

A study to assess myths and concerns regarding COVID-19 vaccination among medical students in a Tertiary Health Centre in Chennai – A Cross-sectional study

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ABSTRACT

BACKGROUND: Medical students are likely to be exposed to COVID-19 patients, so achieving high vaccination coverage rates for COVID-19 in this group is mandatory. Willingness to vaccinate against SARS-CoV-2 as soon as possible depends on several factors. Based on this perspective, this study aims to determine vaccine acceptance among undergraduate medical students and study the barriers to COVID-19 vaccination including various myths and misconceptions among the students.

METHODOLOGY: The current cross-sectional study was carried out among 400 undergraduate medical students in a tertiary health centre in Chennai by using simple random sampling method. A semi-structured questionnaire was utilized to obtain information about the socio-demographic data, myths and concerns regarding COVID-19 vaccination.

RESULTS: All the students are vaccinated against COVID-19. Above 50% of students are concerned about the serious adverse events from the currently available COVID-19 vaccines. Nearly 60% of students perceive themselves as not at elevated risk of acquiring COVID-19 infection. Around 40% of students think all age groups are eligible for COVID-19 vaccination. Only 5.8% of students believe vaccine approval alone does not guarantee its safety.

CONCLUSION: The undergraduate medical students lack awareness regarding COVID-19 vaccination eligibility, concerns regarding adverse events and the efficacy of the COVID-19 vaccine. As future health care providers, medical students' concerns should be prioritized.

KEYWORDS: awareness, misconception, college

MAIN TEXT

INTRODUCTION:

The several cases of severe pneumonia of unknown origin observed in Wuhan at the end of 2019 have initiated one of the most important events of this century. The condition was referred to as Coronavirus Disease 2019 (COVID-19), and it was established that the underlying cause of the disease constitutes a novel coronavirus, classified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)¹. The increasing incidence of COVID-19, as observed both in China and worldwide, led to the announcement of the COVID-19 pandemic by the World Health Organization in March 2020². Thus, a race against time in the middle of death and devastation has begun. As it was put by Khuroo et al., "no drug has the power to fight the infection and bring normalcy to the utter chaos." The only solution for the remaining problem seems to be an effective and safe vaccine, available at an affordable price³.

As healthcare workers (HCW) and medical students are particularly exposed to biological risks during their everyday occupations, vaccination strategies developed by proper government institutions worldwide have indicated them as the first group to get the vaccine. Previously published papers revealed that the coverage for recommended vaccination among healthcare workers is generally <30%, despite the confirmed effectiveness and safety of the vaccines⁴.

The pandemic of COVID-19 is considered a global challenge for all countries worldwide to contain its spread. There are no specific antiviral medications for COVID-19, and among the used drugs, a few have shown potential to

reduce mortality among patients with COVID-19. Thus, the best strategy to control and gradually silence this pandemic is to develop an effective vaccine⁵.

India began the administration of COVID-19 vaccines on 16th January 2021. As of 17th June 2022, India has administered over 1.9 billion doses, including first, second and booster doses of the currently-approved vaccines⁶.

As medical students are likely to be exposed to COVID-19 patients, achieving high vaccination coverage rates for COVID-19 in this group is mandatory as soon as the vaccine is widely available as they can be used as vaccination role models for the public⁵.

Studies performed on medical students have proven that the willingness to vaccinate against SARS-CoV-2 as soon as possible depends on several factors: fear of passing on the disease to relatives, fear of long-term side effects, and the presence of the depression symptoms in the past week¹.

Based on this perspective, this study aims to determine vaccine acceptance among undergraduate medical students and study the barriers of COVID-19 vaccination, including various myths and misconceptions among the students.

METHODOLOGY:

STUDY DESIGN AND AREA:

The current cross-sectional study was done in Chennai, Tamil Nadu.

STUDY POPULATION:

Undergraduate medical students in a tertiary health centre in Chennai.

STUDY PERIOD:

March 2022 to May 2022.

SAMPLE SIZE:

From a study done by Jyoti Jain et al., the prevalence of vaccine hesitancy among medical students was found to be 10.6%⁷. Taking this as P-value and applying the formula Z^2PQ/L^2 where P= 10.6, Q= 89.4 and absolute precision (L) was taken as 3%, the required sample size was calculated as 400.

METHODS & MATERIALS:

SAMPLING TECHNIQUE: Simple random sampling. The attendance register with names and roll numbers of pre-clinical and paraclinical undergraduate medical students were obtained and used as a sample frame. Using the lottery method, students were selected from the list until the required sample size of 400 was reached.

