

COVID-19 VACCINE ACCEPTANCE BY TEENAGERS

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Abstract

When COVID-19 hit the world in December 2019 it crippled the world in no time. Starting from China, it spread to the whole world. The world was shut down in order to contain the spread of virus but it was of little use. No existing medicine was able to cure it. The only hope was an early development of coronavirus vaccine. So the scientists started working on it and within a year pharmaceutical companies came up with different versions of the vaccine but the fast track process raised questions about efficacy and safety of the vaccine. The vaccine was administered in a phased manner to different groups of the population. Some accepted it willingly and others were hesitant to receive it. This study tried to analyze how teenagers responded to the vaccine. The study was conducted on a sample of 71 teenage girls and boys in the age group of 15-18 years, residing in the tri-city of Chandigarh. Data were collected through the questionnaire on vaccine acceptance - constructed by investigators themselves. Percentages were calculated to analyze the opinions of the teenagers on the various statements on the questionnaire. The t-test between girls and boys to see the difference in the mean scores relating to vaccine acceptance was also calculated through SPSS software. The results highlighted that 42.9% of the teenagers showed their acceptance of the COVID-19 vaccine due to some social factors, 68.2% took the vaccine as they were aware of its efficacy, and 62.8% of teenagers showed trust in the COVID-19 vaccine. Taking into account the risks/ side effects shown by the COVID-19 vaccine 72.7% perceived fewer risks of taking the COVID vaccine than advantages. While comparing the acceptance rate of girls and boys for the vaccine it has been found that girls showed more acceptance for getting the COVID-19 vaccine than boys.

Introduction

The novel Coronavirus disease 2019 (COVID-19 pandemic) has become a public health crisis worldwide. This has led to a massive impact on health, economics, and individuals' life, (Wong et al., 2020). To better control the pandemic, growing attention has been paid to COVID-19 vaccination. Since early 2020, global researchers have made efforts in developing and testing vaccines against COVID-19. Despite the availability, the success of COVID-19 vaccination would strongly depend on individuals' vaccine acceptance.

A safe and effective vaccine for the Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), has been on the wish list of healthcare agencies across the globe, (Chakraborty & Maity, 2020).

The process of vaccine development is a slow and time-consuming process and has to go through multiple checks for potency, efficacy, and safety, particularly in high-risk individuals' viz., elderly, pregnant women, and people with co-morbidities, and immune deficiencies, (World Health Organization, 2020).

Studies adopting the health belief model (HBM) or protection motivation theory have indicated that the acceptance of pandemic vaccines is considerably affected by the risk

perception of the disease, perception of the efficacy and safety of vaccines, history of vaccination, a vaccination-related attitude of the public, recommendations of the doctors, price of vaccines, and socio-demographic characteristics, (Zijregtop, 2009, Lau et al., 2010).

Vaccine hesitancy among the public is a primary obstacle in promoting the acceptance of pandemic vaccines, (Larson et al., 2012).

Though availability and equability distribution of vaccines is the top priority of the governments in different countries but ensuring acceptance among the population is also important, COVID-19 vaccine acceptance is an issue of global concern because any hesitancy in taking the vaccine can lead to the emergence and spread of new variants of the virus of deadly COVID-19. So the acceptance of the vaccine by the people and trust in the institution that administers it are the key determinants of the success of the vaccination campaign against COVID-19.

Factors that affect the attitude towards acceptance of vaccination include complacency, convenience, and confidence. Complacency denotes the low perception of the disease risk; hence, vaccination was deemed unnecessary. Confidence refers to the trust in vaccination safety, and effectiveness, besides the competence of the healthcare systems. Convenience entails the availability, affordability, and delivery of vaccines in a comfortable context, (Sallam, 2021).

Attitudes and acceptance toward the COVID-19 vaccine should be evaluated because it could help to plan an effective communication campaign and strengthen trust in the health institutions, (Lin et al., 2021).

If vaccine acceptance rates are estimated correctly it could be helpful to plan necessary strategies and interventions to increase awareness of people about the benefits of vaccines. It can in turn help to increase the acceptance of vaccines and control the spread of the disease.

(Habersaat et al., 2020).

The knowledge and perspective regarding COVID-19 vaccine acceptance among students have not been studied and it is anticipated that there will be great variation in vaccine-related perspectives and attitudes across students depending on socio-economic, education, and age group.

