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Research Article

**COVERAGE OF TETANUS TOXOID AND RUBELLA VACCINATION  
AMONG FEMALE STUDENTS OF QAMC AND IUB, BAHAWALPUR**<sup>1</sup>Sadia Kanwal, <sup>2</sup>Sobia Kanwal, <sup>3</sup>Abnas Kousar, <sup>4</sup>Abdul Basit<sup>1</sup>QAMC Bahawalpur<sup>2</sup>PMC Faisalabad<sup>3</sup>RHC Wahndo,<sup>4</sup>Health Services Academy Islamabad**Abstract:**

**Introduction:** Tetanus also called Lockjaw is a highly characteristic disease caused by *Clostridium Tetani* found in the soil throughout the tropical and temperate regions of the world. This disease can be prevented by the use of vaccine and developing countries like Pakistan are trying to eliminate this disease by various vaccination programs i.e. vaccination program of reproductive age group women. Rubella is a contagious disease caused by a virus. While the infection is mild in children but in pregnant women, it can cause fetal death or severe congenital defects like Congenital Rubella Syndrome (CRS).

**Objective:** The objective of the study was to:

1. Determine the vaccination coverage of Tetanus Toxoid and Rubella among female students of Quaid-e-Azam Medical College and Islamia University, university Chowk, Bahawalpur.

**Materials and Methods:**

**Study Design:** Cross sectional descriptive study.

**Study Setting:** It was conducted in Quaid-e-Azam Medical College and Islamia University, Bahawalpur.

**Results:** The vaccination coverage against Tetanus was found to be 75% while 25% were non-vaccinated. According to the grading of vaccination status, 25% were not vaccinated at all while 73% were partially vaccinated and only 2% were completely vaccinated. The reasons for not being vaccinated were fear (16%), unawareness (68%), bad experience (4%), don't think its useful (8%), others (4%). The vaccination coverage against Rubella was found to be 12% while remaining 88% were non-vaccinated. According to the grading of vaccination status, 88% were non-vaccinated while 9% were partially vaccinated and only 3% were completely vaccinated. The reasons for not being vaccinated were unawareness (73.8%), fear (5.6%), bad experience (2.2%), don't think its useful (5.6%), others (12.5%).

**Conclusion:** About two-third of the female students were immunized against Tetanus. Among them mostly were partially vaccinated. Reasons for not being vaccinated were unawareness, fear and bad experience. Only few students were vaccinated against Rubella. Unawareness, fear and bad experience were the main reasons for non-vaccination.

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**INTRODUCTION:**

Tetanus is an acute fatal disease caused by an exotoxin and highly potent neurotoxin tetanospasmin, which is produced during the growth of anaerobic bacterium *Clostridium tetani*. *Clostridium tetani* is not an invasive organism; infection with *clostridium* remains localized.

Tetanus spores are wide spread in the environment. Tetanus bacilli can also enter the body through contaminated puncture wounds and sometimes seemingly trivial injuries. Once inside neurons, tetanus toxin cannot be neutralized by tetanus antitoxin. Toxin accumulates in the central nervous system where it prevents the release of inhibitory neurotransmitters, such as glycine,  $\gamma$ -amino butyric acid, thereby leaving excitatory nerve impulses unopposed. (5) The major predisposition is lack of maternal vaccination with tetanus toxoid.

Immunization of pregnant women with TT induces the formation of antibodies, primarily of the IgG, which passes to the fetus through the placenta and prevents neonatal tetanus. (2,5)

Tetanus that strikes women during pregnancy or within 6 weeks of termination of pregnancy is called maternal tetanus. A significant amount of women die to maternal tetanus every year. Lack of vaccination coupled with deliveries conducted by untrained caregivers in an unhygienic environment with unhygienic birth practices. These conditions allow tetanus spores to contaminate maternal wounds during childbirth and the umbilical cord if cut or dressed after delivery. (2,8)

In 1989, WHO called for the elimination of neonatal tetanus by 1995. By the year 2000, 104 out of 161 developing countries had achieved this goal. As of February 2012, Pakistan is one of the 24 countries that have not achieved maternal and neonatal elimination. The MNT elimination initiative, the global initiative launched by UN children's fund (UNICEF). WHO and the UNFPA continues to super head the effort to eliminate MNT beyond 2003, the target date for the worldwide elimination of the disease. However, progress in global elimination has been

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deaths were In Pakistan with an NT mortality rate of 5 per 1000 live births. By the year 2008, the WHO estimated that the global NT had declined to 59000, a 92% reduction from the situation in the late 1980s. NT has been actively integrated into the acute flaccid (AFP)/Pollo Surveillance Infrastructure in Pakistan; it is hoped that this Integration will Improve the

reporting of NT remains a public health concern for global elimination hinders effective surveillance. (5)

The Government of Pakistan has set the target to eliminate MNT by 2015. The Government is committed to the goal of reducing the incident of MNT to < 1 case per 1000 live births in all districts of the country. To achieve this, the Pakistan National Plan for immunization has adapted the high-risk approach. Pakistan has made great progress in the last 10 years, Since the high-risk approach strategy was initiated. By the end of 2010, at least three rounds of SIAs has been implemented in 54 out of a total of 135 districts, compared to 64 out of a total of 121 districts in Pakistan by the end of 2003. Coverage with the third dose of TT vaccine was 84% during the first phase and 73% during the second phase of the SIAs conducted between 2001- 2003. The review presents the activities, progress and challenges in achieving NT elimination in Pakistan. Pakistan is one of the 34 countries that have not achieved the NT global elimination target set by the WHO. (5)

A review of literature found TT vaccination coverage in Pakistan ranged from 60% to 74% over the last decade. Low coverage the main driver for NT in Pakistan, is due to many factors including demand failure for TT vaccine resulting from inadequate knowledge of TT vaccine among reproductive age group women and inadequate information about the benefits of TT provided by the health care workers and the media, other factors linked to low vaccination coverage include residing in rural areas, lack of formal education, poor knowledge about place and time to get vaccinated and lack of awareness about the importance of vaccination. A disparity exists In TT vaccination coverage and antenatal care; between urban and rural areas due to access and utilization of health care services, NT reporting is incomplete, as cases from private sector and rural areas are under reported. To successfully eliminate NT, women of reproductive age must be made aware of the benefits of TT vaccine, not only to themselves but also to their families. Effective communication strategies for TT vaccine delivery and health education focusing on increasing awareness of NT are strongly suggested It is imperative that the private and government work cooperatively to report NT cases and improve routine TT vaccination coverage. (5)

