

Impact of First Exposure to High Fidelity Simulation on Self-Reported Psychological Stress Levels amongst EMS Students in Pune, India

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ABSTRACT

Introduction: Stress is an emotion-related response that results from exposure to various emotionally charged clinical events. Anxiety generated by these stressful clinical experiences may inevitably affect learning. A certain level of anxiety shall improve decision-making and clinical performance. High fidelity simulation is an innovative and effective teaching strategy for medical students. Emergency Medical Services (EMS) students are at present exposed more to low fidelity simulation, which fails to replicate real clinical stress. The study aims to assess self-reported psychological stress levels in EMS students before and after exposure to high fidelity simulation.

Objective: To assess the self-reported psychological stress levels in EMS students on their first exposure to high fidelity simulation.

Methodology: A facilitator guided simulation session was conducted in order to study the impact of psychological stress on first exposure to simulation amongst 65 students of Post Graduate Diploma in Emergency Medical Services (PGDEMS). The standardized Stressor Appraisal Scale (SAS) questionnaire comprising of 10 items was administered to the students before and after the simulation session to document the baseline self-reported psychological stress level. The scores of the Post Simulation versus Pre Simulation were tabulated and compared using t test.

Discussion: On comparison of the scores of post simulation questionnaire versus pre simulation questionnaire, the parameters pertaining to demanding and stressful nature of task, level of exertion, degree of effort, seriousness and perception of performance in the task showed remarkable significance as opposed to perception of threat, ability to cope, level of uncertainty and confidence which was not significant.

Conclusion: The participants felt that the simulation session was more stressful than expected. However, this stress was positive in nature as the score obtained on the parameter of importance to do well significantly increased after the simulation session.

Regular exposure to high fidelity simulation may help in channelizing the psychological stress constructively thereby improving the participant performance.

Further elaborate studies are required on this subject.

Keywords: High fidelity simulation, Psychological stress, Emergency medical Services.

Introduction

Medical training is identified as 'full of stress' and it is observed that students undergo tremendous stress during various years of medical training¹. Stress is an emotion-related response that results from exposure to various emotionally charged clinical events². It has

been noted that the anxiety generated by these stressful clinical experiences may inevitably affect learning and clinical performance³.

Simulation is used as a safe format for instruction of students and trainees in the field of medicine and high fidelity simulation is an innovative and effective

teaching strategy for medical students⁴. However, it is observed in many studies that simulation session can cause a certain degree of stress and anxiety in the participants, which can thereby affect their performance both positively and negatively⁵. High-fidelity simulation using physiological. Model-driven, life-sized manikins with measurable vital signs and other 'real' attributes can create 'true to-life' experiences for learners thereby creating an environment similar to real clinical setting⁶.

Emergency Medical Services (EMS) students are at present exposed to low fidelity simulation. It is important to expose them to high fidelity simulation, and evaluate their self-reported psychological stress levels.

Emergency medicine providers are tasked with performing highly complex skills and assessments under dynamic conditions in which every second matters and the cost of failure is significant. Furthermore, researchers in the fields of peak human performance and neuroscience have observed strong correlations between one's performance state and the likeliness of performing optimally under duress. Learning how to prepare and respond more effectively in advance of potentially stressful situations, and how to refocus one's attention within those moments, would be of tremendous value⁷.

A study performed by Geeraerts T *etal*⁸ in 2017 states that even if simulation-induced stress, as measured by self-assessment and biological parameter, does not seem to impact performance negatively, it should be still taken into account. Beverley Nielsen *etal*⁹ in their study conducted in 2013 on anxiety of nursing students claim that anxiety is evident during the simulation experience as students experience heightened anxiety when "onstage" in a scenario.

The study aims to assess the impact of first exposure to high fidelity simulation on the self-reported psychological stress amongst EMS students. This shall help arrive at conclusion regarding utility of high fidelity simulation in creating psychological stress thereby helping learners perform better in real clinical situations.

Objective

To assess the self-reported psychological stress levels in EMS students on their first exposure to high fidelity simulation.

