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RETRACTED: COVID-19 Vaccine Hesitancy and Resistance in India Explored through a Population-Based Longitudinal Survey

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Abstract: Background: The World Health Organization has recommended that individual governments identify vaccine hesitancy areas. It is proposed that the governments, with the aid of local organizations, educate and implement social insights on the vaccination so that high population levels are covered with this safe immune program. Methods: A longitudinal online survey covered 3000 adults from India. We examined the demography, behavioral (socio-economic) attitude, vaccine hesitancy, vaccine resistance for the COVID-19 vaccine. The specific reasons for the COVID-19 vaccine decline were also evaluated. Results: Our survey revealed 59% definite response, 29% low-level response, and 7% high-level response for vaccine hesitancy, while 6% had resistant views on the COVID-19 vaccine. Individuals who had higher income levels, lived in a society, maintained social distancing, had downloaded the COVID-19 update app, showed a positive attitude towards their government, and more confidence in their healthcare system were more inclined towards the vaccination. On the contrary, individuals who had overstated the risks of COVID-19 and had a religious and populistic attitude towards vaccination were more hesitant/resistant to vaccination. The respondents who declined vaccine administration were further evaluated for their specific reason for their response. The most common reasons for declining the COVID-19 vaccine were post-vaccine scare of adverse health effects and accepting the information spread by social media. Conclusions: The results in our study show that by identifying population "hot spots" that have negative or unclear information on the COVID-19 vaccination, these "hot spots" can be addressed by involving friendly organizations that can clear their strong disbeliefs and increase the percentage of vaccine-definite people within the population. The role of government-induced COVID-19 vaccine policy measures can always be beneficial to cause this shift from disbelief to confidence within the population.

Keywords: COVID-19; public health; prevention; decline; government

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1. Introduction

Vaccines have been the foremost confronting factor against viral illness. However, historically vaccine hesitancy has been a challenging factor all over the world. Reasons for vaccine hesitancy worldwide have varied from religious aspects to its association with adverse health hazards [1]. Denmark, Ireland, and India experienced a hindrance in the human papillomavirus (HPV) vaccination program due to media-induced alleged symptomatic manifestations in vaccinated individuals [2,3]. The Hepatitis B vaccination was also alleged to cause multiple sclerosis in France, and HPV was supposedly causing multisystem hazards in vaccinated individuals [4,5]. In the early 1990s, vaccination was even compulsory under the British act; however, this was abolished due to societal concerns [6]. The issues related to vaccine hesitancy have resulted in individual governments in various

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countries worldwide forming health authorities and research panels to identify the most common variables and reasons for vaccine hesitancy.

India has a population of over 1390 million people. The government has presently recommended all its citizens within the inclusion criteria to be immunized by the two vaccines, namely the Covishield (the World Health Organization (WHO)-approved Astra Zeneca vaccine) and Covaxin (approved by India's drug-regulator and locally manufactured by Bharat Biotech) [7,8]. The Indian government has developed and approved urgent vaccine-related infrastructure and provided efficient digital information centers to address and observe the effectiveness and hesitancies of the Coronavirus disease 2019 (COVID-19) vaccination program. The Indian government has constituted a National Expert Group on Vaccine Administration for COVID-19 (NEGVAC) to provide an effective strategy for the existing COVID-19 vaccine coverage across the country. The NEGVAC is responsible for defining the clinical criteria, identifying the high-risk population, providing constant updates on vaccine effectiveness, and monitoring COVID-19 coverage statistics [8,9].

The WHO declared COVID-19 as a pandemic in March 2020 and, later during the year, stated that COVID-19 vaccine coverage is the only long-term solution for the fight against the COVID-19 pandemic [10]. This safe and effective platform, along with identifying vaccine hesitancy "hot spots" within individual countries, will be a crucial step to resolve the COVID-19 pandemic. The immunity within a community is a result of numerous factors. Herd immunity depends on the percentage of the population vaccinated, the effectiveness of the vaccine, and the ineffectiveness of the virus within the population [11]. The virus infectivity within the population can be retarded by adequate vaccination coverage. Estimates suggest that to achieve herd immunity when a vaccine is 100% effective, 67% of the population needs to be vaccinated [6,7]. However, with the presently available vaccines with 80–85% effectiveness, 75% vaccine coverage is required to ensure COVID-19 elimination and control within the population [12].

