



Assessment of Tetanus Toxoid Vaccination Awareness and Uptake among Women of Reproductive Age in Kwara State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author ADB designed the study, wrote the protocol, managed the literature searches and supervised collection of data. Author PEA wrote the first draft of the manuscript and conducted statistical analysis of data. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JOCAMR/2017/37224

Editor(s):

(1) Arun Singh, Community Medicine, Institute: Rohilkhand Medical College & Hospital, Bareilly International University, India.

Reviewers:

(1) Giuseppe Gregori, Italy.

(2) Jamal Hussaini, Universiti Teknologi MARA, Malaysia.

Complete Peer review History: <http://www.sciencedomain.org/review-history/21855>

Original Research Article

Received 6th October 2017
Accepted 30th October 2017
Published 10th November 2017

ABSTRACT

Aims: To assess Tetanus Toxoid (TT) vaccination uptake and dosage completion among women of reproductive age in Ilorin west Local Government area of Kwara state.

Study Design: A cross-sectional study.

Place and Duration of Study: Ilorin west local government, kwara state between Nov 2015 and March 2016.

Methodology: The study involved women of reproductive age between 15-49 years in randomly selected in Ilorin west local government of Kwara state. The instrument was contracted to measure participants' level of awareness of TT vaccine, uptake of the vaccine and level of completion of vaccine dosage. Data collected was analysed using Statistical Package for Social Science (SPSS) version 21.

Results: There were 377 women in this study. Majority of respondents (75.6%) were between the age of 26 and 35 years old and more than half (68.2%) were married with a proportion of 45.3%

having had more than 3 children. Results from this study revealed a low level of awareness on the dosage of TT vaccine and this was reflected in the 0% uptake of TT4 and TT5 by respondents. Further analysis indicated a significant association between respondents awareness and TT vaccine completion at 82.8% (($F=1811.74$; $R\text{ Square}=0.828$; $P < 0.05$). it was also found that uptake of TT vaccine increases with the number of children had, however, non-married and respondents with no children had not started uptake of TT vaccine. Initiation age of TT vaccination among respondents was found to 21 years of age. Findings from this study revealed that respondents' normative beliefs has a significant association with intention of getting Tetanus Toxoid vaccine ($p < 0.05$, $R^2 = 0.014$). Results also revealed that there is a significant difference in awareness across the age, marital status and number of children ($p \geq 0.05$).

Conclusion: From findings of this study, it is evident that uptake of TT vaccine is poor with 0% uptake of both TT4 and TT5 dosage as respondents stop uptake after child delivery, also, respondents younger than 21 years old have not commenced TT vaccination. It is hereby recommended that TT vaccination be initiated at the secondary school for females older than 15 years old to ensure completion of the vaccination and also increase awareness.

Keywords: Tetanus prevention; tetanus toxoid; women; maternal neonatal tetanus; awareness and completion.

1. INTRODUCTION

More than eleven million children under the age of five years die globally every year from mostly preventable diseases [1]. In 1990 about 360 000 neonates died from neonatal tetanus in 20 countries, one of the countries affected was Nigeria with 23,400 neonatal deaths [2] there was an increase of 745% in mortality rate to 198,000 by the year 2006, ranking Nigeria among the worse 13 in the world, in addition, child survival was also reported to be very poor with 70% of infant deaths as a result of Neonatal mortality in Nigeria [3]. It was in light of this that in 1989, the World Health Assembly called for the elimination of Maternal and Neonatal Tetanus (MNT) by the year 2005 and Nigeria did not achieved elimination. In achieving elimination, it is expected that there is less than one case of neonatal tetanus per 1000 live births in every Local Government Area [4].

Of the 28 countries with high number of tetanus cases, 16 countries account for 90% of global neonatal tetanus cases, all these cases are in the African region, Nigeria inclusive. MNT is responsible for an average 110,000 deaths a year in the African Region of the World [5]. It was estimated that tetanus accounted for about 20% of neonatal deaths in Nigeria and has been a major public health problem in the country [6,7].

