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Accessing Coverage Barriers and Impact of Socio-Cultural Factors on Tetanus Toxoid Immunization Uptake among Women of Child Bearing Age in Ogun State Nigeria

Yusuf Rabiu
Department of Public Health, Lead City University, Ibadan, Oyo State, Nigeria

Adesola Musa
Grant (Biostatistics Subunit), Nigerian Institute of Medical Research, Yaba Lagos State, Nigeria

Tubosun Olowolafe
Department of Public Health, Lead City University, Ibadan, Oyo State, Nigeria

Abstract: Introduction: tetanus toxoid is a vaccine preventable disease that is caused by a life-threatening bacterial infection called clostridium tetani. the vaccine is usually given to women of reproductive age in order to protect both mother and newborn from maternal and neonatal tetanus. this study aims to access the coverage barriers and impact of socio-cultural factors on the uptake of the tetanus toxoid immunization in other to reduce the burden of the disease as a public health concern.

Methods: This study utilized a mixed-methods approach. A semi-structured questionnaire was administered to women of childbearing age. One Local Government Area (LGA) was randomly selected from each senatorial district in Ogun State, Nigeria, using a sampling frame. Data were collected, cleaned in Microsoft Excel, and analyzed using SPSS version 27.

Results: The coverage level of uptake of the Tetanus Toxoid immunization is 78.7%based on the result of the study. However, the dosage breakdown further clarifies the immunization dosage received, while 381(37.6%) women received one dose, 261 (25.8%) women received two doses of the tetanus toxoid vaccine, while 15.3% (155) received three doses which indicate a need for increased awareness about the recommended immunization schedule. these figures collectively show the coverage level of tetanus toxoid vaccine. Cultural or religious beliefs affect women's decisions to receive tetanus toxoid immunization with 198 rural women stated that these beliefs influenced their decisions, while 267 said they did not. In urban areas, 164 women reported that cultural or religious beliefs affected their decision-making, while 299 said they were not influenced by such factors. The Chi-square value of 5.951 and P-value of 0.051 indicate a narrow significant difference.

Conclusion: This study explored coverage barriers and impact of socio-cultural factors on tetanus toxoid immunization uptake. The findings spread across significant associations between socio-demographic variables, healthcare accessibility, cultural beliefs and immunization coverage. The results show a very good indicator of uptake of preventive care vaccine, the cultural and Religious Beliefs shows their attitude towards the immunization decisions, a

reasonable amount of women in rural areas said such belief hinder their decision to receive the vaccine.

Keywords: Tetanus toxoid, Coverage, Cultural believe, Healthcare provider, Immunization.

INTRODUCTION

Approximately 300,000 deaths worldwide are caused by tetanus each year [1]. Tetanus, a highly fatal non-communicable disease, is caused by *Clostridium tetani* [2]. Globally, tetanus is a significant public health problem, particularly affecting women and newborns. Tetanus toxoid (TT) immunization plays a critical role in preventing this disease, thereby reducing the risk of infection [3-6]. It was reported that World Health Organization (WHO) that 90% of maternal and neonatal tetanus occurred in South East Asian and Sub-Saharan African countries and most times all cases end with death [6]. In developed countries, such as the United States, Canada, and European nations, Tetanus toxoid immunization coverage among women of child bearing age is generally high due to well-established healthcare systems and effective immunization programs [7]. These countries have achieved significant success in reducing the burden of tetanus and eliminating maternal and neonatal tetanus cases. The coverage of Tetanus toxoid immunization among women of child bearing age varies in Sub-Saharan Africa. While some countries have made substantial progress, others still face challenges in achieving high coverage rates. Factors such as access to healthcare services, availability and affordability of vaccines, education and awareness, and cultural beliefs and practices influence immunization uptake in these regions [6-8]. According to the 2008 National Demographic and Health Survey (NDHS), 48% of Nigerian women who gave birth in the five years prior to the survey reported receiving two or more tetanus toxoid injections during pregnancy. However, the NDHS report also shows clearly that there is a regional difference in coverage rates with the southwest region having about 77%, Although this coverage is below the WHO target of 80% eradication for the epidemic [9]. This study aimed to explore the coverage barriers, and impact of socio-cultural factors on tetanus toxoid immunization uptake among women of child bearing age in Ogun State Nigeria. Understanding the factors influencing immunization uptake will provide valuable insights for targeted interventions and strategies to improve coverage and protect women of reproductive age and their infants from tetanus.

