Effect of Clinical Pharmacists' Intervention on the Knowledge, Attitude and Practice of Youth towards COVID-19

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ABSTRACT: Coronavirus disease (COVID-19) is an infectious disease caused by a novel enveloped beta Corona virus of the 'CORONAVIRIDAE' family. To reduce the spread and improve vaccination acceptance, it is essential that measures are taken to ensure the public is well-informed on how the virus spreads, how preventive measures help and the significance of taking vaccination. **Objectives:** The main objective of the study was to assess the effect of clinical pharmacists' intervention on the Knowledge, Attitude and Practice (KAP) of youth on COVID-19. The other objective of the study was to assess their attitude towards COVID-19 vaccination. **Materials and Methods:** This was an observational-interventional study. The subjects' demographic details and responses were collected using a standardized questionnaire. The collected data was entered in Microsoft Excel and appropriate descriptive and inferential statistical analysis was performed. **Results:** The association between the pre and the post KAP scores were statistically analyzed using the paired t test. The results showed statistical significance ($p = 0.001$; p value < 0.05) in the scores of subjects after educational intervention. The attitude of the youth towards COVID-19 vaccination was analyzed using descriptive statistics which showed that majority of the subjects had a positive attitude towards vaccination but most of the subjects (73%) were concerned about the serious side effects of the vaccine. **Conclusion:** In conclusion, educational interventions and public health education programs can enhance knowledge, attitude, and establish healthier behaviours to protect oneself and others in the event of a healthcare emergency such as a pandemic.

Key words: COVID-19, Knowledge, Attitude, Practice, Youth, COVID-19 vaccine.

INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by a newly identified coronavirus.[1] The International Committee on Taxonomy of Viruses termed the causative virus SARS-COV-2, belonging to "CORONAVIRIDAE" family.[2] This virus went on to become a major global threat affecting more than 185 countries and 35,00,000 people and causing nearly 2,50,000 deaths worldwide.[3] The pathogen has been identified as a novel enveloped RNA beta-coronavirus. The first case of COVID-19 in India was reported on January 30, 2020. As of April 26, 2021, death toll in India has increased to over 1.95 lakh and active cases have crossed the 28-lakh mark, while more than 1.43 crore people recovered after testing positive. The country has vaccinated over 14.19 crore people as of April, 2021.[4]

Overall, from the time of exposure to COVID-19, to the development of symptoms, it can range anywhere from 5-6 days to 1-14 days.[5] The symptoms range from mild to severe respiratory problems and in many cases loss of taste and smell along with high fever, dyspnoea and cough are common symptoms. Patients who are severely ill experience pneumonia, ARDS and cardiac problems.[6] Among the individuals who suffer from symptoms, most (about 80%) recuperate from the illness without requiring emergency clinical treatment. About 15% become severely ill and require oxygen and 5% become critically ill and need serious treatment. In uncommon circumstances, children can present with a multisystem inflammatory disorder a few weeks after the disease.[7]

Importance of educating the public on COVID-19

Public education plays a key role in keeping the disease in check. Another key factor to limit the spread is to educate the public on good hygiene practices including the use of sanitizers, washing hands, wearing masks to avoid frequent touching of face, or coughing into a flexed elbow.[1]

Vaccine acceptance is another hurdle. It is necessary to build a trust in the COVID-19 vaccines before people can form opinions against them. This should involve using trusted messengers to convey information about COVID-19 and providing faith in the vaccine development process through transparency and managing expectations.[8]

The youth make up a large part of the Indian population, approximately 27% as of 2020[9]. The young population is the backbone of our society and the choices they make, decide the future.

Reasons why educating the youth may be instrumental in minimising the spread

- Helping the youth understand the potential risks, preventive measures and creating awareness that prevention is better than cure is easier compared to the older generation.
- They can act as a carrier of information to people in their homes and societies.
- Counselling them about the do's and don'ts of COVID-19 is very important as they may easily act as carriers of the virus to the elderly and children.

- Informing them about the misconceptions regarding the vaccine, for example, taking a dose of the vaccine can result in infertility, can help them understand the truth about the vaccines and choose whether to get vaccinated or not when the time comes.[10]

  As a lot of misinformation and xenophobia is being spread regarding the pandemic and vaccination, therefore it is the duty of health professionals to ensure the information provided to public is valid and to educate them in order to eliminate chances of misconceptions that could lead to health hazards in the community.

