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Original Research Article

Evaluation of Tetanus Vaccination Coverage among Women of Reproductive Age in a Primary Health Care Center in Baghdad City

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Abstract

***Background**:* The tetanus vaccine in pregnancy is crucial for preventing tetanus, a potentially fatal bacterial infection. Tetanus is particularly dangerous for newborns if contracted by pregnant women, as it can lead to neonatal tetanus. The vaccine, typically given as part of the Tdap (tetanus, diphtheria, and pertussis) vaccine, helps protect both the mother and the unborn child by passing on antibodies. It's generally recommended during the third trimester of each pregnancy, providing passive immunity to the newborn until they're old enough to receive their own vaccinations. The tetanus vaccine, when administered during pregnancy, has been shown to be safe for both the mother and the developing fetus. Numerous studies have demonstrated its safety profile. Timing: The vaccine is typically recommended during the third trimester of each pregnancy, ideally between weeks 27 and 36. This vaccination timing ensures optimal transplacental transfer of protective antibodies to the fetus. Tetanus, caused by the neurotoxin-producing bacterium Clostridium tetani, presents significant risk due to its ubiquitous presence in soil, dust, and animal face. ***Objective**:* This study investigates women's awareness of the tetanus vaccine and measures its association with Clinical outcomes. ***Methods**:* This is a cross-sectional study. Data were collected from thirty women who attended the Yarmouk Primary Health Care. It included the data collected by the researchers, the questions were explained face to face, samples were taken and recorded manually, and then collected via the Excel program. The data was analyzed using the Statistical Package for the Social Sciences (IBM SPSS) version20. The confidence level is 95% with a significant level of $P < 0.05$. ***Results**:* The sample consisted of 30 case (mean age 33.17 years; minimum 20 yr and maximum 45yr). Taking into account the educational level of each woman, it was noted that this affects prenatal health care and general information about the vaccine. 96% of women received the tetanus vaccine, of which 41% percent received the full five doses.

Keywords: Tetanus vaccine, Pregnancy, Neonatal tetanus, Antibodies, Public health.

INTRODUCTION

In numerous developing countries, the primary cause and foundation of neonatal and infant mortality remains. [1]. Tetanus continues to pose a significant public health challenge in developing nations, despite the widespread availability and proven efficacy of tetanus toxoid vaccines as a preventive measure [2]. Tetanus infection exhibits characteristically high mortality rates in untreated cases, with case fatality approaching 100%. However, prompt medical intervention reduces mortality to 10-60%, with outcomes strongly dependent on intensive care capacity. This dramatic reduction underscores the critical importance of healthcare access in tetanus management. Recent epidemiological data indicate that neonatal tetanus remains a persistent threat, with an estimated 30,848 newborn deaths attributed to this preventable condition in the most recent reporting year [3]. "Tetanus is a preventable, non-communicable disease caused by the bacterium Clostridium tetani. The infection occurs when bacterial spores, which are

[1]Burgess C, Gasse F, Steinglass R, Yakubu A, Raza AA, Johansen K. Eliminating maternal and neonatal tetanus and closing the immunity gapThe Lancet. 2017;389(10077):1380–1

[2] Khan R; Vandelaer J; Yakubu A;Raza A A; and Zulu F;:Maternal and neonatal tetanus elimination: from protecting women and newborns to protecting all. A review.," International journal of women`s health, vol. 7, no. 1, pp. 171- 180, 2015

[3] WHO. Immunization, surveillance, assessment and monitoring 2019 June. www.who.int/immunization/diseases/MNTE_initiative

ubiquitous in the environment, enter the body through breaks in the skin - typically via wounds contaminated with soil, dust, or other infected materials [4]. "Global health data indicate tetanus causes approximately 309,000 deaths annually worldwide. Notably, maternal and neonatal tetanus account for significant mortality, with an estimated:5% of maternal deaths resulting from infection during unclean deliveries 14% of neonatal deaths attributable to maternal-neonatal tetanus transmission" [5].

