

Factors associated with knowledge of mother-to-child transmission (MTCT) of HIV/AIDS among young adults in Indonesia: Analysis of IYARHS

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DOI: <https://doi.org/10.36685/phi.v9i3.710>

Received: 4 July 2023 | Revised: 5 August 2023 | Accepted: 1 September 2023

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Abstract

Background: The prevalence of mother-to-child transmission (MTCT) of HIV/AIDS is increasing, particularly in low- and middle-income countries. Most previous studies focused on pregnant women in antenatal care, but this study examined the early phases of non-married women, which are young adults.

Objective: This study aimed to examine the factors associated with knowledge MTCT of HIV/AIDS among young adults in Indonesia.

Methods: This study used secondary data from the Special Indonesia Demographic Health Survey (IDHS), also known as the Indonesia Young Adult Reproductive Health Survey (IYARHS). The unit of analysis in this study is a non-married young adult aged 14 to 24 from 34 provinces in Indonesia. The final samples brought into the analysis were 9,600 women. The univariate analysis, bivariate analysis using the Chi-Square test, and multivariate analysis using binary logistic regression were done using the STATA 17 version licensed by the Institute for Population and Social Research, Mahidol University.

Results: This study revealed that 33.75% of the respondents had poor knowledge of the MTCT of HIV/AIDS. Moreover, the factors found to be significantly associated with knowledge of MTCT of HIV/AIDS were age (19 to 24 years old), residence in an urban area, graduation from junior high school, senior high school, academy, and university, and also those who talked about sexual matters with friends.

Conclusion: This study suggests supporting and encouraging related stakeholders in order to provide education about MTCT in the early years of adulthood so the prevention program can be applied more easily.

Keywords: *Mother-to-child transmission (MTCT); HIV/AIDS; IYARHS; IDHS; Indonesia*

Background

The epidemic of HIV/AIDS, which uses a different method of transmission from mother to child, is

wreaking havoc on the human race at a rapid rate. The results of investigations showed that in Nigeria, Mali, and Lesotho, respectively, 7.5%, 10.3%, and

11.8 percent of women had a thorough understanding of MTCT prevention (Acharya et al., 2018). Due to a lack of treatment, between 15 and 30 percent of kids born in Nepal with HIV (human immunodeficiency virus) become infected during labor and delivery, and between 5 and 20 percent become infected during nursing (Acharya et al., 2018). According to a study conducted in Uganda, 6.1% of pregnant women and 50% of newborns had HIV infections (Operto, 2020). In reality, more than 90% of newborns with HIV/AIDS were transmitted from their mothers during pregnancy, labor, delivery, and the postpartum period (Sekar et al., 2021)

The HIV-infected population is increasing globally, leading to public health concerns. Housewives are not an exception because of the risk of being transmitted by their husbands. Mother-to-child transmission (MTCT) is one of the most common routes for spreading HIV infection in pregnant women. Without treatment, one-third of children living with HIV die before the age of one year, and almost half of them by the age of two. With the appropriate intervention, the risk rate of MTCT can be decreased by up to 2% (Acharya et al., 2018). Some interventions that can be done are antiretroviral (ARV) prophylaxis and screening. However, those two prevention methods must be estimated together with the total number of pregnant women infected by HIV.

Low- and middle-income countries are the most risky for MTCT of HIV/AIDS. One of the intervention methods established by the Indonesian government is providing HIV screening for pregnant women in primary health care. However, HIV screening is ineffective since coverage was only 13% in 2018. Some factors have been found to define the low ARV screening and testing for HIV, such as lack of knowledge about HIV, unwillingness to get blood tests, poor perception of HIV settings, and not all health care centers providing HIV testing. All the stakeholders tried to support the prevention program of MTCT so babies would be delivered free from HIV/AIDS.

Several factors contributed to the high prevalence of MTCT of HIV/AIDS: facing at least one pregnancy, lack of awareness of HIV status, poor adherence to ART, lack of clinic-based HIV education and counseling, low educational level, poor wealth index,

urban residency, exposure to media, and exposure to HIV/AIDS knowledge.

