Clinical Simulation in Nursing (2019) 29, 24-28

Clinical Simulation in Nursing

www.elsevier.com/locate/ecsn

Featured Article

Anxiety Caused by Simulated Prehospital Emergency Care

Anna Abelsson, CCRN, ICRN, PhD*

Department of Nursing Science, School of Health Sciences, Jönköping University, 551 11 Jönköping, Sweden

KEYWORDS
simulation;
manikin;
anxiety;
prehospital emergency care;
Emergency Medical Services

Abstract: During the simulation, participants experience different degrees of stress and anxiety. It could be described as ''*Anxiety is like perpetually hearing the enemy music but never seeing the threat*''. This study aimed to describe the Emergency Medical Services personnel's feelings of anxiety during simulation. The study had a qualitative design with interviews of 28 participants. The data were analyzed using content analysis. The result shows how the simulation could be perceived as a stage performance in the form of a theatre. The perceived acting was unpleasant and embarrassing due to unfamiliarity to perform. To be scrutinized meant having spectators reviewing ones' performance. It was considered more natural to care for actors than manikins. The interaction and connection with a human, even unconscious, were more natural. To care for a human did not require the imagination to empathize in the simulation.

Cite this article:
Abelsson, A. (2019, April). Anxiety caused by simulated prehospital emergency care. *Clinical Simulation in Nursing, 29*(C), 24-28. https://doi.org/10.1016/j.ecns.2019.02.004.

During simulation, participants experience different degrees of stress and anxiety. It could be described as a known tweet, *"Anxiety is like perpetually hearing the enemy music but never seeing the threat"*. The level of anxiety effects participant learning capabilities in a simulated prehospital emergency scenario. To find the optimal level of challenge, which promotes learning during simulation, is difficult. The complexity increases further when a group of people is involved (Palethorpe & Wilson, 2011).

In literature, the words anxiety and stress are used as synonyms (Melincavage, 2011). The difference between the two words can, however, be defined by their source of stimulation. Stress is an objective answer to a stimulus that occurs as a result of external influence (Lazarus, 1966). Anxiety is a subjective reaction to stimulus, a result of internal influence, a cognitive appraisal of one's own ability to handle what is ahead of us. Anxiety can, in turn, be divided into a state of anxiety and anxiety disorder (Edelman, 2006). A state of anxiety is a temporary response to a threatening situation. The response is both physical and psychological. Anxiety disorder includes a physical and psychological response that does not diminish even when the threatening situation has passed (Edelman, 2006).

The performance and learning are at its best when the participants have their personal optimal level of anxiety. In (Palethorpe & Wilson, 2011) model of the inverted-U curve representing the learning and challenge, three zones are described. In the comfort zone, the participants are

Funding: None.

* Corresponding author: anna.abelsson@ju.se (A. Abelsson).

1876-1399/$ - see front matter © 2019 International Nursing Association for Clinical Simulation and Learning. Published by Elsevier Inc. All rights reserved.
https://doi.org/10.1016/j.ecns.2019.02.004

comfortable and are not exposed to challenges. Without enough stimulus, very little learning occurs.

In the stretch zone, with a moderate level of anxiety, learning is elevated. Participants are encouraged to perform their best (Palethorpe & Wilson, 2011). Experiencing a moderate amount of anxiety is positive for learning. A moderate sympathetic reaction helps the participant to learn and to perform over his or her normal cognitive ability (Al Sabei 2016; Calabrese, 2008).

Key Points

- To perform and to learn during simulation requires an individually adapted level of anxiety.
- When the simulation is perceived unpleasant and embarrassing to participants unfamiliar to performing, the anxiety level is too high, and learning is severely impaired.
- The interaction with an actor, even unconscious, does not require the imagination to empathize in the simulation. Actors therefore cause less anxiety then manikins.