"Tetanus toxoid disease can affect individuals of all ages, but neonates (through umbilical stump contamination) and their mothers face the highest risk. This is particularly common after unhygienic vaginal deliveries involving contaminated equipment or septic conditions. Such cases predominantly occur in women with inadequate or no prior immunization against tetanus." and their newborns [6]. "Unhygienic delivery practices - including contaminated surfaces, unclean hands, and non-sterile instruments - significantly increase the risk of perinatal infection transmission to both mother and neonate. Furthermore, the application of substances such as animal dung, ash, or soil to umbilical cords has been documented in some traditional newborn care practices) to the umbilical stump, ostensibly to control bleeding or accelerate drying. These practices dramatically elevate the risk of tetanus infection in the newborn [7]. Limited health literacy poses a dual risk for tetanus: it may lead to either vaccine-preventable infections or unnecessary complications from excessive immunization. Maternal knowledge significantly influences tetanus toxoid vaccine uptake during pregnancy, which is crucial for protecting both mothers and neonates. Effective vaccination programs require high coverage rates to establish herd immunity. However, in Iraq, immunization coverage varies substantially by vaccine type. For instance, the 2010 tetanus toxoid vaccination rate among pregnant and non-pregnant women was alarmingly low at just 0.1% of the target population, highlighting critical gaps in preventive healthcare delivery [8].

METHODOLOGY

Study and Setting: This is a cross- sectional study. Data were Accumulated from thirty women who attended the Yarmouk Primary Health Care. It included the data collected by the researchers, the questions were explained face to face, samples were taken and recorded manually during February and march 2024.

Data collection and sampling technique: A total of 30 women who attended the Yarmouk Primary Health Care who had accepted to participate in the study. In all subjects the questions were explained face to face in simple word.

Data collected by questionnaire was filled out manually by the researchers. The questionnaire consisted of 21 question; age, occupation and level of education, gravida, para and abortion number, antenatal care and doses of vaccine if taken and some else questions about vaccine information.

Statistical Analysis: Data were entered in Microsoft Excel 2019 and analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 20. Categorical variables were presented by frequency and percentages A test with a p-value
< 0.05 was considered as statistically significant.

RESULTS

Discuss the results of the questionnaire questions study the relationships between data and ratios and translate the study objectives into some tables.

Among the 30 women who attended the Yarmouk Primary Health Care who had accepted to participate in the study. Table 1 show that there are 8 participant age 35-40 in 21.2% and 10 participant age 30-35 years in 30.3% and it's the highest percent recorded, 6 participant for 20-30 in 18.2%, the lowest percent for 15-20 age.

[4] Novak RT, Thomas CG, Infectious Diseases Related to Travel, Tetanus. IN Yellow Book: edited by Centers for Disease Control and Prevention: USA: Atlanta,2012, Ch3: 71. Available from: http://wwwnc.cdc.gov/travel/yellowbook/2012/chapter-3- infectiousdiseases-related-to-travel/tetanus. Accessed at 17 July 2013

[5] Vandelaer J; Birmingham M; Gasse F; etal;: Tetanus in developing countries: an update on the Maternal and Neonatal Tetanus Elimination Initiative. Vaccine 2003 Jul 28;21(24):3442-5

[6] Mathias G. Abah; Otobong A. Asuquo; and Emmanuel C. Inyangetoh3;:Knowledge and Behaviour Towards Tetanus Toxoid Immunisation in SouthSouth, Nigeria: Findings from Antenatal Clinic Attendees . Asian Journal of Applied Sciences (ISSN: 2321 – 0893) Volume 07 – Issue 05, October 2019

[7] Naeem M., Khan M. Z.-U.-I., Abbas S. H., et al. Coverage and factors associated with tetanus toxoid vaccination among married women of reproductive age: a cross sectional study in Peshawar. *Journal of Ayub Medical College Abbottabad.*

Table 1: Age

Age	Frequency	Percent
15--20	2	6.1
20--25	3	9.1
25--30	3	9.1
30--35	10	30.3
35--40	7	21.2
40--45	5	15.2
Total	30	100.0

Table 2 shows that all the participant from Baghdad in 100% percent.

Table 2: Residency

Residency	Frequency	Percent
Baghdad	30	100
Total	33	100.0

Table 3 and figure 1 show the level of education for the participants, primary study is the highest in 36.6 percent then the university degree in 30.3 percent high school primary secondary uni degree uni student.