In order to prevent HIV MTCT during pregnancy, labor, and breastfeeding, Prevention of Mother-to-Child Transmission (PMTCT) programs offer a variety of services to women and infants, including counseling and testing, antiretroviral drug therapy, thorough antenatal care, safer delivery practices, and appropriate infant feeding. By engaging in these activities, the risk of vertical HIV transmission can be cut to under 1%. To begin antiretroviral medication (ART) and end HIV MTCT, HIV testing is necessary both before and throughout pregnancy (Mudji et al., 2023).

Women are the highest-risk population to be infected by HIV from husbands and partners. Knowledge and awareness will be useful for them to protect themselves and the people around them from HIV infection and take HIV testing as a preventive measure. Various studies have been done globally to examine the knowledge of MTCT among women, particularly among pregnant women on antenatal care and the general population of women. However, this study only focused on young adults as the initial description of young adult factors as early prevention. Thus, to provide more comprehensive data, this study aimed to examine the factors associated with MTCT of HIV/AIDS among young adults aged 14 to 25 years old in Indonesia.

Methods

Study Design

The IYARHS provided the secondary data for this investigation (Indonesia Young Adult Reproductive Health Survey). IYARHS is a component of the Indonesia Demographic Health Survey (IDHS), also referred to as the Special IDHS. IYARHS concentrated on survey respondents who were young adults. The Indonesian Demography and Health Survey (IDHS) 2017 secondary data are used in this cross-sectional research study. A global survey that focuses on fertility, family planning, and mother and child health is called the Demographic and Health Survey (DHS). In cooperation with the National Population and Family Planning Board (BKKBN) and the Indonesian Ministry of Health (MoH), Statistics Indonesia (BPS) carried out the Indonesia Demographic and Health Survey (IDHS).

The poll, which ran from July 24 to September 30, 2017, was financed by the Indonesian government. ICF provides technical support through the DHS Program, which is financed by the United States Agency for International Development (USAID) and provides financial support and technical support for demographic and health surveys in nations around the world (DHS, 2017).

Setting

The original survey (IYARSH) was a cross-sectional frame, which was done in 2017. However, this current study using IDHS was downloaded, cleaned, and processed in July 2023. The IYARSH has been done in 34 provinces in Indonesia, representing 100% of the Indonesian population.

Samples/Participants

The IDHS 2017 used stratified cluster-random sampling to select the sample (DHS, 2017). The sample frame used in IDHS 2017 was the Master Sample of Census Blocks from the 2010 Population Census. The sample of IDHS 2017 covered 1,970 census blocks in urban and rural areas and 49,250 households. This study only focuses on never-married women and young adults aged 15 to 24 years old. The total number of eligible women was 11,032, but only 10,691 of them were eligible to be interviewed. Finally, after data cleaning, 9,600 of them were brought into the analysis.

Instrument

The instrument used by IDHS 2017 was the standardized questionnaire. The variable of mother-to-child transmission was derived from 3 questions: 1) HIV can be transmitted from mother to baby during pregnancy. (yes/no); 2) HIV can be transmitted from mother to baby during delivery? (yes/no); 3) HIV can be transmitted from mother to baby during breastfeeding? (yes/no). MTCT was categorized as good if the respondent answered (yes) to all three questions. MTCT was categorized as poor if the respondent answered (no) to at least one question.

Data Analysis

The outcome variable of this study is the MTCT of HIV/AIDS transmission. It combined three questions, including whether HIV/AIDS can be

transmitted from mother to child during pregnancy, delivery, and breastfeeding. If the respondents could answer “yes” to all those questions, it would be categorized as “good,” but if they answered at least one “no,” it would be categorized as “poor.” The predictors in this study consist of age, place of residence, highest educational level, having talked about sexual matters with a friend, owning a mobile telephone, having ever used the internet, having ever had sexual intercourse, reading a newspaper or magazine at least once a week, listening to the radio, and watching television.

The data were tested for univariate, bivariate (Chi-square), and multivariate (binary logistic regression) by using the STATA 17 version licensed for the Institute for Population and Social Research, Mahidol University.

Ethical Considerations

The IDHS 2017 obtained ethical clearance from the National Agency for Research and Health Development, Ministry of Health, Republic Indonesia. The raw data is available on the website <https://dhsprogram.com/data/> and is free to download after registering and receiving approval by email.

