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Determinant of service utilization for triple elimination of mother-to-child transmission of HIV, syphilis, and hepatitis B among women living with HIV during COVID-19 pandemic in Indonesia



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ABSTRACT

Background: HIV-AIDS and sexually transmitted infections are still a public health burden in Indonesia. Women living with HIV have a higher risk of transmitting HIV, Syphilis, and Hepatitis B to their babies. While the effort to increase the services coverage for the prevention of mother-to-child transmission (PMTCT) was detained due to the COVID-19 pandemic and the lack of published studies that explore this, this study aimed to assess the determinant of service utilization for triple elimination of mother-to-child transmission of HIV, Syphilis, and Hepatitis B among women living with HIV during COVID-19 pandemic in Indonesia.

Methods: This cross-sectional study targeted women living with HIV in Indonesia who are planning to get pregnant. A simplified-snowball sampling technique was used in this study. A dependent variable in this study was the service utilization of PMTCT for HIV, Syphilis, and Hepatitis B. In contrast, the independent variables in this study consisted of demographic characteristics, perception according to Health Belief Model constructs, and stigma and discrimination experiences. Multiple logistic regression was used to find the determinants of service utilization.

Results: Among 336 women living with HIV that were interviewed, only 28.27% (95% CI = 23.69 – 33.34) accessed the PMTCT services during the COVID-19 pandemic. Moreover, the likelihood of PMTCT service utilization was decreased among the women living with HIV who perceived higher barriers (aOR = 0.56; 95% CI = 0.31 – 0.99) and experienced stigma and discrimination from partner (aOR = 0.50; 95% CI = 0.25 – 0.99). On the other hand, the PMTCT service utilization was increased among those who perceived less severity (aOR = 2.07; 95% CI = 1.21 – 3.54). No other factors were associated with the PMTCT service utilization among women living with HIV during the COVID-19 pandemic.

Conclusion: The PMTCT service utilization was relatively low, increased by the higher perceived severity, and reduced among those who perceived higher barriers and experienced stigma and discrimination from the partner. Therefore, improving the knowledge about HIV, Syphilis, and Hepatitis B related to PMTCT services is essential, as well as providing social support to reduce the stigmas and discrimination among women living with HIV.

Keywords: PMTCT, triple elimination, women living with HIV, COVID-19, Health Belief Model.

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INTRODUCTION

HIV-AIDS and sexually transmitted infections (STIs) are still a public health burden in Indonesia. Until March 2021, the total number of HIV infections in Indonesia was about 427,201 cases, and about 131,147 cases were in the AIDS stage.¹ In the same year, the total number of laboratory-confirmed sexually transmitted infections in Indonesia was about

11,133 cases, which were dominated by Syphilis (34.7%) and Gonorrhea (22.3%). Moreover, the HIV/AIDS estimation and projection in 2019 found that new HIV infections in Indonesia until 2024 will be dominated by “low-risk” women (35.0%), followed by men who have sex with men (25.0%), female sex workers (19.0%), and other population.² According to this situation, higher HIV cases among “low-

risk” women, could increase the risk of mother-to-child transmission of HIV, as well as the transmission of STI.^{3,4}

Until March 2021, the number of AIDS cases among “low-risk” women, such as housewives, was the third-highest (18,848 cases) in Indonesia compared to other groups.¹ A study in Bandung, Indonesia, found that most HIV-positive men did not use condoms when they had sex with

their wives.⁵ This situation increases the risk of HIV transmission through sexual transmission mode, as about 51.5% of HIV infections in Indonesia were found among heterosexuals.¹ This situation also explained that most of the women in Indonesia knew their HIV status either through pre-natal HIV services or when their husband was severely ill or died from HIV.⁵⁻⁷ Therefore, the effort to increase HIV testing among women, especially to prevent the transmission from mother to child, has been initiated through the integration of services for PMTCT (Prevention of Mother to Child HIV Transmission) and MCHS (Mother and Child Health Services) since 2006.⁸

