Effectiveness of Health Education Message in Improving Tetanus Health Literacy among Women of Childbearing Age: A Quasi-Experimental Study

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Author’s Contribution
1 Conception of study
2 Experimentation/Study conduction
1 Analysis/Interpretation/Discussion
1 Manuscript Writing
2,3 Critical Review
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Abstract

Background: Pakistan is one of the 34 countries yet to achieve the neonatal tetanus global elimination target set by the World Health Organization. Lack of vaccination, inadequate knowledge about prevention and unsafe practices are major causes of spread. The study aims to determine the effectiveness of health education messages in improving tetanus health literacy among women of age 16 to 45 years.

Material and Methods: The quasi-experimental study which was carried out from April 2018 to June 2018 at Holy Family Hospital, Rawalpindi consisted of 150 female respondents of age 16 to 45 years selected by non-probability convenience sampling. Written informed consent was taken from each participant. Afterwards, respondents were sequentially delivered pre-test proforma, health education message (verbally and in the form of pamphlet), and a post-test proforma after a gap of 2 days. The pre-test and post-test proformas assessed knowledge about tetanus. Data were analyzed via SPSS version 22.

Results: Out of 150 women 20.1% were uneducated and 79.9% were educated. Area of residence was urban for 83.3% and rural for 16.7%. Mean tetanus health literacy scores increased significantly from 6.32 ± 2.85 to 10.55 ± 3.87 (p=0.01). Health education message was more effective for students and employees compared with housewives (p=0.01). Similarly, women possessing higher education were more likely to have high scores on post-tests (p=0.01).

Conclusion: The health education message is effective in improving tetanus health literacy among women.

Keywords: Tetanus, Health literacy, Intervention.
Tetanus, a paralytic disease caused by toxin of clostridium tetani, is responsible for 5-7% of global neonatal mortality. As estimated by the WHO, each year 0.29 million tetanus related infant deaths occur, of which 0.13 million are neonatal mortalities. Also, the WHO reports that among vaccine preventable diseases, tetanus is the second leading cause of death. A past study shows, the worldwide fatalities from neonatal tetanus reduced by 78%, from 1980s to 2020, which was attributed to vaccination. It is recommended by WHO that in high risk areas, up to 90% females should be vaccinated.

In Canada, women have good knowledge and attitude about tetanus immunization and 89% claim that they follow their physician’s advice and undergo vaccination as scheduled. Similarly, 60.6% of Egyptian mothers are found to be vaccinated against tetanus. Knowledge about tetanus has been reported as a major factor for vaccine coverage not only in Egyptian but also in Nigerian studies. On the contrary, in India, pregnant women believe that immunization should be stopped if it has side effects. In Pakistan, the vaccine coverage over the past decade ranged from 60 to 74%. Pakistan, being one of the 34 such countries, has not yet achieved the neonatal tetanus global elimination target set by the World Health Organization. A study depicted that low coverage of tetanus vaccine in Pakistan is largely influenced by lack of knowledge among the women. In Karachi, a prior study illustrated 39% improvement in vaccine completion rates following an educational intervention for illiterate people. Despite the preventable nature of disease and wide availability of vaccines, the literature indicates that the disease is still prevalent in Pakistan, particularly due to lack of knowledge, a big hurdle in its prevention.

With lack of community participation and lack of interest in physicians to impart knowledge, Pakistan lags behind the world in tetanus elimination like Polio eradication. It becomes imperative to prove the effectiveness of a simple health education message and subsequently implement it on a large scale. The objective of this study is to evaluate the effectiveness of health education messages in improving tetanus health literacy among women of childbearing age.

This quasi-experimental study was carried out from April 2018 to June 2018 at Holy Family Hospital, Rawalpindi after approval from institutional ethical research forum. Sample size was calculated by WHO calculator using reference study. 169 women of childbearing age (from 15 to 45 years) were selected by non-probability convenience sampling. However, only 150 respondents could be followed up. Women of childbearing age admitted to Holy Family Hospital were included in the study, except those who were medical personnel (e.g. lady health workers or nurses) or had prior exposure to knowledge about tetanus (e.g. vaccination counseling in obstetric units). Written informed consent was taken from each study participant.

The prior knowledge of the participants was assessed by a pre-test questionnaire. It was followed by intervention that included delivery of a health education message. The knowledge about tetanus was conveyed orally and pamphlets were also distributed among the participants. Afterwards, a post-test questionnaire that assessed knowledge after intervention, was distributed and collected after a gap period of two days.

