



The Association Between Pregnant Women's Knowledge of Triple Elimination and Compliance with Screening Examinations

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Abstract: Knowledge about Triple Elimination, an integrated screening program for HIV, hepatitis B, and syphilis, plays a vital role in improving pregnant women's adherence to early detection procedures during the first trimester. Strengthening maternal awareness is essential to prevent mother-to-child transmission of these infections. This study aimed to examine the association between pregnant women's knowledge of Triple Elimination and their compliance with the recommended screening examinations. A quantitative descriptive design with a cross-sectional approach was employed. A total of 350 pregnant women were selected as the study sample. Data were analyzed using the chi-square statistical test to determine the association between knowledge levels and examination compliance. The results showed a significant relationship between knowledge about Triple Elimination and screening compliance ($p = 0.000$; $\alpha = 0.05$), indicating that higher levels of maternal knowledge were associated with greater adherence to the recommended tests. This study highlights the importance of strengthening educational strategies to improve maternal knowledge and ensure consistent compliance with Triple Elimination screening. The findings can serve as evidence for policymakers and healthcare providers in designing sustainable interventions to enhance maternal and neonatal health outcomes.

Keywords: Maternal knowledge; Pregnant women; Screening compliance; Triple elimination

Introduction

The global burden of infectious diseases transmitted from mother to child—particularly HIV, syphilis, and hepatitis B—remains a significant public health challenge. Despite advances in diagnostic technologies and access to treatment, vertical transmission continues to contribute to neonatal morbidity and mortality worldwide. This situation is exacerbated by the “tip of the iceberg” phenomenon, in which reported cases represent only a fraction of actual infections due to underdiagnosis and underreporting

(UNAIDS, 2022). Consequently, strengthening early detection among pregnant women has become a priority in achieving improved maternal and child health outcomes.

Globally, the burden of HIV, syphilis, and hepatitis B remains substantial. In 2020, an estimated 1.7 million new HIV infections were recorded, with 12 million people living with HIV at risk of progressing to AIDS without treatment, and more than 700,000 deaths reported in 2019 (UNAIDS, 2023). Syphilis contributes to half of all adverse pregnancy outcomes, including fetal death, with a global prevalence of 0.32% (WHO, 2023).

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Hepatitis B prevalence in Southeast Asia is approximately 2% (Pusat Data dan Informasi Kementerian Kesehatan Republik Indonesia, 2023). In Indonesia, the prevalence of HIV, syphilis, and hepatitis B in pregnant women has reached 0.39%, 1.7%, and 2.5%, respectively, with more than 41,987 HIV cases identified in 2020, 13% of which were found among pregnant women (Yunita, 2023). These epidemiological patterns highlight the urgent need for integrated maternal screening to prevent vertical transmission (Kementerian Kesehatan Republik Indonesia, 2017, 2022).

To address this challenge, the WHO introduced the Triple Elimination initiative—an integrated strategy aimed at eliminating mother-to-child transmission (EMTCT) of HIV, syphilis, and hepatitis B (Yuliana et al., 2024). Indonesia operationalized this initiative through the Ministry of Health Regulation No. 52 of 2017, which outlines national goals for reducing new infections, mortality, and stigma by 2030. Despite this policy framework, screening coverage remains far below national targets. As of January–June 2024, screening rates reached only 33% for HIV, 29% for syphilis, and 30% for hepatitis B (Ministry of Health of the Republic of Indonesia, 2024). These low coverage levels, along with regional disparities, indicate that many pregnant women are not undergoing recommended tests, thereby increasing the risk of vertical transmission and adverse infant outcomes—including low birth weight, congenital abnormalities, liver disease, and infant mortality (Lestari et al., 2021; Yunita, 2023).

Existing evidence suggests that maternal knowledge significantly influences adherence to Triple Elimination screening (Gudino, 2023). Limited knowledge, social stigma, and misconceptions about HIV, syphilis, and hepatitis B often contribute to screening refusal among pregnant women (Fatimah et al., 2020; Muryati & Kusuma, 2023). Yuliana et al. (2024) found that pregnant women with poor knowledge had a 3.52-fold higher risk of non-compliance with Triple Elimination testing. However, empirical studies examining this association remain limited, particularly in the context of national screening targets for 2025 (World Health Organization, 2023). This research fills that gap by analyzing the relationship between pregnant women's knowledge and their compliance with Triple Elimination tests. Understanding this relationship is crucial for informing more effective educational strategies and improving screening coverage. Therefore, this study aims to determine the association between pregnant women's knowledge of Triple Elimination and examination compliance in 2025, providing evidence to support targeted maternal health interventions.