In the panic zone, learning is severely impaired due to the negative connection between cognitive overload and performance (Palethorpe & Wilson, 2011; Schlairet, Schlairet, Saul, & Bellflowers, 2015). The sympathetic nervous system of the individual is activated in response to the demands to the available resources. When the requirements of the response needed to outweigh the resources are available, the participant will experience an overwhelming threat (Timmermans, Xiong, Hoogenraad, & Krugers, 2013). This overwhelming threat debilitates the cognitive function (Merz, Dietsch, & Schneider, 2016; Nourbakhsh, Chen, Wang, & Calvo, 2017). The reason is that the number of signals the brain is processing is too many that leads to attention restriction, which results in a deterioration in participant's performance (Palethorpe & Wilson, 2011).

The teacher or the facilitator at the simulation needs to identify the causes of anxiety (Miller & Sawatzky, 2017). They need to respond to the scenario and participants to bring them from the panic zone to the stretch zone (Palethorpe & Wilson, 2011). Tuson (1994) describes this as broadening the participants' stretch zone, which will decrease their panic zone. Interesting enough, Fraser et al. (2012) show that the participant's motivation to simulate increased despite high cognitive load and poor performance.

Anxiety can be measured through physiological responses such as heart rate and blood pressure (Mills et al., 2016) or stress biomarkers in the saliva (Ignacio et al., 2015; Keitel et al., 2011). It can also be measured through electrodermal activity (Nourbakhsh et al., 2017) or eye-tracking technology (Mills et al., 2016). A subjective measurement can be made through the participant's self-reported perception (Beischel, 2013; Keitel et al., 2011; Mills et al., 2016; Schlairet et al., 2015). During the simulation, the participants always experience a level of anxiety independent of if it is a test or not. It is in the nature of the simulation according to Nielsen and Harder (2013). The relationship between anxiety and memory affects the participant's opportunity for learning. Because knowledge and experience are of great importance to secure good and safe care, it requires the simulation to be carried out on a suitable anxiety level to promote a learning experience for the nurse. It is therefore essential to further investigate anxiety and its effects on participants' performance in simulations. The aim of this study was to describe Emergency Medical Services (EMS) personnel's feelings of anxiety during simulation.

Methods

The study had a qualitative design. Interviews were conducted with two participants at a time. The analysis of data was performed using content analysis according to Hsieh and Shannon (2005).

Participants

In total, 28 EMS personnel participated in the study; 13 females and 15 males, aged between 25 to 56 years (mean 31, median 32). All participants were registered nurses with an average of 8 years' experience from prehospital emergency care (range 1-36 years). All participants were informed about the study by their station chief and the personnel who were willing to participate contacted the researcher themselves. All participants had previous experience of simulation.

Data Collection

The participants carried out a variation of eight simulated scenarios, during a 6-week period. During all scenarios, a Resusci Anne Basic manikin (Laerdal® Stavanger) represented the patient and was moulaged with different injuries, both blunt and penetrating trauma. Vital parameters were given by the facilitator during the scenarios. The facilitator also adjusted the patient outcome based on the interventions made during the different scenarios. After the eighth and last simulation, the interviews were conducted with two participants at a time. All interviews included one open-ended question: Would you like to describe your feelings of anxiety during simulation? This question was followed up by in-depth questions such as the following: Can you give an example? or Can you describe what you mean? to get a more in-depth description from the participants. The interviews lasted from 20 to 30 minutes and were recorded and transcribed verbatim.

Data Analysis

Data were analyzed with conventional content analysis according to Hsieh and Shannon (2005). The conventional content analysis enables for an understanding of EMS personnel's feelings of anxiety during simulation. This method is appropriate in the analysis of interviews. Initially, the text was read several times to get a sense of the whole. The text was then read word for word to enable codes to be created that captured key thoughts or concepts. These codes were then organized in a coding scheme and in the final interpretive process, sorted into categories that emerged from the text through analysis (Hsieh & Shannon, 2005).

Ethical Consideration

The study followed the ethical principles of the (World Medical Association, 2013) to anonymity and integrity. Ethical approval for this study was obtained from the Institutional Review Board. Informed consent was obtained from each participant. No unauthorized person has had access to the material.

