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Impact of Counseling based Edu Vaccine on the Control and Prevention of COVID-19 pandemic

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Millions of people throughout the world are affected by the coronavirus outbreak brought on by the pandemic Coronavirus Disease (COVID-19), which is the first significant human catastrophe in history. This study aimed to assess the effect of counseling based Edu Vaccine on prevention and control of COVID-19 pandemic. This pre and post designed, prospective, study was conducted in different states of India using an online survey. A 30-items questionnaire as an instrument was sent to 1597 potential responders. The responded participants were enrolled as study participants and divided into counseling and non-counseling groups. The obtained data were analyzed using SPSS version 21. Chi-square test was used to assess the level of association among variables and independent t-test was used to compare participants' demographic and socioeconomic measurements. Out of 1597 only 829 participants responded and completed the survey questionnaire. At baseline, half of the population found that the symptoms of COVID include fever, cough and trouble breathing, but after the counseling a significant change was observed ($p<0.001$) in the counseling group. 91.7% population were agreed that social distancing, maintain hygiene and public awareness can help to control the community spread or 3rd stage of COVID-19. Around 96 % of the population in the counseling group was aware of the preventive measures recommended by WHO to avoid COVID-19 infection after the counseling. A significant improvement was observed in general population's the knowledge levels regarding COVID-19 and its preventive measures. We observed that people were aware of COVID-19 and preventive masseurs but they do not adhere so there is an urgent need to continuous educational campaigns with follow-ups that target less-educated, lower-income population and further studies are warranted.

Keywords: COVID-19, Prevention, Control, Pandemic, Counseling, Edu Vaccine.

In December 2019, the World Health Organization (WHO) identified an outbreak of an acute respiratory disease caused by the 7th strain of coronavirus. It was firstly reported in Wuhan, named "COVID-19", later, renamed "SARS-CoV-2" by the International Committee

on Taxonomy of Virus (ICTV).[1,2,3] The cases of COVID-19 were earlier recorded as pneumonia of unknown etiology.[4,5]

According to the available data, 7 strains of coronavirus can infect humans. Four of them cannot distort human physiology. The 5th and 6th coronaviruses are MERS-CoV and SERS-CoV that cause Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome, respectively. The 7th strain was named "SARS-CoV-2" which causes COVID-19.[6,7]

The incubation period of COVID-19 is between 2 to14 days and the signs and symptoms of COVID-19 are similar to the common cold to a great extent that includes cough, fever, shortness of breath, and fatigue. The less common symptoms of COVID-19 are sore throat, nasal congestion, aches, pains, bluish lips, confusion, and diarrhea.[8-10] SARS-CoV-2 is believed to 1st develop in bats and then transmitted to pangolins and ultimately to humans. In humans, SARS-CoV-2 can be transmitted through direct, indirect, or close contact with the infected person via mouth or nose secretions that include saliva, respiratory secretions, or secretion droplets. A person can also get an infection indirectly by touching a surface or object that is possessing virus on its surface or is contaminated with the SARS-CoV-2 virus. Covering your mouth and nose with either elbow or a piece of cloth can prevent the spread of the virus to healthy people.[11] According to published study findings, COVID-19 has grown dramatically, resulting in millions of fatalities worldwide.[12-14]