Table 3: Level of education

	Frequency	Percent
high school	3	9.1
Primary	12	36.4
Secondary	3	9.1
University degree	10	30.3
University student	2	6.1
Total	30	100.0

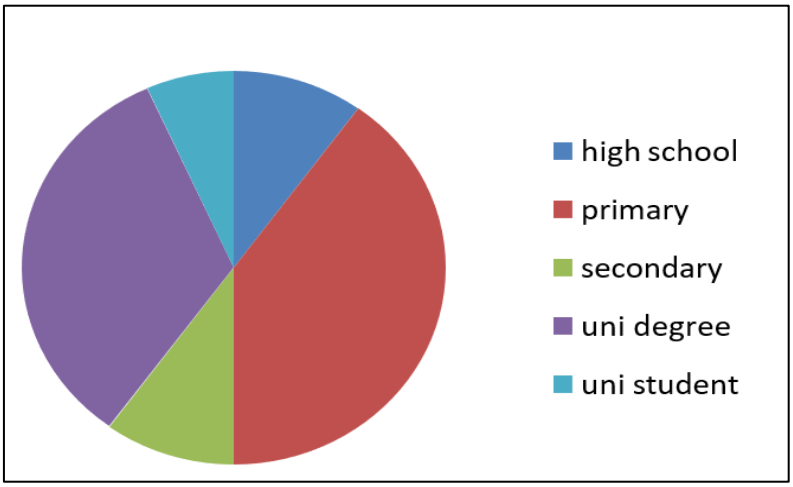


Figure 1: level of education

Table 4 and figure 2 shows that 36.4 percent taken the full doses of vaccine and 3% didn't take it at all.

Table 4: Doses of vaccine taken

Doses of vaccine taken	Frequency	Percent
0	1	3.0
1	1	3.0
2	2	6.1
3	8	24.2
4	6	18.2
5	12	36.4
Total	30	100.0

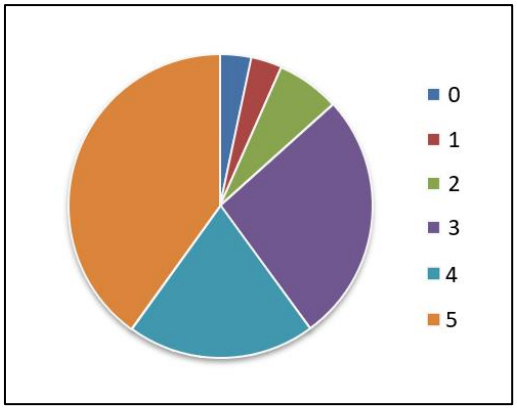
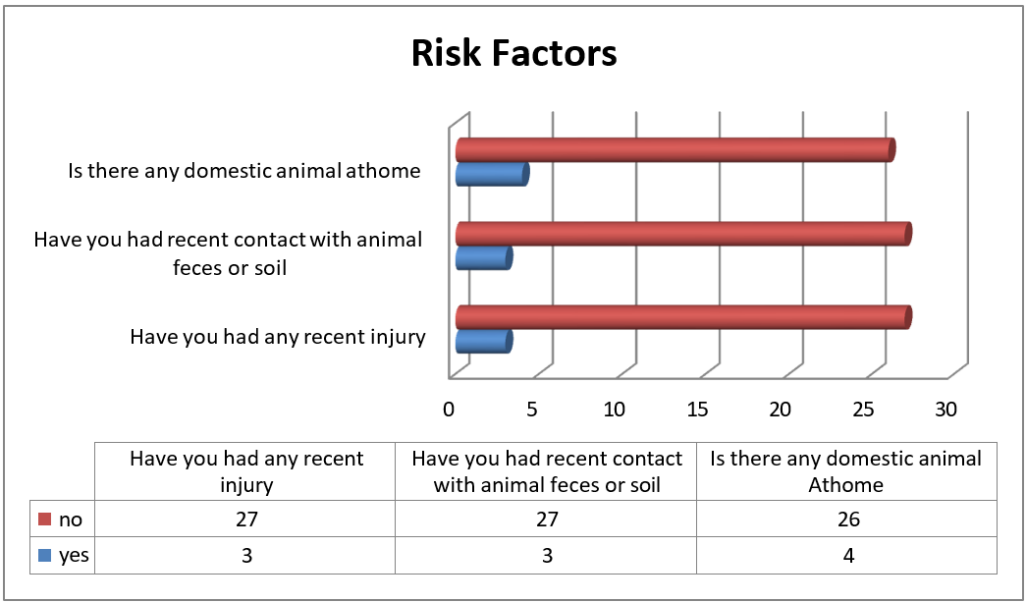


