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Potential vaccine hesitancy regarding COVID-19 vaccines in Kashmiri population

Syed Najmul Ain¹, Rabia Ahmad¹, Reyana Qulsum², Mohamad Azhar Gilani³

Abstract:

BACKGROUND: India is all set to begin vaccination against COVID-19. A good number of people are falling prey to anti-vaccination campaigns, and therefore, some amount of vaccine hesitancy must have developed. The primary objective of the study was to find the level of potential COVID-19 vaccine hesitancy in Kashmiri population.

MATERIALS AND METHODS: This was a cross-sectional study conducted in the valley of Kashmir. A predesigned questionnaire was shared online. The participation of respondents was voluntary. Exclusions were made on account of residence outside Kashmir valley, duplicate forms, and wrong information. The data were entered into Microsoft Excel 2010 and analyzed using SPSS version 23.

RESULTS: A total of 487 respondents were included. About 67% of the participants were in the age group of ≤ 30 years, 55% female, 54% rural, and 16% had ever been COVID-19 positive. About 14% of the participants were completely hesitant about receiving the COVID-19 vaccine, whereas 40% were unsure if they will accept the vaccination. The main reason for the total nonacceptance of the vaccine was the doubts about the safety of COVID-19 vaccines (67%). Urban people were more likely to be hesitant to the vaccine than rural people (odds ratio [OR] 1.845, confidence interval CI 1.022 to 3.333). Those who were ever COVID-19 positive were 3.3 times more likely to say "no" to COVID-19 vaccination than those who were never positive.

CONCLUSION: Strategic steps must be taken to minimize the vaccine hesitancy associated with COVID-19 vaccination. Authorities should direct efforts toward vaccine education, creating awareness among people about the importance of COVID-19 vaccination.

Keywords:

Behaviour, compliance, COVID-19, vaccine

Introduction

Vaccination has long proved to be one of the most important and efficient measures undertaken by the public health industry against infectious diseases. It has largely helped contain the spread of, and in the prevention of deadly and morbid diseases with high mortality rates. As the entire world is struggling with the coronavirus pandemic, there has never been more urgency in the making of a vaccine. A number of vaccine candidates are in the trial as of now and some have

been approved for use. Vaccination process has already kicked off in the US, UK, and some other European nations.^[1] India, on the other hand, is all set to approve a vaccine for COVID-19 in a few weeks' time and a number of vaccine candidates are already in trial.^[2] The first round of dry run has been conducted in four states which include Andhra Pradesh, Assam, Gujarat, and Punjab. Other states are going to follow suit and the vaccine is expected to be available soon.^[3] The purpose of dry run is to detect beforehand, any lacunae or loopholes that may be present in the logistics, workforce, or operational feasibility of the vaccination

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¹Senior Resident at
The Department of
Community Medicine,
GMC, Baramulla,
Jammu and Kashmir,
India, ²Senior Resident
at The Department of
Community Medicine,
SKIMS Soura, Srinagar,
Jammu and Kashmir,
India, ³Post-graduate
Student at the Department
of Orthopaedics SKIMS
Medical College, Srinagar,
Jammu and Kashmir, India

Address for correspondence:

Dr. Mohamad Azhar Gilani,
Noorbagh,
Baramulla - 193 101,
Jammu and Kashmir, India.
E-mail: azhargilani123@gmail.com

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process. Since the preparations are in full swing, a question that arises is that of public response when the vaccination is actually available and if the people will accept the vaccination? If yes, to what extent? Given the fact that a lot of propaganda is being disseminated online in the form of fake news and conspiracy theories, and that the society lacks in scientific temperament already, a good number of people are falling prey to anti-vaccination campaigns giving rise to more and more “anti-vaxxers” in the country, who believe COVID-19 to be nothing more than a hoax – and a conspiracy.^[4] A critical question raised is the unusually fast development of the vaccine.^[5] In light of the reasons above, it could be a challenge for the authorities in Kashmir to accomplish their goal of achieving immunity against COVID-19 through vaccination. It remains to be seen how far are people going to embrace or reject the vaccine, and if it is skepticism or certainty that dominates the public attitude. Keeping all these things in view, this study, therefore, was carried out with the aim to determine the level of vaccine hesitancy to COVID-19 in the valley of Kashmir.

Objectives

Primary objective: To find the level of potential COVID-19 vaccine hesitancy in the Kashmiri population.

Secondary objectives:

1. To find the sociodemographic correlates of the potential COVID-19 vaccine hesitancy
2. To find out the reasons for the potential COVID-19 vaccine hesitancy.

