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Original Article

Maternal Immunization Knowledge, Attitudes, and Practices on Tetanus Toxoid Vaccination Among Pregnant Teenagers

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Abstract. Tetanus toxoid vaccination is a key maternal immunization intervention for preventing maternal and neonatal tetanus, a highly fatal yet preventable condition. Despite free provision by the Philippine Department of Health, vaccination uptake among pregnant teenagers remains inconsistent. However, there is limited local evidence examining the knowledge, attitudes, and practices related to tetanus toxoid vaccination among pregnant adolescents, particularly in community-based settings. This study assessed levels of knowledge, attitudes, and practices regarding tetanus toxoid vaccination among pregnant teenagers in San Pablo City, Laguna, and examined differences by selected socio-demographic characteristics. A descriptive-comparative quantitative design was utilized, involving 65 pregnant teenagers selected through purposive sampling from barangays with high teenage pregnancy prevalence. Data were collected using a validated and reliability-tested questionnaire. Statistical analyses included frequency and percentage, mean and standard deviation, and the Mann–Whitney U test and Kruskal–Wallis test. Findings indicated moderate knowledge, positive attitudes, and generally adequate but inconsistent vaccination practices. Significant differences in knowledge were observed across age and educational attainment groups, whereas attitudes differed significantly by civil status. No significant differences were found in practices across socio-demographic variables. These findings emphasize the need for adolescent-centered maternal immunization education, early engagement in antenatal care, and supportive vaccination counseling. As a practical output, a Personalized Tetanus Toxoid Immunization Journal was developed to enhance dose monitoring, awareness, and vaccination compliance among pregnant teenagers. Strengthening youth-focused maternal immunization initiatives may help reduce the risk of maternal and neonatal tetanus at the community level.

Keywords: *Adolescent pregnancy; Immunization; Maternal health; Pregnant teenagers; Tetanus Toxoid.*

Maternal and neonatal tetanus remain serious threats to maternal and infant health, particularly in communities where vaccination coverage is inconsistent. Neonatal tetanus continues to cause preventable deaths worldwide and persists as a major public health concern because of its extremely high fatality rate (Kanu et al., 2022). In the Philippines, although reported cases have declined over recent decades,

disruptions in maternal healthcare services—especially during the COVID-19 pandemic—have adversely affected antenatal care attendance and routine tetanus toxoid vaccination (Lanuza et al., 2024; Jones et al., 2024). These circumstances underscore the need to strengthen maternal immunization programs, particularly for vulnerable populations.

Adolescent mothers face unique challenges related to health literacy, antenatal care engagement, and socioeconomic constraints. Neonatal immunity is highly dependent on maternal tetanus toxoid vaccination, making timely immunization essential for protecting both mother and infant (Albrecht & Arck, 2020). Evidence further shows that pregnant women's knowledge and attitudes significantly influence their willingness to complete recommended tetanus toxoid doses. At the same time, misconceptions and fear of adverse effects continue to hinder vaccine uptake (Alghamdi & Tayyib, 2023). In addition, socio-demographic factors such as age, educational attainment, parity, and antenatal care attendance have been shown to shape maternal vaccination behaviors (Amoak et al., 2022; Ibrahim et al., 2023; Bizuneh & Mustofa, 2024; Tamiru et al., 2024). Collectively, these findings highlight the importance of improving tetanus toxoid awareness and implementing adolescent-friendly maternal health strategies.

Within San Pablo City, the continuing rise in teenage pregnancy heightens the urgency of understanding how young mothers engage with maternal health services, particularly tetanus toxoid vaccination. Although tetanus toxoid immunization is included in routine prenatal care, there is limited local evidence on pregnant teenagers' knowledge, attitudes, and practices regarding this intervention. This lack of localized data poses a challenge to developing targeted and effective programs for adolescent mothers. Accordingly, this study aims to determine the knowledge, attitudes, and practices of pregnant teenagers toward tetanus toxoid vaccination in San Pablo City, Laguna, and to examine significant differences based on selected socio-demographic characteristics. The findings are intended to inform youth-centered maternal health initiatives and strengthen local maternal immunization programs.

Methodology

Research Design

This study employed a quantitative, descriptive–comparative research design, which is appropriate for examining measurable variables and identifying differences across groups. A quantitative approach enabled the researchers to collect numerical data on pregnant teenagers' knowledge, attitudes, and practices (KAP) regarding tetanus toxoid vaccination using a structured questionnaire. The descriptive component enabled the study to summarize and characterize the respondents' knowledge, attitude, and practice levels. In contrast, the comparative component allowed the researchers to examine differences across socio-demographic characteristics, such as age and educational attainment. This design was selected because it aligns directly with the research questions, which sought to identify respondents' knowledge, attitudes, and practices and to determine whether statistically significant differences existed among demographic subgroups.

Participants and Sampling Technique

The study population consisted of 80 pregnant teenagers aged 13 to 19 years from three barangays in San Pablo City with the highest reported cases of teenage pregnancy based on 2024 data from the City Health Office, namely Barangay Del Remedio, Barangay San Francisco, and Barangay San Jose. Of this population, 65 pregnant and postpartum teenagers were included in the study, representing approximately 80% of the target population. The final sample size was determined by the actual number of eligible and available participants during the data collection period.

A purposive sampling technique was employed to deliberately select respondents who met the study's specific criteria. This approach was appropriate because the study focused on teenagers who were currently pregnant or had given birth within the past year, allowing for a more accurate assessment of their knowledge, attitudes, and practices regarding tetanus toxoid vaccination. Pregnant and postpartum respondents were analyzed as a single group, as both had direct exposure to antenatal care services and tetanus toxoid immunization during pregnancy.

The inclusion criteria were as follows: **(1)** teenagers aged 13–19 years old; **(2)** currently pregnant or postpartum; and **(3)** residents of the selected barangays in San Pablo City. The **exclusion criteria** included: **(1)** individuals aged 20 years and above; **(2)** adolescents who were neither pregnant nor postpartum; and **(3)** those who did not meet the specified age or pregnancy status requirements. This sampling strategy ensured that participants in the study

were appropriate and capable of providing relevant information aligned with the study objectives, specifically to assess pregnant teenagers' knowledge, attitudes, and practices regarding tetanus toxoid vaccination.

Research Instrument

The study utilized an adapted and researcher-revised questionnaire originally developed by Fassikaw Kebede Bizuneh (2021) in the study "Uptake of protective tetanus toxoid vaccine doses and maternal associated factors during pregnancy in armed conflict zone: a hospital-based cross-sectional study." Formal permission to use and modify the original instrument was obtained from the author prior to its adaptation. The questionnaire was prepared in both English and Tagalog to ensure clarity and accessibility for teenage respondents. An English teacher reviewed the English version, and a Filipino teacher validated the Tagalog version to ensure linguistic accuracy and cultural appropriateness. Content validation was further conducted by four health experts—an obstetrician-gynecologist, a midwife, a registered nurse, and a community health nurse—who evaluated the instrument for relevance, clarity, and suitability for pregnant teenagers.