Bao-Liang Zhong *et al* conducted a survey on Chinese residents during COVID-19 and observed that good COVID-19 knowledge is associated with optimistic attitudes and appropriate practices towards COVID-19, suggesting that health education programs aimed at improving COVID-19 knowledge help encourage an optimistic attitude and maintain safe practices.[15] Pascal Geldsetzer *et al* conducted an online survey to assess the perception of residents of the US and UN during the COVID-19 outbreak. He concluded that ensuring that the local public is well informed about a pandemic like COVID-19 could reduce unnecessary anxiety. The local public has adequate information about the transmission and precautions that can also reduce disease spread and ultimately save lives.[16] Similarly Michael S. Wolf *et al* conducted a survey on US adults to assess their knowledge, attitude, awareness, and actions regarding COVID-19. They reported that adults with comorbid conditions had not adequate knowledge of COVID-19 and, despite the concerns; they were not changing daily routine and habits.[17] Hence the educational awareness is key component to manage and prevent covid-19 infection. The worldwide spread of COVID-19 has posed challenges on the health and well-being of the general public globally. Public adherence towards preventive measures is directly influenced by their knowledge and attitude regarding COVID-19. Keeping this is mind, the present study we conducted an online survey, we provided a questionnaire to the local public containing basic questions related to COVID-19 including prevention, transmission, and risk factors. Following online survey, we again conducted a survey to check the improvement in the people's awareness, knowledge, and attitude towards COVID-19. Hence, the main objective of this survey was to assess and increase the knowledge and awareness of the general public about COVID-19.

MATERIALS AND METHODS

This pre and post designed, prospective, study was conducted in different North Indian states of India (Rajasthan, Haryana, Delhi, Bihar, and Utter Pradesh) in the form of an online survey. The primary data was collected using a convenient sampling technique for five months period from 4th March to 7th July, 2020. The survey questionnaires was sent to 1597 potential responders (general population) which included students, parents, housewives, and medical professionals. Out of 1597, a total of 826 responders completed the survey questionnaires. The responded participants were enrolled as study participants and divided into two groups. The first group received COVID-19 related information through video and audio by whatsapp video and audio calling with the help of COVID-19 booklet hence the group known as counseling group, and the second group did not received counseling, they only received COVID-19 booklet through the email and what's app and known as non-counseling group.

Eligibility Criteria of study participants: The participants who were included

in this study were either sex, aged between 18 to 70 years, willing to participate and able to give valid consent, and not participate in any other survey related to COVID-19 from the last 3 months. The patients who excluded aged below 18 and above 70, participated in any other survey related to COVID-19 from the last 3 months and not willing to participate and not showing interest in gathering awareness about COVID-19.

Counseling based Edu Vaccine

We developed a counseling based Edu Vaccine for increasing awareness about COVID-19 prevention and control the spread in the society. This counseling based Edu Vaccine consist all relevant information to prevention and control of COVID-19. The purpose is to educate people about COVID-19 through counseling, face to face and online meetings and awareness through booklet, videos and photos and make them ready to follow the necessary measures for prevention of COVID-19 infection.

Development of a tool for data collection

A 30-items questionnaire as an instrument was developed by using standard resources course materials and guidelines on promising respiratory viruses, including COVID-19. The developed draft of the questionnaire was distributed to 3 randomly selected field experts to assess its reliability and validity before pretesting among the general population. Corrections were made as necessary to make easy better comprehension the final survey questionnaire was distributed to the study population.

Content of the study tool and intervention

The study instrument was a self-administered questionnaire comprised of 30 closed-ended questions and took approximately 5-10 minutes to complete. The self-administered 30-item questionnaire was divided into three parts- *1st* part consisting of 10 socio-demographic information related questions including participant characteristics (5 items), socioeconomic status (3 items), food habits, and locality (2 items), *2nd* part consists of 10 questions based on general knowledge and awareness about Covid-19, basic information and different modes of transmission (5 items), knowledge about symptoms of COVID-19 (2 items), high-risk population and sample collection (3) and *3rd* part consist of questions related to the precautions and risk prevention (4 items) and perceptions of COVID-19 (4 items). Enough time duration was given to participants to read, understand, and answer all the questions.[18,19]