To eradicate the COVID-19 disease it is important that the vaccine should be widely accepted among all age groups. To achieve high rates of immunization it is critical to understand the factors that influence the acceptance. Though many studies are done in various countries few studies are found that focus on vaccine acceptance among teenagers. So, the purpose of our study is to describe the current vaccine acceptance among teenagers.

Keywords: COVID-19, vaccine acceptance, social factors, awareness, trust in the vaccine, perceived advantages of COVID-19 vaccine, teenagers

Review of literature

Ward et al. (2020) studied the French public attitude towards COVID-19 vaccine and the politicization of public health issues. Our online surveys were conducted in April 2020 for the French population 18 years and above during the lockdown period and deaths were at their peak. They found that if the COVID-19 vaccine was made available at that time, one-quarter of the people would refuse to take it due because the vaccine was made in very less time and it would have been dangerous.

Lazarus et al., (2020) surveyed for potential acceptance of the COVID-19 vaccine. 13426 people were surveyed from 19 countries to determine potential acceptance rates and factors influencing acceptance of COVID-19 vaccine. 71.5% of the participants reported to take vaccine. They also pointed out that a relatively high likelihood of acceptance of the COVID-19 vaccine was found in middle-income countries, such as Brazil, India, and South Africa.

Skjefte et al.(2021) surveyed 16 countries to analyze the acceptance rate of the COVID-19 vaccine among pregnant women and mothers of young children. A sample of 17871 pregnant women was taken from the surveyed countries. The study aimed to find the acceptance of the COVID-19 vaccine among the sample women and access the potential predictors of acceptance. The strongest predictors of COVID-19 vaccine acceptance were confidence in COVID-19 vaccine safety and effectiveness, belief in the importance of vaccines/mass vaccination to their own country, confidence in routine childhood vaccines, worry about COVID-19, trust in public health agencies and science, as well as compliance with face mask-wearing guidelines. COVID-19 vaccine efficacy was found to be 90%. 52% of pregnant women and 73.4% of non-pregnant women intended to receive vaccine. 69.2% of the total sample showed their intention to get their children vaccinated.

Solis et al. (2021) studied COVID-19 vaccine acceptance in low and middle-income countries (LMIC). Fifteen survey samples were taken from 10 LMICs in Asia, Africa, South America, Russia, and the US. A sample of 44260 was taken for the study. The results showed a considerably high willingness to take the COVID-19 vaccine in LMIC (approx. 80%) as compared to US (65%) and Russia (30%). Personal protection has been found to be the reason behind vaccine acceptance and side effects from the vaccine contributed to hesitancy in taking the vaccine. Health workers are the most trusted source of guidance about COVID-19 vaccine.

Fisher et al. (2020) studied the attitude of US adults towards a potential SARS-CoV-2 vaccine. The aim of the study was to assess the intent to be vaccinated against COVID-19 and identify predictors and reasons for vaccine hesitancy. A cross-sectional survey was done from 16-20 April, 2020. Around 1000 adults were drawn from an Amerispeak probability-based research panel covering 97% of the US household population. The results showed that around 58% intended to get vaccinated whereas 11% did not intend to get vaccinated. Younger age, black race, low education, and not having received the influenza vaccine, were the reasons behind vaccine hesitancy. Vaccine-specific concerns, less knowledge about vaccines, anti-vaccine attitudes, and lack of trust are some other reasons behind vaccine hesitancy.

Vaccine literature has highlighted the value to investigate the patterns of weighing factors in vaccination decision making in different groups because individuals who hesitate or

refuse to take vaccines may show different vaccine belief systems (Smith, 2017). Such knowledge can inform tailored vaccine promotion interventions or vaccine communication campaigns for people with different vaccine acceptance levels (acceptance, hesitancy, and refusal) to achieve a successful COVID-19 vaccination

Delimitation

The study was delimited to teenage- girls and boys in the age group of 15-18 years residing in the tri-city of Chandigarh.

Objectives

The objectives of the present study are:

1. To study the acceptance for getting vaccinated for COVID-19 by teenagers, in the age group of 15-18 years, residing in the tri-city of Chandigarh.
2. To study the difference, in acceptance for getting vaccinated for COVID-19, between teenage girls and boys, in the age group of 15-18 years, residing in the tri-city of Chandigarh.