Data collection in both pre-test and post-test were based on a referenced questionnaire. The questionnaire assessed, firstly, demographic details, education status and vaccination status of the respondents. Secondly, it inquired participants’ social parameters, details about children and their vaccination status. Thirdly, it encompassed general questions concerning tetanus spread, its prevention and vaccination. Fourthly, it assessed knowledge about tetanus spread and vaccination associated with pregnancy. Finally, knowledge concerning spread and vaccination of neonatal tetanus was inquired.

The knowledge scores were categorized as low with up to 30% correct responses, moderate with correct responses ranging from 31% to 60% and high with more than 60% correct responses. Data were analyzed using SPSS version 22. Any improvement of knowledge was assessed via comparison of mean scores of the participants in pre-test and post-test using paired sample t-test. Comparison of responses to each question in pre-test questionnaire to the responses in post-test questionnaires was made by chi square tests. A p-value of less than 0.05 was considered as significant.
Results

The study included 169 participants selected after they satisfied the inclusion and exclusion criteria. 19 participants were lost to follow up. The mean age of the remaining 150 respondents was 26.33 ± 6.9 years as most of the women were below age 30. Although almost three out of four women were educated (77.3%), only one sixth (14.0%) were working women. Almost two thirds of the women (64%) were vaccinated against tetanus whereas, 36% were either not vaccinated or were unaware of their status. Among the 150 women, 102 were urban residents (68%) while the remaining 48 were rural (32%).

The demographic characters of the respondents including marital status, age, vaccination status, literacy, place of residence and occupation status are shown in Table 1. Married women accounted for 36% of the study population and 26% of the participants had children. Among those women who did have children, 82.0% claimed that their children had been immunized according to EPI.

Table 1: Demographic characters of participants

| Variable              | N (%) |
|-----------------------|-------|
| Marital status        |       |
| Married               | 54 (36.0) |
| Single                | 96 (64.0) |
| Age                   |       |
| Age group 16 to 30    | 116 (77.3) |
| Age group 31 to 45    | 34 (22.7) |
| Vaccination status    |       |
| Vaccinated            | 96 (64) |
| Not vaccinated        | 54 (36) |
| Literacy              |       |
| Educated              | 116 (77.3) |
| Uneducated            | 34 (22.7) |
| Place of residence    |       |
| Urban                 | 102 (68) |
| Rural                 | 48 (32) |
| Occupation Status     |       |
| Working               | 21 (14) |
| Student               | 87 (58) |
| Housewife             | 42 (28) |

On pre-test the mean score of the participants was 6.27 ± 2.85 and 71.3% had low scores. Compared to the pre-test score, the mean score of post-test was higher i.e. 10.67 ± 3.87. Educated individuals (mean score 9.45 ± 3.33) were more likely to have better scores than uneducated ones (mean score 8.88 ± 2.83) (p=0.01). However, marital, vaccination, occupational and residential status were not significantly associated with health literacy score on pre-test. The percentage of participants that had low scores decreased from 71.3% in pre-test to 15.3% in post-test. Likewise, the percentage of individuals with high scores also increased from 3.3% to 30.0%, in pre- and post-tests, respectively. On comparing means by paired sample t-test, the mean score increment of 4.4 ± 1.22 (22% of total) was statistically significant (p<0.01). In post-test, educated (p=0.01) and married (p=0.03) respondents were more likely to score high. In contrast, vaccination, occupational and residential status were not significantly associated with health literacy score. The results for pre- and post-tests, categorized as low, moderate and high scores, are illustrated in detail in Tables 2 and 3, respectively.

Table 2: Pre-test score of the study participants

| Score category | Description               | N (%) |
|----------------|---------------------------|-------|
| Low Score      | Up to 30% correct responses | 107 (71.3) |
| Moderate Score | 31% to 60% correct responses | 38 (25.3) |
| High Score     | Above 60% correct responses | 5 (3.3) |

Table 3: Post-test score of the study participants

| Score category | Description               | N (%) |
|----------------|---------------------------|-------|
| Low Score      | Up to 30% correct responses | 23 (15.3) |
| Moderate Score | 31% to 60% correct responses | 82 (54.7) |
| High Score     | Above 60% correct responses | 45 (30.0) |

