

# Reasons for hesitancy to take COVID-19 vaccine: A survey amongst healthcare workers

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## Abstract

**Background:** Concern about vaccine hesitancy is growing worldwide. Vaccine hesitancy can have effects for both the individual and the community, especially in the context of severe acute respiratory syndrome coronavirus 2 disease (COVID-19) pandemic.

**Methods:** A 16-item questionnaire was administered to 385 healthcare workers to find out the reasons for COVID-19 vaccine hesitancy.

**Results:** Their mean age was  $36.6 \pm 9.6$  years. 'Fear of getting side effects' (61.8%) was the most common reason for vaccine hesitancy, followed by reasons such as 'to wait and observe for some more time' (60.3%), 'doubts on safety and efficacy of vaccine' (49.4%), 'The intensity of COVID-19 has come down' (36.6%), 'self-perception of having good immunity' (33.8%), 'need to apply for leave' (30.3%) and 'Fear of death' (29.0%). 'To wait and observe for some more time' was the major reason for hesitancy amongst men. Security guards were more hesitant to take the vaccine, because of side effects, whereas doctors and sanitary workers wanted to wait and observe for some more time.

**Conclusions:** Factors identified in the present study need to be addressed for overcoming vaccine hesitancy.

**Keywords:** COVID -19, healthcare workers, vaccine hesitancy

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## INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) disease (COVID-19) pandemic, has been infecting more than 5.5 million over 144 countries.<sup>[1-3]</sup> The pandemic poses a significant threat to the public health system<sup>[3,4]</sup> including catastrophic economic consequences around the world. Concern about vaccine hesitancy is growing worldwide;<sup>[5]</sup> in fact, the World Health Organization (WHO) identified it as one of the top ten global health threats in 2019. In many countries, vaccine

hesitancy and misinformation present substantial obstacles to achieving coverage and community immunity.<sup>[5]</sup>

In 2015, the WHO Strategic Advisory Group of Experts on Immunization defined vaccine hesitancy as a 'delay in acceptance or refusal of vaccination despite availability of vaccination services'.<sup>[6]</sup> There is a continuum from acceptance to refusal of all vaccines, with vaccine hesitancy considered to reside between the two poles and potential variation within individuals in stance on vaccination for different diseases. Vaccine hesitancy can have effects for

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both the individual (a greater risk of having the disease) and potentially the community (greater virus transmission). Misinformation spread through multiple channels could have a considerable effect on the acceptance of a COVID-19 vaccine.<sup>[1]</sup> The accelerated pace of vaccine development has further heightened public anxieties and could compromise acceptance.<sup>[1]</sup> Governments and societies must gauge current levels of willingness to receive a potentially safe and effective COVID-19 vaccine and identify correlates of vaccine hesitancy and/or acceptance. Equitable vaccination across all population groups is challenging due to the complex human behaviour which changes over space and time.<sup>[7]</sup>

An individual's decision as to whether to accept a vaccine can be understood as a weighing up of risk and benefit. Vaccine hesitancy is seen when there is a low perception of need for a vaccination (termed complacency) and concerns over the efficacy and safety (termed low confidence).<sup>[8]</sup>

COVID-19 vaccination programme was launched by the Government of India on 16<sup>th</sup> January 2021 for healthcare workers on priority basis. In spite of free supply of the vaccine, beneficiaries did not turn up to the extent expected. Hence, the present study was aimed at finding out the proportion of various reasons for vaccine hesitancy amongst healthcare workers, who served at a tertiary care, state COVID hospital in Tirupati, South India.

### MATERIAL AND METHODS

The present cross-sectional study was conducted on 16<sup>th</sup> February 2021 amongst health-care workers (doctors, nurses, personal assistants, laboratory technicians and sanitary workers) at our tertiary care teaching hospital in Tirupati, South India, which also served as the 'State COVID hospital'. The study was initiated after obtaining approval from the institutional ethics committee. Written informed consent was taken from all study participants.

A 16-item questionnaire which contained most common reasons for vaccine hesitancy along with an open-ended question to mention any other reasons was administered to all the study participants. The questionnaires were distributed and collected on the same day. For each item, three response options, namely, Yes/No/I cannot say were given. All the 'Yes' Responses were taken into consideration to assess hesitancy.

### Statistical analysis

Data were entered into MS Excel (Microsoft Corporation, Redmond, WA, USA). For statistical analysis, the 16 study

questions were categorised into seven clusters, namely fear of side effects; to wait and observe for some more time; doubts on safety and efficacy of vaccine; intensity of COVID-19 has come down; self-perception of having; fear of death and need to apply for leave.