INCLUSION CRITERIA:

Medical undergraduate students > 18 years of age

EXCLUSION CRITERIA:

Undergraduate students who have active COVID-19 infection.

DATA COLLECTION TOOLS:

A pretested semi-structured questionnaire was utilized to obtain information about the socio-demographic data, myths and concerns regarding COVID-19 vaccination. 11 questions were designed according to the vaccine on Hopkins Medicine platform^{8,9} were asked to assess the myths and concerns with YES and NO as answers.

OPERATIONAL DEFINITION:

1. Myth - a popular belief or tradition that has grown up around something or someone¹⁰
2. A COVID-19 vaccine is a vaccine intended to provide acquired immunity against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes coronavirus disease 2019 (COVID-19)¹¹

DATA ANALYSIS METHOD:

The data was imported into MS EXCEL and analyzed using SPSS-version 21. Chi-square value, p-value and odds ratio were calculated to find the association between myths, concerns and related variables.

HUMAN SUBJECT PROTECTION AND ETHICAL CONSIDERATION:

- Approval from the Institutional Human ethics committee of Sree Balaji Medical College and Hospital was obtained.
- Student's information was kept confidential and anonymous.

RESULTS:

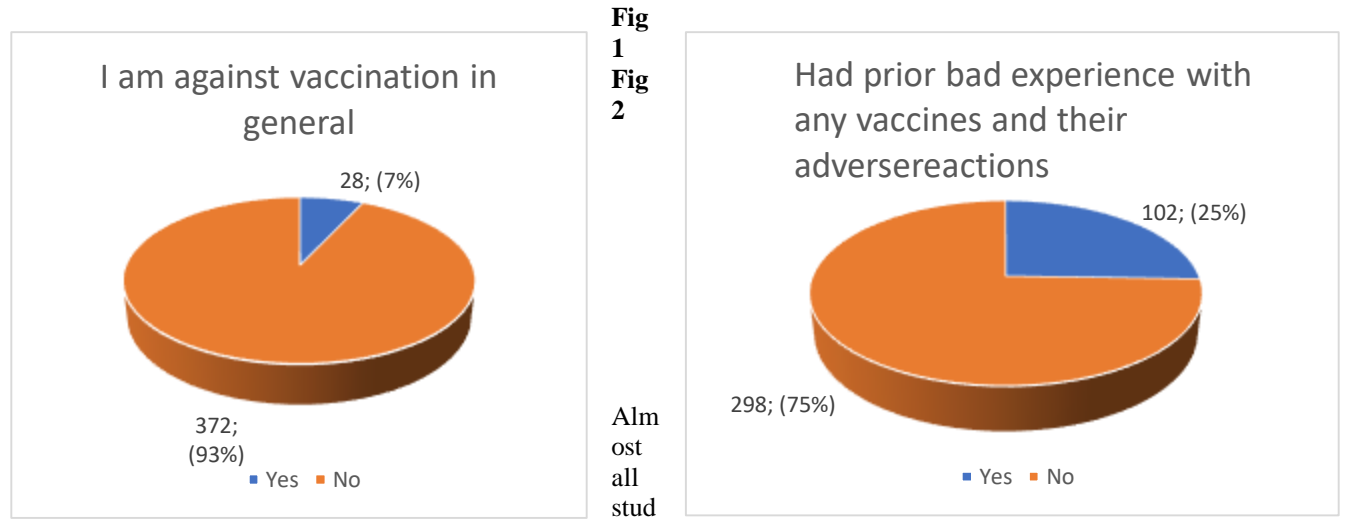
More than half of the 400 students who participated in the study were females; 270 (67.5%). 102 (25.5%) students are aged between 21 – 23 years. The educational qualification of their father and mother mainly were Arts & Science degrees – 186 (46.5%) and 265 (66.3%), respectively (Table 1).