Among the participants, 24.7% claimed that they knew about tetanus previously while in post-test, 87.3% claimed so. Tetanus vaccination is necessary, as was the opinion picked by 12.7% respondents in pre-test which raised to 96.7% in post-test. There was improvement in the number of correct responses to the questions about vaccination of infants, pregnant and non-pregnant women which is illustrated in Table 4.
Table 4: Responses to questions about tetanus vaccination and spread of tetanus

| Questions                                                                 | Pre-test responses N (%) | Post-test responses N (%) | P value |
|---------------------------------------------------------------------------|--------------------------|---------------------------|---------|
| Claimed to know about tetanus                                             | 37 (24.7)                | 131 (87.3)                | 0.01    |
| Tetanus vaccination is necessary                                           | 19 (12.7)                | 145 (96.7)                | <0.01   |
| Knows correct vaccination schedule for non-pregnant women                  | 14 (9.3)                 | 81 (54.0)                 | 0.92    |
| Knows correct vaccination schedule for pregnant women                      | 28 (18.7)                | 110 (73.3)                | 0.04    |
| Knows correct vaccination schedule for infant                              | 27 (18.0)                | 88 (58.7)                 | 0.15    |
| Knows correctly that tetanus vaccine must be used after road traffic accident | 118 (78.1)               | 120 (80.0)                | 0.97    |
| Believed that presence of trained birth attendant increases the chance of clean delivery and reduces the risk of tetanus | 119 (79.3)               | 138 (92.0)                | 0.84    |
| Believed that contaminated delivery is a cause of neonatal tetanus         | 60 (40.0)                | 125 (83.3)                | 0.11    |
| Believed lack of vaccination of infant is risk factor of tetanus later in life | 43 (28.7)                | 74 (49.3)                 | 0.15    |
| Believed that contaminated wounds are a cause of tetanus                   | 81 (54.0)                | 100 (66.7)                | 0.53    |
| Believed that contaminated delivery is a cause of maternal tetanus         | 25 (16.6)                | 110 (73.3)                | 0.01    |
| Believed lack of vaccination of women is risk factor of maternal tetanus   | 20 (13.3)                | 68 (45.3)                 | 0.17    |

Table 5: Responses to questions about common misconceptions about tetanus vaccination and cord application

| Questions                                                                 | Pre-test responses N (%) | Post-test responses N (%) | P value |
|---------------------------------------------------------------------------|--------------------------|---------------------------|---------|
| Believes tetanus vaccine must be discontinued if it has side effects      | 55 (36.7)                | 39 (26.0)                 | 1.31    |
| Believed one dose vaccine is sufficient to achieve protection             | 122 (81.3)               | 104 (57.8)                | 0.84    |
| Believed that cord application should be continued as it does not cause disease | 71 (47.3)                | 30 (20.0)                 | 0.95    |

Discussion

This paper provides evidence of the impact of health education messages in improving knowledge about tetanus. Our study depicts a 22% (of total) increase in tetanus health literacy in the research participants. In comparison, Iranian and British studies show similar (21.8% and 22% respectively) increase in scores. The reason, for large increase, could be that the majority of the participants in our study had no prior knowledge about tetanus as counselling about vaccination and prevention in Pakistan is largely neglected. Before participating in this study, 75.3% had never heard about tetanus which is similar to a study in Saudi Arabia (69.2%). In pre-test, 12.7% claimed that tetanus vaccination is necessary which is very low compared with a German study where 80% claimed so. After provision of health education message, 96.7% women believed that vaccination is essential. In our study population, vaccine coverage was 64% which is lower than a study from AKUH, Karachi (76%) but is approximately equal to a study in Peshawar (65%). Our study implies that educated women have higher pre-existing knowledge compared to uneducated women, and can score better on post-test as well, which is in accord with an Italian study. Vaccination
status was not significantly associated with knowledge about tetanus in our study. In another study, knowledge about neonatal tetanus and its immunization was one of the factors determining the rate of vaccination.\textsuperscript{19} It might be such because in Pakistan those vaccinated are not educated about what they are being vaccinated for.

The study setting was a tertiary care hospital in urban city of Pakistan and non-probability convenience sampling was used. Hence, the results of the study cannot be generalized to the general population. Moreover, the study was an uncontrolled trial and a randomized control trial would have provided more authentic results.

**Conclusion**

The health education message is effective in improving health literacy of tetanus among women of childbearing age. Health education messages should be used to educate the masses so that prevention of maternal and neonatal tetanus can be ensured to a greater degree by better sanitary practices and immunization rates. National public health strategies against tetanus should include health education not only in the form of pamphlets but also extensive media programs to ensure the participation of the community to eliminate the disease.

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