

Original Research Article

Knowledge, attitude and practice among first year MBBS and nursing/paramedical students of GMC Anantnag regarding tetanus vaccination: a cross-sectional study

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ABSTRACT

Background: Tetanus is a life-threatening, yet vaccine-preventable disease that continues to contribute in morbidity and mortality, especially in low- and middle-income countries. Despite the availability of an effective vaccine, and inclusion of booster doses at 10 and 16 years under the UIP, gaps in awareness and vaccination practices persist. Objective of the study was to assess the knowledge, attitude and practice (KAP) regarding tetanus vaccination among first-year MBBS and nursing/paramedical students of Government Medical College (GMC), Anantnag.

Methods: A cross-sectional analytical study was conducted among 235 first-year MBBS and nursing/paramedical students at GMC Anantnag from June to July 2025. Data was collected using a structured, self-administered questionnaire assessing KAP related to tetanus vaccination. Data was analyzed using descriptive and inferential statistics.

Results: The overall mean KAP score was 47.7%, with knowledge (42.5%) and practice (43.0%) scores being suboptimal despite a relatively higher attitude score (63.0%). Female participants demonstrated marginally higher knowledge and attitude scores, whereas males had significantly higher practice scores ($p=0.02$). No significant gender difference was observed in overall KAP scores.

Conclusions: The study revealed inadequate knowledge and practices regarding tetanus vaccination with slightly better attitude scores among first-year students. Strengthening school-based and adolescent health programs, along with routine verification of immunization status during primary care visits, can help improve booster coverage and prevent gaps in protection against tetanus.

Keywords: Tetanus vaccination, Knowledge attitude practice, MBBS students, Nursing students, Paramedical students

INTRODUCTION

Tetanus is a serious infectious disease with high mortality.¹ Tetanus is a disease caused by a toxin produced by the bacterium *Clostridium tetani* (*C. tetani*) particularly in Tropical regions. *C. tetani* is a gram-positive anaerobic bacterium, which has the ability to form spores and has a habitat of soil. However, it can be isolated from the faeces of domestic and human individuals.² *C. tetani* produces a potent neurotoxin which is retrogradely transported to the CNS, where it prevents the release of gamma-amino-

butyric acid (GABA) and glycine from inhibitory interneurons. This causes unnervingly active motor neurons and results in the hallmark presentation of muscle spasms and rigidity in tetanus infections.³

According to the Global Burden of Disease report in 2019, there were more than 73,000 cases of tetanus infection and more than 30,000 deaths from tetanus globally.⁴ The mortality rate of tetanus infections may go as high as 80% in LMICs.⁵

Vaccination against tetanus triggers the production of IgG antibodies, which provide protection against the infection. Tetanus infection is non-immunizing and the patient should be completely immunized for adequate protection in the future. One dose induces little to no long-term immunity. The second dose induces 90% immunity in 2 to 4 weeks, although in most cases the immunity is not long-lived. The third dose is needed to provide almost universal immunity for at least 5 years.⁶ The administration of the initial combination series of three doses of pentavalent vaccine in infancy at 6 weeks, 10 weeks and 14 weeks of age along with boosters at 5 years, 10 years and 16 years has been advised under UIP. Also, pregnant women are given two doses of tetanus vaccine, first dose in early pregnancy and second dose 4 weeks apart.⁷ Maternal immunization results in the generation of IgG antibodies against tetanus. The antibodies are then passively transferred from the mother to the neonate through the placenta. This usually occurs in the third trimester of pregnancy. The antibodies then protect the neonate from tetanus infection during the neonatal period. Therefore, immunization during pregnancy is necessary for preventing neonatal tetanus.⁸

First-year students of MBBS, nursing and paramedical courses are usually in the age group of 18–21 years. Since the booster dose of tetanus toxoid is recommended at 16 years of age, most of these students are likely to have received the booster recently and are expected to recall it. Therefore, this group represents an appropriate and reliable population for assessing knowledge, attitude and practices (KAP) regarding tetanus vaccination.

Aim

The aim of the study was to study the KAP among first year MBBS and nursing/paramedical students of GMC Anantnag regarding tetanus vaccination.