To improve the PMTCT services, Indonesia has integrated HIV services with Syphilis and Hepatitis B through the triple elimination program, initiated in 2017.⁹ The progress of this program in 2020, there were 2.404.754 pregnant mothers were tested for HIV, and 6.094 of them (0.25%) were HIV positive. Moreover, about 498 babies were born to women with HIV, and about 67 newborn babies (13.45%) were HIV positive. For Syphilis, there were 753.669 pregnant women tested, and about 4.198 of them (0.56%) were positive for Syphilis. Even though the Indonesian government has struggled to achieve the elimination target by the end of 2022, however, the progress of the HIV prevention program has been detained due to the COVID-19 pandemic.¹⁰ A similar situation is also found globally, especially toward the progress of the Hepatitis B prevention program.¹¹

Women living with HIV are considered a vulnerable group being infected by COVID-19.¹² On the other hand, COVID-19 also negatively impacts mental health, not only for the general population but also for women living with HIV.^{13,14} Moreover, women living with HIV often get stigma and discrimination from their environment, which worsens their mental health problems and affects their intention to access health services.^{15,16} Recently, there were limited studies in Indonesia about the service utilization of PMTCT for HIV, Syphilis, and Hepatitis B among women with HIV. Therefore, understanding the determinant of PMTCT service utilization among women with HIV is essential,

especially to improve the services during the pandemic.

METHODS

Study Design and Setting

We conducted an online cross-sectional study using a Google Form platform from 1 to 31 October 2021. Married women who live with HIV aged 18 years old and above, planning to get pregnant, and can read and understand Bahasa Indonesian, were considered eligible. Those who did not plan to get pregnant and were HIV negative or did not know their HIV status were considered ineligible. We recruited the participants using a simplified-snowball sampling technique. For the data collection, we invited the participants through a WhatsApp group affiliated with the NGOs and a peer support group for women living with HIV facilitated by the Jaringan Indonesia Positif. In addition, the sample was calculated using OpenEpi 3 (<https://www.openepi.com>), assuming that the proportion of HIV new cases among sex workers is 19,0%, with a 5% margin of error and 95% confidence interval.² Therefore, the minimum sample for this study was 237 respondents.

Study Variables, Tools, and Measurement

The dependent variable for this study was the service utilization of HIV, Syphilis, and Hepatitis B during the COVID-19 pandemic, defined as whether the respondent has ever accessed any kind of PMTCT services since March 2, 2020.¹⁷ The triple elimination for HIV, Syphilis, and Hepatitis B services consisted of routine testing and treatment, counseling, as well as pregnancy program and other supporting services.⁹

The independent variables consisted of demographic characteristics of women living with HIV, such as place of residence, age, education level, profession, period of HIV diagnosis, partner's HIV status, and pregnancy status. Experience related to stigma and discrimination from health providers as well as from their partners was also evaluated in this study. Moreover, we also evaluate respondents' knowledge and perception of PMTCT of HIV, Syphilis, and Hepatitis B. The questionnaire for perception in this study was developed

according to Health Belief Model Theory.¹⁸ The knowledge was measured using a multiple-choice question consisting of two choices (right and wrong). In contrast, the perception was measured using a four-point Likert item, ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The total score for each construct for knowledge and perceptions was then rated into two categories (low and high) based on the cut-off point using mean or median according to the data distribution. [Table 1](#) shows the list of questions used in this study.

Statistical Analysis

A Series of univariate and multivariate analyses were conducted using STATA version 15. This study employs a Multiple Logistic Regression model to identify the determinant of service utilization for triple elimination of mother-to-child transmission of HIV, Syphilis, and Hepatitis B programs among women living with HIV during the COVID-19 Pandemic in Indonesia. We constructed two models in multivariate analysis: Model 1, which included demographic characteristics only, while Model 2 included both demographic characteristics, perception constructs, and stigma and discrimination experiences. The independent variables showing a p -value $< 0,05$ will be considered the determinant. An adjusted odds ratio (aOR) and 95% confidence intervals were presented to measure the strength of association.

RESULTS

We received 342 responses, and 6 were excluded from the analysis due to ineligibility (not planning to get pregnant and be HIV-negative). Based on [Table 2](#), most of the respondents were from Sumatra and Java island, the mean age was 35,16 years old, and they graduated from senior high school. Moreover, about 44.35% of respondents were housewives, had been diagnosed with HIV for more than 5 years, their partner's HIV status was HIV-negative and was planning to get pregnant within the next 1 and 2 years.

