https://doi.org/10.53964/jmnpr.2023026

https://www.innovationforever.com

Journal of
Modern Nursing Practice and Research

ISSN 2708-2202 (Online)

Open Access

Short Commentary

The Potential of Mental Simulation for Enhancing Self-efficacy and Managing Stress in Emergency Care: A Nurse Education Perspective

Nick White[1*], Anil Hormis[2]

[1]Department of Nursing and Midwifery, College of Health, Wellbeing and Life Sciences, Sheffield Hallam University, Sheffield, UK

[2]Department of Allied Health Professions, College of Health, Wellbeing and Life Sciences, Sheffield Hallam University, Sheffield, UK

[*]**Correspondence to: Nick White,** EdD, Senior Lecturer, Department of Nursing and Midwifery, College of Health, Wellbeing and Life Sciences, Sheffield Hallam University, Howard Street, Sheffield, S1 1WB, UK; Email: n.white@shu.ac.uk

Received: September 4, 2023 **Revised:** November 8, 2023 **Accepted:** November 22, 2023 **Published:** December 22, 2023

Abstract

This theoretical article explores how mental simulation can enhance self-efficacy and stress management in emergency care, focusing on its application in nurse education. This article delves into the concept, functionality, and applications of mental simulation in nurse education, specifically addressing stress mitigation in emergency care. We offer an overview of relevant literature and research, including a specific focus on surgical skills education. The mechanisms of mental simulation, encompassing the simulation theory of action and dual code theory, are discussed, providing valuable insights into neural networks and image evocation processes. The article underscores the significant impact of stress on emergency care performance. It highlights the potential benefits of incorporating mental simulation as a stress-exposure training technique in the learning process. By adopting a Bandurian theoretical framework, the article proposes how mental simulation can contribute to the cultivation of self-efficacious nurses. Integrating mental simulation in nurse education has the potential to mitigate stress's negative impact on emergency care. Nurses mentally rehearse and simulate scenarios, becoming familiar with demands and stressors. This practice can potentially refine skills, improve performance under pressure, and boost self-efficacy. Mental simulation replicates real-life situations, enhancing learning from a patient safety perspective. Mental simulation enhances self-efficacy and stress management in emergency care. Its integration into nurse education prepares nurses for high-stress situations. Further research should explore its diverse applications. Understanding mental simulation mechanisms can improve training programmes, potentially empowering nurses in delivering self-confident emergency care.

Keywords: mental simulation, nurse education, self-efficacy, stress management, emergency care

Citation: White N, Hormis A. The Potential of Mental Simulation for Enhancing Self-efficacy and Managing Stress in Emergency Care: A Nurse Education Perspective. *J Mod Nurs Pract Res*, 2023; 3(4): 26. DOI: 10.53964/jmnpr.2023026.

https://doi.org/10.53964/jmnpr.2023026

1 INTRODUCTION

1.1 Mental Simulation and Stress

This theoretical article investigates the potential of mental simulation to enhance self-efficacy and stress management in emergency care, particularly from the perspective of nurse education. Mental simulation is widely discussed in surgical skills education, but its potential in areas of nurse education remains underexplored. This paper focuses on utilising mental simulation for stress exposure training and enhancing self-efficacy in emergency care situations. Mental simulation, a cognitive visualisation technique, enables contemplation of hypothetical events and deliberate practice without physical movement[1]. It creates an authentic learning environment that replicates real-life situations and emotions. Mental simulation can be ad hoc or script-based, exposing nurses to clinical stressors during skills practice[2]. Integrating mental simulation has the potential to lessen stress impact on emergency care. As with simulated practice, mental simulation is scenario-based. Nurses mentally navigate scenarios written by educators, developing adaptive responses, refining skills, and optimising performance under pressure. This paper introduces the concept, functionality, and applications of mental simulation in the nurse simulation community.

Mental simulation has been researched extensively with several meta-analysis showing that mental simulation has an overall significant positive effect on learning of skillsets in sports[3-5]. Mental simulation has the capacity to evoke emotions similar to real-world psychological and somatic responses[2]. As a result, it holds potential as a stress exposure training technique. Immersing oneself in imagined scenarios may lead to desensitization, thereby reducing stress and anxiety during actual practice. This process can diminish self-doubt and foster self-belief.