Recent substantial studies in Khyber Pakhtunkhwa have been done on tetanus immunization; an important health issue study was focused on was assessing the different causes of low vaccination coverage of tetanus toxoid in married women in Peshawar with respect to users, in order to provide

new material for any future approaches. (8)

Rubella is an acute exanthemata's viral infection that predominantly affects children but is also seen in adults. Although life-long immunity and protection against rubella result from natural infection with the virus, when susceptible pregnant women are exposed to the virus in the first months of their pregnancies, the virus can cause congenital rubella syndrome (CRS) and can have disastrous effects on the fetus. Therefore, the susceptibility of women in the reproductive age group to rubella virus, especially before gestation, is closely related to the potential risk for congenital infection and sequel. Since many rash illnesses may mimic rubella infection, and up to 50% of the infections may be sub-clinical, immunity against the virus cannot be confidentially predicted from a patient's clinical history of the disease, and can only be documented through the determination of rubella-specific antibodies. Clinical immunity is usually parallel to the serum rubella antibody titers. Successful rubella vaccination policies have been implemented in most western developed countries and high sero-positivity rates have been obtained through vaccination, although some resurgences have also been reported in many developing countries, CRS is an under recognized public health problem and there is an urgent need for collection of appropriate data. It is necessary to determine the rubella susceptibility in a population in order to determine the feasibility of rubella vaccination as a natural policy. (14)

Rubella (German measles) has been directly responsible for much pregnancy wastage and severe congenital malformation in the live born infants including congenital hearing impairment (60%), congenital heart disease (45%), microcephaly (27%), congenital cataract (25%) and mental retardation (13%). It is the second largest cause of non-traumatic childhood cataract. Infants usually present with more than one symptom of CRS. Recently it has also been suggested that CRS includes autism spectrum disorders. Congenital rubella syndrome is preventable. Vaccination is offered to all women of child-bearing age. (12,20)

Rubella is caused by an RNA virus of the Toga virus family. Source of infection is clinical or subclinical cases. A large number of rubella infections are, in fact, subclinical. Rubella is much less communicable than measles probably because of less coughing in rubella. One attack usually results in life-long immunity. Active vaccination against rubella is now possible with live attenuated vaccines. The goal of rubella immunization is the prevention of

rubella infection during a future pregnancy. Rubella vaccine is also available as combined measles mumps and rubella (MMR) vaccine. It is equally effective. The immunization priority is first to protect women of child bearing age and then to interrupt transmission of rubella by vaccinating all

#### LITERATURE REVIEW

A cross sectional study was undertaken in which 851 female adolescents were selected from eight secondary high schools in Ibadan, south-west of Nigeria using a three stage rando sampling technique. A pretested questionnaire was used to obtain information on demographic and socioeconomic characteristic history of tetanus vaccination and adolescents knowledge of tetanus infection. Mean age of respondents was  $14.3 \pm 1.9$  years. Only 3.1% had received tetanus toxoid injection 1 year prior to study. Most frequently following a wound or injury (65.4%). Though 344(40.4%) respondents claimed that they knew about tetanus as a serious neurological disease. Only 46.5% correctly defined tetanus. Overall, the mean knowledge score was  $4.8 \pm 3.1$  and 64.7% of the respondents had poor knowledge. Academic class was significantly associated with knowledge, higher mean score among senior ( $5.3 \pm 5.3$ ) than junior classes ( $4.4 \pm 3.2$ );  $P < 0.001$ . Over half (56.2%) of the adolescents disagreed that tetanus immunization can be given to students in the school premises. (1)

Another cross-sectional study was carried out in university of Port Harcourtian Nigeria in 2014. A pre-tested questionnaire was administered to 512 female students selected through a multi-staged technique. Information sought included awareness of TT vaccine, Knowledge of vaccination campaign for women of childbearing age and TT vaccine status. Mean age of female students was  $22 \pm 2.79$  years. Two hundred and ninety-eight (58.2%) and 10(2%) students had received at least 1 dose and 5 doses respectively. Students who had knowledge of the target population for TT vaccination campaign (OR=2.41,  $P < 0.001$ ) were more like, receive at least a dose of TT vaccine. So, there was a poor knowledge of TT vaccination campaign for women of childbearing age and coverage of TTS among the female undergraduate students that should be reached during TT vaccination campaigns. (2)

A survey was made to analyze the coverage of tetanus toxoid immunization among women of reproductive age group in zone 3 of Dhaka city, Bangladesh. A cross-sectional study with an estimated 41,000 cases were made by medical students. Only 11% of women of reproductive age

had obtained the complete series of five TT immunization. (3)

A descriptive cross-sectional survey was performed among women Yemen. 449 fertile women were included in this study. Yemen health reported that only 11.69% of fertile women were vaccinated. Only 20.9% had received the complete series of five TT vaccines. (4)

A cross sectional study was carried out on 113 female students randomly selected from Dhaka university. About 90% of the respondents knew about tetanus TT vaccination. Regarding the number of doses for complete vaccination 60% respondents mentioned five;10.9% three and 4.9% two. Twenty two percent (22.1%) of the respondents didn't know. Over one-third (34.5%) of the respondents were mentioned to be completely immunized; 24.8% on schedule;17.7% incompletely immunized and 23% were not at all immunized. Among the non-vaccinated group 50% respondents told of their unawareness about the need for vaccination before the start of their reproductive life, 15.4% told about lack of information regarding place and time of vaccination and 19.6% complained about inconvenient schedule and place of vaccination. More than two third of respondents had knowledge about tetanus toxoid vaccination before the start of their reproductive life but only half of them were completely vaccinated. (6)

A descriptive cross-sectional survey was conducted in 11 colleges of Karachi and university of Karachi. The study was made to know the frequency of tetanus toxoid among female students of Karachi. A total of 1407 was interviewed for the study. This study reported that only 41 female students had received complete course of 5 doses. Only 560 students had received at least 1 out of 5 doses. A majority of 232 students were not tetanus immunization for females of reproductive age group. (7)

A cross-sectional study was carried out in Peshawar, Pakistan in 2010. A total of 304 females of reproductive age (17-45) years were selected from both urban and rural areas of Peshawar through random sampling. Overall, 55.6% were vaccinated. Urban population was 55.3% while rural was 45.7% vaccinated. Reasons for not being vaccinated were Unawareness (38.4%), being busy (18.1%), distant centers of vaccination (18.1%), misconception (10.86%), and fear of side effects (4.3%). (8)