  With the right information and guidance, we will be able to convey that COVID-19 is just a '**phase**', and if we stand together in this battle against it then we will surely win.[10]

This study aims to assess the effect of clinical pharmacists' intervention on the knowledge, attitude and practice of youth on COVID-19 and also assess their attitude towards the COVID-19 vaccination.

MATERIALS AND METHODS

Subjects for the study were identified by the investigators during community visits based on the inclusion and exclusion criteria. The subjects were explained the purpose of the study and the informed consent was obtained. Relevant data (demographic details) was recorded, and the subjects were administered with other study tools to obtain relevant information. The data thus obtained was entered in a Microsoft Excel sheet and appropriate analysis was performed.

Study Site: The study was conducted in selected areas of Soldevanahalli of Bengaluru for 6 months.

Study Design: This is an observational-interventional study.

Study Criteria: A total of 300 subjects fulfilling the inclusion criteria were included in the study.

Inclusion Criteria

a. Subjects who are willing to give consent.
b. Subjects of age 18 years and above.

   Exclusion Criteria

a. Subjects above 24 years of age.
b. Subjects with mental disabilities.

   Ethical Approval: The study was approved by Institutional Ethics Committee of Acharya and BM Reddy College of Pharmacy, Bengaluru-560090, Karnataka, India.

   Data collection tools

1. Self-designed demographic data sheet: To collect relevant demographic details of the study subjects.
2. KAP questionnaire: It is a standard data collection tool to assess the knowledge, attitude and practice regarding the COVID-19 pandemic. It contains 16 questions (Knowledge –12; Attitude – 2; Practice – 2) that are graded by providing one point for each correct answer and zero points for the wrong answer.
3. Attitude towards vaccination questionnaire: It is an instrument to assess the attitude of the subject to receive COVID-19 vaccination. It has 9 questions that are graded from a scale of Strongly Agree (4 points) to Strongly Disagree (1 point).
4. Patient Information Leaflet: It contains information regarding the pandemic and the vaccination to educate the subjects on the topic.
5. Blooms cut-off score: The overall Knowledge, Attitude and Practice was categorized, using Bloom's cut-off point, as good knowledge, attitude and practice if the score was between 80-100%, moderate knowledge, attitude and practice if the score was between 60-79%, and poor knowledge, negative attitude and poor practice if the score was less than 59%.

Statistical Analysis

All recorded data were entered into MS Excel software and analyzed using SPSS 22 version software for determining for the statistical significant. Statistical analysis was performed using Student's paired t-test to assess the effect of clinical pharmacists' intervention by comparing the pre-test and post-test KAP scores of selected subjects.

Data for the study was collected and analyzed statistically by computing the proportions for all qualitative data, mean and standard deviation for quantitative data. This result was expressed in terms of 95% confidence interval. The results were also represented on tabular and figurative form wherever needed. For the comparison between pre-test and post-test KAP scores, the results were considered statistically significant if p value is less than 0.05. Descriptive statistics was used to assess the attitude of youth towards COVID-19 vaccination.

RESULTS

The study was conducted in the subjects drawn from the population within selected areas of Soldevanahalli of Bengaluru who were fulfilling the inclusion criteria and had provided the informed consent to participate in the study.

Distribution of subjects by gender

The study included a total of 300 subjects, out of which 97 were selected based on their KAP score.

From the selected subjects, 61 subjects were male (63%) and 36 subjects were females (37%) as shown in Table 1.

Table 1*:* Distribution of subjects based on Gender.

Gender	Number of Subjects	Percentage
Male	61	63%
Female	36	37%

Distribution of subjects by education level

Out of 97 subjects, 27 subjects (28%) were higher secondary students and 70 subjects (72%) were college students as shown in Table 2.

Table 2: Distribution of subjects based on Education level.

Education Level	Number of Subjects	Percentage
Higher Secondary	27	28%
College/University	70	72%

Distribution of subjects by occupation:

Out of 97 subjects, 3 subjects (3%) were office workers, 2 subjects (2%) were self-employed and 2 subjects (2%) were housewives, only 1 subject was unemployed and the remaining 89 subjects (92%) were students as shown in Table 3.