Stefanidis et al.[6] utilized mental simulation to reduce stress in surgery, using a randomized control trial design. The six-item State-Trait Anxiety Inventory was used to subjectively assess stress levels before and after interventions. They studied junior surgeons (n=60) and found lower stress levels in the mental simulation group during transfer and retention tests (P<0.05). There is limited research on mental simulation's role in reducing stress during emergency situations. This article offers a theoretical perspective on how mental simulation could help, with plans for future research in this area.

1.2 Self-efficacy

Bandura's self-efficacy theory is used to explain how mental simulation enhances self-belief. Self-efficacy plays a crucial role in delivering emergency care skills, as nurses need to believe in their ability to perform under pressure[7]. It is an often-underappreciated aspect of the skill learning process, correlating with psychomotor skill delivery in nurses' management of emergency care[8]. Therefore, it is important, but often underappreciated aspect of the skill learning process. This article delves into a more comprehensive exploration of these ideas, providing a more detailed examination of the potential of mental simulation as a stress exposure training technique. It investigates how the use of mental simulation can evoke emotions akin to real-world psychological and somatic responses, thereby contributing to stress reduction and desensitisation. Additionally, the article investigates how mental simulation can play a crucial role in diminishing self-doubt and fostering self-belief in real-world practice.

2 THE IMPACT OF STRESS ON EMERGENCY CARE PERFORMANCE

High-stress situations, such as cardiac arrests, can hinder effective emergency care delivery[9]. Stress and anxiety lead to heightened arousal, negatively impacting performance and increasing the likelihood of errors[10,11]. These stress-induced challenges include decreased attention, increased distractibility, impaired recall, and cognitive overload[12,13]. External pressure triggers stress, which, when demands exceed available resources, results in adverse physiological, psychological, or behavioural[14,15]. Consequently, individuals are more susceptible to making mistakes in such demanding situations[16].

In the face of these challenges posed by high-stress situations, the integration of mental simulation techniques can offer a valuable approach to mitigate the negative impact of stress on emergency care delivery. Mental simulation, as a cognitive visualisation tool, enables nurses to mentally rehearse and simulate emergency scenarios, creating a virtual practice environment in one's imagination, that mirrors real-life situations[1]. By engaging in mental simulation, nurses can familiarise themselves with the demands and stressors of emergency care, allowing them to develop adaptive responses and refine their skills. Mental simulation provides an opportunity for deliberate practice, allowing nurses to mentally navigate through potential challenges, enhance their decision-making abilities, and optimise performance under pressure. By incorporating mental simulation into their training and preparation, nurses can better manage the inherent stressors of high-stress situations, leading to improved performance and patient outcomes. The subsequent section delves into the intricate workings of mental simulation, shedding light on its functional mechanisms and processes.

3 AIMS AND THEORIES OF MENTAL SIMULATION IN EDUCATION

3.1 The Role and Impact of Mental Simulation in Skill Acquisition and Self-efficacy Enhancement

The terminology surrounding mental simulation can sometimes be used interchangeably with other terms such as "mental imagery", "mental practice", or "motor imagery".

"Mental simulation" is a widely recognised term for this method of imaginal learning, as emphasised in Holmes and Collins' influential paper on imagery[17]. Extensive research has been conducted on mental simulation in various contexts, demonstrating its positive effects on skill acquisition and performance[18]. It is a well-established approach in sports and exercise sciences, with studies showcasing its benefits for skill acquisition, both with and without accompanying physical practice[19]. Mental simulation has been found to enhance learning even when performed in isolation, suggesting the ability to generate motor plans without prior physical practice[20]. However, the combination of mental simulation with physical practice has been particularly effective[19,20], as physical practice provides essential feedback for updating motor plans based on error detection and correction mechanisms[20]. In addition to skill acquisition, self-belief in skill execution is of great significance in the nursing field. Nurses not only require knowledge, skills, and attitude but also need to believe in their ability to implement learned skills when needed. Mental simulation has been shown to contribute to the enhancement of self-efficacy in nurses learning new skills[21]. This often-underappreciated outcome of simulation is a crucial aspect of skill learning.

3.2 Exploring the Mechanisms of Mental Simulation: From Action Simulation Theory to Dual Code Theory (DCT)

The phenomenon of mental simulation and its effectiveness in learning can be partly understood through Jeannerod's seminal work[22] on the "simulation theory of action". According to this theory, observing, imagining, and understanding motor actions activate the same neural networks involved in physically executing those actions. While there are differences between covert (imagined) and overt (actual) action, there is a partial overlap in the neural networks involved[22]. Neuroimaging studies have further demonstrated the functional neuroanatomical equivalence between mentally simulated images and actual motor execution[23]. Although physical practice is not a necessity for successful mental simulation, the strength of memory experiences plays a vital role, following a dose-response relationship[24].