Table 1:
Socio-demographic characteristics of the study participants:

| Variables | n | % |
|-----------|---|---|
|-----------|---|---|

| | | |
|---|-----|------|
| Gender | | |
| Male | 130 | 32.5 |
| Female | 270 | 67.5 |
| Age | | |
| 18 – 20 years | 298 | 74.5 |
| 21 – 23 years | 102 | 25.5 |
| Year of Study | | |
| 1 st Year | 114 | 28.5 |
| 2 nd Year | 111 | 27.8 |
| 3 rd Year | 175 | 43.8 |
| Educational Qualification of their fathers | | |
| 10th/12 th | 66 | 16.5 |
| Arts and Science degree | 186 | 46.5 |
| Degree in law | 15 | 3.8 |
| Engineering degree | 89 | 22.3 |
| MBBS/MD/MS/Alt. Medicine | 40 | 10.0 |
| Others | 4 | 1.0 |
| Educational Qualification of their mothers | | |
| 10th/12 th | 79 | 19.8 |
| Arts and Science degree | 265 | 66.3 |
| Degree in law | 9 | 2.3 |
| Engineering degree | 15 | 3.8 |
| Medicine degree | 27 | 6.8 |
| Others | 5 | 1.3 |

About 7%, i.e., 28 students, are against vaccination in general (Fig 1). 1/4th (102) of the students had a prior bad experience with vaccines and/or their adverse reactions (Fig 2). Despite that, all students took either one or two doses of the COVID-19 vaccine.

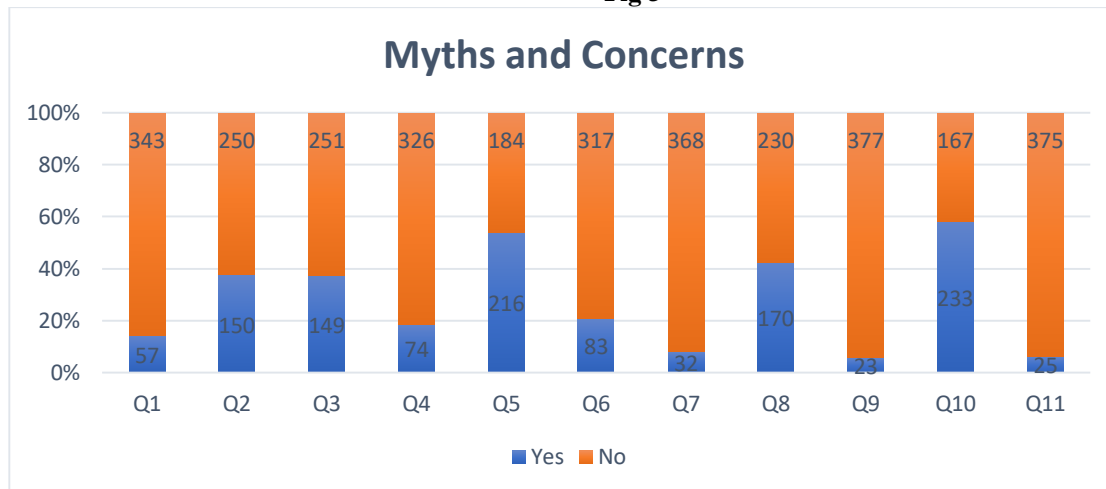


ents - 375 (93.8%)- support that the best preventive measure for COVID-19 is getting vaccinated. 216 (54%) students are concerned about the serious adverse events from the currently available COVID-19 vaccines. Nearly 233 (58.3%) students perceive themselves as not at elevated risk of acquiring COVID-19 infection. 170 (42.5%) students think all age groups are eligible for COVID-19 vaccination. Only 23 (5.8%) students believe vaccine approval alone does not guarantee its safety (Table 2 & Fig 3).

Table 2
Frequency of responses to the questions about myths and concerns regarding COVID-19 vaccination

| Q.No. | Question | Yes (n) | % |
|-------|--|---------|------|
| Q1 | If you have already had COVID-19, then you do not need a vaccine? | 57 | 14.2 |
| Q2 | Are you concerned that present COVID-19 vaccines may not have been tested rigorously before launch | 150 | 37.5 |
| Q3 | Are you concerned that the current COVID-19 vaccines may not be effective enough | 149 | 37.3 |
| Q4 | Does getting the COVID-19 vaccine causes COVID-19 infection? | 74 | 18.5 |
| Q5 | Are you concerned about the serious adverse events from the currently available COVID-19 vaccines | 216 | 54.0 |
| Q6 | Are side effects of the COVID-19 vaccine dangerous? | 83 | 20.8 |
| Q7 | Does the COVID-19 vaccine enter your cells and changes your DNA? | 32 | 8.0 |
| Q8 | Are all age groups people eligible for COVID-19 vaccination? | 170 | 42.5 |
| Q9 | I think that approval of the vaccine alone does not guarantees its safety | 23 | 5.8 |
| Q10 | I perceive myself not at elevated risk of acquiring COVID-19 | 233 | 58.3 |
| Q11 | The best preventive measure for COVID-19 is getting vaccinated | 375 | 93.8 |