Literature studies and the available research data suggest that vaccination intent varies significantly in each country [12]. When an individual is unsure of getting vaccinated, the term vaccine hesitancy is used. When an individual objects to get vaccinated, the term vaccine resistance is used. Vaccine hesitancy constitutes a greater proportion of the population that will not be vaccinated compared to the latter individuals. In the United States of America, vaccine hesitancy was 21% compared to 31% of vaccine resistance individuals [13]. In the United Kingdom, 6–9% were resistant, and 25–27% were vaccine hesitant [14]. The WHO has proposed that national governments take dynamic responses to identify vaccine hesitancy "hot spots" utilizing the available behavioral and social mediums [15]. Therefore, the national COVID-19 updates and statistical information form the cornerstone for the dexterous response on COVID-19 vaccination coverage programs.

The aim of this study is to present the formal analysis and results of a national survey that represents the importance of vaccination coverage within the country to fight COVID-19. We present the demography, behavioral (socio-economic) attitude, vaccine hesitancy, and vaccine resistance to the COVID-19 vaccine. We distinguish vaccine-hesitant people from people who are sure to get the vaccine and examine the vaccine-resistant population. Given the Indian government's active role in providing vaccines at a subsidiary cost, we hypothesize the confidence in the government and healthcare sectors, their attitudes, and adherence towards the delivery of COVID-19 vaccines to the population will play a very vital role in a successful vaccination outcome [16–18]. We also examine if the vaccine hesitancy or resistance was related to downloading the COVID-19 safe app.

2. Methods

2.1. Study Design and Participants

This study used a Minimetric poll that collected data from 3000 respondents across four states in India. The mean age of the participants was 46.64 (Standard Deviation (SD) = 14.3) years. The data collection was performed predominantly online (94%), and a minor portion was obtained using the phone. The phone respondents completed the

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survey over a period, ranging from 17 respondents on the first day to 1222 respondents on the two other days (12 and 13 January 2021).

The individual respondents were initially sent an email invitation comprising of the aim of the study and consent for their involvement in the study. Once accepted, the respondent was provided with a survey questionnaire.

The Minimetric poll utilized participants from the India Life online web portal. This portal allowed the recruitment of respondents using email IDs [17]. During April–June 2021, the portal was refreshed, with 347 respondents being emeritus and 1810 being newly recruited. This new recruitment was barcoded, and the file sample was stratified using web methodology. This study included only online respondents to maintain balanced demographics. This was mainly done as the age of the panel members was older, and they were more educated than the average Indian population. The replenishment rate of the recruiters was 12.1%.

The offline members of the India Life online portal were contacted using SMS and frequent call-cycle over a period of 14 days. A weekly SMS reminder was sent on Fridays. The recent accumulative response rate was 7.8%, a minor decline as compared to the previous response rate in January 2021.

The India Life online portal used the following methods to be uniform with the national population benchmark:

- Base weight is computed for every respondent using two weight categories.
- The initial selection chances and follow-up post-stratification for their enrolment weight.
- The available information from respondents and non-respondents to the present wave for their propensity weight.
- The recent population benchmark was satisfied by the adjustment to the base weights. This was done for the demographic characteristics.

2.2. Ethical Declaration

The Minimetric poll device, its contents and the research methods were submitted for consideration by the ethical board. The board members sought further clarification on societal factors, respondents' identifiers, and political variables. This was re-edited and submitted. Afterwards, the Human Research Ethics Committee (#22/2021) was approved at RRN hospital and research center, India, for this study. Informed consent was obtained either online or verbally.

2.3. Survey Questions

This study included questions regarding vaccine acceptance, hesitance, and resistance. The questions were provided in English; however, respondents who had language understanding difficulty were guided with a translator upon request to the research team. The questions had independent variables stratified into demographic, socio-economic, political, employment, COVID-19 anxiousness, and adherence to government advocated safety norms. The dependent variables were of their opinion on vaccine acceptance, hesitance, and resistance, as shown in the Table S1. The individual variables were decided by the survey research team based on previous studies. The approximate time span for completing this survey questionnaire was 10–12 min. Respondents with translators took approximately 18–20 min to complete the survey questions. The variables were categorized into standard attributes, and the respondents were documented using valid value types.