Mothers and newborns contract tetanus, an extremely deadly and paralyzing disease, when deliveries happen in unhygienic conditions – as can be the case in remote and underdeveloped

areas [8]. Risk factors for Neonatal Tetanus incidence relate to prenatal, perinatal and neonatal factors, and include lack of antenatal care for the pregnant woman, including lack of her immunization with Tetanus Toxoid (TT), and unhygienic delivery and cord care, limited access to health services, poor hygienic conditions, lack of access to sterilized childbirth delivery tools and unhygienic practices during childbirth [9,10].

Maternal Neonatal tetanus can be prevented by immunizing the women with Tetanus Toxoid vaccine; this has since gathered documented success as immunization is one of the most successful public health initiatives towards MNT elimination. But vaccination coverage of pregnant women in most developing countries remains low, and unsafe birth practices persist [11].

In prevention of neonatal tetanus, Tetanus Toxoid (TT) is given to women of child bearing age of between 15 and 49 years old. Tetanus toxoid vaccine schedule for women in child bearing age is given at first contact (TT1) which gives no protection, then 2nd dose (TT2) is given after four weeks which gives 3 years protection (infant born to the mother will be protected from Neonatal Tetanus), 3rd dose (TT3) is given at 6months after the 2nd dose, gives 5 years protection, 4th dose (TT4) given 1 year after 3rd dose gives 10 years protection and the 5th dose (TT5) is given 1year after 4th dose gives protection for lifetime [12]. Data from the DVDMT template of Oyo state, Nigeria (2014) showed a 47% coverage of TT1 and 36% coverage of TT2, data for TT3, TT4 and TT5 are missing, reason being that women do not come for TT

Table 1. Schedule for TT dosage immunization

Vaccine	Minimum time interval	Protection	Benefits
TT1	As early as possible during pregnancy or from 15 years of age.	None	None
TT2	At least 4 weeks later	80%	Gives 3 years of protection for the mother.
TT3	At least 6 months later	95%	Gives 5 years of protection for the mother.
TT4	At least 1 year later	99%	Gives 10 years protection for the mother.
TT5	At least 1 year later	100%	Gives lifetime protection for the mother.

vaccination until during pregnancy when they receive the TT1 and TT2 vaccines and due to lack of follow up, they are unable to receive the TT3, TT4 and TT5 vaccine.

Studies carried out in Enugu and Benin City, Nigeria, showed an upsurge of neonatal tetanus cases which was attributed to rejection of tetanus toxoid vaccination by pregnant women owing to misconceptions about the vaccine by some religious sects and the absence, or incomplete Tetanus Toxoid vaccination of mothers during pregnancy [7,13-15].

It was further discovered that there is a dropout in TT vaccination as most women after collecting the TT1 tend not to collect the TT2 vaccine and also that many women after the TT1 and TT2 during pregnancy they may not continue with the antigen up to TT5 exposing their children to maternal neonatal tetanus after the stipulated 3 years of protection that TT2 guarantees [10,16-18].

It is in light of this that the study aims to assess Tetanus Toxoid (TT) vaccination uptake and dosage completion among women of reproductive age in Kwara state.

2. MATERIALS AND METHODS

This study was carried out in Ilorin west local government area with an estimated population of 350,000 to 400,000, it is located in Kwara state in north central geopolitical zone of Nigeria. It is mainly populated by the Yorubas while other ethnic groups include Nupe, Bariba and the Fulanis. Participants for this study were women between the ages of 15-49 years, this is done as this age group are found to be child bearing age and can get pregnant. In this study, for the quantitative approach, data collected from a previous study of a field

research [19] showed the proportion of women of childbearing age between the ages of 15-49 years of age participating in immunization was estimated to be 60.3%. Therefore, the sample size for this study was calculated based on the following equation

$$n = Z_{\alpha}^2 \cdot P (1 - P) / d^2$$

Where,

$$\begin{aligned} Z_{\alpha} &= 1.96 \\ P &= 0.6 \\ d &= 0.05 \end{aligned}$$

The minimum sample size from computation was given at approximate 369 respondents, a total of 400 instruments were used for this study with equal distribution across all five (5) selected markets. Research instrument for this study was an interviewer-administered questionnaire with items in the instrument taking into consideration the aim of the study with the help of 5 trained research assistants, all items were ensured answered by respondents, instrument with unanswered items were discarded during data analysis. Data collected were analysed using SPSS version 21.

