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Determinants of Pregnant Women Participation on Triple Elimination of HIV, Syphilis, and Hepatitis B, in Semarang

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ABSTRACT

Background: HIV, Syphilis, and Hepatitis B infections are very susceptible to transmission from mother to child during pregnancy, childbirth, and breastfeeding. In 2014, the World Health Organisation (WHO) established a list of validation criteria to facilitate efforts of elimination of mother-to-child transmission (EMTCT) of HIV and syphilis. This study aimed to analyze determinants of pregnant women participation in the triple elimination uptake.

Subjects and Method: This was a cross sectional study conducted at 25 Public health centers, in Semarang District, Central Java, from December 2019 to February 2020. A sample of 200 pregnant women was selected by random sampling. The dependent variable was triple elimination. The independent variables were intention, access to information, knowledge, outcome expectation, modeling, distance, self-efficacy, and husband support. Community health center was variable in level 2. The data were collected by questionnaire and analyzed by a multiple logistic multilevel analysis.

Results: Triple elimination participation in pregnant women increased with good access to information (b= 1.76; 95% CI= 16.72 to 102.18; p<0.001), good knowledge (b= 2.09; 95% CI= 10.91 to 56.14; p<0.001), positive outcome expectation (b= 2.03; 95% CI= 12.93 to 71.91; p<0.001), strong modeling (b= 2.03; 95% CI= 2.83 to 1.64, p< 0.001), strong intention (b= 2.43; 95% CI= 8.49 to 46.22; p <0.001), strong self-efficacy (b= 2.48; 95% CI= 12.64 to 72.37; p<0.001), and strong husband support (b= 1.97; 95% CI= 12.2 to 65.24; p <0.001). Triple elimination participation in pregnant women decreased with further distance to health center (b= -2.20; 95% CI= 0.41 to 1.38; p= 0.032). Public health center had contextual effect on the participation of triple elimination in pregnant women with ICC= 40.64%.

Conclusion: Triple elimination participation in pregnant women increases with good access to information, good knowledge, positive outcome expectation, strong modeling, strong intention, strong self-efficacy, and strong husband support. It decreases with further distance to health center. Public health center has contextual effect on the participation of triple elimination in pregnant women

Keywords: triple elimination, HIV, Syphilis, Hepatitis B, multilevel analysis

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BACKGROUND

Three infectious diseases that are very susceptible to transmit from mother to child during pregnancy, childbirth and breast-feeding are HIV, Syphilis and Hepatitis B infections. These diseases can cause morbidity, disability and death, thus adversely affecting the survival and quality of life of

children (Moura et al., 2015). Through the Elimination of Mother to Child Transmission (EMTCT) program, it can give every child the greatest opportunity to start a healthy life free from infectious diseases (WHO, 2018).

HIV prevalence in pregnant women in the Asia Pacific is 71,000 cases and only (46%) are receiving antiretroviral therapy (ART), in newborns by 15,000 cases (rate of transmission from mother to child by 21%). The incidence of syphilis infection in pregnancy is 167,000 cases and (15%) has chronic hepatitis B (WHO, 2018). In Indonesia the prevalence of infection in pregnant women for HIV cases is 0.39%, syphilis by 1.7% and hepatitis B by 2.5%. The risk of transmission from mother to child for HIV is 20% - 45%, syphilis transmission is 69 - 80%, and for hepatitis B transmission is ≥90%. Transmission of HIV infection, syphilis, and hepatitis B in children ≥90% are infected vertically from mothers (Ministry of Health, Republic of Indonesia, 2018).

The number of new cases of HIV in Central Java in 2017 was 2,270 cases, higher than the discovery of HIV cases in 2016 of 1,867. The number of syphilis infections was 181 cases and hepatitis B was 160 cases, the largest infections occurred in the fertile age group, between the ages of 25 to 49 years (Dinas Kesehatan, Central Java Province, 2017). In Semarang district, HIV infection was the highest case with 42 cases, and in pregnant women during January - June 2019 with 3 cases, hepatitis B in pregnant women with 79 cases and syphilis infection in pregnant women with 14 cases (Semarang District Health Office, 2019).

