Full Length Research Paper

Effect of tetanus toxoid immunization training program on knowledge and attitude on female nursing students in Government Universities in Khartoum State

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Tetanus is an acute infectious disease, most cases occur due to lack of vaccination or incomplete immunization on exposure leading to increase morbidity and mortality. Studies reveal that adequate knowledge regarding tetanus is more important for the prevention of maternal and neonatal tetanus in the future. The study aims to study effect of tetanus toxoid immunization training program on knowledge and attitude of female nursing students in government universities in Khartoum state. The Experimental design was used. The study was done in Government Universities in Khartoum state which has faculty of nursing, randomly; Tow University selected study group and the rest control group. A total of 181 students were recruited study group and 246 control group. Data were collected from both groups using structure close end questionnaire and attitude scale; pre intervention and training program offered to the study group and after six months data recollected from both groups. Mean knowledge changed from 1.5709 pre to 1.8154 post interventions for the study group and showed statistically significant with p-value = 0.000, while control group showed statistical significant knowledge. Total mean percent for positive attitude 65 (48%) pre were changed to 72.8 post intervention; while negative attitude were changed from 34.55% pre to 27.28% post in the study group. In the control group, Wilcoxon ranged test showed a statistical significant in the control group from pre to post intervention. From the study group, health education is effective and is the best strategy to improve knowledge, attitudes and increased vaccination status of participants.

Key words: Effect, tetanus, training, program, students.

INTRODUCTION

Tetanus is a vaccine-preventable disease that causes an annual deaths of 309,000 and in the year 2000, it killed about 200,000 new born (Ogbeyi et al., 2017). Tetanus spores are widespread in the environment and transmission occurs when spores are introduced into the body, usually through a puncture-type wound (Ogbeyi et
Maternal immunization with tetanus toxoid or lower the risk of tetanus in newborns. However, due to lack of knowledge or outside of pregnancy, many women during pregnancy or within 6 weeks of the termination of pregnancy are not aware of the benefit of vaccination. Maternal tetanus (MT) is responsible for at least 5% of maternal deaths. It is a deadly infectious disease for which immunization is available in expanded program of immunization (EPI) at both infant and reproductive age.

More than 95% of patients who develop tetanus have not been previously immunized. Worldwide, more than 50,000 maternal deaths occur per year, but still, more than 270,000 newborns and 30,000 women die of tetanus yearly. As a result of improved maternal immunization with tetanus toxoid (TT), approximately 725,000 cases of neonatal tetanus are prevented worldwide. Maternal and neonatal tetanus (MNNT) can be prevented by immunizing women of childbearing age during pregnancy or outside of pregnancy through a three-dose series of vaccines. The Expanded Program on Immunization (EPI) in the WHO’s (EPI) as early as the mid-1970s and is now a standard practice. Increasing knowledge about tetanus is an important precondition to improve the increase of TT coverage. Other factors influencing TT immunization coverage showed that the awareness of mothers, place of residence and maternal education are predictors for TT immunization status.

The (TT) vaccination of pregnant women was included in the WHO’s (EPI) as early as the mid-1970s and is now a standard practice. Justification for TT immunization for women in childbearing age was not sufficient, the government introduced supplemental immunization activities for all women in childbearing age and for all children.

In Sudan, there is no available information on the TT vaccination coverage of women in childbearing age. However, the study aims to increase level of knowledge and attitude of the university students from structural training program of TT vaccine for women in childbearing age.

Justification

The Expanded Program on Immunization (EPI) rescheduled five doses of TT for all women of childbearing age, but the strategy could not attain the coverage as expected, because large number of women in childbearing age were not aware of the benefit of immunization and complete protection against tetanus. The study aims to increase level of knowledge and attitude of the university students from structural training program of TT vaccine for women in childbearing age.
suggested additional factors might have been preventing translation of knowledge into one's practice.\(^{(17)}\) In the view of the fact that in developing countries, majority of deliveries are assisted by non-health workers, increasing coverage of tetanus toxoid is desirable.

**Hypotheses**

H1: Undergraduate students who receive TT vaccination training program will have highest percentage of level of knowledge and attitude than group not received TT program.

H0: There is no change on the level of knowledge and attitude among the students who took the TT vaccination training program to the control group.

**Aims of the study**

To study the effect of tetanus toxoid immunization training program on knowledge and attitude of female nursing students in Government Universities in Khartoum state.

**MATERIALS AND METHODS**

**Study design**

A quasi experimental research design was used.

