

Analysis of Tetanus Immunization During Pregnancy Among Married Women of Childbearing Age Attending Gynecology and Pediatrics GDP of Nishtar Hospital, Nishtar Medical University, Multan

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Abstract

Background: Neonatal tetanus is one of the major causes of neonatal deaths in developing countries including Pakistan. This can be combated by clean, sterile method of delivery and risk can be significantly reduced by 94% if two shots of tetanus toxoid vaccination are administered to women during gestation. **Objective:** The study was carried out to assess the knowledge, attitude and practice of married women of age 16-50 years regarding tetanus toxoid immunization during pregnancy. **Material and method:** A cross-sectional study was carried out in Gynecology and Pediatrics out-patient department of Nishtar medical college and hospital for twelve days. 150 married women of child bearing age were included in the survey. The women were personally interviewed to fill the questionnaire Performa. Moreover, the data was analyzed by using SPSS 10. **Results:** It was found that 23 women (15.3%) had received one shot of tetanus toxoid vaccine during pregnancy. 69 women (46%) had received two shots and 58 women (38.7%) had never been vaccinated against tetanus during pregnancy. 53 out of 106 urban women (49.5%) were aware of tetanus and its risk. On the other hand, only 21 out of 44 rural women (46.8%) had the awareness. 48 out of 68 women of higher socio-economic status (70.6%) were well-informed while 19 out of 82 women belonging to low socio-economic status (23%) were well-informed. 51 of 76 literate women (67.1%) had awareness. In contrast, 24 of 74 illiterate women (32.4%) were well aware. 45 out of 95 housewives (47%) were well acquainted with knowledge of tetanus while 17 out of 55 working women (31.3%) were familiar with the diseases and risks. **Conclusion:** The awareness about tetanus and benefits of tetanus toxoid vaccination during gestation is fairly low. Hence, tetanus toxoid immunization coverage is below satisfactory as well. Efforts need to be made to increase awareness and campaigns should be arranged for mass immunization of women of child-bearing age. (Key words: tetanus, married women, tetanus toxoid vaccination, pregnancy).

Keywords: Tetanus, Tetanus toxoid vaccination, neonatal deaths, immunization.

Type of study: **Original Research Article.**

1. INTRODUCTION

Tetanus is a fatal infectious disease caused by toxigenic strains of *Clostridium tetani*. Tetanus and neonatal tetanus is still a major health problem in considerable number of developing countries. Since the discovery and productions of the tetanus vaccines, the occurrence of tetanus has decreased. Using US population derived figures, following vaccination, 100% of people are protected from tetanus. Before the vaccine there was an average of 580 annual cases of tetanus and 472 annual deaths from tetanus. There is 93% reduction in occurrence of tetanus and a 99% reduction in fatalities resulting from tetanus² in a similar manner, immunization of pregnant women in rural Bangladesh with two doses of aluminum-absorbed tetanus toxoid reduced neonatal mortality by one-third during a period of 9-32 months after vaccination. The reduction in mortality rate was attributable almost entirely to a 75% lower mortality rate among 4-14 day old infants, when tetanus was the predominant cause of death. In the period up to 20 months following vaccination, the reduction in deaths among 4-14 day old infants after a single dose of tetanus toxoid was about the same as that after two doses. However, beyond 20 months a single dose did not appear to provide protection³.

Different studies have showed that decreased vaccination among the pregnant women has increased the incidence of Neonatal Tetanus which is an acute disease presenting with loss of ability to suck, generalized rigidity and painful muscle spasms. It is one of the leading causes of infant death throughout world mainly due to

low coverage of facility births and tetanus toxoid immunization in countries like India and Nigeria ⁴.

One approach to prevention of neonatal tetanus and to decrease the mortality rate of neonate and pregnant women is through improving quality of prenatal, obstetrical and postnatal maternal and child health services. Another complementary approach is active immunization of women before or during pregnancy with tetanus toxoid.

An analysis of the live births between September 1978 and December 1979 in a rural epidemiologic surveillance area of Bangladesh showed that for infants whose mother had received two tetanus injections 48-64 months prior to delivery, the neonatal mortality rate was 63.8 per 1000 live births compared with 78.3 per 1000 for infants whose mother did not receive tetanus immunization².