Objectives

Primary objective was to estimate the knowledge among first year MBBS and nursing/paramedical students of GMC Anantnag regarding tetanus vaccination.

Secondary objectives were to estimate the attitude among first year MBBS and nursing/paramedical students of GMC Anantnag regarding tetanus vaccination, and to estimate the practice among first year MBBS and nursing/paramedical students of GMC Anantnag regarding tetanus vaccination.

METHODS

Sample size

The sample size was calculated using the formulae given.

$$n = [Z^2 \times (p) \times q] / d^2$$

Where, n=sample size, z=relative deviate (at 95% confidence interval) i.e. 1.96, p=estimated prevalence based on previous studies, p=0.33, and d=allowable error, which was taken as 0.06, 1-P=0.67.⁹

Hence the required sample size calculated as follows.

$$n = (1.96)^2 \times 0.33 \times \frac{1 - 0.33}{(0.06)^2} = 8493.7776/36 = 235$$

This cross-sectional analytical study was conducted from 30 June 2025 to 16 July 2025 among first-year MBBS and Nursing/Paramedical students at Government Medical College (GMC), Anantnag. All eligible students were approached and informed about the nature, objectives, and significance of the study, and the scope and procedures involved were clearly explained. Students who voluntarily agreed to participate and provided written informed consent were included, while those with a history of mental illness or memory disorder were excluded. Data were collected using a structured, anonymous, self-administered questionnaire designed to assess KAP regarding tetanus disease and its vaccination. Participants completed the questionnaire independently based on their current knowledge, attitudes and practices. Participant details about age, gender and course were also included in the questionnaire.

Ethical consideration

Prior to the commencement of the study, approval was obtained from the Scientific Research Committee of Government Medical College (GMC), Anantnag. Subsequently, ethical clearance was secured from the Institutional Ethics Committee of GMC, Anantnag. Confidentiality and anonymity of the participants were strictly maintained, and no personal identifiers were collected.

RESULTS

The majority of the respondents were from the MBBS group (60.4%), followed by the paramedical group (30.7%). The gender composition of the respondents was almost equal (Table 1).

Table 1: Distribution of study participants according to their course and gender.

Parameters	Frequency	Percent
Course name		
MBBS	142	60.4
Nursing	21	8.9
Paramedical	72	30.7
Gender		
Male	114	48.5
Female	121	51.5

Mean age was 19.5 years with no gender differences (Table 2).

Males had significantly higher scores in practice domain while there was no significant difference between males and females in other domains.

The attitude domain had the highest percentage of correct responses (63.0%), followed by practice (43.0%) and

knowledge (42.5%) domains with an overall percentage of correct response rate of 47.7%.

Table 2: Age distribution.

Gender	Mean age in years	Standard deviation	Mean difference	P value
Female	19.5	1.1	0.01	0.97
Male	19.5	1.1		

Table 3: Distribution of responses in knowledge, attitude and practice.

Parameter	% score in knowledge	% score in attitude	% score in practice	Overall % score
Mean	42.5	63.0	43.0	47.7
Median	37.5	75.0	50.0	43.8
Std. deviation	19.3	30.2	31.1	17.7
Minimum	12.5	0.0	0.0	6.3
Maximum	100.0	100.0	100.0	93.8
IQR	25-50	50-75	25-75	31.2-62.5

Table 4: Comparison of various parameters between male and female participants.

Parameter	Gender	Mean	Std. deviation	Mean difference	P value
% score in knowledge	Female	43.1	20.2	1.19	0.64
	Male	41.9	18.4		
% score in attitude	Female	65.7	31.1	5.61	0.15
	Male	60.1	28.9		
% score in practice	Female	38.2	29.9	-9.80	0.02
	Male	48.0	31.6		
Overall % score	Female	47.5	18.0	-0.45	0.85

Table 5: Status of knowledge, attitude and practice among participants.

