









SPECIAL COMMUNICATION

# Prehospital training and educational programs during the COVID-19 pandemic: a Saudi Red Crescent Authority experience

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## ABSTRACT

In the prehospital era, the provision of targeted educational and training programs for certain population sets was essential for maintaining healthcare services and ensuring favorable outcomes. During the coronavirus disease pandemic of 2019 (COVID-19), the prehospital educational and training programs for overcoming the challenges and reaching the targeted audience in the Saudi Red Crescent Authority (SRCA) differed significantly. In the Kingdom of Saudi Arabia, sharing the experiences and lessons learned in relation to the selection of priorities and the development of new strategies for implementing prehospital educational and training programs during pandemics will assist other educational and training entities in building their programs without compromising the learning outcomes. In this review, we discuss the types of educational and training programs, main learning outcomes, targeted audiences, and new strategies adopted by the SRCA during the COVID-19 pandemic. Preserving and advancing essential prehospital knowledge and skills for targeted population sets during pandemics are challenging, and the selection of educational and training programs should be approached differently to achieve best results.

**Keywords:** Training programs, education program, coronavirus disease 2019, COVID-19, Saudi Arabia.

## Introduction

Over the past year, the coronavirus disease (COVID-19), declared as a pandemic by the World Health Organization (WHO), affected the global health image and health-related systems in many ways [1]. As of November 30, 2021, over 261 million confirmed COVID-19 cases, 5 million deaths, and 7 billion administered COVID-19 vaccine doses were reported worldwide [2]. In the Kingdom of Saudi Arabia (KSA), various measures were implemented during the early stages of the pandemic to curb the spread of the disease. These include but are not limited to the suspension of domestic and international flights, imposition of partial and full curfews, and banning of all social activities. Furthermore, various medical education and training programs in the country, including lectures, courses, and seminars, were provided online through electronic platforms with virtual attendance [3]. Over time, the provision of targeted educational and training programs for certain population sets was essential for maintaining healthcare services and ensuring favorable outcomes in certain areas [4]. Many countries have developed detailed strategies for

combating COVID-19 via the provision of continuing medical education and targeted training programs, as well as best care practices during the prehospital era [5-7]. The Saudi Red Crescent Authority (SRCA) developed four main strategies: (1) adjusting learning outcome priorities, (2) developing new educational and training platforms, (3) targeting a new set of the population, and (4) inventing new modes of training delivery.

In this review, we share the experiences and lessons learned related to the selection of priorities and development of new strategies to implement prehospital

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educational and training programs during the COVID-19 pandemic in SRCA to aid other educational and training entities in building their programs without compromising on the learning outcomes.

## Discussion

Although the impact of the pandemic on medical education and training for prehospital care is documented, the knowledge for supporting emergency medical service (EMS) professionals during the COVID-19 pandemic is lacking [8,9]. As an extension of KSA's never-ending endeavor to ensure the safety and well-being of the citizens and residents during the pandemic, rapid access to healthcare services was afforded as a part of the health sector transformation plan and Vision 2030 [10]. In solidarity with this noble cause, the SRCA assisted in refining community health awareness, delivering first responders training, and improving prehospital services. Furthermore, they swiftly allocated resources to aid people in the fight against this pandemic by providing vital information to the public and prehospital personnel. Therefore, the SRCA attempted to ameliorate this precarious situation by adopting several strategies to deliver a series of educational and training programs.

### *Adjusting learning outcome priorities*

Due to the urgent need for certain knowledge and skills for the community and specialized prehospital personnel in the early phases of the pandemic, the SRCA developed a list of learning outcome priorities that were aligned with the Saudi Public Health Authority guidelines for the public and healthcare workers. This included (1) COVID-19 public awareness, (2) training on the use of personal protective equipment (PPE), and (3) respiratory and critical care management [11]. These outcomes have been documented in previous studies recommending similar cornerstone skills during the pandemic [12-14].

This has resulted in 11 specific COVID-19 multilingual (Arabic, English, Hindi, Urdu, Bengali, and Tagalog) awareness courses developed for the public free of charge.

