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RESEARCH PAPER

Acceptance and hesitancy towards Covid-19 vaccination in the local population of East Khasi Hills, Meghalaya, and Sonitpur, Assam

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Background and aims: Hesitancy towards COVID-19 vaccines can be a barrier to the mass immunization policy of the government, even though the availability of vaccines is there. This research was done to assess acceptance and hesitancy towards COVID-19 vaccination in the local population of one district in each of the two states of Northeast India. Materials and methods: 75 study participants were recruited over a period of six months, and their vaccination status was assessed along with their socio-demographic status. The reason for acceptancy was assessed in those fully vaccinated or partially vaccinated. In those not taking a single dose, the reason for hesitancy was assessed. Results: Socio-demographic variables were found to have no significant association with vaccination status. However significant association was found between education status and vaccination. Those who had accepted showed their trust in the government's propaganda and messaging for taking vaccination, as well as recommendations from friends and colleagues. Those who did not receive a single dose feared the vaccine's side effects. Conclusion: To target special groups like people with lesser education, tailor-made messages by policymakers, and recruitment of leaders of society like headmen, reputable colleagues, or pro-vaccinated friends can increase acceptance of COVID-19 vaccination among the local population of Northeast India.

Keywords: COVID-19; Northeast; vaccination; acceptancy; local; hesitancy.

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INTRODUCTION

The behaviour of hesitation for vaccination is impacted by a variety of factors like concerns of trust (don't trust vaccination or provider), complacency (don't think a vaccine is necessary, don't value the vaccine), and practicality (access). People wary of vaccinations include a diverse population with varying degrees of uncertainty concerning general or particular vaccinations. Vaccine-hesitant people may receive all vaccinations but continue to worry about them, and some people may delay or refuse some but accept others; others might reject all vaccinations.[1]

The World Health Organization (WHO) started organizing a worldwide campaign for disease prevention, early detection, and medical treatment after COVID-19 was

declared a pandemic.[2] Medical authorities and academics worldwide could see that vaccination was urgently needed since it was the only solution to end the COVID-19 pandemic for good.[3] Multiple vaccinations were created and put through various clinical trials on various populations in the following months, setting a new record for how quickly a vaccine had been manufactured. On Mar 3, 2020, the first COVID-19 vaccination clinical study in humans began in the United States. Several additional human trials followed.[4] Researchers have investigated high-income countries' readiness to receive a potential COVID-19 vaccine. Some have also included middle-income nations.[5] Some studies assessed the vaccine barriers in India. However, more needs to be researched on acceptancy and hesitancy in the Northeastern region.

Hence, this study was taken up to assess the acceptance and hesitancy towards Covid-19 vaccination in the local population of East Khasi Hills, Meghalaya, and Sonitpur, Assam.

MATERIAL AND METHODS

Study design: This is a prospective cross-sectional study done for a period of 06 months from November 2021 to April 2022.

Study setting: This study was donein two tertiary care institutes; one in East Khasi Hills district, Meghalaya, and another in Sonitpur district, Assam.

Sampling method: A convenience sampling method was used.

Inclusion criteria: Patients' attendants coming with patients to the study settings for treatment.

Exclusion criteria: People attending the COVID-19 vaccination centresin the two institutes.

Ethical considerations: Informed written voluntary consent is obtained before the inclusion of the subjects as study participants and data collection. Ethical clearance was obtained from the ethics Committee of the institution.

Study variables: Part 1 contained the independent variables, including age, sex, residence, religion, community, education, occupation, monthly income, and chronic illness. Covid-19 vaccination status was the dependent variable. Part 2 consisted of 5 questions based on COVID-19 exposure. Part 3 consisted of 5 questions having reasons for taking the COVID-19 vaccination. Part 4 consisted of 5 questions having reasons for not taking COVID-19 vaccination. Figure 1 shows the data collection format.