Table 3: Distribution of subjects based on Occupation.

| Occupation	Number of Subjects	Percentage
Office Worker	3	3%
Self-Employed	2	2%
Housewife	2	2%
Unemployed	1	1%
Student	89	92%

Distribution of subjects by course of study

Out of 97 subjects, 22 subjects (23%) are enrolled in medical courses and 75 subjects (77%) are enrolled in non-medical courses. The distribution of subjects by course of study can be seen in Table 4 given below.

Course of Study	Number of Subjects	Percentage
Medical	22	23%
Non-Medical	75	77%

Comparison of Pre and Post-test Knowledge, Attitude and Practice Scores

Pre and Post-test Knowledge Score

Students paired t test was done to test the association between pre and post knowledge score, the test statistic value was -21.604. The p value was found to be 0.001 (p value<0.05) which was statistically significant as shown in Table 5. The comparison of the mean pre and post-test knowledge score is given below in Figure 1.
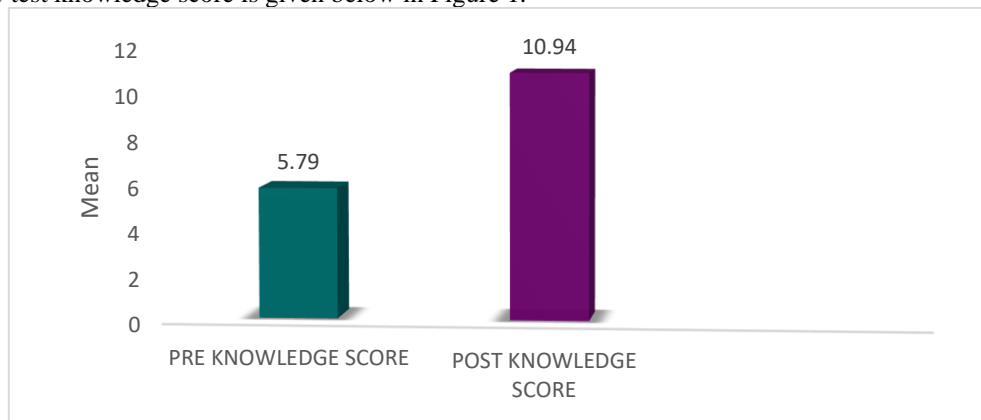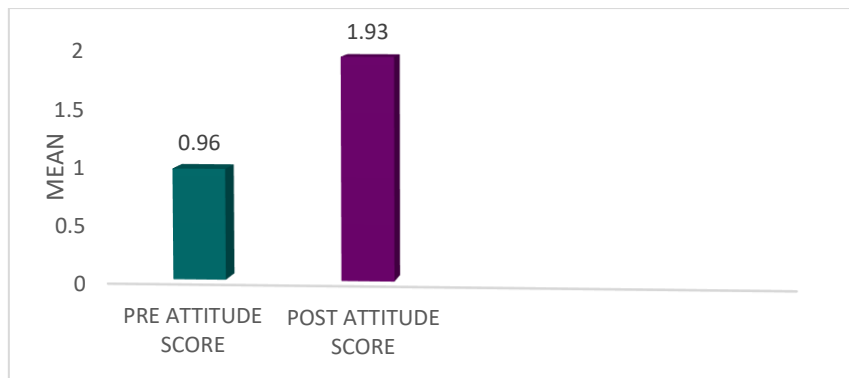

Figure 1: Distribution of subjects' mean pre and post-test knowledge scores.

Table 5: Distribution of subjects' mean pre and post-test knowledge scores and statistical analysis.

Variables	Mean	Standard Deviation	Mean Difference	t-value	Df	P value
Pre-test knowledge score	5.79	2.081	-5.144	-21.604	96	0.001
Post-test knowledge score	10.94	1.019				

Pre and Post-test Attitude Score:

Students paired t test was done to test the association between pre and post attitude score, the test statistic value was -17.393. The p value was found to be 0.001 (p value<0.05) which was statistically significant as shown in Table 6. The comparison of the mean pre and post-test attitude score is given below in Figure 2.
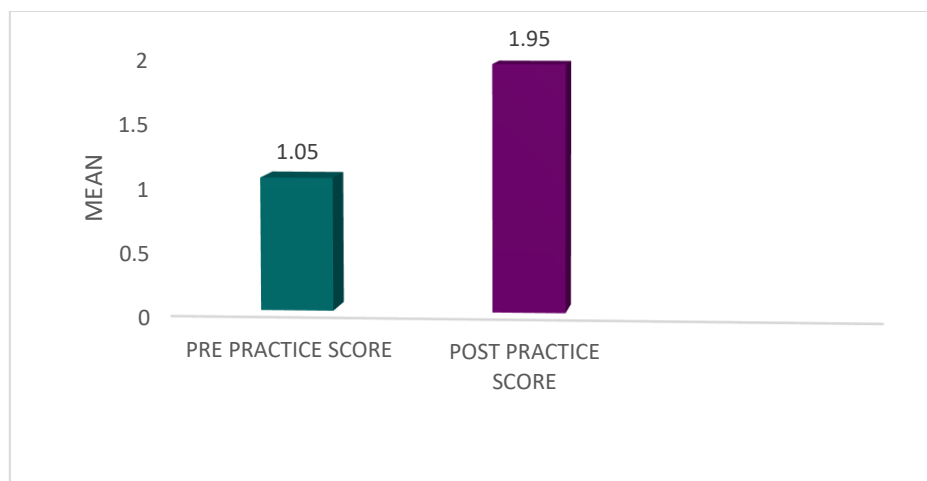
Figure 2: Distribution of subjects' mean pre and post-test attitude scores.

Table 6: Distribution of subjects' mean pre and post-test attitude scores and statistical analysis.

Variables	Mean	Standard Deviation	Mean Difference	t-value	Df	P value
Pre-test attitude score	.96	.557	-0.969	-17.393	96	0.001
Post-test attitude score	1.93	.260				

Pre and Post-test Practice Scores

Students paired t test was done to test the association between pre and post practice score, the test statistic value was -14.636. The p value was found to be 0.001 (p value<0.05) which was statistically significant as shown in Table 7. The comparison of the mean pre and post practice score is given below in Figure 1.


Figure 3: Distribution of subjects' mean pre and post-test practice scores.

Table 7: Distribution of subjects' mean pre and post-test practice scores and statistical analysis.

Variables	Mean	Standard Deviation	Mean Difference	t-value	Df	P value
Pre-test practice score	1.05	.619	-0.897	-14.636	96	0.001
Post-test practice score	1.95	.222				

Assessment of attitude towards COVID-19 vaccination
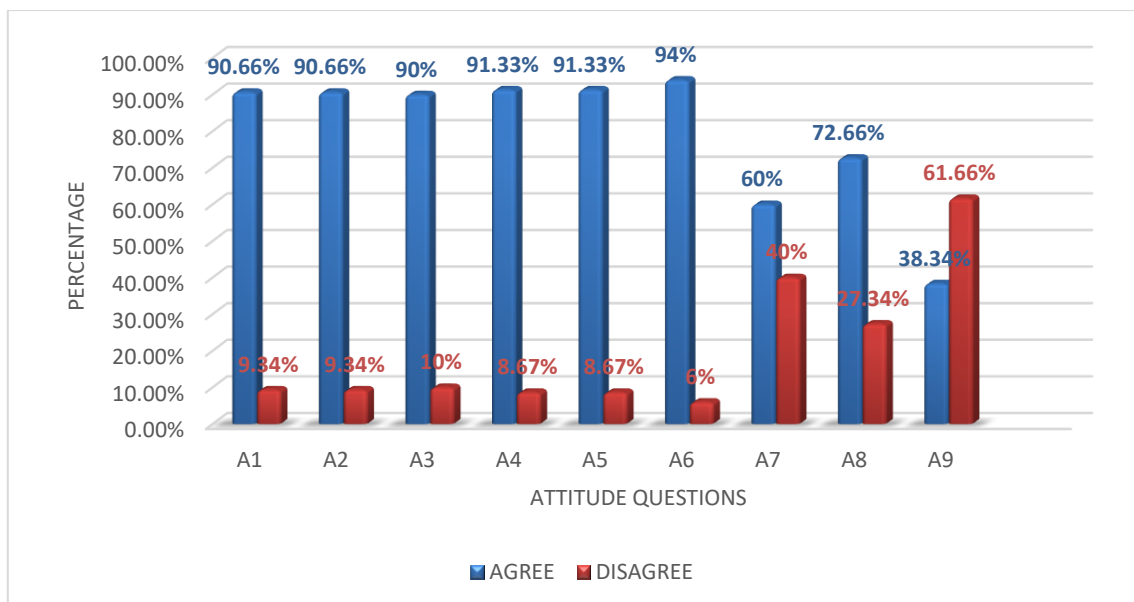
Figure 4: Distribution of subjects' attitude towards COVID-19 vaccination.