A cross-sectional study was conducted to assess rubella vaccination in Ujjain district in Central India in 2013. It was conducted among 202 women

medical professionals. The study revealed that though the awareness about rubella was high (94.1%), vaccination coverage was only 42.1%. The commonest reasons quoted for non-vaccination were related their non-seriousness about this issue. Sources of information for rubella vaccination were their gynecologist/doctor (62.3%) or medical books/literature (36.5%) and not any mass media. (1)

A cross-sectional study was conducted in Kolkata to identify the level of immunity. The study was conducted on 124 female health care students in a teaching hospital. No participant had recorded evidence of vaccination against MMR in childhood. The study reveals that protective level of antibodies was present in 73 (58.8%) but absent in 42 (33.8%), 9 (7.2%) of the participants had equivocal results. (2)

To evaluate the susceptibility of women in women of reproductive age group to rubella virus, a program was started in Turkey implementing MMR as part of national vaccination schedule for children (12 months and 6 years) and adolescents. The study was done in rural area in Ankara. A total of 490 women aged between 15-49 years were targeted for this study. 68.2% were reached and 467 of them had a serology test. Sero-positivity was 95.5% for total group and 96.2% among pregnant women. (3)

A retrospective cross-sectional study was conducted in Jeddah, Saudi Arabia in 2014 to determine the presence of Rubella immunity among pregnant women. Data was hospital records for 10276 women who came for their first prenatal visits between 1 Jan,2008 to 31<sup>st</sup> Dec,2011. Rubella screening test (IgM and IgG), Rubella antibody titers, patient s age gravidity, parity and no of previous abortion were analyzed. Out of the group, 91.6% were immune (IgG +ve) and remaining 8.4% were susceptible and there were no significant differences in gravidity, parity and no. of previous abortions. There was significant difference in rubella immunity between age groups 15-49yrs and 40-49yrs. (17)

In 2011, a cross-sectional survey to assess MMR antibodies was undertaken in two cities of the Zhejiang Province, China. IgG levels in the serum were tested by ELISA and seroprevalence rates were analyzed according to age groups and gender. Rubella sero-positivity was seen to be significantly lower in female adults than male adults. From the total 1015 participants selected randomly, there were 186 cases of Rubella and 50.5% of the rubella cases were 15-39yrs of age Overall sero-positivity of Rubella was 74.6%. (18)

In a study done in Mumbai from January to April in 2015, vaccination coverage was assessed among university students aged 18-25yrs. Out of the 149 students, 66.4% were vaccinated by MMR. (19)

In a study conducted in adolescent school girls aged 10-19yrs in Abbottabad in 2009. Results showed sero-positivity in 94% of the research group. (20)

A cross sectional stud, was conducted among college of nursing Nishtar Hospital Multan in 2006. out of 280 students, unmarried aged 26-24 hours whose serum was screened for, IgG against Hubella. 93.3\* (168 students) were seropositive 5% (students) were seronegative and 1.696(3 students) were in the intermediate range. None among the group were previously vaccinated for Rubella. In 6.196(11 students), there was possible history of contracting Rubella. (21)

Rubella susceptibility and continuing risk of infection in pregnancy: Sera of 2000 pregnant women attending the antenatal care of Aga Khan university hospital were tested for rubella antibodies. Of these, 1684(84.2%) were immune and 316(15.8%) were susceptible to rubella. Majority (99.8%) of women were Asian in origin. Susceptibility decreased with increasing age and parity. We conclude that apart from vaccination of all young children, greater attention should be paid to immunization of women of child- bearing age. (4)

**Methodology Study Design:** Cross sectional descriptive study.

**Study Setting:** It was conducted in Quaid-e-Azam Medical College and Islamia University, Bahawalpur.

**Duration:** Study was conducted from 1<sup>st</sup> April, 2016 to 30<sup>th</sup> May, 2016.

**Sample Size:** 100 Female students were selected for this study. 50 of them were from Quaid- e-Azam Medical College and 50 of them were from Islamia University, Bahawalpur.

**Ethical Issues:** Informed consent was taken from all participants.

**Sampling Technique:** It was a convenient sampling method.

**Inclusion Criteria:** All the students/girls of reproductive age group (15-49 years) who were willing to participate were included.

**Exclusion Criteria:** Not willing to be included in the study.

**Data Collection:** Data was collected through preformed pretested questionnaire that comprises of two parts. Part-1 includes demographic variables as name, age, class, study institution, residence and part – II consists of study variables i.e. TT coverage and Rubella coverage.

**Data Analysis:** Data was entered and analyzed manually. Frequencies and percentages were calculated. The data was presented in the form of tables and graphs.

Table – I: Age Distribution of students

Age in Years	Frequency	Percentage
18-20	55	55%
21-23	37	37%
24-26	8	8%
Total	100	100%