Recruitment, response rates of the participants, and data collection

The study began with the sending of 30 items self-administered questionnaire survey to 1597 participants of different states in India (Rajasthan, Haryana, Delhi, Bihar, and utter Pradesh) through email, whatsapp and Facebook messenger and wait for their responses' with gentle reminders. Out of 1597 only 826 participants responded and completed the survey questionnaire and agree to participate and give consent to complete the study. The remaining 771 applicants were excluded because they did not respond and incompletely filled the questionnaire survey. The total duration of the study was 5 months (from 4th March to 7th July, 2020). Participants were allocated to counseling and non-counseling groups. Each group had 413 participants. 30 participants did not complete the study questionnaire from the counseling group and 28 patients from the non-counseling group were excluded because patients did not complete the questionnaire. Finally, 768 (385 in the non-counseling group and n=383 in the counseling group) have completed whole study. The counseling group received educational awareness counseling while the non-counseling group received only COVID-19 booklet on their mail and what's app. After giving the educational intervention the post- assessment questionnaire was sent to the participants of both the groups on their similar platform and taking the responses of participants as the answer to the questions. A summary and study overview is given in *Figure 1*.

Ethical considerations

The privacy and confidentiality of the study participants' information were maintained throughout the study. All the eligible participation was voluntary and was not compensated in this survey. Online informed consent was taken from each participant before continuing with the questionnaire.

Data analysis

The data collected was encoded, validated and analyzed using SPSS version 21. The calculation of frequencies and proportions is based on descriptive analysis. The chi-square test was used to study the association level

between variables. Statistically significant was a *p*-value of less than 0.05. Demographic and socio-economic assessments of participant participants were compared between individual t-test groups. Individual comparisons were made using the median test to obtain the correct answer percentage. Descriptive analyses, sample paired and independent t tests (Mean, Median (Min-Max), SD). A t-test for analyzing data with an interval of confidence of 95% and a significant of 5% or *p*-value < 0.05 was considered.

RESULTS

Baseline Characteristics of Participants

The average age of the study participants was 26.2±8.7 years (mean± SD) with an age range from 18 to 60 years. The number of male participants was higher (395) as compared to the females (373) participants. The study data showed that a maximum number of participants belonged to the urban area (461) as compared to rural and semi-urban 163 and 144 respectively. In this study, a large number of participants belong to graduation (531) level education followed by postgraduate and school.

Participants were from various types of occupations, most of the participants were students (425) followed by housewives, health care professionals, businessmen, and other professionals. The demographic and socioeconomic profile of study subjects is presented in *Table 1.*

Pre and Post Counseling Assessment

Table 2 shows the pre and post counseling assessment regarding the knowledge about COVID-19 among counseling and non-counseling group participants. We identified a significant knowledge gaps between counseling and non-counseling group in the post-assessment. For instance, in the baseline assessment, only 35% and 41.4 % of participants of the non-counseling and counseling group were aware of COVID-19 after counseling there was a significant difference found, 83% participants were completely awarded about COVID-19. In the beginning, only half of the population was aware of the present source of COVID-19 infection after counseling a significant change was observed (87.8% vs. 53.1%, p<0.05) between groups.

At baseline, approximately half of the population were aware that fever, cough, difficulty in breathing are the symptoms of COVID-19 but after counseling, this percentage became increased (96%) in counseling group. At baseline, population was confused about COVID-19 can transfer from pregnant women to their baby and what type of sample is required to test COVID-19, after counseling 79.7% and 78.9% population were aware of this concepts. However, the participants' knowledge about questions related to the incubation period of COVID-19 and mode of transmission was not good at baseline but after counseling around 85.9% population were aware of the incubation period (2-14 days) of COVID-19 and most of the population were aware of the mode of transmission of COVID-19 (p<0.05). After receiving counseling 72.4% population were aware that for 72 hours coronavirus can survive on plastic or stainless steel surface (mobile phone) and 78.6% population knows that old age persons with co-morbidities more are susceptible to COVID- 19 infection. Total, 92.8% counseling group participants were agreed that lockdown play an important role to control the COVID-19 outbreak.

