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Virtual Patients in Emergency Nursing Training

Tudor Calinici*

Iuliu Hatieganu" University of Medicine and Pharmacy Cluj-Napoca, Romania

***Corresponding author:** Tudor Calinici, Department of Medical Education, Medical Informatics and Biostatistics Discipline, Louis Pasteur Street, No 6, 400012, Cluj-Napoca, Romania, Tel: 0040722605122, E-mail: tcalinici@umfcluj.ro

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Abstract

Emergency nurses are specialized to provide rapid assessment and treatment to patients in the initial phase of illness or trauma and often in life-threatening situations. They are required to have a lot of knowledge –not only in medical area - and to possess multiple abilities which will enable them to face different situation that may occur. Due to different constrains – time, money, ethical considerations, etc., the institutions which provide training for emergency nurses are forced to find alternative methods to reach all the outcomes required in real life situations. One of the methods is the use of virtual patients. The scope of this paper is to present the concept of virtual patients, to describe their main characteristics which recommend them to be used for training the emergency nurses and to present the main types of virtual patients.

Keywords: Emergency nursing training; Virtual patients

Introduction

Emergency nurses are specialized to provide rapid assessment and treatment to patients in the initial phase of illness or trauma and often in life-threatening situations. Practicing not only in emergency departments of the hospitals, but on cruise ships, crisis intervention centers or prisons, they must have a lot of knowledge about general as well as specific health issues in order to assess, intervene and stabilize a variety of trauma and illness with decisive action. [1]

One of the actions in which the emergency nurses are involved is the triage. [2] An emergency nurse must have the ability to make quick and accurate assessments about incoming patients, including both physical and mental health conditions and find and record relevant information about incoming patients like medical problem, any allergies that the patient may have, the current medication, if exists, body temperature, blood rate, etc. The emergency nurses are expected also to perform other different actions like to clean and bandage wounds, to administer medication, to move patients, to take blood samples, so on.

Emergency nurses are expected to comply with protocols, procedures and safety policies of a health care facility. Emotional stability, communication, leadership, sympathy and attention to detail are characteristics expected and appreciated for emergency nurses. [1]

Patient contact with medical and healthcare trainee is at the heart of gaining the clinical competency. However this vital contact is declining. [3] The training of emergency nurse using the patient contact is hampered by two important factors: the healthcare budget constraints that increasingly limit clinical teaching and the specific of the emergency which leave no room for practice and little time for explanations.

A method for increasing the level of knowledge and clinical abilities for emergency nurses is the use of e-learning applications: simulations, virtual worlds, virtual patients, games and many more, applications with proven impact in medical education. [4] The uses of those methods provide repeated practice opportunities in dispersed locations with uncommon, life-threatening trauma cases in a safe, reproducible, flexible setting. [5] The goal of those methods is not to replace the contact with the patient which is indispensable for medical education, but to provide to the trainees more opportunities to practice specific tasks in order to obtain specific outcomes. [6]

Virtual patients

A virtual patient is defined as "an interactive computer simulation of real-life clinical scenarios for the purpose of medical training, education or assessment" [7]. Generally, the virtual patients have two components, the patient case, and the educational activities leading to a specific educational goal [8].

The virtual nature of the patient allows emergency nurses to practice in a virtual – safe – environment. Each virtual patient will be designed for learning specific learning outcomes or for assessing the knowledge. Because of their limitations – the impossibility of performing real maneuvers on them –this method could be located between first two steps on a scale which contain the main sources for gaining clinical abilities, as is shown in Figure 1

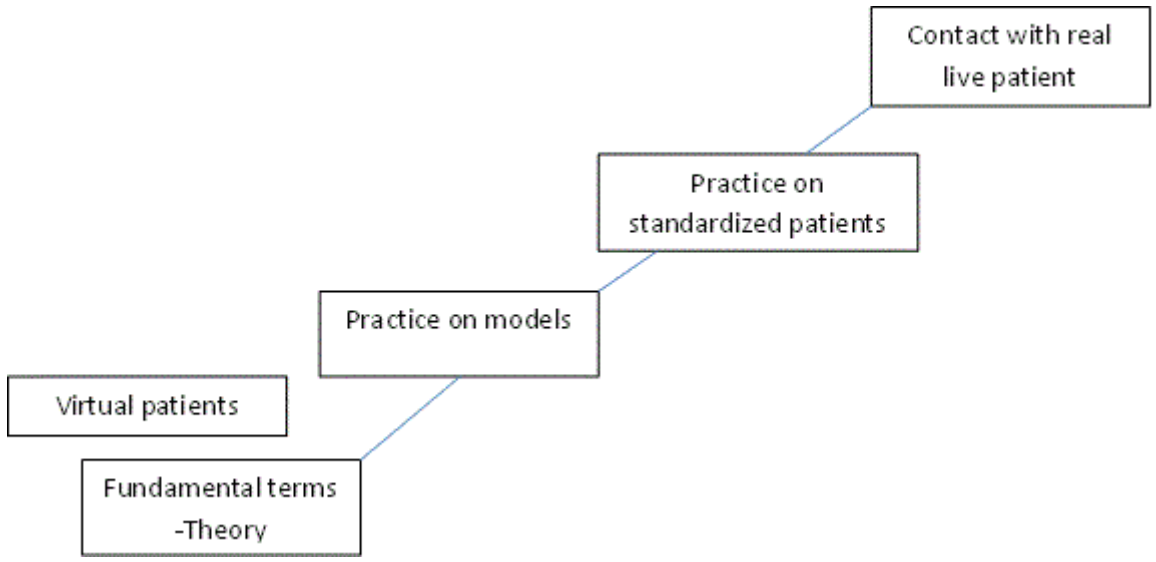

Figure1: The hierarchy of sources for gaining clinical abilities

Virtual patients are associated with large positive effects compared with no intervention. Effects in comparison with non- computer instruction are on average small. [9] The increase is evident in clinical reasoning – the critical analysis of patients' symptoms, signs, laboratory results and imaging, to support the determination of a diagnosis, and the planning of an appropriate attitude. [10]