Materials and Methods

Study design and setting

This was a cross-sectional study. The study was carried out when COVID-19 vaccines (COVISHIELD and COVAXIN) were to be introduced in Kashmir.

Study participants and sampling: All of the general population of Kashmir was considered potential study population unless a person opted out of the study. Online mode was employed in order to reach a wider population and collect information as there were limitations on physical movement because of the pandemic.

Data collection and technique

A predesigned questionnaire was framed keeping in view the likely sociodemographic correlates of COVID-19 vaccine hesitancy. The questionnaire included some simple arithmetic and cognitive questions in between the main study-related questions to filter out participants lacking in attention. It was framed in consultation with community medicine experts and circulated online via WhatsApp, Facebook, Instagram,

and E-mail using Google Forms. The online mode was employed for collecting data for there were limitations on physical movement because of the pandemic. The questionnaire was circulated for a period of ten days starting from December 17, 2020. All the participants who were included belonged to the Kashmir valley, while those who resided outside the valley were excluded. Exclusions were also made on account of duplicate forms (one of such forms was excluded) where the information was the exact same, with the same date and time, and wrong information, for example, writing name in the age column. The responses were closed on December 26, 2020, as the response rate had been sharply decreasing coming to just a few responses during the last few days.

Statistical analysis

The data were entered into Microsoft Excel 2010 and analyzed using IBM SPSS Statistics version 23 Armonk, NY, U.S.A. The categorical data were summarized as frequencies and percentages, whereas the continuous data (only age was measured as continuous variable although it was also categorized for further analysis) were summarized as mean and deviation. Our independent variables were age, gender, residence, education, occupation, and COVID-19 status of a person. The outcome of interest was whether the respondents were willing to accept the COVID-19 vaccine when one is available. It was measured as a categorical variable with three categories (Yes, No, and May be). Multivariate multinomial regression model was employed to find out the association between independent and dependent variables. The variable “source of knowledge about COVID-19 vaccination” was not included in the final model as it had no association with the dependent variable and after removing the variable, the overall model improved and the association of other variables with the dependent variable became clearer on removing this variable.

Ethical considerations

The research purpose and author information was shared at the beginning of the questionnaire. The participation of respondents was voluntary as they were asked to fill in the questionnaire by volition, while their identity remained confidential. The ethical clearance was obtained from the Institutional Ethical Committee.

Results

A total of 525 responses were recorded out of which 38 responses were excluded owing to 2 people failing to meet the criteria for attention, 7 being from outside the valley, 6 writing wrong information, and 18 forms being duplicates. Finally, 487 respondents were included in the study as participants.

The sociodemographic characteristics of the participants are given in Table 1. About 67% of the participants were in the age group of below or equal to 30 years. The mean age was 29.6 years with a standard deviation of 7.7 years. The age range was from 16 to 64 years. There was female preponderance in the study sample with a 55% female population. Fifty-four percent of the participants belonged to rural areas. Forty-six percent of the participants had at least completed their graduation and about 39% of the participants were from medical profession, whereas an equal percentage was from other professions.

In our study, excluding 2 (0.4%) participants, all had some information (self-reported) about COVID-19 vaccination [Table 2]. The main source of their information was medical literature (38%), followed by social media (35%).

Sixteen percent of the participants in our study had ever tested positive for COVID-19 virus [Table 3].

Vaccine hesitancy was assessed in terms of complete hesitancy and partial hesitancy, i.e., those who were unsure whether they were going to accept the vaccination or not (response “may be”), as depicted in Table 4. About 14% of the participants declared that they were completely hesitant about receiving the COVID-19 vaccine when it is available and would rather not go for it. Other 40% of the participants declared that they were unsure if they will accept the vaccination when available.

The reason for total nonacceptance of the vaccine or complete vaccine hesitancy as declared by most of the participants was the doubts about the safety of COVID-19 vaccines (67%), followed by lack of trust in the manufacturers of COVID-19 vaccines (15%).

Of the participants who were unsure if they will accept the vaccination, most stated the main reason again as the doubt in the safety of COVID-19 vaccines (33%). About 45% of these respondents did not state the reason as to why they were not sure about the vaccination yet.

Table 5 summarizes the results of multivariate multinomial regression.

