



## **Factors Influencing The Behavior of Pregnant Women in Triple Elimination Screening**

**Iskandar Muda<sup>1\*</sup>, Erika<sup>1</sup>, Chalermchai Khemkhaeng<sup>2</sup>**

<sup>1</sup>Riau University, Indonesia

<sup>2</sup>Prince of Songkla University, Thailand

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### **Abstract**

Pregnant women are a vulnerable group to sexually transmitted infections such as HIV/AIDS, hepatitis B, and syphilis, which can have serious effects on both maternal and fetal health. These infections can be vertically transmitted from mother to baby, potentially leading to premature birth, low birth weight, congenital defects, or neonatal death. The objective of this systematic review is to identify the factors influencing pregnant women's behavior in undergoing triple elimination screening. The databases used were PubMed, Science Direct, and Google Scholar. The keywords employed were factors influencing the behavior of pregnant women in triple elimination screening. A total of 7 articles were obtained from the literature search. The search results were filtered using the PICO framework and the CRAAP method. The study identified five factors influencing the behavior of pregnant women in triple elimination screening, namely: the role of healthcare providers, information sources, family support, utilization of prenatal classes, and maternal age. This analysis concludes that five factors influence the behavior of pregnant women in triple elimination screening: the role of healthcare providers, information sources, family support, utilization of prenatal classes, and maternal age. However, further research is needed to explore additional factors that may affect the behavior of pregnant women in triple elimination screening.

### **Keywords**

triple elimination; behavior; pregnant women

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\*Corresponding Author: Iskandar Muda (E-mail: iskandarsaja30@gmail.com)

## Introduction

Pregnant women represent a highly vulnerable group to sexually transmitted infections (STIs) such as HIV/AIDS, hepatitis B, and syphilis, which pose significant health risks to both the mother and the fetus. These infections can lead to severe complications, including premature birth, low birth weight, congenital anomalies, or even neonatal mortality (Armini, Sriasih, & Marhaeni, 2020). The transmission of these infections from mother to child during pregnancy, childbirth, or breastfeeding—known as Mother-to-Child Transmission (MTCT)—remains a critical public health concern (Wardiana et al., 2022).

The World Health Organization (WHO) reported that in 2021, approximately 1.3 million women worldwide were living with HIV, with 57% of infected children acquiring the virus through MTCT. The estimated number of children living with HIV reached 1.8 million. Moreover, around 16% of pregnant women were estimated to be infected with hepatitis B and syphilis, yet only 6% received appropriate treatment (WHO, 2022). In sub-Saharan Africa, 75% of new HIV infections among individuals aged 15–19 occurred in young women and adolescent girls (Namara-Lugolobi et al., 2022).

To address this issue, the WHO introduced the Triple Elimination screening program, which integrates HIV, hepatitis B, and syphilis screening for pregnant women (WHO, 2021). Indonesia has adopted this program as part of its antenatal care (ANC) services, aligning with the Ministry of Health Regulation No. 52 of 2017, which aims for zero new infections by 2030. However, despite its crucial role in preventing vertical transmission, the coverage rate of triple elimination screening remains suboptimal across various regions in Indonesia (Kemenkes. RI, 2020).

HIV remains a leading cause of Acquired Immune Deficiency Syndrome (AIDS) in pregnant women (Safitri, Qurniasih, & Panduwinata, 2019). Estimates suggest that

around 9,000 pregnant women in Indonesia are infected with HIV/AIDS annually, with approximately 3,000 newborns acquiring the virus at birth (Nainggolan, Lumbanraja, & Sibero, 2021). Infants born with HIV face significant health challenges, including immune system suppression, which severely impacts their quality of life and survival rates which can impact their quality of life and even lead to death (Juliarti, 2023).

Hepatitis B, an infectious disease that causes inflammation of liver tissue, can be transmitted from a mother to her baby, resulting in low birth weight (LBW), premature birth, congenital anomalies, or neonatal mortality (Berliana & Sulastri, 2023). Similarly, syphilis, a severe sexually transmitted infection (STI), can affect multiple organ systems and cause congenital syphilis if left untreated (Azhali, Setiabudi, & Alam, 2023). The WHO estimates that approximately 1.5 million pregnancies worldwide are affected by syphilis, with 50% of untreated cases leading to congenital syphilis. Up to 40% of these cases result in stillbirth or neonatal death (WHO, 2023).

