

Article

# Determinants of tetanus toxoid immunization uptake among brides-to-be: a mixed-method analysis

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**A B S T R A C T**

This study investigates the factors affecting Tetanus Toxoid (TT) immunization among brides-to-be in Aceh, using a mixed-method approach. Tetanus, a potentially fatal bacterial infection, poses a significant risk, particularly to maternal and neonatal health. Despite government mandates for TT immunization, uptake remains inconsistent. Quantitative data from structured questionnaires assessed respondents' knowledge, attitudes, and healthcare provider support. The qualitative component used in-depth interviews with brides-to-be, healthcare providers, and community leaders to explore contextual factors impacting TT immunization. Results showed that 92.9% of respondents were aged 20-35, indicating the importance of targeting this demographic. While 57.1% held college degrees or higher, a high unemployment rate (35.7%) suggested potential barriers to healthcare access. Misinformation, societal resistance, and religious concerns emerged as key challenges, with misconceptions about vaccine safety contributing to vaccine hesitancy. Recommendations for improving TT immunization uptake include targeted education campaigns, addressing religious and cultural concerns, and simplifying the immunization process. By implementing these strategies, public health authorities can increase TT immunization rates, leading to better maternal and neonatal health outcomes in Aceh.

## I. INTRODUCTION

Tetanus, commonly known as "lockjaw," is a severe bacterial infection caused by *Clostridium tetani*, which produces a potent neurotoxin leading to muscle spasms, rigidity, and potentially fatal outcomes (Mehanna, 2021). The bacteria enter the body through cuts, punctures, or other breaches in the skin, where they release toxins that interfere with nerve signals, causing the characteristic symptoms. Although tetanus is relatively rare in developed countries due to widespread immunization, it remains a significant public health concern in developing nations like Indonesia, where vaccination coverage can be inconsistent (Nur et al., 2020).

Indonesia has implemented various public health strategies to address tetanus, including national immunization campaigns. A crucial part of these efforts involves administering Tetanus Toxoid (TT) immunization to women of childbearing age, particularly brides-to-be, to prevent maternal and neonatal tetanus (Yuliani et al., 2022). Neonatal tetanus is especially concerning due to its high mortality rate among newborns, who typically have underdeveloped immune systems and limited access to adequate medical care (Dhir et al., 2021).

Despite government mandates for TT immunization, several factors may affect its uptake among brides-to-be. A key determinant is the level of knowledge and awareness regarding tetanus and the benefits of TT immunization. If brides-to-be and their families do not fully understand the risks associated with tetanus or the protective benefits of the vaccine, they might be hesitant to receive it (Afolabi et al., 2023).

Attitudes and beliefs are also significant factors. Cultural, religious, or personal beliefs can shape views towards vaccination, often leading to vaccine hesitancy. Misconceptions about vaccine safety, fears of adverse effects, and religious concerns about vaccine ingredients can contribute to a reluctance to accept TT immunization. In some regions of Indonesia, these factors have contributed to lower vaccination rates (Yuliani et al., 2022).

Another critical factor is support from healthcare providers. Effective communication, education, and consistent encouragement from medical professionals can positively influence immunization rates. Conversely, when healthcare providers do not adequately promote TT immunization, or if they lack resources, uptake may decline (Yeshaw et al., 2021).

Socioeconomic factors also play a role in determining access to healthcare services and, consequently, to TT immunization. Brides-to-be from lower socioeconomic backgrounds may face barriers such as transportation costs, limited access to healthcare facilities, and time constraints due to work or other responsibilities (Desta Belihu et al., 2017).

Furthermore, government policies and regulations mandating TT immunization for brides-to-be are essential to ensure compliance. However, enforcement can vary, and a lack of consistent oversight can lead to gaps in immunization coverage (Yeshaw et al., 2021).

Given these factors, this study aims to explore the determinants affecting TT immunization among brides-to-be. The objective is to identify underlying factors that contribute to low immunization rates, providing insights for developing targeted public health interventions to improve TT immunization coverage and reduce the risk of maternal and neonatal tetanus.