However, the participants' knowledge about questions related to the preventive measures, social distancing, Lockdown role to control the COVID-19 outbreak, and community spread or 3rd stage of COVID-19 was average but they did not adhere to the preventing measure. After counseling 76.6% of participants of the counseling group knows that social distancing breaks the chain of COVID-19 replication. Total, 91.7% participants were agreed that social distancing, maintain hygiene and public awareness can help to control the community spread or 3rd stage of COVID-19. After counseling 91.9% population counseling group knows that avoid close contact with people who are sick, avoid touching your eyes, nose, and mouth and stay home and washing hands often with soap and water are the best policy to prevent the infection of COVID-19. 94.5% counseling group participants were aware that to eat a diet high in fruits, vegetables, and protein, to take a multivitamin if you suspect that you may not be getting all the nutrients and do exercise and meditation regularly and get enough sleep may keep my immune system strong. Around 96 % population of the counseling group were aware of the preventive measures recommended

by the WHO to avoid COVID-19 infection after counseling. 71.4% participants knew the intake of hot water, tea, turmeric milk, vitamin-C, and garlic can prevent the infection of COVID-19.

DISCUSSION

This prospective online survey, both pre and post-designed, was conducted across various states in India with two primary objectives.

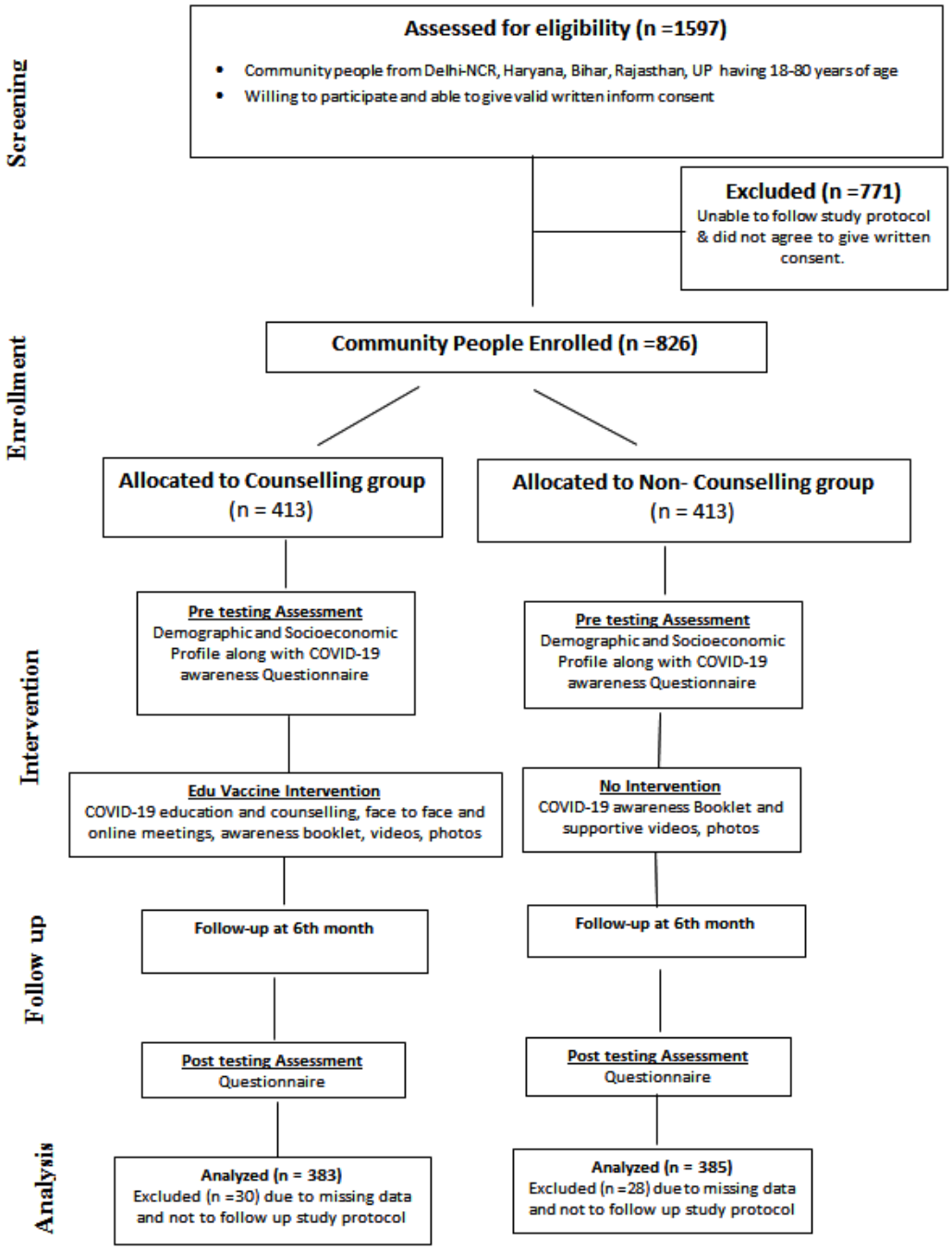

Fig. 1. Overview of Study with Screening, Enrollment, Intervention and Analysis

Firstly, it aimed to evaluate the level of awareness regarding COVID-19 infection and preventive measures among both counseling and non-counseling groups. Secondly, it sought to bolster public awareness regarding the infection and its prevention. Given the widespread discussion of COVID-19 in the media and among the general public, the current surge in COVID-19 transmission has induced stress among healthcare professionals, health systems, and the general populace. Hence, our study focused on assessing the knowledge and awareness levels pertaining to COVID-19 among the general population, particularly in terms of prevention and control during this global epidemic.