All 300 subjects were included in the assessment of attitude towards COVID-19 vaccination. Their responses to the questions are distributed in the Figure 4 and will be described in words along with the questions below.

A1: The COVID 19 vaccine will be important for my health.

Out of 300 subjects 272 (91%) subjects agreed about the importance of vaccine for keeping the pandemic under control while a small percentage of about 28 (9%) disagreed with the statement.

A2: Getting a COVID vaccine would be a good way to protect me from coronavirus.

Out of 300 subjects 272 (91%) believed in vaccine as an effective way to prevent COVID 19 and a small percentage of about 28 (9%) disagreed about the statement.

A3: The COVID vaccine will be effective if it is approved by the FDA or CDC

Out of 300 subjects 270 (90%) agreed that they would go for vaccine once approved by FDA or CDC and a small percentage of about 30 (10%) disagreed about the statement.

A4: Getting the COVID vaccine will be important for the health of others in my community

Out of 300 subjects 274 (91%) beliefs that getting COVID 19 vaccine protects the infectious spread to community which is important for the health of others and a small percentage of about 26 (9%) disagreed about the statement.

A5: The COVID vaccine will be beneficial to me

Out of 300 subjects 274 (91%) agreed about the benefits of vaccine in them and about 20 (7%) disagreed about the statement and a small population of subjects of about 26 (9%) strongly disagreed with statement.

A6: I will do what my doctor or health care provider recommends about the COVID vaccine.

Out of 300 subjects 282 (94%) agrees that they would go for vaccine once their health care provider told to do so and a small percentage of about 18 (6%) disagreed about the statement

A7: The COVID vaccine will not be long enough to be sure it is safe.

Out of 300 subjects 180 (60%) agreed about the statement that COVID-19 vaccine will not be long enough to be sure it is safe and about 120 (40%) disagreed about the statement.

A8: I am concerned about the serious side effects of the COVID vaccine.

Out of 300 subjects 218 (73%) of subjects is concerned about the serious side effects of vaccine and a small percentage of about 82 (27%) disagreed about the statement.

A9: I think the COVID-19 vaccine might cause lasting health problems for me.

Out of 300 subjects 115 (38%) of subjects is concerned about long lasting side effects of vaccine and majority of about 185 (61%) disagreed about the statement.

DISCUSSION

The study was a 6-month long observational-interventional study performed in the youths of the Soldevanahalli community, which is a located at Bangalore district, Karnataka, India. The study was conducted in a period of 6 months. A total of 300 subjects were enrolled in the study out of which 97 subjects were filtered out based on various inclusion and exclusion criteria (i.e. blooms cut off score) for the pre post assessment on the Knowledge, Attitude and Practice of COVID-19.

Subjects were further classified based on certain demographics such as level of education (higher secondary/college) and course of study (medical/non-medical) out of which 28% were from the higher secondary section and the majority 72% being college students. which is similar to the study performed by *Zhong LB et al.,*[11] where 17.6% of the subjects enrolled in the study were from the higher secondary section and majority of the individuals (44%) being college students. This study is basically a pre-post study of KAP whose post scores were determined after a Clinical Pharmacist intervention i.e., disease counselling provided by means of verbal counselling and printed disease information leaflets. Students paired t test was used to analyse the association between pre and post knowledge, attitude and practice score which was found to be statistically significant with a p value less than 0.05. Independent t test was done to assess the demographics of the filtered subjects which was found to be statistically insignificant with a p value greater than 0.05.

From our study we observed that the mean scores obtained for the pre-test 5.79(S.D 2.08), done for the knowledge of COVID-19, were considerably low. This indicates that the study subjects were not well aware of the current situation due to lack of awareness programs, which had a major impact in the post scores 10.94(S.D 1.01) after the intervention.

Our study was similar to a study performed by *Tabash ML et al.,*[12] which was done to assess the knowledge attitude and practice before and after an intervention.

We also observed that the mean scores obtained for the pre-test 0.96(S.D 0.55), done for the attitude of COVID-19, were considerably low. This indicates that the study subjects had a negative attitude towards the pandemic, but we could observe a significant improvement in their post scores after the educational intervention. The post scores obtained were 1.93(S.D 0.260).

