Effectiveness of Video-Based Educational Intervention on Knowledge, Attitude, and Practice (KAP) of COVID-19 Health Care Workers: Lesson for Future Pandemic Preparedness

Surbhi Gupta[1] Binita Goswami[2] S.V. Madhu[3]

[1] Center for Diabetes, Endocrine and Metabolism, GTB Hospital, Dilshad Garden, Delhi, India
[2] Department of Biochemistry, Maulana Azad Medical College, New Delhi, India
[3] Department of Endocrinology, Centre for Diabetes, Endocrine and Metabolism, GTB Hospital, Dilshad Garden, Delhi, India

Address for correspondence Surbhi Gupta, MD, D-230, Anand Vihar, Delhi-110092, India (e-mail: surbhi.2911@gmail.com).

Ann Natl Acad Med Sci (India) 2023;59:233–236.

Abstract

Introduction As we have seen from the previous health emergencies, most recently the COVID-19 pandemic, public health education is often the first line of defense in any disease prevention. Through a short educational video intervention, this study aims to improve the awareness regarding COVID-19 infection control practices to be followed in a clinical laboratory.

Methods An online pre- and posttest survey was conducted. After pretest, an educational video was shared among the study participants followed by post test survey. This questionnaire contains items on three domains: knowledge, safe laboratory practices, and attitude.

Results Significant improvement occurred in all three domains in study participants post educational intervention.

Conclusion Simple educational video intervention can substantially improve the readiness of frontline workers to deal with any kind of pandemic situation.

Keywords
- COVID-19
- health care personnel
- medical education
- preparedness

Introduction

Coronavirus disease 2019 (COVID-19) has exposed the lack of preparedness of the health care system in dealing effectively with a pandemic. Learnings and experience of previous waves of the current pandemic should be harnessed to enhance our preparedness for any subsequent insults. With its first case reported in Wuhan, China, in December 2019, India has witnessed three catastrophic waves of COVID-19 so far. This novel corona virus is known to keep mutating its own genetic material quite fast,[1] and we have seen the severity of alpha, delta, and omicron variants in the Indian population. India is brutally affected with 44.7 million confirmed positive cases and 531,000 recorded deaths (last updated on January 15, 2023).[2] Some countries are now regaining a degree of normality, although the threat of

article published online
December 13, 2023

DOI https://doi.org/10.1055/s-0043-1772218.
ISSN 0379-038X.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

another variant-induced wave of disease remains. Omicron BF.7, the latest variant of concern, has been on the rise since the beginning of 2023.[3]

As the pandemic has entered its third year, it is speculated that virus may reach an endemic stage in India rather than completely disappear.[4] Although India is well prepared to deal with another COVID wave if it happens in terms of sufficient corona-bedded hospitals, oxygen supplies, personal protective equipment (PPE) kits, genomic surveillance, and vaccine drives, the at-risk population has not backed up sufficiently in terms of continued educational interventions regarding corona pandemic preparedness. An effective public health education program is essential to disease prevention. Data from the 2002 severe acute respiratory syndrome (SARS) and 2012 Middle East respiratory syndrome (MERS) outbreaks support that knowledge, attitude, and practice (KAP) toward disease outbreaks affects individual action.[5] Health care workers are the frontline heroes in our fight toward effective pandemic response. A routine practice of precautionary behaviors among them must become essential. The objective of this study is to assess the effectiveness of educational intervention regarding recent corona outbreak on KAP of health care workers. This study also aims to improve knowledge, implement infection control practices, and promote positive attitude of health care workers regarding COVID-19 to prepare themselves for the next wave if it were to occur or in case of similar future pandemics through a short video-based intervention.

Methodology

This study was conducted in two parts: pretest and posttest questionnaire. A convenient sampling method targeting the medical personnel, medical students, and laboratory staff of Lok Nayak Jai Prakash Hospital, Delhi, India, was chosen. The questionnaire was given in the form of an online Google Form in the English language. Hard copies of Google Forms in their native language (Hindi) were also given to those staff who were not well versed with Google Forms. Consent was taken from all the participants in their native language. No financial incentive was provided. The institutional ethics committee (IEC) reviewed the study-related documents: F.1/IEC/MAMC/(73/01/2020) No. 146. The questionnaire was prepared mainly from frequently asked questions on the World Health Organization (WHO) Web site. The questionnaire was first provided to 10 individuals for content validation. Their responses were not included in the final analysis but used to improve the quality of the questionnaire.