The finalized questionnaire consisted of five parts: consent and assent, socio-demographic and obstetric profile, knowledge, attitude, and practices related to tetanus toxoid vaccination. All structured items were measured using a 5-point Likert scale. Knowledge items were rated from 1 (Not Knowledgeable at All) to 5 (Very Knowledgeable); attitude items ranged from 1 (Strongly Disagree) to 5 (Strongly Agree); and practice items ranged from 1 (Never) to 5 (Always). To facilitate interpretation of results, mean scores were categorized using standard Likert-scale cutoffs: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40 (Moderate), 3.41–4.20 (High), and 4.21–5.00 (Very High). These cutoffs were applied uniformly across the knowledge, attitude, and practice domains to enable meaningful comparisons of respondents' levels.

A pilot test was conducted among 30 respondents from Barangay San Lorenzo and Barangay San Ignacio, which ranked 4th and 5th in teenage pregnancy cases in San Pablo City. These barangays were selected because they shared similar demographic characteristics with the main study sites, but were excluded from the final data collection. Reliability analysis yielded excellent internal consistency for the knowledge ($\alpha = 0.954$) and practices ($\alpha = 0.961$) subscales, and good internal consistency for the attitude subscale ($\alpha = 0.860$), confirming the instrument's reliability for the main study.

Data Gathering Procedure

Data collection began after the researchers secured all necessary permissions, including approval from the City Health Office (CHO) to obtain secondary data identifying barangays with the highest rates of teenage pregnancy, and authorization from the Dean of the College of Nursing at Canossa College to conduct the study in selected communities. Permissions were also obtained from the Barangay Captains of Del Remedio, San Francisco, and San Jose to access the respondents listed in their barangay health centers. Following approval and coordination with barangay health workers, the researchers conducted house-to-house visits to identify eligible respondents. Data were collected face-to-face using a validated paper-and-pen structured questionnaire, with barangay health workers assisting in identifying and approaching participants. The researchers explained the purpose of the study, assured confidentiality, and obtained informed consent and assent before administering the questionnaire. Throughout the survey process, the researchers were present to clarify questions and ensure accurate responses.

The data collection phase lasted approximately five weeks, from February to March 2025, and continued until all identified respondents were reached and all questionnaires were fully completed. After data gathering, responses were encoded and submitted to a statistician for analysis using appropriate descriptive and inferential statistical procedures. The analyzed results were subsequently returned to the researchers for interpretation and discussion.

Data Analysis Procedure

The study employed quantitative data analysis consistent with its descriptive–comparative research design. After data collection, all responses were encoded in a spreadsheet and processed by a statistician. To describe the respondents' socio-demographic and obstetric profiles, frequency distribution and percentage were computed. These techniques summarized the distribution of respondents according to variables such as age, educational attainment, and pregnancy-related characteristics.

To determine the respondents' levels of knowledge, attitudes, and practices, the study utilized the mean (M) and standard deviation (SD). The mean (M) represented the central tendency or average score for each variable, while

the standard deviation (*SD*) measured response variability, indicating how closely individual scores clustered around the mean. These descriptive statistics established the overall levels of knowledge, attitudes, and practices of pregnant teenagers in the selected barangays.

For hypothesis testing, the study applied non-parametric inferential statistics appropriate for ordinal data derived from Likert-scale responses. The Kruskal–Wallis test was used to compare median scores for knowledge, attitude, and practice across three or more groups, while the Mann–Whitney U test was used to compare two independent groups. Statistical significance was evaluated using the probability value (p), with the level of significance set at $p < .05$. These tests determined whether observed differences in group scores were statistically significant.

Validity and reliability were ensured by using a pilot-tested, expert-validated instrument. Reliability analysis using Cronbach's alpha (a) yielded values of 0.954 for knowledge, 0.961 for practices, and 0.860 for attitude, indicating excellent to good internal consistency. These results confirm that the measures used to assess knowledge, attitudes, and practices were stable and dependable. Content validity was further strengthened through evaluation by subject-matter experts and language reviewers, enhancing the trustworthiness of the data gathered.

Ethical Considerations

Ethical principles of participant protection, voluntary participation, and confidentiality were strictly observed throughout the study. The research protocol did not require formal institutional review board (IRB) approval; however, administrative and ethical clearance to conduct the study was obtained from the Dean of the College of Nursing of Canossa College and from the Barangay Captains of the selected barangays in San Pablo City, in accordance with institutional and community research protocols. Participants were fully informed about the nature, purpose, benefits, and potential risks of the study. Written informed consent was obtained from respondents aged 18–19 years. For respondents aged 13–17 years, parental consent and participant assent were obtained to protect minors, in accordance with the Special Protection of Children Against Abuse, Exploitation, and Discrimination Act (Republic Act No. 7610).

Strict confidentiality and anonymity were maintained by ensuring that no identifying information—such as names or addresses—was collected. All data were used solely for academic purposes and stored securely, accessible only to the researchers. These procedures complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173). Participation was entirely voluntary, and respondents were informed of their right to withdraw from the study at any time without penalty. Throughout the research process, the researchers ensured that respondents were treated with respect and provided with a safe and supportive environment, particularly given that many participants were minors or young mothers.

Results and Discussion

Demographic Profile of Respondents

Table 1.1. *Demographic Profile of the Respondents When Grouped According to their Age*

Age	Frequency	Percentage (%)
13	0	0%
14	6	9.2%
15	4	6.2%
16	6	9.2%
17	5	7.7%
18	21	32.3%
19	23	35.4%
Total	**65**	**100.0**

Table 1.1 presents the respondents' age distribution (N = 65). The majority were 19 years old (n = 23, 35.4%), followed by those aged 18 years (n = 21, 32.3%). Lower proportions were observed among respondents aged 16 (9.2%), 14 (9.2%), 17 (7.7%), and 15 (6.2%). No respondents were recorded at age 13. These findings indicate that the study sample was composed predominantly of late adolescents. The concentration of respondents in the 18–19 age group suggests that the perspectives in this study largely align with those of older pregnant teenagers. Late adolescence is typically associated with greater cognitive maturity and increased exposure to health-related information, which may influence understanding of pregnancy and maternal health practices. Conversely, the

limited representation of younger adolescents (ages 13–16) indicates that the unique challenges faced by very young pregnant teenagers—such as greater dependence on guardians, lower health literacy, and increased social vulnerability—may not be fully captured in the findings.

The lower participation of younger adolescents may also be attributed to recruitment barriers. Adolescents below 16 years of age often require parental consent, which can discourage participation in research involving sensitive topics such as pregnancy. Additionally, younger teenagers may have less confidence or willingness to engage in studies related to reproductive health. Similar observations were reported by Smith et al. (2021), who noted that older adolescents are better able to engage in health-related research due to increased maturity and independence. Matthews (2020) likewise found that younger adolescents experience greater hesitation in discussing personal health matters. Undie and Birungi (2022) further emphasized that younger pregnant adolescents often face heightened stigma and health risks, suggesting that their experiences may differ significantly from those of older teens.

Overall, the age distribution indicates that the study primarily reflects the experiences of older pregnant teenagers. While this provides valuable insight into adolescent maternal health behaviors, it may limit the generalizability of the findings to younger pregnant adolescents, who may require more targeted support and age-appropriate health education interventions.