Fig 3



The pre-clinical year students are associated with increased odds of thinking that they do not need vaccination if they already had COVID-19 infection in the past compared to paraclinical year students [$\chi^2=4.001$, $p=0.045$, $O.R=1.829$]. The students who had history of COVID-19 infection in their family are associated with having concern that the current COVID-19 vaccines may not be effective enough [$\chi^2=4.844$, $p=0.028$, $O.R=1.582$], and side effects of the COVID-19 vaccine are dangerous [$\chi^2=4.358$, $p=0.037$, $O.R.=1.687$] (Table 3 & 4).

Table 3

Association between myths, concerns regarding COVID-19 vaccination and related variables.

| S.No | Variables | If you have already had COVID-19, then you do not need a vaccine? | | Are you concerned that present COVID-19 vaccines may not have been tested rigorously before launch | | Are you concerned that the current COVID-19 vaccines may not be effective enough | | Does getting the COVID-19 vaccine causes COVID-19 infection? | |
|------|-----------|---|------------|--|------------|--|------------|--|------------|
| | | Yes n(%) | No n(%) | Yes n(%) | No n(%) | Yes n(%) | No n(%) | Yes n(%) | No n(%) |
| 1. | Gender | | | | | | | | |
| | Female | 33 (12.2) | 237 (87.8) | 103 (38.1) | 167 (61.9) | 106 (39.3) | 164 (60.7) | 50 (18.5) | 220 (81.5) |
| | Male | 24 (18.5) | 106 (81.5) | 47 (36.2) | 83 (63.8) | 43 (33.1) | 87 (66.9) | 24 (18.5) | 106 (81.5) |

| | | | | | | | | | |
|----|---|---|--------------------------|---|--------------------------|---|--------------------------|---|--------------------------|
| | χ^2 p OR C.I | 2.796 0.095 0.615 0.347 – 1.091 | | 0.149 0.700 1.089 0.706 – 1.681 | | 1.435 0.231 1.308 0.843 – 2.029 | | 0.0 0.989 1.004 0.586 – 1.721 | |
| 2. | Age 21 – 23 years 18 – 20 years | 13 (12.7) 44 (14.8) | 89 (87.3) 254 (85.2) | 37 (36.3) 113 (37.9) | 65 (63.7) 185 (62.1) | 41 (40.2) 108 (36.2) | 61 (59.8) 190 (63.8) | 26 (25.5) 48 (16.1) | 76 (74.5) 250 (83.9) |
| | χ^2 p OR C.I | 0.254 0.614 0.843 0.434 – 1.638 | | 0.088 0.767 0.932 0.584 – 1.486 | | 0.508 0.476 1.182 0.746 – 1.875 | | 4.437 0.035* 1.782 1.036 – 3.063 | |
| 3. | Year of Study Pre-Clinical Paraclinical | 39 (17.3) 18 (10.3) | 186 (82.7) 157 (89.7) | 88 (39.1) 62 (35.4) | 137 (60.9) 113 (64.6) | 78 (34.7) 71 (40.6) | 147 (65.3) 104 (59.4) | 44 (19.6) 30 (17.1) | 181 (80.4) 145 (82.9) |
| | χ^2 p OR C.I | 4.001 0.045* 1.829 1.006 – 3.324 | | 0.570 0.450 1.171 0.777 – 1.763 | | 1.468 0.226 0.777 0.517 – 1.169 | | 0.380 0.538 1.175 0.704 – 1.962 | |
| 4. | Had COVID-19 infection? Yes No/Not Tested | 10 (10.4) 47 (15.5) | 86 (89.6) 257 (84.5) | 36 (37.5) 114 (37.5) | 60 (62.5) 190 (62.5) | 41 (42.7) 108 (35.5) | 55 (57.3) 196 (64.5) | 13 (13.5) 61 (20.1) | 83 (86.5) 243 (79.9) |
| | χ^2 p OR C.I | 1.519 0.218 0.636 0.308 – 1.313 | | 0.000 1.000 1.000 0.623 – 1.606 | | 1.610 0.204 1.353 0.848 – 2.160 | | 2.060 0.151 0.624 0.326 – 1.193 | |
| 5. | Had COVID-19 infection in the Family? Yes No/Not tested | 26 (12.7) 31 (15.9) | 179 (87.3) 164 (84.1) | 86 (42) 64 (32.8) | 119 (58) 131 (67.2) | 87 (42.4) 62 (31.8) | 116 (57.6) 133 (68.2) | 42 (20.5) 32 (16.4) | 163 (79.5) 163 (83.6) |
| | χ^2 p OR C.I | 0.845 0.358 0.768 0.438 – 1.349 | | 3.555 0.059 1.479 0.984 – 2.224 | | 4.844 0.028* 1.582 1.050 – 2.382 | | 1.102 0.294 1.313 0.789 – 2.183 | |
| 6. | Type of Vaccine Covaxin Covishield | 19 (17.6) 38 (13) | 89 (82.4) 254 (87) | 44 (40.7) 106 (36.3) | 64 (59.3) 186 (63.7) | 43 (39.8) 106 (36.3) | 65 (60.2) 186 (63.7) | 20 (18.5) 54 (18.5) | 88 (81.5) 238 (81.5) |
| | χ^2 p OR C.I | 1.353 0.245 1.427 0.782 – 2.603 | | 0.663 0.416 1.206 0.768 – 1.896 | | 0.416 0.519 1.161 0.738 – 1.826 | | 0.000 0.995 1.002 0.567 – 1.768 | |
| 7. | Dose 2 nd dose 1 st dose | 57 (14.8) 0 (0) | 328 (85.2) 15 (100) | 149 (38.7) 1 (6.7) | 236 (61.3) 14 (93.3) | 146 (37.9) 3 (20) | 239 (62.1) 12 (80) | 72 (18.7) 2 (13.3) | 313 (81.3) 13 (86.7) |
| | χ^2 p OR C.I | 2.590 0.143 5.426 0.320 – 91.959 | | 6.322 0.012* 8.839 1.150 – 67.916 | | 1.984 0.159 2.444 0.678 – 8.804 | | 0.276 0.599 1.495 0.330 – 6.772 | |