Transmission of infection from mother to infants can be prevented by a simple and effective intervention in the form of early detection (screening) during antenatal care, early treatment, and immunization (Bristow et al., 2016). In line with

the goals of sustainable development or Sustainable Development Goals (SDGs) 3, to ensure the survival of children it is necessary to make efforts to break the chain of transmission of HIV, syphilis, and hepatitis B (Taylor et al., 2017).

Triple elimination inspection efforts have been carried out in Semarang District, but preliminary data from January - June 2019 show that the scope of the implementation of tri elimination has not reached 50% (Semarang District Health Office, 2018). The coverage is still low, so it requires more efforts to reach the target. The target in 2022 is to reduce the number of new cases of HIV infection, syphilis and hepatitis B in newborns by <50 cases/ 100,000 live births (Ministry of Health Republic of Indonesia, 2017).

Public health center as a health facility at the first primary level that is easily accessible by the whole community. Accredited health centers have good resources and infrastructure so that they are able to motivate pregnant women to carry out tri-elimination checks (Anggraeni et al., 2016).

Lack of knowledge and lack of information, lack of support to carry out triple elimination examinations in pregnant women results in high rates of transmission and transmission of HIV, syphilis, and Hepatitis B infections from mother to baby (Mehta et al., 2015). Several other factors such as intention, distance affordability, support from a partner, self-efficacy and outcome expectations can also influence examination visits (Visser et al., 2019).

SUBJECTS AND METHOD

1. Study Design
This was an analytic observational study with a cross sectional design. The study was conducted at 25 public health centers in Semarang, Central Java, from December 2019 to February 2020.

2. Population and Sample

The study population was pregnant women. A sample of 200 pregnant women in Semarang, Central Java was selected by simple random sampling.

3. Study Variables

The dependent variable was participation in triple elimination. The independent variables were access to information, knowledge, outcome expectation, modeling, distance, intention, self-efficacy, and husband support.

4. Operational Definition of Variables

Access to information was the frequency and ease of pregnant women in obtaining information about triple elimination. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= lack (score <3) and 1= good (score ≥3).

Knowledge was the understanding of pregnant women about the triple elimination of learning outcomes or information obtained. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= poor (score <4) and 1= good (socre ≥4).

Outcome expectation was the results or benefits expected by pregnant women from the tri elimination examination that will be carried out. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= negative (score <15) and 1= positive (score ≥15).

Modeling was the process of learning by watching and observing the behavior of others, then repeating the behavior. The data were collecetd by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= weak (score <15) and 1= strong (score ≥15).

Distance was the distance traveled by a pregnant woman from her home to the Public health center in kilo meters. The data were collecetd by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= close distance (<5 km) and 1= long distance (≥5 km).

Intention was the desire of pregnant women to do or not do the elimination tri-examination. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= weak (score <17) and 1= strong (score ≥17).

Self-efficacy was the ability of mothers to have confidence in themselves in carrying out tri elimination checks. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= low (score <15) and 1= high (score ≥15).

Husband support was a response from the presence or absence of encouragement, motivation, advice that will influence pregnant women to continue or stop the tri elimination examination. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0= negative (score <3) and 1= positive (score ≥3).

5. Data Analysis

Univariate analysis is used to describe each dependent and independent variable. The data is then grouped according to the type of data and entered into a frequency distribution table.

Bivariate analysis was used to determine the relationship between the independent variables and the dependent variable with the Chi-square test.

Multivariate analysis can explain the effect of independent variables on the dependent variable with multilevel analysis techniques. The individual level in this study is pregnant women and the community level is the Public health center.

6. Research Ethics

This study was conducted based on research ethics, namely informed consent, anonymity, confidentiality, and ethical eligibility. Ethics permit in this study was obtained from the Ethics Commission of Dr. Moewardi Hospital, Surakarta, Indonesia, No. 1,328/XII/HREC/2019.