On March 2, 2020, the first confirmed COVID-19 case in KSA was documented, and various training courses were launched by the SRCA [15]. By the end of May 2020, the targeted number of participants for these courses was set at 100,000 from the conception of the "safety through knowledge" initiative. However, over half a million individuals, from public or specialized prehospital personnel through over 653 trainers across the country, benefited from this initiative, as shown in Table 1 [16]. The infection control course tackles the principles of infection control measures, including the definitions of confirmed and suspected COVID-19 cases, hand hygiene precautions, isolation and social distancing, use of PPE, cleaning and disinfection, and waste management. Considering the special circumstances of the pandemic, the disaster management course provided knowledge on the methods to address unplanned events. Community awareness was reinforced in the "Life Ambassador" initiative to impart knowledge and skills in first aid, cardiopulmonary resuscitation, airway obstruction management (e.g., choking), and trauma and medical emergency handling. Nevertheless, these learning objectives were considered for a special population (visually impaired) to ensure the generalizability of the message. Frontline workers (e.g., public safety officers) were regarded as the top priority target population because of their major role as first responders and their comparatively high risk of exposure to the virus. Therefore, a special occupational course addressing pandemic awareness and the basic principles of first aid was necessary to prevent the disease from spreading and saving lives.

For healthcare providers, interpreting basic and advanced electrocardiogram (ECG) rhythms, distinguishing shockable from non-shockable rhythms, analyzing the airway anatomy, optimizing bag-mask ventilation, reviewing extra glottic devices, and managing the post-intubation phase were set among the highest priority courses. The principles of volunteering work and its impact on communities during pandemics were addressed as part of these selected courses.

**Table 1.** Names of the SRCA courses and numbers of participants during COVID-19.

#	Name of course	Number of participants
1	Infection control	287,878
2	Disaster management	53,183
3	Life ambassador	116,574
4	Life ambassador for the visually impaired	91
5	Occupational safety and first aid for first responders	28,000
6	ECG-basics	13,723
7	ECG-advanced	11,353
8	Rapid sequence intubation	10,160
9	Airway management	9,742
10	Mechanical ventilation	13,371
11	Volunteering principles	26,451
	Total	570,526



**Figure 1.** Cabin interior of the FTU (Rufaida) showing the simulation manikin and basic EMS equipment used for training.



**Figure 2.** FTU (Rufaida) showing the external screen mirroring the cabin interior of the ambulance for training.

### ***Developing new educational and training platforms***

To ensure the effective delivery of the educational and training courses to the targeted population during COVID-19, an online platform was created to operate the entire process from registration to virtual course attendance to certificate printing [17]. According to the United Nations Department of Economics and Social Affairs report, KSA was voted among the most prominent

and prolific contributors to digital solutions and alternatives for helping curb the spread of the COVID-19 virus during the pandemic. Out of the 43 initiatives submitted, 17 along with the “safety through knowledge” initiative, was nominated for top acknowledgment [18].

### ***Targeting a new population set***

The main targeted population of the educational and training programs during the COVID-19 pandemic included: (1) healthcare providers, (2) prehospital

personnel, (3) frontline workers (public safety officers), and (4) members of the community.

### ***Inventing new modes of training delivery***

Adopting new educational strategies and training delivery methods is crucial and an ongoing process in SRCA. One of these strategies is the building of a new field-training unit (FTU) (Rufaida). This unit targets a random group of prehospital healthcare providers located at different EMS stations in KSA to evaluate pre-selected competencies (knowledge and skills) to maintain the best practices in the prehospital field at all times. Moreover, this unit targets community members and their role as first responders in life-threatening situations. The idea of building this unit was taken from an ambulance simulator that is available in many prehospital educational institutions worldwide [19].

Instead of mimicking an ambulance in a training center and exposing trainees to certain scenarios, Rufaida is a true ambulance vehicle operated by two trainers (expert physicians and paramedics). It is prepared and equipped with simulation manikin, basic EMS equipment, and an external screen mirroring the cabin interior of the ambulance (allowing other trainees to visualize the training session), as shown in Figures 1 and 2. This unit adds the element of surprise in examining the true level of knowledge and skill of prehospital personnel. Furthermore, it skips the routine training sessions that could interrupt employees' working duties and its mobility to multiple locations targeting prehospital personnel and the public.

### **Conclusion**

Considering the COVID-19 pandemic, adopting strategies to maintain the education and training process in the prehospital field is an ongoing challenge. To overcome this, the SRCA developed four main strategies: (1) adjusting learning outcome priorities, (2) developing new educational and training platforms, (3) targeting a new set of the population, and (4) inventing new modes of training delivery. Sharing this experience would further guide prehospital training entities in developing excellent approaches for education and training during pandemics to ensure competent trainees in the field.

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### **List of Abbreviations**

COVID-19	Coronavirus disease 2019
FTU	Field-training unit
KSA	Kingdom of Saudi Arabia
SRCA	Saudi Red Crescent Authority

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The authors declare that there are no conflicts of interest regarding the publication of this article.

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