**Study setting**

The study targeted all Government Universities that have faculty of nursing sciences in Khartoum State and these universities are International University of Africa, AlzaiemAlazhari University, Khartoum North University, Al-Neelain University, Khartoum University, and Omdurman Islamic university. However, the study was conducted in five universities, Al-Neelain University was not accepted to participate in the study.

**Population**

Female students in first year were included in the study. Only females were included because the TT is only given to females in the reproductive age, since they will be married soon and may face a lot of problems during deliveries or miscarriages due to unsafe environments. First year students were chosen because they have not been exposed to any vaccination topics as not to have any confounding factor that can contaminate the data and to facilitate the follow up during the four years of being in the universities.

**Inclusion criteria**

The study included female students in first year.

**Exclusion criteria**

The study excluded male students.

**Sampling procedure**

Simple random sample was used, two universities were study group and the rest were control group.

**Sample size**

For total coverage, study group was 181 students and control group was 246 students.

**Variables under study**

**Dependent variable**

Knowledge and attitude of tetanus toxoid vaccine in child bearing age.

**Independent variable**

Training program on tetanus toxoid immunization for women in child bearing age.

**Methods of data collection**

Data were collected using structured closed ended questionnaire to assess the students' knowledge on tetanus toxoid immunization in childbearing age, as well as attitude scale pre and post intervention.

**Development of data collection tools**

**Structured knowledge questionnaire**

(i) The researcher developed the questionnaire in reference to related original research articles, and literature (Appendix I).

(ii) The questionnaire consists of three parts:

**Section I:** Consist of demographic variables such as age, marital status, residence and university name.

**Section II:** consist of questions for knowledge information on tetanus and tetanus toxoid immunization in childbearing age.

(iii) The questionnaire was pretested in the study population before usage for knowledge questions; a correct answer will give 1 point while a wrong answer will give 0. Wilcoxon study rank test was used to determine and compare the changes or improvement on the level of the knowledge for the study population.

**Section III:** Immunization status of the participant

**Attitudes scale**

There were 10 questions for the attitude which were answerable by “Strongly Agree”, “Agree”, “Disagree”, and “Strongly Disagree”. Pre-intervention and post intervention mean percentage were analyzed using descriptive and inferential statistics (Appendix II)

**Work plan**

**Phase I: Assessment phase**

Data were collected from the intervention and control group using structured questionnaire and attitude scale which was considered
Table 1. General information about tetanus for study and control group pre and post.

| Variable                                           | Study group pre | Study group post | Control group pre | Control group post | P value |
|----------------------------------------------------|-----------------|------------------|-------------------|--------------------|---------|
| What do you know about tetanus?                    | Frequency       | %                | Frequency         | %                  | P value |
| Highly infectious                                  | 56              | 30.9             | 165               | 91.2               | 0.000   |
| Vaccine preventable                                | 125             | 69.1             | 151               | 83.4               | 0.000   |
| Enter the body through the wound                   | 132             | 72.9             | 168               | 92.8               | 0.000   |
| Enter the body through umbilical stump and UN clean delivery | 123             | 68.0             | 169               | 93.4               | 0.000   |
| It cause by anaerobic bacteria                      | 35              | 19.3             | 159               | 87.8               | 0.000   |
| It affect pregnant mother                          | 95              | 52.5             | 172               | 95.0               | 0.000   |
| It affect women in childbearing age                | 106             | 58.6             | 167               | 92.3               | 0.000   |

Total mean percent: Study group pre 53.1, Study group post 90.8, Control group pre 55.8, Control group post 60.9

as baseline data before the program about tetanus toxoid immunization in child bearing age.

Phase II: Implement TT training program

In which tetanus toxoid immunization in childbearing age program material was developed by the researcher based on available resources and review of relevant literature including WHO and booklets regarding tetanus toxoid immunization in childbearing age to help the participant in receiving the message. The program activities were implemented through two sessions; the time period for each session was two hours for study group, one week for each university. The program were presented in a clear, concise manner and focused on the point to be learned, using different methods such as lectures, pictures, broacher discussion, and videotapes.

Phase III: Evaluation phase

Evaluation of the program for TT immunization of women in childbearing age were done six months after implementation of the program, data were collected using the same method of data collection used in phase one.

Data analysis method

(i) The collected data were interred in to SPSS variation 20.

(ii) The data were organized, tabulated and analyzed using descriptive statistics.

