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Psychological Factors and Acceptane Rate at Early Stage of COVID-19 Vaccine: A questionnair-based survey study

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Abstract

Introduction: The COVID-19 pandemic had a major impact on the health-care system that significantly reduced the capacity to continue delivery of health-care services to common people. ***Objectives***: The study aimed to understand knowledge, anxiety and wiliness about COVID-19 vaccine among frontline health-care workers.

Methods: This non-experimental cross-sectional online survey was conducted among frontline health-care workers in India. Snowball sampling technique was used to recruit participants for the study and data were collected through online social media platforms. Independent paired t-test was used to compare between anxiety with exposed to COVID-19, diagnosed with COVID-19, willingness, and knowledge. Multiple logistic regression model was used to assess the potential effects between the anxiety and other independent variables.

Results: Out of 884 responses, 844 respondents were included after removing incomplete and duplicate responses. An association was found between anxiety with age, education, income, and occupation. Except for those diagnosed with COVID-19, other parameters were found significant with anxiety. Similarly on comparison between willingness and not willingness with independent parameter, except for anxiety, all other variables were found significant (P=0.05). Anxiety was found potentially significant with independent variables. Higher anxiety i.e. 0.6 times higher anxiety was found among those exposed to COVID-19, 2.2 times higher anxiety found among those willing to vaccinate, 0.7 times higher anxiety found among those with income less than 10,000, and 0.8 times higher anxiety among those who were student by occupation ($p<0.05$).

Conclusion: Though the vaccinecan boost our immune system and would significantly reduce the strain on the health-care system, It's important to find ways to keep the stress at bay—not only for emotional wellbeing, but also to make sure to get the full benefits of the vaccine.

Background: The Sever acute respiratory syndrome coronavirus 2(SAR-CoV-2) is the prime causative virus for the COVID-19 on going pandemic. It was reported in December 2019 in Wuhan, China for first time, later spread through the world. The COVID-19 pandemic result in a devasting effect on normal life of human being and it has been claimed millions of lives. Health authorities from the city of Wuhan, China, informed World Health Organization (WHO) about an increase in pneumonia cases of unknown origin on December 31, 2019. Health authorities in China detected novel coronavirus as the causative agent for the pneumonia cases and the virus was initially named "2019-nCoV", which was later renamed as coronavirus disease 2019 (COVID-19). Owing to the virus virulency and its contagious nature, WHO declared novel coronavirus outbreak a public health emergency of international concern. With the steep rise in number of people infected with the virus outside China, WHO stated the eruption as a pandemic on March 11, 2020[1].

Combating a pandemic would require inter-sectoral co-ordination and vaccine hold one among the key's to resolve the pandemic crisis. In 2015, the World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization outlined vaccine hesitance as a 'time lag in credence or turn down of vaccination despite handiness of vaccination services[2] that varies in form and intensiveness based on from where and when it occurs and what vaccine is involved with, as reported in various studies.[3, 4]

Keywords: COVID-19; Vaccine; Anxiety; Depression; Willingness.

Introduction

In 2019, WHO identified vaccine hesitancy as one among the top ten global health threats[5]. There has been widespread reports of hesitancy and misinformation from various countries that has presented substantial obstacle to achieve coverage and community immunity[6,7]. Governments, public health officials and advocacy groups must be prepared to address hesitancy and build vaccine literacy so that the public will accept immunization when appropriate. Anti-vaccination activists are already campaigning in multiple countries against the need for a vaccine, with some denying the existence of COVID-19 altogether[8]. Misinformation spread through multiple channels could have a considerable effect on the acceptance of a COVID-19 vaccine[9]. The accelerated pace of vaccine development has further heightened public anxieties and could compromise acceptance[10, 11].

Health behaviors and psychological factors play a major role in the immune response towards vaccine administered. Regrettably, the unvarying tenseness of piloting our interrupted routine and social lives during the COVID-19 pandemic may have set us back when it comes to maintaining healthy behaviors. An impaired immune response could interfere with the development of antibodies against pathogen, swift erosion of antibody protection that does develop, and intensified vaccine side-effects[12]. The COVID-19 pandemic has dramatically changed and challenged the health care system, which has also interrupted the provision of basic health-care services.Lockdown is been attributed as one among the several reasons that severely disturbed normal services. Approximately 20% countries reported shortage of medications, diagnostics tools and other technology during this crisis times. COVID-19 pandemic has caused unprecedented hazards in the mental health of people across the globe, owing to the number of death and economic impacts caused by it.

Healthcare workers (HCWs) would be the primary group to be administered with vaccine. So, it would be of prime importance to assess their psychological factors and address their barriers for a widespread acceptance and a better immune response towards the vaccine administered.

Method

After obtaining permission from the competent authority, an online survey was carried out from January 1, 2021 to January 28, 2021 among the frontline health-care workers in India. Snowball sampling technique was adopted for the study. Various online platforms viz. Gmail, Whatsapp, and Facebook were used up to capture data from the eligible participants. After obtaining informed

consent from the participants, they were asked to fill in the questionnaire that comprised of Demographic proforma, Knowledge questionnaire, Generalized Anxiety Disorder scale (GAD-7) and Willingness questionnaire. Though we had instructed the participants to send the filled questionnaire form within 5 days, 40% of the participants had to be reminded again through personal message to get the completed questionnaire form.