MATERIALS AND METHODS

Study Area

This study was conducted across the three senatorial districts in Ogun State, Nigeria, with one local government area selected from each district. Specifically, Ipokia Local Government was chosen from Ogun West Senatorial District, Obafemi Owode Local Government from Ogun Central Senatorial District, and Ijebu North Local Government from Ogun East Senatorial District. These selected areas encompass both urban and rural settings, reflecting a diverse mix of socioeconomic and cultural dynamics. Ogun State is predominantly inhabited by the Yoruba ethnic group, and Yoruba is the primary language spoken across its communities.

Study Design

We carried out a cross-sectional study using mixed methods approach, comprising a household survey while administering a semi-structured questionnaire. The process began with simple random sampling to select one Local Government Area (LGA) from a sampling frame representing the three senatorial districts. The communities within the chosen LGA were classified as either urban or rural, and simple random sampling was then employed to select communities from each category. Households in the selected communities were identified using systematic sampling. Lastly, purposive sampling was applied to recruit eligible women of childbearing age from each community.

Data Collection

Data were gathered using a structured and pretested questionnaire administered through face-to-face interviews. The questionnaire was adapted from similar studies to ensure relevance and reliability [10-12]. The questionnaire was developed in English and was later translated into local dialects for the respondents to ensure clear communication. Research assistants who speaks English and Yoruba fluently were engaged in data collection. The procedures involved approaching participants, obtaining informed consent, and administering the research instruments to gather the necessary data on Tetanus toxoid immunization coverage among women of Child bearing age in Ogun State. Participants had the opportunity to ask questions and clarify any concerns before providing their written consent.

Sample Size Calculation

The formula as $n = z^2pq/d2$ was used to estimate the sample size. We made the following assumptions while calculating the sample size. The degree of precision (d) chosen to be 0.03 with the normal (z) vale of ($z = 1.96$). Therefore, the proportion $P = 0.69$ and $q = 0.31$. This gave a sample size of 913. We considered adding a 10% nonresponse rate and we obtain a sample size of 1014. A total of 1013 questionnaires was administered during the study data collection.

Data Analysis

The collected data were entered and stored in Microsoft Excel before being imported into Statistical Package for the Social Sciences (SPSS) software version 27 for analysis. Descriptive statistics were employed to summarize demographic characteristics, coverage and socio-cultural factors of the Tetanus Toxoid Vaccine uptake, which were presented using frequency distribution tables and graphical figures. Cross-tabulation was utilized to explore associations between variables. A p-value of less than 0.05 was deemed statistically significant.

RESULTS

A total of 1013 study participants completed the study. The study sample consisted predominantly of married individuals (87.5%), with singles, divorced, widowed, and separated individuals making up 5.9%, 3%, 0.4%, and 3.3%, respectively. The majority had higher/tertiary education (34.3%), followed by those with no formal education (27%), secondary education (20.2%), and primary education (18.5%). Christianity (45.9%) and Islam (44.4%) were the main religious affiliations, while traditional beliefs and others accounted for 8.8% and 0.9%. Most respondents were skilled workers (68.1%), with unskilled, unemployed, and housewives representing 21.3%, 3.1%, and 7.5%, respectively. The Yoruba ethnic group dominated (67.7%), followed by Igbo (10.9%), Hausa (9.4%), and others (12%). The mean age was 33.5 years (±59.3 variance), with most respondents aged 29-38 years (44.2%), followed by 18-28 years (29.6%), 39-48 years (23.6%), and over 48 years (2.6%).

Table 1: Socio-demographic characteristics of participants.

Variables	Frequency (n)	Percent (%)
Marital Status		
Single	60	5.9
Married	886	87.5
Divorced	30	3
Widowed	4	0.4
Separated	33	3.3
Respondent's Education		
None	274	27
Primary Education	187	18.5
Secondary Education	205	20.2
Higher/Tertiary Education	347	34.3

Religious Affiliation		
Christianity	465	45.9
Islam	450	44.4
Traditional	89	8.8
Others	9	0.9
Employment Status		
Skilled	690	68.1
Unskilled	216	21.3
Unemployed	31	3.1
Housewife	76	7.5
Ethnic Group		
Igbo	110	10.9
Hausa	95	9.4
Yoruba	686	67.7
Others	122	12
Age (Mean±Variance)	33.5 ± 59.3	
18 – 28	300	29.6
29 – 38	448	44.2
39 – 48	239	23.6
Greater than 48	26	2.6

As displayed in figure 1, antenatal care was highly utilized, with 91.0% of respondents attending antenatal visits, reflecting a strong awareness of maternal health practices. The number of antenatal visits varied, with a notable 23.8% attending 10 visits, which aligns with standard healthcare recommendations. This high engagement in antenatal care could have implications for positive health outcomes for both mothers and children, as frequent antenatal visits are linked to better coverage level of Tetanus Toxoid (TT) Uptake.

