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Proceeding Paper

Perception, attitude and intention towards COVID-19 vaccination

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Abstract: To overcome the situation due to pandemic (COVID-19), vaccination became essential. So, it was important to understand the overall perception, attitude and intention of respondents towards vaccination. This study aimed to investigate the combined effect of usefulness and trust on attitude towards COVID-19 vaccination and to understand the perception of vaccinated and unvaccinated people towards vaccination. Self administered questionnaire was used to collect the data. In the descriptive research design, Structural Equation Modeling was used to test the combined effect of usefulness and trust on attitude towards COVID-19 vaccination and one-way ANOVA was used to test the difference in perception of vaccinated and unvaccinated people. Simple random sampling was used in this study. The questionnaire based data were collected from 400 respondents of Haryana from April 24, 2021 to May 13, 2021. As per results, more than 70% were not vaccinated, around 16% received their first dose of vaccine and less than 15% received both doses of vaccine. Usefulness and trust had an impact on the attitude towards vaccination. There was significant difference between those who didn't receive any dose of the vaccine i.e either Covishield (viral vector vaccine) or Covaxin (inactivated viral vaccine) and those who received both doses of the vaccine. The results reveal that attitude is strengthened by positive relation between trust and usefulness. Even though there were large number of people who were not vaccinated at the time of the survey, these people had positive perception towards the vaccine. So, they were most likely to get vaccinated in the future. It was also found that vaccine history of the respondents played an important role in future vaccination. Awareness programmes become important as people need to be well informed about the benefits of vaccination.

Keywords COVID-19; Pandemic; COVID-19 vaccine; hesitancy ; Vaccine refusal

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Introduction

COVID-19 (Coronavirus disease 2019) declared as a pandemic by the World Health Organization which is caused due to severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The SARS-CoV-2 has almost affected 200 nations across the world killing more than a million people since its discovery. First COVID-19 case in India was reported on January 27, 2020, in Kerala. To tackle this situation, COVID-19 vaccination drive began on January 16, 2021, in India, and till July 15, 2021, 39,13,40,491 (According to government reports (cowin.gov.in)) first and second doses have been administered. So, the deciding factor will be the rate at which India carries out its vaccination drive. The World Health Organization in its report stated vaccine hesitancy as one of the greatest threats to the global healthcare sector. The general behavior of the population with respect to the acceptance of vaccine varies with the geographical location, time and the beliefs of the society (Padhi & Almohaithef, 2020). This research paper shall delve into investigation of combined effects of trust and usefulness on attitude towards COVID vaccine, intention to get vaccinated and perception of people towards COVID-19 vaccine.

Literature Review

The World Health Organization has reported that one of the major threats to the global health in the recent times is hesitancy of the people towards vaccination and in order to slow down the growth of the epidemic curve, vaccine coverage at a large scale is needed. There are certain beliefs and barriers regarding vaccination among the general public. Vaccine coverage and its acceptance varies with respect to behavior of the people, geography, and time (Padhi & Almohaithef, 2020). Hesitancy to take vaccine is not only affecting the individual but also the community as a whole which makes it really challenging to curb the pandemic (Adebisi et al., 2020). The main causes regarding vaccine hesitancy were concerned with the vaccine use and lack of trust in vaccines (Al-Qerem& Jarab, 2021; Al-Mohaithef & Padhi, 2020). Other than trust and efficacy level of the vaccine; the three main reasons were people who were generally against vaccine, vaccine made available at such a short duration, and those who considered the vaccine useless (Ward et al., 2020). Moreover, personal and social challenges which hampers the acceptance of vaccine includes cost of vaccine, educational and social status of the masses, previous vaccine history, belief in the healthcare services available in the country, attitude of administration towards vaccination and severity of the disease (Nguyen et al., 2011). Since, the development of a new vaccine generally takes a longer period of time with many clinical trials to make it safe for human consumption. Therefore, the acceptance of the public for a new vaccine for the ongoing pandemic at such a short interval of time made it challenging for immunization against COVID-19 as the people are hesitant about the safety and efficiency of the vaccine (Yaqub et al., 2014; Dubé & MacDonald, 2016). A global survey showed that if a vaccine is riskless, effective, and available in the market, 74.53% population will take interest in the vaccine. 18-24 age group is less likely to take interest than other age groups (Lazarus, 2021).