Table 1.2. *Demographic Profile of the Respondents When Grouped According to Their Educational Attainment*

Educational Attainment	Frequency	Percentage (%)
Elementary	7	10.8%
Junior High School	29	44.6%
Senior High School	27	41.5%
College	2	3.1%
Total	**65**	**100.0**

Table 1.2 presents the respondents' educational attainment (N = 65). Most pregnant teenagers had reached the secondary level of education, with 44.6% (n = 29) having completed junior high school and 41.5% (n = 27) senior high school. Only a small proportion had elementary education (10.8%, n = 7) or college exposure (3.1%, n = 2), and none were college graduates. These findings indicate that most respondents had completed only basic education at the time of pregnancy. The concentration of respondents at the secondary level suggests that adolescent pregnancy most commonly occurs during mid to late adolescence, when individuals are still completing compulsory education. The very low number of respondents who reached college implies that pregnancy may disrupt educational progression, likely due to increased responsibilities, financial constraints, and social challenges associated with early motherhood. Conversely, the small proportion of respondents with only elementary education suggests that pregnancy is less common among very early adolescents.

Educational attainment has important implications for maternal health behaviors, including tetanus toxoid vaccination. Higher education levels are often associated with better comprehension of health information and greater adherence to maternal health recommendations. Previous studies have shown that women with higher educational attainment are more likely to receive adequate tetanus toxoid vaccination during pregnancy (Yaya et al., 2020; Faria et al., 2021; Tilahun et al., 2025). These findings support the interpretation that limited educational exposure among pregnant teenagers may affect their awareness and understanding of maternal immunization.

Overall, the results indicate that most pregnant teenagers in the study were still enrolled in secondary education, which may influence their knowledge and practices regarding tetanus toxoid vaccination. The limited progression to higher education highlights the need for targeted, school- and community-based maternal health education to ensure that pregnant adolescents receive accurate and accessible information regardless of educational level.

Table 1.3. *Demographic Profile of the Respondents When Grouped According to the Duration of Their Pregnancy*

Duration	Frequency	Percentage (%)
1st Trimester	8	12.3%
2nd Trimester	12	18.5%
3rd Trimester	45	69.2%
Total	**65**	**100.0**

Table 1.3 shows the trimester distribution of the respondents (N = 65). The majority were in the third trimester (69.2%, n = 45), followed by the second (18.5%, n = 12) and first (12.3%, n = 8) trimesters. This indicates that most participants were in the later stages of pregnancy at the time of data collection. The predominance of third-trimester respondents suggests increased engagement with prenatal services as pregnancy progresses. Later trimesters are typically associated with more frequent antenatal visits, which increase opportunities for vaccination counseling and receipt of the tetanus toxoid vaccine. This pattern highlights the importance of sustained contact with healthcare providers in facilitating maternal immunization. However, the smaller proportion of respondents in the first and second trimesters points to delayed initiation of prenatal care among some pregnant teenagers. Early antenatal engagement is critical to ensure timely administration of the tetanus toxoid and completion of the recommended doses before delivery. Delays may shorten the window for adequate immunization and reduce protection for both mother and newborn.

These findings are consistent with clinical guidance recommending tetanus toxoid vaccination during pregnancy to optimize antibody transfer to the fetus (Centers for Disease Control and Prevention, 2020). Increased antenatal visits have also been associated with a higher likelihood of receiving accurate information and completing vaccination schedules (Iqbal et al., 2020). Overall, the results emphasize the need to strengthen early prenatal education and encourage timely antenatal care among pregnant adolescents to improve maternal immunization outcomes.

Table 1.4. *Demographic Profile of the Respondents When Grouped According to Their Gravidity (GTPAL)*

Gravidity	Frequency	Percentage (%)
Primigravida	50	76.9%
Multigravida	15	23.1%
Total	**65**	**100.0**

Table 1.4 presents the respondents' gravidity (N = 65). The majority were primigravida (76.9%, n = 50), while 23.1% (n = 15) were multigravida. This indicates that most participants were experiencing pregnancy for the first time. The predominance of first-time pregnancies among respondents suggests limited prior exposure to maternal healthcare services. As primigravida adolescents, many may still be developing knowledge, confidence, and decision-making skills related to pregnancy and maternal health practices, including tetanus toxoid vaccination. A first-time pregnancy can increase vulnerability to misinformation and uncertainty, particularly among adolescents who are simultaneously adjusting to early motherhood.

Previous studies indicate that while first-time mothers may show strong motivation to protect their infants, they often lack sufficient practical knowledge and experience to follow maternal health recommendations consistently. Sari et al. (2023) reported that primigravida women are generally receptive to maternal health guidance, yet El-Adham et al. (2022) noted that compliance may remain lower without adequate counseling and reinforcement. These findings support the need for targeted and continuous maternal health education for first-time pregnant adolescents. Overall, the high proportion of primigravida respondents highlights the importance of providing clear, age-appropriate, and sustained prenatal education to support informed decision-making and improve adherence to essential maternal immunization practices, including tetanus toxoid vaccination.

Table 1.5. *Demographic Profile of the Respondents When Grouped According to Their Parity (GTPAL)*

Parity	Frequency	Percentage (%)
Nullipara	10	15.4%
Primipara	42	64.6%
Multipara	13	20%
Total	**65**	**100.0**

Table 1.5 shows the respondents' parity (N = 65). Most were primipara (64.6%, n = 42), followed by multipara (20.0%, n = 13), while a smaller proportion were nullipara (15.4%, n = 10). These findings indicate that many respondents had already experienced at least one childbirth. The predominance of primiparous respondents suggests that many teenage mothers were navigating early motherhood with limited prior experience. First-time mothers often require greater support in understanding pregnancy-related care, postpartum adjustment, and preventive health practices, including maternal vaccination. In contrast, multiparous respondents may have greater familiarity with healthcare services from repeated exposure during previous pregnancies, which can influence their confidence and engagement with maternal health interventions.

Research indicates that parity influences maternal health behavior in different ways. While experience from previous pregnancies may increase familiarity with healthcare services, it does not always guarantee consistent adherence to recommended practices. Studies have shown that primiparous women often require more structured guidance, whereas multiparous women may rely on prior experience and, in some cases, delay or reduce engagement with antenatal care (Chamangasht et al., 2020; Wang et al., 2021). These patterns highlight the need for parity-sensitive approaches in maternal health education.

Overall, the findings suggest that maternal health interventions, including education on tetanus toxoid vaccination, should be tailored according to parity. Providing additional guidance and reassurance to first-time mothers and reinforcing the importance of continued adherence among multiparous adolescents may help improve maternal and neonatal health outcomes.

Table 1.6. *Demographic Profile of the Respondents When Grouped According to Their Term (GTPAL)*

Term	Frequency	Percentage (%)
1	39	60%
2	7	10.8%
3	0	0%
Others	7	10.8%
Unknown	12	18.5%
Total	**65**	**100.0**

Table 1.6 presents the respondents' pregnancy outcomes, specifically the number of full-term deliveries (N = 65). Most respondents reported having one-term delivery (60.0%, n = 39). A smaller proportion reported two-term deliveries (10.8%, n = 7), while none reported three-term deliveries. The remaining respondents were categorized as "Others" (10.8%, n = 7) or "Unknown" (18.5%, n = 12). The predominance of respondents with only one full-term pregnancy is consistent with earlier findings indicating that many participants were first-time or early-stage mothers. The absence of respondents with three-term deliveries further emphasizes that the study population was mainly in the early phase of their reproductive lives. These patterns are expected among adolescent mothers and reflect limited cumulative pregnancy experience.