The core assumption of mental simulation is that the representations formed in memory during mental simulation can later guide the performance of corresponding real-world activities, a concept known as the "functional equivalence" of mental simulation[17]. Mental simulation engages neural networks shared with major cognitive functions and closely resembles the networks involved in actual execution.

DCT, based on the work of Paivio[25], provides further insight into the mechanisms of mental simulation, particularly in relation to the evocation of images. DCT posits the existence of two systems: the verbal system (logogen / language) and the non-verbal system (imagen / images). The non-verbal system specialises in representing and processing information from nonverbal objects, while the verbal system focuses on language-related information. These systems function independently yet are interconnected, facilitating the activation of representational links. The associative strength between visual images and thoughts / memories plays a crucial role in mental simulation, as it allows for the evocation of relevant mental simulations[26,27].

In addition to creating visual images, mental simulation can evoke heightened states of arousal, as mental images have the ability to elicit emotional response[28]. Imagery acts as an emotional amplifier, activating stored information that overlaps with actual experiences of emotionally charged stimuli[29]. By engaging in mental simulation, individuals not only learn the simulated skill but also experience associated emotions, potentially leading to desensitisation over time[2]. The next section explores the relationship between desensitisation and self-efficacy in individuals.

4 DISCUSSION ON THE VALUE OF MENTAL SIMULATION

4.1 Enhancing Self-efficacy and Performance through Mental Simulation

The repeated exposure to stress can lead to improved performance through desensitisation[30]. Performing a specific task in a classroom environment differs significantly from performing the same task in a stressful real-world setting[30,31]. However, repeated exposure to stress in simulated practice has been shown to reduce stress levels over time[31]. In this context, the use of mental simulation for learning skills needed in stressful situations could assist nurses in effectively coping with real-world challenges. It appears that it is not enough for nurses to have the "knowledge" (know), "skills" (able to), and "attitude" (prepared to). They also need to believe in their ability (dare to) to perform under pressure[32] in an emergency scenario.

Self-efficacy, the belief in one's ability to perform a specific task in various circumstances, is highly task-specific and predictive of behaviour[33]. Healthcare practitioners, including nurses, are expected to master providing emergency care and perform effectively when required, often facing anxiety-provoking situations that may undermine their self-belief[34]. Bandura[35] argues that individuals with self-belief and self-assurance can protect themselves from stress-related errors, which is crucial for patient safety. Doubts about their abilities can impact nurses' thoughts and feelings regarding emergency care delivery.

Bandura[33] suggests that self-efficacy can be achieved through various sources of experience, including enactive mastery experience (performance accomplishments)

and emotional arousal. Mastery experiences, particularly successful ones, contribute significantly to building a robust belief in personal efficacy[36]. Stressful situations can stimulate emotional arousal, which also influences self-efficacy beliefs in coping with high-stakes scenarios[37]. Mental simulation may act as a form of enactive mastery experience, allowing individuals to approximate real-world emergency care scenarios and evoke the emotional aspects associated with them. By engaging in mental simulation, individuals can potentially experience desensitisation to anxieties related to cardiac arrest, leading to reduced stress levels and improved performance[2].

Increasing self-efficacy can have a positive impact on emergency care and life-support skill performance[4]. Studies have shown that self-efficacy is a highly accurate predictor of behavioural change after complete desensitisation[38,39]. Lower levels of anxiety are associated with a higher likelihood of success, as individuals are less perturbed by fear-provoking thoughts[40]. Mental simulation can potentially provide exposure to anxieties related to cardiac arrest, leading to desensitisation, and ultimately enhancing nurse performance in stressful emergency care conditions.

The above discussion makes a case for the utility of mental simulation in enhancing nurses' confidence and self-efficacy when performing life-saving procedures during emergencies. The connection between past performance and self-efficacy is reinforced by Sitzmann and Yeo[41]. Bandura's work[42] supports the role of mental simulation in managing anticipatory self-arousal and alleviating fear-provoking thoughts. Furthermore, Rushton[43] lends credibility to the assertion that nurses often lack confidence and self-assurance in conducting BLS during emergencies. Describing mental simulation as an enactive mastery experience aligns with Bandura's theory[44], offering a plausible mechanism for promoting behavioural accomplishments and reducing fear-arousal.