A pivotal factor in preventing the progression of both infectious and chronic diseases is increasing public awareness about these diseases and the strategies to mitigate them. Numerous studies have underscored that a higher level of disease awareness significantly contributes to primary prevention and control. Moreover, it aids individuals in recognizing early signs and symptoms, enabling them to take necessary precautions to prevent infection spread and seek treatment during the initial stages of the disease 20-23.

The rapid escalation of the COVID-19 outbreak led to its classification as a global public health emergency in January 2020. This was due to its uncertain incubation period spanning from day 1 to day 14, as well as the delayed onset of signs and symptoms24.The findings from this study in India shed light on the level of knowledge and awareness about COVID-19 among the general population before and after receiving online counseling. Initially, the baseline assessment indicated an average level of understanding regarding COVID-19. However, after participants underwent online counseling sessions, there was a noticeable improvement in their knowledge regarding various aspects of the virus, including its origin, symptoms, incubation period, mode of transmission, and preventive measures. Comparatively, those who received counseling showed a more significant increase in knowledge compared to participants who did not undergo counseling. This reinforces

Table 1. Demographic and socioeconomic characteristics of study participant

Characteristics	Total (n=768)	Counseling Group (n=384)	Non-Counseling Group (n=384)	*p-value
Age (in years)	26.2±8.7	26.1±8.3	26.2±8.9	0.989
Gender				
Male (n)	395	51.4 %	50.2%	0.891
Female (n)	373	48.6%	49.8%	
Locality				
Rural	163	21.2%	20.4%	0.936
Urban	461	60.0%	61.6%	
Semi-urban	144	18.8%	18.0%	
Education				
School	104	13.5%	14.6%	0.789
Graduate	531	69.1%	68.0%	
Post-graduates	123	16.0%	16.4%	
Doctorate	10	1.3%	1.0%	
Occupation				
Unemployed	52	6.8%	6.7%	0.892
Housewife	24	3.1%	4.2%	
Health worker	74	9.6%	9.7%	
Student	425	55.3%	54.4%	
Business	24	3.1%	4.0%	
Professional	169	22.0%	21.0%	