Among 336 women living with HIV interviewed in this study, the proportion of respondents who access and utilize the PMTCT services was relatively low, about

Table 1. The measurement of knowledge and perception of PMTCT of HIV, Syphilis, and Hepatitis B.

Measure	No	Statements	Cronbach α
Knowledge	1	Pregnant women with HIV have a risk of transmitting HIV, Syphilis, and Hepatitis B to their babies.	0.6103
	2	The mother-to-child transmission of HIV, Syphilis, and Hepatitis B can occur during pregnancy.	
	3	The mother-to-child transmission of HIV, Syphilis, and Hepatitis B can occur during giving birth.	
	4	The mother-to-child transmission of HIV, Syphilis, and Hepatitis B can occur during breastfeeding.	
	5	Using condoms while having sexual intercourse can prevent the transmission of HIV, Syphilis, and Hepatitis B.	
	6	The health services for HIV, Syphilis and Hepatitis B were available in clinics, midwives, primary health care, hospital, and general practitioner.	
	7	Early detection and treatment can prevent mother-to-child transmission of HIV, Syphilis, and Hepatitis B.	
	8	The test and treatment services for HIV, Syphilis, and Hepatitis B were free and provided by the government.	
Perceived Susceptibility	1	I feel quite at risk of transmitting HIV, Syphilis, and Hepatitis B to my baby.	0.7774
	2	I am afraid of transmitting HIV, Syphilis, and Hepatitis B to my baby.	
Perceived Severity	1	When I think about HIV, Syphilis, and Hepatitis B transmission from mother to child, these diseases make me afraid and palpitate.	0.8587
	2	I will harm my womb/baby if I am pregnant with HIV, Syphilis, and Hepatitis B.	
	3	Relationships in my family will be threatened if I transmit HIV, Syphilis, and Hepatitis B to my child.	
	4	HIV, Syphilis, and Hepatitis B are diseases with no hope of a cure.	
	5	I feel I will turn helpless if my child catches HIV, Syphilis, and Hepatitis B from me.	
	6	My finances will be chaotic if my child also catches HIV, Syphilis, and Hepatitis B from me.	
	7	The problems I experienced due to my child contracting HIV, Syphilis, and Hepatitis B would burden the family.	
	8	HIV, Syphilis, and Hepatitis B will be more serious than other diseases.	
Perceived Benefits	1	Screening for HIV, Syphilis, and Hepatitis B during pregnancy can prevent the transmission of these diseases to my baby.	0.8515
	2	I have benefited greatly from getting tested for HIV, Syphilis, and Hepatitis B.	
	3	Screening for HIV, Syphilis, and Hepatitis B can help me find disorders/problems early in my womb.	
	4	If I took the routine HIV, Syphilis, and Hepatitis B screening once a year for 3 consecutive years, I might be able to find signs of the disorder earlier before it was found to be severe.	
	5	I won't be nervous about HIV, Syphilis, and Hepatitis B if I regularly get tested for HIV, Syphilis, and Hepatitis B.	
Perceived Barriers	1	I feel ashamed when I do an HIV, Syphilis, and Hepatitis B test.	0.8848
	2	I'm afraid to do HIV, Syphilis, and Hepatitis B tests.	
	3	I think testing for HIV, Syphilis, and Hepatitis B is painful.	
	4	I think testing for HIV, Syphilis, and Hepatitis B is time-consuming.	
	5	My family/friends will laugh at me if I get tested for HIV, Syphilis, and Hepatitis B.	
Cues to Action	6	I think HIV, Syphilis, and Hepatitis B tests can interfere with my activities.	0.7006
	7	I think testing for HIV, Syphilis, and Hepatitis B is expensive.	
	1	I took the initiative to check for HIV, Syphilis, and Hepatitis B.	
	2	I followed a friend's suggestion to do a screening test for HIV, Syphilis, and Hepatitis B because it benefited my health and my womb.	
	3	I screened for HIV, Syphilis, and Hepatitis B because some of my neighbors/relatives/friends were infected with HIV, Syphilis, and Hepatitis B and passed it on to their children.	
	4	I screened for HIV, Syphilis, and Hepatitis B on information from health workers.	