3. RESULTS AND DISCUSSION

This study was carried out among women of child bearing age bracket of 15 – 49 with 377 respondents. Majority of respondents (75.6%) were between the age of 26 and 35 years old and more than half (68.2%) were married with a proportion of 45.3% having had more than 3 children. Findings showed that majority of the respondents (89.1%) had formal education.

Findings on the level of awareness of respondents on TT vaccination showed that respondents' level of awareness was low at 25.7% with a very low level of awareness on the

number of doses needed for complete protection. Respondents believed two (2) to three (3) doses were enough to guarantee complete protection from MNT. Likewise, they were found to be unaware of the age at which vaccination starts with majority stating 'onset of pregnancy' at the start of vaccination.

Level of awareness was found to vary across respondents' number of children ($F=136.741$; $df=5$; $P<0.05$). Further analysis showed that respondents with no children had the least level of awareness at 7.8% while respondents with 5 children had the highest level of awareness at 83.3% (Fig. 1).

Similarly, unmarried respondents had very low level of awareness compared to married respondents (Fig. 2).

On assessment of the uptake of TT vaccine by respondents, it was found that uptake was a

function of the number of children had by respondents, it was discovered that the number of TT dosage taken increased with number of children of respondents, however, there were no data on uptake of TT4 and TT5 (Fig. 3). This low level of TT vaccine completion was found to be a function of respondents' low level of awareness ($F=1811.74$; $R\text{ Square}=0.828$; $P < 0.05$) indicating an 82.8% low awareness influence on uptake and completion of TT vaccine.

3.1 Discussion

Maternal and Neonatal Tetanus (MNT) is a disease of public health importance that is marked out for elimination worldwide for as far back as 1989 [7] but studies carried out in Enugu and Benin city said elimination hasn't been achieved in Nigeria with new cases still coming up as a result of non-completion of the Tetanus Toxoid (TT) vaccine [13-14].