Result

The aim of this study was to describe EMS personnel's feelings of anxiety during simulation, and in the result, three categories emerged: *Simulation as acting, To be scrutinized,* and *To care for a human vs. To care for a manikin.*

Simulation as Acting

The participants described the simulated situation as uncomfortable, and a reason for anxiety was that the simulation was not perceived as real. The simulation was perceived as a stage performance and was described in the form of a theatre. To participate in acting was perceived as unpleasant and embarrassing due to unfamiliarity to performing in front of people.

> It is a little bit hard to take the situation seriously. One perceives it as acting. If one rarely simulates, the acting is uncomfortable in front of an audience.

To regard the simulation as acting results in the situation becoming hard to take seriously. The risk was that the simulation was performed half-heartedly, which was experienced to reduce the learning opportunity.

The participants described how the anxiety in the situation was reduced with increased simulation experience. The more times they simulated, the more comfortable they became in the situation. The instinct to act became more natural, the more the participants became comfortable in the simulation.

> The more one simulates, the less strange the simulation is perceived. Familiarity with "acting" in the simulation makes it feel more natural.

The participants described that after a while, the simulated situation became comfortable enough that they could act as if it was a real care situation without experiencing anxiety or being embarrassed. To get used to simulating also meant that the participants felt more confident performing emergency care, both in the simulation and in real life.

To be Scrutinized

The simulation could also be experienced to create anxiety because the participant's care actions were observed. Having one or more spectators was perceived as negative because it involved a review of the participant's performance. The participants described a feeling of discomfort and anxiety about being exposed to colleagues, for performing care actions incorrectly or not knowing what to do.

> It's hard to expose what you don't know, especially when an audience is watching.

The simulation could also be experienced to create anxiety when participants had a sense of being tested. The experience of simulation as a test was enhanced with external personnel being responsible for the simulation. However, having external personal as facilitators gave more seriousness to the situation, which resulted in the participants focusing and taking the simulation more seriously.

> One focuses when unfamiliar individuals participate. Things become more serious. You are present in the moment. Everything becomes more tangible.

To Care for a Human Versus To Care for a Manikin

Participants expressed anxiety in the simulated situation because it was perceived as unnatural and unconventional to care for a manikin.

> It becomes unnatural and odd with a manikin. It is hard to immerse into the simulation. It requires imagination.

Participants considered it to be more natural to care for an actor than a manikin. The participants perceived interacting and connecting with a human more natural, even if the person was unconscious. To care for a human did not require the same amount of imagination to empathize in the simulation.

> Human actor's reactions make it more comfortable than with a manikin. It is a more natural care situation with a real patient in front of you.

Participants describe how they experience reduced anxiety levels with patient actors who were strangers in comparison to colleagues they knew. The scenarios, however, should not be exaggerated as those were described to create an unnatural and excessive care situation with high levels of anxiety regardless of human actors or manikins.

Discussion

The result revealed how the participants perceived the simulation as acting in a theatre setting. Simulation creates anxiety due to performing in front of other people. Paskins and Peile (2010) show how participants' performance-anxiety during simulation can be relieved by increasing realism in the simulated scenario. The participants in this study described how anxiety affected learning and caused the simulation being performed half-heartedly. Previous research describes decreased learning opportunity for the participants who are observing a simulation, if they are embarrassed or uncomfortable (Abelsson & Bisholt, 2017).

In the opposite, there is a positive learning situation when the participants experience the scenarios as suitable (Abelsson & Bisholt, 2017.) It allows the participants to explore the limits of their knowledge and increase their sense of competence (McDermott, 2016).