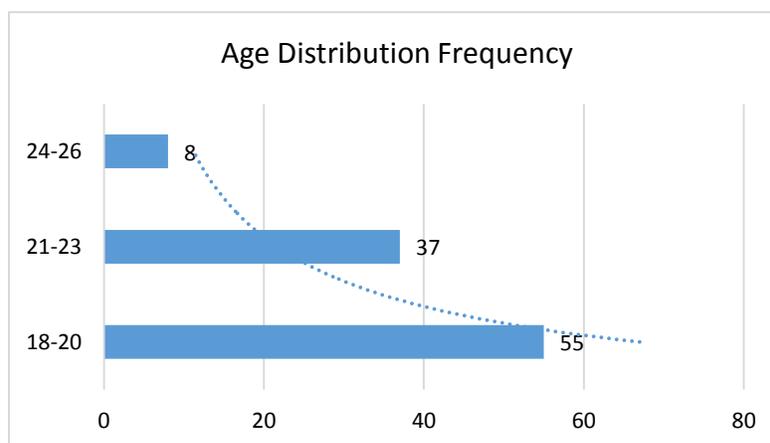


Table – II: Number of Students selected from College / University

COLLEGE/UNIVERSITY	NUMBER OF STUDENTS	PERCENTAGE
IUB	50	50%
QAMC	50	50%
<b>TOTAL</b>	<b>100</b>	<b>100%</b>

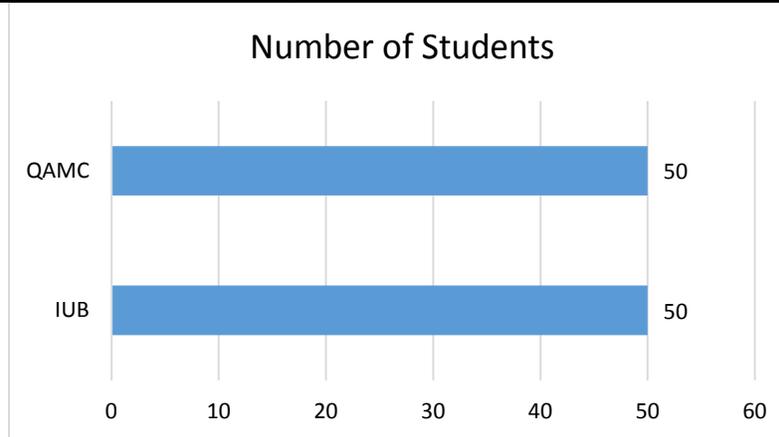


Table – III: Marital Status of Students

Marital status	Number	Percentage
<b>Married</b>	3	3%
<b>Unmarried</b>	97	97%
<b>Total</b>	<b>100</b>	<b>100%</b>

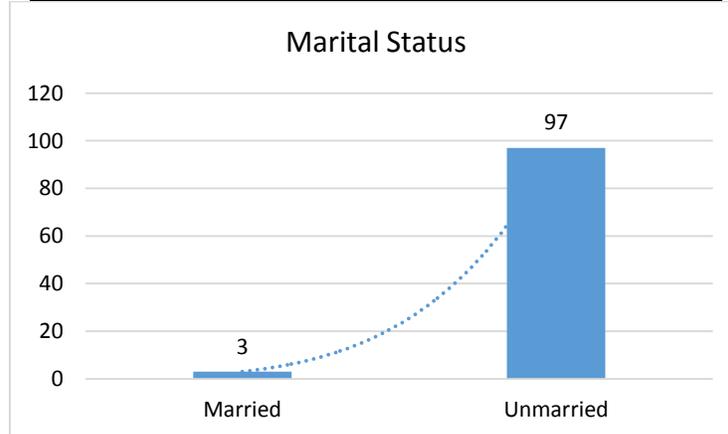


Table – IV: Sources of vaccination of tetanus toxoid

Source	Number	Percentage
<b>Gov. hospital</b>	50	66.70%
<b>Private hospital</b>	10	13.30%
<b>LHV</b>	15	20%
<b>LHW</b>	0	0
<b>Doctor</b>	0	0
<b>Total</b>	<b>75</b>	<b>100%</b>

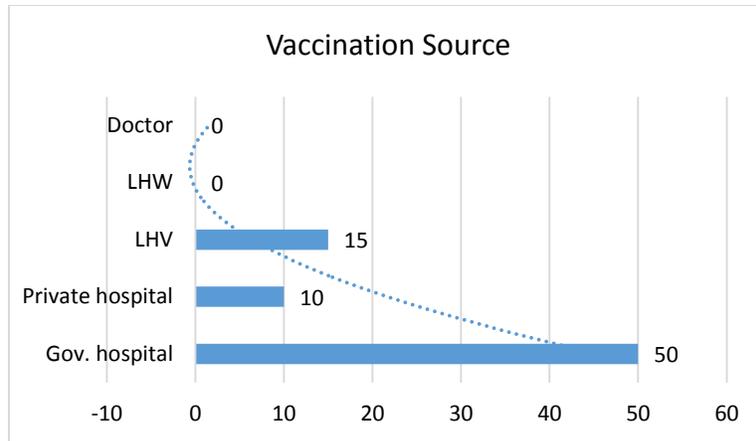


Table – V: Sources of vaccination of tetanus toxoid in QAMC and IUB

Source	QAMC		IUB	
	Number	Percentage	Number	Percentage
Gov. hospital	30	71%	20	60.60%
Private hospital	0	0	10	30.30%
LHV	12	28.50%	3	9.10%
LHW	0	0	0	0
Doctor	0	0	0	0
Total	42	100%	33	100%

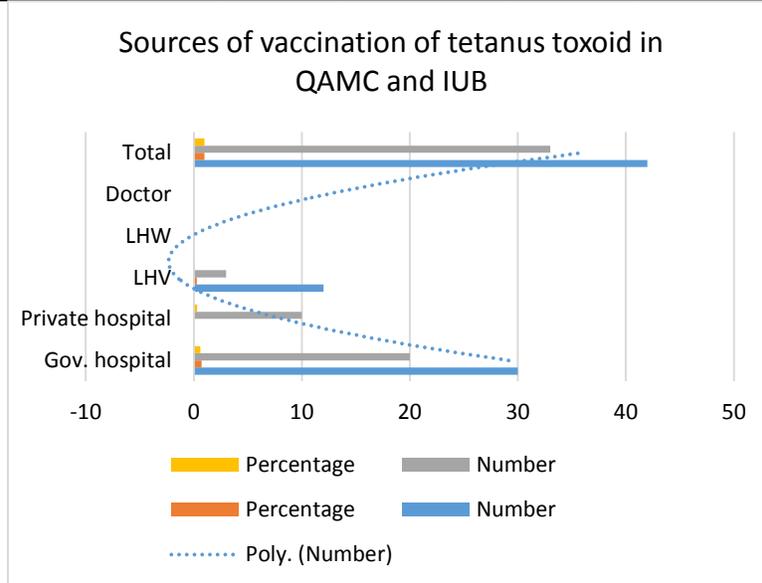


Table – VI: Reasons of not being vaccinated

Reason	Number	Percentage
Fear	4	16
Bad experience	1	4
Unawareness	17	68
Don't think it is useful	2	8
Others	1	4
Total	25	100