Study definitions: Age was categorized into groups of 18-44 years, 45-64 years, 65 years, and above. Sex was categorized into male, female, and others. The residence was categorized into urban and rural. Religion was characterized as Hindu, Muslim, Christian, Sikh, Buddhist, and others. The community was categorized into Tribal and Non-tribal. Education was categorized into Uneducated, School education, Graduation, and Post-Graduation. The occupation was categorized as Unemployed and Employed. Monthly income was categorized into Poor (<Rs 4000), Low (Rs 4001-Rs 20,000), Middle (Rs 20,001-Rs 40,000), Upper Middle (Rs 40,001-Rs 1,00,000), High (>Rs 1,00,000). Chronic illness was categorized as Present (Having) and Not present (Not having).

Statistical analysis: Data was expressed as frequency and percentages, and the Chi-square test was used to analyze the categorical variables. A p-value of less than 0.05 was regarded as statistically significant.

RESULTS

A total of 75 cases were taken for the study, of which 46 were taken from the Sonitpur district of Assam and 29 from the East Khasi Hills district of Meghalaya. Among the study participants, 42 were males, and 33 were females. In East Khasi Hills, more female study participants were more than their male counterparts (55.17%), whereas, in Sonitpur district, males were the majority (63.04%). In East Khasi Hills, the study participants were 51.72% from urban areas, and 48.28% hailed from rural areas. In the Sonitpur district, 10.87% were from urban areas, whereas 89.13% were from rural areas. In Sonitpur district, the distribution of the participants with regards to their religionsshowed that 50% of them were Hindu, followed by 45.66% Muslims and 4.34% Christians. In East Khasi Hills, the majority of the participants were Christians (79.31%) which is followed by Hindus (10.34%), Muslims (6.89%), and 3.46% who practised other religions. In Sonitpur district, 95.65% were Non-Tribals, and 4.35 % were tribals, whereas, in East Khasi Hills, 82.75% were Tribals and 17.25% were non-tribals. In the Sonitpur district, 52.17% had completed their school education. 21.74% were uneducated, and 26.09% were graduates. In East Khasi Hills, 37.93% were graduates, 37.93% had completed their school education, 10.35% were uneducated, and 13.79% were postgraduates.

In Sonitpur, 65.25% were unemployed, and in East Khasi Hills, 62.06% were unemployed. In the Sonitpur district majority were poor (52.18%) or had low monthly income (47.82%). In East Khasi Hills, 65.6% were poor, and 17.2% had low and middle monthly incomes. In the Sonitpur district, 26.08% had chronic illnesses, whereas in East Khasi Hills, 13.79% had chronic illnesses. In the Sonitpur district, 65.22% were fully vaccinated, 26.08% were partially vaccinated, and 8.7% had not taken a single vaccination dose. In East Khasi Hills, 75.86% were fully vaccinated, 17.25% had partial vaccinations, and 6.8% did not take any vaccine doses. The independent variables were associated with COVID-19 vaccination status using a chi-square test. However, only the association of education and occupation to vaccination status was found to be significant, as depicted in **Table 1**.

Table 1 Association of socio-demographic variables with COVID-19 vaccination status

		Not	Partially	Fully vaccinated	P value vaccinated	Significance vaccinated
Age	18-44years	3	8	27	0.94	Not Significant
	45-64 years	3	6	22		
	>65 years	1	2	3		
Sex	Male	3	13	30	8.99	Not Significant
	Female	3	12	22		
Community	Tribal	3	5	18	0.66	Not Significant
	Non-Tribal	3	12	34		
Address	Urban	2	5	17	0.28	Not Significant
	Rural	4	5	42		
Religion	Hindu	1	9	16	0.50	Not Significant
	Muslim	2	3	18		
	Christian	3	5	17		
	Sikh	0	0	0		
	Buddhist	0	0	0		
	Others	0	0	1		
Education	Uneducated	6	5	1	0.0004	Significant
	School Education	3	5	27		
	Graduation	3	6	18		
	Post-Graduation	0	0	1		
Occupation	Unemployed	5	11	32	0.57	Not Significant
	Employed	1	6	20		
Chronic Illness	Present	2	5	9	0.43	Not Significant
	Not present	4	12	43		
Monthly income	Poor	4	10	25	0.84	Not Significant
	Low	2	5	20		
	Middle	0	1	7		
	Upper middle	0	1	0		
	High	0	0	0		

The study participants were given five questions regarding their COVID-19 experience, and the results in frequency and percentages were incorporated in **Table 2**.

