

Original Article

# Model of Risk Behavior for Prevention of HIV/AIDS Transmission Based on Self-Efficacy in Adolescents

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**ABSTRACT**

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**Keywords:**

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**Background:** Adolescents are a group that is vulnerable to the spread of HIV/AIDS due to risky behavior such as unprotected sexual intercourse and drug use. One approach that can be used to understand and reduce this risky behavior is self-efficacy, which is an individual's belief in their ability to take preventive action. The purpose of this study was to test the model of risky behavior towards preventing HIV/AIDS transmission based on self-efficacy in adolescents in Sumenep City District,  
**Methods:** This study is an observational analytical study, the population of the study is all adolescents aged at least 16 years in the Sumenep City District  
**Results:** Based on the Goodness of Fit table, the final model for adolescent risk behavior in the Sumenep City District can be said to be fit when viewed from several criteria, for example the Chi-square value of 0.001 (which is expected to be small), the GFI value of 0.915 (standard > 0.90), the NFI value of 0.934 (standard > 0.90), and the RMR value of 0.030 (standard < 0.05).  
**Conclusion:** Based on the results of the study, it can be concluded that the self-efficacy-based behavioral model is effective in reducing risky behavior and increasing preventive measures for HIV/AIDS transmission among adolescents in the Sumenep City District. This approach can be an effective strategy in preventing HIV/AIDS in the adolescent community by increasing their confidence in their ability to take appropriate preventive measures

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## Introduction

HIV/AIDS is one of the issue significant global health with impact wide to individuals and society. The spread of HIV/AIDS is not only limited to adults, but also increasingly worrying among teenagers (Fair & Jutras, 2022)(Bhana, Kreniske, Pather, Abas, & Mellins, 2021). In

the District of Sumenep City, the prevalence of HIV/AIDS among teenager Keep going show significant improvement in a number of year Lastly. Factors like lack of knowledge about HIV/AIDS, behavior sexual risky, and limited access to service health become reason main spread of this virus among people teenagers (Folayan,



[Sam-Agudu, & Harrison, 2022](#); [Kawuki, Gatasi, Sserwanja, Mukunya, & Musaba, 2023](#)). HIV/AIDS remains become challenge global health impacts millions of people around the world. Indonesia is also experiencing improvement HIV/AIDS cases, including in previously non - HIV areas considered at risk low Teenagers be one of the most vulnerable groups to the spread of HIV/AIDS. They often involved in behavior at risk high, like connection sexual without condom, use drugs, and lack of knowledge about method HIV/AIDS prevention.

Behavioral model based on self-efficacy has Lots used For understand and modify behavior health in various context. Self-efficacy, which is belief individual to his ability For do action certain, play a role important in behavior HIV/AIDS prevention. Teenagers with high self-efficacy tend more active in action prevention, such as use condom, avoid connection sexual risky, and undergo HIV test online periodically Study This aiming develop and test behavioral models at risk to prevention HIV/AIDS transmission based on self-efficacy among teenagers in Sumenep City District. Approach This important For identify factors that influence adolescent self-efficacy in prevention of HIV/AIDS and how is self-efficacy can improved through appropriate intervention. With understanding more Good regarding behavioral models at risk based on self-efficacy, it is expected can developed strategy more prevention effective and focused on teenagers. This is important Because teenager is vulnerable groups to the spread of HIV/AIDS, but also has potential big For change behavior with proper support ([Aggleton & Warwick, 2022](#); [Diclemente, 2022](#))Based on data from Service Health P2KB District Sumenep, number HIV/AIDS sufferers experience improvement every year, from 52 cases in 2021, to 65 cases in 2022, and reaching 84

cases in 2023. The increase this is also followed with increasing number death related to HIV/AIDS, with distribution the case that occurred both in mainland areas and also archipelago Regency Sumenep. Sumenep City District, a region located in Madura, East Java, is facing challenge similar. Although effort prevention Already done, still needed a more approach effective and appropriate with context local. Research show that self-efficacy plays a role role important in influence behavior prevention health. In context HIV/AIDS prevention, self-efficacy refers to beliefs teenager that they capable prevent behavior risky, such as use condom, routine do HIV testing, and avoiding behavior at risk high. High level of self-efficacy can Motivate teenager For adopt behavior healthy and proactive in prevent transmission of HIV/AIDS ([Huang et al., 2024](#); [Mwangi, 2022](#)).