Of the total 30 questions; there were 9 questions intended to capture the demographic profile of the participants, 8 items intended to assess participant's knowledge on COVID-19 vaccine, 7 items on generalized anxiety, and 6 items to assess their willingness towards COVID-19 vaccine.

Items were prepared in a Google form and its Uniform Resource Locator (URL) was send through various online platforms. Each participant would require an approximate 15-20 minutes, to fill up the entire questionnaire.

Data collected through Google form was organized in a real time excel sheet. Data was checked for appropriateness and completeness of all intended information. Missing and duplicate data's were removed. Descriptive statistics were used to assess the frequency, percentage, mean, and standard deviation. Chi-square was used for analyzing relation between the anxiety score and categorical variables viz. age, gender, income, occupation, and religion. Independent t-test was used to compare between anxiety, willingness, and other parameters.Multiple logistic analyses were used to measure the potential risk factors of patient. All the results were considered statistically significant when P-value = 0.05.

Result

Table 1: Socio-demographic characteristics of the frontline health-care workers and knowledge.

Variables	Anxiety on vaccination			Chi-square	P-value
	With anxiety	Without anxiety	Total		
Age					
16-30	352	241	593		
31-40	109	103	212	9.97	0.01
40-45	25	8	33		
>45	2	4	6		
Gender					
Male	169	128	297		
				0.15	0.69
Female		319	228	547	
Education					
Primary	74	63	137		
Secondary	307	200	507	9.81	0.01
Graduation	107	93	200		
Religion					
Hindu	396	286	682		
Muslim	43	25	68	2.08	0.35
Christian	49	45	94		
Occupation					
Health worker	153	83	236		
Teacher	54	46	100	7.36	0.05
students	238	186	424		
Others	41	43	84		
Income					
<10000	237	170	405		
10001=25000	148	83	231	12.2	0.01
25001-50000	70	65	135		
>50000	33	38	71		

Table 2: Frequency, percentage, mean and SD of uni-variate variables.

Variables	Frequency & percentages			Mean and SD
	Remark	Frequency	Percentage	
Exposed to COVID-19	No	668	79.1	1.209±0.40
	Yes	176	20.9	
Diagnosed with COVID-19	No	812	96.9	
	Yes	26	3.1	1.031±0.17
Knowledge	No	358	42.6	1.574±0.49
	Yes	486	57.4	
Anxiety	No	356	42.2	1.580±0.49
	Yes	488	57.8	
Willingness	No	107	12.7	1.870±0.33
	Yes	737	87.3	

Table 3: Comparison of anxiety and willingness with independent variables.

Variables		Anxiety on COVID-19 vaccination				Independent t value	P value
		With anxiety		No anxiety			
		F (%)	Mean & SD	f (%)	Mean & SD		
Exposed to COVID-19	No	399	1.50± 0.50	269	1.60±0.49	2.19	0.00
	Yes	89		87			
Diagnosed with COVID-19	No	472	1.60±0.54	340	1.50±0.49	-0.34	0.48
	Yes	16		10			
Willingness	No	447	1.60±0.48	290	1.38±0.49	-1.41	0.00
	Yes	41		66			
Knowledge	No	218	1.55±0.49	140	1.60±0.48	1.55	0.00
	Yes	270		216			

Variables		Willingness for COVID-19 vaccination				Independent t value	P value
		Willingness		Without willingness			
		F (%)	Mean & SD	F (%)	Mean & SD		
Exposed to COVID-19	No	592	1.18+0.32	76	1.82+0.38	2.21	.00
	Yes	145		31			
Diagnosed with COVID-19	No	722	1.88+0.32	90	1.60+0.54	4.87	.00
	Yes	15		11			
Anxiety	No	290	1.80+0.39	66	1.91+0.28	-4.41	.67
	Yes	447		41			
Knowledge	No	317	1.88+0.32	41	1.86+0.34	0.91	.02
	Yes	420		66			

Table-4: Multiple logistic regression analysis of anxiety factors associated with demographic variable, knowledge, willingness, exposed to COVID-19 and diagnosed with COVID-19.

Anxiety	B	S.E.	Sig.	Odd	CI (95%)	
					Lower	Upper
Knowledge	-.194	.149	.193	.824	.616	1.103
Willingness	.883	.225	.000	2.419	1.555	3.763
Exposed to COVID-19	-.379	.178	.034	.685	.483	.971
Diagnosed with COVID-19	.502	.444	.258	1.652	.692	3.941
Gender Female	-.031	.157	.845	.970	.714	1.318
Age	-.044	.126	.727	.957	.748	1.224
Education Post graduation	-.042	.118	.721	.959	.761	1.208
Occupation Student	-.266	.077	.001	.766	.659	.890
Income Low income	-.206	.078	.009	.814	.698	.949

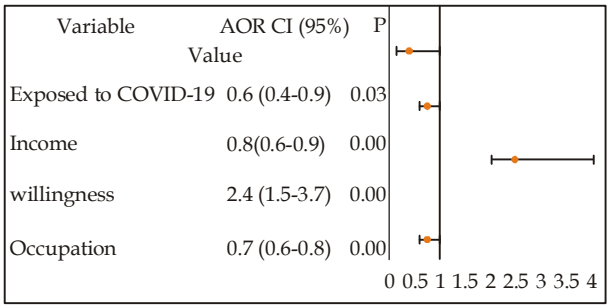

Fig. 1: Prediction of anxiety and other variables among frontline workers.