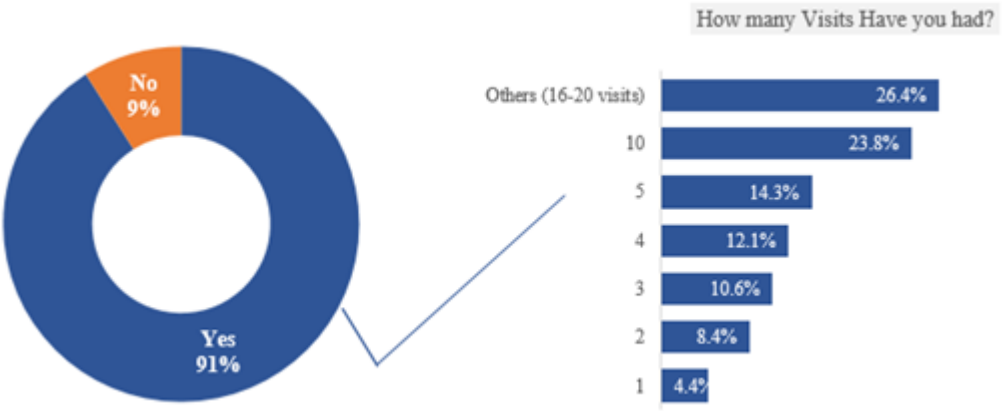

***Figure 1**: Antenatal visit of respondents during there last pregnancy*

Table 2 provides the current coverage level of Tetanus Toxoid (TT) immunization among The respondents. The result shows that 78.7% of women had received tetanus toxoid immunization during their current pregnancy, indicating a strong uptake of preventive care. Similarly 74.8% reported receiving tetanus toxoid immunization during previous pregnancies, suggesting consistent immunization practices across multiple pregnancies. however, the result shows areas for improvement, as 15.4% and 19.2% of women did not receive tetanus toxoid immunization in their current and previous pregnancies, respectively. the dosage breakdown further clarifies the immunization dosage received, while 381(37.6%) women received one dose, 261 (25.8%) women received two doses of the tetanus toxoid vaccine. notably, only 15.3% (155) received three doses, which indicate a need for increased awareness about the recommended

immunization schedule. these figures collectively show the coverage level of tetanus toxoid vaccine.

Table 2 Tetanus Toxoid Immunization Coverage Among Pregnant Women

Variable	Frequency (N)	Percent (%)
Tetanus Toxoid immunization received during current pregnancy		
Yes	797	78.7
No	156	15.4
Tetanus Toxoid immunization receives during previous pregnancy		
Yes	758	74.8
No	195	19.2
how many doses of Tetanus Toxoid vaccine received		
None	156	15.4
One dose	381	37.6
Two doses	261	25.8
Three doses	155	15.3

Table 3 explain barriers and challenges that women of reproductive age encounter when accessing tetanus toxoid immunization. The most significant reason why some women have not received tetanus toxoid immunization was Distance to healthcare facilities, with 367 women (36.2%) reporting that long distances hinder their ability to receive the vaccine. Also lack of awareness is another major barrier, with 198 women (19.5%) stating they were unaware of the need for the vaccine. Financial constraints affect a smaller but little portion of the population, with 75 women (7.4%) identifying it as a challenge. Additionally, fear of side effects discourages 108 women (10.7%), while cultural or religious beliefs are only a barrier for a small minority, 19 women (1.9%). A significant number (18.4%) selected "Others," indicating there may be additional unidentified reasons impacting access which is best k own to them. The second section of the result deals with specific obstacles women face when attempting to access tetanus toxoid vaccine. Difficult access to a healthcare facility was reported by 240 women (32.0%), making it the leading obstacle. The Cost of transportation to the healthcare facility also poses a significant challenge for 224 women (29.8%), showing that financial and logistical barriers are key issues hindering their access to the facilities. Long waiting times at healthcare facilities were a frustration for 192 women (25.6%), further emphasizing service-related barriers. Other challenges include inadequate information or communication, reported by 52 women (6.9%), and lack of vaccine availability, affecting 36 women (4.8%). Only a very small percentage (0.9%) reported other unspecified challenges. Also, in awareness of the recommended schedule for tetanus toxoid immunization, majority 620 women (61.2%) are aware of the schedule, while 333 women (32.9%) are not, indicating an important gap in public health education. Financial barriers, with 388 women (38.3%) reporting financial constraints in receiving the vaccine, though a majority, 565 women (55.8%), did not experience such financial limitations.