RESULTS

1. Sample Characteristics

Characteristics of the sample describe continous data which are then identified based on access to information, knowledge, outcome expectation, intention, modeling, distance, self-efficacy, and husband support. The results of the analysis of continuous data characteristics are shown in table 1.

Table 1. Sample characteristics of continuous data

Variable	N	Mean	SD	Min.	Max.
Information access	200	3.01	1.78	0	5
Knowledge of pregnant women	200	4.17	2.61	1	7
Outcome expectation	200	15.72	8.79	5	25
Modeling	200	15.79	9.02	5	25
Distance to health center	200	5.88	3.77	1	14
Intention	200	17.55	8.36	5	25
Self-efficacy	200	15.58	9.17	5	25
Husband support	200	3.09	1.73	0	5

Table 2. Sample characteristics of categorical data

Independent Variable	n	%
Triple Elimination Participation		
Yes	120	60.0
No	80	40.0
Information access		
Good (≥ 3)	115	42.5
Lacking (< 3)	85	57.5
Education		
Good (≥ 4)	117	58.5
Lacking (< 4)	83	41.5
Outcome expectation		
Positive (≥ 15)	113	56.5
Negative (< 15)	87	43.5
Modeling		
Strong (≥ 15)	113	56.5
Weak (< 15)	87	43.5
Distance to health center		
Far (≥ 5 km)	99	49.5
Close (< 5 km)	101	50.5
Intention		
Strong (≥ 17)	136	68.0
Weak (< 17)	64	32.0
Self-Efficacy		
High (≥ 15)	110	55.0
Low (< 15)	90	45.0
Husband support		
Positive (≥ 3)	121	60.5
Negative (< 3)	79	39.5

Table 2 shows a description of the results of study on each of the variables. the percentage of study subjects who participated did a tri elimination check of 120 subjects (60%) and who did not do a tri elimination check of 80 subjects (40%). There were 115 (57.5%) had good information access and 85 subjects (42.5%) had less information access. There are 117 subjects (58.5%) have good knowledge and 83 subjects (41.5%) have less knowledge. Pregnant women with a positive expectation outcome of 113 (56.5%) and pregnant women with a negative expectation outcome of 87 (43.5%). There were 113 subjects (56.5%) had strong modeling and 87 (43.5%) subjects with weak modeling. Pregnant women with a long distance of 94 subjects (47.0%) and mothers with a short distance to the health center by 106 (53.0%).

Pregnant women with strong intention of 136 (68.0%) and mothers with weak intentions of 64 (32.0%). Pregnant women with high self-efficacy by 110 subjects (55.0%) and mothers with low self-efficacy by 90 subjects (45.0%). There were 121 study subjects (60.5%) had positive support and 79 (39.5%) had negative support.

Table 3. Chi square test of factors influencing tri elimination participation

Independent variables	Triple Elimination Participation				OR	p
	Yes		**No**			
	n	**%**	**n**	**%**		
Information access						
Good	104	90.43	11	9.57	40.77	<0.001
Lacking	16	18.82	69	81.18		
Knowledge						
Good	102	87.18	15	12.82	24.56	<0.001
Lacking	18	21.69	65	78.31		
Outcome Expectation						
Positive	101	89.38	12	10.62	30.12	<0.001
Negative	19	21.84	68	78.16		
Modeling						
Strong	87	76.99	26	23.01	5.48	<0.001
Weak	33	37.93	54	62.07		
Distance to health center						
Far (≥5km)	53	56.38	41	43.62	0.75	0.032
Close (<5km)	67	63.21	39	36.79		
Intention						
Strong	109	80.15	27	19.85	19.45	<0.001
Weak	11	17.19	53	82.81		
Self-Efficacy						
High	99	90	11	10	29.57	<0.001
Low	21	23.33	69	76.67		
Husband Support						
Positive	105	86.78	16	13.22	28	<0.001
Negative	15	18.99	64	81.01		

2. Bivariate Analysis

Table 3 shows that pregnant women with good information access were 41 times more likely to have triple elimination than those with less information access (OR= 40.77; p <0.001).

