

Factors Associated with Uptake of Tetanus Toxoid Vaccine among Pregnant Women Attending Antenatal Clinic at Nyamagana Health Centre Mwanza-Tanzania

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ABSTRACT

Background: Maternal and neonatal tetanus remains a public health problem in low- and middle-income countries despite increasing investment in tetanus toxoid vaccines (TTV). Tanzania still records fatalities from tetanus, predominantly in women of reproductive age and newborns. We aim to determine the factors associated with low uptake of tetanus toxoid vaccine among pregnant women attending the antenatal clinic at Nyamagana Health Centre in Mwanza, Tanzania

Method: A prospective cross-sectional health facility-based study was conducted. A total of 383 pregnant women attending the antenatal clinic at Nyamagana Health Center in Mwanza, Tanzania, were recruited using simple random sampling. Structured questionnaires were used to collect data. Data were recorded in Microsoft Excel, cleaned, and analyzed using STATA version 14.

Results: The predominant age of the respondents was 21–26 years (34.7%). A total of 245 (64%) participants were married. A total of 172 (44.9%) participants had secondary education. Overall, 226 (59.01%) of participants were unaware of the number of doses of tetanus toxoid (TT) vaccine required during pregnancy, and 205 (53.50%) were unaware of tetanus immunization. Notably, 178 (46.48%) of respondents did not know the importance of receiving the tetanus toxoid (TT) vaccine. There was a significant relationship between socio-demographic characteristics and awareness of the importance of the TT vaccine.

Conclusion: Pregnant women in Nyamagana Health Center, Mwanza, Tanzania, are not receiving the recommended TT vaccinations and lack awareness of their importance. Efforts are needed to educate expecting mothers and increase vaccination rates.

Keywords

Tetanus toxoid, Immunization, Pregnant women, Knowledge and attitudes uptake, Antenatal clinic.

List of Abbreviations

TTV: Tetanus toxoid Vaccination, ANC: Antenatal clinic, WHO: World Health Organization, BMC: Bugando Medical Centre,

CUHAS: Catholic University of Health and Allied Sciences.

Introduction

Maternal and neonatal tetanus remains a public health problem in low- and middle-income countries, particularly in Southeast Asia and sub-Saharan Africa, with fatality rates sometimes as high as 100% in newborns [1]. Neonatal tetanus by definition

affects newborns within their first month of life, whereas maternal tetanus occurs during pregnancy or within six weeks of the end of a pregnancy, regardless of the outcome (live birth, stillbirth, miscarriage, or abortion) [2]. According to the World Health Organization (WHO), the disease remains a public health problem in many parts of the world, especially in middle- and low-income countries, where immunization coverage is low and it is most commonly associated with unclean birth practices [3]. Neonatal tetanus protection can be ensured when women either receive at least two doses of the tetanus toxoid vaccine, the last dose within the previous 3 years; receive at least three doses, the last within the previous 5 years; receive at least four doses, the last within the previous 10 years; or receive five or more doses anytime during their life [4].

Tanzania, through its Ministry of Health, Community Development, Gender, Elderly, and Children (MoHCDGEC), recommends that all women receive at least five TT doses in their reproductive life. Little is known about the predictors of TT uptake during pregnancy among women of reproductive age in Tanzania [5]. According to studies done, some of the reasons for the persistence of neonatal tetanus include low income, poor access to antenatal care, lack of education, lack of information, unskilled birth attendants, and unhygienic and traditional abortion practices. It has also been reported that attending an antenatal clinic during pregnancy has been associated with being protected from tetanus [6], this gives an opportunity for a woman to be reviewed and given her due doses of TT.

Poor access to vaccines and lack of knowledge are primary factors for poor vaccination coverage. Other reasons for low coverage include lack of knowledge of the time and place for TT immunization, and misconceptions of vaccines as contraceptive agents [7]. Moreover, different socio-demographic factors such as antenatal care visits [8,9], women's employment, maternal age at delivery, maternal education [10], place of residence, multiparity, healthcare decision-making, contraceptive use, and husband's education have an association with tetanus toxoid immunization [11]. Therefore, this study assessed the factors associated with tetanus toxoid uptake among pregnant women attending antenatal care at Nyamagana Health Centre in the Mwanza region.

Methods and Materials

This was Health facility based cross-sectional study which involved 383 pregnant women attending antenatal care at Nyamagana health Centre in Mwanza region. The sample size was estimated by using the Kish Leslie formula (1965) using prevalence of 90.5% [12]. A simple random sampling of the pregnant women was used. The consent and the questionnaires were administered in Swahili to ensure widespread understanding. The knowledge of tetanus toxoid and awareness on the benefits of uptake of tetanus toxoid vaccine among pregnant women was established through a series of questions.

Data was coded and entry was done in excel sheet. Data cleaning was done and analysis using appropriate software STATA version 14. Cross tabulations were used to examine the relationship between variables. Then, descriptive statistics of demographic characteristics, knowledge, and uptake of Tetanus Toxoid Vaccine items were presented using the Frequency Distribution Table and Figures.