All quantitative variables are presented as mean  $\pm$  standard deviation. Chi-square test was used to study the association between vaccine hesitancy and responses to each of the questions. A two-tailed  $P < 0.05$  was considered statistically significant. Statistical analysis was carried out using IBM SPSS statistical software version 26 (IBM Corp Somers NY, USA).

### RESULTS

A total of 479 healthcare workers were screened for inclusion in the study, of which 94 were excluded. Reasons for exclusion were pregnant women ( $n = 13$ ), lactating women ( $n = 23$ ), severe medical/surgical illnesses ( $n = 42$ ) and incomplete data ( $n = 16$ ). Responses from 385 healthcare workers were considered for analysis. Their mean age was  $36.6 \pm 9.6$  years (range: 18–69 years). 'Fear of getting side effects' (61.8%) (fever, headache, body pains, muscle pains, cough and cold) was the most common reason for vaccine hesitancy, followed by reasons such as 'to wait and observe for some more time' (60.3%), 'doubts on safety and efficacy of vaccine' (49.4%), 'the intensity of covid-19 has come down' (36.6%), 'self-perception of having good immunity' (33.8%), 'need to apply for leave' (30.3%) and 'fear of death' (29.0%) (Table 1).

**Table 1: Reasons for COVID-19 vaccine hesitancy in healthcare workers (n=385)**

| Reasons for vaccine hesitancy            | "Yes" response (%) |
|--|--------------------|
| Fear of side effects                     | 61.8               |
| To wait and observe for some more time   | 60.3               |
| Doubts on safety and efficacy of vaccine | 49.4               |
| Intensity of COVID-19 has come down      | 36.6               |
| Self-perception of having good immunity  | 33.8               |
| Need to apply for leave                  | 30.3               |
| Fear of death                            | 29.0               |

COVID-19=severe acute respiratory syndrome coronavirus 2 disease

Women (59.3%) were more worried about the 'safety and efficacy of the vaccine', compared to men (39.3%) ( $P < 0.001$ ) and 66.6% of women wanted 'to wait and observe for some more time' compared to men (53.9%) ( $P = 0.026$ ). Majority of men (40.3%) believed that they had good immunity compared to women (27.3%) ( $P = 0.017$ ).

There were no statistically significant gender differences with respect to reasons, such as, 'fear of getting side

effects' ( $P = 0.461$ ), 'the intensity of COVID 19 has come down' ( $P = 0.632$ ), 'fear of death' ( $P = 0.659$ ) and 'need to apply for leave' ( $P = 0.664$ ) (Table 2).

Significant age differences were noticed in reasons, such as, 'fear of Side Effects' ( $P = 0.020$ ), 'fear of death' ( $P = 0.034$ ), 'the intensity of COVID-19 has come down' ( $P = 0.036$ ) and 'doubts on safety and efficacy of vaccine' ( $P = 0.043$ ) in young adults (18–35 years) compared to the other two age groups such as 36–50 years and above 50 years. There were no significant age differences with respect to the reason, 'self-perception of having good immunity' ( $P = 0.215$ ), 'to wait and observe for some more time' ( $P = 0.834$ ) and 'need to apply for leave' ( $P = 0.107$ ) (Table 3).

Significant occupational differences were observed with respect to reasons such as 'Fear of side effects', 'Doubts on safety and efficacy of vaccine', 'Self-perception of having good immunity', 'To wait and observe for some more time',

'The intensity of COVID-19 has come down', 'Need to Apply for leave' and 'Fear of death' ( $P < 0.01$ ).

Fear of side effects (87.6%), self-perception of having good immunity (56.2%), need to apply for leave (42.9%) and fear of death (44.8%) were the main reasons for hesitancy to take COVID-19 vaccine in security guards compared to other healthcare workers. Nurses were more worried about the safety and efficacy of vaccine (67.7%). Most of the laboratory technicians (41.1%) were of the opinion that the 'Intensity of COVID-19 has come down' and majority of the sanitary workers (76.9%) followed by doctors (71.4%) wanted to 'Wait and observe for some more time' to take COVID-19 vaccine (Table 4).