(iii) The inferential statistics (nonparametric test Wilcoxon sign rank test) were used to find out the differences in knowledge and attitude between pre and post-test for study and control group. The results were presented in Tables 1 to 7 and Figures 1 to 4.

Ethical consideration

Official consent was obtained from the Graduate College Medical and Health Studies Board -University of Khartoum.

An official consent was obtained from the dean of faculties of nursing students.

The researcher made it clear to the participants in the study that they could withdrawal at any time and their rights will be protected.

High confidentiality were observed during filling questionnaire.

RESULTS

An interventional study was conducted to study the effect of tetanus toxoid immunization training program on knowledge and attitude of female nursing students. All the data was obtained from a sample of 181 of students in the study group, and 246 of the students for control group, both groups were enrolled in the study. The data collected were analyzed statistically and the result were categorized in parts which are demographic variable, previous immunization, sources of information, numbers of doses and reasons for not being immunized for the study and control groups. These also include knowledge of study and control group and the statistical test for it, practicing immunization and finally mean percentage of the attitude. The study has shown the following findings as explained in the Figures 1 to 4 and Tables 1 to 7.

DISCUSSION

An interventional study was conducted to study the effect of tetanus toxoid immunization training program on knowledge and attitude of female nursing students. In this study, mean knowledge was changed obviously from 1.5709 pre to 1.8154 post interventions. The result supported by MIJAL study, showed changed in mean score from 4.77
### Table 2. Complication, venerable age group and target group for immunization of study and control pre and post intervention.

| Variable                  | Study group pre | Study group post | Control group pre | Control group post | P value |
|---------------------------|-----------------|------------------|-------------------|--------------------|---------|
|                           | Frequency       | %                | Frequency         | %                  | P value |
|                           |                 |                  | Frequency         | %                  |         |
| Complication              |                 |                  | Frequency         | %                  |         |
| Disability                | 77              | 42.5             | 160              | 88.4               | 0.000   |
| Death                     | 89              | 49.2             | 154              | 85.1               | 0.000   |
|                          |                 |                  | 164              | 66.7               |         |
| Total mean percent        | 45.9            | 86.8             | 62.6             | 63.3               |         |
| Venerable age group prone to tetanus |              |                  |                   |                    |         |
| Neonate                   | 100             | 55.2             | 172              | 95.0               | 0.000   |
| 1 month – 1 year          | 46              | 25.4             | 164              | 90.6               | 0.000   |
| 1-5 years                 | 45              | 24.9             | 158              | 87.3               | 0.000   |
| 6-12 years                | 63              | 34.8             | 158              | 87.3               | 0.000   |
| Women of 15-49 years      | 123             | 68.0             | 177              | 97.8               | 0.000   |
| Others                    | 34              | 18.8             | 158              | 87.3               | 0.000   |
| Total mean percent        | 37.9            | 90.9             | 45.1             | 34.6               |         |
| Target group for immunization |              |                  |                   |                    |         |
| Newborn                   | 117             | 64.6             | 165              | 91.2               | 0.000   |
| Mother of newborn         | 128             | 70.7             | 163              | 90.1               | 0.000   |
| Both mother and newborn   | 126             | 69.6             | 175              | 96.7               | 0.000   |
| Women of 15-49 years      | 116             | 64.1             | 158              | 87.3               | 0.000   |
| Pregnant women            | 113             | 62.4             | 168              | 92.8               | 0.000   |
| Children <5 years         | 47              | 26.0             | 122              | 67.4               | 0.000   |
| Total mean percent        | 59.6            | 87.6             | 52.9             | 53.7               |         |

### Table 3. Knowledge about immunization schedule, importance, purpose of vaccine receiving and side effects of vaccine for study and control group pre and post intervention.

| Variable                                                                 | Study group pre | Study group post | Control group pre | Control group post | P value |
|--------------------------------------------------------------------------|-----------------|------------------|-------------------|--------------------|---------|
|                                                                          | Frequency       | %                | Frequency         | %                  | P value |
|                                                                          |                 |                  | Frequency         | %                  |         |
| Knowledge about immunization                                             |                 |                  |                   |                    |         |
| Did you know about tetanus toxoid immunization schedule in child bearing age | 71              | 39.2             | 167              | 92.3               | 0.000   |
| Did you have knowledge about the importance of TT vaccination            | 92              | 50.8             | 174              | 96.1               | 0.000   |
| Five doses of vaccine should receive during reproductive age             | 26              | 14.4             | 157              | 86.7               | 0.000   |
| Total mean percent                                                       | 34.8            | 91.7             | 61.2             | 69.5               |         |
Table 3. Cont’d.