Results

Socio-demographic characteristics

As summarized in Table 1, a total of 383 pregnant women participated in this study with an age range of 15 to 44 years. The leading age group was 21–26 years, which constituted 133 (34.73%) participants. More than half (245 (63.97%)) of the participants were married. A total of 172 (44.9%) participants had a secondary level education, and the majority (188 (49.09%)) had a low-income status. See table 1

Table 1: Socio-demographic characteristics of participants.

Variable	Frequency (N=383)	Percentage (%)
Age		
15 - 20	32	8.36
21 - 26	133	34.73
27 - 32	113	29.50
33 - 38	79	20.63
39 - 44	26	6.79
Marital status		
Single	69	18.02
Married	245	63.97
Divorced	48	12.53
Widowed	21	5.48
Level of education		
No formal education	18	4.70
Primary	29	7.57
Secondary	172	44.91
Middle-level college	131	34.20
University	33	8.62
Income status		
Low	188	49.09
Middle	182	47.52
High	13	3.39
Number of children		
None	19	4.96
One	68	17.75
Two	2	0.52
Three	24	6.27
Four	39	10.18
Five	113	29.5
More than five	118	30.81

Knowledge and Attitudes towards Tetanus Toxoid Vaccine

The study showed that 322 (84.07%) of participants had knowledge of the meaning of the tetanus toxoid (TT) vaccine, while only 61 (15.93%) were unable to state the meaning of the vaccine. A total of 296 (77.28%) participants received the information from the antenatal clinic, 41 (10.70%) from other women, and only 7.84% from mass media. See figure 1.

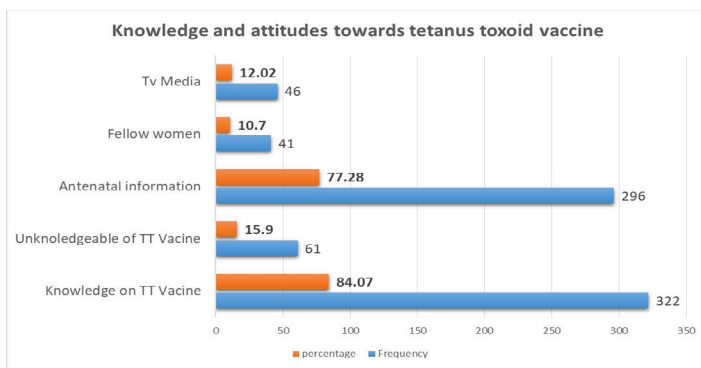


Figure 1: Knowledge and attitudes towards tetanus toxoid vaccine.

Uptake of Tetanus Toxoid Vaccine and Doses of TT Vaccine

About 205 (53.52%) of respondents were aware of the benefits of the TT vaccine, while 178 (46.48%) of respondents did not know exactly the benefits of the TT vaccine. Regarding the number of doses of TT vaccine that should be received during pregnancy, 152 (39.69%) of participants did not know exactly how many doses are needed, 66 (17.23%) knew that three doses are needed, and only 54 (14.10%) knew that they should receive two doses of tetanus toxoid (T_d) vaccine during pregnancy. See table 2.

Table 2: Uptake of tetanus toxoid vaccine and Doses of TT vaccine.

Uptake of tetanus toxoid vaccine and Doses of TT vaccine should be received		Frequency (N=383)	Percentage
Uptake of the TT vaccine	Adequate uptake of TT vaccine	205	53.52
	Inadequate uptake of TT vaccine	178	46.48
Doses of TT vaccine received during pregnancy			
	1 dose	10	2.61
	2 doses	54	14.10
	3 doses	66	17.23
	4 doses	37	9.66
	5 doses	64	16.71
	Don't know	152	39.69

Factors Hindering the Uptake of Tetanus Toxoid Vaccine among Pregnant Women

The results show that 226 (59.09%) of participants agreed that unawareness of the number of doses of TT vaccine required during pregnancy was a major factor hindering their uptake of TT vaccine. This was followed by unawareness of the importance of tetanus toxoid immunization against tetanus (205 (53.52%)), inconvenient interval between doses (211 (55.09%)), poor communication from healthcare workers (198 (51.7%)), and long distance from immunization center (195 (50.9%)). See Table 3.

Table 3: Factors hindering the Uptake of TT vaccine among pregnant women attending Antenatal Clinic.