The Triple Elimination program is a comprehensive strategy to prevent the transmission of HIV/AIDS, hepatitis B, and syphilis from mothers to infants by integrating screening into antenatal care (ANC) services (Juliarti, 2023).

Indonesian government has set a target of achieving 100% early detection coverage for HIV, syphilis, and hepatitis B in pregnant women. However, in 2021, actual screening coverage was 50.8% for HIV, 16.4% for syphilis, and 60.3% for hepatitis B—far below the expected target (Ayunda, Arso, & Nandini, 2023). Behavioral factors significantly influence participation in MTCT prevention programs, as maternal health-seeking behaviors, partner involvement, and societal influences play a crucial role in adherence to treatment and healthcare access. Stigma, misinformation, cultural norms, and lack of family support often deter pregnant women from undergoing triple elimination screening. Understanding these barriers is

essential for designing targeted interventions to improve screening adherence, enhance treatment compliance, and ultimately reduce vertical transmission risks. The aimed of this review article is to understand the factors influencing the behavior of pregnant women regarding triple elimination screening.

**Method**

**Study Design**

This study uses a literature review method to gather data from previously conducted research rather than direct observations. The objective is to synthesize relevant research findings on the factors influencing the behavior of pregnant women in triple elimination screening programs.

**Search Strategies**

The researcher collected journal articles from multiple reliable databases, including PubMed, ScienceDirect, EBSCO, Emerald, Scopus, and Google Scholar. The search focused on articles published between 2019 and 2024. Keywords in English were used, applying Boolean operators to combine search terms based on the PICOS elements: Search terms: (“triple elimination” OR “Mother-to-Child Transmission”). These terms helped the researcher identify studies focused on interventions related to mother-to-child transmission in pregnant women.

**Inclusion and Exclusion Criteria**

The selection process involved two levels of screening based on predefined inclusion and exclusion criteria. Inclusion Criteria: Articles related to the PICOS elements, specifically focusing on pregnant women (population), triple elimination screening (intervention), and behavior of pregnant women (outcome), Articles written in Indonesian or English, Publication date: Between 2019 and 2024, Study designs: Cross-sectional, experimental, and randomized controlled trials. Exclusion Criteria: Articles that could not adequately answer the research ques-

tion after review and Articles that failed to meet CRAAP evaluation criteria during the screening process.

During the first screening, 38 articles were excluded for not meeting the inclusion criteria. In the second screening, 11 more articles were excluded, resulting in 7 selected articles that aligned with the research objectives (Figure 1).

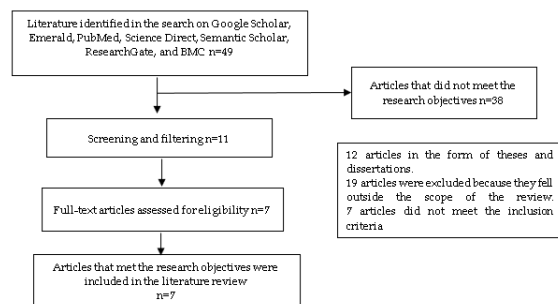
**Data Extraction**

The researcher selected the 7 final articles based on their ability to address the research question. Each article was reviewed using the CRAAP evaluation criteria: Currency: Publication within the last five years. Relevance: Alignment with the study’s focus on the behavior of pregnant women in triple elimination screening programs. Authority: Articles from reliable, peer-reviewed sources. Accuracy : Consistency of the research findings. Purpose: Articles that contribute to answering the research question meaningfully.

**Data Analysis**

The selected articles were analyzed qualitatively to synthesize key findings relevant to the research objective. The synthesis focused on identifying common factors influencing the behavior of pregnant women in relation to triple elimination screening programs. This approach allowed the researcher to consolidate evidence from multiple sources and provide insights into the topic, highlighting gaps and suggesting areas for future research.

The flow of article selection can be seen in Figure 1.