Hypothesis

- There is no significant difference in acceptance for getting vaccinated for COVID-19, between teenage girls and boys, in the age group of 15-18 years, residing in the tri-city of Chandigarh
- **Sample**

A representative sample of 71 teenage girls and boys was drawn out from the said population residing in the tri-city of Chandigarh. The sample was taken using snow ball sampling technique.

Tools used

- Questionnaire on Vaccine acceptance - constructed by investigators themselves.

Procedure

Questionnaires related to Vaccine acceptance for COVID-19 were constructed by the investigators. Google form was prepared and the link was mailed to teenagers. The raw data was tabulated in the excel sheet and subjected to descriptive and inferential statistics. The difference in the mean scores between teenage girls and boys and t-ratios were calculated for vaccine acceptance for COVID-19 using SPSS software. Thereafter results were interpreted and conclusions were drawn out.

Statistical tools used

Descriptive statistics, such as mean, standard deviation, percentage responses, and inferential statistics such as t-ratios were employed to analyze the data.

Analysis of the data

A number of researches all over the world have shown that people of different ages took vaccines developed for Coronavirus to protect themselves from the ongoing pandemic. There was some initial resistance due to a lack of knowledge about and trust in vaccines. Soon, social factors, awareness, trust, and perception about the risks of taking vaccine motivated the people to go for the COVID-19 vaccination. In the present study, researchers analyzed the factors of vaccine acceptance by teenagers in the age group of 15-18 years.

Table1: Vaccine acceptance due to Social factors of the teenagers

S.No.	Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
1.	I am willing to take COVID 19 vaccine as it is available free of cost.	50.7	18.3	26.8	0	4.2
2.	I think it is my social responsibility to get vaccinated.	67.6	21.1	8.5	1.4	1.4
3.	I would ask my friends and dear ones to get vaccinated.	49.3	29.6	15.5	4.2	1.4
4.	I feel encouraged to get vaccinated because my parents are already vaccinated.	43.7	39.4	12.7	4.2	0
5.	I want to get vaccinated so that I can go back to school.	39.4	36.6	14.1	4.2	5.6
6.	After getting vaccinated I don't need to follow preventive measure such as social distancing and wearing masks.	7	5.6	9.9	50.7	26.8
	Average	42.9	25.1	14.6	10.8	6.6

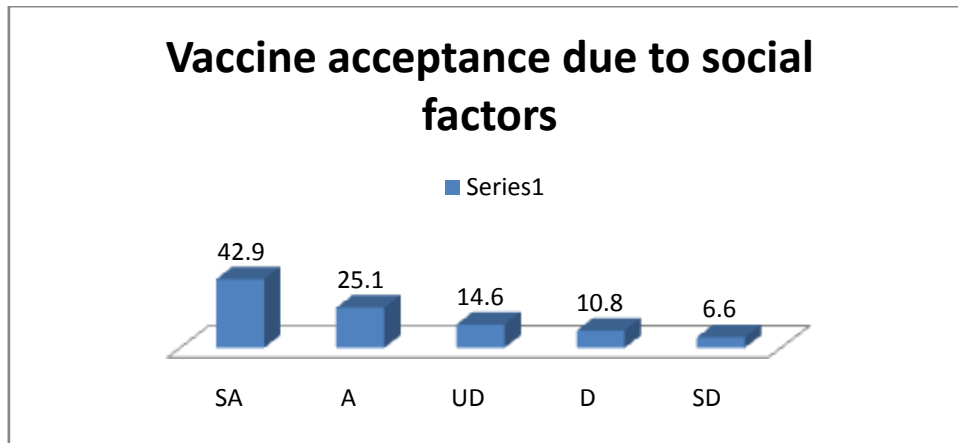


Figure 1: Vaccine acceptance due to social factors

On average 42.9% of the teenagers showed their acceptance of the COVID-19 vaccine due to social factors, 25.1% accepted it but were slightly reluctant to do so, whereas 17.4% (6.6+10.8) were hesitant in taking the vaccine. A small number of them, 14.6%, could not decide what to do.

Question-wise analysis shows that 69% (50.7+18.3) of teenagers showed their acceptance because it was free in government hospitals. There was a very less number (4.2%) who disagreed with this and 27% were undecided whether to take it or not even if it was free.

It is encouraging to see that 88.7% (67.6+21.1) believe that getting vaccinated is their social responsibility. Even 78.9% (49.3+29.6) agreed to motivate their friends and dear ones to take the jab.