Domain	Percentage of correct response
Knowledge	42.5
Attitude	63.0
Practice	43.0
Total	47.7

DISCUSSION

This study aimed to assess the knowledge, attitude and practices regarding tetanus vaccination among first-year MBBS, nursing and paramedical students. Tetanus is a severe, life-threatening infectious disease, which can be prevented through vaccination by adopting full vaccination schedule, which is of utmost importance. As first-year medical and allied health students belong to an age group which has been eligible for tetanus booster vaccination in recent past, they represent an appropriate population for assessing awareness and vaccination-related practices.

A total of 235 first-year students took part in the study. Representation of the study participants in terms of the course and the gender is shown in Table 1. Of the 235 study

participants, 142 (60.4%) were from the MBBS course, 72 (30.7%) were from the Paramedical course, while 21 (8.9%) were from the Nursing course. With regard to the gender distribution, 114 (48.5%) were from the male gender, while 121 (51.5%) were from the female gender. The mean age of both male and female participants was 19.5±1.1 years, with no significant age difference between genders (p=0.97), indicating age comparability across the study population.

In the present study, the overall mean knowledge score regarding tetanus and its vaccination was low at 42.5% (Table 3), indicating inadequate awareness among first-year students despite a relatively moderate attitude score of 63.0% and suboptimal practice score of 43.0%. This pattern of insufficient knowledge but comparatively better attitudes has been observed in previous KAP studies on tetanus immunization. For example, a cross-sectional survey in Western India reported low levels of detailed knowledge about tetanus toxoid immunization among the general population, despite some positive perceptions towards vaccination, highlighting persistent gaps in understanding of immunization schedules and importance.^{10,11} Similarly, the research work conducted on tetanus vaccination among university students indicated poor knowledge about the mode of transmission,

symptoms, and immunization schedules of tetanus.¹² However, despite such knowledge gaps, a good attitude toward vaccination against tetanus was noted, with high intentions to undergo post-exposure vaccination. These findings confirm that although attitudes related to health issues can be moderately positive among young adults, improvements in knowledge are required if efficient tetanus vaccination coverage levels are to be achieved.

Table 4 presents a gender-wise comparison of KAP scores. Female participants had slightly higher mean knowledge (43.1±20.2%) and attitude scores (65.7±31.1%) compared to males; however, these differences were not statistically significant (p=0.64 and p=0.15, respectively). In contrast, males demonstrated significantly better practice scores (48.0±31.6%) than females (38.2±29.9%), with a statistically significant mean difference of -9.80% (p=0.02). No statistically significant difference was observed in overall percentage scores between genders (p=0.85). This suggests that while knowledge and attitude were comparable, males were more likely to translate knowledge into practice. In the current study, it could be observed that there were differences in knowledge, attitude and practices scores across the gender, though majority of differences were not significant. The findings are in line with previous studies that were conducted on healthcare students and young people in India.^{13,14} Also, these findings are in agreement with the results from a recent KAP study among non-medical university students that reported female participants to have significantly higher knowledge about the mode of transmission and symptomatology of tetanus and vaccine timing compared to the male counterparts.¹² The decreased conversion of knowledge into practice among female respondents might be due to sociocultural factors and the lack of autonomy, as stated in the earlier studies.

The scores on attitude (63.0%) were higher than both scores on knowledge (42.5%) and practices (43.0%) (Table 5), which signifies the obvious gap between the positive attitude and practices. For example, positive attitudes were promoted among undergraduate medical students irrespective of knowledge and practices with regards to national health programs, suggesting that learning about topics related to health strengthens positive views with no guarantee of related skills in knowledge or practices by students.¹⁴

CONCLUSION

The present study highlights important insights into the levels of knowledge, attitude and practice regarding tetanus vaccination among the study participants. Overall KAP scores were found to be 47.7% (knowledge 42.5%, attitude 63%, and practice 43%) which not only depicts a gap between attitude and actual practices, particularly among female participants, but also an overall low KAP levels. While females demonstrated comparatively better knowledge and attitudes, males showed significantly better practice scores.

Recommendations

Specific measures focusing on awareness generation and effective implementation of tetanus vaccination should be initiated at the primary care level, with special emphasis on timely administration of booster doses at 10 and 16 years of age. Strengthening school-based and adolescent health programs, along with routine verification of immunization status during primary care visits, can help improve booster coverage and prevent gaps in protection against tetanus.

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