## Result and Discussion

In the literature search conducted, various study designs that contribute to the understanding of triple elimination were identified. The search results yielded quantitative research with a cross-sectional design. This analysis indicates that the most frequently used study design in research related to triple elimination is cross-sectional. This study design provides important insights into the factors influencing pregnant women's behavior concerning triple elimination screening.

### Role of Healthcare Workers

Healthcare workers play a crucial role in accelerating health development, as they are responsible for providing services that meet the needs of clients (Paramita, Palu, & Ahri, 2023). Specifically, they play an important role in preventing the transmission of HIV, syphilis, and hepatitis B from mothers to babies (Rohani et al., 2022). In the triple elimination program, healthcare workers, in line with their competencies and authorities, are expected to prevent the transmission of these diseases and reduce morbidity, disability, and mortality rates among mothers and children. This effort aims to achieve zero transmission of HIV, syphilis, and hepatitis B by 2030 (Pujianto, 2022).

The role of healthcare workers significantly influences the compliance of pregnant women in undergoing triple elimination screenings (Kurnia, 2023); (Sumarni & Masluroh, 2023). Providing effective information and counseling related to this program can enhance pregnant women's motivation to adhere to screenings. The role of healthcare workers, especially in terms of informational support and motivation to the community for voluntarily participating in triple elimination screenings, is a critical factor impacting the utilization of screenings by pregnant women (Sumarni & Masluroh, 2023). In addition to direct interventions, healthcare workers can also influence the environment surrounding pregnant women.

A study on the determinants of triple elimination screenings in Surakarsmi Village, Mergemendurg District in 2021 indicated that educational approaches by village midwives to pregnant women, involving village heads and community leaders through social activities such as religious gatherings and mini-workshops held quarterly, could enhance the role of husbands or families in providing support to pregnant women. This support includes accompanying, reminding pregnant women to check their pregnancies, and inquiring about the results of their pregnancy screenings (Inayah, 2022).

### Sources of Information

Information regarding triple elimination screenings is provided to pregnant women to undergo blood tests in laboratories during pregnancy. The more information received, the greater the understanding, including understanding of the triple elimination screenings (Septiyani et al., 2023). Exposure to health information for individuals will encourage health behavior. Support for information regarding the transmission of HIV, syphilis, and hepatitis B, as well as prevention efforts, is an important factor that encourages the implementation of triple elimination screenings among pregnant women (Sumarni & Masluroh, 2023).

Sources of information are media or channels for obtaining information and facilitating the acceptance of messages by the community or recipients of messages (Vebriyani et al., 2022). Sources of information are very important because they relate to the level of understanding, which will influence a person's awareness in carrying out health efforts (Wiyayanti & Sutarno, 2023). Sources of information encourage individuals to act, shape decisions, and influence attitudes. Research on the relationship between sources of information, social support, and young women's attitudes toward self-breast examination behavior indicates a significant relationship between sources of information and health behavior. Pregnant women who receive information from trusted sources will

Table 1. List of articles from the search, along with a summary of the study designs used.