Notably, the relatively high proportion of respondents in the "Unknown" category suggests gaps in awareness or documentation of pregnancy history among teenage mothers. Limited understanding of pregnancy timelines and outcomes may reflect inadequate health education or inconsistent engagement with prenatal services. This gap has implications for maternal health monitoring, as awareness of pregnancy history is important for identifying risks and guiding appropriate prenatal interventions.

Previous literature highlights the importance of full-term pregnancy as an indicator of favorable maternal and neonatal outcomes (American College of Obstetricians and Gynecologists, 2021). Maternal immunization, including tetanus toxoid vaccination, has been associated with reduced pregnancy-related complications and improved neonatal protection (World Health Organization, 2022). Overall, the findings underscore the need for strengthened prenatal education among pregnant adolescents, particularly in helping them understand and track pregnancy outcomes as part of comprehensive maternal care.

Table 1.7. *Demographic Profile of the Respondents When Grouped According to Their Pre-term (GTPAL)*

Preterm	Frequency	Percentage (%)
1	5	7.7%
2	0	0%
3	0	0%
Others	8	12.3%
Unknown	52	80%
Total	**65**	**100.0**

Table 1.7 presents the respondents' history of preterm deliveries (N = 65). Only 7.7% (n = 5) reported one preterm birth, while none reported two or three preterm deliveries. A small proportion were categorized as "Others" (12.3%, n = 8), whereas the majority of respondents were categorized as "Unknown" (80.0%, n = 52). The very high proportion of "Unknown" responses indicates a substantial gap in awareness or documentation of pregnancy history among teenage mothers. This finding suggests that many respondents may lack sufficient understanding

of gestational age or have limited access to complete medical records. Such gaps are common among adolescent mothers, particularly those with limited exposure to prenatal education and healthcare services.

The low reported incidence of preterm birth should therefore be interpreted cautiously, as it may reflect underreporting rather than the actual absence of preterm deliveries. Inadequate knowledge of pregnancy timelines may prevent young mothers from recognizing or accurately reporting preterm birth experiences. This highlights the need for improved prenatal counseling focused on pregnancy monitoring and recognition of potential risks. Preterm birth remains a major contributor to neonatal morbidity and mortality worldwide (World Health Organization, 2023). Strengthening health education among pregnant adolescents—particularly regarding gestational age, warning signs of preterm labor, and the importance of regular prenatal care—may support earlier detection of risks and improve pregnancy outcomes. Overall, the findings emphasize the importance of enhancing both maternal health literacy and record-keeping among teenage mothers as part of comprehensive prenatal care.

Table 1.8. *Demographic Profile of the Respondents When Grouped According to Their Abortion (GTPAL)*

Abortion/Miscarriage	Frequency	Percentage (%)
1	3	4.6%
2	0	0%
3	1	1.5%
Others	61	93.8%
Total	**65**	**100.0**

Table 1.8 presents the respondents' history of abortion or miscarriage (N = 65). The majority of respondents reported no history of abortion or miscarriage (69.2%, n = 45). A small proportion reported one abortion or miscarriage (7.7%, n = 5), while none reported two or more events. The remaining respondents were categorized as "Unknown" (23.1%, n = 15). The predominance of respondents with no reported history of abortion or miscarriage suggests generally favorable pregnancy outcomes among the study population. However, the relatively high proportion of "Unknown" responses indicates gaps in awareness, recall, or documentation of pregnancy outcomes among teenage mothers. This may reflect a limited understanding of early pregnancy loss or insufficient engagement with healthcare providers during early gestation.

The low reported incidence of abortion or miscarriage should therefore be interpreted with caution, as underreporting is possible, particularly among adolescents. Social stigma, emotional sensitivity, and lack of medical confirmation may influence the disclosure of pregnancy loss. These factors underscore the need for sensitive, adolescent-friendly counseling and improved education on reproductive health. Previous studies emphasize that awareness of pregnancy outcomes is important for identifying maternal risk factors and guiding appropriate prenatal care (World Health Organization, 2022). Strengthening reproductive health education and early antenatal engagement among pregnant adolescents may help improve awareness, reporting accuracy, and overall maternal health outcomes.

Table 1.9. *Demographic Profile of the Respondents When Grouped According to Their Living (GTPAL)*

Living	Frequency	Percentage (%)
1	35	53.8%
2	7	10.8%
3	2	3.1%
Others	21	32.3%
Total	**65**	**100.0**

Table 1.9 shows the number of living children (*N* = 65). The majority of respondents, 35 (53.8%), reported having one living child. This was followed by 21 respondents (32.3%) in the "Others" category, including those who had not yet given birth. Seven respondents (10.8%) had two living children, while only two (3.1%) had three. The results indicate that most pregnant respondents were either first-time mothers or had minimal experience in raising children. The high percentage of respondents with no or one living child shows that many were still learning to manage the responsibilities of motherhood. This finding highlights the need to strengthen prenatal and postnatal education so that young mothers receive the guidance and support needed to care for themselves and their babies.

The presence of respondents who had not yet given birth also indicates that some were still pregnant. For these individuals, targeted education on newborn care and important preventive practices is essential. One of the key

preventive measures is the tetanus toxoid vaccination, which protects newborns from neonatal tetanus. Since neonatal tetanus can be life-threatening, especially in low-resource settings, first-time and inexperienced mothers must understand why this vaccination matters for their baby's safety. These findings are supported by existing research. The Centers for Disease Control and Prevention (2020) notes that neonatal tetanus often occurs within the first month of life through infection of the umbilical stump, and that tetanus toxoid vaccination is an effective way to prevent it. The World Health Organization (2023) continues to recommend that all women of reproductive age receive at least two doses of the vaccine, especially in areas with greater health risks.

A recent study by Naha et al. (2025) also found that higher compliance with tetanus toxoid vaccination among pregnant women significantly reduces newborn deaths and infections. Their research further showed that first-time mothers who receive clear prenatal education are more likely to complete the required doses. This emphasizes the importance of providing consistent health education and support for pregnant adolescents to help ensure healthy outcomes for both mother and child.

Knowledge on Tetanus Toxoid Vaccination

Table 2 presents the level of knowledge among pregnant teenagers regarding the tetanus toxoid vaccine. The results showed varying levels of knowledge. The highest mean score (M = 4.02) was recorded for the statement, "Tetanus toxoid vaccine is important for pregnant women to protect both the mother and the baby," indicating a strong understanding of its importance. High scores were also noted for statements related to routine prenatal administration (M = 3.98) and prevention of infections during childbirth (M = 3.91), showing awareness of the vaccine's role in maternal and newborn protection.