## II. METHODS

This study employs a mixed-method approach to examine the factors affecting the administration of Tetanus Toxoid (TT) immunization among brides-to-be in Aceh Regency. This methodology integrates quantitative surveys and qualitative interviews, allowing for a comprehensive analysis of the determinants of TT immunization uptake.

In the quantitative component, structured questionnaires were used to collect data on knowledge, attitudes, and support from healthcare providers regarding TT immunization. This approach allows for the measurement of these factors and facilitates the use of statistical analyses

to explore relationships among them. The qualitative component involved in-depth interviews with key informants, such as healthcare providers, community leaders, and brides-to-be, to gain a deeper understanding of the social and contextual factors influencing TT immunization acceptance.

The population for this study comprised all brides-to-be in North Aceh Regency, who registered with local marriage authorities during the study period. Total sampling was employed, resulting in a sample of 42 brides-to-be, ensuring that the entire population was represented. In addition, qualitative data were collected from key informants, including healthcare providers and community leaders, who could offer insights into local attitudes and behaviors related to immunization.

The study examined several key variables to understand the factors influencing TT immunization. These variables included knowledge, attitudes, healthcare provider support, and socioeconomic status. Knowledge referred to the level of understanding about tetanus and the benefits of TT immunization. Attitudes encompassed personal, cultural, or religious beliefs that might impact vaccine acceptance. Healthcare provider support addressed the degree to which healthcare professionals encouraged and promoted TT immunization, while socioeconomic status considered factors that might affect access to healthcare services.

Quantitative data were analyzed using descriptive statistics to summarize the responses and inferential tests to determine significant relationships among the variables. The qualitative data from in-depth interviews were analyzed through thematic analysis, which involves identifying common themes and patterns in the data.

To ensure the accuracy and consistency of the quantitative data, the questionnaire underwent testing for validity and reliability. Content validity was established by expert review to confirm that the questions were relevant to the study's goals. Construct validity was tested using statistical methods like factor analysis to ensure the questionnaire items accurately represented the theoretical constructs. Reliability was assessed using Cronbach's alpha to evaluate internal consistency, and test-retest reliability to confirm the stability of the results over time.

The study adhered to ethical research standards, with approval from the relevant ethics review board. Informed consent was obtained from all participants, and their confidentiality and anonymity were maintained throughout the study.

Overall, this mixed-method approach, along with the rigorous testing for validity and reliability, provided a solid foundation for exploring the determinants of TT immunization among brides-to-be North Aceh Regency. The results of this study are expected to contribute valuable insights into public health policies and strategies aimed at increasing TT immunization coverage and reducing the risk of maternal and neonatal tetanus.

### **III. RESULT**

#### **1. Characteristics of Respondents**

This study examined three key variables—age, education, and occupation—among respondents in the context of a survey related to Tetanus Toxoid (TT) immunization for brides-to-be. The table below provides a frequency distribution and percentage breakdown for each variable.

**Table 1 Characteristics of respondents**

No	Variables	Frequency	Percentage (%)
1	Age (year)		
	1. < 30	1	2.4
	2. 20-35	39	92.9
	3. > 35	2	4.8
2	Education		
	1. Basic	0	0
	2. Midle	18	42.9
	3. High	24	57.1
3	Occupation		
	1. Worked	15	35.7
	2. Not worked	27	64.3

Based on the data, the majority of respondents fall within the 20-35 age group, accounting for 92.9% of the total sample. This indicates that the study primarily focuses on a young demographic, with only 2.4% of respondents under 20 years of age and 4.8% over 35 years. The education levels among respondents show a skew toward higher education. Among the three categories—Basic (Primary and Middle School), Mid-level (High School), and Higher Education (Diploma and Bachelor's Degree)—the data reveal that no respondents had only a basic education (0%), while 42.9% had completed high school, and 57.1% had higher education qualifications. Regarding occupation, 64.3% of respondents are employed, while 35.7% are unemployed. This finding indicates that a majority of respondents are working individuals. However, the presence of a significant proportion of unemployed respondents also highlights a potential gap in access to healthcare and related services, which might affect TT immunization rates.