Of the 884 responses received from the participants, 844 respondents were included after removing incomplete information and duplicates. Majority of the participants 593 (70.2%) aged between 16-30 years, 547 participants (64.8%) were female, 507 participants (60%) had completed secondary education, 682 participants (80.7%) belonged to Hindu religion, 424 (50.2%) participants were students, and 405 (48%) participants had an income of less than 10,000 per

month. An association was found between anxiety with age, education, income, & occupation. Table-1

The uni-variate variables viz. exposed to COVID-19, diagnosed with COVID-19, knowledge, anxiety and willingness were summarized in form of frequency, percentage, mean, and standard deviation. Table-2

Independent paired t-test was used to compare between anxiety with exposed to COVID-19, diagnosed with COVID-19, willingness, and knowledge. Willingness to COVID-19 vaccination is summarized. Table-3 Except for those diagnosed with COVID-19, other parameters were found significant between anxiety. Similarly on comparison between willingness and not willingness with independent parameter, except for anxiety, all other variables were found significant (P=0.05). Table-3

Multiple logistic regression model

Multiple logistic regression model was used to assess the potential effects between the anxiety and other independent variables. Table-4 Anxiety was found potentially significant with independent variables. Higher anxiety i.e. 0.6 times higher anxiety was found among those exposed to COVID-19, 2.2 times higher anxiety found among those willing to vaccinate, 0.7 times higher anxiety found among those with income less than 10,000, and 0.8 times higher anxiety among those who were student by occupation ($p<0.05$). Figure-1

Discussion

Though people are excited about the early arrival of a potential vaccine to an ongoing pandemic, they are equally worried about the swift production of a vaccine. COVID-19 vaccine has been invented in a record time of a mere one year, from the day coronavirus was reported. The last time a vaccine was invented with such a pace was the Mumps vaccine (4 years); all credit to the sophisticated technology and global co-ordination [2].

Our study result revealed that 668 (79.1%) of participants were exposed to the COVID-19 pandemic. 812 (96.9%) participants diagnosed with COVID-19. About 486 (57.4%) had poor knowledge and 488 (57.8%) of participants were anxious about the COVID-19 vaccination, and 737 (87.3%) participants were ready for COVID-19 vaccination. Compared to the previous vaccine status, the majority of the people are willing to take the COVID-19 vaccine. In a systematic review carried out, acceptance rates of vaccine were evaluated from 33 countries[13]. Low rate of acceptance were reported from Middle-East, Russia, Africa, and several European countries. While, acceptance rate of 78.1% was found among Israel healthcare workers. Among the public, the same study reported an acceptance rate = 70%.(14) Approximately 87% of participants believed that the Indian COVID-19 vaccine is safe[15, 16].

This is a first study illustrating prediction of knowledge, anxiety, and willingness on COVID-19 vaccine. Celebrates and eminent people insists to take COVID-19 vaccine in public places to motivate common people. However, proper counseling would be required before initiating mass COVID-19 vaccination in a country like India.[17]

Willingness for taking the COVID-19 vaccine is an individual perception. Our study revealed that approximately 87% of participants were ready for the COVID-19 vaccination. Of 71.5% of participants acceptance of COVID-19 vaccine, the range vaccine varies from China and Russia 90% and 55% respectively. However, people are higher trust on government trusts were more likely accept the vaccine. Similar study was reported from Kuwait, about 53.1% participants were willing to take COVID-19 vaccine once its available from approved agencies.[18,19,20] There were 0.6 times higher anxiety among those exposed to COVID-19, 2.2 times higher anxiety among those willing to be vaccinated, 0.7 times higher anxiety among those with an income less than 10,000, and 0.8 times higher anxiety among those who were student by occupation; p=0.05. On the other hand, knowledge is an important factor that influences behavior of an individual. Our study revealed that approximately 58% of participants were knowledgeable about COVID-19 vaccine.[21, 22]

Conclusion

With the initial attempts towards developing COVID vaccine, it was pre-decided that the health-care workers would be the first to receive vaccination, as this would save most of the lives and would significantly reduce the strain on the health-care system. Though the vaccine has been fast-tracked, the aspects involving safety hasn't been compromised. Being stressed can weaken the immune system, which could affect the ways in which body would respond to virus. It's important to find ways to keep the stress at maynot only for emotional wellbeing, but also to make sure to get the full benefits of the vaccine.

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