83% (43.7+39.4) got vaccinated because their parents were already vaccinated for the COVID-19 vaccine. And, 76% (39.4+36.6) wanted to attend the school offline. Only a very few 12.6% (7+5.6) wanted to get vaccinated to shell off preventive measures whereas 77.5% (26.8+50.7) were against his view.

Table2: Vaccine acceptance due to Awareness about vaccine in teenagers

S.No.	Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
1.	Benefit of vaccine outweighs the risk of side effects.	20	34.3	27.1	14.3	4.3
2.	The approval of organizations such as WHO has motivated me to take the vaccine.	31	38	22.5	7	1.4
3.	Being vaccinated is safer than getting exposed to the disease.	49.3	42.3	5.6	0	2.8
4.	Social media has positively affected my opinion of the getting the vaccine.	26.8	31	33.8	5.6	2.8
	Average	31.8	36.4	22.3	6.7	2.8

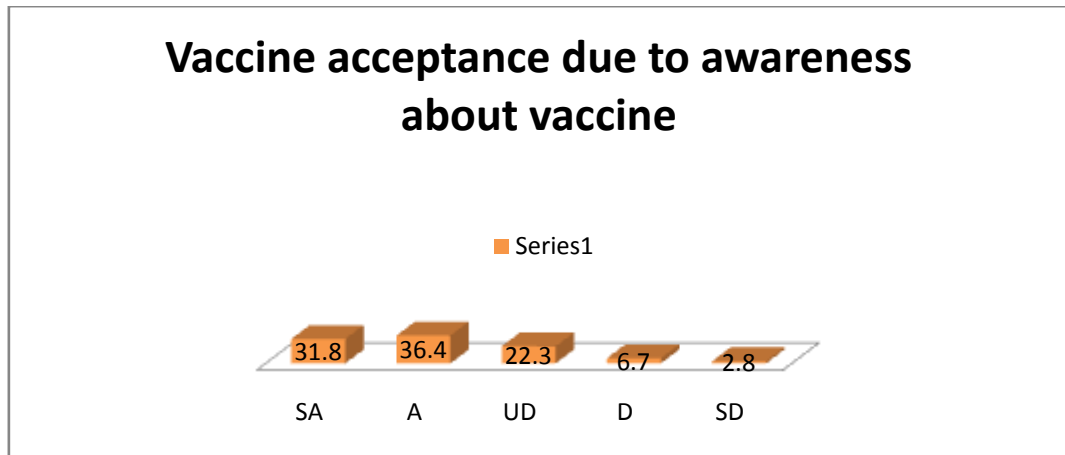


Figure 2: Vaccine acceptance due to awareness about vaccine

68.2% (31.8+36.4) were aware of the efficacy of the COVID-19 vaccine, whereas 9.5% (2.8+6.7) showed that they were not aware of the efficacy of the vaccine and 22.3% were undecided about this.

Point-wise analysis showed that 54.3% of teenagers agreed with the benefits of taking a vaccine as compared to its side effects, whereas 18.6% (4.3+14.3) were against this view and 27.1% were undecided.

67% (31+38) were aware of the approval of WHO to the available vaccines and felt motivated to take them. Only 8.4% (1.4+7) were not aware of the approval by WHO.

Most of the participants about 91.6% (49.3+42.3) agreed that getting vaccinated is safer than being exposed to the disease.

57.8% (26.8+31) showed their agreement about the effect of social media on their decision to take the vaccine whereas 33.8% were undecided.

Table 3: Vaccine acceptance due to Trust shown by teenagers in the vaccine

S.No.	Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
1.	I believe COVID 19 vaccine will be able to protect me against it in the future too.	42.3	28.2	23.9	4.2	1.4
2.	I think vaccines have already proved its efficacy in case of adults.	31	38	26.8	4.2	0
3.	There is sufficient data to prove efficacy of the vaccines.	14.1	28.2	39.4	11.3	7
4.	I prefer COVID 19 vaccine over alternative systems of medicine/remedies.	26.8	42.3	18.3	7	5.6
	Average	28.6	34.2	27.1	6.7	3.5

