

## Hybrid Simulations: Applied Cases

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### ABSTRACT

Nursing education has been constantly renewing itself through the technological developments. The use of interactive education methods in nursing education has been increasing, and its reflection on clinical setting has been tried to be more visible. Hybrid simulation, which is one of the simulation methods, has important effects on nursing education. In this paper, it is aimed to offer a definition of hybrid simulation and its implementation examples. In the literature, there is limited number of studies based on hybrid simulation method. Therefore, it is important to fill this gap in order to discuss the importance and use of hybrid simulation method.

**Key words:** Nursing, simulation, hybrid, standardized patient, nursing education.

### INTRODUCTION

In nursing education, traditional methods have been replaced by more innovative methods. <sup>[1]</sup> In the report published by The Institute of Medicine in 2010, it was emphasized that the curriculum of healthcare institutions should be re-designed because insufficient education programs may lead to mistreatment of patients. <sup>[2]</sup> In Turkey, “Healthcare Education and Health Labor Force Information Report” was published in 2014. <sup>[3]</sup> According to the report, there are certain developments in nursing education parallel with the technological developments; however the current situation at national level is still unsatisfactory.

Nursing education is based on two fundamental levels, namely theoretical and applied. <sup>[4]</sup> Complementarity of these two areas is quite important. However, this complementarity has not been achieved yet. Nursing students feel incompetent, and this lead to increased stress in clinical setting. <sup>[5]</sup>

The solution of this anxiety is based on improving nursing students’ knowledge and skills, and increasing their experience as well.

Today, simulation training is one of the most common and important education methodologies. <sup>[6]</sup> Being one of the innovative approaches, simulation training has become very popular in nursing education because simulation training matches the demands of future nurses through its complementary nature. <sup>[7-9]</sup> Cognitive, psychomotor, and affective learning outcomes of simulation training are shown by certain studies. <sup>[10,11]</sup> Nonetheless, its effect on clinical area is still a black-box. <sup>[12]</sup>

Simulation training offers various types of alternative learning instruments to the educators, depending on their learning outcome. <sup>[13]</sup> After high-fidelity simulators, which are computer integrated as well, various types of technological instruments are waiting for their users, such as mobile

learning tools and game-based learning applications (second-life). In this paper, it is aimed to examine hybrid simulation method, of which effect on clinical setting is more powerful.

### Hybrid Simulation

Simulation in nursing is a method, which is based on developing students' knowledge and skills in a realist environment, without clinical setting anxiety. [6] Instant feedbacks given to the students contribute to the interactivity of the training, and stimulate permanent learning in students. Moreover, educators can also set measureable and consistent aims. Due to its repeatable nature, hybrid simulation method may help students to show better performance. Thus, simulation is considered as an instrument of replicating the real world. [14]

Realism in simulation is based on animating the medical practices that are required to be obtained by the students prior to their graduation. [8] In nursing, hybrid simulation methodology is used in order to increase realism. Hybrid simulation, which is also called as patient-based simulation, involves both standardized patients and other supporting methods.

The concept of standardized/simulated patient was first used in 1960 by Howard Barrow. [15] These individuals have training and expertise in order to act as a real patient. Simulated patients have important contribution to nursing education, such as improving physical examination skills, establishing and maintaining communication with patients and with other healthcare professionals, understanding patients' emotions and feelings, and preventing falling hazard. Therefore, nursing students may develop attitudes based on patient safety and patient requirements. [16] Moreover, one of the most important features of standardized patients is that it also prepares nursing students to clinical setting because standardized/simulated patients give the opportunity of safe and controlled learning

environment without causing any real damage. [17]

In addition to the cognitive and psychomotor skills, various number of affective scenarios can be generated in hybrid simulation. Applications such as placing vascular access mannequin on standardized patient and combining birth mannequin with standardized patients contribute to the nursing students' learning, and prepare them to real clinical setting. [10] Moreover, these implementations also contribute to problem solving, critical thinking, and decision making abilities as well. Furthermore, visual and aural implications, when they are combined with realistic learning environment, are more likely to increase students' willingness to learn. [18] Furthermore, hybrid simulations have become an ethical necessity in order to develop students' skills without giving any potential damage to real patients. [19]

### Application Examples in Healthcare

In the literature, the number of research involving hybrid simulation method is limited. Standardized/simulated patients used in this method are individuals who act as a real patient for a fee. [20] However, using supportive materials, in addition to the standardized patients, may increase the cost as well. Still, hybrid simulation method, compared to other simulation methods, can be used at reasonable costs.

Drawing upon the prior studies focused on hybrid simulations' effect on critical thinking, learning performance, and confidence, Jeffries (2005) argues that hybrid simulation method is a very useful method for both students and educators. [21]

Hybrid simulation method is widely used in trainings based on gynecology practices. According to Miller et al. (2015), students rated hybrid simulation training as highly realistic. [22] In another study, an endovaginal ultrasound (US) task trainer was combined with a high-fidelity US mannequin to create a hybrid simulation model. The authors found that, compared to the residents assigned to the standard

simulation scenario, residents assigned to the hybrid model reported an increase in their overall educational experience, and felt the hybrid model was a better measure of their ability to interpret endovaginal US images. [23]

The fact that hybrid simulation is an efficient method for teaching clinical implementation skills is supported with other studies. [24,25] Moreover, it is advised that nursing educators should consider simulation trainings as an important clinical tool, and use it. [26]

Vaugh, Lister, and Shaw (2016) developed an innovative hybrid simulation designed to increase the perception of realism in a high-fidelity simulation. Students in the study cared for a mannequin in a simulation lab scenario through wearing a high tech-glass, which transforms the mannequin to a real patient. According to the results, students noted that the simulation gave them confidence that they were developing skills and knowledge to perform necessary tasks in a clinical setting, and they achieved the learning objectives of the simulation as well. [11] According to another study, which focused on psychomotor skills and confidence, Suk Jeong et al. (2013) found that students taking the simulation training performed better at psychomotor skills and expressed higher levels of confidence than students who did not take simulation training. [26]

Kneebone et al. (2002) used hybrid simulation integrated with standardized/simulated patients for teaching urinary catheterization and wound closure skills. The authors found that the integrated model was feasible and was perceived to be valuable by the students. Moreover, students also noted that they perceived hybrid simulation as an opportunity to integrate, within a safe environment, communication and clinical skills, which are often taught separately. [27] Similarly, Terzi et al. (2016) found that students showed higher levels of communication skills in clinical settings rather than in standardized patient lab. [5]

Stroud and Cavalcanti (2013) developed a hybrid simulation model for teaching arthrocentesis to internal medicine students and developing their communication skills. They found that hybrid simulation facilitates simultaneous acquisition of technical and communication skills, and they emphasized that future research should examine whether hybrid simulation improves transfer of skills to the clinical setting as well. [19]

Dryden-Palmer, Kotsakis, and Berry (2011) found that hybrid simulation method helps achieving cognitive and affective learning outcomes. [28] In another study focuses on psychomotor skills, it was found that hybrid simulation designed to teach technical skills for ellipse excision and wound closure was effective and useful in terms of achieving learning outcomes. [29]

In conclusion, it is possible to argue that trainings performed with hybrid simulation method, similar to the other types of simulation methods, have advantages and benefits to the students. However, there are still substantial gaps in terms of the effect of hybrid simulation to clinical setting. Specifically, despite the effect and benefits of hybrid simulation are widely known, its use is still limited. Therefore, future studies involving randomized control are required in order to increase the use of hybrid simulations.

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