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SIMULATION TRAINING IN MEDICINE: FROM PROBLEM TO SOLUTION

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Abstract:

All work in the hospital, from the reception of patients to their treatment, must be carried out with the utmost care, caution and, of course, accuracy. Today, simulation training, which fully simulates procedures performed on patients, is becoming widespread in many medical schools. This training method consists of robotic manikins reproducing a real patient and special equipment. This article will discuss about the importance of creating, penetrating and spreading simulation training in medicine.

Keywords:

simulation, modeling, mannequin-robot, medicine

INTRODUCTION

In medical education, medical students and doctors are forced to develop their skills on real patients in order to acquire the necessary skills. On the other hand, doctors and students also have an obligation to ensure appropriate treatment and patient safety. These two competing needs can sometimes create a dilemma in medical education. Also, medicine is both a science and an art at the same time, and only repeated practice helps to increase the competence and confidence of the doctor. [1]

The increasing complexity of patient care requires not only knowledge and practical skills from physicians, but also the ability to communicate effectively with patients, relatives, and other health care providers, as well as to coordinate various patient care activities. Physicians must be good team members, and their curricula must cover these skills. The concept of teamwork is a relatively new concept in healthcare.

SIMULATION BASED LEARNING

Simulation is a practice and learning method that can be applied to many different disciplines and practice types. It is a technique (but not technology) of replacing and augmenting real experiences with guided experiences, often "immersive" in nature, that fully interactively recreate or replicate important aspects of the real world. "Immersive" here refers to the virtual immersion of users in a task or environment as if it were in the real world.[2,3]

Full-body mannequin simulators emerged in the field of anesthesia in the late 1960s based on the work of Denson and Abrahamson at the University of Southern California. This model was known as "Sim One" and was used to teach endotracheal intubation and induction of anesthesia. In the 1980s, with the increasing availability of personal computers and the proliferation of computer simulation software, independent groups

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began developing simulation systems. Much of it was used in the fields of aviation, military training, nuclear power generation and space flight. In the early 1990s, MedSim and later Medical Education Technologies Inc. (METI) developed comprehensive anesthesia simulation environments, including the Advanced Human Patient Simulator. Aviation simulation training concepts are gradually being incorporated into anesthesia and other areas of medicine, such as intensive care, obstetrics, emergency medicine, and internal medicine. Current human full-body simulator models include computerized models that closely approximate the physiology seen in the human body.

Simulation-based learning can be an appropriate answer to questions related to the development of knowledge, skills and competencies of medical professionals, while protecting patients from unexpected and "unnecessary" risks. Simulation-based medical education can be a platform for learning to ease ethical tension and solve practical dilemmas. Simulation-based teaching methods, tools, and strategies can be used in the design of existing learning experiences, and can be used as a measurement tool related to targeted teamwork competencies and learning objectives.

Simulation is also beginning to change the way medicine is taught and the way interns and junior doctors acquire relevant skills. Health care workers have been able to repeatedly develop and improve their skills using simulation technology without putting patients' lives at risk.[4] Simulation training centers have their with new techniques and equipment, they provide unique opportunities to apply and manage dynamic, complex and unexpected medical situations. In health care, human performance is strongly influenced by the situation, that is, the interaction between the task, the environment, and the behavior of team members.

Despite the high costs of simulation-based learning (SLT) when it was first implemented, few institutions have predicted that it will be a long-term investment. It has indeed proved to be a very flexible and robust form of medical education and training. Most of the costs were related to labor or technical costs, as well as laboratory setup and maintenance costs. Computer and information technology-driven equipment has advanced medical education and ensures that students and doctors learn repeatedly before performing any practice on real patients. Relearning when necessary to correct simulated errors and improve the sequence and quality of skill execution. [5,6]. There may also be simulated examples or scenarios of situations that are difficult or unusual to encounter in a clinical setting, and this also provides students with the opportunity to work out of situations when they encounter these rare situations later in the same learning process. Simulated situations and scenarios can serve as a field of real experience for students and doctors who have just started their career. It can certainly help in creating books and lecture materials as well. ST helps ensure that students and practitioners gain clinical experience so that they are not accidentally exposed to certain clinical situations in the future. Many experts believe that SO' increases the effectiveness of the learning process in a controlled and safe environment. [9,10]

Skills requirements that can be enhanced through simulation include:

a. Technical and functional specialty training

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b. Problem solving and decision making skills
c. Interpersonal and communication skills or team-based skills

All of these have a common goal in that they require active listening and collaboration in addition to basic knowledge and skills. Feedback should be linked to learning outcomes and there should be an effective exchange of ideas after all simulation exercises. Studies have shown that ST improves the learning and performance of certain skills. [5 , 6 , 9 , 11] Simulation is effective in developing skills in procedures that require hand-eye coordination and bilateral maneuvers, such as bronchoscopy and other endoscopic procedures[9,11] Simulation training prepares students to deal with unexpected medical events helps them to grow and thereby increases their self-confidence

Multidisciplinary and comprehensively formed teams teams can provide many health care services today, but many organizations still focus on individual technical responsibilities, leaving practitioners ill-prepared to enter complex team settings. shows. When health care providers from different fields are trained separately, it can be difficult to combine their capabilities. Effective multidisciplinary teams must always have good communication and leadership behaviors that help ensure patient safety.