There was no statistically significant association of vaccine hesitancy with age or gender both for complete vaccine hesitancy and for those who were unsure about vaccination acceptance yet. Those living in urban areas were more likely to say “no” to COVID-19 vaccines than those living in rural areas (odds ratio [OR]: 1.845, confidence interval [CI]: 1.022 to 3.333). Those who are graduates or postgraduates are almost half as likely to reject the vaccination as those who have a professional degree although the association is not statistically significant, it is near significant. There was no positive

Table 1: Sociodemographic profile of participants

Characteristic	n (%)
Age group	
≤30	325 (66.7)
≥31	162 (33.3)
Gender	
Male	218 (44.8)
Female	269 (55.2)
Residence	
Urban	222 (45.6)
Rural	265 (54.4)
Education	
Passed high/higher secondary	54 (11.1)
Graduation/postgraduation	224 (46.0)
Professional	209 (42.9)
Occupation	
Nonworking	108 (22.2)
Medical professional	189 (38.8)
Others	190 (39.0)
Total	487 (100)

Table 2: Knowledge about COVID-19 vaccination

Knowledge about COVID-19 vaccination	n (%)
Do you have any knowledge about COVID-19 vaccination?	
Yes	485 (99.6)
No	2 (0.4)
Total	487 (100.0)
What is the main source of your knowledge regarding COVID-19 vaccination?	
Medical literature	186 (38.4)
Mass media	77 (15.9)
Print media	27 (5.6)
Social media	171 (35.3)
People around me	24 (4.9)
Total	485 (100.0)

Table 3: COVID-19 status of participants

COVID-19 status	n (%)
Ever positive	79 (16)
Never positive	408 (84)
Total	487 (100)

association of occupation with vaccine hesitancy. The persons who were ever COVID-19 positive were more likely to be hesitant to the vaccine. Those who were ever COVID-19 positive were 3.3 times more likely to say “no” to COVID-19 vaccination than those who were never positive. There was no significant association of any of the predictors with being unsure for the vaccination (answering “May be”).

Discussion

Vaccine hesitant people can fall anywhere on a continuum of vaccine hesitancy ranging from a total non-acceptance to a complete acceptance.^[6] Social,

Table 4: Vaccine hesitancy and reasons

Vaccine Hesitancy	n(%)
Will you accept COVID-19 vaccine when available (effective, accessible, and affordable)	
Yes	224 (46.0)
No (complete vaccine hesitancy)	67 (13.8)
May be (not sure for acceptance of vaccine)	196 (40.2)
Reasons for nonacceptance or vaccine hesitancy	
Complete vaccine hesitancy	
Doubt in the safety of COVID-19 vaccine	45 (67.2)
Lack of trust in the manufacturers of COVID-19 vaccines	10 (14.9)
Other*	12 (17.9)
Total	67 (100.0)
Not sure for acceptance of vaccine	
Doubt in the safety of COVID-19 vaccine	64 (32.7)
Lack of trust in the manufacturers of COVID-19 vaccines	22 (11.2)
Other*	22 (11.2)
No answer	88 (44.9)
Total	196 (100.0)

*Other reasons included the reasons which had very low frequency. All such reasons were grouped into this category

political, or religious factors could be responsible for the loss of confidence in vaccination among people leading to vaccine hesitancy. In this study, we wanted to know the level of the likely or potential vaccine hesitancy among the Kashmiri population. As such, the answer to the question of vaccine acceptance of COVID-19 vaccine was sought from the general people in terms of three responses “yes, no and may be” as vaccine hesitancy is a continuum as discussed earlier. In our study participants, 14% expressed that they were intending to completely reject the vaccination when one is available, whereas another 40% were unsure if they will accept the vaccination. Therefore, if these 40% are taken as a vaccine-hesitant group as they do not have complete confidence in COVID-19 vaccines yet, the percentage of vaccine hesitancy recorded in our study was 54% which is very high. For acquiring herd immunity, the vaccination coverage should range between 55% and 80%.^[7] There may be many factors interplaying with one another which has reflected in such a huge amount of vaccine hesitancy, but the main reason that the participants gave was the doubt in the safety of COVID-19 vaccines followed by lack of trust in the manufacturers of the vaccines of COVID-19. Both of these reasons can seem justifiable for the common man because COVID-19 as a disease was refuted by many intellectuals as a conspiracy.^[4,8] and many people still believe it to be a hoax. However, on the other hand, it represents the more accessibility of misinformation and rumors to the general masses than the more scientific and logical evidences. Moreover “anti-vaxxers” appeal to emotions more than reasoning. Therefore, before the actual vaccination starts, the masses need to be educated

about the vaccination and doubts need to be addressed. It is pertinent to mention here that the percentage of vaccine hesitancy at the actual time of vaccination may not be the same as found out in this study because views change over time and actual behavior of people may be different at the time of vaccination.