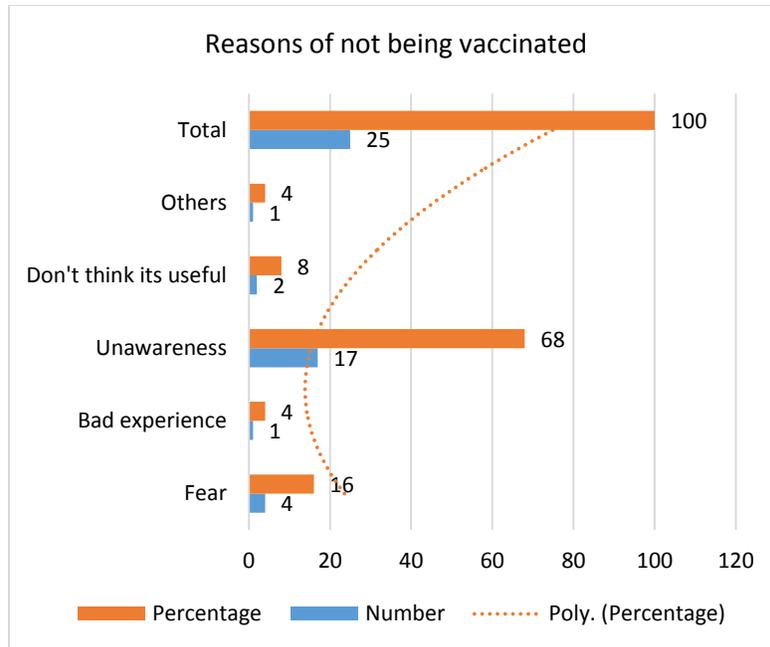


Table – VII: Reasons of not being vaccinated against tetanus in QAMC and IUB

Reason	QAMC		IUB	
	Number	Percentage	Number	Percentage
Unawareness	5	62.5	12	70.6
Fear	3	37.5	1	5.9
Bad experience	0	0	1	5.9
Don't think it is useful	0	0	2	11.7
Others	0	0	1	5.9
<b>Total</b>	<b>8</b>	<b>100</b>	<b>17</b>	<b>100</b>

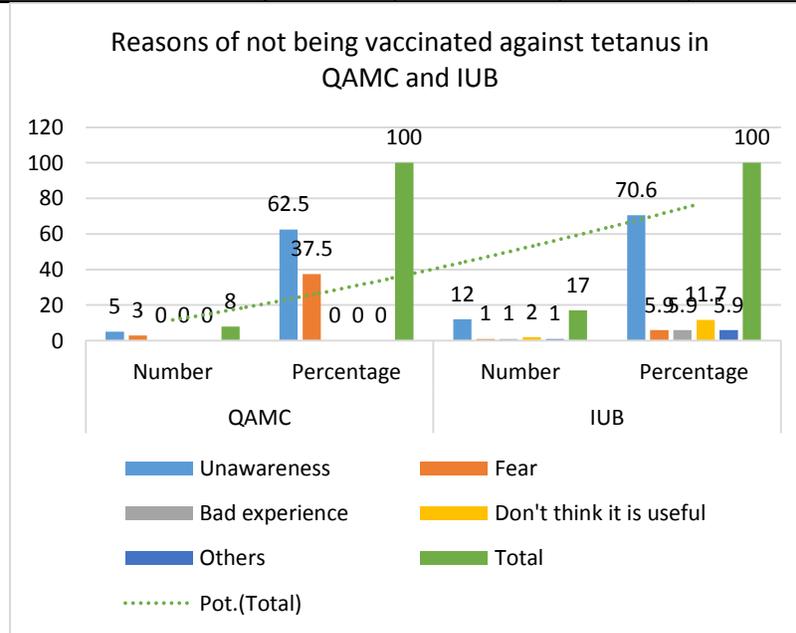


Table – VIII: Source of vaccination against rubella

Source	Number	Percentage
Gov. hospital	9	75
Private hospital	3	25
LHV	0	0
LHW	0	0
Doctor	0	0
<b>Total</b>	<b>12</b>	<b>100</b>

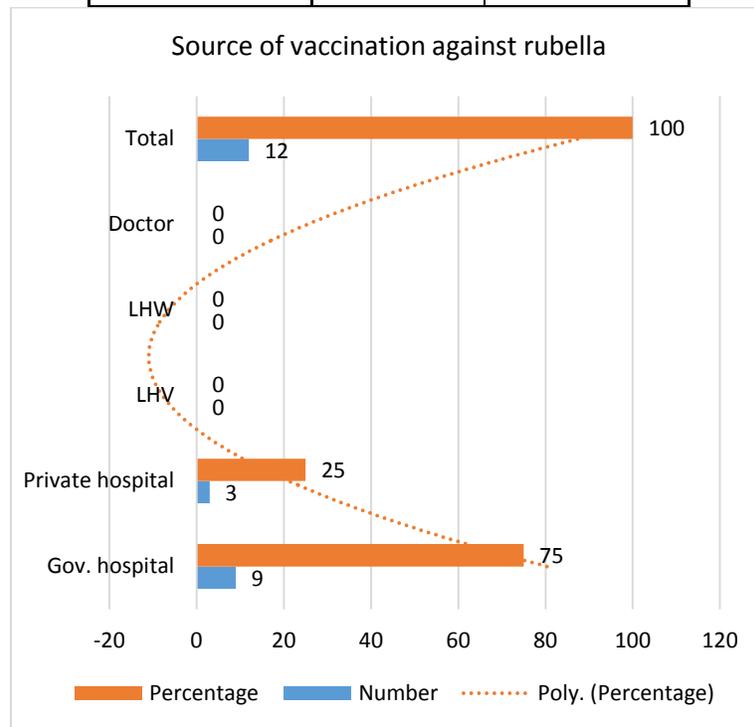


Table – IX: Source of vaccination against rubella in QAMC and IUB

Source	QAMC		IUB	
	Number	Percentage	Number	Percentage
Gov. hospital	7	87.5	2	50
Private hospital	1	12.5	2	50
LHV	0	0	0	0
LHW	0	0	0	0
Doctor	0	0	0	0
<b>Total</b>	<b>8</b>	<b>100</b>	<b>4</b>	<b>100</b>