*p < 0.05, statistically significant at 95% Confidence Interval, OR – Odd's Ratio, χ^2 – Chi-square, C.I – Confidence Interval

The female students and 21 -23 years old students are associated with having increased concern regarding the serious adverse events from the currently available COVID-19 vaccines when compared with male students and 18 – 20 years old students, respectively [$\chi^2 = 6.826$, $p=0.009$, O.R=1.751] & [$\chi^2= 7.527$, $p=0.006$, O.R=1.914] (Table 4).

The students vaccinated with two doses of COVID-19 vaccines are associated with the false belief that all age groups people are eligible for COVID-19 vaccination [$\chi^2=5.425$, $p=0.020$, O.R=5.032] (Table 4).

Table 4
Association between myths, concerns regarding COVID-19 vaccination and related variables.

| S.No | Variables | Are you concerned about the serious adverse events from the currently available COVID-19 vaccines | | Are side effects of the COVID-19 vaccine dangerous? | | Does the COVID-19 vaccine enter your cells and changes your DNA? | | Are all age groups people eligible for COVID-19 vaccination? | |
|------|--|---|------------|---|------------|--|------------|--|------------|
| | | Yes | No | Yes | No | Yes | No | Yes | No |
| 1. | Gender | | | | | | | | |
| | Female | 158 (58.5) | 112 (41.5) | 58 (21.5) | 212 (78.5) | 13 (4.8) | 257 (95.2) | 119 (44.1) | 151 (55.9) |
| | Male | 58 (44.6) | 72 (55.4) | 25 (19.2) | 105 (80.8) | 19 (14.6) | 111 (85.4) | 51 (39.2) | 79 (60.8) |
| | χ^2 | 6.826 | | 0.270 | | 11.452 | | 0.842 | |
| | p OR C.I | 0.009* 1.751 1.148 – 2.671 | | 0.603 1.149 0.680 – 1.941 | | 0.001* 0.296 0.141 – 0.619 | | 0.359 1.221 0.797 – 1.870 | |
| 2. | Age | | | | | | | | |
| | 21 – 23 years | 67 (65.7) | 35 (34.3) | 27 (26.5) | 75 (73.5) | 8 (7.8) | 94 (92.2) | 44 (43.1) | 58 (56.9) |
| | 18 – 20 years | 149 (50) | 149 (50) | 56 (18.8) | 242 (81.2) | 24 (8.1) | 274 (91.9) | 126 (42.3) | 172 (57.7) |
| | χ^2 | 7.527 | | 2.725 | | 0.005 | | 0.023 | |
| | p OR C.I | 0.006* 1.914 1.199 – 3.056 | | 0.099 1.556 0.918 – 2.636 | | 0.946 0.972 0.422 – 2.237 | | 0.880 1.036 0.658 – 1.631 | |
| 3. | Year of Study | | | | | | | | |
| | Pre-Clinical | 116 (51.6) | 109 (48.4) | 45 (20) | 180 (80) | 17 (7.6) | 208 (92.4) | 95 (42.2) | 130 (57.8) |
| | Paraclinical | 100 (57.1) | 75 (42.9) | 38 (21.7) | 137 (78.3) | 15 (8.6) | 160 (91.4) | 75 (42.9) | 100 (57.1) |
| | χ^2 | 1.237 | | 0.176 | | 0.138 | | 0.016 | |
| | p OR C.I | 0.266 0.798 0.536 – 1.188 | | 0.675 0.901 0.555 – 1.465 | | 0.710 0.872 0.423 – 1.799 | | 0.899 0.974 0.653 – 1.453 | |
