Introduction

Corona virus disease (COVID-19) is a fatal disease that continues to affect many countries throughout the globe. It is caused by severe acute respiratory syndrome corona virus 2 (SARS-COV-2), a novel corona virus strain that has become a major public health problem around the world. Some of the greatest hurdles to dedication to hygienic standards are a lack of scientific testing for the vaccination, the fear of vaccine side effects, and reports of active viruses in immunizations. National and international health groups are launching initiatives to promote public knowledge about the COVID-19 vaccinations. This study aimed to understand the knowledge, attitude, and hesitancy toward the COVID-19 vaccine among the people of the Hazaribag district from Jharkhand. Methodology: The present study was conducted in Sheikh Bhikhari Medical College and Hospital, a tertiary care hospital of Jharkhand. It was a cross-sectional study. The research was conducted from June 2021 to December 2021. Result: The majority of respondents (83.3%) were confident in taking the COVID-19 vaccine, and 76% respondents agreed that the COVID-19 vaccinations now in use were safe; nevertheless, concern was expressed by 8% of respondents, whereas neutrality was expressed by 15.1%. Conclusion: Overall, the participants in the study had a good understanding of the coronavirus vaccine and agreed to take it. The development of mild or major side effects following immunization is the most important determinant for vaccine reluctance. Vaccine acceptability may improve whenever more information about vaccine safety and efficacy becomes available in the public domain, preferably from a centralized, trustworthy source. To promote public vaccination acceptance and reduce vaccine hesitancy, ongoing training and health education programs are required.

Keywords: COVID-19 vaccine, knowledge and attitude toward COVID-19 vaccine, vaccine acceptance, vaccine hesitancy
preliminary evidence suggests that the licensed vaccines are safe and effective, long-term efficacy and any long-term negative effects are mostly unknown. Understandably, both healthcare experts and the general public are skeptical of the new vaccine's efficacy. In addition to this, a strong anti-vaccine movement with multiple pseudo-scientific conspiracy theories has flooded the media reports. It is for these reasons that vaccine hesitancy may become an important challenge in the immunization campaign against COVID-19. Vaccination against COVID-19 is voluntary in most countries, and it is therefore important to understand the current views of local populations for the success of vaccination programs. As is known, the role of primary care physicians and the family physician has grown as a result of the pandemic. A large number of patients come in contact with primary physicians. Numerous patients and their relatives ask for COVID-19 vaccination. Therefore, primary care providers and family physicians have the opportunity to check the overall health status of their patients and make a necessary update regarding COVID-19 vaccination as well as motivate them.

This study aimed to understand the knowledge, attitude, and hesitancy toward the COVID-19 vaccine among the people of the Hazaribag district from Jharkhand.

Material and Method

The present study was conducted in Sheikh Bhikhari Medical College and Hospital, a tertiary care hospital of Jharkhand. The Hazaribag district is located in the northern part of Jharkhand and shares a border with Bihar. It is better connected with other areas of Bihar and Jharkhand, and as per census 2011, the overall literacy rate of Hazaribag was 70.48%. It was a cross-sectional study. The research was conducted from June 2021 to December 2021. Data were collected from June 2021 to September 2021. Attendents of patients coming to the medicine out-patient department (OPD) of Sheikh Bhikhari medical college and Hospital, Hazaribag, were invited to participate in the study. It was decided to collect data on two fixed days of OPD, that is, Monday and Thursday. The average footfall in medicine OPD stands between 50 and 60 patients. It was decided to contact 10 subjects per day of data collection. Every fifth patient's attendant was contacted on each day of data collection until meeting with the tenth subject. In this way, a total of 340 subjects were contacted during the data collection period. However, 35 attendants refused to participate in the study, and hence, a total of 305 subjects were included in the study. Only subjects of age 18 years and above who were willing to participate in the study were eligible to participate. Data were collected in a pre-tested semi-structured questionnaire. Informed consent was taken from each subject prior to the study. The study was approved by the institutional ethical committee of Sheikh Bhikhari Medical College and Hospital.

Statistical analysis: The data were entered into an MS Excel spreadsheet, coded appropriately, and then analyzed in SPSS version 21.0. The frequency and percentages were used to represent categorical data. For classified variables, Pearson’s Chi-square test was employed to assess the relationship between variables.

Result

A total of 305 people took part in the survey, with 74.1% of men and 25.9% of women. The participants’ average age was 33.12 (±11.08) years. About half of the participants in the study had a literacy level of less than the tenth grade. The majority of the participants (78%) work in private or other jobs. Only 2% work for the government, 12.8% are students, and 9% were retirees. The majority of the participants (86.6%) were from the below poverty line (BPL) household, whereas 13.4% were from the above poverty line (APL) [Table 1].