Figure 2: Doses of vaccine taken

Figure 3 studies the presence of a number of risk factors for tetanus in the women who participated in the study.



	Have you had any recent injury	Have you had recent contact with animal feces or soil	Is there any domestic animal Athome
no	27	27	26
yes	3	3	4

Figure 3: Risk factors

Figure 4 shows that the all pregnant study participants take the vaccine.

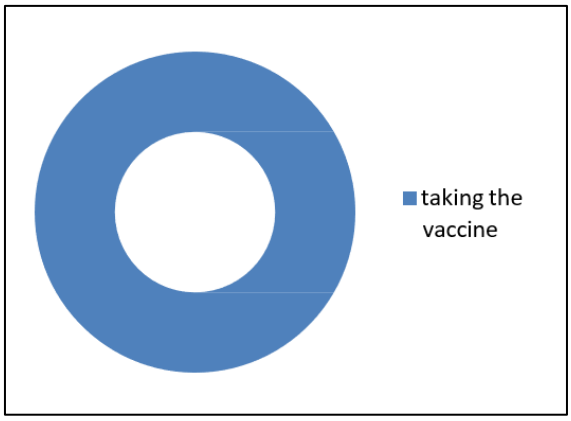


Figure 4 for pregnant woman: Have you received prenatal care including tetanus vaccination status assessment?

Figure 5 measures the extent of women's knowledge about tetanus disease through several clear questions that were explained and simplified to suit the level of understanding of the participating women.

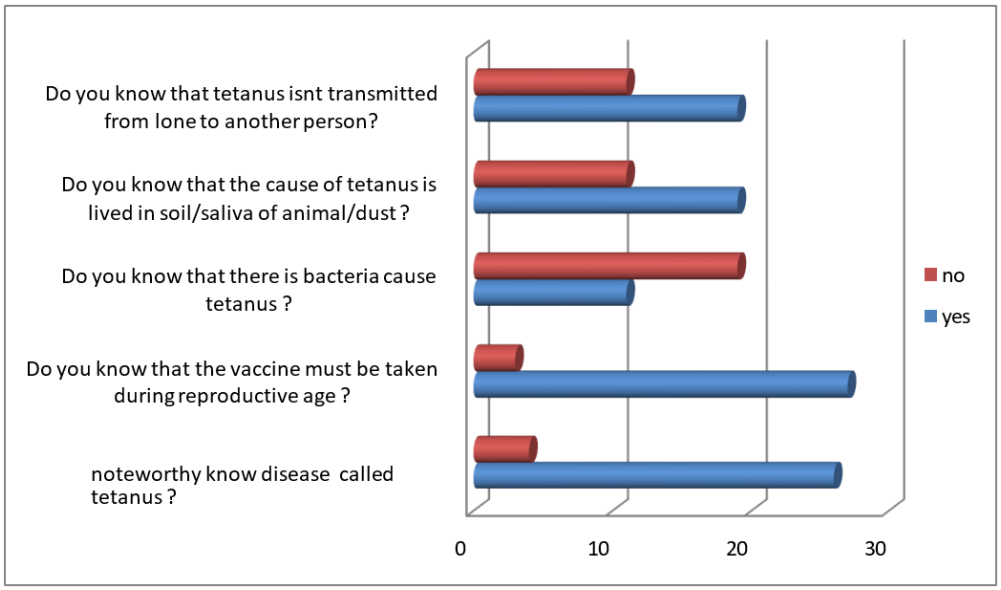


Figure 5: Women's information about tetanus

Table 5 shows the number of women who discussed the importance of taking the vaccine with their health care provider among women who plan to become pregnant in the future.

Table 5: The woman who planning pregnancy: have you discussed tetanus vaccination and its importance with your healthcare provider?