## Methods

Study This is study analytic observational Where study This test hypothesis and interpretation more in about relationships variable. Population study that is all teenager minimum age of 16 years in Sumenep City District. Sample in study This that is teenager minimum age 16 years. The sample size is determined moreover first so that the number respondents needed Can known. As conditions in use of SEM with using application program amos version 8.50 then big sample can counted based on number of indicators 5-10 x number of indicators, where in study This There are 10 indicators So required sample namely 10 x 10 indicators = 100 samples. (A, Azz, 2011). The instrument used that is questionnaire and checklist / sheet observation,tools write. Independent variable or variable exogenous in study This is behavior at risk teenager such as :

characteristics teenagers, culture, obedience religion and the role of mass media whereas variable dependent or endogenous variables, namely knowledge about HIV/AIDS, knowledge about prevention and transmission of HIV/AIDS with self efficacy. Data analysis in study This covering analysis univariate, bivariate, and multivariate. For analysis

univariate describe distribution frequency at each variable in table and graph form, Analysis bivariate use SPSS version 20 for get description connection Variables. Analysis multivariate For see influence independent variable against dependent variable with technique the analysis using the Amos application program.

## Results

Table 1. Respondents according to type gender in Sumenep City District :

Type Sex	Amount	Presentation
Man	62	62%
Woman	38	38%
Total	100	100%

Based on results research, number Respondent man more Lots than women, namely 120 people (60%) for men and 80 people (40%) for Woman.

Table 4.2 Culture Teenagers in Sumenep City District

Culture	Type sex		Total
	Man	Woman	
Very Good	4 (6.5%)	0 (0%)	4 (4%)
Good	57 (91.9%)	5 (13.2%)	62 (62%)
Enough Good	0 (0%)	33 (86.9%)	33 (33%)
No Good	1 (1.6%)	0 (0%)	1 (1%)
Total	62 (100%)	38 (100%)	100 (100%)

Respondents based on culture related behavior sex free show the average value (X) is 1.84, with mark maximum 4, minimum value 1, and standard deviation (SD) of 0.792. Most big teenager men (91.9%) think culture related behavior sex free as something good, only 1 person (1.6%) thought it was No good. Meanwhile that, the majority teenager women (86.9%) think culture This Enough good, with 5 people (13.2%) considering it Good.

Table 2. Compliance Religion in Teenagers in Sumenep City District

Compliance Religious	Type sex		Total
	Man	Woman	
Very obedient	0 (0%)	0 (0%)	0 (0%)
Obedient	48 (77.4%)	0 (0%)	48 (48%)
Enough obedient	10 (16.1%)	30 (78.9%)	40 (40%)
No obedient	4 (6.5%)	8 (21.1%)	12 (12%)
Total	62 (100%)	38 (100%)	100 (100%)

Respondents based on compliance religious show the average value (X) is 1.84, with mark maximum 4, minimum value 1, and standard deviation (SD) of 0.792. In general general, part big teenager man obedient in operate teachings his religion (77.4%), with only 4 people (6.5%)

did not obey. While that, the majority teenager Woman Enough obedient in operate teachings his religion (78.9%), although there were 8 people (21.1%) who did not obedient.

**Table 3. Respondents according to the role of mass media in Sumenep City District**

The Role of Mass Media	Type sex		Total
	Man	Woman	
Very play a role	0 (0%)	0 (0%)	0 (0%)
Playing a role	48 (77.4%)	0 (0%)	48 (48%)
Enough play a role	10 (16.1%)	28 (78.7%)	38 (38%)
No play a role	0 (0%)	10 (26.3%)	10 (10%)
Total	62 (100%)	38 (100%)	100 (100%)

Average role of mass media is (X) 1.93, with mark maximum 4, minimum value 1, and standard deviation (SD) of 0.780. Most big teenager man consider mass media Enough play a role in give information about HIV and AIDS, with 77.4% viewing mass media play a role and only 16.1% consider mass media to be Enough play a role. While that, part of it big teenager women also consider mass media Enough play a role in give information about HIV and AIDS, with 78.7% agreeing that the mass media Enough play a role, and only 26.3% think on the contrary.