Table 2. Pre and Post Counseling Assessment

Variables	Questionnaire	Counseling Group %	Non-Counseling Group %	Difference between the group
(p-value)				
What is COVID-19?				
Pre Assessment (Response)	1	44.5	46	<0.001
	2	01	02	
	3	13.0	17	
	4	41.4	35	
Post Assessment	1	7.0	42.7	
	2	3.6	1.6	
	3	6.3	13.8	
	4	83.1	41.9	
Difference within group (p-value)	Pre – Post	<0.001	0.782	
What is the present source of COVID-19 infection?				
Pre Assessment (Response)	1	9.1	8.3	<0.001
	2	9.1	3.6	
	3	26.6	33.1	
	4	55.2	54.9	
Post Assessment	1	4.2	9.1	
	2	4.4	7.0	
	3	3.6	30.7	
	4	87.8	53.1	
Difference within group (p-value)	Pre – Post	<0.001	0.821	
What are the symptoms of COVID-19?				
Pre Assessment (Response)	1	16.4	25.0	<0.001
	2	14.6	9.1	
	3	9.4	8.9	
	4	59.6	57.0	
Post Assessment	1	1	24.0	
	2	2	12.5	
	3	1	9.4	
	4	96	54.2	
Difference within group (p-value)	Pre – Post	<0.001	0.542	
Can COVID-19 transfer from pregnant women to her baby?				
Pre Assessment (Response)	1	26.6	24.7	<0.001
	2	22.7	30.7	
	3	21.6	21.1	
	4	29.2	23.4	
Post Assessment	1	5.2	26.3	
	2	79.7	21.4	
	3	6.8	22.9	
	4	8.3	29.4	
Difference within group (p-value)	Pre – Post	<0.001	0.758	
What type of sample is required to test COVID-19?				
Pre Assessment (Response)	1	40.4	29.2	<0.001
	2	28.1	44.3	
	3	13.0	7.8	
	4	18.5	18.8	
Post Assessment	1	78.9	38.0	
	2	9.6	31.0	
	3	3.6	13.3	
	4	7.8	17.7	

Difference within group (p-value)	Pre – Post	<0.001	0.926	
What is incubation period of COVID-19?				
Pre Assessment (Response)	1	10.4	9.9	<0.001
	2	10.4	9.1	
	3	60.9	59.4	
	4	18.2	21.6	
Post Assessment	1	6.8	9.1	
	2	2.9	12.5	
	3	85.9	57.3	
	4	4.4	21.1	
Difference within group (p-value)	Pre – Post	<0.001	0.589	
Can it transmit through water, milk and food items?				
Pre Assessment (Response)	1	37.8	43.0	<0.001
	2	24.5	28.9	
	3	12.2	10.4	
	4	25.5	17.7	
Post Assessment	1	75.3	39.8	
	2	11.2	23.2	
	3	4.4	12.0	
	4	9.1	25.0	
Difference within group (p-value)	Pre – Post	<0.001	0.798	
Can COVID-19 be transmitted from a pet animal to human?				
Pre Assessment (Response)	1	18.5	19.3	<0.001
	2	48.4	39.1	
	3	11.5	15.1	
	4	21.6	26.6	
Post Assessment	1	8.9	16.7	
	2	75.8	47.1	
	3	6.5	13.5	
	4	8.9	22.7	
Difference within group (p-value)	Pre – Post	<0.001	0.989	
How long coronavirus can survive on plastic or stainless steel surface (mobile phone)?				
Pre Assessment (Response)	1	27.9	22.7	<0.001
	2	33.3	27.1	
	3	33.3	36.2	
	4	5.5	14.1	
Post Assessment	1	9.6	28.4	
	2	12.5	33.3	
	3	72.4	32.0	
	4	5.5	6.3	
Difference within group (p-value)	Pre – Post	<0.001	0.677	
Who is more susceptible to COVID-19 infection?				
Pre Assessment (Response)	1	6.3	20.3	<0.001
	2	14.8	9.1	
	3	55.5	46.4	
	4	23.4	24.2	
Post Assessment	1	3.6	7.0	
	2	9.6	13.3	
	3	78.6	56.8	
	4	8.1	22.9	
Difference within group (p-value)	Pre – Post	<0.001	0.792	
What preventive measures should be taken to break the chain of COVID-19 spread?				
Pre Assessment (Response)	1	45.1	41.9	<0.001
	2	16.4	20.1	
	3	20.8	20.6	
	4	17.7	17.4	
Post Assessment	1	76.6	39.6	