	Frequency	Percent
No	3	33.3
Yes	6	66.6
Total	9	100

In this 2X2 table we can see that there is inverse relationship between number of abortion and doses of vaccination (significant 0.474); the woman that take full doses of tetanus vaccine being less likely to get the disease. See table 6.

Table 6: Relation between number of abortion and taking the vaccine

		Number of abortion	Dose of vaccine taken
Number of abortion	Pearson Correlation	1	-.136
	Sig. (2-tailed)		.474
	N	30	30
Dose of vaccine taken	Pearson Correlation	-.136	1
	Sig. (2-tailed)	.474	
	N	30	30

Table 7 shows the direct relationship between number of abortion and the contact with animal feces or soil (significant 0.843); the woman who had recent contact with animal feces or soil more likely to suffer abortion.

Table 7: Relation between number of abortion and the contact with animal feces or soil

		Number of abortion	Have you had any recent contact with animal feces or soil
Number of abortion	Pearson Correlation	1	.038
	Sig. (2-tailed)		.843
	N	30	30
Have you had any recent contact with animal feces or soil	Pearson Correlation	.038	1
	Sig. (2-tailed)	.843	
	N	30	30

DISCUSSION

The ongoing incidence of maternal and neonatal tetanus in developing nations represents a failure of implementation rather than medical capability, as existing protocols demonstrate high efficacy when properly delivered.

In this cross-sectional study, combined coverage of at least two doses of tetanus toxoid immunization was 93%. This result was consistent with the report of studies conducted in Kenya (52.0%) and Pakistan (55.6%) [7]. It was low compared to studies conducted in other developing countries such as Ghana 71% [8], India 68% [9] and Sierra Leone 82.1% [10] A possible explanation for this difference may be due to geographic differences, sociocultural variation, and utilization of maternal health services between countries. The difference may also be due to the nature of the studies and the difference in the number of study participants between studies.

The results of this study showed a high level Absorption of vaccination against tetanus toxoid and this is what happened. It is found as a result of receptive tetanus Toxoid vaccination by pregnant women due to Percentage of learners in the study [11], and awareness Recommended doses for protection. It was inconsistent with the results By [12] it can be said that this is a major factor. Contributing to the decrease in TT vaccination as the level of knowledge and awareness of the individual very important because they are closely related behavior of neonatal tetanus immunization tetanus prevention [13].

Limitation

The cross-sectional nature of this study design inherently limits causal inference due to its snapshot methodology. A significant methodological constraint arises from the substantial clinical and methodological heterogeneity observed across included primary studies, which may compromise the validity of pooled analyses. Additionally, the English-language inclusion criterion potentially introduces selection bias, thereby restricting the geographical and cultural representativeness of our findings and their applicability to diverse populations.

CONCLUSION

This cross-sectional study revealed significant disparities in tetanus toxoid vaccine coverage between urban and rural populations, with childbearing women in Baghdad demonstrating substantially higher immunization rates compared to their rural counterparts. Higher educational attainment emerged as a key determinant of improved vaccine uptake among study participants.

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REFERENCES

1. Burgess C, Gasse F, Steinglass R, Yakubu A, Raza AA, Johansen K. Eliminating maternal and neonatal tetanus and closing the immunity gapThe Lancet. 2017;389(10077):1380–1
2. Khan R; Vandelaer J; Yakubu A;Raza A A; and Zulu F;:Maternal and neonatal tetanus elimination: from protecting women and newborns to protecting all. A review.," International journal of women`s health, vol. 7, no. 1, pp. 171-180, 2015
3. WHO. Immunization, surveillance, assessment and monitoring 2019 June. www.who.int/immunization/diseases/MNTE_initiative
4. Novak RT, Thomas CG, Infectious Diseases Related to Travel, Tetanus. IN Yellow Book: edited by Centers for Disease Control and Prevention: USA: Atlanta,2012, Ch3: 71. Available from: http://wwwnc.cdc.gov/travel/yellowbook/2012/chapter-3- infectiousdiseases-related-to- travel/tetanus. Accessed at 17 July 2013
5. Vandelaer J; Birmingham M; Gasse F; etal;: Tetanus in developing countries: an update on the Maternal and Neonatal Tetanus Elimination Initiative. Vaccine 2003 Jul 28;21(24):3442-5.
6. Mathias G. Abah; Otobong A. Asuquo; and Emmanuel C. Inyangetoh3;:Knowledge and Behaviour Towards Tetanus Toxoid Immunisation in SouthSouth, Nigeria: Findings from Antenatal