**Table 4. Knowledge teenager about IMS in Sumenep City District**

Knowledge Respondents	Type sex		Total
	Man	Woman	
Very Good	5 (8.1%)	0 (0%)	5 (5%)
Good	52 (83.9%)	10 (26.3%)	62 (62%)
Enough Good	0 (0%)	28 (81.2%)	28 (28%)
Not enough Good	5 (8.1%)	0 (0%)	5 (5%)
Total	62 (100%)	38 (100%)	100 (100%)

Knowledge teenager about Infection Infectious Sexual (STDs) have the average value (X) is 1.74, with mark of a maximum of 4, minimum value 1, and standard deviation (SD) of 0.745. The majority teenager men (83.9%) have level good knowledge regarding STIs, only 5 people (8.1%) had lack of knowledge good. On the side others, the majority teenager women (81.2%) have sufficient knowledge Good about STIs, with 10 people (26.3%) having good knowledge.

**Table 5. Knowledge Teenager about method HIV/AIDS transmission in Sumenep City District**

Knowledge Respondents	Type sex		Total
	Man	Woman	
Very Good	19 (30.7%)	0 (0%)	19 (19%)
Good	42 (67.8%)	28 (78.7%)	70 (70%)
Enough Good	1 (1.6%)	8 (26.3%)	9 (9%)
Not enough Good	0 (0%)	2 (5.3%)	2 (2%)
Total	62 (100%)	38 (100%)	100 (100%)

Average level knowledge teenager about method transmission of HIV and AIDS is (X) = 2.99, with mark maximum 4, minimum value 2, and standard deviation (SD) of 0.486. A total of 42 teenagers men (67.8%) have level good knowledge about method transmission of HIV and



AIDS, while 1 person (1.6%) had sufficient knowledge good. On the side others, 28 teenagers women (78.7%) have good knowledge about method transmission of HIV and AIDS, and 2 people (5.3%) had lack of knowledge Good

### Model Test Analysis

Models tested in study This is a behavioral model risky for teenagers related transmission of HIV and AIDS. This model based on concepts and modifications theory behavior from H. Blomm and the Theory of Planned Behavior (TPB) by Fishbein. According to Bloom's theory, behavior influenced by knowledge, attitudes, and actions. Temporary that, according to Ajzen and Fishbein in the Theory of Planned Behavior, attitudes No direct cause behavior, but rather There is factor intention somebody For do desired behavior.

Based on modification second theory said, researchers designing behavioral models at risk related to HIV and AIDS in adolescents with a number of variable exogenous, including characteristics teenagers (X1) consisting of from a number of variable observation like age, economy, culture, and compliance religion and the role of mass media. Endogenous variables include knowledge (Y1), confidence behavior (Y2), trust normative (Y3), trust control (Y4), intention (Y5), and behavior

(Y6). Variables type sex will analyzed in different groups.

### Analysis Track

Analysis track aiming For understand connection between a number of variable exogenous and endogenous simultaneously, so that allow testing to variable moderation, intervening, or variable intermediary. Besides that, analysis path can also be used For measure connection direct and also No direct between variables. The model used in analysis track This consists of from two approach : analysis track single without consider type gender and analysis grouped paths based on type sex.

For behavioral models at risk related to HIV and AIDS in adolescents, analysis track done with moreover formerly count mark score factor from each variable latent. This is done with multiply total score of each Respondent with lambda ( $\lambda$ ) value obtained from analysis confirmatory (CFA). With Thus, it was obtained score factor For each variable latent.

Based on framework draft research, analysis track done use results score factor variable For every respondents. Analysis results track This shown in figure 1.