Overall, these results provide an overview of the demographic characteristics of the respondents in terms of age, education, and occupation. Understanding these characteristics helps identify patterns and trends that could influence the success of public health programs, such as TT immunization for brides-to-be.

**Table 2. Knowledge and Attitude of Respondents Regarding Tetanus Toxoid Administration**

No	Variables	Frequency	Percentage (%)
1	Knowledge		
	1. Good	13	31.0
	2. Weak	29	69.0
2	Attitude		
	1. Positive	19	45.2
	2. Negative	23	54.8

The "Knowledge" variable is categorized into two groups: "Good" and "Weak." The data indicate that a majority of respondents (69.0%) have weak knowledge about TT immunization, while only 31.0% have good knowledge. The "Attitude" variable is also divided into two categories: "Positive" and "Negative." The data show that 45.2% of respondents have a positive attitude toward TT immunization, while 54.8% hold a negative attitude.

## 2. Qualitative Research Findings

### 2.1 Informant Information

Who are the key informants involved in this study?

This question identifies the demographic characteristics of the qualitative research informants, such as their roles, ages, education levels, and occupations. Understanding the background of these informants is crucial to contextualizing their perspectives.

The qualitative research component of this study offers insights into the perspectives and experiences of key informants involved in the Tetanus Toxoid (TT) immunization program for brides-to-be in Sawang District, North Aceh Regency. The informants comprise a diverse group, providing a comprehensive understanding of the factors affecting TT immunization.

The informants include three brides-to-be, a religious leader, and a healthcare professional. Each informant brings a unique perspective based on their roles, ages, educational backgrounds, and occupations. This diversity in informant characteristics contributes to a richer analysis of the qualitative data.

The age range of the brides-to-be is primarily in their twenties, reflecting the typical age for marriage in the district. The religious leader and healthcare professional are older, representing roles that require more experience and authority within the community. This age variation offers a broad spectrum of viewpoints, from those preparing for marriage to those responsible for guiding and supporting community practices.

Education levels among the informants are also varied. The brides-to-be have completed high school or college degrees, which could influence their level of knowledge and openness toward TT immunization. The religious leader and healthcare professional both possess higher education degrees, suggesting they have a deeper understanding of religious and health-related issues. The educational diversity among the informants is significant, as it indicates the breadth of perspectives on TT immunization, from basic to more advanced understandings.

Occupationally, the informants are equally diverse. The brides-to-be are primarily focused on their upcoming weddings, while the religious leader holds an important position in the local religious office, playing a key role in marriage ceremonies and community religious practices. The healthcare professional is directly involved in administering and promoting TT immunization, providing practical insights into the challenges and successes of the program. The varying occupations of the informants are critical, as they reflect the different levels of influence and authority in promoting or discouraging TT immunization.

### 2.2 Sources of Information

1. Where do informants typically get information about TT immunization?

This question explores the sources from which informants obtain their knowledge about TT immunization. These sources could be healthcare providers, family, friends, or other community members. The results can help identify which channels are most influential in spreading information.

Informants gain information about Tetanus Toxoid (TT) immunization from various sources, which play a crucial role in shaping their understanding and attitudes toward the vaccine. Healthcare providers emerge as the primary source of information. This is due to the trust and authority they hold in medical matters, and their role in guiding brides-to-be on health-related issues. Health professionals, such as doctors,

nurses, and midwives, often discuss the benefits of TT immunization and explain why it's essential for those preparing for marriage.

Family and friends also serve as important information channels. Brides-to-be frequently rely on advice from family members and peers who have had direct experience with TT immunization. This type of peer-to-peer sharing can encourage others to follow suit or, conversely, spread doubts and misinformation if the shared information is incorrect or incomplete.