	2	1.8	20.1	
	3	19.7	21.9	
	4	1.9	18.5	
Difference within group (p-value)	Pre – Post	<0.001	0.965	
What does "social distancing" means?				
Pre Assessment (Response)	1	55.0	51.6	<0.001
	2	1	4.9	
	3	42.0	35.7	
	4	2	7.8	
Post Assessment	1	77.6	54.0	
	2	4.9	1.0	
	3	10.2	43.0	
	4	7.3	2.0	
Difference within group (p-value)	Pre – Post	<0.001	0.853	
Is lock down playing important role in controlling COVID-19 outbreak?				
Pre Assessment (Response)	1	51.6	42.4	<0.001
	2	13.5	16.7	
	3	16.9	23.4	
	4	18.0	17.4	
Post Assessment	1	92.8	45.8	
	2	1.0	14.8	
	3	2.3	23.2	
	4	3.9	16.1	
Difference within group (p-value)	Pre – Post	<0.001	0.812	
How can we help to control the community spread or 3rd stage of COVID-19 spread?				
Pre Assessment (Response)	1	19.5	23.2	<0.001
	2	16.9	19.3	
	3	14.6	15.6	
	4	49.0	41.9	
Post Assessment	1	5.5	21.6	
	2	1.8	9.9	
	3	1.0	19.3	
	4	91.7	49.2	
Difference within group (p-value)	Pre – Post	<0.001	0.866	
What is the best policy to prevent the infection of COVID-19?				
Pre Assessment (Response)	1	12.8	13.5	<0.001
	2	23.2	30.5	
	3	18.0	16.9	
	4	46.1	39.1	
Post Assessment	1	1.0	9.9	
	2	5.0	20.1	
	3	2.1	25.5	
	4	91.9	44.5	
Difference within group (p-value)	Pre – Post	<0.001	0.761	
What should I do to protect others if I get diagnosed with COVID-19 infection?				
Pre Assessment (Response)	1	18.2	26.3	<0.001
	2	16.7	19.5	
	3	11.2	17.2	
	4	53.9	37.0	
Post Assessment	1	7.9	16.9	
	2	1.8	24.0	
	3	2.5	11.2	
	4	88.8	47.9	
Difference within group (p-value)	Pre – Post	<0.001	0.994	
What can I do to keep my immune system strong?				
Pre Assessment (Response)	1	9.4	15.9	<0.001

	2	15.9	14.3	
	3	19.8	26.6	
	4	54.9	43.2	
Post Assessment	1	2.1	13.3	
	2	1.5	18.0	
	3	1.8	14.6	
	4	94.5	54.2	
Difference within group (p-value)	Pre – Post	<0.001	0.541	
What preventive measures are recommended by WHO to avoid COVID-19 infection?				
Pre Assessment (Response)	1	12.5	26.0	<0.001
	2	17.2	19.5	
	3	10.7	13.5	
	4	59.6	40.9	
Post Assessment	1	1.6	10.7	
	2	1.0	13.3	
	3	1.3	13.0	
	4	96.1	63.0	
Difference within group (p-value)	Pre – Post	<0.001	0.632	
What should I do I had close contact with COVID-19 infected person?				
Pre Assessment (Response)	1	44.8	47.7	<0.001
	2	4.4	3.6	
	3	47.4	45.8	
	4	3.4	2.9	
Post Assessment	1	17.4	45.8	
	2	9.4	3.9	
	3	65.9	46.1	
	4	7.3	4.2	
Difference within group (p-value)	Pre – Post	<0.001	0.769	
Can intake of hot water, tea, turmeric, milk, vitamin-C and garlic can prevent infection of COVID-19?				
Pre Assessment (Response)	1	21.1	28.9	<0.001
	2	39.6	40.4	
	3	11.7	9.9	
	4	27.6	20.8	
Post Assessment	1	7.0	21.4	
	2	71.4	40.4	
	3	11.7	12.5	
	4	9.9	25.8	
Difference within group (p-value)	Pre – Post	<0.001	0.871	

the idea that educational interventions, like counseling sessions, can effectively enhance public awareness and knowledge about COVID-19.