Table 2. *Knowledge of Pregnant Teenagers Receiving and Completing the Tetanus Toxoid Vaccine during Pregnancy*

Knowledge	Mean	SD	Remarks
The purpose of the tetanus toxoid vaccine for pregnant women is to prevent infections during childbirth.	3.91	1.40	Knowledgeable
The tetanus toxoid vaccine is important for pregnant women to protect both the mother and the baby.	4.02	1.34	Knowledgeable
The first dose of the tetanus toxoid vaccine should be given as early in pregnancy as possible.	3.37	1.53	Somewhat Knowledgeable
If a mother does not complete the tetanus toxoid vaccination schedule, the baby is at risk of neonatal tetanus.	3.32	1.63	Somewhat Knowledgeable
Swelling and redness at the injection site are common side effects of the tetanus toxoid vaccine.	3.69	1.55	Knowledgeable
The tetanus toxoid vaccine should be given to pregnant women in all pregnancies, regardless of previous vaccination.	3.57	1.45	Knowledgeable
Tetanus toxoid vaccination is necessary only for women who have never been vaccinated.	3.52	1.46	Knowledgeable
Neonatal tetanus is preventable through maternal tetanus toxoid vaccination.	3.78	1.47	Knowledgeable
The tetanus toxoid vaccine is effective in preventing neonatal tetanus, even when administered in the later stages of pregnancy.	3.57	1.58	Knowledgeable
The tetanus toxoid vaccine has no harmful effects on the fetus during pregnancy.	3.86	1.46	Knowledgeable
The tetanus toxoid vaccine is typically administered during routine prenatal visits to ensure timely protection.	3.98	1.43	Knowledgeable
Five doses of the tetanus toxoid vaccine are required to ensure complete protection.	2.72	1.62	Somewhat Knowledgeable
Overall Result	**3.61**	**1.077**	

Note: 1.00 to 1.80 (Not Knowledgeable); 1.81 to 2.60 (Slightly Knowledgeable); 2.61 to 3.40 (Somewhat Knowledgeable); 3.41 to 4.20 (Knowledgeable); 4.21 to 5.00 (Highly Knowledgeable)

However, lower mean scores were observed for several items. The lowest score (M = 2.72) was recorded for the statement, "Five doses of the tetanus toxoid vaccine are required to ensure full protection," indicating limited knowledge of the complete vaccination schedule. Lower scores were also noted for the duration of protection, possible side effects, and the risk of neonatal tetanus. These findings show that while pregnant teenagers recognized the general importance of tetanus toxoid vaccination, their knowledge of specific benefits, dose requirements, and health risks remained limited, highlighting the need for improved health education.

From a theoretical perspective, these findings align with the Health Belief Model of Irwin Rosenstock, which states that understanding the seriousness of a health threat and the benefits of preventive action influences health behavior. Although respondents knew the vaccine was important, incomplete knowledge of dose requirements may reduce completion of the vaccination schedule. The Health Promotion Model of Nola Pender further

emphasizes that access to health services and past experiences influence health behaviors, supporting the need for more accessible education efforts. These results support Sustainable Development Goal (SDG) 3, particularly SDG 3.1 and SDG 3.2, which aim to reduce maternal mortality and prevent neonatal deaths, and SDG 3.7, which promotes access to essential prenatal services. Ensuring accurate information about tetanus toxoid vaccination contributes to reducing preventable maternal and newborn deaths.

Existing literature supports these findings. The World Health Organization (2023) and the Centers for Disease Control and Prevention (2022) emphasize that completion of the full vaccination schedule is necessary for long-term protection. Studies report that incomplete knowledge, limited access to healthcare, cultural beliefs, fear of side effects, and lack of guidance from healthcare providers affect vaccine completion (Modawey, 2019; Liyew & Ayalew, 2021; Pepito et al., 2021; Nigussie, 2021). Overall, the respondents' mean knowledge score of 3.61 indicates a generally good level of understanding with important gaps. The results emphasize that although pregnant teenagers recognize the importance of tetanus toxoid vaccination, more precise and more complete information is needed to ensure full protection for both mother and baby.

Attitude Towards Tetanus Toxoid Vaccination

Table 3 shows the attitudes of pregnant teenagers toward receiving and completing the tetanus toxoid vaccination during pregnancy. The results indicated that most participants held a positive attitude toward the vaccine. The highest mean score (M = 4.43) reflected confidence that the vaccine is free of charge and available at health centers. High mean scores were also noted for vaccine safety during pregnancy (M = 4.38), its importance for pregnant women (M = 4.37), willingness to receive it (M = 4.29), and concern about the risks of tetanus infection (M = 3.86). These findings indicate that respondents believed the vaccine is safe, accessible, and essential for maternal care. On the other hand, lower mean scores were recorded for concerns about possible side effects (M = 3.55) and hesitancy in completing all recommended doses (M = 3.42), indicating uncertainty that may affect full compliance. Overall, the data showed generally positive attitudes toward tetanus toxoid vaccination with moderate concerns.

Table 3. *Attitudes of Pregnant Teenagers Receiving and Completing the Tetanus Toxoid Vaccine during Pregnancy*

Attitude	Mean	SD	Remarks
I feel confident that tetanus toxoid vaccines are free of charge and available at Health Centers/RHUs.	4.43	0.951	Strongly Agree
I believe that it is safe to be vaccinated of tetanus toxoid vaccine during pregnancy.	4.38	1.011	Strongly Agree
I am concerned about the potential risks of tetanus infection during and after pregnancy.	3.86	1.345	Agree
I am concerned about the possible side effects of the tetanus toxoid vaccine.	3.55	1.511	Agree
I believe that tetanus toxoid vaccination is important for pregnant women.	4.37	1.153	Strongly Agree
I am willing to receive a tetanus toxoid vaccination during pregnancy.	4.29	1.259	Strongly Agree
I am willing to complete all recommended doses of tetanus toxoid vaccine during pregnancy.	3.42	1.657	Agree
Overall Result	**4.04**	**0.673**	

Note: 1.00 to 1.80 (Strongly Disagree); 1.81 to 2.60 (Disagree); 2.61 to 3.40 (Moderately Agree); 3.41 to 4.20 (Agree); 4.21 to 5.00 (Strongly Agree)

From a theoretical perspective, the Health Belief Model, developed by Irwin Rosenstock, explains that concerns about side effects and about completing all doses may act as barriers despite recognition of benefits. The Health Promotion Model of Nola Pender emphasizes that health education and support from healthcare providers can improve adherence. These findings support Sustainable Development Goal 3, particularly target 3.7 on access to maternal health services.

Existing literature supports these results, showing that accessible health facilities and confidence in vaccine safety encourage uptake, while fear of side effects discourages dose completion (Yaya et al., 2019; Niguissie et al., 2021; World Health Organization, 2024). However, completion rates remain low despite positive attitudes (Ibrahim et al., 2023). Overall, a mean score of 4.04 indicates a positive attitude toward tetanus toxoid vaccination, underscoring the need to strengthen health education to ensure completion of the whole vaccine schedule among pregnant teenagers.

Practices Towards Tetanus Toxoid Vaccination

Table 4 presents the practices of pregnant teenagers regarding receiving and completing the tetanus toxoid vaccination during pregnancy. The results showed positive to moderate vaccination practices. The highest mean score (M = 4.17) was recorded for trust in healthcare providers to guide the timing and dosage of the vaccine, indicating strong confidence in healthcare professionals. High mean scores were also noted for attending

scheduled health check-ups (M = 4.06), visiting healthcare facilities for vaccination (M = 3.97), and cooperating with health workers during appointments (M = 3.77). These findings suggest that many respondents actively engaged with healthcare services during pregnancy.