## DISCUSSION

Fear of side effects was the most commonly cited reason for hesitancy to take COVID-19 vaccine amongst study

**Table 2: Reasons for vaccine hesitancy as per gender**

| Reasons for vaccine hesitancy            | "Yes" (%)   |               | P-value |
|--|-------------|---------------|---------|
|  | Men (n=191) | Women (n=194) |         |
| Fear of side effects                     | 64.9        | 58.8          | 0.461   |
| Self-perception of having good immunity  | 40.3        | 27.3          | 0.017   |
| Doubts on safety and efficacy of vaccine | 39.3        | 59.3          | 0.000   |
| Intensity of COVID-19 has come down      | 35.1        | 38.1          | 0.632   |
| To wait and observe for some more time   | 53.9        | 66.6          | 0.026   |
| Need to apply for leave                  | 28.8        | 32.0          | 0.664   |
| Fear of death                            | 29.3        | 28.9          | 0.659   |

COVID-19=severe acute respiratory syndrome coronavirus 2 disease

**Table 3: Reasons for COVID-19 vaccine hesitancy in different age groups**

| Reasons for vaccine hesitancy            | Yes (%)             |                     |                  | P-value |
|--|---------------------|---------------------|------------------|---------|
|  | 18-35 years (n=191) | 36-50 years (n=158) | >50 years (n=36) |         |
| Fear of side effects                     | 62.8                | 61.4                | 58.3             | 0.020   |
| Self-perception of having good immunity  | 36.1                | 30.4                | 36.1             | 0.215   |
| Doubts on safety and efficacy of vaccine | 56.0                | 44.3                | 36.1             | 0.043   |
| Intensity of COVID-19 has come down      | 41.4                | 29.7                | 36.6             | 0.036   |
| To wait and observe for some more time   | 60.7                | 60.8                | 55.6             | 0.834   |
| Need to apply for leave                  | 35.1                | 27.8                | 16.7             | 0.107   |
| Fear of death                            | 34.6                | 25.3                | 16.7             | 0.034   |

COVID-19=severe acute respiratory syndrome coronavirus 2 disease

**Table 4: Reasons for COVID-19 vaccine hesitancy according to category of healthcare workers**

| Reasons for vaccine hesitancy            | Yes (%)        |                |                               |                            |                         |                         | P-value |
|--|----------------|----------------|-------------------------------|----------------------------|-------------------------|-------------------------|---------|
|  | Doctors (n=49) | Nurse s (n=65) | Laboratory technicians (n=73) | Personal assistants (n=54) | Sanitary workers (n=39) | Security guards (n=105) |         |
| Fear of side effects                     | 46.9           | 52.3           | 63.0                          | 50.0                       | 41.0                    | 87.6                    | <0.001  |
| Self-perception of having good immunity  | 18.4           | 10.8           | 34.2                          | 37.0                       | 25.6                    | 56.2                    | <0.001  |
| Doubts on safety and efficacy of vaccine | 53.1           | 67.7           | 58.9                          | 46.3                       | 41.0                    | 34.3                    | <0.001  |
| Intensity of COVID-19 has come down      | 32.7           | 38.5           | 41.1                          | 33.3                       | 25.6                    | 40.0                    | <0.001  |
| To wait and observe for some more time   | 71.4           | 66.2           | 61.6                          | 68.5                       | 76.9                    | 40.0                    | <0.001  |
| Need to apply for leave                  | 28.6           | 40.0           | 19.2                          | 14.8                       | 25.6                    | 42.9                    | <0.001  |
| Fear of death                            | 18.4           | 40.0           | 26.0                          | 3.7                        | 23.1                    | 44.8                    | <0.001  |

COVID-19=severe acute respiratory syndrome coronavirus 2 disease

population (61.8%), followed by reasons such as 'to wait and observe for some more time' (60.3%), 'doubts on safety and efficacy of vaccine' (49.4%), 'the intensity of covid-19 has come down' (36.6%) and 'self-perception of having good immunity' (33.8%). In a review<sup>[9]</sup> on worldwide COVID-19 vaccine hesitancy, highest vaccine acceptance was reported in countries like Ecuador (97%), Malaysia (94.3%), Indonesia (93.3%) and China (91.3%). Lowest vaccine acceptance is reported in countries like Jordan (28.4%) and Kuwait (23.6%).

A study<sup>[10]</sup> conducted in France during the COVID-19 pandemic showed 75% of the respondents likely to get vaccinated once it becomes available and 48% of respondents accepted to participate in COVID-19 clinical trials. It also showed that healthcare workers are more prone to get vaccinated than non-healthcare workers. In a study<sup>[11]</sup> conducted in Indonesia, 93.3% of the participants would like to get vaccinated for 95% effective vaccine and 67% of the participants for 80% effective vaccine. In our study, 'Doubts on safety and efficacy of the vaccine' was the third top most reason (49.4%) for hesitancy to take the vaccine. Most of the earlier studies<sup>[9-11]</sup> were done before vaccine came into existence, so there could have been doubts on safety and efficacy on different types of vaccines. People were eager to get vaccinated when it was in clinical trials, but after availability, 49.4% were hesitant, doubting the safety and efficacy of vaccine.

