COVID-19 Preparedness and Response Hands-on Training to Healthcare Workers at Shree Birendra Hospital: An Analysis of Retrospective Data

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ABSTRACT

Introduction: COVID-19 pandemic in many countries of the world, including Nepal, is requiring a level of response which is beyond the capacity of the nation. Healthcare professionals from NAIHS and SBH started COVID-19 preparedness and response hands-on training to frontline workers. The aim of this study was to analyze the effectiveness of this training to healthcare professionals.

Methods: This was a retrospective study using secondary data from COVID-19 preparedness and response hands-on training at SBH which was conducted from July to December 2020. In this training, pre-test and post-test was done on 821 training participants by using semi-structured self-administered questionnaire and was recorded in the training register. Among the 821 participants involved in pre and post-test, 266 participants were purposively selected for further analysis. Data were analyzed by using Microsoft Excel and described by using descriptive and inferential statistics.

Results: A knowledge score of ≥ 80% was acquired by 25.2% participants in pre-test and 76.3% participants in post-test. There was a significant increase in participants' knowledge scores in post-test as compared to pre-test scores (p-value < 0.001).

Conclusions: There is positive change in knowledge score after intervention hence such type of training might be effective in gaining knowledge on key areas of COVID-19 preparedness and response.

Key words: COVID-19; healthcare workers; infection prevention and control; preparedness and response; pre-test; post-test

INTRODUCTION

COVID-19 was declared a "Public Health Emergency of International Concern" by the World Health Organization (WHO) on January 30, 2020.[1] COVID-19 crises affecting the world today is requiring a level of response that goes beyond the capacity of any health institutions. In this situation, the importance of emergency preparedness and response with regard to training and capacity building on human resources and infrastructure development across the country needs to be emphasized. Similarly, each health institution needs a strategy to manage their space, staff and supplies so that optimum care is provided to patients during the pandemic.[2-5]

In this context, simulation or hands-on training is important for healthcare provider learning and systems integration on testing and integrating new processes, workflows, and rapid changes to practice and changes to the delivery of clinical care.[6] This type of training to healthcare workers is helpful in combating disease because healthcare workers who are directly or indirectly involved in patient care are at greatest risk of contracting the disease. With this vision, healthcare professionals from Nepalese Army Institute of Health Sciences (NAIHS) and Shree Birendra Hospital (SBH) started COVID-19 preparedness and response hands-on training to the frontline workers of SBH and other health facilities in the beginning of first wave of COVID-19 pandemic in Nepal.

There has been no research in this sector in our scenario. Hence, this study has been designed to analyze the effectiveness of COVID-19 preparedness and response hands-on training to healthcare professionals using retrospective data.

METHODS

This is a secondary analysis of pre-experimental study data from COVID-19 preparedness and response hands-on training to identify its effectiveness. Initially this training was started at academic block of SBH and later at NAIHS. Training participants were frontline workers from NAIHS, SBH and other COVID-19 dedicated hospitals. Total number of participants included in this study was 266 which were calculated at 95% confidence level, 5% margin of error and 50% population proportion. It was based on total number of training participants who were involved in pre-test and post-test in their

training session i.e., 821 healthcare workers. The required participants were taken purposively from training register. Ethical approval for the study was taken from the Institutional Review Board (IRC) of NAIHS (Regd. No. 512). A record review guide was used for data collection. The guide consisted of socio-demographic information of all training participants and their pre-test and post-test score. After getting verbal permission from NAIHS / SBH, researchers identified the training register and from this register, they collected required information for further analysis. Data were analyzed by using Microsoft Excel and described by using descriptive and inferential statistics.

RESULTS

As per table 1, 48.8% training participants were different categories of staffs from SBH. Around 35% participants were MBBS and nursing students and 3.2% were others i.e., doctors and nurses from Central Government Hospital, Nepal Police Hospital, Armed Forces Police Hospital and few other medical colleges.

Table 2 indicates that maximum participants i.e. 33.8% were from the age group 21 - 25 years and minimum i.e. 9.8% were of ages 36 - 40 years. Similarly, 67.7% were males and 86.5% were working as non-officer level staff.

Table 1. Categories of participants who received the training

Categories of participants	Number	Percentage
Academics and other staffs from NAIHS	88	3.5
Healthcare workers from SBH	1245	48.8
MD / MS residents	63	2.5
Interns	182	7.1
MBBS / Nursing students	890	34.9
Others	81	3.2
Total	2549	100

Table 2. Socio-demographic information of participants (n = 266)

Variables	Frequency	Percentage
Age (in years)		
21 - 25	90	33.8
26 - 30	82	30.8
31 - 35	68	25.6
36 - 40	26	9.8
Gender		
Female	86	32.3
Male	180	67.7
Employment level		
Non-officer level	230	86.5
Officer level	36	13.5

Table 3. Difference between pre-test and post-test score (n = 266)

Score %	Pre-test		Post-test		Value*	p-value**
	No.	%	No.	%		
60%	83	31.2	5	1.9	156.97	<0.001
70%	116	43.6	58	21.8		
≥ 80%	67	25.2	203	76.3		

*Value is calculated with chi-square test

** p-value is significant at < 0.005

Table 3 illustrates the difference between pre-test and post-test score. In this training, a score of 60% was obtained by 31.2% participants in pre-test and 1.9% participants in post-test. Similarly, a score of 70% was obtained by 43.6% participants in pre-test and 21.8% in post-test. A score of 80% or greater was obtained by 25.2% participants in pre-test versus 76.3% in post-test, with a significant p-value of < 0.001. Therefore, there were significant differences in pre-test and post-test scores among participants.