Method

Time and Place of the Research

This study was conducted from January to June 2025 in two provinces in Indonesia, namely Jakarta and Banten. Data collection was carried out in selected maternal and child health centers (Puskesmas) and affiliated healthcare facilities that routinely implement the Triple Elimination screening program.

Study Design

This research employed a quantitative analytic approach with a cross-sectional design, in which data on the independent and dependent variables were collected at the same point in time. The study population consisted of all pregnant women who received antenatal care services in Jakarta and Banten during the study period. A total sample of 350 pregnant women was determined using the Slovin formula, with a margin of error of 5%. The sampling technique used was proportionate stratified random sampling, ensuring equal representation from both provinces, as recommended in standard sampling references (Sastroasmoro & Ismail, 2014). The independent variable in this study was the level of knowledge about the Triple Elimination program, while the dependent variable was the pregnant women's compliance with Triple Elimination screening examinations. Data were collected using a structured questionnaire validated through expert judgment and reliability testing (Cronbach's alpha > 0.70). The research employed tools such as questionnaires, informed consent forms, and documentation sheets, while materials used included printed instruments and digital recording devices for data accuracy and verification.

Procedure

The research began with obtaining ethical approval from the relevant health ethics committee, followed by coordination with the health offices and selected healthcare facilities in Jakarta and Banten. The next stage involved the preparation of research instruments, including questionnaire validation through content validation and reliability testing. After instrument preparation, the researchers conducted participant recruitment based on inclusion criteria: pregnant women in any trimester, willing to participate, and able to communicate in Bahasa Indonesia. Participants who met the criteria were provided with informed consent and subsequently guided to complete the questionnaire. Data collection was carried out by trained enumerators who followed standardized procedures to ensure consistency. Completed questionnaires were then checked for completeness, coded, and entered into a database to minimize errors. Data cleaning, verification,

and quality control were conducted before the dataset was processed for statistical analysis.

Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Univariate analysis was performed to describe the distribution of participant characteristics and research variables. Bivariate analysis using the chi-square test was employed to determine the association between knowledge of the Triple Elimination program (independent variable) and compliance with screening examinations (dependent variable). A significance level of $\alpha = 0.05$ was applied, and results were interpreted based on p-values and prevalence ratios.

Result and Discussion

Compliance of Pregnant Women with Triple Elimination Examinations

This study examined the level of compliance among pregnant women in undergoing Triple Elimination examinations, which include screening for HIV, syphilis, and hepatitis B. The data were analyzed descriptively to provide an overview of respondent behavior toward the recommended screening procedures. Table 1 presents the distribution of compliance among the 350 respondents.

Table 1. Distribution of Compliance with Triple Elimination Examinations (n = 350)

Compliance Level	Frequency (F)	Percentage (%)
Compliant	233	66.6
Non-compliant	117	33.4
Total	350	100

As shown in Table 1, the majority of pregnant women (233 respondents or 66.6%) were compliant with the Triple Elimination examination, while 117 respondents (33.4%) did not complete the recommended screening.

Table 3. Cross-tabulation of Knowledge and Compliance with Triple Elimination Screening (n = 350)

Knowledge Level	Compliant		Non-compliant		Total		p-value	OR
	f	%	f	%	f	%		
Good	208	93.7	14	6.3	222	100	0.000	61.211
Poor	25	19.5	103	80.5	128	100		
Total	233	66.6	117	33.4	350	100		

Discussion

This study found that most pregnant women were compliant with Triple Elimination screening, with 66.6% completing the recommended examinations. This level of compliance shows moderate effectiveness of

Knowledge Level of Pregnant Women About Triple Elimination

In addition to assessing compliance, this study also evaluated maternal knowledge regarding the Triple Elimination program. Knowledge is considered an important determinant of maternal participation in early detection of infectious diseases. Table 2 presents the frequency distribution of respondents based on their knowledge level.

Table 2 shows that most respondents had good knowledge of the Triple Elimination program (222 respondents or 63.4%), while 128 respondents (36.6%) demonstrated poor knowledge.

Table 2. Distribution of Knowledge Level among Pregnant Women (n = 350)

Knowledge Level	Frequency (F)	Percentage (%)
Good	222	63.4
Poor	128	36.6
Total	350	100

The Relationship Between Knowledge and Compliance with Triple Elimination Examinations

To determine the association between knowledge and compliance with screening examinations, a chi-square test was performed. The cross-tabulation and statistical results are presented in Table 3.