| The purpose of vaccine receiving | Pre Mean percent | Post Mean percent | Total Mean Percent |
|---------------------------------|-----------------|------------------|--------------------|
| Protect mother and child        | 168 92.8        | 181 100.0        | 215 87.4           |
| Side effects of vaccine         |                 |                  |                    |
| Pain in the site of injection   | 107 59.1        | 158 87.3         | 181 73.6           |
| Swollen at site of injection    | 64 35.4         | 137 75.7         | 138 56.1           |
| Slight fever                    | 76 42.0         | 138 76.2         | 151 61.4           |
| Headache                        | 44 24.3         | 119 65.7         | 106 43.1           |
| Allergy                         | 59 32.6         | 129 71.3         | 52 21.1            |
| Total Mean Percent              | 38.7            | 75.2             | 51.1               |

Table 4. Mean percent of knowledge for study and control group.

| Variable                                    | Mean percent of study group | Mean percent of control group |
|---------------------------------------------|-------------------------------|--------------------------------|
| General information about tetanus           | Pre 53.1, Post 90.8          | Pre 50.8, Post 60.9           |
| Spread of tetanus                           | Pre 40.03, Post 85.06        | Pre 52.7, Post 55.2           |
| Signs and symptoms                          | Pre 31.9, Post 92.8          | Pre 41.6, Post 49.8           |
| Complication                                | Pre 45.9, Post 86.8          | Pre 62.6, Post 63.3           |
| Venerable age group prone to tetanus        | Pre 37.9, Post 90.9          | Pre 45.1, Post 43.6           |
| Target group for immunization               | Pre 59.6, Post 87.6          | Pre 52.9, Post 53.7           |
| Dealing of wound, emergency care for break skin | Pre 64.2, Post 86.6       | Pre 69.6, Post 62              |
| Period of communicability for study group   | Pre 18.2, Post 56.2          | Pre 42.2, Post 36.6           |
| Knowledge about immunization                | Pre 43.8, Post 91.7          | Pre 61.2, Post 69.5           |
| The purpose of vaccine receiving            | Pre 92.8, Post 100            | Pre 87.4, Post 93.1           |
| Side effects of vaccine                     | Pre 38.7, Post 75.2          | Pre 51.1, Post 41.5           |
| Total                                       | 47.83, 85.78                | 56.11, 57.2                   |

Table 5. Knowledge mean and standard deviation of study group pre and post.

| Variable     | N  | Mean | Std. Deviation |
|--------------|----|------|----------------|
| Study group pre | 181 | 1.5709 | 0.14531 |
| Study group post | 181 | 1.8154 | 0.12049 |
Table 6. Test statistics for study and control group pre and post.

| Knowledge of study group (post – pre) | Attitude of study (group post _ pre) | Knowledge of control (post- pre) | Attitude of control group (post _ pre) |
|--------------------------------------|--------------------------------------|----------------------------------|---------------------------------------|
| Z                                    | -10.525<sup>c</sup>                 | -11.980<sup>b</sup>              | -1.059<sup>b</sup>                    | -.239<sup>b</sup>                     |
| Sig. (2-tailed)                      | 0.000                                | 0.000                            | 0.290                                 | 0.811                                |

Wilcoxon Signed Ranks Test.

Table 7. Attitude of study group pre and post.

| Variable                                                                 | Pre       | Post       | Pre       | Post       |
|--------------------------------------------------------------------------|-----------|------------|-----------|------------|
|                                                                          | Positive  | Negative   | Positive  | Negative   |
|                                                                          | F         | %          | F         | %          |
| Tetanus immunization can be given to students in the university          | 163       | 90         | 19        | 10.0       |
| Do you need to be routinely immunized against tetanus in child bearing   | 113       | 62.4       | 88        | 37.6       |
| My family will not agree that I should be given injection in the        | 3         | 1.7        | 178       | 98.3       |
| It is not possible to give immunization in the form of injections to    | 5         | 2.8        | 176       | 97.3       |
| Routine tetanus immunization in adults is neglected in our country.     | 87        | 48.1       | 94        | 52.0       |
| Updating knowledge on adult immunization can be achieved through        | 171       | 94.5       | 10        | 5.5        |
| Regular seminar/refresher courses regarding immunization are needed.    | 168       | 92.8       | 13        | 7.2        |
| I think majority of students will receive tetanus immunization in       | 168       | 92.9       | 13        | 7.2        |
| Immunization against tetanus is the responsibility of all health care    | 167       | 92.2       | 14        | 7.8        |
| Awareness and knowledge among students and teachers concerning the      | 140       | 77.4       | 41        | 22.6       |
| Total                                                                    | 65.48     | 34.55      | 72.08     | 27.28      |