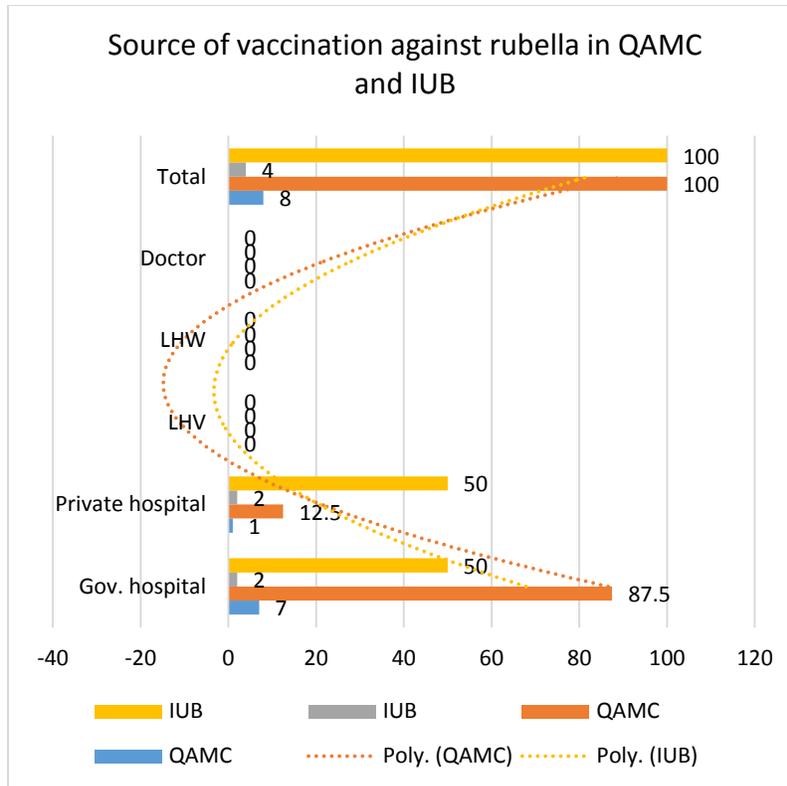


Table – X: Reason of not being vaccinated against rubella

Reason	Number	Percentage
Unawareness	65	73.8
Fear	5	5.6
Bad experience	2	2.2
Don't think it is useful	5	5.6
Others	11	12.5
<b>Total</b>	<b>88</b>	<b>100</b>

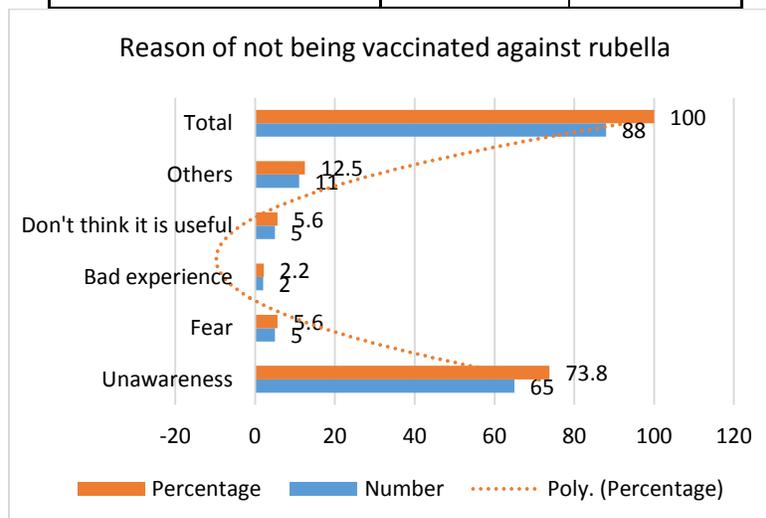
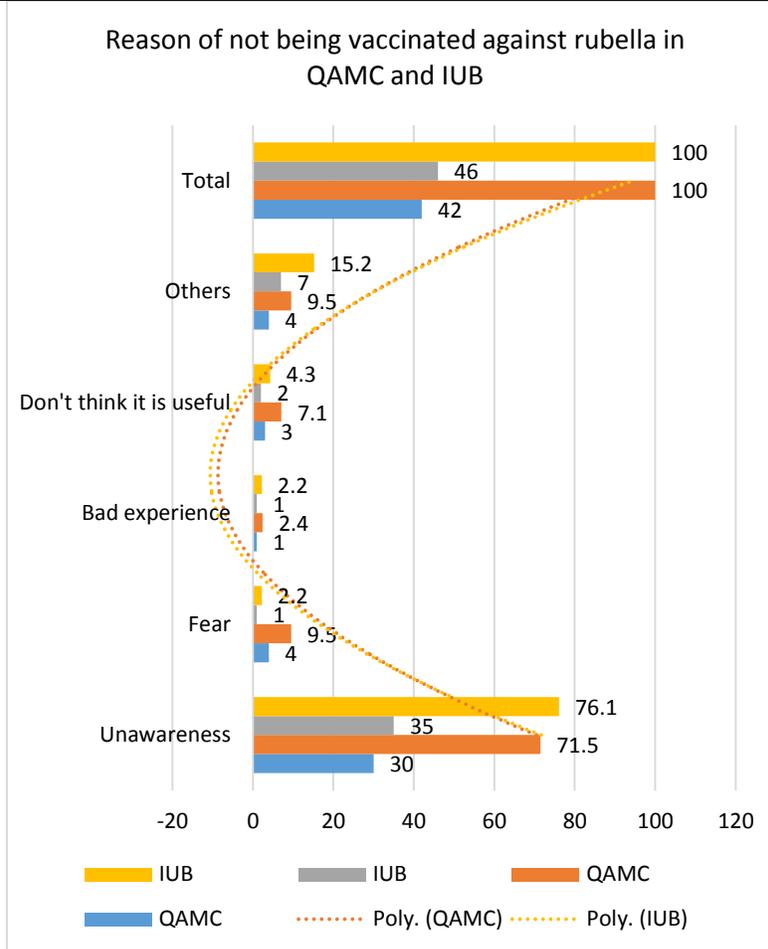


Table – XI: Reason of not being vaccinated against rubella in QAMC and IUB

Reason	QAMC		IUB	
	Number	Percentage	Number	Percentage
Unawareness	30	71.5	35	76.1
Fear	4	9.5	1	2.2
Bad experience	1	2.4	1	2.2
Don't think it is useful	3	7.1	2	4.3
Others	4	9.5	7	15.2
<b>Total</b>	<b>42</b>	<b>100</b>	<b>46</b>	<b>100</b>



**RESULTS:**

In this study a simple of 100 female students were taken mean age was (22±7.6).