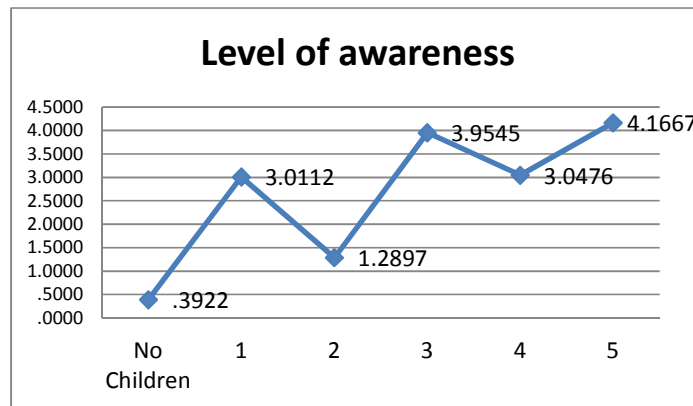


Fig. 1. Level of awareness of respondents across numbers of children

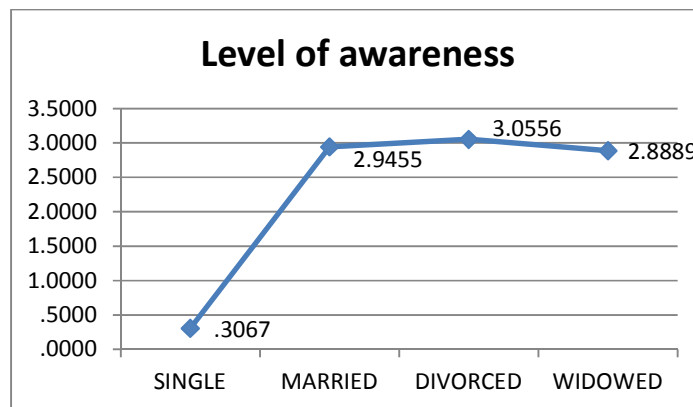


Fig. 2. Level of awareness of respondents across marital status

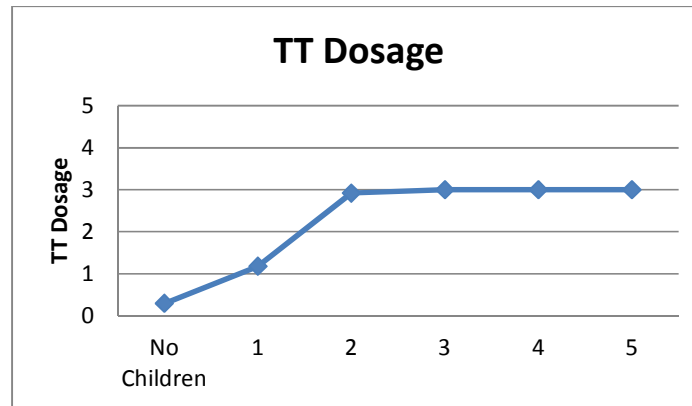


Fig. 3. TT dosage uptake across number of children of respondents

Result from this study showed a low level of Tetanus Toxoid vaccination uptake and this has been found to be a result of rejection of Tetanus Toxoid vaccination by pregnant women owing to misconceptions and irregular immunization leading to low vaccination [14], awareness of the doses recommended to be taken for protection against MNT at 25.7% was in line with findings by [20,21], this can be said to be a major factor contributing to low TT vaccination as an individual's level of knowledge and awareness is very important because they are closely related to tetanus immunization behavior for neonatal tetanus prevention [22].

While the TT vaccine is recommended for women between the ages of 15 and 49 years old, it was evident from results of this study that respondents with no children and unmarried have not started uptake of TT vaccine and furthermore, respondents of ages between 15 and 20 have not had any dosage of TT vaccine, this is likely attributed to the low awareness of respondents on when the dosage starts, as most believe it starts from onset of pregnancy.

This study further revealed a good level of husband's support for TT vaccination but respondents do not have enough support from Doctors and siblings as compared to significant other and parents, this however reflects a below average level of normative beliefs of respondents, this is an important factor as these social variables have been found to influence women's behaviour [23] and likewise, according to [22], women's decision making are influenced greatly by their husband.

However, respondents in this study showed a low level of behavioral control [47.41%] with

emphasis on accessibility to health center and lack of knowledge on the benefits of the dosage, this is similar to study conducted by [23] where many women did not have time to get the tetanus vaccination because the time of the immunization days was at the same time as their work and distance was too far from residence.

These aforementioned factors might be responsible for the low level of respondents' uptake of TT vaccination as they do not deem it necessary to get vaccinated after the first three doses especially during ante-natal visits.

4. CONCLUSION

From findings of this study, it is evident that uptake of TT vaccine is poor with 0% uptake of both TT4 and TT5 dosage, further factors influencing the high prevalence of neonatal tetanus preventing the status of neonatal tetanus elimination was found to include external variables such as immunization sites, family income and level of knowledge and awareness. These factors directly influence the behavioral intention in having the tetanus vaccination for MNT prevention among respondents. Maternal Neonatal Tetanus is long due for elimination in Nigeria since the establishment for elimination in 1989; however that is not the case. Despite availability of the vaccines, women are not taking the vaccine and findings from this study showed that awareness of women is a big factor in the non-completion of the TT vaccine. This finding is important as it gives an insight to public health promoters for areas for intervention to achieve maternal and neonatal elimination. It is in light of these findings that it is recommended that TT vaccination be initiated at the secondary school for females older than 15 years old to ensure

completion of the vaccination and also increase awareness, with this, pregnancy will not be seen as the open window for vaccination against MNT.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the Babcock University Health Research and Ethics Committee (BUHREC) and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Section A: Demographic Characteristics of Respondent

Kindly tick 'x' in the appropriate box

1. Age: 16 -20 years [] 21-25 years [] 26 – 30 years [] above 30 years []
2. Marital status: single [] Married [] Divorced []
3. No of Children: _____
4. Education: Primary [] Secondary [] Tertiary []
5. Income: Low [] Moderate []
6. Religion: Christianity [] Islam [] others (specify)

Section B: Womens Knowledge about Neonatal Tetanus

Please tick as appropriate to the questions using the key below:

7. Neonatal tetanus is caused by _____.
(a) Virus (b) Protozoan (c) Bacteria (d) Insect bites (e) fungi
8. Neonatal tetanus can be prevented by _____.
(a) Prayer (b) Vaccination (c) drugs (d) education (e) herbal concoction
9. Neonatal tetanus can occur _____.
(a) After delivery (b) During delivery (c) Before delivery (d) Before and after delivery
(e) All of the above
10. _____ can prevent Maternal and neonatal tetanus.
(a) Cow dung (b) Clean delivery (c) Palm wine (d) Herbs (e) doctors
11. Using contaminated instrument by a midwife to cut the umbilical cord can cause _____.
(a) Typhoid (b) Malaria (c) Maternal and neonatal tetanus (MNT) (d) Diarrhea (e) Cholera
12. Maternal and Neonatal Tetanus can occur if mother don't get _____.
(a) Yellow fever vaccine (b) Tetanus vaccine (c) BCG (d) Polio vaccine (OPV) (e) Measles vaccine
13. How many doses of tetanus vaccination have you received?
(a) One dose (b) Two doses (c) 3 doses (d) 4doses (e) Five doses

Section C: Attitude towards Having Tetanus Vaccine of MNT Prevention

Please tick as appropriate to the questions using the key below; **SA** - Strongly agree, **A** – agree, **D** – disagree, **SD**– strongly disagree

S/N	Statement	SD	D	A	SA
14.	If I get at least four doses of TT vaccine for my next pregnancy there is a likelihood of getting miscarriage				
15.	Getting at least four doses of TT for my next pregnancy my children will be protected from MNT				
16.	If I get at least four doses of TT vaccine I will be unsafe				
17.	I will gain better understanding on the benefits of TT vaccine if I get at least four doses for my next pregnancy				
18.	Getting at least four doses of TT is enough to prevent tetanus				
19.	Getting at least four doses of TT vaccine will give me solid immunity				
20.	Getting TT vaccine will make my child unintelligent				
21.	Getting TT vaccine will cause malformation for my child				

Section D: Normative Beliefs of Getting Tetanus Vaccine of MNT Prevention

Please tick as appropriate to the questions using the key below **SA** - Strongly agree, **A** – agree, **D** – disagree, **SD** – strongly disagree

S/N	Statement	SD	D	A	SA
22.	Doctors at the hospital think I should get at least four doses of TT vaccine				
23.	Nurses at the hospital think I should get at least four doses of TT vaccine				
24.	Health workers in the community think I should get at least four doses of TT vaccine				
25.	My mother think I should get at least four doses of TT vaccine				
26.	My husband think I should get at least four doses of TT vaccine				
27.	My relatives think I should get at least four doses of TT vaccine				
28.	My close friend think I should get at least four doses of TT vaccine				
29.	My brothers and sisters think I should get at least four doses of TT vaccine				

Section E: Women’s Power of Control Factors of Getting Tetanus Vaccine for MNT Revention

Please tick as appropriate to the questions using the key below; **SA** - strongly agree, **A** – agree, **D**– disagree, **SD** – strongly disagree

S/N	Statement	SD	D	A	SA
30.	A community health center is close to my house				
31.	I have a means of transportation to visit health centers				
32.	Am always busy at home with house chores				
33.	I don’t know how many dose of TT vaccine that will keep me protected during pregnancy				
34.	I should take three vaccine dose for protection during child bearing				
35.	I don’t know about the side effects of the vaccine				
36.	The benefits of the vaccine are clear to me				
37.	The vaccines are not always available at the community centers I visit				
38.	I don’t have money to get vaccine at the preventive health centers				
39.	Vaccination is done every month at the routine immunization sites in villages				

Section F: Intention in Having Tetanus Vaccine of MNT Prevention

Please tick as appropriate to the questions using the key below; **SA**- strongly agree, **A** – agree, **D**– disagree, **SD** – strongly disagree

S/N	Intention	SD	D	A	SA
40.	I intend to get at least four doses of tetanus vaccine in my pregnancy				
41.	Plan to get at least four doses of TT vaccine in my next pregnancy				
42.	I want to get at least four doses of TT vaccine in my next pregnancy				
43.	Expect to get at least four doses of TT vaccine in my next pregnancy				
44.	I will try to get at least four doses of TT vaccine in my next pregnancy				
45.	Make an effort to get at least four doses of TT vaccine in my next pregnancy				

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Peer-review history:
The peer review history for this paper can be accessed here:
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