Table 3 Barriers and Challenges in Accessing Tetanus Toxoid Immunization

Variable	Frequency (N)	Percent (%)
Reasons Tetanus Toxoid immunization has not been received		
Lack of awareness	198	19.5
Financial constraints	75	7.4
Distance to healthcare facilities	367	36.2
Fear of side effects	108	10.7
Cultural or religious beliefs	19	1.9
Others	186	18.4
Challenges or obstacles faced in accessing Tetanus Toxoid immunization services		
Cost of transportation to the healthcare facility	224	29.8

Difficult access to a healthcare facility	240	32
Long waiting times at healthcare facilities	192	25.6
Inadequate information or communication	52	6.9
Lack of availability of vaccines	36	4.8
Other	7	0.9
Awareness of the recommended schedule for Tetanus Toxoid immunization		
Yes	620	61.2
No	333	32.9
Financial constraints in receiving tetanus toxoid immunization		
Yes	388	38.3
No	565	55.8

Table 4 explain association between place of residence (rural vs. urban) and key factors influencing access to tetanus toxoid immunization, including the ease of accessing healthcare services, distance to healthcare facilities, transportation difficulties, and the impact of cultural or religious beliefs. Healthcare services for tetanus toxoid immunization are easily accessible in rural versus urban communities. The result shows that 355 rural women reported easy access to services, compared to 125 women who did not. In urban areas, 298 women indicated that services were easily accessible, while 175 said they were not. The Chi-square value of 13.258 and a P-value of 0.001. Distance to the nearest healthcare facility offering tetanus toxoid immunization also shows that majority of respondents in both rural and urban areas live within 1-5 kilometers of a facility (229 rural compared to 231 urban), with a smaller proportion living less than 1 kilometer away (155 rural compared to 131 urban). Fewer women live further from facilities 60 rural compared to 56 urbans at 5-10 kilometers, and 26 rural compared to 46 urban at more than 10 kilometers. The Chi-square value of 7.678 and P-value of 0.053 this shows a narrow significant different. Transportation difficulties in reaching healthcare facilities in rural areas, 280 women reported difficulties arranging transportation, compared to 287 in urban areas. Conversely, 200 rural women and 186 urban women indicated no difficulties. The Chi-square value of 0.543 and a P-value of 0.461. Cultural or religious beliefs affect women's decisions to receive tetanus toxoid immunization. In rural areas, 198 women stated that these beliefs influenced their decisions, while 267 said they did not. In urban areas, 164 women reported that cultural or religious beliefs affected their decision-making, while 299 said they were not influenced by such factors. The Chi-square value of 5.951 and P-value of 0.051 indicate a narrow significant difference.

Table 4: Influence of Place of Residence on Accessibility, Transportation, and Cultural Beliefs Regarding Tetanus Toxoid Immunization

Variables	Place of residence		Chi-square	P-value
	Rural	Urban		
Accessibility of healthcare services for Tetanus toxoid immunization in your community				
Yes	355	298	13.258	0.001
No	125	175		
Distance of healthcare facility providing Tetanus toxoid immunization services from your residence				
Less than 1 km	155	131	7.678	0.053
1-5 km	229	231		
5-10 km	60	56		
More than 10 km	26	46		
Difficulties in arranging transportation to healthcare facilities for Tetanus toxoid immunization				
Yes	280	287	0.543	0.461
No	200	186		

Cultural or Religious beliefs affect your decision to receive Tetanus toxoid immunization during pregnancy				
Yes	198	164	5.951	0.051
No	267	299		
Not applicable	15	10		