Table 2 Response to questions depicting experience with COVID-19

1.	Have you ever been diagnosed with Covid-19?		
	Yes (21, 28%)	No (54, 72%)	
2.	Have any of your relatives or friends been diagnosed with Covid-19?		
	Yes (31, 41.33%)	No (23, 30.67%)	Do not know (21, 28%)
3.	Are you at risk of getting Covid-19?		
	Yes (6, 8%)	No (39, 52%)	Do not know (30, 40%)
4.	Have you heard about the Covid-19 vaccine?		
	Yes (75, 100%)	No (0, 0%)	
5.	Do you think that the vaccine will prevent Covid-19 infection?		
	Yes (19, 25.33%)	No (4, 5.33%)	Do not know (52, 69.33%)

Among the study participants, those vaccinated or waiting for their turn were given five questions regarding reasons for taking the Covid-19 vaccine. The results in frequency and percentages are depicted in **Table 3**.

Table 3 Response to questions depicting reasons for taking the COVID-19 vaccine

1.	I believe it will protect me from Covid-19 infection		
	Strongly agree (7, 10%)	Agree (36, 51.43%)	Neutral (25, 35.71%)
	Disagree (2, 2.86%)	Strongly disagree (0, 0%)	
2.	It is recommended by my colleagues and friends		
	Strongly agree (8, 11.43%)	Agree (29, 41.43%)	Neutral (23, 32.85%)
	Disagree (10, 14.29%)	Strongly disagree (0, 0%)	
3.	It will prevent transmission of the disease in the community		
	Strongly agree (4, 5.71%)	Agree (27, 38.57%)	Neutral (32, 45.71%)
	Disagree (7, 10%)	Strongly disagree (0, 0%)	
4.	I trust the measures taken by the government in the fight against Covid-19		
	Strongly agree (0, 0%)	Agree (21, 30%)	Neutral (38, 54.28%)
	Disagree (11, 15.71%)	Strongly disagree (0, 0%)	
5.	I need a vaccination certificate to work/travel		
	Strongly agree (7, 10%)	Agree (25, 35.71%)	Neutral (14, 20%)
	Disagree (16, 22.86%)	Strongly disagree (8, 11.43%)	

Table 4 Response to questions depicting reasons for not taking the COVID-19 vaccine

1.	I am concerned about the side effects of the vaccine		
	Strongly agree (0, 0%)	Agree (2, 40%)	Neutral (3, 60%)
	Disagree (0, 0%)	Strongly disagree (0, 0%)	
2.	I am afraid because I have never been vaccinated in my life		
	Strongly agree (0, 0%)	Agree (0, 0%)	Neutral (3, 60%)
	Disagree (2, 40%)	Strongly disagree (0, 0%)	
3.	I do not trust the measures taken by the government		
	Strongly agree (0, 0%)	Agree (0, 0%)	Neutral (5, 100%)
	Disagree (0, 0%)	Strongly disagree (0, 0%)	
4.	I have had a prior adverse reaction to vaccination		
	Strongly agree (0, 0%)	Agree (0, 0%)	Neutral (0, 0%)
	Disagree (0, 0%)	Strongly disagree (5, 100%)	
5.	My headman/religious leader has not recommended it		
	Strongly agree (0, 0%)	Agree (0, 0%)	Neutral (0, 0%)
	Disagree (5, 100%)	Strongly disagree (0, 0%)	

Those who showed hesitancy towards Covid-19 vaccination and had not taken a single dose during the data collection (5 in no.) were given five numbers of questions regarding reasons for not taking the COVID-19 vaccine, and the results are incorporated as frequency and percentages in **Table 4**.