Community-based sources, like community health center, are also mentioned as key places where informants learn about TT immunization. These health posts are often led by healthcare workers and are designed to promote health education at the local level. Additionally, some informants gain information from religious or community leaders. These figures carry significant influence within their communities, and their support or criticism can affect the general acceptance of TT immunization.

Overall, the findings indicate that healthcare providers are the most reliable source of information, but other channels such as family, friends, and community gatherings also have a considerable impact on the dissemination of information. By focusing on these trusted sources, public health campaigns can effectively reach brides-to-be, address misinformation, and promote the importance of TT immunization in Sawang District, North Aceh Regency.

## 2. Understanding of TT Immunization

What do informants know about TT immunization?

This question investigates the level of understanding informants have about TT immunization. It explores their perceptions of its purpose, benefits, and potential side effects. The results can indicate the level of awareness and id Informants' understanding of Tetanus Toxoid (TT) immunization varies, with some showing basic knowledge and others displaying confusion or holding misconceptions. The qualitative research explored their level of understanding by examining perceptions of the vaccine's purpose, benefits, and potential side effects.

Most informants recognize that TT immunization is meant to prevent tetanus, a bacterial infection that can lead to severe muscle spasms and even death. They are generally aware that tetanus bacteria enter through cuts or wounds and that the vaccine is intended to offer protection. However, the depth of their knowledge varies, with some having a more detailed understanding of how TT immunization benefits maternal and neonatal health, while others have only a vague sense of its purpose.

Misconceptions about TT immunization are common, particularly regarding side effects and religious concerns. Several informants express fear of side effects like pain at the injection site or fever, leading to hesitancy about getting vaccinated. Additionally, some informants doubt the halal status of the vaccine, influenced by rumors or cultural beliefs. These misconceptions can contribute to resistance against TT immunization among brides-to-be.

The research indicates that targeted educational efforts are needed to address these knowledge gaps. Healthcare providers should proactively communicate the safety and benefits of TT immunization, emphasizing its role in preventing tetanus and protecting maternal and neonatal health. By challenging misconceptions and engaging with community and religious leaders, public health authorities can reduce skepticism and encourage greater acceptance of TT

immunization in Sawang District, North Aceh Regency. This could lead to increased vaccination rates and improved public health outcomes. Identify gaps in knowledge.

### 3. Attitudes Toward TT Immunization

What are the attitudes and beliefs of informants regarding TT immunization?

This question aims to capture informants' feelings and beliefs about TT immunization. The responses may reveal fears, misconceptions, or cultural and religious concerns that could impact acceptance and willingness to promote TT immunization.

The attitudes and beliefs of informants toward Tetanus Toxoid (TT) immunization reflect a mix of positive and negative perspectives. This qualitative research aimed to understand informants' feelings and beliefs about TT immunization and identified various factors that might affect their acceptance and willingness to promote it.

Some informants expressed positive attitudes toward TT immunization, recognizing its role in preventing tetanus, particularly for mothers and newborns. This positivity is often linked to a basic understanding of the vaccine's benefits and an appreciation for its role in maternal and neonatal health.

However, negative attitudes were also prevalent, often driven by fears and misconceptions. Concerns about potential side effects, such as pain or fever after injection, contributed to vaccine hesitancy. These fears could lead to reluctance to get vaccinated or promote TT immunization to others.

### 4. Challenges in Promoting TT Immunization

What are the barriers or challenges in promoting TT immunization?

This question seeks to uncover the obstacles faced when promoting TT immunization among brides-to-be. Responses may highlight issues such as societal resistance, misinformation, religious beliefs, or lack of knowledge. These challenges are key to understanding the broader context in which the program operates.

Promoting Tetanus Toxoid (TT) immunization among brides-to-be faces several challenges, stemming from societal resistance, misinformation, religious beliefs, and a general lack of knowledge.