Thus, the advent of vaccine resulted in reduction of neonatal tetanus in high income countries and also opened progress in low-income settings ³.The vaccine used is an inactivated toxin (toxoid) that was first produced in 1924.It became commercially available in 1938 ^{5,12}.

The number of doses required and timing of boosters during pregnancy will depend on the past immunization history of the pregnant mother with tetanus containing vaccines. Pregnant women who have not received tetanus vaccine during infancy and childhood should be immunized during first pregnancy with first dose after 12th week of gestation and 2nd; 1st dose 6-8 weeks after first dose,

3rd,4th and 5th dose during 2nd,3rd and 4th pregnancy after 12 weeks of gestation respectively. Pregnant women who have received these five doses of tetanus toxoid during previous pregnancies do not need further booster doses of tetanus toxoid during subsequent pregnancies. Concentrations of tetanus antitoxin exceeding 0.1-0.15 IU/ml measured by standard enzyme linked immunosorbent assay, are considered protective. These are achieved 24 weeks after the second dose of tetanus toxoid in 90% of adults. Although immunity wanes over time, more than three-quarters of women will maintain protective levels for 3 years. A third dose given 6-12 months after the first two doses increase both the level of neutralizing IgG antibody and duration of immunity for at least additional 5 years. Additional doses given at least 1 year apart further prolong the duration of protection. After the fifth dose, protective antibody levels last for at least 20 years³. Hence, while tetanus immunization is now a standard practice, the evidence base to support the mortality effect estimate for use in the list tool is limited, mainly because the vaccine was accepted for practice before the era of randomized controlled trials.

2. METHODS AND MATERIAL

1. TYPE OF STUDY: Cross sectional Observational Study.

2. DURATION OF STUDY: Twelve days (12)

3. SETTING: Nishtar Hospital (Gynecology and Pediatrics OPD), Multan

4. SAMPLING METHOD: Non-probability convenience sampling

5. SAMPLE SIZE: 150 married women of childbearing age (15-45 years) attending Gynecology and Pediatric CPD

6. INCLUSION & EXCLUSION CRITERIA:

A) Inclusion: Married Women of child- bearing age (16-50 years)

B) Exclusion: Unmarried women of lesser than 16 years and more than 50 years of age.

7. DATA COLLECTION PROCEDURE:

Questionnaire- based interview to get answers to the question relevant to objectives of study

8. ANALYTICAL TECHNIQUES: By using SPSS 10 version

3. FINDINGS

Results and Findings:

Awareness of Tetanus in Various Age Groups

Age groups	Number of females	Percentage %
20 and below	12	8 %
21-25	32	21.33%
26-30	49	32.67 %
31-35	38	25.33%
36-40	11	7.33%
41-45	5	3.33 %
46-50	3	2%

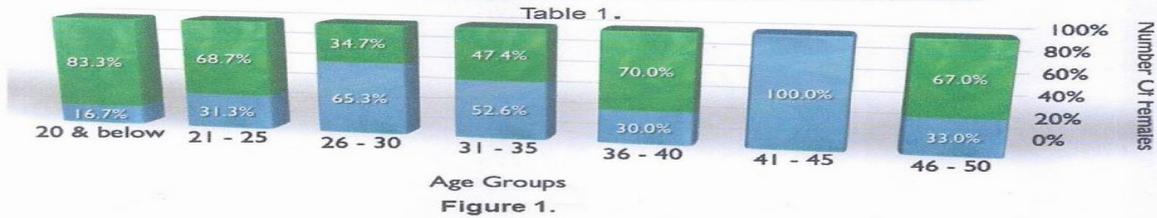
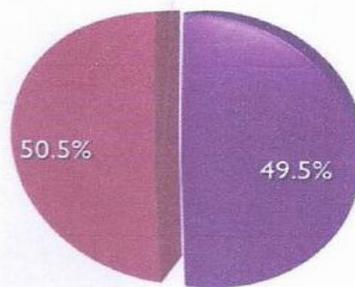


Figure 1.
 Legend:
 ■ Knew about Tetanus (Blue)
 ■ Did not know about Tetanus (Green)
 ● All females between the age group 41-45 knew about tetanus

	total no. of people	percentage
Knew about tetanus	52	49.5%
did not know about tetanus	54	50.5%

Table 2.

Percentage of Females Who Knew About Tetanus in Urban Population



Legend:
 ● Knew about Tetanus (Purple)
 ● Did not know about Tetanus (Red)

Figure 2.

