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Original Article

Frequency of Tetanus Toxoid Vaccine and Associated Factors among Pregnant Women in District Shaheed Benazirabad

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Abstract

Background: Maternal and Neonatal Tetanus (MNT) is an acute and possibly fatal illness affects women during pregnancy or within six weeks of postpartum.
Objective: To assess the frequency of Tetanus Toxoid (TT) vaccination among pregnant women and to identify the factors associated with TT vaccination during pregnancy.
Methods: This cross-sectional study was conducted in Department of Gynecology and Obstetrics in collaboration with Department of Community Medicine, Peoples Medical College Hospital (PMCH), Nawabshah from March to August 2023. A total of 192 pregnant women aged 15 to 49 years were included. Data were collected on a pre-designed Proforma. The data entry and analysis were performed by SPSS software version 25. A chi-square test was used to identify associated factors contributing to the vaccination of TT, data was compared using appropriate stats and a p-value of <0.05 was considered significant.
Results Around 41% of pregnant women received the recommended doses of TT. Only 32% of all illiterate participants were fully vaccinated while this factor surged to 80% in participants who received university education. Considering the major cause of not having vaccination, about 80% participants had lack of awareness regarding vaccination.
Conclusion: The present study demonstrated inadequate coverage of TT vaccination among women. Several factors were significantly associated with TT vaccination, including place of residence, women's educational status, knowledge regarding TT doses during pregnancy and across the lifetime, employment status of women, husband's income, travel time to the health facility, husband's consent, and availability of a TT vaccination card.
Key words: Tetanus toxoid, vaccination, pregnant women, vaccine coverage, associated factors.

Introduction

Tetanus, an acute and possibly lethal illness brought on by the bacteria Clostridium tetani, has several different names, including Maternal and Neonatal Tetanus (MNT).[1] It affects women while they are pregnant or within six weeks of giving birth, as well as children in the first 28 days of life.[2] Tetanus toxoid immunization of women and ensuring basic hygienic birth-related practices are effective ways to prevent maternal and neonatal tetanus.[3] In addition, the immunization offers outstanding defense against newborn tetanus for three months after delivery.[4] 47 of the 59 prioritized nations slated for MNTE as of December 2020 have achieved MNTE. Pakistan is among the 12 countries that have not yet attained the elimination of the disease.[5]

Protection at birth (PAB) refers to the proportion of mothers who were spared neonatal tetanus after their most recent live birth. According to the WHO, women of childbearing age are advised to take five doses back-to-back for lifelong protection against tetanus.[6] Two doses of TT during pregnancy are considered an appropriate dosage.[7] Mothers who receive the full TT doses generate

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Authors Contribution

IM conceptualized the project. AS, AR & DR did the data collection. IM & HKT performed the statistical analysis. SK did the literature search. Drafting, revision & writing of manuscript were done by IM, SK, HKT & AS.

antibodies that provide protection from tetanus and endure for about three, five, ten, and thirty years.[4] According to meta-analysis, TT vaccination with minimum two shots can reduce newborn tetanus death by 94%. Currently, 75% of pregnant women worldwide have had TT2+ vaccinations, with rates between 53% in the East Mediterranean and 63% in Africa, down from 95% in Southeast Asia.[3] Pakistan is having difficulty meeting the goal of a minimum of 1 case per 1000 live births at the district level. Currently, 50% of districts are regarded as at greater risk due to decreased TT immunization coverage.[8]

Pakistan's TT immunization coverage has fluctuated between 60% and 74%.[9] In Pakistan, there are still disparities in terms of poverty and marginalization when it comes to access to immunization services.[2] In a study conducted in Rawalpindi, Pakistan, out of 400 women, 57.5% were covered with TT2, and >TT2 women were 14.25% at reproductive age. The majority of respondents were not vaccinated because they were ignorant.[8] The districts of Lahore and Sheikhupura study showed that all respondents (100%) knew about tetanus toxoid. Due to fear of danger to themselves and their unborn babies, over three-quarters of pregnant women who lack literacy have not gotten the Tetanus toxoid vaccine during pregnancy.[10] According to research done in semi-urban areas of Hala New District, Matiari Sindh, 74.37% of women had two shots of the toxoid of tetanus vaccination.[11]

The literature revealed various factors associated with the Vaccination of TT, including mother's age, educational attainment, residency, husband's education, parity, mass media contact, ethnicity, working women, family structure, employment of husband, distance to health facility, number of ANC visits, timely initiation of visits, fear, lack of knowledge, and the client's perception of the standard and behavior of the service provider all have an impact on the vaccination rate.[12,13] The purpose of this study was to assess the frequency of TT vaccination among pregnant women and to identify the factors associated with TT vaccination during pregnancy at the PMCH. This study contributes to the existing literature and important in achieving the Sustainable Development Goals (SDGs) by 2030 through the widespread promotion of immunization campaigns against TT.