Table 4. *Practices of Pregnant Teenagers Regarding Receiving and Completing the Tetanus Toxoid Vaccine during Pregnancy*

Practices	Mean	SD	Remarks
I visited a healthcare facility, the Health Center, RHU, for the Tetanus Toxoid vaccination during my pregnancy.	3.97	1.42	Practice
I cooperate with health workers during vaccination appointments to ensure the timely administration of the tetanus toxoid vaccine.	3.77	1.56	Practice
I have attended the scheduled health check-ups for my pregnancy, including those for the tetanus toxoid vaccine.	4.06	1.32	Practice
I follow up on any missed or delayed doses of the tetanus toxoid vaccine, as advised by my healthcare provider.	3.25	1.73	ModeratelyPractice
I trust the healthcare providers to guide me on the timing and dosage of the tetanus toxoid vaccine during my pregnancy.	4.17	1.41	Practice
I insist on completing the 5 doses of the tetanus toxoid vaccine.	2.71	1.75	Moderately Practice
Overall Result	**3.65**	**1.194**	

Note: 1.00 to 1.80 (Not Practice at all); 1.81 to 2.60 (Less Practice); 2.61 to 3.40 (Moderately Practice); 3.41 to 4.20 (Practice); 4.21 to 5.00 (Strongly Practice)

However, the lowest mean score (M = 2.71) was recorded for intention to complete all five recommended doses, indicating that full compliance with the complete vaccination schedule remains a challenge. Although trust in healthcare providers was high, hesitancy to complete the whole series of doses persisted, suggesting possible challenges related to health literacy, access to health services, or inconsistent follow-up. These findings highlight the need for continuous health education and supportive systems to improve complete vaccination rates among pregnant teenagers.

The Health Promotion Model of Nola Pender explains these results by emphasizing that past experiences, access to health services, and personal motivation influence health behaviors. Pregnant teenagers who maintain a good rapport with healthcare providers and attend prenatal visits are more likely to adhere to recommended doses, while limited resources and poor health literacy may hinder compliance. This supports Sustainable Development Goal 3, particularly targets 3.1 and 3.2, which aim to reduce maternal mortality and prevent neonatal deaths by ensuring completion of essential maternal vaccinations.

Existing literature supports these findings. Studies show that guidance from healthcare providers, health education, and counseling increase adherence to tetanus toxoid vaccination, while missed doses and hesitancy remain common despite awareness (Mehanna et al., 2020; Manzoor, 2019; Tamiru et al., 2024). Trust in healthcare providers also plays a key role in vaccination practices (Johm et al., 2021), although completing all doses remains a challenge. Overall, the respondents' mean score of 3.65 indicates generally positive vaccination practices. These findings support evidence that strong knowledge, positive attitudes, and trust in healthcare providers are associated with better vaccination practices, emphasizing the importance of strengthening education and follow-up to ensure complete protection for pregnant teenagers and their babies.

Differences in Knowledge, Attitude, and Practices According to Demographic Profile

Table 5.1. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Age*

Age	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	14.60	5	0.012	Significant
Mean (Attitude)	6.53	5	0.258	Not Significant
Mean (Practices)	4.36	5	0.499	Not Significant

The table shows a significant difference in knowledge of tetanus toxoid vaccination when respondents were grouped by age, as assessed by the Kruskal–Wallis test. Younger pregnant adolescents, particularly those around fifteen years old, were generally less knowledgeable compared to older respondents. This gap has important implications, as teenage pregnancy already carries increased risks for both the mother and the newborn, and limited knowledge about essential preventive measures, such as tetanus vaccination, can further increase these risks. When younger adolescents do not understand the purpose or schedule of the vaccine, they are less likely to receive it on time, reducing protection against maternal and neonatal tetanus. The age-related difference in

knowledge suggests that younger adolescents may miss vaccinations not because of biological factors but because of limited information. This highlights the need for health programs to tailor education and services to better reach this vulnerable group. Even slight differences in knowledge between age groups may lead to meaningful differences in vaccine uptake and health outcomes.

The Health Belief Model helps explain these findings. Older adolescents may better understand the seriousness of tetanus, recognize the benefits of vaccination, and perceive fewer barriers to care. In comparison, younger adolescents may have lower awareness, fewer cues to action, and lower self-efficacy in making healthcare decisions. Strengthening information, access to services, and reminders is therefore especially important for younger pregnant adolescents. These efforts support Sustainable Development Goal 3, particularly SDG 3.1, SDG 3.2, and SDG 3.7, which focus on reducing maternal mortality, preventing neonatal deaths, and ensuring access to maternal immunization.

Existing literature supports these results. Mehanna et al. (2020) found that women with lower knowledge about tetanus vaccination were less likely to complete the recommended doses, emphasizing that knowledge and health beliefs strongly influence immunization behavior. This reinforces that younger and less informed pregnant adolescents are at higher risk of incomplete vaccination, underscoring the need for targeted, age-appropriate health education to protect both mother and newborn.

Table 5.2. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Educational Attainment*

Educational Attainment	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	2.29	3	0.514	Not Significant
Mean (Attitude)	1.08	3	0.782	Not Significant
Mean (Practices)	2.43	3	0.488	Not Significant

The statistical results in Table 5.2 showed no significant differences in knowledge, attitudes, and practices regarding the tetanus toxoid vaccine among pregnant teenagers when grouped by educational attainment. This finding suggests that educational attainment alone may not be a reliable predictor of health behavior related to tetanus vaccination. Even teenagers with secondary or higher education may not receive, understand, or retain essential information about tetanus vaccination during pregnancy, allowing preventable maternal or neonatal tetanus to persist. The absence of differences across educational levels highlights a widespread gap in health knowledge and practice among pregnant adolescents. Given that teenage pregnancy is already associated with increased vulnerability due to age, stigma, limited healthcare access, and social constraints, this result underscores the need for health communication strategies that are broad, inclusive, and sensitive to contextual barriers beyond formal education.

The Health Belief Model supports this interpretation by emphasizing that perceptions of risk, susceptibility, and benefits, rather than demographic characteristics, influence health behavior. Teenagers may underestimate the seriousness of tetanus or lack cues to action, such as reminders from healthcare providers, which may explain the similar levels of knowledge, attitudes, and practices across education groups. These findings align with Sustainable Development Goal 3, particularly SDG 3.1, SDG 3.2, and SDG 3.7, which emphasize reducing maternal mortality, preventing newborn deaths, and ensuring access to reproductive healthcare services. Additionally, existing literature supports these results. Mehanna et al. (2020) found that lower knowledge and health beliefs were associated with failure to complete tetanus toxoid vaccination. This reinforces the need for targeted and consistent health education for all pregnant adolescents, regardless of educational attainment, to improve maternal and neonatal health outcomes.

Table 5.3. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Duration*

Duration	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	3.06	2	0.216	Not Significant
Mean (Attitude)	2.71	2	0.215	Not Significant
Mean (Practices)	11.29	2	0.004	Significant

Table 5.3 shows that, based on the Kruskal–Wallis test, there were no significant differences in knowledge and attitudes toward tetanus toxoid vaccination across pregnancy durations. This suggests that awareness and perception of the vaccine did not vary substantially across trimesters. However, post-hoc analysis revealed a significant difference in vaccination practices, particularly between the second and third trimesters, indicating

that the likelihood of receiving the tetanus toxoid vaccine increases as pregnancy progresses. Delayed vaccination has important implications for maternal and neonatal health. Early immunization is essential to ensure the timely transfer of protective antibodies and reduce the risk of neonatal tetanus. The finding that many pregnant teenagers receive the vaccine later in pregnancy highlights gaps in early prenatal care. It shortens the time available to complete the recommended two-dose schedule, potentially increasing risks for both mother and newborn.