The authors of the virtual patients can imagine many emergency scenarios in which the trainees are able to see the consequences of their actions. Those actions, which sometimes are wrong, will build experiences which can increase awareness and serve as powerful teaching strategies. [11]

The main advantages of the virtual patients in training of emergency nursing are:

Availability and accessibility

In contrast to real emergency cases which could happen in any moment and must be resolved at the time, the virtual patients are available any time. The emergency nurse could choose the moment in which he/she wants to train by solving a specific virtual patient. Most of the virtual patients management systems are implemented to be accessible online, so, in those situations, the trainee only need equipment connected on internet. More, the trainee has the opportunity to select the type of the situation (pathology) which wants to practice, this thing being impossible in real-life emergency room.

Diversity

Using virtual patients the authors have the chance to present a lot of situations that the emergency nurses may face. They can build scenarios based by rare but big impact incidents – as earthquakes or terrorist attacks; they can introduce patients with rare pathologies; they can combine different parts of real-life events in order to cover as many situations as it is possible. In case of a similar real-life event, it is a big possibility that the emergency nurse to react in an adequate manner.

Reusability

Once it was created, a virtual patient could be a source for different clinical scenarios. By doing small changes – like changing the value of biological parameters – the user will face different situations, triggering changing in attitude and different decisions. More, a study conducted by Muntean et al [12] indicated that the virtual patients could be used in multicultural and multilingual environment, with small efforts for adaptation. The development of the standards for exchange between different applications [13] made virtual patients more popular, being easier to find a proper virtual patient for a specific outcome.

The main disadvantage of this method consists in the amount of time consumed for creating a virtual patient. Major collaborative studies in Europe have suggested that the mean time spent on creation of a virtual patient is about 20–80 hours. [14] Having this in mind, it is easy to realize that the cost in money could vary from cheap to very expensive [15].

Types of virtual patients

There are three main categories of virtual patients: linear, demi-linear and branched virtual patients. The difference between those categories is given by the way in which the user interacts with the clinical scenario. The way of interacting is related with the purpose of use of different types of virtual patients – learning, training, assessing.

Linear virtual patients

In this case, each sequence of the clinical scenario is presented as a slide. The user has only one option to advance, only when the actions related to the side were finished, as it is presented in Figure 2.

Figure 2: Linear virtual patient schema

The feedback could be available to the users any time when the author of the scenario considers that is necessary. The design of those virtual patients makes them suitable for learning – protocols, simple procedures, etc.

CAMPUS [16] and CASUS [17] are the most common applications for creating and using linear virtual patients.

Demi-linear virtual patients

In this situation, like in precedent, each sequence of the clinical scenario is presented as a slide, but on each slide there are mandatory or optional things to do, or actions to perform. The user can move between the slides and choose the time when to perform the actions. The demi-linear virtual patient schema is presented in Figure 3.

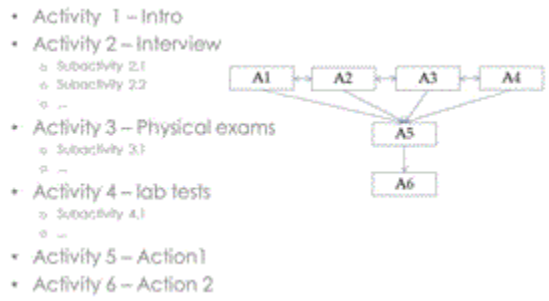

Figure 3: Demi-linear virtual patient schema

The feedback will be available to the user only when the case is finished. These virtual patients are usually used for learning – clinical thinking and resource planning and using.

WebSp [18] is most representative demi-linear virtual patient system, being in the same time probably the most geographically widespread virtual patient system. [6]

Branched virtual patients

In this case, on each slide of the clinical scenario, the user could choose to perform between different actions or take different attitudes, and the scenario is changing according to the selected action. The user is able to see the consequences of his/her choice. The schema for branched virtual patients is presented in figure 4.

Figure 4: Branched virtual patient schema

The user has a lot of freedom of choice. Each action could modify the scenario. The feedback could be available any time. This structure makes this type of virtual patients to be used for self-training or assessment and it seems to be an alternative for the classical problem base learning paper-based cases. [19]

One of the most representative applications for creating and managing branched virtual patients is OpenLabyrinth. [20]

Conclusion

Because of their characteristics, virtual patients could be a useful tool to be used in emergency nurses training. Without having the purpose to replace the rest of methods of training, the use of virtual patients together with all the available methods could increase the performance and the level of knowledge of the emergency nurses both on undergraduate or postgraduate level.

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