INTERDISCIPLINARY TEAMWORK AND SKILLS

Health care includes doctors, nurses, physiotherapists, radiologists, pharmacists, medical students and other staff in various disciplines. The content varies depending on the purpose of the teams; Examples include stroke teams, trauma teams, acute coronary syndrome intervention teams, and more. The training of each member of the team is determined according to his field. Thus, in order to learn how to manage a patient with complex medical problems, they must be brought together in an integrated manner. No one area is more important than another. Everyone has a role in the team, and in simulated team exercises, members learn not to "step on each other's heels." They are briefed on their collaborative roles. Teamwork skills and interpersonal skills are important components of such training and exercises.[13–16]

Simulation trainers are often senior staff who understand a team-based approach and are able to think holistically. They should be able to objectively see the group dynamics and interactions within the teams they train and provide valuable feedback. They evaluate team performance in real time and can maintain checklists of activities, actions and related human factors. Videotaping the role play is useful as it can be shared with the team as part of the learning process and key points can be discussed. Coaches can demonstrate both negative and positive practices and behaviors to participants. [16,17].

Some common errors and omissions observed during teamwork include:[17,18]

a. Not understanding the roles and responsibilities of other team members in areas.
b. Lack of clearly defined roles despite generally accepted team performance; This may not be apparent until there is a change in team members, which then reveals the confusion of the script.
c. Most healthcare industries lack or have no processes or backup plans in place when things go wrong.

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SAFETY AND SIMULATION TRAINING

Healthcare security is comparable to other high-stakes industries such as aviation, the military, and nuclear power generation. In these areas, security depends on preventing human error and responding to system failures. The utility of simulation in healthcare is certainly interesting to consider in the context of patient safety.[23-25]

One of the important concepts in medical safety is how to learn. Traditionally, medicine operates on a mentor-disciple model. Practitioners and graduate and clinical residency students begin caring for patients on the first day of practice under the supervision of experienced staff who provide a safety net for errors. Although they have learned about medical care before assuming the responsibility of a patient, it is the first time they are independently exposed to performing high-risk procedures, resuscitation and critical decision-making skills on real patients. Simulation provides a learning model to complement traditional education in medicine. It has been shown that the experience of performing operations reduces the rate of development of complications in the patient. Simulators allow patients to develop experience before performing these procedures. [4, 11, 23, 25]

A review of the literature from 1969 to 2003 indicated that the rigor and quality of simulation research needs to be improved, but that high-fidelity simulations are educationally effective and can be used in patient care settings. complements traditional teaching. The best features of simulation training include: [23 , 26]

- Availability of feedback;
- Availability of repeated practice;
- Curriculum integration;
- Ability to change difficulty levels;
- Opportunity to study rare clinical cases;
- Ability to increase the level of safety for patients.

However, to date, there have been no studies demonstrating that simulation training directly improves patient care outcomes. There may be several reasons for this.

FUTURE DIRECTIONS

Perhaps one day we will be able to use it as a tool to assess applicants for medical school, just as dental students in some developed countries are given manual dexterity tests. As medical simulation games are developed, medical training can include a portion of the time devoted to learning through play. Additional studies and research are also needed to determine whether simulation improves patient outcomes. Creators continue to improve virtual reality technology to make experiences as seamless as possible.[26]

CONCLUSION

Simulation training has opened a new educational program in medicine. Evidence-based practices can be implemented using protocols and algorithms, which can then be applied through simulation scenarios. The key to success in simulation training is its integration into traditional educational programs. Clinical faculty should actively participate in the

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development of such a program. Team-based training in a simulated environment can provide additional benefits to traditional didactic instruction, increasing efficiency and possibly reducing errors. The cost-effectiveness of potentially expensive simulation-based medical education and training needs to be examined in terms of improving clinical skills and its impact on patient safety. It is possible that with the adoption of simulation training as a certification standard, the development of practical skills and decision-making skills in specific areas and rare situations will become more comprehensive and, perhaps, patients increasing the level of security for them will put an end to their wandering.

ADABIYOTLAR

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