Results

Table 1 provides general information about the respondents. It was shown that 33.75% of the young adults had poor knowledge about HIV/AIDS mother-to-child transmission. In terms of age, more than half of them are aged 14 to 18 years old (55.75%). According to place of residence, the majority of them lived in the urban area (62.23%). The respondents of this study were predominantly those who graduated from senior high school (62.16%), had a tendency to talk with friends about sexual matters (64.26%), owned a mobile phone (92.18%), and had ever used the internet (91.46%). In terms of their sexual intercourse experiences, most of them said never (98.11%). According to access to media, including newspapers and magazines, radio, and television, at least once a week they could access those media by 16.29%, 15.85%, and 81.23%, respectively.

Table 1 The general characteristics of the respondents

Variables (n = 9,600)	Frequency	Percentage
Knowledge about MTCT of HIV/AIDS		
Poor	3.240	33.75
Good	6.360	66.25
Age		
14 to 18 years old	5.352	55.75
19 to 24 years old	4.248	44.25
Place of residence		
Rural	3.626	37.77
Urban	5.974	62.23
Highest educational level		
Primary	124	1.29
Junior high school	766	7.98
Senior high school	5.967	62.16
Academy	517	5.39
University	2.226	23.19
Talk about sexual matters with friends		
No	3.431	35.74
Yes	6.169	64.26
Own a mobile telephone		
No	751	7.82
Yes	8.849	92.18
Have ever used the internet		
No	820	8.54
Yes	8.780	91.46
Have ever had sexual intercourse		
No	9,419	98.11
Yes	181	1.89
At least once a week read a newspaper or magazine		
No	8.036	83.71
Yes	1.564	16.29
At least once a week listen to the radio		
No	8.078	84.15
Yes	1.522	15.85
At least once a week watch television		
No	1.802	18.77
Yes	7.798	81.23

The predictors that were found to correlate with knowledge of mother-to-child transmission of HIV/AIDS are age, place of residence, educational level, talking about sexual matters with friends, owning a mobile phone, access to the internet, and access to a newspaper or magazine. However, other variables, including having ever had sexual intercourse and having access to radio and television, showed no correlation with knowledge of mother-to-child HIV/AIDS transmission (**Table 2**).

Table 3 shows that variables significantly associated with knowledge of mother-to-child HIV/AIDS transmission included age, place of residence, highest educational level, and talking about sexual matters with friends after controlling for

another independent variable. In detail, respondents who were aged 19 to 24 years old were 1.18 times more likely to have good knowledge of MTCT HIV/AIDS compared to young adults aged 14 to 18 years old. According to place of residence, those who lived in urban areas were 1.21 times more likely to have good MCTC knowledge than those who graduated from primary school. In terms of the highest educational level, it was found that those who graduated from junior high school, senior high school, academy, and university were 1.58, 2.15, 4.47, and 2.91 times more likely to have good MCTC knowledge. Moreover, those who mostly talked with friends about sexual matters were 1.38 times more likely to have good MCTC knowledge compared to those who did not talk with friends.

Table 2 The bivariate analysis of each independent variable with the knowledge of MTCT

Variables	Knowledge of MTCT of HIV/AIDS		Total	p-value
	Poor (%)	Good (%)		
Age				<0.000
14 to 18 years old	2.009 (62.01)	3.343 (52.56)	5.352 (55.75)	
19 to 24 years old	1.231 (37.99)	3.017 (47.44)	4.248 (44.25)	
Place of residence				<0.000
Rural	1.356 (41.85)	2.270 (35.69)	3.626 (37.77)	
Urban	1.884 (58.15)	4.090 (64.31)	5.974 (62.23)	
Highest educational level				<0.000
Primary	68 (2.10)	56 (0.88)	124 (1.29)	
Junior high school	339 (10.46)	427 (6.71)	766 (7.98)	
Senior high school	2.151 (66.39)	3.816 (60.00)	5.967 (62.16)	
Academy	96 (2.96)	421 (6.62)	517 (5.39)	
University	586 (18.09)	1.640 (25.79)	2.226 (23.19)	
Talk about sexual matters with friends				<0.000
No	1.366 (42.16)	2.065 (32.47)	3.432 (35.74)	
Yes	1.874 (57.84)	4.295 (67.53)	6.169 (64.26)	
Own a mobile telephone				0.040
No	279 (8.61)	472 (7.42)	751 (7.82)	
Yes	2.961 (91.39)	5.888 (92.58)	8.849 (92.18)	
Have ever used the internet				0.001
No	321 (9.91)	499 (7.85)	820 (8.54)	
Yes	2.919 (90.09)	5.861 (92.15)	8.780 (91.46)	
Have ever had sexual intercourse				0.109
No	3.189 (98.43)	6.230 (97.96)	9.419 (98.11)	
Yes	51 (1.57)	130 (2.04)	181 (1.89)	
At least once a week read a newspaper or magazine				<0.000
No	2.774 (85.62)	5,262 (82.74)	8.036 (83.71)	
Yes	466 (14.38)	1.098 (17.26)	1.564 (16.29)	
At least once a week listen to the radio				0.129
No	2.752 (84.94)	5.326 (83.74)	8.078 (84.15)	
Yes	488 (15.06)	1.034 (16.26)	1.522 (15.85)	
At least once a week watch television				0.133
No	581 (17.93)	1.221 (19.20)	1.802 (18.77)	
Yes	2.659 (82.07)	5.139 (80.80)	7.798 (81.23)	