| 4. | Had COVID-19 infection? | | | | | | | | |
| | Yes | 60 (62.5) | 36 (37.5) | 19 (19.8) | 77 (80.2) | 8 (8.3) | 88 (91.7) | 46 (47.9) | 50 (52.1) |
| | No/Not Tested | 156 (51.3) | 148 (48.7) | 64 (21.1) | 240 (78.9) | 24 (7.9) | 280 (92.1) | 124 (40.8) | 180 (59.2) |
| | χ^2 | 3.674 | | 0.071 | | 0.019 | | 1.517 | |
| | p OR C.I | 0.055 1.581 0.988 – 2.531 | | 0.791 0.925 0.522 – 1.641 | | 0.890 1.061 0.460 – 2.445 | | 0.218 1.335 0.842 – 2.118 | |
| 5. | Had COVID-19 infection in the Family? | | | | | | | | |
| | Yes | 120 (58.5) | 85 (41.5) | 51 (24.9) | 154 (75.1) | 12 (5.9) | 193 (94.1) | 96 (46.8) | 109 (53.2) |
| | No/Not tested | 96 (49.2) | 99 (50.8) | 32 (16.4) | 163 (83.6) | 20 (10.3) | 175 (89.7) | 74 (37.9) | 121 (62.1) |
| | χ^2 | | | | | | | | |
| | p OR C.I | | | | | | | | |

| | | | | | | | | | |
|-----------|------------------------|---------------|------------|----------------------|------------|----------------|------------|----------------|------------|
| | χ^2 | 3.484 | | 4.358 | | 2.632 | | 3.225 | |
| | p | 0.062 | | 0.037* | | 0.105 | | 0.073 | |
| | OR | 1.456 | | 1.687 | | 0.544 | | 1.440 | |
| | C.I | 0.981 – 2.161 | | 1.029 – 2.764 | | 0.258 – 1.145 | | 0.967 – 2.145 | |
| 6. | Type of Vaccine | | | | | | | | |
| | Covaxin | 64 (59.3) | 44 (40.7) | 20 (18.5) | 88 (81.5) | 8 (7.4) | 100 (92.6) | 48 (44.4) | 60 (55.6) |
| | Covishield | 152 (52.1) | 140 (47.9) | 63 (21.6) | 229 (78.4) | 24 (8.2) | 268 (91.8) | 122 (41.8) | 170 (58.2) |
| | χ^2 | 1.647 | | 0.448 | | 0.071 | | 0.229 | |
| | p | 0.199 | | 0.503 | | 0.790 | | 0.632 | |
| | OR | 1.340 | | 0.826 | | 0.893 | | 1.115 | |
| | C.I | 0.857 – 2.095 | | 0.472 – 1.446 | | 0.389 – 2.054 | | 0.714 – 1.740 | |
| 7. | Dose | | | | | | | | |
| | 2 nd dose | 209 (54.3) | 176 (45.7) | 82 (21.3) | 303 (78.7) | 32 (8.3) | 353 (91.7) | 168 (43.6) | 217 (56.4) |
| | 1 st dose | 7 (46.7) | 8 (53.3) | 1 (6.7) | 14 (93.3) | 0 (0) | 15 (100) | 2 (13.3) | 13 (86.7) |
| | χ^2 | 0.337 | | 1.880 | | 1.355 | | 5.425 | |
| | p | 0.561 | | 0.170 | | 0.621 | | 0.020* | |
| | OR | 1.357 | | 3.789 | | 2.842 | | 5.032 | |
| | C.I | 0.483 – 3.817 | | 0.491 – 29.236 | | 0.166 – 48.596 | | 1.120 – 22.604 | |

*p < 0.05, statistically significant at 95% Confidence Interval, OR – Odd’s Ratio, χ^2 – Chi-square, C.I – Confidence Interval

The students who had COVID-19 infection and tested positive are associated with perceiving themselves as not at elevated risk of acquiring COVID-19 again without vaccination [$\chi^2=5.726$, $p=0.017$, O.R=1.805] (Table 5).