In our study, those from urban areas were more likely to be hesitant to the vaccination than those from rural areas. It may reflect the fact that more access the people have to information, the more they question things which again reflects a need for vaccine awareness and education. In addition, those who were ever positive were 3.3 times more likely to reject the vaccination than those who were never positive. It implies that the people might be having a sense of security after recovering from the COVID-19 once. However, the duration of immunity imparted by COVID-19 infection is still not completely known.^[9] Cases of re-infection have been recorded and how well a person is protected after the first attack of COVID-19 is still a critical question.^[10] Besides, many experts and vaccinologists recommend vaccination in previously infected people.^[11] Policymakers need to take this thing into consideration owing to resource constraints and large population in our country. It may be wise to vaccinate people who were never positive first to build the level of immunity in the community and then the previously infected persons. Our study [Table 5] shows that those who are graduates or postgraduates are almost half as likely to reject the vaccination as those who have a professional degree. Although the OR is not statistically significant, it is near significant. Hence, it is recommended to further dig into the matter if there is really any such thing as this.

Strengths of the study

This study reflects the level of potential vaccine hesitancy in Kashmiri population and the reasons involved which may be very helpful in current circumstances when vaccine can be available anytime soon. It may help the public health experts and policymakers to decide what needs to be done to make people more receptive and compliant to the COVID-19 vaccines when all the efforts are being put together to make COVID-19 vaccination a success for controlling the pandemic.

Limitations

Questionnaire was shared online, so the sampling technique could not be completely scientific in our study. However, online mode of data collection is very feasible in the present COVID situation and is widely used by researchers. Many parameters were self-reported so there might have been some source bias in our study which was tried to be minimized by ensuring anonymity at the start of the questionnaire so that the participants could freely express what they might have concealed in

Table 5: Results of multivariate multinomial regression (correlates of vaccine hesitancy)

Correlates of vaccine hesitancy	OR	95% CI for OR	P
Will you accept COVID-19 vaccine? No versus yes			
Age group (years)			
≤30	0.752	0.417-1.356	0.343
>30			
Gender			
Male	0.618	0.335-1.143	0.125
Female			
Residence			
Urban	1.845	1.022-3.333	0.042
Rural			
Education			
Passed high/higher secondary	1.267	0.417-3.850	0.677
Graduation/postgraduation	0.529	0.260-1.075	0.078
Professional degree			
Occupation			
Nonworking	1.059	0.467-2.402	0.890
Medical professional	0.683	0.332-1.404	0.300
Others			
COVID status			
Ever positive	3.302	1.677-6.501	0.001
Never positive			
Will you accept COVID-19 vaccine? May be versus yes			
Age group			
≤30	1.462	0.944-2.266	0.089
>30			
Gender			
Male	0.877	0.577-1.333	0.539
Female			
Residence			
Urban	1.285	0.852-1.938	0.232
Rural			
Education			
Passed high/higher secondary	1.895	0.886-4.053	0.099
Graduation/postgraduation	0.691	0.418-1.143	0.150
Professional degree			
Occupation			
Nonworking	1.415	0.822-2.436	0.210
Medical professional	0.816	0.485-1.374	0.445
Others			
COVID status			
Ever positive	1.541	0.867-2.739	0.140
Never positive			

OR=Odds ratio, CI=Confidence interval

a face-to-face interview. Besides illiterate people, people who do not have access to Internet and people who are not using social media (especially elders of our society) could not be included in our study because of the online mode of contact.

Recommendations

Authorities and public health officials should direct efforts toward vaccine education, creating awareness among people about the importance of COVID-19 vaccination. Addressing doubts and misinformation

about the safety and efficacy of COVID 19 vaccine should be prioritized and there should be an emphasis on the clearance of misconceptions.

Owing to resource constraints and large population in our country, it may be wise to vaccinate people who were never positive first to build the level of immunity in the community and then the previously infected persons.

Conclusion

Our study shows that a high level of vaccine hesitancy

is expected when the COVID-19 vaccination is started in Kashmir which may be detrimental for the public health efforts directed at controlling the COVID-19 pandemic. Strategic steps must be taken to minimize the vaccine hesitancy associated with COVID-19 vaccination. Authorities should direct efforts toward vaccine education, creating awareness among people about the importance of COVID-19 vaccination.

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Conflicts of interest

The authors declare no conflicts of interest.

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