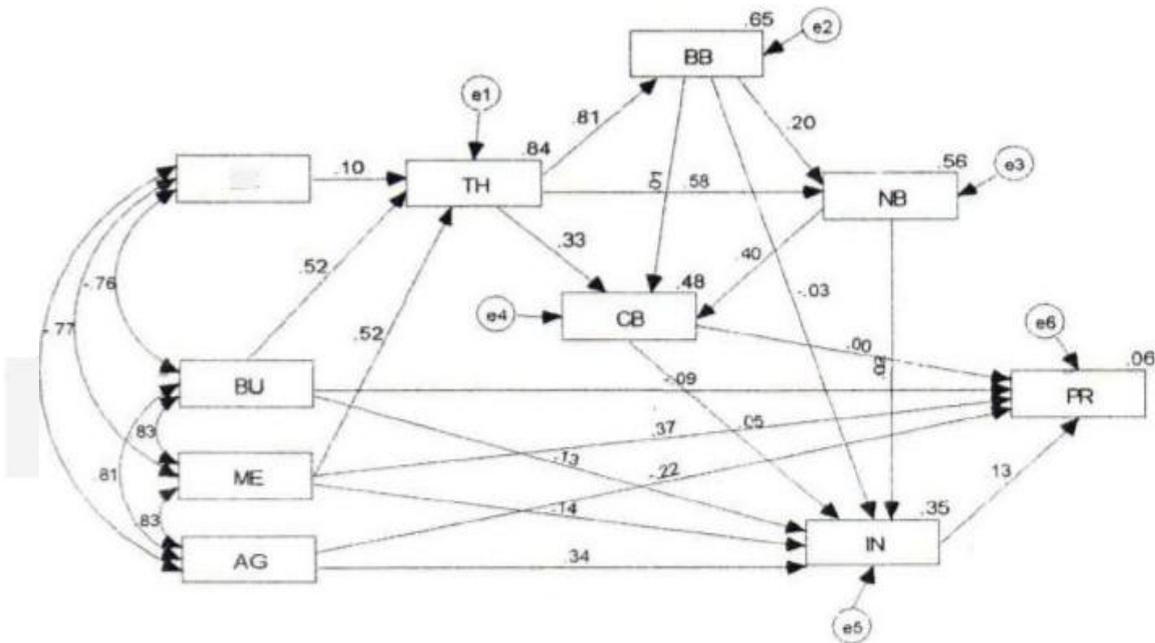


Figure 1. Initial Model Analysis Paths in Teenagers

**Initial Model Analysis Track Behavior At risk Teenager**

Based on the initial model above, there are a number of variables that have connection No significant between variable with p value > 0.05. Variables the including connection between trust normative (normative beliefs), beliefs control (control beliefs), and trust behavior (behavior beliefs) that are not own influence significant to intention, as well as behavior that is not influenced by intention.

**Table 6. Analysis results group connection between variables that are not significant in the initial model behavior teenagers in Sumenep City District**

Variables	A	P	Information
Behavior 7 Beliefs Control Beliefs	0,014	0.866	No Significant
Normative 7 Beliefs	0,045	0.839	No Significant
Control 7 Beliefs Pencer	-0,007	0.979	No Significant
Religion 7 Pencer	-0,610	0.113	No Significant
Culture Intensi	0,118	0.277	No Significant
Media mass 7 Intensi	0,130	0.262	No Significant
Buddhism 7 Behavior	-0,201	0.528	No Significant

In the early models analysis track behavior risk in adolescents, there are a number of connection between significant variables. Knowledge influential in a way significant to belief (

trust) behavior, beliefs normative, and trust control ), while that, aspect culture and mass media influential significant to knowledge teenager.

Table 7 Analysis results group connection between significant variables in the initial model behavior teenagers in Sumenep City District

Variables	A	P	Information
Knowledge> Behavior Beliefs	0,807	0.001	Significant
Knowledge> Normative Beliefs	0.578	0.001	Significant
Knowledge> Control Beliefs	0.329	0.001	Significant
Normative Beliefs> Control Beliefs	0.399	0.001	Significant
Behavior Beliefs> Nonative Beliefs	0,198	0,013	Significant
Culture> Knowledge	0.520	0.001	Significant
Media> Knowledge	0,521	0.001	Significant
Agarna> Intensi	0,338	0.002	Significant

Calculation results coefficient the path above show that a number of variable own p value > 0.05, which indicates that connection between formed variables No significant or No fulfil terms (offending estimate). Variables the Then deleted in a way gradually until a significant model is formed.