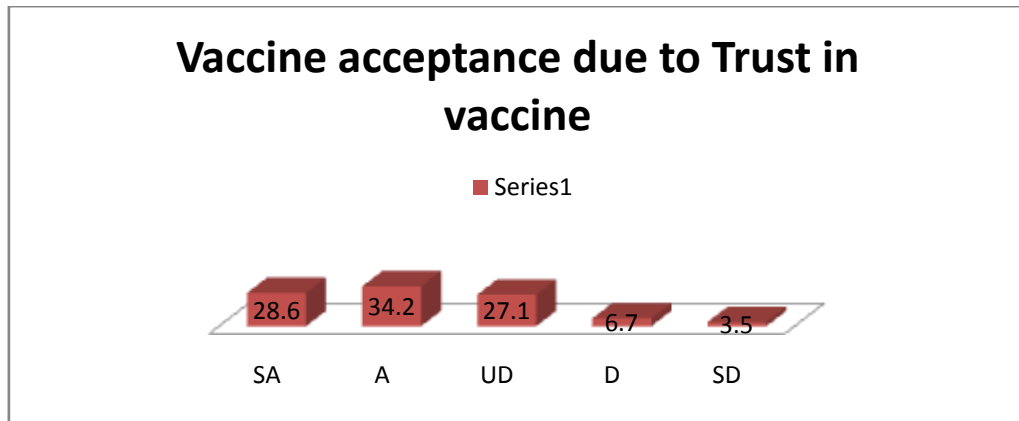


Figure 3: Vaccine acceptance due to Trust in vaccine

Trust in the efficacy of the vaccine proved to be an important factor in accepting the COVID-19 vaccine. 62.8% (28.6+34.2) agreed about the efficacy of the COVID-19 vaccine whereas 27.1% were undecided. Only 10.2% (3.5+6.7) of teenagers have not shown their trust in the vaccine.

70.5% (42.3+28.2) agreed that the COVID-19 vaccine will protect them against coronavirus in the future also. 23.9% were undecided.

69% of teenagers agreed that vaccines have already proved their efficacy in the case of adults. 26.8% were undecided about this proposition.

42.3% (14.1+28.2) agreed that sufficient data is available to prove the efficacy of the COVID vaccine. 39.4% could not decide whether it is true or not.

69.1% (42.3+26.8) preferred the COVID-19 vaccine over alternative system of medicines/remedies. 18.3% were not sure.

Table4: Vaccine acceptance due to Perceived advantages of vaccine over the side effects

S.No.	Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
1.	I believe that side effects of the available vaccines are milder than ill-effects of covidCOVID-19.	46.5	36.6	11.3	4.2	1.4
2.	I believe there is advantage of getting vaccinated though I can get COVID even after that.	22.5	29.6	28.2	11.3	8.5
3.	I am willing to take vaccine even if my academic / studies suffer due to its side effects.	39.4	43.7	8.5	4.2	4.2
	Average	36.1	36.6	16	6.6	4.7

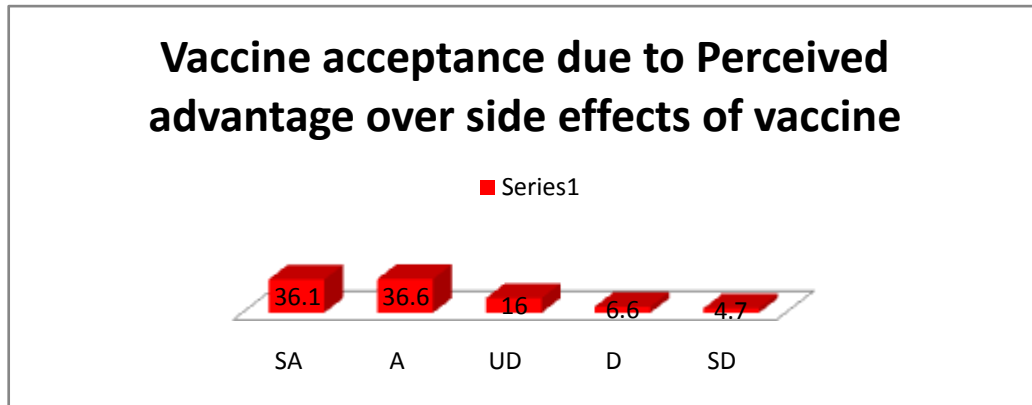


Figure 4: Vaccine acceptance due to Perceived advantage over side effects of vaccine

Taking into account the risks/ side effects shown by the COVID-19 vaccine 72.7% (36.1+36.6) of teenagers agreed that there are mild side effects of this vaccine and there are more advantages than disadvantages to taking this vaccine. Only 11.3% (4.7+6.6) were against this view. 16% were undecided.