It was also discovered that some variables do not have a correlation with MTCT knowledge, such as owning a mobile phone, having ever used the internet, having ever had sexual intercourse, reading a newspaper or magazine at least once a week, listening to the radio, and watching television.

Discussion

According to the study results above, the prevalence of poor MTCT for HIV was 33%. Another study in Indonesia found that 37% of women did not know how to prevent MTCT (Mutiar et al., 2022). The study in Nepal reported similar results, with only 84.4% of respondents knowing the transmission of

HIV during pregnancy, delivery, and breastfeeding (Acharya et al., 2018). In Ethiopia, the knowledge of the prevention of MTCT for HIV/AIDS is only 30.7% (Dina et al., 2021). Knowledge of HIV/AIDS transmission during breastfeeding can be one point to emphasize, like in the study in Uganda that reported more than 50% of MTCT was found during breastfeeding practice (Operto, 2020). In Congo, only 30.4% of respondents knew MTCT as a route of HIV/AIDS transmission (Mudji et al., 2023). In the Indonesian context, the vertical transmission of HIV in Indonesia is still a major problem because of 2,101 new cases of perinatal HIV/AIDS in 2017 (Savitri et al., 2016).

Table 3 The multivariate analysis of factors associated with MTCT of HIV/AIDS

Variables	AOR	95% C.I.	p-value
Age (ref: 14 to 18 years old)			
19 to 24 years old	1.18	1.07 – 1.31	0.001
Place of residence (ref: rural)			
Urban	1.21	1.11 – 1.33	<0.000
Highest educational level (ref: primary)			
Junior high school	1.58	1.08 – 2.33	0.019
Senior high school	2.15	1.50 – 3.09	<0.000
Academy	4.47	2.93 – 6.84	<0.000
University	2.91	2.00 – 4.22	<0.000
Talk about sexual matters with friends (ref: no)			
Yes	1.38	1.26 – 1.51	<0.000
Own a mobile telephone (ref: no)			
Yes	0.91	0.76 – 1.08	0.273
Have ever used the internet (ref: no)			
Yes	0.95	0.80 – 1.13	0.579
Have ever had sexual intercourse (ref: no)			
Yes	1.22	0.87 – 1.70	0.247
At least once a week read a newspaper or magazine (ref: no)			
Yes	1.09	0.96 – 1.23	0.171
At least once a week listen to the radio (ref: no)			
Yes	1.02	0.90 – 1.15	0.788
At least once a week watch television (ref: no)			
Yes	0.94	0.84 – 1.05	0.304

LR chi2 (13) = 277.86 | Prob > chi2 = 0.000 | Pseudo R2 = 0.0226 | Log likelihood = -5998.9577

Supporting the results of this study, some previous studies found that variables of educational level are correlated to MTCT knowledge. In Ethiopia, other variables had significance for the MTCT of HIV/AIDS knowledge, such as wealth index, media exposure, and knowledge about HIV (Kebede et al., 2021). The study in Ethiopia found that knowledge of the prevention of MTCT was higher among respondents aged less than 25 years (Dina et al., 2021). In line with the findings of this study, the study in Congo found that older participants and those with higher educational levels tend to have higher knowledge of the MTCT of HIV/AIDS (Mudji et al., 2023). As the general information about HIV, some findings showed that the factors of educational level and living in the urban area tend to have HIV knowledge, including MTCT knowledge (Sari et al., 2020).