The majority of respondents (94.4%) heard about the COVID-19 vaccine, and 86.2% correctly knew recommended doses of the vaccine. About 41% of respondents had correct knowledge that the vaccine was protective after a certain period, 24.9% had incorrect knowledge, and 34.1% were neutral. Similarly, half of the respondents had known that the vaccine is protective because of the rising of antibodies against COVID-19. Correct knowledge regarding vaccination in children was limited to only (5.2%). Most of the participants (70.8%) knew side effects such as fever [Table 2].

The majority of the respondents (83.3%) had confidence in taking the COVID-19 vaccine, and 76.1% think that the Indian

| Table 1: Socio-demographic details of the study participants (n=305) |
|---------------------------------------------------------------|
| **Characteristics** | **Number** | **Percentage** |
|---------------------|------------|----------------|
| **Gender**          |            |                |
| Male                | 226        | 74.1           |
| Female              | 79         | 25.9           |
| **Marital status**  |            |                |
| Married             | 98         | 32.1           |
| Unmarried           | 204        | 66.9           |
| Widow               | 3          | 1.0            |
| **Educational status** |          |                |
| Illiterate          | 39         | 12.8           |
| Less than 10th      | 115        | 37.7           |
| Graduate            | 129        | 42.3           |
| Post-graduate       | 22         | 7.2            |
| **Occupation**      |            |                |
| Student             | 39         | 12.8           |
| Private Job         | 139        | 45.6           |
| Govt Job            | 6          | 2.0            |
| Retired             | 21         | 6.9            |
| Others              | 100        | 32.8           |
| **Socio-economic status** |      |                |
| BPL                 | 264        | 86.6           |
| APL                 | 41         | 13.4           |
| **Residence**       |            |                |
| Rural               | 174        | 57.0           |
| Urban               | 131        | 43.0           |
vaccine is safe for use. About 69% opined Covishield is a better vaccine, whereas 21.3% opined Covaxin is better. Half of the respondents accept that they would take the vaccine after the recommendation of their relative/friend, and 37.1% of the participants were willing to get the vaccine even if they need to pay. Among 305 subjects, 203 (66.6%) knew that individuals can still be infected after vaccinations, whereas 17 (5.6%) think no and 85 (27.9%) had no opinion [Table 3].

Out of 305 study participants, 245 (80.3%) said that all family members in the age group 18–60 years took at least one dose of the COVID-19 vaccine. However, people aged more than 60 years were vaccinated in families of only 63 (20.7%) study participants [Table 4].

The confidence in the Indian COVID-19 vaccine was significantly associated with gender, educational status, and socioeconomic status of study participants but with the place of residence. Similarly, the willingness to pay for the COVID-19 vaccine was significantly associated with the educational status and socio-economic status of study participants. However, the willingness to pay for the COVID-19 vaccine was not significantly associated with gender and place of residence of study participants [Tables 5 and 6].

**Discussion**

The COVID-19 pandemic continues to pose a threat to the world. Vaccination provides a big hope for finding a way to stop the virus from spreading. Vaccines against the coronavirus are now widely accessible. A vaccination must, however, be acceptable and used by the majority of the population to be effective. The first step in advancing public education is to understand the problem. Disease transmission, preventive measures, and vaccination information are all critical for promoting vaccine adoption and reducing vaccine hesitancy among the general public to eradicate the coronavirus infection.

Vaccines have traditionally been delivered through primary care practices. Because many patients obtained their immunizations...
Table 4: Acceptance of COVID-19 vaccination at the family level of study participants (n=305)

| Age group | Number | Percentage |
|-----------|--------|------------|
| Taken     | 245    | 80.3       |
| Not taken | 60     | 19.7       |
| >60 years | 15     | 5.7        |
| Taken     | 63     | 20.7       |
| Not taken | 242    | 79.3       |

Table 5: Association between selected socio-demographic variables and attitude regarding the confidence in the Indian COVID-19 vaccine (n=305)

| Socio-demographic variables | Confidence in the Indian COVID-19 vaccine | P |
|-----------------------------|-----------------------------------------|---|
| Gender                      | Yes (83.6%), No (3.1%), No opinion (13.3%) | 0.001 |
| Male                        | 189                                  | 7 (3.1%) |
| Female                      | 65                                   | 10 (12.7%) |
| Educational status          |                                       | 4 (5.1%) |
| Illiterate                  | 24 (61.5%)                           | 6 (15.4%) |
| Less than 10<sup>th</sup>   | 92 (80.0%)                           | 20 (17.4%) |
| Graduate                    | 117 (90.7%)                          | 8 (6.2%) |
| Post-graduate               | 21 (95.5%)                           | 0 (0.0%) |
| Socio-economic status       |                                       |   |
| BPL                         | 215 (81.4%)                          | 34 (12.9%) |
| APL                         | 39 (95.1%)                           | 2 (4.9%) |
| Residence                   |                                       | 0 (0.0%) |
| Rural                       | 144 (82.8%)                          | 18 (10.3%) |
| Urban                       | 110 (84.0%)                          | 5 (3.8%) |