Going for point-wise analysis, 83.1% (46.5+36.6) of teenagers agreed that the side effects of the available vaccines are milder than the ill-effects of COVID-19 whereas 11.3% could not decide about this.

52.1% (22.5+29.6) agreed that there is an advantage to getting vaccinated though they could get COVID even after that whereas 19.8% (8.5+11.3) were against this view.

The majority of the teenagers 83.1% (39.4+43.7) showed their willingness to take the vaccine even if their academic / studies suffer due to its side effects.

Table 5: Difference in mean scores for vaccine acceptance and t- value between Girls and boys in the age group of 15-18 years

Gender	N	M	SD	SEm	Df	t-value	Level of significance
Girls	49	67.71	8.73	1.25	69	3.196	.01
Boys	22	60.77	7.81	1.67			

Table 5 shows that the mean values for scores of vaccine acceptance between teenager girls (49) and boys (22) are 67.71 and 60.77 respectively. t-value is 3.196 for 69 degrees of freedom which is significant at 0.01 levels of significance. Hence the null hypothesis, "There is no significant difference in acceptance for getting vaccinated during COVID-19 between teenager girls and boys, in the age group of 15-18 years may not be accepted. Since the mean value for vaccine acceptance for girls is more than that for boys hence girls showed greater acceptance for getting the COVID-19 vaccine than boys.

Results

1. Average (42.9+25.1) % of the teenagers showed their willingness to take the vaccine. (67.6+21.1)% felt it to be their social responsibility and (49.3+29.6) % even would encourage their friends to get vaccinated. A parent's vaccination status also proved to be one of the major social factors for acceptance.
2. Awareness factors such as benefits of the vaccine, approval of WHO, safety, and social media, showed their importance in shaping their intentions in taking the COVID-19 vaccine. 69% were aware of WHO approval. 58% were positively influenced by social media. And 91.6% agreed that the COVID-19 vaccine is safer than getting exposed to the disease.
3. Trust in the vaccine could prove to be an important factor in shaping the intent of getting vaccinated. 70.5% trusted that vaccines could protect them in the future also. 69% had trust in the efficacy of the vaccine. 69% showed their interest in vaccines over the alternate system of medicine. An average of 62% showed their trust in the vaccine.
4. Average of 72.7% agreed that vaccines have an advantage over their side effects. 83.1% agreed that its side effects are milder than the ill effects of the disease. 52% were ready to accept it even if they get COVID in the future. 83.1% were willing to take it in spite of the loss of studies due to side effects.
5. Vaccine acceptance is found to be more among girls as compared to boys (significant at .01 levels).

Discussion

The results of the study show that social factors are strong predictors of vaccine acceptance. The vaccination status of adults especially parents can motivate children to get vaccinated. It is encouraging to see that teenagers accept vaccination as their social responsibility. This is similar to the findings of a recent study conducted by Skjefte et al. (2021) where the perceived risk of COVID-19 for the population, belief in the importance of having a COVID-19 vaccine, and mass vaccination, was a much stronger predictor of COVID-19 vaccine acceptance in comparison to a perceived risk of infection for themselves.

Another important factor highlighted by the present study is the awareness level about the vaccine and its side effects. Greater awareness leads to more acceptance. Social media can play a positive and constructive role in improving levels of acceptance. Also if people are aware that institution, like WHO, have approved the vaccine, they get motivated to take the vaccine. The results are in accordance with one of the studies by Fisher et al., 2020 who reported associations between some of the factors (i.e., beliefs and attitudes, safety concerns, and provider recommendations) and COVID-19 vaccine acceptance.

The proven efficacy of the vaccine builds trust that the vaccine will be able to save the recipient from COVID in the future. Lastly, the awareness campaign run by govt. agencies and social media can help to build opinion regarding the advantages of taking vaccines over the ill effects of the disease. As teenagers spend more time on social media so it can be used as an effective medium to improve immunization among teenagers.

There is a significant difference in acceptance for getting vaccinated during COVID-19 between teenage girls and boys. Girls show greater acceptance for getting the COVID-19 vaccine than boys.

Conclusion

The present study is among one of the few studies to explore the factors responsible for the acceptance of COVID-19 vaccine in teenagers. As teenagers form an important part of the population to get vaccinated in order to eradicate the disease the results of the study can provide important insights for formulating effective strategies to increase the vaccine rate in India.

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