Methods

This cross-sectional study was conducted at the Gynecology and Obstetrics Department of PMCH Tertiary Care Hospital, Nawabshah from March to August 2023. Study participants included all pregnant women of childbearing age (15-49 years) who attended the hospital for delivery and post-partum periods. The sample was obtained through convenient sampling. Women who were severely ill, unable to talk, or unwilling to participate were excluded. A sample size of 192 pregnant women was statistically calculated using credentials of previous study from Nawabshah.[14] Data was collected using a self-structured questionnaire developed after reviewing various literature sources.[1,11] Further information about the patient was collected from hospital records. The questionnaire was written in English, Urdu, and Sindhi for the understanding of the participants. It had three parts: demographic, healthcare accessibility, and awareness-related factors. The data was collected by the researchers themselves. The adjustments were made based on pre-test feedback. One-day training on data collection and accuracy was conducted. Data coding and entry were checked at each step, with regular monitoring and rechecking to address any issues.

Approval for data collection was sought from the gynecology department at PMCH Nawabshah, and the informed written consent of participants was obtained before involving them in the study. The participants were informed about the purpose, method of collection, benefits, and risks of the study. Privacy and confidentiality were assured throughout the research process.

The data was analyzed using SPSS version 25. Descriptive statistics of frequencies and percentages were generated for categorical variables and presented in the form of tables. A chi-square test was used for statistical associations. Statistical significance was considered at a 95% confidence level, with a p-value of <0.05.

The outcome variable was "TT vaccination coverage," defined as two or more TT doses among mothers of childbearing age (15-49 years) in a health facility. A single dose of vaccination is not considered "TT vaccinated" because it does not ensure immunity.

Results

For the purpose of analysis, individuals aged 15 to 49 were segmented into seven age brackets, each spanning a five-year interval, except minors. Of the 192 participants, 11 were under the age of 18. For these minors, individual assent was obtained alongside informed consent from a legal guardian or a spouse of legal age. The majority of the study population fell within the 18-28 age demographic. The mean age of the participants were 26.67±5.43 years.

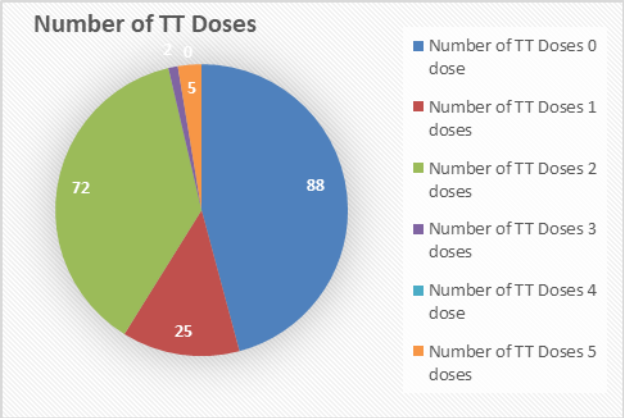

Figure 1: TT Vaccination frequency and number of doses.

Figure-1, illustrates the Vaccine frequency of TT doses, the 79 (41%) of pregnant women received tetanus toxoid, while 113 (59%) of women did not receive. Regarding the number of doses, 88 (45.8%) and 25 (13%) of respondents were not TT-vaccinated (given only zero or one dose). While 72 (37.5%) received 2 doses. The lowest 2.6% and 1.0% took the 5 and 4 dosages, respectively.

Table illustrates the statistically significant association of explanatory variables with TT coverage. Among the 192 study participants of childbearing-age women, 39 (61.9%) of urban women were TT vaccinated. The level of education of pregnant women showed that illiterate women 35 (32%) and women with university education (80.0%) were more likely to receive tetanus toxoid. Working women had (80.0%) of TT vaccination, compared to 71 (39.0%) of housewives. Women with husbands earning less than 12000 per month had coverage (34%). Pregnant mothers who knew about 1 to 2 TT doses required during pregnancy had 53 (74%) coverage. Women who travel less than 30 minutes were more likely to have 49 (61%) coverage as compared to those who travelled more than 2 hours 1 (6%).