In a study<sup>[12]</sup> conducted in Kuwait, 53.1% of the participants were willing to get vaccinated and physicians were most willing to take the vaccine. Prior influenza vaccine uptake was associated with increased willingness to accept COVID-19 vaccine. In our study, 71.4% of the doctors wanted 'to wait and observe for some more time' to take the vaccine and 53.1% were 'doubting the safety and efficacy' of the vaccine. As influenza vaccine was not routinely taken in India, comparative study was not possible.

A study<sup>[13]</sup> conducted in French population during May 2020 to October 2020, showed women, young people, less educated and individuals dissatisfied with governments response to COVID-19 crisis were more hesitant to take COVID-19 vaccine, whereas in our study, women were more concerned about safety and efficacy of the vaccine and they wanted to wait and observe for some more time and men had self-perception of having good immunity.

In a study<sup>[14]</sup> conducted on Maltese healthcare workers, 52% were likely to take the vaccine, 22% were undecided and 26% were unlikely to take the vaccine. Amongst them doctors, men and those who had taken influenza vaccine

were more likely to take the vaccine, whereas those who were not willing to take the vaccine had insufficient knowledge and had fear of unknown side effects as it was a novel vaccine. In our study, 61.8% expressed fear of side effects.

In our study, significant age differences were found with respect to reasons such as 'Fear of side effects', 'Doubts on safety and efficacy of vaccine' and 'The intensity of COVID-19 has come down'. Younger participants were more hesitant when compared to older participants.

In a web-based national survey<sup>[15]</sup> conducted in Saudi Arabia, older age group participants (45 years and above), married, those with postgraduate and higher educational qualification and those who were employed in government sector showed higher vaccine acceptance. Our study is in correlation with this study with respect to younger age group hesitancy in taking the vaccine. This could probably be due to high confidence levels in younger age groups.

A survey<sup>[16]</sup> conducted on 1205 Nurses in Hong Kong during mid-March to late April 2020 showed that influenza vaccine uptake and the proportion intending to take COVID-19 vaccine were 49% and 63%, respectively, and younger age group participants were more willing to take the vaccine in contradistinction to the present study.

A study<sup>[17]</sup> conducted on 968 Italians on mistrust in biomedical research and vaccine hesitancy showed that middle-aged group participants were less likely to take the vaccine compared to 18–34-year age group and there were no significant differences between younger and older (above 60 years) participants in hesitancy to take COVID-19 vaccine, but in our study, young people were more hesitant to take the COVID-19 vaccine.

In our study, nurses (67.7%) were more doubtful about the safety and efficacy of vaccine when compared to laboratory technicians (58.9%) and doctors (53.1%). A study conducted on 1941 Israeli population (healthcare workers and general public) showed that nurses and medical workers who had not cared for SARS-COV-2 patients were not willing to take the vaccine.<sup>[18]</sup> In spite of serving at the state COVID hospital for almost an year, majority of the nurses expressed hesitancy in taking the vaccine. This could probably be due to recent discovery of the vaccine. In an online survey conducted on COVID-19 vaccination hesitancy in the USA, multiple regression analysis showed that sex, education, employment, income, having children at home and perceived threat of getting infected with COVID-19 in



the next 1 year were the reasons for COVID-19 vaccination hesitancy.<sup>[19]</sup> The results of our study were similar. In a study from Mumbai,<sup>[20]</sup> vaccine hesitancy can be a major hindrance to achieve desired vaccination coverage in India. Our observations have been similar.

In conclusion, our observations suggest that healthcare workers, instead of setting an example to the general public showed more hesitancy. The factors identified as reasons for vaccine hesitancy can guide policymakers to design health education initiatives to promote vaccine acceptance.

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### Conflicts of interest

B. Vengamma is Honorary Editor-in-chief of Journal of Clinical and Scientific Research. Swetha Rao and Ram are faculty members of Sri Venkateswara Institute of Medical sciences, Tirupati, of which Journal of Clinical and Scientific Research is the official Publication. The article was subject to the journal's standard procedures, with peer review handled independently of these faculty and their research groups.

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