



Research on Disaster Medical Rescue Skill Training of Dazhou Based on Virtual Simulation Platform

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How to cite this paper: He, X.C. (2022) Research on Disaster Medical Rescue Skill Training of Dazhou Based on Virtual Simulation Platform. *Open Access Library Journal*, 9: e8485.
<https://doi.org/10.4236/oalib.1108485>

Received: February 15, 2022

Accepted: March 15, 2022

Published: March 18, 2022

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Abstract

With the development of social economy, disaster medical rescue plays an important role in guaranteeing the safety of life and property of people affected by disasters, and a complete disaster medical rescue skill training system is the key to guarantee the level of disaster medical rescue. Based on the virtual simulation platform of clinical Skill Center in Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital, this paper discusses the topic of “Disaster medical rescue skills’ training in Dazhou based on virtual simulation platform” and analyzes the training system of disaster medical rescue talents based on virtual simulation platform from the aspects of training course structure, course arrangement and assessment standard. It also evaluates the training effect, finds out the existing problems in the training process, and puts forward countermeasures for further improving the training in the future.

Subject Areas

Sociology

Keywords

Virtual Simulation Platform, Dazhou, Disaster Medicine, Rescue Skills, Training

1. Introduction

In recent years, there have been frequent disasters around the world, such as

drought, waterlogging, landslide, debris flow, gale, earthquake, fire and other disasters occurring concurrently or alternately, showing the characteristics of successive severe disasters, severe consequences, wide impact area, and many casualties. Taking Sichuan province as an example, in the past 10 years, there have been major natural disasters such as the Wenchuan earthquake, the Lushan earthquake, the June 24 landslide in MAO County, the 7.0-magnitude Jiuzhaigou earthquake, and the forest fire in Muli County, Liangshan Prefecture. Man-made disasters are countless, such as Haoyixin fire in Dazhou. Due to the sudden and destructive nature of disaster events, it is difficult to deal with disaster relief, and the first responders are often people without medical background. Improving the ability of the public to help each other is an important way to reduce disaster losses.

Developed countries generally attach importance to the popularization of disaster rescue training for the whole population and all medical personnel. For example, the United States carries out “Community Disaster Education Program” to enhance the ability of the public to escape and save themselves, and establishes community disaster Emergency Rescue Organization (CERT) to maximize the ability to resist disasters. At present, China’s disaster medical rescue lacks a system and mechanism for universal training, as well as professional training teachers and facilities, resulting in a shortage of disaster medical rescue professionals. Disaster medical rescue teams are usually formed by temporarily transferring medical personnel from various clinical specialties, thus unable to meet the professional needs of one specialty and multiple abilities. The public’s insufficient awareness of disaster prevention and relief and disaster relief ability seriously affect the success rate of post-disaster emergency rescue.

As the backbone of disaster medical rescue, medical personnels are also an important force in carrying out universal training for the public. It is one of the most direct and effective ways to improve the level of medical rescue and reduce disability under the current mode to train medical staff in standard rescue skills and further publicize and popularize them. To this end, the Emergency Response Office of the National Health Commission has organized the compilation of “Technical Training outline for Disaster Rescue”, aiming to guide and standardize the training work and ensure the quality of training. At present, the academic research results on disaster medical rescue mainly involve the current situation and countermeasures of disaster medical rescue system [1], requirements of disaster medical rescue for nursing staff [2], ethics of disaster medical treatment [3], ways of training disaster medical talents [4], the effect of simulation-based training on nursing students [5], etc. There are few research achievements on disaster medical rescue skills training from the perspective of virtual simulation platform. In recent years, virtual simulation platform has become an important means of disaster medical rescue training. It is characterized by practical teaching, situational

teaching and individualized teaching, and carries out teaching in a way as close to the real environment as possible and more in line with ethics, so as to create opportunities for trainees to master skills. Its main technology includes four types: one is the single-machine virtual simulation experiment platform; second, the virtual simulation experiment platform based on C/S architecture; third, the virtual simulation experiment platform based on B/S architecture; the fourth is the virtual simulation training platform of mixed architecture.

Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital have purchased network courses of disaster medical rescue theory, advanced cardiopulmonary resuscitation simulator, advanced trauma simulator, emergency first aid basic equipment and other relevant training items, and have built a clinical skills center of more than 1000 square meters for real-life training of simulated disaster medical rescue skills. In view of this, this paper intends to rely on the virtual simulation platform of Dazhou integrated TCM & Western Medicine Hospital and Medicine Clinical Skills Center at Dazhou Central Hospital, from the aspects of training course structure, course arrangement and assessment standard, training effect and existing problems, and countermeasures for further improvement of training in the future to discuss the topic of “Disaster medical rescue skills training in Dazhou Based on virtual simulation platform”.