Societal resistance can be a major hurdle, as cultural norms may favor traditional practices over vaccines, leading to skepticism or distrust toward TT immunization. This resistance often requires healthcare providers to work harder to encourage participation in vaccination programs.

Religious beliefs and cultural attitudes can impact the acceptance of TT immunization. Some informants expressed concern that the vaccine might conflict with religious practices, leading to resistance against vaccination. Addressing these concerns requires clear communication and engagement with religious and community leaders to dispel doubts.

A general lack of knowledge and awareness about TT immunization is also a notable challenge. Informants with limited understanding of the vaccine's purpose and benefits are more likely to hesitate or refuse vaccination. This knowledge gap emphasizes the need for improved health education and consistent messaging from healthcare providers.

### 2.3 Recommendations for Improving TT Immunization

#### 1. What suggestions do informants have for improving TT immunization programs?

This question gathers informants' recommendations for enhancing the effectiveness of TT immunization programs. Suggestions could include improved education and awareness campaigns, addressing cultural or religious concerns, or enhancing healthcare provider support.

Informants offered various suggestions for improving Tetanus Toxoid (TT) immunization programs among brides-to-be. These recommendations focus on addressing existing barriers, improving communication, and fostering greater acceptance of TT immunization.

A common suggestion is to increase educational efforts and awareness campaigns to promote the benefits of TT immunization. Informants believe that more comprehensive education can help dispel myths and misconceptions, providing brides-to-be with accurate information about the importance of the vaccine. This approach involves consistent messaging and engagement through multiple channels, such as healthcare providers, community gatherings, and religious leaders.

Informants also suggest addressing cultural and religious concerns directly. Given that some resistance to TT immunization arises from religious doubts or cultural beliefs, it's crucial to engage religious authorities and community leaders to address these issues. By fostering dialogue and providing clear explanations about the vaccine's safety and compatibility with religious practices, public health officials can reduce hesitancy and build trust among the community.

Improving the role of healthcare providers in promoting TT immunization is another key suggestion. Informants recommend that healthcare professionals take a more active role in educating brides-to-be about the vaccine, answering questions, and alleviating fears. This enhanced support from healthcare providers can make a significant difference in the acceptance and uptake of TT immunization.

Some informants suggest simplifying the immunization process to encourage participation. This might include providing more flexible scheduling, reducing wait times, or offering immunization services in locations that are more convenient for brides-to-be. By making the process easier and more accessible, public health authorities can increase participation rates.

## IV. DISCUSSION

The findings from this study provide a comprehensive analysis of the factors influencing Tetanus Toxoid (TT) immunization among brides-to-be in Aceh Regency. The discussion is structured around key areas: characteristics of respondents, sources of information, understanding of TT immunization, attitudes towards vaccination, challenges in promoting TT immunization, and recommendations for improving TT immunization programs.

The demographic analysis revealed that the majority of respondents were between 20 and 35 years of age, accounting for 92.9% of the sample. This age group represents the primary target for TT immunization since it aligns with the typical age for marriage (Ameen, 2021). The education levels among respondents also showed a tendency towards higher education, with 57.1% holding college degrees or higher. This educational background can play a significant role in how these individuals perceive and understand the importance of TT immunization (Leo et al., 2023). A more



educated population might be more open to receiving health-related information and less likely to adhere to myths or misconceptions (Fouad El-Adham et al., 2022).

However, the high percentage of unemployed respondents (35.7%) raises concerns about their access to healthcare resources and services. This lack of employment may limit their interaction with workplace-based health programs, thereby impacting the likelihood of receiving TT immunization (Nur et al., 2020). Addressing these socio-economic factors is crucial for improving overall immunization rates.

The study explored where respondents typically get their information about TT immunization. Healthcare providers emerged as the most reliable source of information due to their expertise and authority in medical matters. Health professionals, such as doctors and nurses, often discuss the benefits of TT immunization and why it is crucial for brides-to-be (Mehanna, 2021). Family and friends also play a role in spreading information. This peer-to-peer sharing can be beneficial, but it can also lead to the spread of misinformation if the information shared is incorrect (Morhason-Bello et al., 2022).