2.3.1. Dependent Variable

The study of vaccine intention was measured using the following questions:

- "Your view on COVID-19 vaccine";
- "Are you willing to be vaccinated"?

The response would be categorized into four weighted sections, namely

- Definitely no (5.5%);

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- Probably no (7.2%);
- Probably (28.7%); and
- Definitely yes (58.5%).

Based on the vaccine acceptance literature, the definitions for vaccine resistance and hesitancy are as follows:

- Vaccine resistance is defined as those people who will definitely not be willing to get vaccinated [16]. Vaccine hesitancy (high level) is defined as the probable number of people who will not get vaccinated.
- Vaccine hesitancy (low level) is defined as people who are uncertain of their decision on being vaccinated [16].

2.3.2. Independent Variable

The variables included in this study are provided in Table S1.

Demographic variables used in our study are age, gender, birthplace, socio-economic status, education, employment, and income. Health-related variables were the presence of disability, chronic illness, and self-rated health status. The COVID-19-related variables were if they were tested for COVID-19, were worried about a family member contracting COVID-19, agreement to maintain social distancing, and downloaded COVID-19 safe app. Social and political-related questions were attitudes towards social trust, confidence, altruism in government and the health care system, religiosity, and voting intentions.

2.4. Statistical Analyses

The statistical analysis was performed using the ordinal probit model. This model was used from STATA 15.1 using the oprobit command. The survey included information from 3000 respondents. The number of the respondents varied on the rate of survey completion. The inclusion of numerous independent variables was analyzed using several models.

- Model 1—demographic variable; completed survey respondents from January 2021; respondents had absolute vaccination intention data.
- Model 2—demographic and health variables including disability measure from February 2021 Minimetric Poll.
- Model 3—demographic and COVID-19 variable from April and May 2021 Minimetric Poll.
- Model 4—demographic and socio-political variable from February and April 2021 Minimetric Poll.
- Model 5—demographic and statistically significant ($p < 0.05$) variables from Models 2–4.

The respondents who were categorized as vaccine hesitant and vaccine resistant were further asked to fill up the reason for their decline response to the COVID-19 vaccine, as shown in Table S1. A chi-square test was applied, and a p value of < 0.05 was considered as a statistically significant variable. This statistical analysis was performed using Statistical package for social science (SPSS) software.

3. Results

3.1. Vaccine Hesitancy and Resistance

One in two Indians (58.5%) were definitely getting vaccinated. The vaccine hesitancy was divided into low levels and high levels. Low-level vaccine hesitancy was respondents who were probably likely to get vaccinated (28.7%). High-level vaccine hesitancy was respondents who were probably unlikely to get vaccinated (7.2%). Vaccine-resistant individuals were respondents who were not taking the vaccine (5.5%).

3.2. Statistical Correlates and Its Analysis

Statistical data from the various models were analyzed. Variables were marginalized from Model 1 and included demographic, socio-political, economic, and education variables, as presented in Table 1. The demographic breakdown revealed that older re-

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spondents (>55 years) were more likely to be vaccinated and constituted a low proportion of vaccine-resistant or hesitant groups. Females were more vaccine resistant or hesitant. Respondents in universities or holding a graduate degree were more in favor of getting a vaccination in comparison to respondents who had been to school until Year 12.

Table 1. Minimetric poll survey chart demonstrating statistically significant variables.