[8] Diamenu S. K. Introducing protection at birth method of monitoring tetanus-diphtheria vaccination coverage of mothers in Ghana. *International Journal of Vaccines and Immunization*

[9] Singh A., Pallikadavath S., Ogollah R., Stones W. Maternal tetanus toxoid vaccination and neonatal mortality in rural North India. *PLoS One.*

[10] Yaya S., Kota K., Buh A., Bishwajit G. Prevalence and predictors of taking tetanus toxoid vaccine in pregnancy: a cross-sectional study of 8, 722 women in Sierra Leone. *BMC Public Health*

[11] Khan R. E. A., Raza M. A. Maternal health-care in India: the case of tetanus toxoid vaccination. *Asian Development Policy Review*

[12] Hashmi F. K., Islam M., Khan T. A., Tipu M. K. Vaccination coverage of mothers during pregnancy with tetanus toxoid and infants after birth. *Pakistan Journal of Pharmacy.*

[13] JSI. *An Extended Programme on Immunization Coverage in Selected Ethiopia Zones a Baseline Survey for L10 kms Routine Immunization Improvement Initiative* . Boston, MA, USA: JSI

Clinic Attendees. Asian Journal of Applied Sciences (ISSN: 2321 – 0893) Volume 07 – Issue 05, October, 2019

7. Naeem M., Khan M. Z.-U.-I., Abbas S. H., et al. Coverage and factors associated with tetanus toxoid vaccination among married women of reproductive age: a cross sectional study in Peshawar. *Journal of Ayub Medical College Abbottabad. 2020;22(3):136–140.*
8. Diamenu S. K. Introducing protection at birth method of monitoring tetanus- diphtheria vaccination coverage of mothers in Ghana. *International Journal of Vaccines and Immunization2015;1(1):101-116*
9. Singh A., Pallikadavath S., Ogollah R., Stones W. Maternal tetanus toxoid vaccination and neonatal mortality in rural North India. *PLoS One . 2012;7(11, article e48891)*
10. Yaya S., Kota K., Buh A., Bishwajit G. Prevalence and predictors of taking tetanus toxoid vaccine in pregnancy: a cross- sectional study of 8, 722 women in Sierra Leone. *BMC Public Health 2020;20(1):1–9.* 11- Khan R. E. A., Raza M. A. Maternal health-care in India: the case of tetanus toxoid vaccination. *Asian Development Policy Review 2018;1(1):1–14.*
11. Hashmi F. K., Islam M., Khan T. A., Tipu M. K. Vaccination coverage of mothers during pregnancy with tetanus toxoid and infants after birth. *Pakistan Journal of Pharmacy . 2016;24(2):1–3.*
12. JSI. *An Extended Programme on Immunization Coverage in Selected Ethiopia Zones a Baseline Survey for L10 kms Routine Immunization Improvement Initiative* . Boston, MA, USA: JSI; 2015:6-11.

The questionnaire

* Age\
* Level of education\
* Occupation\
* Residency\
* Number of pregnancies(gravidarum) \
* Number of birth (para)\
* Number of abortion\
* Doses of vaccine taken \
* Is there any domestic animal at home?
* Do you know disease called tetanus?
* Do you know the five vaccine doses must be taken during reproductive age?
* Do you know that there is bacteria cause tetanus?
* Do you know there is vaccine to prevent tetanus?
* Do you know the causes of tetanus is lived in soil ,saliva of animal,dust?
* Have you had any recent contact with animal feces or soil?
* Do you know that tetanus disease is not transmitted from one to another person?
* Have you had any recent injury or wonds?
* Are you currently pregnant or planning to become pregnant?
* If planning pregnancy: have you discussed tetanus vaccination and its importance with your healthcare provider?
* If pregnant: have you received prenatal care including tetanus vaccination status assessment?