Authors and Title	Objective	Sample and Methods	Result
Husband Support and The Role of Health Officers with Triple Elimination Examination in Pregnant Women (Rohani, Fitria, Wahyuni, & Mukhlis, 2022)	Understanding the correlation between the decrease in the number of deliveries and the role of health workers, which is three times higher in elimination checks during pregnancy	146 Respondents (cross-sectional study)	The research results indicate that out of 146 respondents, 67 respondents (45.9%) underwent examinations, with 75 respondents (51.4%) showing a positive correlation with maternal health issues, and 88 respondents (60.3%) showing a positive correlation with health service issues. There is a correlation between maternal health issues (p-value = 0.003) and health service issues (p-value = 0.000) with triple elimination checks at Puskesmas Surkaramer
The Relationship Between Perception, Sources of Information, and Pregnant Women's Behavior Toward Triple Elimination Checks at PMB Nerti Verbriyani (Vebriyani, Putri, & Munawaroh, 2022)	To understand the relationship between perception, sources of information, and pregnant women's behavior toward triple elimination checks	50 Respondents (cross-sectional study)	The research results indicate that among pregnant women aged 20–35 years, there are 45 individuals (90%) with a high school education, 21 individuals (42%) are homemakers, and 37 individuals (74%) have had multiple pregnancies. Among the respondents, 26 (52%) are multigravida. There are 31 pregnant women (62%) with a positive perception. The source of information from health workers is 36 individuals (72%). Positive behavior toward triple elimination checks is observed in 28 individuals (56%)
Determinants of Triple Elimination Checks for Pregnant Women in Surkarasmi Village, Mergemendung Subdistrict (Inayah, 2022)	To understand the relationship between the utilization of maternal classes, sources of information, and the role of village midwives regarding triple elimination checks for pregnant women in Surkarasmi Village, Mergemendung Subdistrict, Bogor, in 2021	124 Respondents (cross-sectional study)	The analysis indicates a relationship between the utilization of maternal classes (p-value = 0.000 < 0.05, OR 95% CI = 3.624 (1.292-5.957)), sources of information (p-value = 0.009 < 0.05, OR 95% CI = 2.383 (0.674-4.092)), and the role of village midwives (p-value = 0.024 < 0.05, OR 95% CI = 2.054 (0.389-3.719)) with triple elimination checks in Surkarasmi Village, Mergemendung Subdistrict, Bogor Regency, in 2021
Determinants of the Implementation of Triple Elimination Checks for Pregnant Women in the Area of Puskesmas Wanajaya, Cibitung, Bekasi, for the Period of January-June (Wiyayanti & Sutarno, 2023)	To understand the determinants of the implementation of Triple Elimination Checks	165 Respondents (cross-sectional study)	The results of the Chi-Square test indicate a p-value of 0.002 (p < 0.05), thus concluding that there is a relationship between the employment of pregnant women and triple elimination checks at Puskesmas Wanajaya, Cibitung, Bekasi, during the period of January – June
Perception, Family Support, and the Role of Health Workers and Their Relationship with the Readiness of Pregnant Women in the Third Trimester for Triple Elimination Checks (HIV, Syphilis, and Hepatitis B) at Surmarno Merdika Primary Clinic (Kurnia, 2023)	To understand the relationship between perception, family support, and the role of health workers with the readiness of pregnant women in the third trimester for triple elimination checks at Surmarno Merdika Primary Clinic	88 Respondents (cross-sectional study)	The research results indicate a significant relationship between perception and the readiness of pregnant women in the third trimester for triple elimination checks, with a p-value of 0.005 (<0.05), family support and the readiness of pregnant women in the third trimester for triple elimination checks, with a p-value of 0.033 (<0.05), and the role of health workers and the readiness of pregnant women for triple elimination checks, with a p-value of 0.001 (<0.05)
Factors Related to Triple Elimination Checks for Pregnant Women at Puskesmas Ciberber, Cimahi City (Septiyani, Karlina, & Barbara, 2023)	To analyze the factors related to triple elimination checks for pregnant women at Puskesmas Ciberber, Cimahi City.	86 Respondents (cross-sectional study)	Most pregnant women do not undergo triple elimination checks (55.8%), nearly half of the pregnant women have a lack of understanding (40.7%), almost half have low motivation (47.7%), nearly half receive information about triple elimination from the media (44.2%), and almost half experience barriers to perception (34.9%). There is a relationship between understanding (p-value = 0.004), motivation (p-value = 0.002), information exposure (p-value = 0.000), and perception barriers (p-value = 0.017) with triple elimination checks. There is a relationship between understanding, motivation, information exposure, and perception barriers regarding triple elimination with triple elimination checks at Puskesmas Ciberber, Cimahi City.
The Relationship between Information Sources, Family Support, and Health Worker Support with the Interest of Pregnant Women in Undergoing Triple Elimination Checks in the Working Area of Puskesmas Cikerusal, Serang Regency, Banten (Sumarni & Masluroh, 2023)	To understand the relationship between information sources, family support, and health worker support with the interest of pregnant women in undergoing triple elimination checks in the working area of Puskesmas Cikerusal, Serang Regency, Banten	63 Respondents (cross-sectional study)	The results of the univariate analysis indicate that 50.8% of pregnant women are not interested in undergoing triple elimination checks, 76.2% receive information from health workers, 63.5% have family support, and 81% have support from health workers. The results of the bivariate analysis show a significant relationship between information sources (p-value = 0.022), family support (p-value = 0.000), and health worker support (p-value = 0.005) with the interest of pregnant women in undergoing triple elimination checks. Information sources, family support, and health workers are related to the interest of pregnant women in undergoing triple elimination checks