Community-based sources, such as community health center, are mentioned as key places where respondents learn about TT immunization. These settings are ideal for public health outreach and education campaigns, as they offer a platform to reach a wider audience (Desta Belihu et al., 2017). Additionally, some respondents reported gaining information from religious or community leaders, indicating the significant influence these figures have in shaping public opinion (Yusuf et al., 2021).

The level of understanding of TT immunization among respondents was variable. While most recognized that TT immunization prevents tetanus, some were less clear about its specific benefits and potential side effects. Misconceptions about the vaccine, such as concerns over side effects or religious beliefs questioning its halal status, were prevalent (Yeshaw et al., 2021). These fears and misconceptions can impact attitudes towards immunization and create resistance.

The study also explored the attitudes and beliefs of respondents regarding TT immunization. Positive attitudes were linked to a basic understanding of the vaccine's role in preventing tetanus and protecting maternal and neonatal health. Negative attitudes, on the other hand, often stemmed from fears of side effects and religious concerns (Desta Belihu et al., 2017). Addressing these fears through effective communication and education is critical to improve the acceptance of TT immunization.

Promoting TT immunization among brides-to-be in Aceh District faces significant challenges, including societal resistance, misinformation, and cultural or religious beliefs. Misinformation, in particular, plays a significant role in creating vaccine hesitancy. Rumors that the vaccine might contain haram substances can lead to skepticism and reluctance to get vaccinated (Yuliani et al., 2022). Religious beliefs and cultural attitudes also contribute to resistance, suggesting a need for more targeted engagement with religious and community leaders to address these concerns (Yusuf et al., 2021).

To overcome these challenges, the study's findings suggest several recommendations for improving TT immunization programs. Increasing education and awareness campaigns, addressing cultural and religious concerns, and enhancing healthcare provider support are critical steps to encourage greater acceptance of TT immunization among brides-to-be. Simplifying the immunization process, offering flexible scheduling, and reducing wait times can also improve participation rates (Desta Belihu et al., 2017).

Overall, these recommendations, combined with a concerted effort to address the challenges, can lead to higher acceptance of TT immunization among brides-to-be in Aceh Regency. By implementing these strategies, public health authorities can work towards improved maternal and neonatal health outcomes and ensure the success of TT immunization programs (Somoro et al., 2019).

## V. CONCLUSION

The examination of Tetanus Toxoid (TT) immunization among brides-to-be in Aceh Regency reveals key factors that influence the acceptance and uptake of this important vaccine. The study indicates that the majority of respondents are between 20 and 35 years old, aligning with the typical age for marriage and underscoring the importance of TT immunization in this demographic. Although the education level is relatively high, a significant proportion of respondents are unemployed, pointing to potential barriers in accessing healthcare services, which need to be addressed to increase vaccination rates.

The most trusted source of information about TT immunization comes from healthcare providers, yet other informal channels like family, friends, and community gatherings are also influential. Despite this, misinformation—particularly regarding religious concerns and possible side effects—remains a significant challenge, leading to vaccine hesitancy. The study found that while some respondents understood the benefits of the vaccine, many held misconceptions or fears that deterred them from getting vaccinated.

To improve TT immunization rates, a comprehensive approach is required. This includes targeted education campaigns to correct misinformation and increase awareness. Engaging religious and community leaders is essential for dispelling misconceptions and fostering community support for vaccination. Healthcare providers should proactively communicate the safety and benefits of TT immunization, addressing any religious or safety-related concerns. Recommendations for simplifying the immunization process, such as offering vaccinations at convenient locations and reducing wait times, can further encourage participation. Consistent outreach through community-based platforms can also help to reduce resistance and promote acceptance. By implementing these strategies, public health officials can work towards higher immunization rates, contributing to better maternal and neonatal health outcomes in the region.

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