Modeling process end done For obtain a suitable and significant model between variable latent. Modeling results end of adolescence show that variable beliefs / beliefs do not own influence significant to variable intention and behavior. In adolescents, the variables economy, culture and mass media own influence significant to level knowledge teenagers, meanwhile variable compliance religious own influence significant to Intensity.

Table 8 relationships Between Significant Variables in the Final Model Behavior Teenagers in Sumenep City District.

Influence	A	P	Information
Knowledge> Behavior Beliefs	0,807	0.001	Significant
Knowledge> Normative Beliefs	0.578	0.001	Significant
Knowledge> Control Beliefs	0.329	0.001	Significant
Normative Beliefs> Control Beliefs	0.399	0.001	Significant
Behavior Beliefs"> Nonative Beliefs	0,198	0,013	Significant
Culture> Knowledge	0.520	0.001	Significant
Media> Knowledge	0,521	0.001	Significant
Agarna> Intensi	0,338	0.002	Significant

**Model Testing**

Model testing is performed through evaluation compatibility overall (overall model fit) using various criteria with Goodness of Fit standards for measure conformity between the actual observation data with prediction of the proposed model. Index suitability of the Goodness of Fit model used covering chi-square value and probability significance.

Based on model test results using Goodness of Fit criteria, known that behavioral model at risk before and after modification show that the model after modification more Good or more in accordance compared to previous models modification. Therefore that, behavioral model risk of HIV and AIDS in adolescents deemed fit based on table following :



Table 9. Model Based Testing Goodness of Fit Criteria for the Final Model Behavior Teenagers in Sumenep City District

Goodness of Fit Index	Cut-off Value	Early Model	Final Model
Chi-Square	It is expected small	0.001	0.001
Significance Probability	=df	19	29
CMIN/DF	<2.0	5,556	4,051
GFI	>0.90	0.925	0.915
RMSEA	<0.08	0.151	0.124
NFI	>0.90	0.941	0.934
RMR	<0.05	0.015	0.001

Based on Goodness of Fit table above, final model For behavior at risk teenagers in Sumenep City District can said to be fit if seen from a number of criteria, for example Chi-square value of 0.001 ( expected ) small ), the GFI value is 0.915 ( standard >0.90), the NFI value is 0.934 ( standard >0.90), and the RMR value is 0.030 ( standard <0.05).

### Discussion

Behavior at risk teenagers who can cause HIV/AIDS transmission includes sex without safety, use drugs with needle alternating injections, and lack of awareness will dangers of STIs. Behavior at risk This can influenced by various factors, such as influence Friend peers, low knowledge about HIV/AIDS and STIs, as well lack of access to information accurate prevention. Research This find that in the District of Sumenep City, there are many teenagers involved in behavior at risk although own knowledge base about HIV/AIDS. This is show that knowledge solely No Enough For push change healthy behavior.

Prevention transmission of HIV/AIDS can achieved with approach based on education and change behavior ([Farahani, Darabi, & Yaseri, 2020](#); [Obeagu, Obeagu, Ede, Odo, & Buhari, 2023](#)) This is including increase understanding teenager about ways prevention like use condom, avoid connection sexual risky, and avoid abuse drugs. However, for reach optimal results

are needed a considerate approach factors individual and social influences decision teenager. Self-efficacy is belief somebody to his ability For overcome challenges and do action certain. In context HIV/AIDS prevention, adolescents who have high self-efficacy tend feel more capable take action prevention, such as use condom or reject connection risky sexual behavior In the research this, was found that high self-efficacy relate with decision For avoid behavior at risk. Teenagers who feel Certain can protect self they from HIV/AIDS tends to more proactive in guard health sexual them ([Nesamoney et al., 2022](#)). On the other hand, teenagers with low self-efficacy tend affected by pressure Friend same age or factor an envirmment that encourages behavior risky

Culture play role important in formation norms and values social influencing behavior teenagers ([Dilnoza, 2023](#); [Laursen & Veenstra, 2021](#); [Zewude, Siraw, Engdawork, & Tadele, 2023](#)). In the District of Kota Sumenep, the culture thick local with values traditional and religious



often lead to taboos talks about sex and HIV/AIDS. This is cause Lots teenager not enough get adequate information about HIV/AIDS risks and how method prevention. A culture that emphasizes norm social certain, such as prohibition speak open about sex, can also to worsen lack of knowledge and understanding teenager about prevention of HIV/AIDS. Therefore that, research This highlight importance understand How culture local can support or hinder education health sexual for teenagers. Efforts sensitive education to culture local and capable accommodate norms social will more effective in incese awareness and reduction behavior risky.