The mention of enactive mastery experiences increasing efficacy belief levels for previously feared and avoided activities is backed by Bandura[44]. This suggests that mental simulation can effectively address nurses' lack of confidence and help them become self-efficacious practitioners. The idea that mental simulation can lead to a cessation of apprehensive thinking and an increased sense of control over potential psychological threats is logical and aligns with Bandura's notion[35] of exercising control. The overall argument highlights the potential of mental simulation to improve nurses' confidence and belief in their ability to perform required actions during emergencies.

Overall, this article provides a clear and concise explanation of the relationship between rehearsing performance through mental simulation, and self-efficacy. However, to further strengthen the evaluation, it would be beneficial to include any potential limitations or counterarguments regarding the effectiveness of mental simulation in improving nurses' confidence and self-efficacy.

4.2 Limitations of the Concept and Further Research Areas

(1) Limited research in nurse education: Despite the potential of mental simulation, there is a lack of extensive research specifically focusing on its application and effectiveness in nurse education. This limited evidence base makes it challenging to fully understand its impact and identify the best practices for integrating mental simulation into nursing curricula. This idea is currently theoretical and needs empirically testing.

(2) Variability in individual responses: Mental simulation may elicit different responses and outcomes among individuals. Factors such as prior experience, cognitive abilities, and emotional resilience can influence how nurses engage with and benefit from mental simulation.

(3) Ethical considerations: Creating realistic scenarios through mental simulation can potentially evoke emotional distress in nurses. Simulating high-stress situations repeatedly may lead to psychological strain or trigger traumatic memories, affecting the well-being of individuals. Ethical guidelines and safeguards must be implemented to ensure the emotional safety and psychological support of nurses engaging in mental simulation.

(4) Transferability to real-world contexts: While mental simulation can provide a simulated learning environment, there may be limitations in the transferability of skills and self-efficacy from simulation to real-world emergency care situations. The complexity and unpredictability of actual clinical scenarios may require additional training and experience beyond mental simulation to ensure optimal performance and patient outcomes.

(5) Contextual limitations: Mental simulation techniques may be more applicable to certain emergency care situations or nursing specialties than others. The specific challenges and stressors faced in different clinical settings may vary, and the effectiveness of mental simulation in addressing these context-specific issues requires further exploration. Adapting mental simulation to diverse clinical contexts and ensuring its relevance and applicability across various nursing specialties is an area that requires careful consideration.

It is important to address these limitations through further research, careful implementation, and ongoing evaluation to maximise the benefits and overcome potential challenges associated with integrating mental simulation into nurse education and training and this is the authors intent.

5 CONCLUSION

In conclusion, mental simulation is a valuable tool for stress exposure training and self-efficacy enhancement in

emergency care. While widely used in surgical education, its potential in nursing has been underexplored. This paper introduced mental simulation's concept, functionality, and applications in nursing education, focusing on its stress management role.

High-stress situations, like cardiac arrests, hinder emergency care delivery due to anxiety. Mental simulation allows nurses to mentally rehearse and simulate emergencies, offering a virtual practice environment. Nurses can familiarize themselves, develop adaptive responses, and refine their skills, enabling deliberate practice, better decision-making, and optimized performance under pressure.

Mental simulation also contributes to skill acquisition and self-efficacy enhancement. It helps nurses build confidence to perform under pressure. Nurses can approximate real-world scenarios, desensitize to anxieties, and improve performance in high-stress situations.

Incorporating mental simulation into nurse education prepares them for high-stress scenarios, improving performance and patient outcomes. Future research should explore its applications in nursing education and practice further.

Acknowledgements

We express our sincere gratitude to Dr. James Rumbold and Dr. Iain Garner.

Conflicts of Interest

The authors declared no conflict of interest.

Author Contribution

In crafting this paper, both authors played crucial roles. White N drew upon their extensive research from doctoral studies, providing foundational insights. Hormis A contributed significantly by refining the manuscript, ensuring clarity, coherence, and overall quality. Their expertise in writing and publication, coupled with shaping the conceptual framework, resulted in a well-rounded and insightful contribution to the field. Together, the collaborative efforts of both authors produced a comprehensive paper that offers readers valuable perspectives on the subject.