find it easier to accept the information provided. Print media (newspapers, magazines), electronic media (television, radio, internet), and health worker activities such as training are potential sources of information (Septiyani et al., 2023). Research findings on the relationship between perception, sources of information, and pregnant women's behavior toward triple elimination screenings indicate that after receiving information from healthcare workers, especially doctors or midwives, pregnant women are more likely to immediately undergo triple elimination screenings. Pregnant women who receive information from healthcare workers, particularly from midwives or doctors at their healthcare facilities, will be more receptive to the information provided (Vebriyani et al., 2022).

### **Family Support**

High motivation among pregnant women will increase participation in triple elimination screenings (Wulandari, Retno Palupi Yonni Siwi, Erma Retnaningtyas, & Maria Meilina Billy, 2022). The motivation that pregnant women have to undergo triple elimination screenings is influenced by external parties, namely family support. Support from husbands and family plays a very important role because they are trusted family members (Sumarni & Masluroh, 2023). Family support is beneficial emotional assistance that provides a positive influence in the form of information, instrumental help, emotions, and assessments given by family members, including husbands, parents, in-laws, and other relatives (Sude, Bouway, Ayomi, Yufuai, & Nurdin, 2023). The pattern of family support can include instrumental support, where family members serve as sources of concrete and practical help, informational support, where family members act as information disseminators, and emotional support (Kurniawati, Rahmatyah, R., & Rheza, 2022).

Families that support pregnant women in undergoing triple elimination screenings will enhance the motivation of pregnant

women to comply with the screenings, compared to pregnant women who receive less support from their families regarding triple elimination screenings (Azizah, Adethia, Damanik, Sinaga, & Pitaloka, 2022).

### **Participation in Antenatal Classes**

Antenatal classes for pregnant women are activities designed to prepare them for a normal and healthy pregnancy and to face childbirth in a comfortable and safe manner (Awalliah, 2023). Antenatal classes play a role in increasing the minimum standards for ANC (Antenatal Care) visits for pregnant women, especially regarding triple elimination screenings. Participating in antenatal classes can improve pregnant women's understanding of the importance of triple elimination screenings during pregnancy and help them recognize danger signs during pregnancy. Antenatal classes also influence understanding in early detection of danger signs for pregnant women (Elmeida, Nurlaila, Nurchairina, & Isnawati, 2023).

In antenatal classes, midwives always explain to the mothers how to undergo triple elimination screenings so that they can perform HIV/AIDS, syphilis, and hepatitis B screenings. This aims to protect the health of the mother and fetus and to prevent early transmission of HIV/AIDS from the mother to the fetus (Inayah, 2022).

### **Age**

As a person ages, cognitive abilities, comprehension, and thinking skills develop, leading to broader and deeper understanding in adulthood due to life experiences. The enhancement of critical and analytical thinking skills helps connect new information with past experiences, making knowledge not only increase but also become more structured and complex, thereby facilitating the reception and comprehension of information (Nisa, Nugraheni, & Ningsih, 2023). Research on the determinants of triple elimination screenings among pregnant women in the Puskesmas Wanajaya Cibitung Bekasi area indicates that there is a relationship

between age and the implementation of triple elimination screenings among pregnant women (Wiyayanti & Sutarno, 2023). Older individuals tend to access information more quickly, influencing their levels of competence and maturity in thinking and receiving information more effectively (Wiyayanti Eko Dewi & Ika Sandhi, 2024).

## Conclusion

The factors influencing pregnant women's behavior regarding triple elimination screenings include the role of healthcare providers, sources of information, family support, participation in antenatal classes, and the age of the pregnant women.

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