DISCUSSION

Healthcare workers are always at the greatest risk of contracting COVID-19 directly while taking care for positive patients and indirectly by caring for other patients whose COVID-19 status is unknown.[7] Healthcare workers of all levels are facing challenges of protecting themselves as well as their patients, family and community. Hence, preparedness is the key method to acquire knowledge and skills to protect themselves and their patients through simulation or hands-on training. Simulation is one of the important learning tools when it comes to skill acquisition and as a supplemental tool for training in high stake situations like COVID-19. It uses practical scenarios and structured feedback to help participants develop new skills in a safe and supported learning environment.[8,9] Healthcare workers who are at the frontline in the fight against infectious disease like COVID-19 are the most vulnerable population therefore extraordinary measures may be needed for them to reduce the morbidity and mortality. These measures are also helpful to protect healthcare workers and optimize their output.[10]

According to WHO, countries should continue to take all necessary measures to slow further spread of COVID-19, prevent infections especially for people vulnerable to severe disease or death, and avoid their health system from being overwhelmed. There is still much to understand about COVID-19 and its impact in different contexts so preparedness, readiness and response actions continue to be driven by rapidly accumulating scientific and public health knowledge.[11] Nepal has been preparing and responding to the COVID-19 situation in its own way. A part of effective response is training on preparedness and response to the health care workers.

In the present study, only 25.2% healthcare workers had acquired ≥ 80% score in pre-test and 76.3% participants acquired ≥ 80% score in post-test. This score was recorded before and after the training on different components of COVID-19 infection prevention and control i.e., hand hygiene, respiratory hygiene and physical distancing; donning and doffing; disinfection and waste management; sample collection; patient transfer; dead body management and stress coping. There was a significant difference in participants' scores in post-test as compared to their scores in pre-test (p-value < 0.001). These findings are consistent with similar training findings conducted in a tertiary care level institution in India among 576 healthcare workers using online platform. The training was focused on do's and don'ts, hand hygiene, donning and doffing of PPE, cleaning and disinfection and bio-medical waste (BMW) management with the help of pre-recorded video. The results of pre-test and post-test scores showed that intervention through video-assisted teaching-learning resulted in improvement of knowledge which was found to be statistically significant (p-value <0.001).[12] The present study findings are also consistent with the findings from quasi-experimental pre-post interventional study design conducted in India

among 50 healthcare workers where in-situ simulation teaching tool was applied to train them for the management of SARS-CoV-2. The difference between the mean pre-test and post-test intervention scores was found to be statistically significant in this study too.[13] The study conducted among 486 healthcare workers in Indira Gandhi Government Medical College, Nagpur, India also showed that such type of training was quite effective which was evident from the pre-test (17.73 ± 5.00) and post-test (20.93 ± 5.033) assessments.[14]

Similar findings were reported in various studies conducted in different countries. In Nigeria, instate COVID-19 tutorial apps was used to train 1051 health workers across 25 states. It was followed by online pre and post test assessment. Overall, there was statistically significant difference between pre-post test knowledge scores (54 increasing to 74). This study concluded that e-health application was also effective methods which can be delivered at minimal cost.[15]

In another study conducted by senior medical students among 150 healthcare workers, participants reported that they were significantly more confident after the training in all aspects of managing COVID-19 patients, including triage, complex discharge, recognizing deterioration, initiating basic life support, managing symptoms and advising on visiting policies (p < 0.001) and 97% of participants rated that the training was useful.[9] But the components / areas included in this training were different than the present training conducted in NAIHS / SBH. Simulation training had been conducted in New York hospital to refine protocols, facilitate practice changes, uncover safety gaps, and train redeployed healthcare workers in unfamiliar roles. Here, system based simulation training covered personal protective equipment (PPE) training, airway management, and emergency code team training, slightly different than our training package.[16] Consistent findings were reported in another similar type of training for preparing obstetrical services to meet the challenges of the COVID-19 pandemic in Canada in two key areas i.e., the impact of infection prevention and control protocols on processes of care and the effects of COVID-19 pathophysiology on obstetrical patients.[17]

Protecting staffs working in the area and era of an outbreak is a critical challenge for health care systems. In times of crisis, health systems leaders need a clear, systematic approach that will enable them to quickly evaluate critical needs, identify areas of weakness, and develop a strategic plan of action. In addition, to flatten the curve of the rates of infection and hospitalization, health systems need to proactively deploy a robust preparedness strategy. Healthcare systems must rapidly evolve staffing protocols to keep their health workforce strong enough to treat rising volumes of patients. Revising approaches to clinical training and utilization of resources can contribute to support essential staffs. All health care personnel caring for suspected or confirmed COVID-19 patients should be instructed in proper donning and doffing of PPE, as well as on how to properly dispose or disinfect used PPE.[18] In this way, these measures could help healthcare workers by keeping them safe and responding to COVID-19 pandemic would result in a better, confident and effective way.

CONCLUSIONS

COVID-19 preparedness and response hands-on training tends to be effective in bringing positive change in knowledge of healthcare workers during pandemic. Such types of trainings can be scaled up during pandemic situations to keep healthcare workers up-to-date so that they become aware on these situations.

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