Demographic Variables	Resistant		Hesitant-High		Hesitant-Low		Likely	
	Marginal Effect	Significant	Marginal Effect	Significant	Marginal Effect	Significant	Marginal Effect	Significant
Female	0.0011	*	0.010	*	0.021	*	−0.042	*
Age 18–24	−0.013		−0.012		−0.026		0.052	
Age 25–34	0.006		0.005		0.010		−0.021	
Age 35–54	0.007		0.006		0.011		−0.025	
Age 55–64	−0.021	**	−0.020	**	−0.047	**	0.089	**
Age 65–74	−0.030	***	−0.030	***	−0.075	***	0.134	***
Age >75	−0.038	***	−0.041	***	−0.112	***	0.191	***
Employed	0.001		0.001		0.001		−0.002	
Not completed school year 10	0.009		0.008		0.014		−0.031	
Has undergraduate degree	−0.019	*	−0.018	**	−0.041	**	0.105	**
Has Post graduate degree	−0.024	**	−0.024	**	−0.056	**	0.105	**
Lives in most disadvantage area (1st quintile)	0.024	*	0.019	**	0.032	*	0.075	*
Lives in next most disadvantage area (2nd quintile)	0.001		0.002		0.003		−0.006	
Lives in next most advantage area (4th quintile)	0.022		0.017		0.029		−0.068	
Lives in most advantage area (5th quintile)	0.002		0.002		0.004		−0.008	
Lives in non-metro city	0.009		0.007		0.013		−0.002	
House-hold income	−0.00003	***	−0.00003	***	−0.0005	***	0.0001	***
Proportion	0.051		0.070		0.298		0.593	

Notes: Minimetric Poll collected through the web portal. Statistical analysis using STATA 15.1 software oprobit command test. Survey respondents: 3000. Survey period: February, April, and May 2021. Model case respondent: 35–44 years Indian female, living in a metro city, employed, and holds a graduate degree with a base household income of 35,000 INR. Table guidance: * as 10% significant level; ** as 5% significant level, *** as 1% significant level.

Society variation showed that respondents living in the fourth disadvantage quintile were more vaccine hesitant and resistant than those living in the third quintile. Respondents living in high-income households were more likely to be vaccinated. Health and disability status, the remaining demographic variables, were statistically insignificant.

The respondent survey also revealed that individual and family concerns on contracting COVID-19 were unrelated to vaccine intentions. Respondents who were adherent to social distancing, followed COVID-19 norms, and had the COVID-19 update mobile app were more likely to get vaccinated (+10.8 percentage points). Respondents who felt that COVID-19 was an overtly unnecessary exertion by the public and government constituted a high proportion of the vaccine-resistant (8.1 percentage points) or vaccine-hesitant (4.2 percentage points) groups and were less likely to get vaccinated (−14.9 percentage points).

The demographic and socio-political variable was applied in Model 4. There were no statistically significant results from this variable. However, the respondents who were

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appreciative of the government efforts to fight COVID-19 and those who trusted their local healthcare system intended or were more likely to get vaccinated (13% and 11.1%, respectively). These respondents showed lower vaccine resistance (−3.4 percentage points) and vaccine hesitancy (−2.8 percentage points).

In Model 5, we included demographic and statistically significant ($p < 0.05$) variables from Models 2–4. This model revealed that respondents over 55 years of age living in high-income households were more definite of being vaccinated. Females and respondents living in a low socio-economic neighborhood were less likely to get vaccinated. Respondents with a higher sense of social distancing who had downloaded the COVID-19 update app were more intent on vaccination. The respondents who considered COVID-19 an exaggerated disease were less definite for vaccination. Those who appreciated their government and healthcare system were less likely to be vaccine hesitant or resistant.

3.3. Rationale for Vaccine Hesitancy and Resistance

The respondents with vaccine hesitancy and resistance were further evaluated for the specific reasons for their responses. Figure 1 depicts the data as tabulated in Table 2. The major detrimental factor was the concerned adverse health effects post-vaccination (88%). This ranged from minor side effects, such as fever, rash, and gastro-intestinal problems, to severe fear of life-threatening risks of cardiac arrest and venous thrombosis. The other major detrimental factor was a lack of clarity about the vaccine (65%) and host-related contra-indications (56%) due to pre-existing chronic diseases (diabetes mellitus, chronic lung disease, and chronic kidney disease). Other minor factors included allowing front-line COVID-19 workers to receive their complete vaccination doses, lacking trust in vaccine protection, and recent exposure to COVID-19 through close-contacts.