From our study we observed that the mean scores obtained for the pre-test 1.05 (S.D 0.619), done for the practice of covid-19, were considerably low as misguided health information and bad informers among their peers are the main culprits for this kind of behaviour, which had a major improvement in scores 1.95(S.D 0.22) after a CP intervention.

Being vaccinated does not mean that we can throw caution to the wind and put ourselves and others at risk, particularly because research is still ongoing into how much vaccines protect not only against disease but also against infection and transmission.

In this study, we assessed the vaccine attitude of all the 300 subjects and assessed their attitude towards vaccination by means of a 9-item questionnaire. We further studied them based on certain demographics such as Gender, Level of Education and Course of study. Out of the 300 subjects, majority of the subjects 180 (60%) were males and the rest 120(40%) were females which was similar to a study performed by *Daly M et al.,* [13] where majority of the study subjects were females 3934(52.1%) and males constituting 3613(47.9%).

From the participated subjects, 101(36.33%%) were Higher secondary students and the majority 199(63.33%) being college students which when compared to a similar study performed by *Daly M et al.,* [13] where the majority were college students constituting 4970 (65.8%) and the rest had a plus two degree 2578(34.2%).

In our study, majority of the subjects showed a positive attitude towards vaccination but majority of the subjects were concerned about the serious side effects of the vaccine. This was compared to a study by *Daly M et al.*, [13] which showed similar results. The reason behind not taking into account the knowledge, practice and post scores of subjects in our study is such that vaccines were still in their development phase and much information regarding this was not yet available.

CONCLUSION

COVID-19 is an infectious disease caused by the newly identified coronavirus. This disease has affected millions of people across different countries and disrupted daily lives of almost all people. Society has been greatly affected by the pandemic, affecting all age groups but mostly the youth due to restrictions in social interaction and exposure to multiple sources of information through various digital platforms.

The study aimed to evaluate the effect of Clinical Pharmacist's intervention on the KAP of youth towards COVID-19. In this study, the subjects showed significant improvement in their KAP after the educational intervention (PIL and counselling), but there were no significant changes in KAP across different demographics suggesting that all groups had similar knowledge, attitude and practice. The study also aimed to assess the attitude of youth towards COVID-19 vaccination. It was observed that the majority of the subjects showed positive attitude towards COVID-19 vaccination but most of them were concerned about the serious side-effects of the vaccination.

In conclusion, the study was able to improve the knowledge, attitude and practice of the subjects using educational intervention and similarly, in the event of a healthcare emergency such as a pandemic, public health education programmes can improve knowledge and attitude, and also help build better habits to protect oneself and others.

ACKNOWLEDGEMENT

Conflict of Interest
The authors declare that there is no conflict of interest.

ABBREVIATIONS
COVID-19: Coronavirus Disease 2019; **SARS-CoV-2**: Severe Acute Respiratory Syndrome Coronavirus 2; **KAP:** Knowledge, Attitude, Practice; **WHO:** World Health Organization; **ARDS:** Acute Respiratory Distress Syndrome; **FDA:** Food and Drug Administration; **CDC:** Centre for Disease Control and Prevention; **SD:** Standard Deviation

SUMMARY
Coronavirus disease (COVID-19) is an infectious disease caused by a novel enveloped beta Corona virus of the 'CORONAVIRIDAE' family. COVID-19. To reduce the spread and improve vaccination acceptance, it is essential that measures are taken to ensure the public is well-informed on how the virus spreads, how preventive measures help and the significance of taking vaccination. The main objective of the research was to assess the effect of clinical pharmacists' intervention on the Knowledge, Attitude and Practice (KAP) of youth on COVID-19. The other objective of the study was assess their attitudes towards COVID-19 vaccination. This was an observational-interventional study. The subjects' demographic details and responses were collected using a standardized questionnaire. The collected data was entered in Microsoft Excel and appropriate descriptive and inferential statistical analysis was performed. The association between the pre and the post KAP scores were statistically analyzed using the paired t test. The results showed statistical significance ($p = 0.001$; p value < 0.05) in the scores of subjects after educational intervention. The attitude of the youth towards COVID-19 vaccination was analyzed using descriptive statistics which showed that majority of the subjects had a positive attitude towards vaccination. The only concern that most of the subjects (73%) had were about the serious side effects of the vaccine. From this study, we were able to conclude that educational interventions and public

health education programs can enhance knowledge, attitude, and establish healthier behaviours to protect oneself and others in the event of a healthcare emergency such as a pandemic.

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