The main concern of the people of the country regarding COVID-19 vaccine is potential safety, efficacy, risk perception and possible side effects of the vaccine (Sharun et al, 2020). Perception and beliefs of the public about the risk and benefits associated with vaccination hampers the acceptance of vaccination (Harmsen et al., 2013). People with low literacy level are hesitant to take COVID-19 vaccine owing to lack of Health literacy leading to decreasing vaccine coverage rates (Biasio, 2020; Lazarus et al., 2021). Vaccine history, willingness to be vaccinated and perception of the people that COVID-19 is a serious problem faced by the world today and these are the important factors that predicts the attitude of people towards COVID-19 vaccine. Perception of risk of getting infected is also one of the factors that reflects the attitude of people towards the acceptance of vaccine. The review shows that it is important to check the impact of trust, usefulness on attitude, and finally, on intention in the context of Indian society.

Research Framework

Based on the literature on trust, usefulness, attitude, and intention discussed above, we propose the research framework which is outlined in Fig. 1.

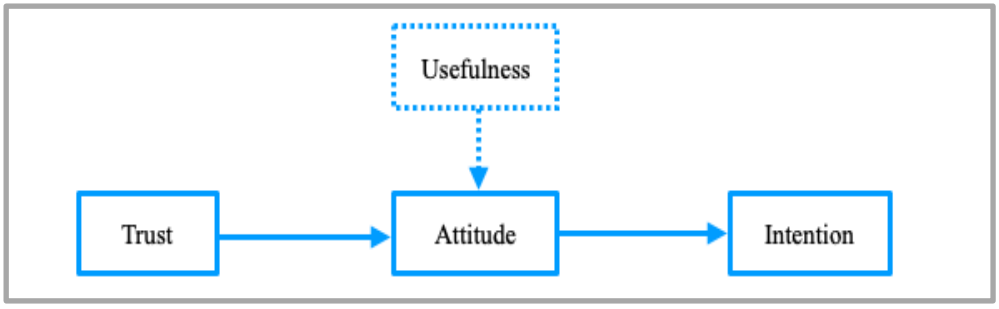

Fig. 1 Research Framework

Research Methods

The data were collected from 400 respondents of Haryana. The responses were collected from April 24, 2021 to May 13, 2021. The target study involved persons of all age groups. The sampling technique was simple random sampling**.** This technique was chosen so as to get the fair idea about the population regarding vaccination rates. For analysis, SPSS (version) and AMOS (version 24) software were used.

Results and Discussion

Demographic data

The data suggest that 71% (284 out of 400) respondents were not vaccinated at the time of the survey, 16.5% (66 out of 400) got their first dose vaccination, and 12.5% (50 out of 400) received both doses of vaccination. 52.5% were female (210 out of 400), 9 respondents were below 18 and one hundred and fifty-eight subjects were in the age-group of 18-25. Further, 109 respondents were in the age group of 26-35 years, 47 were in the age group of 36-45 years and 77 were in the age group of 45 and above. From 400 respondents, 24 people were below 10th standard, 47 had passed 12th class, 116 studied till graduation. 199 subjects had completed post graduate degree and 14 had other education. 50.25% (201 out of 400) respondents were married. There were 109 responses where people had less than 2.5 lakhs, 98 with 2.5-5 lakhs, 30.75% (123 out of 400) people were in the 5-10 lakhs income group and rest of the respondents had more than 10 lakhs. 79.75% (319 out of 400) participants gave first preference to health workers in the vaccination priority categories followed by people who responded health workers with 11.75% (47 out of 400), 5% responded with students and teachers and rest of the people had other preferences. 31.75% (127 out of 400) people responded that they came to know about the vaccine via mass media, 24.75% responded social media as their source, followed by people who believed internet as their preference were 19.25% , 45 respondents reported newspaper and finally, 42 respondents came to know about it from family and relatives.