pre to 13.52 post intervention, Mijal (2009) compared study done in china which showed inadequate knowledge and misunderstanding regarding TT immunization in study participants pre intervention program (Hadeel and Iqbal, 2014). In this study Wilcoxon signed rank test showed statistical insignificant for knowledge between study and control group, and this support educational program can help in changing knowledge. In this study knowledge was adequate in some items, such as purpose of vaccine was 98% pre changed to 100 post; however, in adequate in other items. This is similar to the study done in Iraqi which showed their knowledge of study participants were adequate in some items and inadequate in other items (Essen, 2006).

Knowledge regarding signs and symptoms of study group was inadequate pre intervention, which
Figure 1. Age of study and control group.

Figure 2. Marital status for study and control group.

Figure 3. Percentage of Immunization against tetanus for study and control group.
Figure 4. Reasons for not immunized against tetanus study and control group.

- Represent 31.9 changed to 92, 8 post, and knowledge regarding period of communicability were changed from 18.2 pre to 56.2 post, compared to control group which was changed negatively from 42.2 to 36.6, which means educational program has positive effect on changing knowledge in study participant.

- Total mean percent of knowledge items were changed in the study group (pre 47.8 to 85.8 post and for control group 56.1pre changed to 57.2 post).

- In this study, attitude was changed for study group pre and post, total mean percent for positive attitude 65 (48%) pre were changed to 72.8 post intervention; while negative attitudes were changed from 34.55%pre to 27.28% post. Wilcoxon Signed Ranks test showed statistically significant in study group pre and post intervention with (p value = 0.000) this is similar to MIJAL study, attitude was statistically significant (Mijal, 2009). Concerning attitude of control group, it was insignificant among pre and post intervention.

- This study showed that most participant source of information about tetanus toxoid immunization was family (41.4%), media 30.3%, and health center 18.8 for study group and family 39%, media 26% and health center 17.5 for control group. This is compared to a study done in Dhaka, which showed respondent’s source of knowledge about TT immunization was watching television 35%, health workers 24%, newspaper 16%, radio 13% and other sources 12% (Chowdhury et al., 2011).

- In this study 16.6% of study group were immunized pre and 29.8% post. For participants who were not immunized, misconception had a higher percentage, 62% and tetanus toxoid not available at the near center, 23% for study group. Compared to study done by Tanjida Shilpi, among the group not vaccinated, 50% respondents told their unawareness about need for vaccination against tetanus before the start of their reproductive life, 15.4% said they lack information regarding place and time of vaccination and 19.6% complained about inconvenience in schedule and place of vaccination (Tanjida et al., 2009).

- In this study, participant who were immunized only one number of doses are 13.8 pre and 14.4 post, 0.06% pre to 8.3% post for two. This is similar to the study done by Mijal stating there was dramatic change in dose two from 0% pre to 100 post (Mijal, 2009).

**Recommendation**

1. Use a mass media campaign to create awareness among women, in childbearing age and families about the importance of TT vaccination & consequences of not being vaccinated.
2. Health promotion by making the TT vaccine available & accessible for all women at their reproductive age in the university.
3. Improve the monitoring and supervision of vaccination activities by ministry of health.
4. Regular training program about immunization for students in child bearing age
5. Regular refresh seminars are needed.

**Conclusion**

The educational program resulted in significant changed of knowledge from pre to post intervention for study group, also changed of attitude and increased vaccination status of the participant from pre intervention to post intervention. We need also further study and increasing sample size for generalizability of the study.
CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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APPENDIX

Questionnaire of research

This questionnaire is designed to assess the Effect of Tetanus Toxoid Immunization training Program on Knowledge and Attitude of female nursing students in governmental universities in Khartoum state, and the information is for research purpose only and will be kept safe and not used for other purposes.