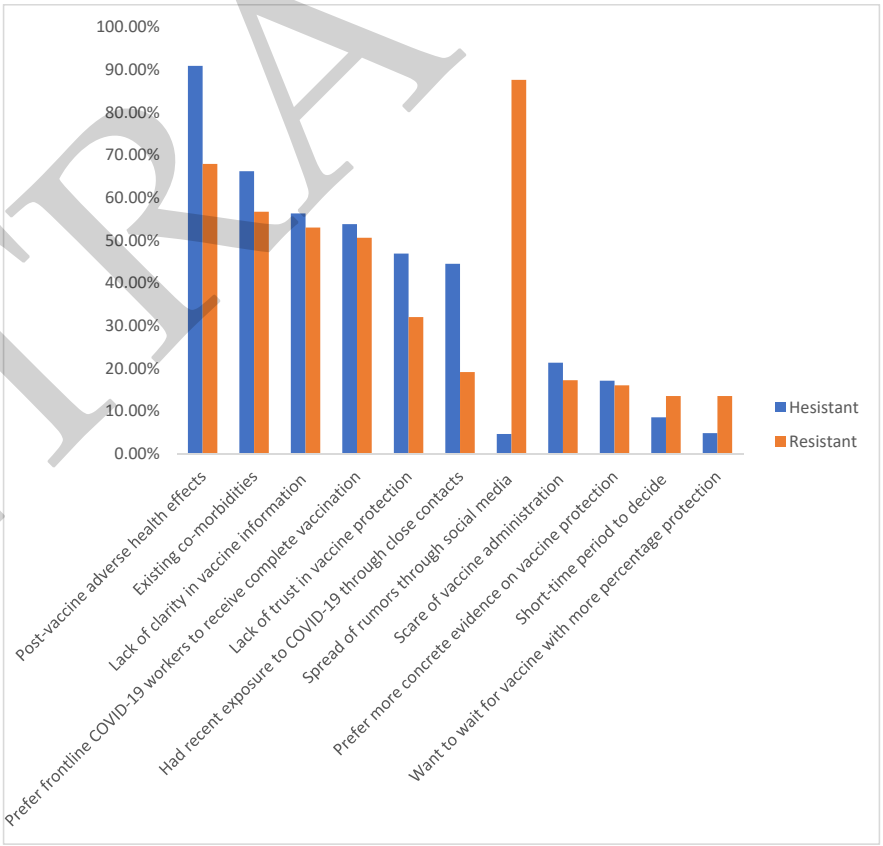


Figure 1. Percentage distribution of reasons for vaccine hesitancy and resistance: the bar chart presented here shows the relevance of post-vaccine adverse health effects (in vaccine-hesitant respondents) and the spread of rumors through close contacts (in vaccine-resistant respondents) being the most common specific reason for their responses.

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The total number of vaccine-hesitant (N) respondents was 1077, and the total number of vaccine-resistant (N) respondents was 162. However, approximately 61.2% of these respondents agreed to consider/change their opinion after a 6-month observation period. This mainly depended on the availability of reasonable information on vaccine safety and vaccine-associated adverse effects.

The vaccine-resistant respondents rendered firm disbelief in vaccine efficacy and cited multiple reasons for declining. The vaccine-hesitant respondents were more ready to seek more information about vaccine efficacy and safety from reasonable sources, showed belief in pharmaceutical vaccine research, and were waiting for the government and healthcare facility to upgrade their public service towards COVID-19. Fifty-five percent of vaccine-hesitant respondents were interested to be part of survey research studies in the future, but a striking 98% of vaccine-resistant respondents were unconcerned about being part of any future survey studies involving COVID-19 vaccines. Rumors spread through social media occupied 87.6% of vaccine-resistant respondents' reasons for COVID-19 vaccine denial. The percentage is astonishingly high compared to 4.6% among vaccine-hesitant respondents.

Table 2. Rationale for vaccine hesitancy and resistance.