Reliability of latent variables

The Kaiser-Meyer-Olkin measure of sample adequacy was 0.823 and validates the assumption of factor analysis. Four factor trust, usefulness, intention and attitude emerged with an eigen value > 1 and these factors explained 67.35 percent variance of the total variance. Referring the threshold >.5 proposed by Hair *et al.* (2010), all the items have loadings >.5. Further, cronbach's α coefficient shows the reliability of constructs and all the constructs exceeding the threshold value (Sekaran, 2000) > 0.7.

Structural model

As the proposed relationship in hypothesized model I, SEM is used to investigate the perception towards Covid-19 vaccine (*see* **Fig 2**). As shown in fit indices mentioned in **Fig. 2**, fit indices for measurement model and structural model validate goodness of models. Researchers recommended the threshold for *CMIN/DF*, *CFI*, *GFI*, *TLI*, *IFI*, *NFI*, *AGFI*, *RMSEA* and *RMR* (Bentler, 1990; Baumgartner and Homburg, 1996; Hu and Bentler, 1999). Therefore, after checking the values of all indices, goodness of measurement model and structural model are satisfactory.

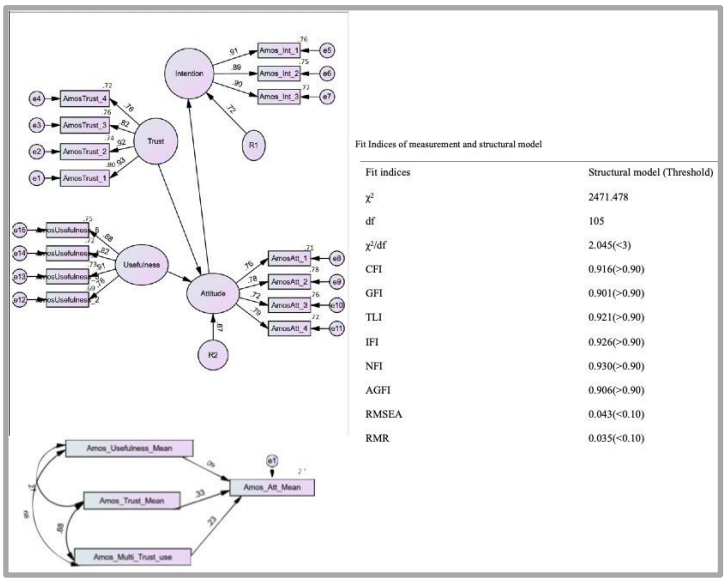

Fig. 2 Empirical Model (Moderation Analysis below) and its fit indices.

Moderation

Fig 2 presents the moderation regression results that effect of usefulness (β = -0.956, *P*=0.000) and trust (β = 0.33, *P*=0.000) on attitude are significant. The interaction term of these variables (use × trust) is also positively significant (β = 0.23, *P*=0.000), implied that attitude is strengthened by the positive relationship between usefulness and trust.

Table 1. One-way Anova results (Higher perception scores= positive outlook towards vaccination) and Post-Hoc Results.

			Test of Homogeneity of Variances		**Anova**	
Vaccination Experience	**Mean**	**Std. Deviation**	**Levene Statistic**	**Sig.**	**F**	**Sig.**
Yes (First dose)	3.9628	.33714	2.140	.119	7.998	.000
Yes (Both dosess)	4.0764	.41329				
No	3.8415	.43097				
Post-Hoc Results (Group Differences)						
Vaccination Experience	**Mean Difference**	**Sig.**	**95% confidence level**			
			Lower Bound		Upper Bound	
Yes (First dose)- Yes (Both dosess)	-.11355	.311	-.2965		.0694	
Yes (Both dosess)- No	.23481*	.001	.0851		.3845	
Yes (First dose)-No	-.12126	.083	-.2546		.0121	