● approximately half of the females in urban population did not know about tetanus.

	total no. of people	percentage
Knew about tetanus	21	46.8 %
did not know about tetanus	23	53.2%

Table 3.

Percentage of Females Who Knew About Tetanus in Rural Population

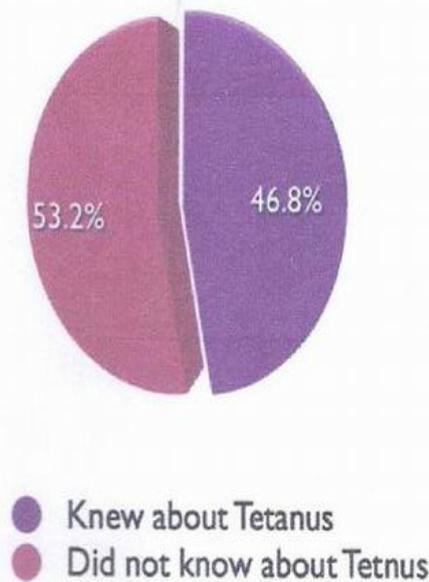


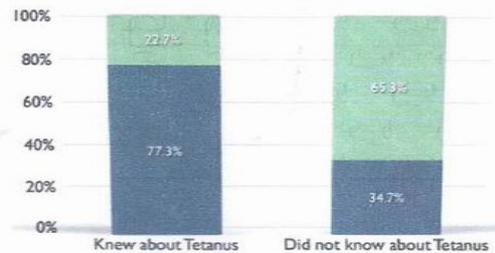
Figure 3.

- Approximately half of the females in rural population knew about tetanus

Comparison of Females Who Knew About Tetanus and Got Vaccinated vs. Females Who Did Not Know About Tetanus and Got Vaccinated

	no	yes
vaccinated	84	56%
Not vaccinated	66	44%

Table 4.



Not Vaccinated
Vaccinated

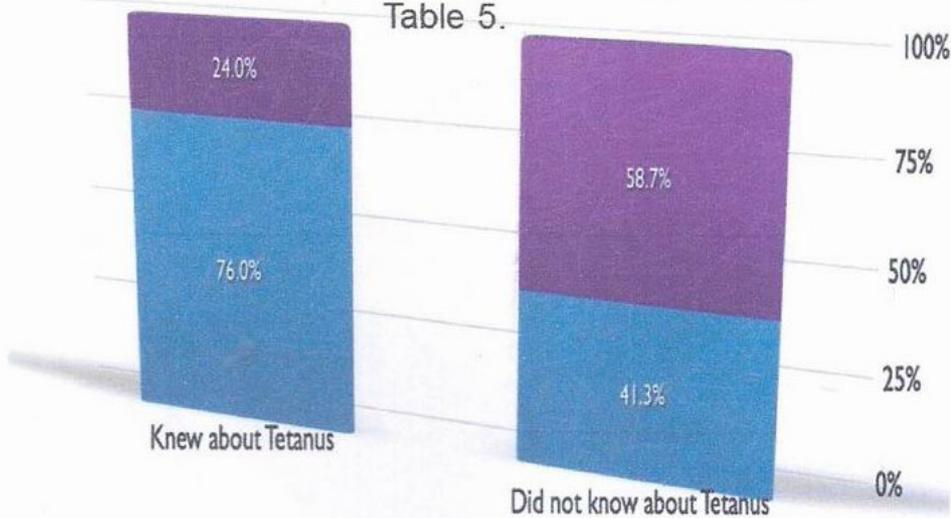
Figure 4.

- 34.7% of the females who did not know about tetanus got vaccinated

Females Who Knew That Tetanus Was Transmitted by Road Traffic Accidents

Mode of transmission	Number of females	percentage
Knew through RTA	88	58.67%
Did'nt know through RTA	62	41.33%

Table 5.



Did not know it was transmitted through road traffic accident
 Knew it was transmitted through road traffic accident

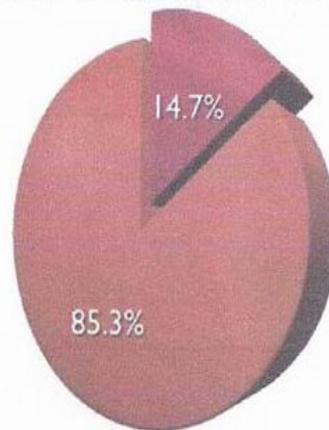
Figure 5.