Based on the results in Table 3, the majority of pregnant women with good knowledge were compliant with Triple Elimination examinations (208 respondents or 93.7%). In contrast, most respondents with poor knowledge were non-compliant (103 respondents or 80.5%).

The chi-square test showed a p-value of 0.000 ($p < 0.05$), indicating a statistically significant relationship between knowledge level and compliance. The Odds Ratio (OR) = 61.211, meaning that pregnant women with good knowledge were 61 times more likely to comply with Triple Elimination examinations than those with poor knowledge. Since the OR value is greater than 1, knowledge is identified as a strong predictor of compliance.

screening programs but also reflects significant gaps, considering that one-third of pregnant women still did not complete the required tests. Previous studies have reported similar patterns, suggesting that screening uptake remains suboptimal in several regions due to a

combination of knowledge gaps, limited access, and psychosocial factors (Kementerian Kesehatan Republik Indonesia, 2024; WHO, 2023).

The results demonstrated that 63.4% of respondents had good knowledge of Triple Elimination. Knowledge is a key determinant in maternal health behavior and plays an important role in enabling pregnant women to make informed decisions about screening. This is consistent with the Health Belief Model (HBM), which states that individuals' health actions are heavily influenced by perceived susceptibility, perceived severity, and cues to action—all of which are improved by accurate knowledge (Janz & Becker, 1984; Rosenstock, 1974, 1977). Thus, knowledge enhancement remains a fundamental strategy for increasing participation in prenatal screening.

The present study found a statistically significant relationship between knowledge and compliance, with a p-value of 0.000 and an odds ratio (OR) of 61.211. This indicates that pregnant women with good knowledge were substantially more likely to comply with Triple Elimination screening than those with poor knowledge. These findings are aligned with Yuliana et al. (2023), who also reported a significant association between knowledge and screening compliance ($p = 0.004$) and found that poor knowledge increased the risk of non-compliance by 3.52 times.

Similarly, research by Fatmiasih et al. (2023) reported that even though some respondents had not fully understood the Triple Elimination program, those with adequate knowledge were more likely to engage in screening procedures. Anggraeni (2024) also found that knowledge significantly affects compliance, emphasizing that higher maternal knowledge correlates with higher screening adherence. Collectively, these studies reinforce that knowledge acts as a behavioral driver influencing preventive health practices during pregnancy.

These results can be explained through behavioral theory principles, which suggest that knowledge affects attitudes, beliefs, and perceived benefits, all of which shape compliance behaviors (Glanz et al., 2015). Accurate knowledge about HIV, syphilis, and hepatitis B strengthens awareness of potential risks and encourages active participation in preventive health actions.

Given the strong relationship between knowledge and compliance, strengthening health education is imperative. Healthcare providers—especially midwives and maternal health officers—should deliver more comprehensive counseling during antenatal care (ANC) visits. Evidence shows that consistent and structured health education significantly increases pregnant women's participation in maternal screening programs (UNAIDS, 2022; WHO, 2023).

Furthermore, community-based information strategies such as digital education, peer support groups, and mother classes can help reduce stigma and misconceptions surrounding infectious disease screening. Ensuring accessibility and clarity of information may also support improved compliance with the Triple Elimination program.

Conclusion

The findings of this study indicate that most pregnant women possess good knowledge and demonstrate adequate compliance with Triple Elimination screening. The analysis also shows a statistically significant relationship between knowledge level and screening compliance, whereby pregnant women with good knowledge are substantially more likely to adhere to triple elimination examinations compared to those with insufficient knowledge. These results highlight the importance of strengthening educational and counseling efforts for pregnant women to improve awareness, understanding, and adherence to triple elimination programs as part of preventive maternal and neonatal health strategies.

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Author Contributions

S.S.N. and A.P. contributed to the conceptualization of the study. H.F. and I.M. developed the methodology. I.Ms. was responsible for software management and data processing. Validation was conducted by S.S.N., A.P., and H.F. Formal analysis was performed by N.K.K., while R.R.M. carried out the investigation. Resources were provided by A.P., and data curation was completed by I.Ms. The original manuscript draft was prepared by S.S.N. and H.F., whereas I.M. and N.K.K. contributed to writing review and editing. Visualization activities were handled by I.Ms. Supervision was provided by S.S.N., and project administration was managed by A.P. Funding acquisition was carried out by S.S.N.

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Conflicts of Interest

The authors declare no conflict of interest.

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