Pregnant women with good knowledge are 25 times more likely to have a triple elimination (OR= 24.56; p<0.001) than those with poor knowledge.

Pregnant women with positive outcome expectation were 30 times more likely

to have triple elimination than those with negative outcome expectation (OR= 30.12; p <0.001).

Pregnant women with strong modeling were 5 times more likely to do a triple elimination than those with weak modeling (OR= 5.48; p<0.001).

Pregnant women with strong intention have the possibility to carry out triple elimination 19 times than those with weak intentions (OR= 19.45; p <0.001).

Pregnant women with strong self-efficacy were 29 times more likely to have a triple elimination than than those with weak self-efficacy (OR = 29.57; p <0.001).

Pregnant women with strong husband support are 28 times more likely to have a triple elimination than those with weak husband support (OR= 28; p <0.001).

Pregnant women with far distances to health center reduced the possibility to participate in triple elimination by 0.75 (OR= 0.75; p = 0.032).

3. Multivariate Analysis

Table 4 shows that participation of triple elimination in pregnant women increased with good access to information (b= 1.76; 95% CI= 0.08 to 3.44; p= 0.040), high knowledge (b= 2.09; 95% CI= 0.28 to 3.89; p= 0.023), positive outcome expectation (b= 2.03; 95% CI = 0.31 to 3.74; p = 0.021), strong modeling (b = 2.03; 95% CI = 0.17 to 3.88; p= 0.032), strong intention (b= 2.43; 95% CI= 0.79 to 4.06; p= 0.004), strong self-efficacy (b= 2.48; 95% CI= 0.19 to 4.76; p= 0.033), and strong husband support (b= 1.97; 95% CI= 0.36 to 3.58; p= 0.017).

Participation in triple elimination decreased with far distance (≥5 km) to the health center (b= -2.20; 95% CI= -4.08 to -0.33; p= 0.021).

Public health center had strong contextual effect of the triple elimination participation in pregnant women with ICC= 40.64%. This means that 40.64% of the variation in tri elimination examination participation is influenced by factors at the public health center level.

Table 4. Multiple multilevel logistic regression analysis of factors affecting triple elimination participation

Independent Variable	Regression Coef. (b)	95% CI		p
		Lower Limit	Upper Limit	
Fixed Effect				
Information access (good)	1.76	0.08	3.44	0.040
Knowledge (good)	2.09	0.28	3.89	0.023
Outcome expectation (positive)	2.03	0.31	3.74	0.021
Modeling (strong)	2.03	0.17	3.88	0.032
Distance (far)	-2.20	-4.08	-0.33	0.021
Intention (strong)	2.43	0.79	4.06	0.004
Self-Efficacy (high)	2.48	0.19	4.76	0.033
Husband support (positive)	1.97	0.36	3.58	0.017
Random Effect				
Public health center	2.25	0.31	16.07	
Var (constanta)				
n observation = 200				
n Public health center = 25				
Log likehood = - 36.22				
LR test vs. logistic regression, p= 0.027				
ICC = 40.64%				

DISCUSSION

1. Effect of information access on participation in triple elimination in pregnant women

Information from health workers as health counselors, is very important in helping mothers make the decision to conduct an examination (Moreira et al., 2019).

The results of this study are in line with Lovero et al. (2018) stating that 24% of pregnant women did not take the triple elimination examination because they did not have access to information about the examination. Good access to information in the form of health cadre counseling, health workers and fellow pregnant women increases the understanding of mothers about screening, so this is one of the initial factors that can increase the motivation of mothers to take the tri elimination examination.

2. Effect of knowledge on participation in triple elimination

One's knowledge can be obtained from experience and understanding that comes from various sources such as: close relatives, mass media, electronic media, print media (manuals), health workers (Thisyakorn, 2017).

Pregnant women with insufficient knowledge frighten the stigma associated with HIV, syphilis and hepatitis B and lead to a misunderstanding of the risk and severity of the disease. In addition, there is a possibility that mothers cannot realize the benefits of the examination that they will be doing so that increases the chances of mothers to refuse and not continue the examination (El Bcheraoui et al., 2015).