Measure	No	Statements	Cronbach α
Self-Efficacy	1	I can get HIV, Syphilis, and Hepatitis B screening tests at the health service.	0.8146
	2	I feel confident screening for HIV, Syphilis, and Hepatitis B in healthcare is very accurate.	
	3	I'm sure I can get tested for HIV, Syphilis, and Hepatitis B at the health service according to a predetermined schedule.	
	4	I'm sure I can invite friends or relatives to do HIV, Syphilis, and Hepatitis B screening tests at the health service.	

28.27% (95% CI = 23.69 – 33.34). Among 95 respondents who accessed the PMTCT services during the COVID-19 pandemic, most accessed the ARV treatment (66.5%) and pregnancy counseling (33.5%).

Table 3 shows the proportion of respondents based on their knowledge and perceptions of mother-to-child transmission of HIV, Syphilis, and Hepatitis B. More than half of the respondents have a low knowledge of the mother-to-child transmission of HIV, Syphilis, and Hepatitis B. Based on the perceived susceptibility, the majority of the respondents perceived less susceptibility to transmitting HIV, Syphilis, and Hepatitis B to their babies. Moreover, 53.27% of respondents perceived less severe if they transmitted HIV, Syphilis, and Hepatitis B to their babies during pregnancy or breastfeeding. Similar trends were also found based on the perceived benefits, in which more than half of respondents perceived fewer benefits if they could prevent the transmission of HIV, Syphilis, and Hepatitis B to their babies. Meanwhile, more than half of the respondents perceived higher barriers in accessing the services for PMTCT of HIV, Syphilis, and Hepatitis B. Moreover, about three-quarters of respondents have low cues to action to prevent the transmission of HIV, Syphilis, and Hepatitis B to their babies. In addition, about 63.69% of respondents have lower self-efficacy in performing behaviors to prevent the transmission of HIV, Syphilis, and Hepatitis B to their babies.

This study also depicted the experience of women living with HIV related to stigma and discrimination from their environment due to their HIV status. According to Table 4, more than half of the respondents have ever been stigmatized and discriminated against by health providers. Moreover, more than 80% of respondents experienced stigma and discrimination from their partners.

Table 2. Demographic characteristics of the respondents (n = 336).

Variables	n (%)
Place of residence	
Sumatera	100 (29.76)
Java	98 (29.17)
Kalimantan	52 (15.48)
Bali and West Nusa Tenggara	26 (15.48)
Sulawesi and Maluku	41 (12.20)
East Nusa Tenggara and Papua	19 (5.56)
Age (years old)	
Mean (SD)	35.16 (6.33)
Min - Max	18 – 48
Education level	
Elementary school	14 (4.17)
Junior high school	56 (16.67)
Senior high school	189 (56.25)
Diploma	28 (8.33)
Bachelor	47 (13.99)
Postgraduate	2 (0.60)
Profession	
Housewife	149 (44.35)
Private employee	94 (27.98)
Government employee	3 (0.89)
Entrepreneur	38 (11.31)
Non-government organization staff	33 (9.82)
Sex worker	17 (5.06)
Student	2 (0.60)
Period of HIV status diagnosis	
< 6 months ago	20 (5.95)
6 to 12 months ago	26 (7.74)
1 to 3 years ago	59 (17.56)
3 to 5 years ago	49 (14.56)
> 5 years ago	182 (54.17)
Partner's HIV status	
Negative	151 (44.94)
I don't know	58 (17.26)
Positive	127 (37.80)
Pregnancy status	
Is having pregnancy	18 (5.36)
Planning to get pregnant within the next 1 or 2 years	318 (94.64)

Table 5 shows the result of Multiple Logistic Regression. This study found three factors associated with using PMTCT services among women with HIV during the COVID-19 pandemic. Those factors are perceived severity, perceived

barriers, and discrimination and stigma experienced by the partner. Based on the perception of severity, the respondents who perceived higher severity would be 2.07 times more likely to access the PMTCT services during the COVID-19

pandemic than those who perceived less severity (aOR = 2.07; 95% CI = 1.21 – 3.54). On the other hand, the respondents who perceived higher barriers were 44% less likely to access the PMTCT services during the COVID-19 pandemic than those who perceived fewer barriers (aOR = 0.56; 95% CI = 0.31 – 0.99). Moreover, the respondents who experienced stigma and discrimination from their partners will be 50% less likely to access the PMTCT services during the COVID-19 pandemic compared to those who never experienced any stigmas and discrimination from their partners (aOR = 0.50; 95% CI = 0.25 – 0.99). In addition, no other factors were associated with the PMTCT service utilization among women living with HIV during the COVID-19 pandemic.