The statistical test One Way ANOVA was used to check the difference in perception of vaccinated and non-vaccinated people towards the corona vaccine. The hypothesis tests that there are significant differences in perception of vaccinated and non-vaccinated people towards the vaccine. There were three categories namely Group 1: first dose of vaccine only, Group 2: both doses, and Group 3: Not vaccinated. The results (refer to **Table 1**) show that there are significant differences in perception of vaccinated and non-vaccinated people at 5% level of significance (F= 7.998 , *P*= .000). The Levene's test Statistic (see **Table 1**) showed equal variances (*P*= 0.119). So, to check the individual differences Tukey's post-hoc test was used. The results reveal that there were no significant differences between the respondents who received the first dose of vaccine (Mean= 3.9628 and S.D.= .33714) and those who received both doses of the vaccine (Mean= 4.0764 and S.D.= .41329). Surprisingly, the results show that the respondents who got vaccinated once and those who didn't get vaccinated at all for the covid vaccine had no significant differences too. However, there is a significant difference between those who didn't receive any dose of the vaccine (Mean= 3.8415 and S.D.= .43097) and those who received Both doses (Mean= 4.0764 and S.D.= .41329). However, the mean scores of the groups confirm that people have positive perception towards the vaccine i.e. mean (yes both doses) > mean (first dose only) > mean (no). This suggests that even though there are larger number of people who did not get vaccinated, they are most likely to get vaccinated in future.

This can be validated from the opinion of the respondents regarding the choice for COVID-19 vaccination. Out of 275 respondents who were of the opinion that everyone should get vaccinated, 74.54% (205 out of 275) were those who didn't receive the vaccine at the time of the survey. Out of 25 people who were not vaccinated, 32% (8 out of 25) respondents believed that vaccine should be given to newly recovered people. From 53 respondents who answered those people should be vaccinated who are infected with COVID-19, 56.60% (30 out of 53) were not vaccinated at that moment. Finally, those who were not vaccinated 87.23 (41 out of 47) believed that people who were not infected should get vaccinated. The strong belief of 205 respondents indicates that even those who didn't opt for vaccination are likely to get vaccinated in the near future. Furthermore, when respondents were asked about their vaccine lifetime history**,** the data reveals that 82.5% (330 out of 400) respondents have taken all the necessary vaccines in their lifetime. Out of those who answered yes when they were asked about their vaccine history, 67.27% (222 out of 330) were those who were not vaccinated for COVID-19 vaccinated when they were surveyed. It was stressed that vaccine history plays an important role in determining the intention to get vaccinated. If respondents had positive outlook towards the vaccines, this helps in building confidence and this leads to more number of vaccinations.

Conclusions and implications

The pandemic has visibly disrupted the balance of the world economy. To overcome this, governments have started various vaccination programmes. The role of usefulness and trust in determining the attitude towards covid 19 vaccine is essential. The results reveal that usefulness and trust together can induce positive attitude towards the vaccine and hence, intention to get vaccinated. Furthermore, it is observed that even those who didn't get vaccinated had positive perception towards the vaccine which indicates that they will get vaccinated in the near future. Vaccine history plays an important role too. Those who had received all necessary vaccines in the past are more likely to receive this vaccine too. This indicates that awareness regarding vaccination is enough in the general public. But to increase the vaccination coverage rate to 100%, awareness programmes should be conducted. As the most popular medium is mass media so government should utilise this platform for awareness purpose. This study provides a knowledge base for the policymakers for communication improvement and confidence-building in relation to COVID-19 vaccine and vaccination. This study proposes that promoting a sense of

community and addressing potential practical constraints will be key in designing an effective COVID-19 vaccination policy.

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Authors' Contributions: Aarti has made substantial contribution to the development of the conceptual framework, research design, data acquisition, data analysis, manuscript editing, and manuscript review. **Dhall** drafted the definition of intellectual content and she contributed in the data acquisition, data analysis, statistical analysis, and manuscript preparation process. **Kundu** has provided her input in the design process, data acquisition, data analysis, statistical analysis, and manuscript preparation. She agreed to act as a guarantor in ensuring that all questions related to the accuracy and integrity of any part of the work are addressed appropriately. **Kataria** helped in the research design, literature review, and data acquisition

Conflicts of Interest The authors declare no conflicts of interest

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