The results of this study are in line with Shamizadeh et al. (2019), which explains that a high level of knowledge (90%) will increase audit participation rather than low knowledge (68%).

3. Effect of outcome expectation on participation in triple elimination in pregnant women

A positive outcome expectation increase behavior. Outcome expectation is strongly influenced by the environment in which observers grow (Murti, 2018).

Results expectation is a strong motivator to be able to participate in triple elimination examinations, so it is important to provide better information and support at the community level and health providers for pregnant women (Penda et al., 2019). This means that before it becomes a behavior, individuals, it is necessary to know the perceived benefits of the expected results to finally be done alone. This is consistent with research conducted by (Tamir et al., 2018) stating that the expectation of knowing HIV status to prevent transmission (90.2%) is the biggest driving factor for using tri elimination services.

4. Effect of modeling on participation in triple elimination

The results of this study support the social cognitive theory (SCT) found by Bandura which states that when an individual observes a model that is doing a behavior, then that person will use that information to guide the behavior to be carried out. The modeling process will have a major impact on one's personality. Following a good example will encourage individuals to do good deeds and vice versa (Murti, 2018).

Observing other people will expand the opportunity to understand and make a comparison (comparative) of themselves with others. So that it will change one's self-concept and increase the likelihood of imitating the behavior of others (Oyugi et al., 2017). The results of this study are supported by Masters et al. (2016) which states that a pregnant woman is more likely to do the examination (37.2% increased to 75%) after seeing and imitating other

mothers to do the examination, than pregnant women who have never seen other pregnant women doing the same examination (48% increased to 58%)

5. Effect of home distance on triple elimination

Distance is a possible factor in improving health checks. The distance to access health services that are increasingly far away is one of the factors that prevent pregnant women from carrying out triple elimination checks (Isah et al., 2019).

The results of this study are consistent with research by Lerebo et al. (2014) which shows that a mother who lives within a radius of <1 km with a health facility has a higher chance of having a PMTCT than a mother who lives within a radius of ≥5 km. As health facilities get closer to where you live, the chances of getting PMTCT services increase.

6. Effect of intention on participation in triple elimination in pregnant women

According to Theory Planned of Behavior (TPB), the greater the intention, the more likely the behavior will occur. Intention forms the behavior of a person (Murti, 2018).

The results of this study are consistent with Angulo et al. (2019) which shows that pregnant women who have strong intention have 4.16 times to do a screening examination (b= 4.16; 95% CI= 1.53 - 11.28) with strong intentions they are able to take a stand towards positive behavior in this case conducting a tri examination elimination to prevent the transmission of HIV, syphilis and Hepatitis B infections to their babies.

7. Effect of self-efficacy on the participation of triple elimination in pregnant women

One construct in social cognitive theory explains that the more skilled an individual is to perform a behavior, the greater the

self-confidence to perform the behavior (Murti, 2018).

Self-efficacy is a feeling that drives someone to take an action or work to achieve the goals to be achieved that come from individuals. Self-efficacy is one of the internal factors related to the intention and decision to perform certain behaviors (Curry et al., 2018).

The results of this study are in accordance with Elsheikh et al. (2015) in Sudan, which states that only 7% of pregnant women want to take an HIV test and this is influenced by one of them by self-efficacy which has a positive impact on HIV screening.

8. Effect of partner support on participation in triple elimination in pregnant women

Behavior is formed from two main factors, namely stimulus and response. In a stimulus there are external factors, and internal factors. Social support for pregnant women can be sourced from a partner. The husband does not directly affect the utilization of health services, but as a motivational factor to generate intention in utilizing health services (Fan et al., 2016).

The results of this study support social cognitive theory (SCT) which in one construct is reinforcement of behavior that is an internal response (an initiative from within oneself) or external (from the environment in the form of partner support) to an individual behavior that will influence the individual to continue or stop a behavior (Murti, 2018).

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