Anxiety is described to decrease the more comfortable they become in the simulation. This is reinforced by previous research that shows how participants feel more comfortable and less anxious after the simulation versus before the simulation (Beischel, 2013). Experiencing a reduced level of anxiety in parity with increased simulation experience may be associated to how well the participants have been prepared. With increased preparation for the simulation, participants' anxiety can decrease even before the simulation (Beischel, 2013). However, there are studies showing how well-prepared participants still have the experience of high anxiety (Gantt, 2013). The reason can be that participants, during the simulation, are waiting in expectation for something extraordinary to happen. The tweet: "*Anxiety is like perpetually hearing the enemy music but never seeing the threat*" describes the feeling of this anticipation. Lasater (2007) describes how the expectation for a seemingly inevitable and undesirable event creates an increased anxiety level for the participants during the simulation.

The participants described, getting used to simulating meant that they could act with more confidence when performing emergency care, both in the simulated and the real-life situation. This is reinforced by Miyasaka, Martin, Pascual, Buchholz, and Aggarwal (2015), which describes how participants' self-esteem at the scene of the accident was enhanced through the prior simulation experience.

Being scrutinized by peer during the emergency care caused anxiety. It is also described in previous research (Teixeira et al., 2014). The fear of both positive and negative criticism is associated with an increase in participants' anxiety levels (Beischel, 2013; Keitel et al., 2011). The participants felt anxiety when a care action was performed incorrectly or when they did not know what to do, while being observed by peers. In the simulation, it needs to be clarified that participants have the chance to recognize and correct mistakes in a safe environment. Simulation enables participants to improve both knowledge and confidence (Boling & Hardin-Pierce, 2016). To minimize learners' anxiety while being observed by peers, observation could take place from a remote location, for example, a control room (Ganley & Linnard-Palmer, 2012).

In the results, the participants also found it more natural to talk to and care for an actor, contrary to a manikin, as also found in Ignacio et al. (2015). An actor did not require imagination to make the participants comfortable with the simulation. It facilitates participants to immerse into their professional role (Paskins & Peile, 2010). But when the actor exaggerates his patient role, the stability of the scenario is lost. The emotional response that the participants perceive will impair learning and instead increase the level of anxiety (Abelsson & Bisholt, 2017). There is, therefore, a need for balance between realism and challenge in the care situation to lead to learning.

Limitations

One limitation may be that the personnel in the study had varying experiences of simulating trauma care. Another limitation could be that all participants in the study were registered nurses and no emergency medical technicians or physicians took part. This could have affected the result.

Conclusion

The participation in the simulation can be perceived as a stage performance in the form of a theatre. To act and have spectators reviewing ones' performance can be unpleasant and embarrassing due to unfamiliarity to perform on or off stage. To care for human actors in opposite to manikins results in a more natural interaction as a connection with a human, even an unconscious one, becomes natural to a certain degree. A manikin requires imagination to empathize in the simulation. To care for a human does not require the same.

References

Abelsson, A., & Bisholt, B. (2017). Nurse students learning acute care by simulation – focus on observation and debriefing. *Nursing Education in Practice*, *24*, 6-13.

Al Sabei, S. D., & Lasater, K. (2016). Simulation debriefing for clinical judgment development: A concept analysis. *Nurse Education Today*, *45*(42), e7.

Beischel, K. B. (2013). Variables affecting learning in a simulation experience: A mixed methods study. *Western Journal of Nursing Research*, *35*(2), 226-247.

Boling, B., & Hardin-Pierce, M. (2016). The effect of high-fidelity simulation on knowledge and confidence in critical care training: An integrative review. *Nurse Education in Practice*, *16*(1), 287-293.

Calabrese, E. J. (2008). Neuroscience and hormesis: Overview and general findings. *Critical Reviews in Toxicology*, *38*(4), 249-252.

Edelman, S. (2006). *Change Your Thinking*. London: Vermilion.

Fraser, K., Ma, I., Teteris, E., Baxter, H., Wright, B., & McLaughlin, K. (2012). Emotion, cognitive load and learning outcomes during simulation training. *Medical Education*, *46*(3), 1055-1062.

Ganley, B., & Linnard-Palmer, L. (2012). Academic safety during nursing simulation: Perceptions of nursing students and faculty. *Clinical Simulation in Nursing*, *8*(2), 49-57.