Abbreviation List

DCT, Dual code theory

References

[1] Pearson J, Naselaris T, Holmes EA et al. Mental Imagery: Functional Mechanisms and Clinical Applications. *Trends Cogn Sci*, 2015; 19: 590-602.[DOI]

[2] White NA. A study into the experiences of pre-registration nurses' use of mental simulation [Doctor's Thesis]. Sheffield City, UK: Sheffield Hallam University; 2022.

[3] Lindsay R, Spittle M, Larkin P. The effect of mental imagery on skill performance in sport: A systematic review. *J Sci Med Sport*, 2019; 22: S92.[DOI]

[4] Simonsmeier BA, Androniea M, Buecker S et al. The effects of imagery interventions in sports: a meta-analysis. *Int Rev Sport Exer P*, 2022; 14: 186-207.[DOI]

[5] Di Corrado D, Guarnera M, Guerrera CS et al. Mental Imagery Skills in Competitive Young Athletes and Non-athletes. *Front Psychol*, 2020; 11: 633.[DOI]

[6] Stefanidis D, Anton NE, Howley LD et al. Effectiveness of a comprehensive mental skills curriculum in enhancing surgical performance: Results of a randomized controlled trial. *Am J Surg*, 2017; 213: 318-324.[DOI]

[7] Vagni M, Malorano T, Glostra V et al. Coping with COVID-19: Emergency Stress, Secondary Trauma, and Self-Efficacy in Healthcare and Emergency Workers in Italy. *Front Psychol*, 2020; 11: 1-12.[DOI]

[8] Roh YS, Issenberg SB. Association of cardiopulmonary resuscitation psychomotor skills with knowledge and self-efficacy in nursing students. *Int J Nurs Pract*, 2014; 20: 674-679.[DOI]

[9] Vincent A, Semmer NK, Becker C et al. Does stress influence the performance of cardiopulmonary resuscitation? A narrative review of the literature. *J Crit Care*, 2021; 63: 223-230.[DOI]

[10] Frazier P, Gabriel A, Merians A et al. Understanding stress as an impediment to academic performance. *J Am Coll Health*, 2019; 67: 562-570.[DOI]

[11] Jamieson JP, Peters BJ, Greenwood EJ et al. Reappraising Stress Arousal Improves Performance and Reduces Evaluation Anxiety in Classroom Exam Situations. *Soc Psychol Pers Sci*, 2016; 7: 579-587.[DOI]

[12] Hunziker S, Pagani S, Fasler K et al. Impact of a stress coping strategy on perceived stress levels and performance during a simulated cardiopulmonary resuscitation: a randomized controlled trial. *BMC Emerg Med*, 2013; 13: 8.

[13] Matthews G, Wohleber RW, Lin J. Introduction: Stress, Skilled Performance, and Expertise: Overload and Beyond. In: The Oxford Handbook of Expertise. Oxford Library of Psychology: Oxford, England, 2019.

[14] Al-Ghareeb AZ, Cooper SJ, McKenna LG. Anxiety and Clinical Performance in Simulated Setting in Undergraduate Health Professionals Education: An Integrative Review. *Clin Simul Nurs*, 2017; 13: 478-491.[DOI]

[15] Driskell JE, Johnston JH. Stress Exposure Training. In: Making Decisions under Stress: Implications for Individual and Team Training. American Psychological Association: Washington DC, USA, 1998; 191-217.[DOI]

[16] Shahrokhi A, Ebrahimpour F, Ghodousi A. Factors effective on medication errors: A nursing view. *J Res Pharm Pract*, 2013; 2: 18-23.

[17] Holmes PS, Collins DJ. The PETTLEP Approach to Motor Imagery: a Functional Equivalence Model for Sport Psychologists. *J Appl Sport Psychol*, 2001; 13: 60-83.[DOI]

[18] Lindsay RS, Larkin P, Kittel A et al. Mental imagery training programs for developing sport-specific motor skills: a systematic review and meta-analysis. *Phys Educ Sport Peda*,

2023; 28: 444-465.[DOI]

[19] Toth AJ, McNeill E, Hayes K et al. Does mental practice still enhance performance? A 24 Year follow-up and meta-analytic replication and extension. *Psychol Sport Exerc*, 2020; 48: 101672.[DOI]

[20] Kraeutner SN, MacKenzie LA, Westwood DA et al. Characterizing skill acquisition through motor imagery with no prior physical practice. *J Exp Psychol Human*, 2016; 42: 257-265.[DOI]

[21] Saeidikia A, Vagharseyyedin SA, Danaie Z et al. Impact of PETTLEP-based mental imagery on nursing and midwifery students' skill of nasogastric tube insertion and self-efficacy. *Int J Psychosoc Rehabil*, 2020; 24: 4373-4387.