Variable	Frequency (N=383)	Percentage
Unaware of immunization		
Strongly agree	68	17.75
Agree	205	53.52
Neutral	20	5.22

Disagree	84	21.93
Strongly disagree	6	1.57
Unaware of the number of doses required during pregnancy		
Strongly agree	51	13.32
Agree	226	59.01
Neutral	24	6.27
Disagree	75	19.58
Strongly disagree	7	1.83
Fear of side effects of vaccine		
Strongly agree	46	12.01
Agree	179	46.74
Neutral	31	8.09
Disagree	121	31.59
Strongly disagree	6	1.57
Long distance from immunization center		
Strongly agree	38	9.92
Agree	195	50.91
Neutral	32	8.36
Disagree	111	28.98
Strongly disagree	7	1.83
The inconvenient interval between doses		
Strongly agree	51	13.32
Agree	211	55.09
Neutral	32	8.36
Disagree	80	20.89
Strongly disagree	9	2.35
Absent of Vaccine		
Strongly agree	51	13.32
Agree	163	42.56
Neutral	42	10.97
Disagree	118	30.81
Strongly disagree	9	2.35
Too busy Mothers with home activities		
Strongly agree	32	8.36
Agree	172	44.91
Neutral	33	8.62
Disagree	139	36.29
Strongly disagree	7	1.83
Social problems		
Strongly agree	35	9.14
Agree	178	46.48
Neutral	42	10.97
Disagree	123	32.11
Strongly disagree	5	1.31
Long time waiting		
Strongly agree	64	16.71
Agree	167	43.60
Neutral	33	8.62
Strongly disagree	5	1.31
Disagree	114	29.77
Poor communication from healthcare workers		
Strongly agree	62	16.19
Agree	198	51.70
Neutral	35	9.14
Disagree	82	21.41
Strongly disagree	6	1.57

Discussion

Tetanus toxoid is a vaccine that protects against tetanus, a serious and potentially fatal disease caused by the *Clostridium tetani*

bacterium. Tetanus can cause muscle spasms, lockjaw, and even death.

This study found that the participants had good knowledge of the meaning of TT vaccine administration in pregnant women, and more than half received the information from the antenatal clinic. These findings are similar to those of a study by Enuke CA and Orru O in central hospital, Benin City [13], who revealed that pregnant women had knowledge of TT vaccine and had received information about TT vaccine in the antenatal clinic. This is important because TT vaccination is essential for protecting pregnant women and their babies from tetanus, a serious and potentially fatal disease. Another study, conducted by Begum T, Khatun M, Begum N et al. [14] in Bangladesh showed that 93% of pregnant women had knowledge of tetanus toxoid (TT) vaccination, but only 76% had received at least two doses of TT vaccine. The most common sources of information about TT vaccine were antenatal clinics (80%) and healthcare workers (70%). Antenatal care is an important opportunity to provide pregnant women with information about TT vaccination and to ensure that they receive all of the recommended doses. In this study, many of the respondents were unaware of the number of doses of TT vaccine required during pregnancy, which was a major factor hindering their uptake of TT vaccine. This was followed by unawareness of the importance of immunization against tetanus. Similarly, a study done in Lahore, Pakistan, observed that unawareness of the need for immunization was the cause for poor uptake of TT vaccine among the respondents [15]. However, a study conducted in Peshawar, Pakistan, observed that 40.5% of the respondents stated that unawareness of the importance was the reason for not being vaccinated [16,17]. All these could be lack of access to adequate education and awareness about TT vaccination, unawareness of the benefits of TT vaccination, misconceptions, cultural beliefs and practices may also hinder TT vaccination among pregnant women, lack of access to healthcare services: Some pregnant women may not have access to healthcare services, or they may not be able to afford to get vaccinated and fear of side effects.

Limitations of the Study

This study assessed the factors associated with low uptake of tetanus toxoid vaccine among pregnant women attending the antenatal clinic at Nyamagana Health Centre in Mwanza, Tanzania. Although the methodology used provided an opportunity to follow up and clarify some issues with the respondents, the study had some limitations. First, information was gathered by means of a questionnaire only. Second, the results of the study were dependent on the accuracy and truthfulness of the participants' responses about the TT vaccine. Both of these factors may lead to information bias. Third, the study included only pregnant women attending the antenatal clinic at Nyamagana Health Centre. Therefore, the findings cannot be generalized to other pregnant women from other health centers in Tanzania, as there may be variation from one place to another.

Conclusion

This study revealed low uptake of the tetanus toxoid (TT) vaccine among pregnant women attending Nyamagana Health Center

in Mwanza. This highlights the critical need to raise awareness among Nyamagana's pregnant women regarding the importance of TT vaccination during pregnancy. Educational campaigns should address the benefits of TT immunization for both mothers and newborns, while also tackling any barriers hindering vaccination rates.

Ethics Approval and Consent to Participate

Ethical approval was granted by the joint Catholic University of Health and Allied Sciences (CUHAS)/ Bugando Medical Centre (BMC) Review Board. All participants signed a written informed consent before participating in the study.

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Authors' contributions

Authors' contributions GM wrote the first draft of the manuscript. GM and BP contributed to the writing of the paper and provided vital feedback. GM, and BP, contributed to data acquisition. BP ran the analyses with input from GM. All authors contributed to the study design and interpretation of analyses. All authors critically reviewed and revised the manuscript and approved the final version

Availability of Data and Materials

The datasets that support the results and conclusion of this article are available upon request to the corresponding author.

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