2. Curriculum Structure, Curriculum Arrangement and Assessment Standards

At present, the virtual simulation platform based disaster medical rescue skills training course structure, course arrangement and assessment standards of Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital are as follows:

2.1. Curriculum Structure

2.1.1. Online Learning in General Practice

Founded in 2008, the platform (<https://www.91huayi.com/>) aims to help improve the level of primary-level medical and health services through distance medical education and medical informatization services. Online learning of general practice can be realized with the help of the training program of general practitioners on the platform. Among them, its main functional modules can be roughly divided into two categories: One is independent online learning, in which the platform provides video learning materials for students to choose learning independently, to meet the individual and personalized needs. One is online academic testing, in which students can test their own learning results in the Chinese medical question bank to further consolidate their learning results.



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2.1.2. Simulation Surgery Training

Simulation surgery training relies on virtual surgery simulation system and simulates possible accidents through virtual reality technology. This course mainly includes three modules: simulation operation observation and learning, simulation operation and real operation. In the first two courses, through repeated learning, training and trial and error, trainees can master skilled surgical experience and improve the success rate of surgery to a certain extent.

2.1.3. Physiological Virtual Experiment

With the help of virtual simulation platform, this course presents the changes of human physiology in different situations in front of participants intuitively by digitization of human body modeling. This course mainly offers three modules: physiological simulation, human physiological changes and physiological functions, so as to deepen the trainees' understanding of human physiological functions and enable them to master patients' conditions in sudden disasters.

2.1.4. Use of Rescue Medical Equipment

This course aims to enable trainees to use medical equipment quickly and well, skillfully use medical equipment such as monitor, sputum suction device, first aid kit and ventilator, and provide the possibility of giving play to the material basis for disaster field rescue.

2.1.5. Rescue Site and Hazard Assessment

Disasters are difficult to predict and unexpected, so trainees should be trained to

cope with sudden disasters such as earthquakes, building fires, nuclear pollution, chemical leakage and infectious diseases. This course will be trained and evaluated on a virtual simulation platform, using a large number of medical models, and simulating specific scenes through makeup techniques and specific geographical environments.

Due to the variability of the rescue site, it is generally necessary to assess the risk in advance to prevent the further complexity of the rescue site from exacerbating the difficulty of the rescue. The risk assessment of the disaster site is conducive to a comprehensive understanding of the disaster site and facilitates rescue activities [6].

2.2. Curriculum Arrangement

Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital take one academic year as the training period, and the course progress is carried out under the principle of basic first, comprehensive second, theory first and practice second.

First, basic rescue knowledge training and practical application. Basic rescue knowledge is a basic work, and the course of basic knowledge mainly strengthens the students' understanding of disaster scene and environment through multimedia teaching, case analysis, disaster rescue scene video playing and other ways. After understanding the basic knowledge, practical operation, through the guidance of theory, students conduct practical simulation with each other.

Second, understanding and operation of various rescue equipment and facilities. Equipment and facilities play a very important role in disaster relief. Without knowledge of rescue equipment, medical personnel cannot effectively carry out rescue operations at disaster sites. In the course, we will first learn the use and use of various rescue equipment, as well as simple inspection and maintenance methods. Then, based on the theoretical knowledge, the practical operation is carried out to ensure that each student can use the rescue equipment.

Third, simulated rescue operations. Rescue operation is not only the core of disaster relief, but also the most complicated part. It involves the processing capacity of different scenes and the selection of equipment. In earthquake, mountain flood, fire and other disaster relief, the first to use high-tech to search for the affected people, search for rescue treatment. The course requires a long time of simulation exercises, which can exercise students' physical and psychological quality.

Fourth, simulated command and cooperative operations. Through case analysis, field simulation and practice drills, setting up specific disaster scenarios and other forms of training, the comprehensive practical ability of field rescue and teamwork ability of trainees are assessed. At present, students have a good grasp of technology, but lack of relevant experience and knowledge in time management and coordination. Disaster scene is quite chaotic, so the rescue personnel must master a certain rescue command ability, to ensure the orderly rescue op-

eration. In our country's emergency rescue team, the search team consists of four members, the rescue team consists of six members, and these members need to cooperate with each other to complete the rescue mission.

Fifth, summing up experience and making plans. Participants and organizers together to summarize the advantages and disadvantages of this year's training, sum up the experience, maintain the advantages, correct the shortcomings, and develop the next year's training plan.

2.3. Assessment Standards

Disaster medical rescue skills training is in order to improve the rescuers on the scene to rescue capabilities, able to cope with the vast majority of emergency, through the virtual simulation platform of training to improve rescue workers in the field operation, deepen the rescuers understanding the patient's condition at the same time, to cope with the vast majority of common disaster relief. Currently, disaster medical rescue skills training assessment of Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital consists of basic knowledge learning phase examination, the rescue stage of basic skills, command coordination phase of examination, and two large-scale half year assessment and year-end appraisal, combining with simulated rescue drill at the same time, a practical type of examine the assessment; For the above assessment results according to different proportion, to constitute the students' graduation results [7]. At the same time, the principle of the assessment of students should not only adhere to the assessment of students' professional theory and technical knowledge, but also adhere to the assessment of students' physical and psychological quality.