Table 6: Association between selected socio-demographic variables and attitude regarding the willingness to pay for the COVID-19 vaccine (n=305)

| Socio-demographic variables | Willingness to pay for the COVID-19 vaccine | P |
|-----------------------------|--------------------------------------------|---|
| Gender                      | Yes (35.8%), No (24.3%), No opinion (39.8%) | 0.314 |
| Male                        | 81                                        | 55 (24.3%) |
| Female                      | 34                                        | 21 (26.6%) |
| Educational status          |                                          | 24 (30.4%) |
| Illiterate                  | 19 (48.7%)                               | 10 (25.6%) |
| Less than 10<sup>th</sup>   | 27 (23.5%)                               | 59 (51.3%) |
| Graduate                    | 65 (50.4%)                               | 39 (30.2%) |
| Post-graduate               | 4 (18.2%)                                | 6 (27.3%) |
| Socio-economic status       |                                           |   |
| BPL                         | 91 (34.5%)                               | 105 (39.8%) |
| APL                         | 24 (38.5%)                               | 8 (19.5%) |
| Residence                   |                                           | 9 (22.0%) |
| Rural                       | 60 (35.5%)                               | 72 (41.4%) |
| Urban                       | 55 (42.0%)                               | 42 (32.1%) |

From their primary care provider, these same providers may play a key role in the COVID-19 immunization distribution and delivery. Whether primary care physicians administer the vaccine or just provide vaccination counseling, their role could assist and ensure that the COVID-19 vaccines are delivered successfully to communities across the country, including rural and isolated areas. In addition to giving immunizations, primary care physicians can give clinical and psychosocial support to help patients understand their current COVID-19 immunologic status, how it may affect vaccine decisions, and how to overcome vaccine hesitation and misinformation. In some studies high acceptance levels of about 86.3% (Sharun et al. 2020)<sup>[4]</sup>, 77.3% (Gautam et al. 2020)<sup>[5]</sup>, 74.5% (Lazarus et al. 2021)<sup>[6]</sup>, and 74% (Kazi Abdul and Khandaker Mursheda 2020)<sup>[7]</sup> were recorded. These studies were conducted before the COVID-19 vaccination program (when the spread was intensive with an alarming number of cases registered per day had started in India).<sup>[8-10]</sup> We also observed that 86% of those who took part in our survey had accurate information regarding the vaccination, and 83% stated that they were comfortable receiving it. Similarly, high acceptance for the COVID-19 vaccine was observed in other studies conducted by Thunstrom et al<sup>[11]</sup> in 2020 in the United States (80%) and by Fu et al<sup>[12]</sup> in China in 2020 (72.5%). On the other hand, a study conducted in Kuwait revealed a low level of vaccination acceptance (53.1%).<sup>[13]</sup>

The vaccination campaign in India began on January 16, 2021, and nearly all the participants were aware of it, with television and social media serving as the primary sources of information. However, people of India were reluctant and apprehensive about the side effects and effectiveness of vaccines developed in India as reported by newspapers and other media sources. In the present study as well, a lack of awareness was evident in other instances, such as 25% of respondents not knowing about the indigenous vaccine (Covaxin) and 41% of respondents having no opinion on India's non-mandatory policy. Vaccination in children was unknown to 88.9% of respondents.

The majority of respondents (76%) believed that the currently administered COVID-19 vaccines were safe; nevertheless, 8% of respondents expressed concern, whereas 15.1% expressed neutrality. It could be attributed to the effectiveness of public awareness programs by the government in raising vaccine awareness and acceptance among citizens. These public awareness programs are necessary to minimize vaccine apprehension, promote vaccine acceptability, and dispel vaccine myths. Previous studies in other countries found that vaccine acceptance rates varied greatly from country to country, with rates ranging from about 93% in Tonga to less than 43% in Egypt.<sup>[14]</sup>

The present study also highlighted the role of family members and friends in raising awareness for the COVID-19 vaccine as about 55% of respondents said that they would take the vaccine if recommended by their relatives and friends. The literacy and socioeconomic status of the population are important determinants for acceptance of any awareness drive. Our study...
also revealed that there was a positive association between the willingness to pay for the vaccine and the educational status and socio-economic status of study participants. However, the willingness to pay for the COVID-19 vaccine was not significantly associated with gender and place of residence of study participants. Similarly, the confidence in the Indian vaccine was significantly associated with gender, socio-economic status, and educational status.

**Limitation**

The study could only involve a small portion of the population, and it is a major limitation of the study. Another limitation of the study was that it did not include equal numbers of people from different socioeconomic and occupational groups, which could have skewed the results.

**Conclusion**

The study’s participants had good knowledge of the coronavirus and its vaccine. Although the vaccine was well-received by the volunteers, there are some reservations about it because of a lack of clinical trials and fears of negative effects. It is critical to provide adequate information on vaccines. To promote public vaccination acceptance and reduce vaccine hesitancy, ongoing training and health education programs are required.

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**Conflicts of interest**

There are no conflicts of interest.

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