- 76% females who knew about tetanus also knew that it was transmitted by road traffic accidents

	total no. of people=75	percentage
knew about it's mode of transmission	11	14.7%
did not now about it's mode of transmission	64	85.3%

Table 6.

Females Who Knew About Tetanus and Its Mode of Transmission



- Knew how it was transmitted
- Did not know how it was transmitted

Figure 6.

- Only a few females who knew about tetanus also knew about its mode of transmission.

Females who got 2 shots of tetanus during pregnancy

shots during pregnancy	knew about tetanus=75	in percentage	did not know about tetanus=75	in percentage
got 2 shots	42	56%	22	29%
did not get shots	33	44%	53	71%

Table 7

Knew about Tetanus

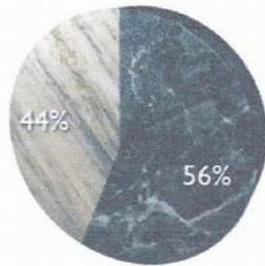


Figure 7.

Did not know about Tetanus



Figure 8.

- Got 2 shots of tetanus during pregnancy
- Got 2 shots of tetanus during pregnancy
- Did not get shots during pregnancy
- Did not get shots during pregnancy
- a substantial number of females who knew about tetanus got 2 shots of tetanus vaccine during pregnancy.

Source of Awareness of Tetanus



Figure 9.

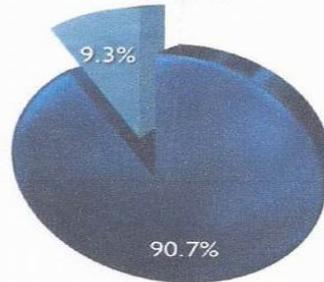
■ number of females

- Doctors are the main source of awareness of tetanus

Females who Knew About Tetanus vaccine and It's Effectiveness

	total number of women who knew about tetanus=75	percentage
Think its effective	68	90.7%
think its ineffective	7	9.3%

Table 8.



- Think tetanus is effective
- Think tetanus is ineffective

Figure 10.

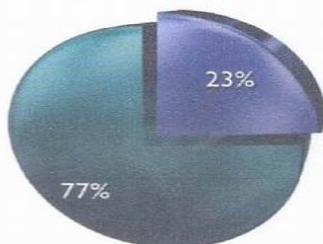
● majority of the females who knew about tetanus vaccine think it is effective

Awareness of Tetanus in Association with Socioeconomic Status

socioeconomic status	knew about tetanus	did not know about tetanus	% who knew about tetanus	% who did not know about tetanus
high SES(68)	48	20	70.6%	29.4%
Low SES(82)	19	63	23%	77%

Table 9.

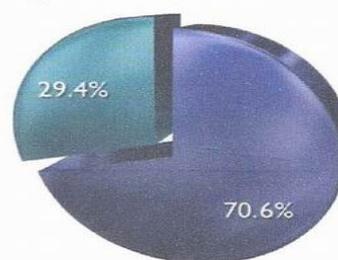
Low Socioeconomic Status



- Knew about Tetanus
- Did not know about Tetanus

Figure 11.

High Socioeconomic Status



- Knew about Tetanus
- Did not know about Tetanus

Figure 12.

● Majority of the females who knew about tetanus belonged to high socioeconomic status.

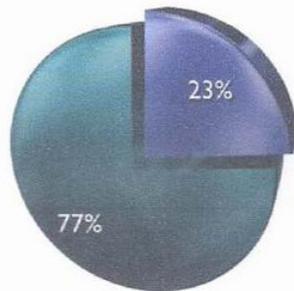
Low socioeconomic status= 10,000 /- and below income per month
 High socioeconomic status= above10,000/- income per month

Awareness of Tetanus in Association with Socioeconomic Status

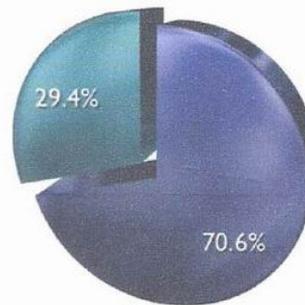
socioeconomic status	knew about tetanus	did not know about tetanus	% who knew about tetanus	% who did not know about tetanus
high SES(68)	48	20	70.6%	29.4%
Low SES(62)	19	63	23%	77%

Table 9.