DISCUSSION

This study found that the service utilization of PMTCT for HIV, Syphilis, and Hepatitis B among women living with HIV was relatively low, at about 28.27%. In Indonesia, less than 10% of pregnant women access PMTCT services, which leads to a missed opportunity for early HIV screening and treatment.¹⁹ Low service utilization for PMTCT also leads to most pregnant women finding out their HIV status in the stage of late pregnancy, which leads to the late treatment for the prevention of mother-to-child transmission.¹⁹

HIV infection is not only a threat to the mother but also their unborn child and can adversely affect the quality of life of the children, both economic and social.^{3,20} Without PMTCT intervention, an infant, born to women with HIV positive will be 45% more likely to be infected with HIV.²¹ Therefore, encouraging the women to be involved in PMTCT intervention is essential to prevent the transmission of HIV, Syphilis, and Hepatitis B from pregnant women with HIV to their babies.

Lower service utilization of PMTCT services could be affected by several factors. This study found that the perception of barriers reduces the likelihood of women living with HIV accessing the services. Those barriers consisted of feeling ashamed, afraid, and perceived that the PMTCT services would be painful, time-consuming, disturbing, and expensive. The

Table 3. Knowledge and perception of the respondent related to mother-to-child transmission of HIV, Syphilis, and perinatal Hepatitis B.

Variables	n (%)
Level of knowledge	
Low knowledge	169 (50.30)
Good knowledge	167 (49.70)
Perceived susceptibility	
Less susceptible	291 (86.61)
High susceptible	45 (13.39)
Perceived severity	
Less severe	179 (53.27)
High severe	157 (46.73)
Perceived benefits	
Fewer benefits	194 (57.74)
High benefits	142 (42.26)
Perceived barriers	
Fewer barriers	128 (38.10)
High barriers	208 (61.90)
Cues to action	
Low	255 (75.89)
High	81 (24.11)
Self-efficacy	
Low efficacy	214 (63.69)
High efficacy	122 (36.31)

Table 4. Stigma and discrimination experienced among women living with HIV.

Variables	n (%)
Stigma and discrimination from a health provider	
Never	128 (38.10)
At least once or more	208 (61.90)
Stigma and discrimination from partner	
Never	53 (15.77)
At least once or more	283 (84.23)

findings from other studies also confirm these types of barriers.^{22,23} According to this situation, reducing the barriers to women living with HIV from accessing the PMTCT services is essential, especially to encourage women living with HIV to access the services.

Reducing barriers among women living with HIV in accessing health services, especially PMTCT, could be conducted by some strategies. A study in Karawang, Indonesia, suggested that support from local organizations, improving the competence and the capabilities of the midwives, and empowering pregnant women by increasing their knowledge can increase the service utilization of PMTCT services.³ Another study in Bandung, Indonesia, also found that the role of the peer support group can increase the

knowledge of women living with HIV related to PMTCT services, which also increases the intention of women living with HIV to access the PMTCT services.²⁴ According to these findings, increasing the knowledge related to PMTCT service can reduce the barriers among women living with HIV.

This study also found that the experience of stigma and discrimination from partners decreases the likelihood of accessing PMTCT services among women living with HIV. This finding was similar to another study, as unsupportive treatment from partners also detains the utilization of services.²⁵ Although this study found no association between experiencing stigma and discrimination from health providers, other studies mentioned that women living with HIV are afraid of receiving

Table 5. Factors associated with the utilization of PMTCT services for HIV, Syphilis, and Hepatitis B among women living with HIV during the COVID-19 pandemic.