The students who had history of COVID-19 infection in their family are associated with believing that the best preventive measure for COVID-19 is getting vaccinated [$\chi^2=6.538$, $p=0.011$, O.R=3.218] (Table 5).

Table 5
Association between myths, concerns regarding COVID-19 vaccination and related variables.

| S.No | Variables | I think that approval of the vaccine alone does not guarantees its safety | | I perceive myself not at elevated risk of acquiring COVID-19 | | The best preventive measure for COVID-19 is getting vaccinated | |
|-----------|----------------------|---|------------|--|------------|--|------------|
| | | Yes | No | Yes | No | No | Yes |
| 1. | Gender | | | | | | |
| | Female | 17 (6.3) | 253 (93.7) | 147 (54.4) | 123 (45.6) | 15 (5.6) | 255 (94.4) |
| | Male | 6 (4.6) | 124 (95.4) | 86 (66.2) | 44 (33.8) | 10 (7.7) | 120 (92.3) |
| | χ^2 | 0.457 | | 4.947 | | 0.684 | |
| | p | 0.499 | | 0.026* | | 0.408 | |
| | OR | 1.389 | | 0.611 | | 0.706 | |
| | C.I | 0.534 – 3.609 | | 0.396 – 0.945 | | 0.308 – 1.617 | |
| 2. | Age | | | | | | |
| | 21 – 23 years | 10 (9.8) | 92 (90.2) | 67 (65.7) | 35 (34.3) | 2 (2) | 100 (98) |
| | 18 – 20 years | 13 (4.4) | 285 (95.6) | 166 (55.7) | 132 (44.3) | 23 (7.7) | 275 (92.3) |
| | χ^2 | 4.152 | | 3.113 | | 4.299 | |
| | p | 0.042* | | 0.078 | | 0.038* | |
| | OR | 2.383 | | 1.522 | | 0.239 | |
| | C.I | 1.011 – 5.616 | | 0.953 – 2.431 | | 0.055 – 1.033 | |
| 3. | Year of Study | | | | | | |
| | Pre-Clinical | 8 (3.6) | 217 (96.4) | 131 (58.2) | 94 (41.8) | 16 (7.1) | 209 (92.9) |
| | Paraclinical | 15 (8.6) | 160 (91.4) | 102 (58.3) | 73 (41.7) | 9 (5.1) | 166 (94.9) |

| | | | | | | | |
|-----------|--|--|--------------------------|---|-------------------------|--|--------------------------|
| | χ^2 p OR C.I | 4.570 0.033* 0.393 0.163 – 0.950 | | 0.000 0.990 0.997 0.668 – 1.489 | | 0.651 0.420 1.412 0.609 – 3.276 | |
| 4. | Had COVID-19 infection? Yes No/Not Tested | 3 (3.1) 20 (6.6) | 93 (96.9) 284 (93.4) | 66 (68.8) 167 (54.9) | 30 (31.3) 137 (45.1) | 10 (10.4) 15 (4.9) | 86 (89.6) 289 (95.1) |
| | χ^2 p OR C.I | 1.606 0.205 0.458 0.133 – 1.576 | | 5.726 0.017* 1.805 1.109 – 2.938 | | 3.743 0.053 2.240 0.971 – 5.167 | |
| 5. | Had COVID-19 infection in the Family? Yes No/Not tested | 13 (6.3) 10 (5.1) | 192 (93.7) 185 (94.9) | 125 (61) 108 (55.4) | 80 (39) 87 (44.6) | 19 (9.3) 6 (3.1) | 186 (90.7) 189 (96.9) |
| | χ^2 p OR C.I | 0.271 0.602 1.253 0.536 – 2.927 | | 1.285 0.257 1.259 0.845 – 1.874 | | 6.538 0.011* 3.218 1.257 – 8.236 | |
| 6. | Type of Vaccine Covaxin Covishield | 2 (1.9) 21 (7.2) | 106 (98.1) 271 (92.8) | 63 (58.3) 170 (58.2) | 45 (41.7) 122 (41.8) | 2 (1.9) 23 (7.9) | 106 (98.1) 269 (92.1) |
| | χ^2 p OR C.I | 4.148 0.042* 0.243 0.056 – 1.057 | | 0.000 0.984 1.005 0.642 – 1.572 | | 4.884 0.027* 0.221 0.051 – 0.952 | |
| 7. | Dose 2 nd dose 1 st dose | 23 (6) 0 (0) | 362 (94) 15 (100) | 223 (57.8) 10 (66.7) | 162 (42.1) 5 (33.3) | 23 (6) 2 (13.3) | 362 (94) 13 (86.7) |
| | χ^2 p OR C.I | 0.951 0.330 2.009 0.116 – 34.636 | | 0.454 0.600 0.688 0.231 – 2.052 | | 1.334 0.248 0.413 0.088 – 1.940 | |