The study's results align with similar research conducted by F.A. Quadri et al among dental healthcare workers, where timely dissemination of information by health authorities positively impacted their knowledge about the virus [25]. This correlation suggests that access to updated and accurate information from reliable sources, like the Ministry of Health, significantly influences people's understanding of COVID-19. The implication of these findings is crucial. Continuously providing counseling and increasing awareness through various channels can play a vital role in controlling and preventing the spread of the disease. When individuals are well-informed about the virus, its transmission, and preventive measures, they are more likely to take appropriate actions, follow guidelines, and contribute to collective efforts in curbing the spread of COVID-19. Essentially, this study highlights the importance of ongoing education and awareness campaigns in empowering communities to combat the pandemic effectively. By continually disseminating accurate information and engaging in counseling sessions,

the population becomes better equipped to make informed decisions, thereby contributing to disease prevention and control efforts.

A similar study conducted in Saudi Arabia by Haridi et al indicates that the population in Saudi Arabia lacked adequate knowledge about COVID-19 and general infectious disease precautions. This finding underscores the need for targeted educational interventions to address these knowledge gaps among the populace[26]. Chhajer et al study echoes the sentiment that there's a widespread lack of information among participants regarding illness prevention. This lack of awareness emphasizes the necessity of robust public awareness initiatives to educate individuals about preventive measures against diseases like COVID-19[27]. Santana et al randomized control trial highlights the importance of continuous counseling and training for healthcare workers to enhance their knowledge about diseases like AIDS. This suggests that ongoing education is crucial to ensure healthcare professionals remain well-informed about disease transmission and precautions [28].

A study conducted by Mohammed et al that targeted and repeated health education interventions should be directed to this particularly vulnerable population, who may be at increased risk of contracting COVID-19.29 The results of the present study suggest that significant knowledge gaps about COVID-19 can be cover by providing depth and continuous knowledge particularly about the mode of transmission and incubation period and standard precautions for COVID-19 to the general population with follow ups can increase their knowledge and decrease disease progression.

The overall assessment, as indicated in multiple studies, suggests a significant lack of accurate information among the general public regarding COVID-19. Misconceptions and misinformation about the virus's transmission, symptoms, and preventive measures prevail, indicating an urgent need for intervention. The studies indicate that social media platforms significantly influence people's perceptions and understanding of the pandemic. Acknowledging this influence is crucial when designing educational campaigns and ensuring that accurate information is disseminated through these channels. The research emphasizes the urgency of intervention to improve public knowledge. Implementing educational campaigns, providing reliable sources of information, and promoting critical thinking skills are identified as essential strategies. Enhancing public awareness can empower individuals to make informed decisions about their health and contribute to controlling the spread of COVID-19 within communities. These findings collectively stress the critical need for comprehensive and continuous educational efforts targeting both the general public and specific vulnerable groups. Addressing misinformation, enhancing awareness, and leveraging various communication channels are vital strategies in mitigating the spread of COVID-19 and other infectious diseases [30-33].

CONCLUSION

The findings of the present study conclude that a significant improvement was observed in the knowledge levels regarding covid-19 and preventive measures to stop the outbreak. We also found a significant improvement in the preventive measures practices to overcome the disease. We observed that people have knowledge but they do not adhere to preventive masseurs so there is an urgent need to continuous greater efforts through educational campaigns with follow-ups that target the general rural and urban population. This study helped people in busting myths, reducing rumors and anxiety among the local public and also enhanced the knowledge of the local public about the transmission, preventions, and risk factors of COVID-19. The results of this study suggest that survey prepared in simple and preferably in local language with more emphasis on relevant information could be very useful in less-educated and lower-income population. These findings may help policymakers identify the target populations, for COVID-19 prevention and health education.

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Conflict of interest

Authors do not have any conflict of interest in this study.

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