Variable	Model I		Model II	
	aOR	95% CI	aOR	95% CI
Age (years old)	0.98	0.95 – 1.02	0.99	0.96 – 1.04
Level of education				
Low	Ref		-	-
High	1.15	0.65 – 2.05	-	-
Employment status				
Unemployed	Ref		Ref	
Employed	0.84	0.52 – 1.36	0.95	0.57 – 1.60
Pregnancy status				
Is having pregnancy	Ref		-	-
Planning to get pregnant within the next 1 or 2 years	1.22	0.44 – 3.38	-	-
Level of knowledge				
Low knowledge			Ref	
Good knowledge			1.10	0.65 – 1.86
Perceived susceptibility				
Less susceptible			Ref	
High susceptible			0.48	0.20 – 1.14
Perceived severity				
Less severe			Ref	
High severe			2.07**	1.21 – 3.54
Perceived benefits				
Fewer benefits			Ref	
High benefits			0.64	0.34 – 1.19
Perceived barriers				
Fewer barriers			Ref	
High barriers			0.56*	0.31 – 0.99
Cues to action				
Low			Ref	
High			1.69	0.79 – 3.67
Self-efficacy				
Low efficacy			Ref	
High efficacy			0.77	0.38 – 1.56
Stigma and discrimination from a health provider				
Never			Ref	
At least once or more			0.84	0.48 – 1.47
Stigma and discrimination from partner				
Never			Ref	
At least once or more			0.50*	0.25 – 0.99

Note: * p -value < 0.05; ** p -value < 0.01

sub-optimal treatment.²⁶ Moreover, stigma and discrimination from the community are also important barriers to continued participation in the PMTCT program.²⁵

As stigma and discrimination still occurred and inhibited the utilization of PMTCT services among women living with HIV, it was essential to provide services that were free from stigma and discrimination, as well as social support to reduce the impact of stigma and discrimination experience. A study in

Yogyakarta found that social support from the midwife can improve the utilization of PMTCT services.²⁷ Other studies also found that social support from peer support groups and health providers can reduce the impact of stigma and discrimination, which increases the confidence of women living with HIV in accessing PMTCT services.^{28,29}

Meanwhile, this study found that perceived severity increases the likelihood of women living with HIV accessing the

PMTCT for HIV, Syphilis, and Hepatitis B. Women living with HIV will become more likely to access the health services because they are afraid of transmitting diseases to their babies, as well as afraid of the severe health.³⁰ According to this finding, increasing the perception of severity through health promotion among women with HIV is essential to encourage women living with HIV to access the PMTCT services.

This study has some limitations. This

study uses online survey data collection that targets a vulnerable population such as women living with HIV. Some of the respondents hesitated to participate in the survey due to being afraid of confidentiality, even though we stated their informed consent at the beginning of the online questionnaire. In addition, this study was also unable to depict the information related to stigma and discrimination experiences, which was important to be explored among women living with HIV. Therefore, a further study that explores the time-to-event and types of stigma must be included.

Moreover, conducting a qualitative study could be essential to get a deeper understanding of the effect of stigma and discrimination on the willingness to access health services. Even though some limitations, this study has provided detailed information on the determinants of services utilization of PMTCT for HIV, Syphilis, and Hepatitis B among women living with HIV during the COVID-19 pandemic in Indonesia. The finding of this study could be used to improve the PMTCT services in Indonesia, especially those targeting women living with HIV.

CONFLICT OF INTEREST

The authors confirmed that the research was conducted without any commercial or financial relationships construed as a potential conflict of interest.

ETHICAL CLEARANCE

This study has been approved by the Research Ethics Commission Institute of Research and Community Services, Universitas Katolik Indonesia Atma Jaya with the document number 0030F/III/LPPM-PM.10.05/10/2021. Participation in this study was voluntary and anonymous. No sensitive information such as the respondent's identity was collected in this study. In addition, only the authorized researcher is allowed access to the password-encrypted dataset.

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AUTHOR CONTRIBUTION

NPAH conceived the idea. NPAH analyzed the data. NPAH drafted the manuscript. NPAH, SN, MS, OSM, and ASW critically reviewed and approved the final version of the manuscript. All authors contributed to the article and approved the submitted version.

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