Compliance religious own significant influence to behavior teenagers, including in matter health sexual. Religion often teaches the values that govern moral behavior, including in matter connection sexual and prevention disease contagious. Teenagers who have level compliance highly religious tend more believe in the teachings of their religion that encourage them For avoid connection extramarital sex and behavior at risk other. However, although religion can influence prevention of HIV/AIDS with give moral guidance, ambiguity about information scientific about HIV/AIDS can cause confusion. Therefore that 's important For balancing between religious teachings with education evidence - based health scientific. Education that combines religious values with knowledge about HIV/AIDS prevention can increase effectiveness intervention health among teenager.

Adequate knowledge about HIV/AIDS very much important For push teenager do action prevention. Research This show that although part big teenagers in Sumenep City District own knowledge base about HIV/AIDS, they often not know in detail the ways effective prevention, such as use

condom with right, the importance HIV testing, and information about IMS.

More knowledge in about HIV/AIDS and STIs can increase adolescent self-efficacy, because they feel more ready and confident self For avoid behavior risky. Therefore that is, education based on delivery comprehensive, practical and easy information understood very important For reduce level behavior risky.

Knowledge about IMS related close with HIV/AIDS prevention. Many teenagers do not realize that IMS can increase its vulnerability against HIV. In study this, part big teenagers in Sumenep City District show low understanding about IMS and how matter the can increase risk transmission of HIV/AIDS.

Counseling that includes information regarding STIs, including symptoms, how to transmission, and prevention, is very important For prevent teenager involved in behavior risky. With more knowledge Good about STIs, teenagers will more aware that action HIV/AIDS prevention can also be reduce risk disease infectious other.

resulting model in study This show that behavior risky for teenagers influenced by a combination between internal factors ( knowledge, self-efficacy) and external factors external ( culture, compliance) religion, support social ). Self-efficacy plays a role as the main mediator in connection between knowledge about HIV/AIDS, culture, and compliance religious to behavior prevention. Teenagers who have good knowledge, support strong social skills, and high self-efficacy will more tend avoid behavior risky.

## Conclusion

This study aims to explore the relationship between risky behavior and prevention of HIV/AIDS transmission in adolescents in Sumenep City District, focusing on the self-efficacy factor as a

variable that influences their health behavior decisions. Based on the results of the analysis, it can be concluded that: Adolescents in Sumenep City District exhibit various risky behaviors that can increase the likelihood of HIV/AIDS transmission, including unsafe sexual practices, sharing needles during drug use, and limited knowledge about preventive measures. These behaviors highlight the critical need for interventions targeting risk reduction among adolescents. At the same time, self-efficacy, or the confidence in one's ability to manage and prevent risky actions, plays a crucial role in shaping adolescents' health decisions. Adolescents with high self-efficacy are more likely to engage in preventive behaviors, such as condom use and avoiding drug-related risks, thereby reducing their vulnerability to HIV/AIDS. To address these challenges, educational initiatives and social support systems are vital in strengthening adolescents' self-efficacy and promoting healthy behaviors. Programs that provide comprehensive HIV/AIDS education and life skills training can empower adolescents with the confidence to make informed decisions. Collaboration among families, schools, and community organizations is essential to reinforce these efforts. Furthermore, self-efficacy-based interventions should be an integral component of HIV/AIDS prevention programs. By fostering adolescents' confidence in avoiding risky behaviors, these interventions can enhance their capacity to take proactive and effective preventive measures.

### Authors Contributions

The author carries out tasks from data collection, data analysis, making discussions to making manuscripts.

### Conflicts of Interest

There is no conflict of interest.

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