Figure-2 represents responses about causes of low or no TT vaccination. The most common was lack of awareness 131 (68.4%), while others were 14 (7.5%) of distance issues, 16 (8.3%) of lack of finances, 16 (8.3%) of transport issues and others.

Table: Factors significantly associated with low TT vaccination.

Variables	*Type*	*TT Coverage*				*p-value*
		Yes		*No*		
		n	*%*	*n*	*%*	
Residence	Rural	40	31.0	89	69.0	0.000**
	Urban	39	61.9	24	38.1	
Educational status	Illiterate	35	32.4	73	67.6	0.029*
	Primary	16	44.4	20	55.6	
	Matric	13	61.9	8	38.1	
	Intermediate	7	43.8	9	56.3	
	College	4	66.7	2	33.3	
	University	4	80.0	1	20.0	
Nature of working	House Wife	71	39.0	111	61.0	0.010*
	Working Women	8	80.0	2	20.0	
Income of Husband	Up to 12,000/month	40	34.2	77	65.8	0.041*
	13,000 to 25,000/month	29	56.9	22	43.1	
	26,000 to 40,000/month	8	47.1	9	52.9	
	Above 40,000/month	2	28.6	5	71.4	
Knowledge of TT doses required during pregnancy	1 to 2	53	73.6	19	26.4	0.000**
	3 to 4	8	40.0	12	60.0	
	Don't know	18	18.0	82	82.0	
Knowledge of TT doses throughout life time	1 to 3	6	42.9	8	57.1	0.024*
	4 to 5	10	76.9	3	23.1	
	Don't know	63	38.2	102	61.8	
TT Card availability	Yes	72	84.7	13	15.3	0.000**
	No	7	30.4	16	69.6	
Husband/Guardian permission	Yes	77	74.0	27	26.0	0.022*
	No	1	20.0	4	80.0	
Time walking to Health facility	Less than 30 minutes	49	61.3	31	38.8	0.000**
	30 min to 1 hour	24	34.3	46	65.7	
	1 to 2 hours	5	20.8	19	79.2	
	More than 2 hours	1	5.6	17	94.4	

p-values were generated with the chi-square test
p-value <0.05*=significant, *p*-value <0.01**=highly significant

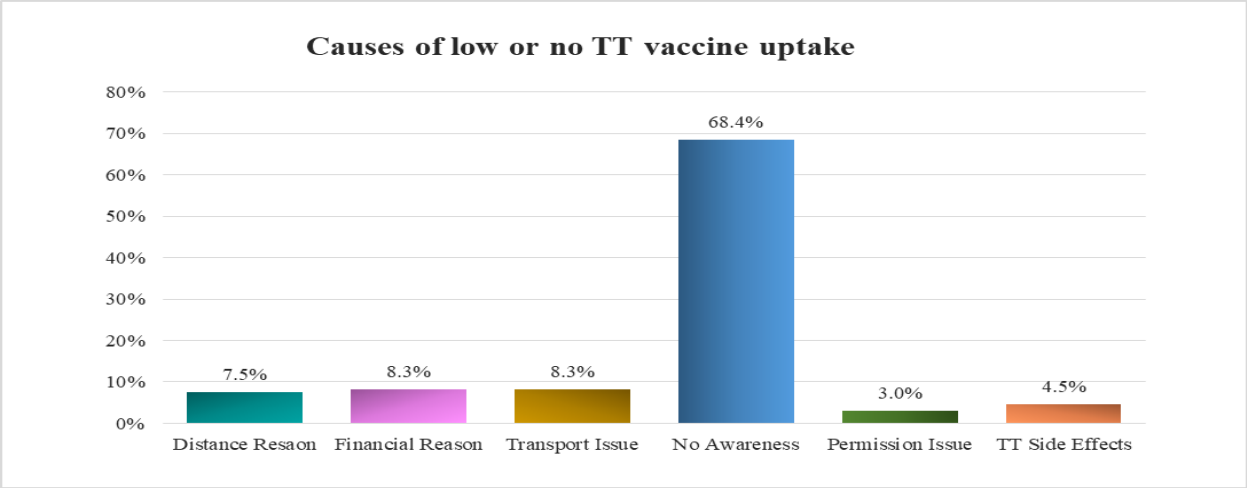

Figure 2: Causes of low or no tetanus toxoid vaccination.