Increased vaccination in later trimesters may be linked to more frequent prenatal visits, stronger healthcare support, and repeated counseling as pregnancy advances. Greater exposure to health information and a stronger sense of responsibility for the unborn child may also encourage compliance. This pattern aligns with the Health Promotion Model of Nola Pender, which emphasizes that health-promoting behaviors increase with greater engagement with healthcare services and exposure to cues to action. These findings underscore the importance of early prenatal interventions, particularly timely tetanus toxoid vaccination, especially during the first trimester. Strengthening education and support early in pregnancy may improve adherence before later stages. Existing literature supports these results. Studies show that early antenatal care attendance and regular follow-up significantly improve completion of the recommended number of doses, whereas limited prenatal care and first-time pregnancy reduce vaccination coverage (Amoak et al., 2022; Bizuneh & Mustofa, 2024; Tamiru et al., 2024; Ibrahim et al., 2023).

Table 5.4. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Gravidity*

Gravidity	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	Mann-Whitney U	284	0.156	Not Significant
Mean (Attitude)	Mann-Whitney U	286	0.164	Not Significant
Mean (Practices)	Mann-Whitney U	287	0.170	Not Significant

The Mann–Whitney U test results in Table 5.4 showed no significant differences in knowledge, attitude, and practice related to tetanus toxoid vaccination between primigravid and multigravid teenage mothers in San Pablo City, Laguna. This indicates that prior pregnancy experience did not lead to a better understanding or improved vaccination practices. Both first-time and repeat adolescent mothers may have received similar levels of health education during prenatal care, or information from earlier pregnancies may not have been retained or reinforced. These findings suggest that healthcare programs should not assume that prior pregnancy leads to better adherence to immunization guidelines and should provide consistent health education to all pregnant adolescents.

This interpretation aligns with the Health Belief Model, which emphasizes that health behavior is influenced by perceived risk, benefits, and barriers rather than demographic factors such as gravidity. Similar responses across groups suggest shared perceptions, such as low perceived susceptibility or common barriers to vaccination. Pender's Health Promotion Model also supports this finding, as prior experience did not appear to influence attitudes or practices. From a public health perspective, these results support Sustainable Development Goal 3, particularly SDG 3.1, SDG 3.2, and SDG 3.7, by emphasizing equitable access to maternal health education and immunization services. Additionally, existing literature supports these findings. Studies show that knowledge, education, and healthcare provider support are stronger predictors of tetanus vaccine uptake than pregnancy history, reinforcing the need for continuous and inclusive health promotion for all pregnant adolescents (Leo et al., 2023; Gelaw et al., 2023; Altaş et al., 2025).

Table 5.5. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Parity*

Parity	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	6.64	3	0.084	Not Significant
Mean (Attitude)	4.67	3	0.197	Not Significant
Mean (Practices)	10.46	3	0.015	Significant

The table showed that, based on the Kruskal–Wallis test, respondents' knowledge and attitudes toward tetanus toxoid vaccination did not differ significantly when grouped by parity. This indicates that the number of pregnancies did not substantially influence what pregnant teenagers knew about the vaccine or how they felt toward it. However, a significant difference was found in vaccination practices, suggesting that those with more pregnancies were more likely to complete the tetanus toxoid vaccination schedule due to increased exposure to prenatal care services. Repeated prenatal visits and prior experience with maternal immunization may have strengthened familiarity with vaccination and reinforced its importance among multiparous adolescents. In contrast, nullipara and primipara adolescents may have limited exposure to prenatal care, making them more

vulnerable to confusion, anxiety, or misinformation and more in need of guidance and reassurance. Differences in practice behaviors across parity groups highlight the influence of experience on health actions. While multiparous adolescents may benefit from repeated exposure to health services, previous studies show that some women with multiple pregnancies may skip recommended visits due to perceived familiarity or competing responsibilities (Alzboon & Vural, 2021; Lee et al., 2024). These findings emphasize that experience alone does not ensure consistent adherence to evidence-based maternal health practices.

From the Health Belief Model perspective, variations in perceived risk and perceived benefits help explain these patterns. First-time mothers may perceive greater susceptibility and severity, which can encourage adherence to maternal health recommendations, whereas multiparous mothers may perceive lower risk based on past experiences. Recognizing the benefits of maternal care increases compliance (Salehe et al., 2025), highlighting the need to emphasize the personal relevance of tetanus toxoid vaccination and address barriers across all parity groups. Existing literature supports these findings. Studies indicate that multiparous women may show higher compliance due to prior exposure to maternal health programs, yet gaps in awareness and practice persist without consistent education (Kuye-Kuku et al., 2022; Mohammed et al., 2021). These results underscore the importance of providing transparent, continuous, and inclusive health education to all pregnant teenagers, regardless of parity, to ensure optimal maternal and neonatal health outcomes.

Table 5.6. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Term*

Term	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	6.64	3	0.084	Not Significant
Mean (Attitude)	4.67	3	0.197	Not Significant
Mean (Practices)	10.46	3	0.015	Significant

The table showed that, based on the Kruskal–Wallis test, knowledge and attitude toward tetanus toxoid vaccination did not differ significantly among respondents when grouped by pregnancy term. This suggests that awareness and beliefs about the vaccine were consistent throughout pregnancy. However, a significant difference was found in vaccination practices: women nearing or at full term were more likely to adhere to the vaccination schedule, likely due to longer, more consistent exposure to prenatal care. Significant differences were noted between one-term births and unknown pregnancies, and between two-term births and unknown pregnancies, indicating that repeated prenatal visits and cumulative health education improve compliance.

In contrast, women with fewer or uncertain pregnancy histories may have had fewer healthcare interactions, resulting in missed information and lower adherence. This reflects a gap between knowledge and practice: early-pregnancy women may perceive fewer immediate consequences of delaying care, while later-term women feel a greater sense of urgency. Nyando et al. (2023) reported that first-trimester women often delay care because the pregnancy "does not yet feel real," whereas later-trimester women engage more in health-promoting behaviors.

Pender's Health Promotion Model explains these differences, as perceived benefits, barriers, and interpersonal influences shape health behavior. Women approaching term perceive greater benefits, receive more support, and face fewer barriers, increasing adherence. Early interventions that reinforce benefits, reduce barriers, and provide support are therefore essential.

Ensuring timely vaccination aligns with SDG 3.2, which targets neonatal mortality reduction through improved prenatal care. WHO (2023) recommends the first dose of tetanus toxoid be given early in pregnancy, with a second dose after at least four weeks to achieve optimal protection. Studies show that increased antenatal care visits improve vaccine completion (Iqbal et al., 2020), while accessibility and provider recommendations influence adherence (Modawey, 2019). Strengthening early pregnancy education and support is critical to improving vaccination compliance and safeguarding maternal and neonatal health.