[22] Jeannerod M. Neural Simulation of Action: A Unifying Mechanism for Motor Cognition. *NeuroImage*, 2001; 14: S103-S109.[DOI]

[23] Ibáñez-Marcelo E, Campioni L, Phinyomark A et al. Topology highlights mesoscopic functional equivalence between imagery and perception: The case of hypnotizability. *NeuroImage*, 2019; 200: 437-449.[DOI]

[24] Paravlic AH, Slimani M, Tod D et al. Effects and Dose–Response Relationships of Motor Imagery Practice on Strength Development in Healthy Adult Populations: a Systematic Review and Meta-analysis. *Sports Med*, 2018; 48: 1165-1187.[DOI]

[25] Paivio A. Intelligence, dual coding theory, and the brain. *Intelligence*, 2014; 47: 141-158.[DOI]

[26] Lang PJ. Emotion's Response Pattern: The Brain and The Autonomic Nervous System. *Emot Rev*, 2014; 6: 93-99.[DOI]

[27] Clark JM, Paivio A. Dual coding theory and education. *Educ Psychol Rev*, 1991; 3: 149-210.[DOI]

[28] Turner NM, Lukkassen I, Bakker N et al. The effect of the APLS-course on self-efficacy and its relationship to behavioural decisions in paediatric resuscitation. *Resuscitation*, 2009; 80: 913-918.[DOI]

[29] Lang PJ. Imagery in Therapy: An Information Processing Analysis of fear - Republished Article. *Behav Ther*, 2016; 47: 688-701.[DOI]

[30] Holmes EA, Geddes JR, Colom F et al. Mental imagery as an emotional amplifier: Application to bipolar disorder. *Behav Res Ther*, 2008; 46: 1251-1258.[DOI]

[31] Driskell T, Sclafani S, Driskell JE. Reducing the Effects of Game Day Pressures through Stress Exposure Training. *J Sport Psychol Acti*, 2014; 5: 28-43.[DOI]

[32] Judd BK, Currie J, Dodds KL et al. Registered nurses psychophysiological stress and confidence during high-fidelity emergency simulation: Effects on performance. *Nurs Educ Today*, 2019; 78: 44-49.[DOI]

[33] Bandura A. Social Cognitive Theory: An Agentic Perspective. *Asian J Soc Psychol*, 1999; 2: 21-41.[DOI]

[34] Hoff JJ, Zimmerman A, Tupetz A et al. Shame and Guilt in EMS: a Qualitative Analysis of Culture and Attitudes in Prehospital Emergency Care. *Prehosp Emerg Care*, 2022; 27: 418-426.[DOI]

[35] Bandura A. Reflections on self-efficacy. *Adv Behav Res Ther*, 1978; 1: 237-269.[DOI]

[36] Bandura A. Self-efficacy: The exercise of control. Henry Holt and Company: New York, USA, 1997.

[37] Bandura A. Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Inc.; Hoboken, USA, 1986.

[38] Bandura A, Adams NE. Analysis of self-efficacy theory of behavioral change. *Cogn Ther Res*, 1977; 1: 287-310.[DOI]

[39] Wright BJ, O'Halloran PD, Stukas AA. Enhancing self-efficacy and performance: an experimental comparison of psychological techniques. *Res Q Exercise Sport*, 2016; 87: 36-46.[DOI]

[40] Bandura A. Self-efficacy conception of anxiety. *Anxiety Res*, 1998; 2: 77-98.[DOI]

[41] Sitzmann T, Yeo G. A Meta-Analytic Investigation of the Within-Person Self-Efficacy Domain: Is Self-efficacy a Product of Past Performance or a Driver of Future Performance?. *Pers Psychol*, 2013; 66: 531-568.[DOI]

[42] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*, 1977; 84: 191-215.[DOI]

[43] Rushton MA, Drumm IA, Campion SP et al. The Use of Immersive and Virtual Reality Technologies to Enable Nursing Students to Experience Scenario-Based, Basic Life Support Training-Exploring the Impact on Confidence and Skills. *Comput Inform Nurs*, 2020; 38: 281-293.

[44] Bandura A. Self-efficacy mechanism in human agency. *Am Psychol*, 1982; 37: 122-147.[DOI]