Gantt, L. T. (2013). The effect of preparation on anxiety and performance in summative simulations. *Clinical Simulation in Nursing*, *9*(1), 25-33.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277-1288.

Ignacio, J., Dolmans, D., Scherpbier, A., Rethans, J., Chan, S., & Liaw, S. (2015). Comparison of standardized patients with high-fidelity simulators for managing stress and improving performance in clinical deterioration: A mixed methods study. *Nurse Education Today*, *35*(12), 1161-1168.

Keitel, A., Ringleb, M., Schwartges, I., Weik, U., Picker, O., Stockhorst, U., & Deinzer, R. (2011). Endocrine and psychological stress responses in a simulated emergency situation. *Psychoneuroendocrinology*, *36*(1), 98-108.

Lasater, K. (2007). High fidelity simulation and the development of clinical judgment: Students' experiences. *Journal of Nursing Education*, *46*(6), 269-276.

Lazarus, R. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.

McDermott, D. S. (2016). The prebriefing concept: A Delphi study of CHSE experts. *Clinical Simulation in Nursing*, *12*(6), 219-227.

Melincavage, S. (2011). Students nurses' experience of anxiety in the clinical setting. *Nurse Education Today*, *31*(6), 785-789.

Merz, C. J., Dietsch, F., & Schneider, M. (2016). The impact of psychosocial stress on conceptual knowledge retrieval. *Neurobiology of Learning and Memory*, *134*, 392-399.

Miller, D. L., & Sawatzky, J. V. (2017). Test anxiety in the nursing skills laboratory: A concept analysis. *Nurse Forum*, *52*(4), 331-338.

Mills, B., Carter, O., Rudd, C., Claxton, L., Ross, N., & Strobel, N. (2016). Effects of low-versus high-fidelity simulations on the cognitive burden and performance of entry-level paramedicine students. *Society for Simulation in Healthcare*, *11*(1), 10-18.

Miyasaka, K. W., Martin, N. D., Pascual, J. L., Buchholz, J., & Aggarwal, R. (2015). A simulation curriculum for management of trauma and surgical critical care patients. *Journal of Surgical Education*, *72*(5), 803-810.

Nielsen, B., & Harder, N. (2013). Causes of student anxiety during simulation: What the literature says. *Clinical Simulation in Nursing*, *9*(11), 507-512.

Nourbakhsh, N., Chen, F., Wang, Y., & Calvo, R. A. (2017). Detecting users' cognitive load by galvanic skin response with affective interference. *ACM Transactions on Interactive Intelligent Systems*, *7*(3), 12.

Palethorpe, R., & Wilson, J. (2011). Learning in the panic zone: Strategies for managing learner anxiety. *Journal of European Industrial Training*, *35*(5), 420-438.

Paskins, Z., & Peile, E. (2010). Final year medical students views on simulation-based teaching: A comparison with the best evidence medical education systematic review. *Medical Teacher*, *32*(7), 569-577.

Schlairet, M., Schlairet, T., Saul, D., & Bellflowers, L. (2015). Cognitive load, emotion, and performance in high-fidelity simulation among beginning nursing students: A pilot study. *Journal of Nursing Education*, *54*(3), 5-11.

Teixeira, C. R. S., Kusumota, L., Pereira, M. C. A., Braga, F. T. M. M., Gaioso, V. P., Zamarioli, C. M., & Carvalho, E. C. (2014). Anxiety and performance of nursing students in regard to assessment via clinical simulations in the classroom versus filmed assessment. *Investigación y Educación en Enfermería*, *32*(2), 270-279.

Timmermans, W., Xiong, H., Hoogenraad, C. C., & Krugers, H. J. (2013). Stress and excitatory synapses: From health to disease. *Neuroscience*, *248*, 626-636.

Tuson, M. (1994). *Outdoor Training for Employee Effectiveness*. London: Institute of Personnel Management.

World Medical Association. (2013). Declaration of Helsinki. Ethical principles for medical research involving human subjects. *JAMA*, *310*(20), 2191-2194.