Discussion

This is the first study ever conducted in Nawabshah, 41% of pregnant women received their recommended TT dose (≥2 doses). The results of this research were lower than those of previous studies done in Pakistan reported from Rawalpindi (57.5%) [8] and Matiari (74.37%).[11] In addition, the figures were also lower than the Asian, African, and global results of recommended doses of tetanus toxoid coverage, according to WHO in the current literature. Findings are also lower from other studies carried out in Ethiopia (56.2%) [1], Brazil (59.2%) [15], Baghdad (59.3%) [16], Egypt (60.6%) [17], Nigeria (62.9%) [18], Sierra Leone (82.12%) [19], Bangladesh (83.2%) [2], and India (96%).[20] Considering various causes of low TT vaccination presently, the most common was lack of awareness, followed by distance of home from health facility, lack of finances, transport issues, permission from head of household, and side effects of TT vaccine.

The findings indicate that urban women were more likely to receive recommended TT doses than women from rural areas. This study agrees with previous research done in African nations.[3,19] The study carried out in Bangladesh is in contrast to the current investigation, which established that residence is not pertinent to immunization.[2]

Women with no formal education were less likely to receive the TT vaccine than women with formal education, who had a higher vaccination. The study shows that the vaccination of the TT increases as the educational level increases. Education enables women to make informed health decisions and addresses misconceptions, myths, and fears surrounding vaccines. The study coincides with earlier research carried out in Ethiopia [1], Nigeria [18], and Pakistan [11], while contrasts with those carried out in Sierra Leone [19], Baghdad [16], and Bangladesh.[2]

Working women are significantly more prone for TT vaccination as compared to the housewives. The reason may be attributed to their enhanced access to resources and empowerment, which are frequently associated with greater knowledge and awareness about health. The current findings align consistently with studies conducted in Matiari, Pakistan [11], and African nation studies.[3] However, some other studies have reported contradictory findings.[1]

Presently household income up to 12,000 per month is less likely to get the recommended doses as compared to greater income. A study conducted in Ethiopia [3], Sierra Leone [19], Bangladesh [2], and Pakistan [11] also agreed the study findings. The financial situation is one of the main determinants influencing a mother's decision to seek healthcare. Higher socio-economic status is associated with better educational opportunities that improve health literacy and awareness about immunization.[3]

Awareness of the required doses during pregnancy contributed positively than in women who were unaware. The findings likely reflect that the majority of the participants in the present research were from remote and rural regions with little access to vaccination information.[18] The level of TT vaccine coverage in Pakistan may be greatly increased with adequate information and improved awareness of the vaccination process.[16] Traditional vaccination beliefs and myths are prominent in some cultures, which might cause hesitation or resistance to inoculation.[8]

The study showed that pregnant women with TT vaccination cards were more likely to receive the recommended TT doses compared to those without cards. In cases where vaccination cards were unavailable, TT vaccination status was based on self-reporting by the participants. Similar findings have also been reported in a community-based study from Nigeria, which identified the availability of TT records as an important determinant of TT vaccination.[18] The study found that pregnant women who lacked their husbands' permission for TT immunization were less likely to receive the vaccine compared to those who had spousal support. This may be attributed to prevailing patriarchal norms, where men often play a dominant role in household decision-making, including women's access to healthcare services such as vaccination.[2]

The study demonstrated that shorter travel distances significantly improve the likelihood of vaccination, consistent with findings from earlier studies.[3,8] This association may be explained by financial constraints, limited transportation facilities, and insufficient health education that does not adequately address misconceptions and fears regarding vaccination.

However, the findings should be interpreted in light of certain limitations. As a cross-sectional and hospital-based study, it cannot establish a causal relationship and its results may differ from those of other populations due to demographic variations. Additionally, the small sample size limits the generalizability of the findings to the wider population. Vaccination status was also based on verbal reports from participants, as most women did not have vaccination cards available during data collection. Despite these limitations, the study offers important insights into vaccination coverage and the factors influencing vaccine uptake among pregnant women.

Conclusion

The present study demonstrated inadequate coverage of TT vaccination among women. The vaccine coverage is influenced by factors like residence, educational status of women, nature of work of the respondent, her husband's income, her knowledge of TT during pregnancy, knowledge of recommended TT doses throughout her lifetime, TT vaccination card availability, and the existence of an illness during pregnancy. These factors emerges as a promising in improving the TT vaccination in the pregnant women.

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Availability of Data: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical Approval: The Research Ethical Committee of Department of Community Medicine, Peoples University of Medical and Health Sciences for Women, Shaheed Benazirabad approved the study via letter no. PUMHSW/SBA/CHS/168 dated 20/03/2023.

Conflict of Interest: None declared.

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