The questionnaire was broadly categorized into four domains: demographics, knowledge, laboratory practices, and attitude. Cronbach's alpha for questionnaire reliability was 0.731, with a value greater than 0.6 considered satisfactory. Demographic sections included name, age, gender, occupation, and education. Knowledge section had 12 questions based on the origin, symptoms, incubation period, mode of spread, high-risk population, mortality, and vaccines. Laboratory practice section had 18 questions regarding social distancing, facemask, cough hygiene, waste disposal, some blood sample processing procedures, disinfectant procedures, and PPE kit. The attitude section had five questions. Each question was scored "1" if the response was correct and "0" if the response was incorrect. The number of correct responses in each question was added to give a cumulative score in that domain.

The period of pretest survey was from May 5 to 9, 2020. On May 10, 2020, an 8-minute educational video with audio in Hindi was shared among all the participants of pretest questionnaire. It was a PowerPoint presentation created by the authors, used for regular departmental academic activities. It contained basic information regarding coronavirus, transmission, clinical symptoms, prevention, and myths. Good laboratory practices for health care workers in clinical laboratory and hospital to prevent the spread of virus were also described. It was circulated through social media apps and was shown personally to all housekeeping staff. Then all the participants were given a post video questionnaire again through an online Google Form in the English language and also through hard copies in the native language. It contained the same questions as in the pretest questionnaire. The period of posttest questionnaire was from May 10 to 14, 2020. Data were tabulated in Microsoft Excel spreadsheet. The distribution of responses was presented as frequency and percentages. The descriptive statistics were applied. Individual pairwise comparison of all subgroups for pretest questionnaire and post video questionnaire were done using the paired Student's *t*-test. A value less than 0.05 was considered significant.

Results

Of 125 likely participants, only 100 responded for the pretest study. Eighty responded for both pre- and posttest studies. In total, only 80 participants completed the study. All the participants were health care workers. Of all the participants, 49 (61.25%) were females and 31 (38.75%) were males. The average age was 33.07 ± 8.6 years. This study population includes 43.75% doctors, 31.25% technicians, 16.25% MBBS students, and 8.76% housekeeping staff.

A comparison of the average percent of correct response in pre- and posttest in each of the three domains (knowledge, practice, and attitude) is given in ►**Table 1**. The average percentages of correct response pretest in the knowledge, practice, and attitude domains were 63.75 ± 11.3, 71.80 ± 10.14, and 79.25 ± 18.4%, respectively. A significant improvement was seen among participants in all three domains posttest. The average percentages of correct response posttest in the knowledge, practice, and attitude domains were 86.25 ± 13.72, 91.38 ± 10.6, and 86 ± 17.38%, respectively. Improvement in the average percent of correct response from pretest to posttest was 22.5% in the knowledge domain ($p < 0.001$), 19.58% in good lab practice ($p < 0.001$), and 6.75% in positive attitude among the study participants ($p < 0.017$). Of all the study groups, doctors and MBBS students showed maximum improvement in all three domains post video exposure. But technicians and housekeeping staff did not show any significant improvement in

Table 1 Comparison of average percent correct response in pre- and posttest in each of the three domains

	Pretest	Posttest	Improvement (posttest–pretest)	*p* value
Knowledge	63.75 ± 11.33%	86.25 ± 13.72%	22.5%	<0.001
Practice	71.8 ± 10.14%	91.38 ± 10.6%	19.58%	<0.001
Attitude	79.25 ± 18.4%	86 ± 17.83%	6.75%	0.017

Table 2 Comparison of the number of participants pre- and posttest in three domains with respect to the pretest performance