Low Socioeconomic Status



High Socioeconomic Status



- Knew about Tetanus
 - Did not know about Tetanus
- Figure 11.

- Knew about Tetanus
 - Did not know about Tetanus
- Figure 12.

- Majority of the females who knew about tetanus belonged to high socioeconomic status.

Low socioeconomic status= 10,000 /- and below income per month
 High socioeconomic status= above 10,000/- income per month

Number of Housewives and Working Women Who Knew About Tetanus

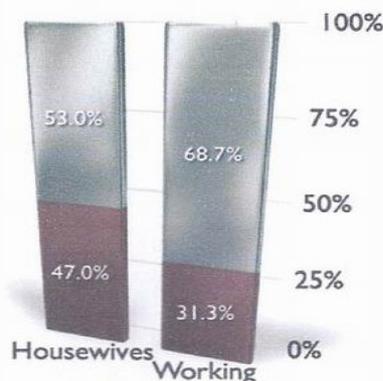


Figure 13.

- Did not know about Tetanus
- Knew about Tetanus

- A large proportion of both housewives and working women did not know about tetanus.

4. RESULTS

Our study was aimed at determining the knowledge, attitude and practice of married women (of childbearing age) towards getting tetanus toxoid vaccination during pregnancy. The study was carried out in the Gynecology and Pediatric Outpatient department of Nishtar Medical College and Hospital, Multan. The questionnaires were filled by personally interviewing the candidates. There were 150 women who were included in the study. Only married women of childbearing age (16- 50 years) were included. The mean age of included women was 30.2 years and the most occurring age group was 35 years. In this sample the 44 women (29.3%) were from rural background and 106 women (70.2%) belonged from urban areas. Moreover, the almost half of women were literate (50.6%) and the rest were illiterate (49.3%). Women who could read and write were considered literate for this study and

the rest were categorized illiterate.

The results show that (61.3%) women had been vaccinated against tetanus during their pregnancies. Out of this, 69 women (75%) had received 2 shots of tetanus toxoid and 23 women (25%) had single shot of tetanus toxoid vaccination during their previous pregnancies. This shows that the tetanus toxoid vaccination coverage in this region is significantly poor. The extent of tetanus toxoid vaccination coverage was mainly influenced by women's awareness about tetanus. Other factors such as literacy status, rural or urban setting, income of husband, and age of women also were found to affect the knowledge and practice of women regarding vaccination against tetanus during pregnancy.

It was found that knowledge of women about tetanus was age related. In age group of 20 or less, least percentage (16.7%) of women was found to be aware of tetanus. The women included in age group 26-30 years (66.5%) were appreciably informed about tetanus. However, the peculiar finding was that 100% of the women in age group 41-45 years knew about tetanus. Moreover, the awareness among women of age 46 years and higher was significantly low, as well. Only (33.0%) women were aware about tetanus in this age group. Awareness was found to be more in women from urban setting. (49.5%) of women from urban areas knew about tetanus and its vaccination in contrast to (46.8%) of the rural women.

The chance of women getting tetanus toxoid vaccination was related to their prior knowledge of the disease. 77.5% of women who knew about tetanus got vaccinated during their pregnancies while only 34.7% of women without knowledge of tetanus availed the immunization. In the study, (76.0%) of women who were informed about tetanus also knew about its mode of transmission. However, (41.3%) of women were such who recognized its mode of transmission but did not have formal information about the disease. (14.7%) of total 150 women knew both about tetanus and its mode of transmission.

The women who were aware of the disease were more likely to have received two shots tetanus toxoid vaccine. (56%) of women who were aware had received the vaccine while coverage was only (29%) in women with no knowledge. The sources of knowledge varied. By large the source of knowledge was from the doctors (25%) followed by health worker (14.0%), social media (12%), family (8.0%). More housewives knew about the disease (47.0%) in comparison to working women (31.3%). Most (90.7%) of women who knew about tetanus toxoid vaccine believed in its effectiveness. Only (23.0%) of women belonging to low socioeconomic status were found to comprehend the hazard of tetanus while (70.6%) of high socio-economic status knew about tetanus. Women who had household earning of 10,000 Rs. and below were considered to have low socioeconomic while household income of more than 10,000 Rs. were considered to have high socio-economic status. Another important factor determining the knowledge of tetanus among married women was their literacy status. Awareness was found to be more (67.1%) among literate women and significantly low (32.4%) among illiterate women.