3. Training Effect and Existing Problems

The disaster medical rescue skill training based on virtual simulation platform in Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital has achieved good development effect, which is embodied in the following aspects:

First of all, skill training of virtual simulation platform is of great significance in scenario-oriented training of disaster medical rescue specialty. Under the State Council promulgated the "national emergency preplans for sudden public events overall" regulation, according to the process, properties, mechanism of events, mainly divided into accident disasters, natural disasters, public health and social security events four categories, and according to different situation, the need of medical rescue program emphasis will be different. After the skill scenario-based training of virtual simulation platform, the rescue efficiency can be improved and casualties can be reduced.

Next, the virtual simulation teaching system provided by the 3 d model can be achieved on the visualization platform for a variety of paths and operation design integration training, more intuitive and convenient to show equipment op-

eration principle, clear display equipment internal structure, improve the efficiency of student learning, deepen the students understanding, at the same time can be to inductive integration of teaching target, greatly convenient for teaching.

Finally, the skill training of the virtual simulation platform effectively propagates the knowledge related to disaster medicine, helps Dazhou and even Sichuan Province to establish the information database of disaster medical rescue talents and teachers, and reserves talents for the later development of disaster medical rescue training.

Of course, there are some problems in training. First, students mainly rely on the Internet for learning, practice and operation opportunities are not many. Second, single monitoring means, most of the on-site teaching lack of effective evaluation means, real-time monitoring of students' learning effect, is difficult to obtain feedback on the learning effect. Students learn mainly through self-awareness rather than supervision. Third, "task randomization" and "diversification" are required, and the depth of course learning remains to be discussed. Fourth, the learning environment is relatively independent, and there is uncertainty in the run-in of the team. Fifth, the students did not consider the reality of the ability to accept, only consider learning and did not consider by, some students difficult to keep up with the learning progress. Sixth, although the prelude of disaster relief training has been opened, there is no comprehensive rescue training system before, during and after disaster relief.

4. Countermeasures to Further Improve Training in the Future

First of all, a large number of virtual simulation and medical simulation technologies are used for training and assessment to solve the problems of "task randomization" and "requirement diversification". Consolidate students' medical rescue knowledge, cultivate students' active learning ability, strengthen their ability to judge the condition, and improve their innovation ability, apperceiving the learned knowledge, form a systematic and systematic knowledge framework. The teacher in charge of the class leads the team to practice more, improve the students' psychological adaptability and teamwork, and consolidate the learning results. Follow the principle of "combining the virtual with the real, not the virtual, and making up the virtual" to provide intuitive and reliable virtual teaching environment for students, students can effectively improve their professional ability through the learning of this teaching system.

Secondly, for the social participant of the training, disaster medical rescue skills training should be carried out under the support of government policies and the technical support of hospitals and enterprises, and these rescue training should not only include people with professional knowledge and skills, but also include as many ordinary people as possible, so that they have the ability to save themselves and "save others" after disasters. The disaster medical rescue skill

training based on virtual simulation technology not only enables the social participants to access the knowledge and skills of disaster medical rescue, but also provides a platform for more knowledgeable and experienced people to share their knowledge and skills related to disaster medical rescue.

Third, explore a kind of disaster medical rescue training mode based on virtual simulation platform and simulation drill. Under the premise of not increasing the risk, the training is as close to the real environment as possible, and the ability of self-rescue, comprehensive medical rescue and team cooperation in disaster site is trained, so as to improve the trainees' sense of actual combat experience and learning enthusiasm, and achieve short-term and efficient training effect.

Finally, explore a multi-level training mode in which professional teachers conduct multi-level training for different training objects and trainees further participate in the training, so as to achieve maximum popularization of the training and reserve teachers for disaster medical rescue training and gradually expand the influence of radiation.

5. Conclusion

All in all, the training of disaster medical rescue skills for Dazhou people is conducive to improving the public's ability to escape, save themselves and assist others at disaster sites, and reducing the death rate at disaster sites. Dazhou oriented hospital medical personnel's teaching method training for disaster medical rescue skills at all levels, and hands-on training to the public, through the combination of theory and practice to enhance the ability of teaching and training skills and optimize the training effect, help Dazhou and even the Sichuan province on establishing information database for disaster medical rescue talents and teachers, reserving talents for disaster medical rescue training in the later stage. Based on the virtual simulation platform of clinical Skill Center in Dazhou integrated TCM & Western Medicine Hospital and Dazhou Central Hospital, this paper discusses the topic of "Disaster medical rescue skills' training in Dazhou based on virtual simulation platform" and analyzes the training system of disaster medical rescue talents based on virtual simulation platform from the aspects of training course structure, course arrangement and assessment standard. It also evaluates the training effect, finds out the existing problems in the training process, and puts forward countermeasures for further improving the training in the future.

Project Funded

The Primary Health Development Research Center of Sichuan Province Program of North Sichuan Medical College in 2019 (project number: SWFZ19-C-75).

Conflicts of Interest

The author declares no conflicts of interest.

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