In terms of the variable of age, older women might have good knowledge of MTCT because they might have more experience and get more information (Gebregziabher et al., 2023; Olopha et al., 2021; Yourkavitch et al., 2018). Regarding the place of residence, living in an urban area will have more tendency to easily access any information to enrich the knowledge, including MTCT of HIV/AIDS

(Ntombela et al., 2022; Qiu & Wu, 2022; Tibebu et al., 2023). The highest educational level is related to the knowledge people get at the formal educational level, which positively increases the knowledge of MTCT of HIV/AIDS (Alemu et al., 2018; Alwafi et al., 2018; Worku et al., 2021). The variable of talking with friends about sexual matters might be related to sharing information with peers, which is related to knowledge about MTCT of HIV/AIDS (Ehiri et al., 2019; Kumbani et al., 2023; Letshwenyo-Maruatona & Gabaitiri, 2018). The media exposures in this study found no association with knowledge of MTCT of HIV/AIDS, which differs from several previous studies (Lakhe et al., 2020; Pachuau et al., 2021; Teshale et al., 2021).

There is a correlation between knowledge and attitude toward the MTCT of HIV/AIDS, as found in the study in Nigeria (Ezenkiri et al., 2020). The study in Tanzania found HIV-infected women had significantly more comprehensive knowledge of HIV/AIDS and prevention of mother-to-child transmission of HIV than HIV-negative women, and comprehensive knowledge of prevention of mother-to-child transmission of HIV was low among the study participants (Ngadaya et al., 2021). Another study examining the MTCT of HIV practice found

that age, education, and attitude played a significant role (Sekar et al., 2021)

In relation to MTCT, early screening can be carried out to obtain the initial diagnosis. The significance of HIV testing for early HIV/AIDS prevention, particularly in the Eastern half of Indonesia, must also be emphasized (Ibrahim et al., 2022). Given that hospitals have hosted the majority of successful MTCT programs, primary health care should integrate MTCT prevention effectively (Indrawati & Setyani, 2019). It also highlighted research done in Indonesia showing that hospitals retained women more frequently than primary health institutions did (Lumbantoruan et al., 2020). Pregnant women can receive integrated ANC services, which also include HIV testing and counseling, HIV diagnosis and antiretroviral therapy for pregnant women, safe delivery, planning for future pregnancies, management of infant and child feeding, administration of antiretroviral (ARV) prophylaxis and cotrimoxazole in children, HIV diagnostic testing in children, and immunization (Witarini, 2021). Testing for syphilis, hepatitis B, and HIV/AIDS can all be done concurrently because they are all non-communicable diseases (Wardiana et al., 2022). In the local scope, the findings of this study can contribute to health promotion initiatives for public health centers (Pusat Kesehatan Masyarakat/ Puskesmas), especially young adults, as the subject to prevent MTCT. In the global scope, this study can give a clear situation of MTCT knowledge among young adults in Indonesia, which can be strong evidence to arrange the policy and health program for all stakeholders.

Conclusion

The prevalence of non-married women with poor knowledge of Mother-to-Child transmission (MTCT) of HIV/AIDS was 33.75%. The factors that were found to be significantly associated with having good knowledge of MTCT of HIV/AIDS were aged 19 to 24 years old, living in an urban area, graduating from junior high school, senior high school, academy, and university, and talking with friends about sexual matters. The stakeholders from related sectors can work together to improve the knowledge about HIV/AIDS, especially MTCT among young adults. The future study can add more variables from different levels, including households and communities.

Declaration Conflicting Interest

The authors declared no competing interest.

Funding

None.

Acknowledgment

The authors would like to thank IDHS of special (IYARSH) and the national government for allowing us to use the data for this study.

Author Contribution

M, EB, and MHNS obtained and analyzed the data and developed the topics. T, NKS, and SS highly contributed to the conceptualization and design of the study. All authors critically reviewed the manuscript and took part in the discussion part. All authors read and approved the final manuscript.

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Cite this article as: Maretalina., Buston, E., Nurmalita Sari, M. E., Nuraeni, T., Sulyastini, N. K., & Sholihat, S. (2023). Factors associated with knowledge of mother-to-child transmission (MTCT) of HIV/AIDS among young adults in Indonesia: Analysis of IYARHS. *Public Health of Indonesia*, 9(3), 96-104. <https://doi.org/10.36685/phi.v9i3.710>