Table 5.7. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Pre-term*

Preterm	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	4.49	2	0.106	Not Significant
Mean (Attitude)	6.61	2	0.037	Significant
Mean (Practices)	6.17	2	0.046	Significant

The table showed that, based on the Kruskal–Wallis test, the respondents' perceptions of knowledge did not differ significantly across groups defined by preterm birth history. This suggests that having experienced a preterm birth did not necessarily increase awareness or understanding of tetanus toxoid vaccination. However, significant differences were noted in attitude and practices, indicating that mothers who had experienced a preterm birth were more likely to have a positive outlook on tetanus toxoid vaccination and follow the recommended schedule. Specifically, meaningful differences in vaccination practices were observed between respondents with one preterm birth and those categorized under "others." This may be explained by increased caution and heightened awareness among mothers who previously encountered a preterm delivery, which can raise understanding of the risks related to inadequate prenatal care, including higher chances of infections and newborn complications. Consequently, these mothers may become more careful in following health guidelines, including completing the tetanus toxoid vaccination on time. Experience with preterm birth may also strengthen a mother's self-efficacy—the confidence in making informed health decisions—because of lessons learned from earlier pregnancies. This increased confidence may help them navigate healthcare systems more effectively and motivate them to avoid similar adverse outcomes.

Women who have experienced or are at higher risk for preterm birth tend to show greater concern and behavioral engagement due to increased awareness of complications. For example, Silva et al. (2021) reported that women with a history of premature birth actively engaged in preventive discussions with healthcare providers. Globally, preterm birth remains a major public health issue, affecting approximately one in ten infants (WHO, 2023), making women with preterm birth a priority group for targeted intervention. The Health Belief Model further explains these findings: women with past preterm births tend to have higher perceived susceptibility and severity, motivating them to take more preventive actions. Pacagnella et al. (2021) found that when women at high risk were informed of their prematurity risk, they fully recognized the seriousness and engaged more actively with recommended care. Conversely, women without preterm experiences may feel less urgency, highlighting the importance of emphasizing benefits and addressing barriers to improve adherence.

This finding also aligns with Sustainable Development Goal 3.2, which prioritizes reducing neonatal mortality through improved prenatal care and adherence to vaccination. Ensuring that mothers with a history of preterm birth remain consistent with recommended tetanus toxoid vaccination can help reduce complications and improve maternal and newborn outcomes. However, structural barriers such as limited accessibility must also be addressed to ensure complete and timely immunization (Ibrahim et al., 2023; Modawey, 2019).

Table 5.8. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Abortion/Miscarriage*

Abortion /Miscarriage	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	4.67	2	0.097	Not Significant
Mean (Attitude)	2.95	2	0.229	Not Significant
Mean (Practices)	2.95	2	0.229	Not Significant

The table shows that, based on the Kruskal–Wallis test, the respondents' levels of knowledge, attitude, and practices regarding tetanus toxoid vaccination did not differ significantly when grouped according to their obstetric history of abortion or miscarriage. This suggests that experiencing an abortion or miscarriage did not meaningfully influence what respondents knew about the vaccine, how they felt about it, or how consistently they practiced recommended vaccination behaviors. The absence of significant differences indicates that women with and without such reproductive experiences exhibit similar awareness and engagement in maternal health practices, implying that interventions to improve tetanus toxoid vaccination uptake can be applied uniformly. Strengthening maternal health education and ensuring equitable access to resources remain critical public health priorities.

The Health Belief Model helps explain this finding. Individuals modify health practices when they perceive higher risk (susceptibility), recognize severe complications (severity), see benefits, and perceive fewer barriers. If women view previous abortion or miscarriage as isolated events, they may not feel increased susceptibility or severity, and their behavior may remain unchanged. Limited access to care or perceived low benefits may also maintain existing practices. Research supports this, showing that without adequate information or support, maternal health behaviors are unlikely to change after reproductive complications (Assefa, 2019).

Shahid et al. (2024) reported that 73% of women had knowledge of tetanus vaccination, with factors such as education, household structure, and occupation having minimal influence. Groom et al. (2023) similarly found that maternal characteristics and recall of healthcare provider communication affected vaccination behaviors, while early prenatal care and primiparity influenced adherence. These findings reinforce that reproductive history alone does not determine maternal health behavior and that comprehensive, accessible education is essential for improving tetanus vaccination outcomes among pregnant adolescents.

Table 5.9. *Results of the Test of Difference in Knowledge, Attitude, and Practices When Grouped According to Living*

Living	χ^2	*df*	*p*	Interpretation
Mean (Knowledge)	4.49	3	0.140	Not Significant
Mean (Attitude)	6.61	3	0.715	Not Significant
Mean (Practices)	6.17	3	0.012	Significant

The table showed that, based on the Kruskal–Wallis test, the mean scores for knowledge and attitude did not differ significantly when respondents were grouped by the number of living children in their obstetric history. This indicates that knowledge and attitudes toward the tetanus toxoid vaccine were consistent across family sizes. However, the Practices mean score showed a statistically significant difference, suggesting that actual vaccination behavior varied with the number of living children.

In practical terms, this implies that maternal behaviors differ with parity in ways that matter for public health. Mothers with multiple children often juggle greater responsibilities and may adopt health behaviors differently than first-time mothers. Some studies show high-parity women delay or reduce antenatal care, while others indicate greater maternal experience can enhance practices such as exclusive breastfeeding or immunization (Coppolecchia et al., 2022; Gebretsadik et al., 2022; Sultana et al., 2023). The significant p-value ($p = 0.012$) for practice highlights the need to tailor interventions: first-time mothers may require more education and support, whereas multiparous mothers may need resources to overcome practical barriers like time constraints or childcare demands.

The Health Belief Model helps explain why parity affects practice despite similar knowledge. Women with multiple children may perceive lower susceptibility to complications but have higher self-efficacy for familiar practices, while practical barriers—time, finances, or fatigue—may reduce adherence to recommended behaviors. Evidence shows repeat teenage mothers engage in more negative health behaviors compared to first-time adolescents, yet cues to action and perceived benefits can improve adherence (Salehe et al., 2025; Gebretsadik et al., 2022). These shifts in perceived risks, benefits, and barriers explain the observed differences in practice.

This finding supports Sustainable Development Goal 3.1, which emphasizes expanding maternal health services to ensure that first-time mothers receive appropriate immunization and care. Zegeye et al. (2024) noted that having more living children can increase healthcare exposure and awareness, improving vaccination adherence. Overall, while knowledge and attitudes toward tetanus toxoid vaccination remain consistent across parity levels, actual practices vary, with multiparous mothers showing higher adherence due to healthcare interactions and personal experience.

Conclusion

This study provides important insights into the knowledge, attitudes, and practices of pregnant teenagers toward tetanus toxoid vaccination in San Pablo City, Laguna, by highlighting how age, parity, pregnancy duration, and a history of preterm birth influence vaccine-related behaviors. The findings address a key research gap in the factors shaping immunization among an understudied and vulnerable adolescent population. The results indicate that while teenage mothers generally understand the importance of the tetanus toxoid vaccine and trust healthcare providers, gaps remain in completing the full vaccination schedule, particularly among younger, first-time, and early-pregnancy adolescents. These findings have practical implications for health workers and community programs, underscoring the need for youth-friendly, culturally appropriate health education, early engagement in antenatal care, and structured counseling to improve vaccine uptake. In education, the results support integrating adolescent-centered maternal health content into nursing and midwifery curricula, including immunization and communication strategies for young mothers.

Limitations of this study include its cross-sectional design, which prevents causal inference, and reliance on self-reported data, which may be affected by recall or social desirability bias. Future research could include larger, multi-city samples, qualitative approaches to capture adolescent experiences, and the evaluation of structured interventions—such as the Personalized Tetanus Toxoid Immunization Journal—to improve awareness and adherence. Continued investigation into adolescent maternal immunization is essential for informing programs that safeguard both young mothers and their newborns.

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