Rationale for Vaccine Hesitance/Resistance	Hesitant (%) N = 1077	Resistant (%) N = 162	*p* Value
Post-vaccine adverse health effect	980 (90.9)	110 (67.9)	0.005
Existing co-morbidities	713 (66.2)	92 (56.7)	0.338
Lack of clarity in vaccine	607 (56.3)	86 (53)	0.01
Prefer frontline COVID-19 workers to receive complete vaccination	580 (53.8)	82 (50.6)	0.003
Lack of trust in vaccine protection	506 (46.9)	52 (32)	0.005
Had recent exposure to COVID-19 through close contacts	480 (44.5)	31 (19.1)	0.004
Spread of rumors through social media	50 (4.6)	142 (87.6)	0.216
Scare of vaccine administration	230 (21.3)	28 (17.2)	<0.0001
Prefer more concrete evidence on vaccine protection	185 (17.1)	26 (16)	<0.0001
Short-time period to decide	92 (8.5)	22 (13.5)	<0.0001
Want to wait for more effective vaccine	52 (4.8)	22 (13.5)	<0.0001

4. Discussion

SARS-CoV-2 induces pneumonia by viral replication and virus-mediated direct tissue damage. The infected host experiences a modified immunological response with cytokine recruitment, causing a classical "cytokine storm" within the host. The ability of SARS-CoV-2 to induce COVID-19 within the host and the rapid spread of the infection across the world vindicated the WHO to announce COVID-19 as a pandemic [10]. With the emergence of the COVID-19 pandemic, various research laboratories worldwide concentrated on the emergency development of vaccines to achieve herd immunity and curtail global medical and societal impairment. Vaccination programs have rolled out across many countries, mainly using Pfizer, AstraZeneca, Moderna, and Janssen to combat this pandemic [19]. However, vaccine-hesitant and vaccine-resistant groups are proving to be the significant setbacks in these government-mediated vaccination strategies.

Based on our survey analysis and results, in June 2021, 36% of Indians are COVID-19 vaccine-hesitant and 6% COVID-19 vaccine-resistant. The variables and factors related to vaccine hesitancy and resistance were disparate. We analyzed the individual variables, namely: age group, gender, social attitude, political views, like/dislike of available government strategies and healthcare facilities to fight COVID-19, education, and income within the household.

These individual variables showed an essential association with vaccine hesitancy and resistance. As discussed in previous relevant articles, respondents with low socio-economic status, unemployment, and a lack of education constituted the primary reason for vaccine

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hesitancy and resistance [16,17]. In our study, females and the younger age group were more vaccine hesitant. Dube et al. reported that young individuals have an active immune status and are seldomly associated with severe forms of viral illnesses; hence, they tend to deny vaccination in a large proportion of cases [20]. This misnomer can be addressed by conducting active seminars/webcast talks by senior professional faculty members citing the advantages of vaccine administration. The COVID-19 behavioral aspects were also important to be noted. Respondents who were serious in adhering to COVID-19 preventive and safety measures had strong intentions for vaccine administration [21]. An individual who would download the COVID-19 update mobile app was more likely to intend to be vaccinated (11% higher). An individual who was more serious about maintaining social distancing in public places had 7% higher intentions to be vaccinated. This information can be utilized in campaigns hosted by the local government and other organizations towards fighting COVID-19.

Previous studies have shown the importance of societal disagreements and anti-vaccine groups mainly associated with vaccine hesitancy or resistance [22–24]. This has been the main concern even in our study. The respondents who considered COVID-19 more of an exaggerated disease, along with individuals who had dissent with their government's approach to fighting COVID-19, composed a significant percentage of vaccine-hesitant or resistant cases. This also included respondents who had no positive sense of their regional COVID-19 healthcare facility [16,25]. These individuals are more likely to spread false information on the risk and side effects of being vaccinated on the probable group of respondents.

Studies on vaccine hesitancy or resistance always target the probable respondents who can be converted into an agreeing group by adequately providing them with positive information on the vaccination. The information should mainly include the efficacy and safety of the available vaccine [26]. The government should provide evidence-based COVID-19 vaccine communication strategies in their COVID-19 health propaganda. Similarly, the health ministry should provide situational awareness, respond to public vaccine-related concerns, and try to counter public confidence about vaccine programs. The role of community health personnel, doctors, politicians, and journalists should all act in unison in developing a positive spread of attitude and information to the public regarding the COVID-19 vaccine [26,27].

Strong anti-vaccine beliefs are mainly held by vaccine-resistant individuals. They also have lower compliance levels in yielding to government-provided health information about COVID-19 preventive measures (e.g., maintaining social distance, downloading COVID-19 update mobile app). This group of vaccine-resistant or hesitant individuals should be streamlined with serious government-induced COVID-19 regulations and monitored vigilantly as they form the main sector for COVID-19 vaccine denial in the healthcare system [27,28].