Regarding age distribution 55% female belong to 18 – 20 year age group, 37% belong to 21 years age group and 8% belong to 24-26 years age group respectively. (Table-1)

Among them 50% were form Islamia University Bahawalpur and 50% were from Quaid e Azam medical college, Bahawalpur. (Table-2)

Considering their marital status,97% were unmarried and remaining 3% were married. (Table-4)

This study revealed that 75% of them were vaccinated against tetanus and remaining 25% were non-vaccinated. (Fig-1)

Among the 50 students of IUB selected for study, 66% students were vaccinated against tetanus and 34% students were non-vaccinated. While among those 50 students of QAMC selected for study, 84% students were vaccinated against tetanus and 16% were non- vaccinated. (Fig-2)

Regarding number of dose of tetanus toxoid vaccine received by the students, only 2.6% students had received complete five recommended dose of TT vaccine. While 10.6% students had received 4 doses, 18.6% students had received 3 doses,28.1% students had received 2 doses and 40.1% students received 1 dose of TT vaccine. (Fig-3)

Considering number of doses of TT vaccine received by the vaccinated students in QAMC, only2.4%students had received complete five recommend doses of TT vaccine, 14.3% had received 4 doses,19% had received 3 doses, 26.2% had received 2 doses and 38.1%had received 1 dose of TT vaccine. (Fig-4)

Considering the number of doses of TT vaccine received by students of IUB 3% students had received complete 5 dose of TT Vaccine while 6% students had received 4 doses. 18% had received 3 doses, 30% had received 2 doses and 42% of them had received only a single dose of TT Vaccine. (Fig-5)

According to the grading of vaccination status, from the 100 female students being selected for the study, 25% students were not vaccinated against tetanus while 73% student were partially vaccinated and only 2% of them were completely vaccinated. (Fig 6)

The grading of vaccination status of students of QAMC,16% students were non- vaccinated, 82%

students were partially vaccinated against tetanus and 2% student was completely vaccinated. (Fig-7)

The grading of vaccination status of students of IUB, 34% students were non-vaccinated, 64% were partially vaccinated while only 2% students was completely vaccinated against tetanus. (Fig-8)

The source of vaccination of tetanus toxoid of 75 vaccinated students, 66.7% students had received vaccine from government hospital, 13.3% had received vaccine from private hospital and 20% had received vaccine from LHV. (Table-4)

Comparing the source of vaccination of tetanus toxoid between QAMC and IUB students, being vaccinated. Among the students of QAMC, 71% had received the vaccine from government hospital, and 28.5% of them had received it from LHV. While among the students of IUB, 60.6% received it from government hospital, 30.3% from private hospital, 9.1% received it from LHV. (Table-5)

The reasons for not being vaccinated,16% were not vaccinated due to fear, 4% had bad experience, 68% of them had not received it due to unawareness while 8% of them thought it was useless and remaining 4% was not vaccinated due to unknown reason.(Table-6) Comparison the reason of no. being vaccinated against tetanus between QAMC and IUB showed that among vaccinated students of QAMC, 62.5% were not vaccinated due to unawareness and 37.5% were not vaccinated due to fear. While among the non-vaccinated students of IUB, 70.6%were not vaccinated due to unawareness, 5.9% were not vaccinated due to fear, 5.9% due to bad experience and 11.7% of them thought it was useless and 5.9% had other reasons. (Table-7)

The students were also asked about the vaccination status against rubella. Among them only 12% students were vaccinated against rubella while remaining 88% were not vaccinated. (Fig – 9)

Among the students of IUB, only 8% were vaccinated against rubella while remaining 92% were non-vaccinated. However, among the students of QAMC, only 16% were vaccinated and 84% were non-vaccinated. (Fig-10)

Regarding the number of doses of rubella received by the vaccinated students of IUB & QAMC, only 25% of them had completed the course of 2 doses while the remaining 75% had received only a single dose. (Fig-11)

Regarding the number of doses received by the vaccinated students of QAMC, only 62.5% of them

had completed the course of 2 doses against rubella while remaining 37.5% of them had received only a single dose. (Fig-12)

Regarding the number of doses received by vaccinated students of IUB, 100% of the vaccinated students had received only a single dose of rubella vaccine. 0% had completed the recommended course of vaccination. (Fig-13)

According to the grading of the vaccination status of rubella, 88% were non-vaccinated, while 9% were partially vaccinated and only 3% were completely vaccinated against rubella. (Fig-14)

The grading of the vaccination of students of QAMC, majority of them 84% were non- vaccinated, 10% were partially vaccinated while only 6% were completely vaccinated. (Fig-15)

The grading of the vaccination of students of IUB, a majority of them 92% were non- vaccinated against rubella, 8% were partially vaccinated while 0% were completely vaccinated against rubella. (Fig-16)

Regarding the source of vaccination of rubella among the vaccinated students, 75% had received the doses from government hospital and 25% had received it from Private hospital. (Table-8)

Among the vaccinated students of QAMC, 87.5% had received the vaccine from government hospital and 12.5% had received it from private hospital. While among the 4 vaccinated student of IUB, 50% had received it from government hospital and 50% had received it from private hospital. (Table-9)

Regarding the reasons for not being vaccinated against rubella, among the non- vaccinated students, 73.8% were not vaccinated due to unawareness, 5.6% due to fear, 2.2% due to bad experience and 5.6% of them thought it was useless, while 12.5% due to other reasons. (Table - 10)

Among non-vaccinated students of QAMC, 71.5% were not vaccinated due to unawareness, 9.5% due to fear, 2.4% due to bad experience and 7.1% of them thought it was useless, while 4 (9.5%) of them were not vaccinated due to other reasons. While among non- vaccinated students of IUB, 76.1% were not vaccinated due to unawareness, 2.2% due to fear, 2.2% due to bad experience, 4.3% of them thought it was useless while 15.2% of them were not vaccinated due to other reasons. (Table – 11)

## DISCUSSION:

Tetanus is still a major health problem in developing countries and it is associated with high morbidity and mortality. Pakistan is a high-risk country regarding Tetanus. WHO recommends that 90% of the females should be vaccinated against Tetanus in developing countries.