Appendix I.

| A- Demographic variables | Scores |
|--------------------------|--------|
| 1- Age in year           |        |
| 2- University name:      |        |
| 1- Omdurman Islamic university |
| 1- Khartoum north university |
| 1- Marital status        |        |
| 1- Married               |        |
| 1- UN married            |        |
| 1- Divorce               |        |
| 4- Residence             |        |
| 1- East of the Sudan     |        |
| 1- North of Sudan        |        |
| 1- West of Sudan         |        |
| 1- Middle of Sudan       |        |
| 1- South of the Sudan    |        |
| 1- Others                |        |

| B Knowledge information | Yes | No | I don’t know |
|-------------------------|-----|----|--------------|
| 5- Do you hear about tetanus toxoid vaccination in child bearing age |
| 6- If yes from where you know (source of knowledge about TT vaccination) |
| - family                |     |    |              |
| - college               |     |    |              |
| - media                 |     |    |              |
| - health center         |     |    |              |
| - others                |     |    |              |
| 7- What do you know about tetanus? |
| - Highly infectious     |     |    |              |
| - Vaccine preventable   |     |    |              |
| - Enter the body through the wound |
| - Enter the body through umbilical stump and UN clean delivery. |
| - It cause by anaerobic bacteria |
| - It affect pregnant mother |
| - It affect women in childbearing age |
| 8- How does the tetanus spread |
| - C. tetani spores can be found in the soil and in the intestines and feces |
| - of many household and farm animals and humans It affect newborn |
| - The bacteria usually enter the human body through a puncture conditions |
| - Tetanus is not spread from person to person |
| 9- Tetanus results in severe, uncontrollable muscle spasms. For example, the jaw is “locked” by muscle spasms, causing the disease |
| 10- Tetanus may develop in people who are not immunized against it or in people who have failed to maintain adequate immunity with active booster doses of vaccine |
| 11- What is venerable age group prone to tetanus |
| - Neonate               |     |    |              |
Appendix I. Cont’d

12. Target group for immunization
   - Newborn
   - Mother of newborn
   - Both mother and newborn
   - Women of 15-49 years
   - Pregnant women
   - Children <5 years
   - No idea

13. If people have a wound, they should seek medical attention
14. If they are not immunized against tetanus or have not kept up tetanus booster shots every 10 years, any open wound is at risk of developing tetanus
15. If individuals have trouble swallowing or have muscle spasms in the facial muscles, go to the emergency department for treatment immediately
16. Any wound that results in a break in the skin should be cleaned with soap and running water in order to prevent tetanus
17. How long does it take to show signs of tetanus after being exposed?
   - The incubation period varies from 3–21 days, with an average of eight days
   - The further the injury site is from the central nervous system, the longer the incubation period.
   - The shorter the incubation period, the higher the risk of death
18. Is TT vaccine important for women in child bearing age
19. Do you know about tetanus toxoid immunization schedule in child bearing age
20. How many doses the women should take in child bearing age to prevent her and her newborn from maternal and neonatal tetanus
   - One dose
   - Two doses
   - Three doses
   - Four
   - Five doses
21. Have you previously been immunized against tetanus?
22. If the answer in the question above no why not immunized before
   - Health centers is far
   - No awareness
   - Bing busy
   - Misconceptions
   - Tetanus toxoid immunization not available in the center
   - Fear of reaction
   - Social norms
   - Others
Appendix I. Cont’d.

23- If the question yes how many doses you take
- Only one
- Two
- Three
- Fourth
- Fifth

24- When you immunized before
- One month ago
- Three month
- Six month
- Over One year
- Cannot remember
- Not receive

25- If you are immunized before At which age you are immunized
- Infancy
- Childhood
- Adolescents
- Adult hood

Appendix 2. Attitudes scale

| Strongly agree | Agree | Disagree | Strongly disagree |
|----------------|-------|----------|-------------------|
| 1- Tetanus immunization can be given to students in the university |
| 2- Do you need to be routinely immunized against tetanus in child bearing age |
| 3- My family will not agree that I should be given injection in the university even if they know the benefits |
| 4- It is not possible to give immunization in the form of injections to the student in the university |
| 5- Routine tetanus immunization in adults is neglected in our country. |
| 6- Updating knowledge on adult immunization can be achieved through participation in a training program. |
| 7- Regular seminar/refresher courses regarding immunization are needed. |
| 8- I think majority of students will receive tetanus immunization in university if government made it compulsory |
| 9- Immunization against tetanus is the responsibility of all health care providers. |
| 10- Awareness and knowledge among students and teachers concerning the importance of tetanus toxoid injection is low |