Our study further extended identifying reasons for vaccine hesitancy and resistance among the respondents. As indicated in the results section of our study, the most common rationale for vaccine denial was panic-stricken post-vaccination adverse effects, the presence of co-morbidity, and a lack of clarity in the provided vaccine information [29]. These similar reasons were cited in previous studies involving vaccine hesitancy. Minor reasons, such as fear of pain, fear of vaccine administration, and a lack of evidence of vaccine protection, were also included among the vaccine-hesitant and resistant respondents. One interesting reason that requires special mention is the social-media-induced spread of rumors about the COVID-19 vaccine. Our study revealed that an astonishing 87.6% of vaccine-resistant responders were involved in spreading and firmly believing anti-vaccine rumors against COVID-19 [30,31]. A study conducted by Krishnamoorthy et al. reported that the social-media-induced spread of rumors is the major reason for vaccine hesitancy and resistance. The rumors mainly arise through the social media group, and the respondents are actively involved in either forwarding messages involving such rumors and involved in the verbal spread of messages in public or social gatherings [32].

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In India, as the COVID-19 pandemic raged during April–May 2021, the healthcare facility was in severe crisis, and this was further exaggerated by the spread of false information and statistical reports by social media. This provoked the Indian government to request the social media companies to seriously regulate their displayed content and check for the spread of such misinformation against COVID-19 and its vaccine. The government also inflated its internet regulation law and enforced arrest and severe punishment to the law defaulters. Few social media platforms were banned in certain states in India [33,34].

Our study shows that quorum of vaccine hesitancy depends on the individual's complacency towards vaccination (its effectiveness), a lack of confidence (in the policymakers, vaccine effectiveness, or safety), and a lack of convenience (cultural, language context, availability, accessibility). The individual's decision on receiving the vaccination entails the composition of cultural, spiritual, political, and socio-economic factors. The vaccine information provided by the internet and social media messages have been a significant concern for inaccurate and anti-vaccine knowledge circulation. The spread of misinformation can be avoided by contacting a reliable physician within the community or family to clarify such negative thoughts or queries on vaccination content.

However, identifying this group throughout the country would only be possible if large-scale studies are held with respondent identifiers, causing a more sophisticated scheme of the research study [19]. Such studies would be faced with serious ethical issues and would also be debated seriously for political and socio-economic reasons. To date, no such research studies have been conducted to focus on identifying vaccine-resistant or hesitant respondents within a population.

5. Conclusions

Vaccine hesitancy and resistance have shown to be consistently high across the globe during the COVID-19 pandemic. The factors are categorized into demographic, socio-economic, attainment of educational qualification, and then the actual rational reasons for vaccine denial. As herd immunity mainly depends on the effectiveness of the administered vaccine and the percentage of the population covered by the vaccine, COVID-19 vaccine coverage in India remains dubious, as, with our study, only 59% of respondents were likely to get the vaccination. As these data are limited to the survey population in four states in India, the results extracted from this study may be limited in application to the entire country due to the differences in the population demography, socio-political, economic, and education variability among the other states in India. However, in comparison to similar studies in the literature, the inferences in our study may potentially apply to other areas of the world as well. Our study also suggests that vaccine-hesitant respondents should be addressed rigorously with positive information about the COVID-19 vaccination and public health information to convert them into the vaccine-definite sector. Propaganda and strategies should be in place by the government and healthcare sector in identifying vaccine-resistant individuals to avoid the spread of misinformation among the public.

Supplementary Materials: The following are available online at https://www.mdpi.com/article/10.3390/vaccines9101064/s1, Table S1: Survey Sheet 1.

Author Contributions: S.U.—Concept and study design, methodology, formal analysis, writing original draft, and review and editing final draft. S.P., N.S. and R.S.—methodology, devising investigation tools, data collection, formal analysis, statistical analysis, and tabulation. The final version was reviewed and approved by all the authors. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: Informed consent was obtained using either online or verbally.

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Data Availability Statement: Data and the copies of the questionnaire are available upon reasonable request to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

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