A study was conducted in QAMC and IUB in 2016 regarding knowledge and practice of TT vaccine. 100 females of child-bearing age lying in age group (22+7.6 years) participated. Among them 3% were married and 97% were unmarried. Only 2% were completely vaccinated, 73% were partially vaccinated and 25% were not vaccinated. Among those who were partially vaccinated, 30 students received one dose, 21 received two doses, 14 students received three doses, 8 received four doses. Top most cause of not being vaccinated was unawareness (68%), while other causes were fear (16%), bad experience (4%), people think that it's not useful (8%) and due to some other causes were 4%. (1,2,6) Among those who were vaccinated; majority got vaccinated through Government hospitals (66.7%), some got vaccinated from private hospitals (13.3%) and some from LHVs (20%). (4)

In our study, coverage for complete immunization was 2%, while similar results were found in Nigeria, where coverage for complete immunization was also 2%. While in the study conducted in Dhaka results for complete immunization were 11%. Similarly, the results were found to be 20.9% in Yemen and results found in a Dhaka university were 34.5%. In a similar study conducted in 11 colleges and university of Karachi, the results for the coverage of complete immunization was found to be 2.9%. (6)

While in Peshawar, it was found to be 55.65%. The least results were found in Karachi, Bahawalpur and Nigeria. Top most reason might be the "unawareness" among people of these areas. Moderate coverage was found In Dhaka, Dhaka university and Yemen due to better knowledge and facilities. While very high coverage was found In Peshawar because the study also included pregnant ladies, better ante natal care, better LHV efforts, better show of LHW and LHV visits, favorable and cooperative attitude from health care providers. (10)

In our study, coverage for partially immunized was 73% while in Port-Harcourt university, coverage for partial immunization was 58.2%. In Yemen, it was 11.69%, in Dhaka university, results were 24.8%. In colleges and university of Karachi, it was found to be 39.8%. (5)

The reason behind high proportion of females on schedule for vaccination might be the medical education, 50% of the sample students are medical students, they have better knowledge and guideline from their instructors. There are better immunization programs and there is better accessibility to health care institutions for both the institutions QAMC and IUB. There are better health seminars and increased distribution of published handouts relating health issues. Whereas, moderate coverage for partial immunization was found in Port- Harcourt university. The reason being located in the capital of the country(Nigeria), where the better facilities are provided to the residents, more awareness and more number of public health institutions. It is an educational institution as well which might also be a reason where health education is promoted. (4)

The least coverage for partial immunization was found in Yemen, Karachi and Dhaka. The reasons might be unawareness, lack of proper instructions, difficult follow-up, inconvenient place and time, unsuitable schedule, being busy, lack of cooperative and favorable attitude by the client and the health care providers. The other vital reason might be lack of political commitment and lack of resources. (2)

In our study, the top most reason for not being vaccinated was unawareness, other reasons following were fear, bad experience, people don't think it's useful. While in Nigeria, the level of unawareness was found to be very high, while In Port-Harcourt University, level of unawareness was low. In Dhaka University, half of the sample population was unaware, other causes found were lack of information about time and place, inconvenient schedule of vaccination. While in educational institutions of Karachi, unawareness was found to be 16.32%. While in Peshawar, the level of unawareness was moderate. The other reasons for not being vaccinated were being busy, distant health centers, misconceptions and fear of side effects.

The reason behind unawareness might be lack of health education programs in universities and colleges, lack of proper instructions, lack of published handouts and health seminars, lack of proper dedication and favorable attitude by outreach teams and health care providers, ineffective role of LHWs. The reasons for low level of unawareness in Port-Harcourt university were proper health educational programs, proper dedication by client and health care providers, effective role of LHWs awareness and proper instructions. (7)

There is little epidemiological data available in Pakistan regarding susceptibility to rubella in pregnancy and incidence of CRS (congenital rubella

syndrome) in newborns.

The coverage was found to be low and among them, three-fourth were partially immunized and only one-fourth were completely vaccinated. While in Ujjain (India), coverage was found to be 42.1%. Similar study was conducted in Aga Khan University on pregnant ladies, coverage was found to be 84.2%. (9) The coverage of MMR in Saudi Arabia, 16 years after the introduction of MMR into the EPI, was found to be 91%. In a study conducted In Zhejiang province in China, less than 30% of adults aged 15-39yrs received one dose of RCV (Rubella containing vaccine). Rubella seropositive rates were lower in young adults and older adolescents. In females aged 20-29yrs the sero-positivity due to vaccination was significantly lower than males. In Mumbai the MMR coverage was 66.4% which is within the recommendations from WHO. In Abbottabad, school girls aged 10-19 years the status of RV IgG was 94% positive. In Nishtar nursing college the coverage of vaccine was 0 out of 168 students. Whereas the natural Immunity shown by sero-positivity for Rubella IgG was 93.3%. This means all the seronegative young females are the ones who are susceptible the Rubella and at risk of contracting Rubella during pregnancy. (17) The main reason was unawareness; other reasons followed are lack of health education programs, lack of proper guidance, lack of cooperative and favorable attitude, lack of disease related seminars, deficient role played by media. (10)

The 2/3<sup>rd</sup> population was unaware about Rubella vaccine while other causes for not being vaccinated were fear, bad experience, people don't think it is useful and some other reasons.

While in Ujjain (India), unawareness was very low. The reasons for high level of unawareness in Pakistan was due to lack of role played by media, lack of health education programs, inefficient role play by the health care providers and lack of published literature regarding health issues. While in Ujjain, the level of unawareness was very low due to proper instructions and awareness, favorable attitude, dedication and devotions by the health care providers, monthly health educational programs arranged by the university and college administrations and a good political support, availability of abundant funds, better resources and proper monitoring and evaluation. (13)

In Saudi Arabia the reason for 8.7% of women being seronegative is thought to be because of absence of vaccination program or inaccessibility or an

incomplete antibody response or a decline in antibodies overtime (as occurs after vaccination or natural infection). In Zhejiang Province of China, the reason for lower coverage of rubella vaccine despite being introduced as MMR into EPI was due to the epidemiological shift that resulted in more disease burden. This is because if the vaccination coverage is insufficient a vaccination program works to decrease the circulation of virus in the community. This results in decreased chances of developing immunity by the natural infections. Paradoxically this can cause even more prevalence of CRS cases in population. In India the coverage was within the recommended percentage. This is because of the good infrastructure and health policies that give more importance and budget to the immunization program. The introduction of MMR when paired with effective long-term strategies can lead to significant decrease in rubella prevalence in a population. In Abbottabad there was higher sero-positivity which not necessarily shows higher coverage of vaccination among them. It can also be due to a recent epidemic or endemic of rubella within the area. Nevertheless, being a more educated place, the higher coverage can also be due to high awareness within the population, lack of fear due to literacy, better health education or due to the local NGO work. In Nishtar a shocking zero percentage was vaccinated for Rubella. This is most probably due to lack of awareness whereas the high sero-positivity despite no vaccination history indicates that the Rubella infection is prevalent in Multan population. (18)

### CONCLUSION:

About two-third of the female students were immunized against Tetanus. Among them mostly were partially vaccinated. Reasons for not being vaccinated were unawareness, fear and bad experience. Only few students were vaccinated against Rubella. Unawareness, fear and bad experience were the main reasons for non-vaccination.

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