DISCUSSION

Tetanus toxoid (TT) immunization protects against tetanus which is a very serious and potentially fatal disease [13]. The findings of this study reveal that 78.7% of pregnant women surveyed had received tetanus toxoid (TT) immunization during their current pregnancy, with 74.8% reporting immunization in previous pregnancies. This relatively high coverage aligns with the increasing global emphasis on maternal immunization for tetanus elimination. Similarly, coverage analysis in developing countries underscores a consistent uptake pattern, as evidenced by UNICEF's findings that highlight the continued prioritization of maternal tetanus immunization in many Nigerian states, although some areas still face challenges in achieving high coverage levels due to healthcare access barriers [14]. In parallel, studies from developed nations such as the United States report that high TT immunization coverage is sustained by robust healthcare infrastructure and comprehensive public health strategies. For example, research from the CDC indicates high TT immunization levels across the U.S., where immunization rates are driven by national healthcare guidelines and maternal health monitoring systems [15]. However, the findings of this study show that 15.4% of respondents received no doses of TT, which aligns with observations in areas with limited healthcare access or competing health priorities. This finding is corroborated by a World Health Organization (WHO) report highlighting that despite progress, substantial gaps remain in tetanus vaccination coverage among women of reproductive age, particularly in regions facing healthcare infrastructure challenges or financial barriers [7]. Additionally, the Global Maternal and Neonatal Tetanus Elimination Initiative has noted coverage disparities within Africa due to such structural and logistical constraints, affecting consistent vaccine delivery and uptake, particularly in rural or underserved areas [7,8]. Distance to healthcare facilities emerged as a significant barrier. Also, Lack of awareness about the necessity of tetanus toxoid immunization was another major barrier, affecting 19.5% of women in the study. Financial barriers also impacted access, with 7.4% of respondents citing financial constraints. This challenge is frequently documented in developing countries. Fear of side effects, which deterred 10.7% of women in this study. Cultural and religious beliefs affect women's decisions to receive tetanus toxoid immunization. In rural areas, 198 women stated that these beliefs influenced their decisions, while 267 said they did not. In urban areas, 164 women reported that cultural or religious beliefs affected their decision-making, while 299 said they were not influenced by such factors. This study is in line with a study in Alexandria which highlights that having a cultural believe thereby associating vaccines with health risks or not recognizing tetanus risks during delivery or abortion in unsafe. However, many women agree that healthcare providers' opinions strongly influence their decision to vaccinate, underscoring the importance of awareness campaigns tailored to cultural believes.

CONCLUSION AND RECOMMENDATION

This study explored coverage barriers and impact of socio-cultural factors on tetanus toxoid immunization uptake. The findings spread across significant associations between socio-demographic variables, healthcare accessibility, cultural beliefs and immunization coverage. the current coverage level of Tetanus toxoid immunization among women of reproductive is 78.7%. This is a very good indicator of uptake of preventive care vaccine, Similarly, 74.8% reported receiving tetanus toxoid immunization during previous pregnancies which shows a consistent immunization practices across multiple pregnancies. However, there is still need for areas for improvement, as 15.4% and 19.2% of women did not receive tetanus toxoid immunization in their current and previous pregnancies, respectively. While it is important to look at the coverage

it is also very crucial to see the adherence of the dosage breakdown which further clarifies the immunization dosage received, the results of the analysis show that most women receive one and two doses of the vaccine, leaving just small portion of the study population 15.3% (155) with three doses. The cultural and Religious Beliefs shows their attitude towards the immunization decisions, 267 of women, particularly in rural areas said such belief hinder their decision to receive the vaccine. The study highlights that improving immunization rates requires approach that addresses both personal and general barriers. While education and awareness campaigns can mitigate vaccine hesitancy driven by cultural beliefs, infrastructural improvements are necessary to enhance access to healthcare services, particularly in rural areas for better coverage level

ETHICAL CONSIDERATION

Ethical approval for this study was approved by the University Research Ethics Committee (HREC) of Lead City University, Ibadan, and the Department of Planning, Research, and Statistics at the Ogun State Ministry of Health. Official permission was also secured from the selected Local Governments and the leaders of each community involved in the study. Participants received an information statement before providing informed verbal consent, which was facilitated by reading the statement in their local language to ensure comprehension.

AVAILABILITY OF DATA

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

AUTHORS' CONTRIBUTIONS

Yusuf Rabiu wrote the first draft of the manuscript. Adesola Musa and Tubosun Olowolafe contributed to the writing of the paper and provided vital feedback. Yusuf Rabiu ran the analyses. All authors contributed to the study design and interpretation of analyses. All authors critically reviewed and revised the manuscript and approved the final version before submission.

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