	Knowledge		Practice		Attitude	
Pretest level	Pretest, *N*	Posttest, *N*	Pretest, *N*	Posttest, *N*	Pretest, *N*	Posttest, *N*
0–50%	4 (5%)	1 (1.25%)	0%	1 (1.25%)	5 (6.25%)	5 (6.25%)
50–75%	55 (68.75%)	11 (13.75%)	48 (60%)	4 (5%)	20 (25%)	5 (6.25%)
75–100%	21 (26.25%)	68 (85%)	32 (40%)	75 (93.75%)	55 (68.75%)	70 (87.5%)
Total (*N*)	80	80	80	80	80	80

their attitude. We have stratified the population based on the pretest level of KAP average percent of correct response in the three groups from 0 to 50, 50 to 75, and 75 to 100%, respectively, in ►**Table 2**. The pretest results showed that in the knowledge domain only 21 of 80 participants scored more than 75%. The results improved after video intervention, with 68 of 80 participants scoring more than 75%. Similarly, 32/80 participants and 55/80 participants scored more than 75% pretest in the practice and attitude domains, respectively. However, there was marked improvement after the intervention of a short video, with 75/80 and 70/80 participants scoring more than 75% posttest in the practice and attitude domains, respectively. As can be seen in ►**Table 2**, there was substantial improvement to more than 75% correct response in each of the three domains among participants who had at least a 50% pretest level of KAP following the intervention of our educational video. No further significant improvement posttest was seen in the participants who already had less than 50% correct response, indicating that such minor educational interventions will further be useful to only those who were already aware of pandemic preparedness.

Discussion

What we are learning from the COVID-19 pandemic is similar to what we learnt in previous pandemics, that is, preparedness is crucial. Since COVID-19 has been here for more than 2 years, health care workers have now become so used to it that they frequently lack accurate knowledge and harbor negative attitude toward health guidelines, resulting in failure to practice essential hygiene and other forms of misconduct. Misconduct is often more prevalent among young people who myopically believe the risk of noncompliance is low in them. We all know that this is not the last pandemic and many first-world countries had failed to detect or respond decisively to the early signs of the outbreak. Regular consolidated and targeted instructional educational intervention might be more effective in improving individual KAP.[6]

To the best of our knowledge, this is among the first few studies to show the preawareness as well as improved postawareness responses regarding COVID-19 after an educational intervention among health care workers. This study has helped us to identify and fill the existing gaps in knowledge, safe laboratory practice, and psychology. Substantial improvement has been noted in study participants with a short educational video. From various responses we received from the participants, we observed that health care workers were already aware of the symptoms of COVID-19, mode of transmission, and COVID waste disposal. However, the awareness was not so common when it comes to practices like de-capping of vials, disinfection with hypochlorite solution, and correct sequence of donning/doffing of PPE. After the intervention, health care workers who were not in direct contact with coronavirus-infected patients could recognize and appreciate that even cloth masks along with social distancing and good personal hygiene were effective for prevention of coronavirus. This resulted in a decrement of hue and cry for N95 masks among them. They were now more satisfied with hospital administration after intervention. This faith in hospital administration is important to maximize the efficiency of health care workers, especially in a government hospital. More than 99% of the participants believed that this study not only improved their knowledge and awareness but also helped in reducing panic among health care workers. However, the improvement in attitude (6.75%) was not as much compared to the improvement in practice (19.58%) and knowledge (22.5%). Such short videos might be not able to bring a change in the attitude of participants so quickly, but it improved their knowledge and good lab practices, which are more the essential and practical needs to deal with any such future crisis. Probably more such repeated or long-term educational interventions will be required to improve their attitude as well.

Limitations of this study is that we were not able to determine the level of engagement with the video for

electronic or face-to-face participants. However, the increase in knowledge posttest helps validate participant engagement. Questionnaire responses were not in the form of Likert's scale, which would have made their responses even more objective. We did not include any control group without intervention, which could have added value to the study.

To conclude, lesson learnt from the COVID-19 pandemic is that we need to invest in preparedness in the form of medical education for health care workers, since we do not know when the next mutated virus will hit us hard.

Authors' Contribution

S.G. prepared the questionnaire, collected the response from participants, analyzed the results, and drafted the manuscript. B.G. developed the original idea of research and guidance. S.V.M. contributed to proofreading of the manuscript and guidance.

Funding

This original research is not funded by any agency, neither national nor international.

Conflict of Interest

None declared.

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