DISCUSSION

Our study found that demographic variables like age, sex, residence, community, religion, and monthly income had no significant association with acceptancy or hesitancy of COVID-19 vaccination. In some studies done in the United Kingdom and Ireland, sex, age, and economic level were the three demographic characteristics most strongly linked to vaccine resistance or hesitance in both nations.[6] In one study, women were found to be more likely to be vaccine-hesitant respondents than respondents who had received the COVID-19 vaccination and found sex and gender-related differences in vaccine uptake and acceptance.[6,7] In our study, we found a significant association between education with COVID-19 vaccination status. According to Pogue et al., there was no correlation between income and vaccination attitudes which is in line with our findings. We found a significant association between the individual's education towards acceptance or hesitance of COVID-19 vaccination.[8] Danis et al., found no correlation between economic difficulty and vaccination refusal but found that it was a factor in vaccine hesitation. On the other hand, reluctance appeared unaffected by parental education, and lower parental education was a reliable predictor of refusal of all vaccinations.[9] In our study, we found monthly income and employment were not factors associated with vaccination status. We excluded hospital employees of the two institutes. However, the study conducted by Dror et al., indicated that those who believed they were at risk of disease and medical staff who cared for COVID-19-positive patients were more likely to self-report assent to the COVID-19 immunization when it was provided. On the other hand, family members who did not care for positive individuals or nurses and healthcare professionals who did not treat SARS-CoV-2 positive individuals displayed higher levels of vaccine hesitation.[2] To estimate prospective acceptance rates and identify factors affecting acceptance of a COVID-19 vaccination, one survey of 13,426 persons in 19 countries in June 2020 was conducted. Of these, 48.1% said they would accept their employer's suggestion to get the COVID-19 vaccine, and 71.5% said they would be very or somewhat inclined to do so. Acceptance percentages varied, going from around 90% (in China) to less than 55% (in Russia). The likelihood of accepting a vaccine and following a doctor's advice was higher among respondents who expressed a higher degree of faith in information from official government sources.[10] In our study, 69.33% of study participants were unsure whether COVID-19 vaccination would prevent the illness, though all participants had heard about the vaccination drive by the government. One preliminary study found that 80% of healthcare providers favoured COVID-19 vaccination and accepted recommendations from friends and colleagues.[11] In our study, we found that of those accepting vaccination, 11.43% strongly agreed, and 41.43% agreed that friends and colleagues recommended it. In our study, 38.57% of participants agreed, and 5.71% strongly agreed that vaccination would prevent disease transmission in the community. 30% strongly agreed that they trusted the measures taken by the government in the fight against Covid-19. 35.71% of participants agreed they needed a vaccination certificate to work/travel. 40% of those who did not take even a single vaccination dose agreed they were concerned about the vaccine's side effects. A decreased likelihood of vaccine hesitancy or resistance was linked to self-reported awareness about conventional vaccinations, including COVID-19 vaccines, and confidence in the effectiveness and safety of conventional vaccination, as found by some researchers.[12] A study comparing the level of acceptance and hesitancy towards the Influenza Vaccine and the COVID-19 Vaccine found that 3.1% of all respondents could not be persuaded to vaccinate by any argument. Among the respondents, 61.6% said they would be open

to vaccinating against the flu, and 83.3% said they would also be open to vaccinating against COVID-19. Even though most respondents said they trusted the influenza vaccination more, more respondents said they planned to obtain the COVID-19 vaccine in time for the 2020–2021 season.[13]

Limitations: The present study was conducted at two single tertiary care centres of one district each of Assam and Meghalaya and comprised a small sample size. Multicentric studies with larger sample sizes can give more insight into this current issue.

CONCLUSION

It is possible to use the high coverage rates of current vaccines and respondents' dependence on friends and family as information sources to encourage the local population's acceptance of COVID-19 vaccines. Social learning techniques and norm-setting are significant behaviour changes in many related fields. Social signalling of favourable sentiments regarding vaccinations may assist in changing social norms in the direction of even greater community adoption and uptake of immunizations. Policy makers should consider developing and analyzing social mobilization techniques to implement vaccination among those with less education.

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