5. DISCUSSION

The results of our study shows that (61.3%) of women had received at least one shot of tetanus toxoid vaccination, (46%) had received two shots of the vaccine while (38.7%) never received the vaccine in any of their pregnancies. In a similar study carried out in Peshawar, Pakistan⁷ it was found that (55.6%) of the women had complete coverage of tetanus toxoid vaccination while (78%) had at least one shot of the vaccine. The statistics of the two studies are almost similar. This shows that the extent of coverage is different in different regions of Pakistan. Nonetheless, these findings are suggestive of the fact that the coverage of tetanus toxoid vaccination is fairly very poor throughout the country on the whole. Efforts need to be made to improve this situation because it has been proved that at least 2 shots of tetanus toxoid vaccine are required to reduce the chance of neonatal tetanus by 94%¹.

The vaccination status of women depended upon various factors. The prior knowledge played a very important role which in turn was influenced by multiple factor itself. Younger mothers had low awareness and so did the women older than 46 years of age. However, the interesting finding was that women of age group 41-45 years had 100% awareness of tetanus. This result can be because women of this age group had been multipara; moreover, with time and experience must have gained knowledge about tetanus. However, since the sample size has been very small and localized to premises of out-patient department of the hospital; this might have subjected this finding to a bias. Moreover, the place where women were settled also played a role in influencing their knowledge and practice. Women of urban settlement had more awareness of tetanus (49.6%) compared to rural women (46.8%). Being settled in urban area allows women to have a greater exposure to sources of awareness and access to health care services which positively influences their knowledge and practice. This finding is in accordance with previous studies^{8, 11}. In a study carried out in Peshawar reported that (79%) of urban women were vaccinated during pregnancy while only (50%) of rural women availed the vaccination.^{8, 11}

Furthermore, literate women were more aware and had more chance of getting vaccinated. Along with education status the economic status also played an important role. Women whose husbands had higher income were more likely to know about tetanus toxoid vaccination and receive the immunization in their pregnancy.

This finding is consistent with previous studies of similar kind. However, a study in Peru reported women of low socioeconomic status to have better vaccination status than the women of higher socioeconomic status.

The reason for this finding was reported to be the focus of government on campaign of mass immunization of women of lower socioeconomic status which successfully increased the percentage of immunized women. This example shows that if such measures are taken in this region, then immunization coverage can be increased to a significantly high level.

The main source of awareness was directly from doctors which mean that access to health-care system was influencing their awareness. The second most frequent source of awareness was through lady health-workers. The women who stayed at home and had no means to go to a clinic or hospital were benefited from this service. This explanation also justifies another finding of our study which was that more housewives (47%) had awareness as compared to working women (31.3%). Working women who go out of houses and spend more time at their workplace miss the opportunity of guidance by lady health-worker or even by some family member. Hence, our finding can be justified by this reason.

6. CONCLUSION

The study shows that overall vaccination status of the married women of childbearing age (16-55 years) in this region is not satisfactory. A fair percentage (61%) got the first shot of tetanus vaccine but number of those getting the second shot of vaccination was significantly low (46%). Where it is recommended that to achieve 94% immunity from neonatal tetanus two doses of vaccination during pregnancy are mandatory. The status of vaccination was influenced by the socioeconomic status, education, area of residence (rural or urban) and the type of health care facilities available.

7. LIMITATIONS

Our study was beset by many limitations including small sample size. The students who gathered information, were not formally trained to ask interview for the questionnaire. Moreover, the information sources were the women themselves. No hospital data or records were available; hence there could be a memory bias. Moreover, the study was aimed at women who attended gynecology outpatient department of Nishtar only. The sample size had been limited and may not represent the whole population of this region. This aspect can be improved by carrying out the study on a wider scale, including other government and private out-door patients as well. However, the results of the study were in coherence with the results of the similar studies conducted in other regions of Pakistan.

8. RECOMMENDATIONS

It is recommended that women of rural population with low socioeconomic status should be targeted and there should be limited surveillance and monitoring of this peculiar age group to bring the vaccination status according to WHO recommended status. This study included only married women of childbearing age. However, the mass immunization activities must be carried out to include unmarried women of childbearing age without discrimination to ensure better coverage. Moreover, awareness campaign must be propagated to increase awareness among women with the help of all communication media.

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