*p < 0.05, statistically significant at 95% Confidence Interval, OR – Odd's Ratio, χ^2 – Chi-square, C.I – Confidence Interval

DISCUSSION:

In this study, it was found that a significant proportion of students have myths and concerns regarding COVID-19 vaccination, like perceiving themselves as not at elevated risk of acquiring COVID-19 infection (58.3%) and having concern about the serious adverse events from the currently available COVID-19 vaccines (54%) (Table 2).

In the study done by Jyoti Jain et al. in India assessed 1068 medical students and found that 43.8% of students were concerned that the present COVID-19 vaccines might not be effective enough, 58.1% of students were concerned about the serious adverse events from the currently available COVID-19 vaccines and 47% students felt that present COVID-19 vaccines might not have been tested rigorously prior to launch⁷. Similar findings are observed in the present study – 37.3% of students were concerned that the current COVID-19 vaccines might not be effective enough, 54% of students were concerned about the serious adverse events from the currently available COVID-19 vaccines and 37.5% of students felt that current COVID-19 vaccines might not have been tested rigorously before launch.

A study done by Archana Kumari et al. in India assessed 201 participants who belong to the general population and found that 64.68% and 45.77% of participants believe that the development of the vaccine was rapid and the

unforeseen future effects that might be associated with it respectively¹². Unlike the above study, in the present study, 37.5% and 20.8% of students have concerns that present COVID-19 vaccines may not have been tested rigorously before launch and side effects of the COVID-19 vaccine are dangerous respectively; this could be due to medical students are more knowledgeable than the general population.

In the study done by Omer Bin Khalid Jamil et al. in Karachi assessed 401 undergraduate medical students and found that 26.4% of students believed that researchers rush in developing the COVID-19 vaccine, so its safety and efficacy cannot be trusted, 11% of students concerned that vaccine enters into your cells and mutates your DNA and 16.5% students believe that the side effects of the COVID-19 vaccine are dangerous¹³. In the current study, similar findings are observed – 37.5% of students are concerned that present COVID-19 vaccines may not have been tested rigorously before launch, 8% of students believe that the COVID-19 vaccine will enter your cells & changes your DNA and 20.8% of students think that side effects of the COVID-19 vaccine are dangerous.

In the study done by Gadoth et al. in Los Angeles among 609 healthcare workers assessed COVID-19 vaccine hesitancy, found out over one-third of participants (35.0%) expressed concern about serious adverse effects from vaccine use¹⁴. In the current study, more than half of the participants (54%) were concerned about the serious adverse events from the currently available COVID-19 vaccines. This increased frequency of concern may be due to differences in the study population and country.

In a similar study done by Kelekar et al. in the USA among 248 dental and 167 medical students, found out 76.7% of Medical & 54.1% of Dental students are concerned that a COVID-19 vaccine may not be effective and 54.6% of Medical & 63.9% Dental students are concerned about serious adverse effects from a COVID-19 vaccine¹⁵. In the present study, 37.3% of students were concerned that the current COVID-19 vaccines may not be effective enough and 54% of students were concerned about the serious adverse events from the currently available COVID-19 vaccines.

CONCLUSION:

The undergraduate medical students lack awareness regarding COVID-19 vaccination eligibility, have concerns regarding adverse events and the efficacy of the COVID-19 vaccine. Although vaccine hesitancy showed a diminishing trend over time, health education programs tailored to boost awareness regarding vaccines and improve trust by government agencies would be helpful. As future health care providers, medical students' concerns should be prioritized.

FINANCIAL SUPPORT: None declared

CONFLICT OF INTEREST: None declared

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