frumence et al., 2014).

Other studies also state that migrants tend to have lower levels of social capital and low socioeconomic status which increases the risk of HIV / AIDS (Sen et al., 2010).

7. The effect of geographical location on the risk of HIV / AIDS

The results of the analysis showed that there was an indirect positive relationship between geographical location and HIV / AIDS infection through unsafe sexual behavior.

Global maritime industries such as seafarers, fishing, ports and other land personnel had the risk of infection with sexually transmitted diseases including HIV. The proximity of prostitution and the large population of sex workers, as well as the fact that many sexually active young seafarers are a compound problem and

increase the danger of HIV infection (Ogboghodo et al., 2016).

The location of a residence near a port or coast was more easily infected with HIV due to access to a localization site and a large population of WPS around the port and the large number of entrants coming in and out of the port.

8. The effect of injection drug use on HIV / AIDS

The results of path analysis showed that there was a direct positive influence between injecting drug use and the risk of HIV / AIDS infection.

Men who consume drugs before having sex are 10 times more likely to have unprotected sex (Don et al., 2012). The results of this study are in line with Yu et al. (2017) that the frequency of drug injections has a significant effect on HIV, men who use injecting drugs are 9 times more likely to be HIV positive.

9. The effect of perceived susceptibility on HIV / AIDS

The results of path analysis showed that there was an indirect positive relationship between perceptions of vulnerability with HIV/AIDS infection through perceived threat. High perceptions of vulnerability would increase 4 times the perception of threats compared to perceptions of low vulnerability. Therefore, the perception of a high threat about HIV / AIDS would reduce behavior which could increase the risk of HIV / AIDS infection.

Perceived susceptibility improve the prevention behavior of HIV/AIDS transmission. The results of the study stated that perceptions of road construction workers who feel vulnerable to HIV are more twice as consistent in using condoms than those who feel less vulnerable (Tarkang, 2018).

10. The effect of perceived seriousness on HIV / AIDS

The path analysis results showed that there was an indirect positive relationship between the perception of seriousness with HIV/AIDS infection through the perception of threats. A high perception of the seriousness of the disease would increase the perception of the threat to the disease.

The results of other studies showed a significant perception of severity with STI prevention behavior. Commercial sex workers with a perception of high severity are likely 4.02 times more likely to have healthy behavior in preventing STIs (Wulandari et al., 2017).

11. The Effect of perceived threats on the risk of HIV / AIDS

The results of path analysis showed that there was an indirect negative relationship between perceived threat and HIV / AIDS infection through the frequency of relationships, unsafe sexual behavior and sexual orientation.

Perceived susceptibility and severity that was felt was a perceived threat of the situation, which was characterized by contracting certain diseases. Current studies referred to the perceived threat to HIV/AIDS infection. The perceived threat or perceived risk can motivate to avoid threats (Tarkang, 2018).

12. The effect of self-efficacy on the risk of HIV / AIDS

The results of the analysis showed that there was an indirect positive relationship between self-efficacy and HIV/AIDS infection through the perception of threats.

Self-confidence about people's capacities influenced how they behaved. So that self-efficacy affects the success of someone using a condom to prevent the risk of HIV / AIDS (Tarkang, 2018).

This study is also in line with the study conducted by Wulandari et al. (2017)

stating that female commercial sex workers with strong self-confidence have 7.32 times greater ability to have healthy behavior in the prevention of sexually transmitted diseases.

AUTHORS CONTRIBUTION

Ita Fijanah Puspita, the main researcher played a role in collecting and processing the data; Uki Retno Budihastuti, reviewed the manuscript; Vitri Widyaningsih, examined the conceptual framework and methodology.

FUNDING AND SPONSORSHIP

The author used her own money to conduct the study.

CONFLICT OF INTEREST

There was no conflict of interest in this study.

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