Methodology

A facilitator guided simulation session was conducted in order to study the impact of psychological stress on first exposure to simulation was conducted amongst 65 students of Post Graduate Diploma in Emergency Medical Services (PGDEMS).

Stressor Appraisal Scale (SAS) a standardized questionnaire was administered to evaluate self reported psychological stress amongst students before and after the exposure to high fidelity simulation.

On the day of session, One-hour orientation was conducted on the subject of Simulation and high fidelity manikin prior to the simulation in order to orient them to simulated environment.

The standardized SAS questionnaire comprising of 10 items was administered to the students before the simulation session to document the baseline self-reported psychological stress level. The items were scored on a 7-point Likert scale with one depicting lowest and seven depicting highest score.

The students were divided into six groups of 10 each and a facilitator guided simulation scenario was conducted. The session lasted for 10 minutes followed by a focused debriefing session. The session was video recorded with the consent of the participants. The same facilitator debriefed all the groups to avoid bias.

The SAS questionnaire was administered again immediately after the simulation session to document the post session stress levels. The scores of the post simulation questionnaire versus pre simulation questionnaire were tabulated and compared using 't'test for equality of means of independent samples.

The models used for analysis were present in the Statistical Package for Social Sciences (SPSS) v23.

Results

Table No. 1.

Items	Pre-session Mean	Post Session Mean	p value
Threat Perception of the task	3.61	3.74	0.69
Demanding Nature of the Task	4.76	5.28	0.02*

Conted...

Stressful nature of task	3.79	4.39	0.02*
Level of Exertion required in task	4.82	5.44	0.009*
Degree of effort required in task	4.93	5.47	0.02*
Degree of seriousness regarding the task	6	6.37	0.04*
Uncertainty regarding the task	4.47	4.62	0.57
Management of the demands imposed in the task	4.87	4.76	0.61
Ability to Cope with the task	4.96	4.80	0.44

Table No.1 depicts, T test results and the * marked show significant p values.

Discussion

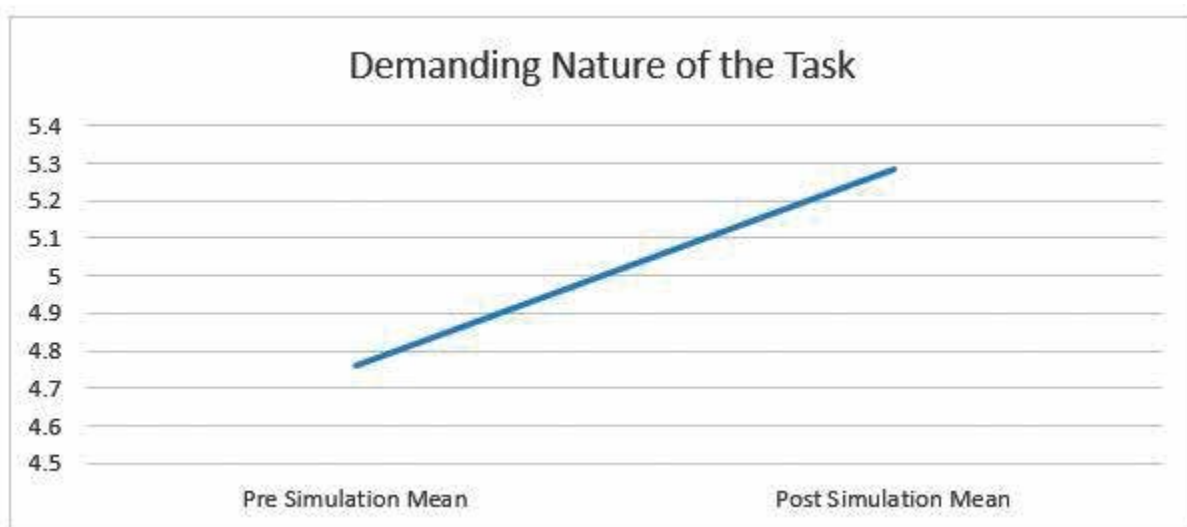


Figure 1

As seen in fig.1, the participants underestimated the demanding nature of simulation before the session. This is reflected by the sharp increase in the score obtained after the session.

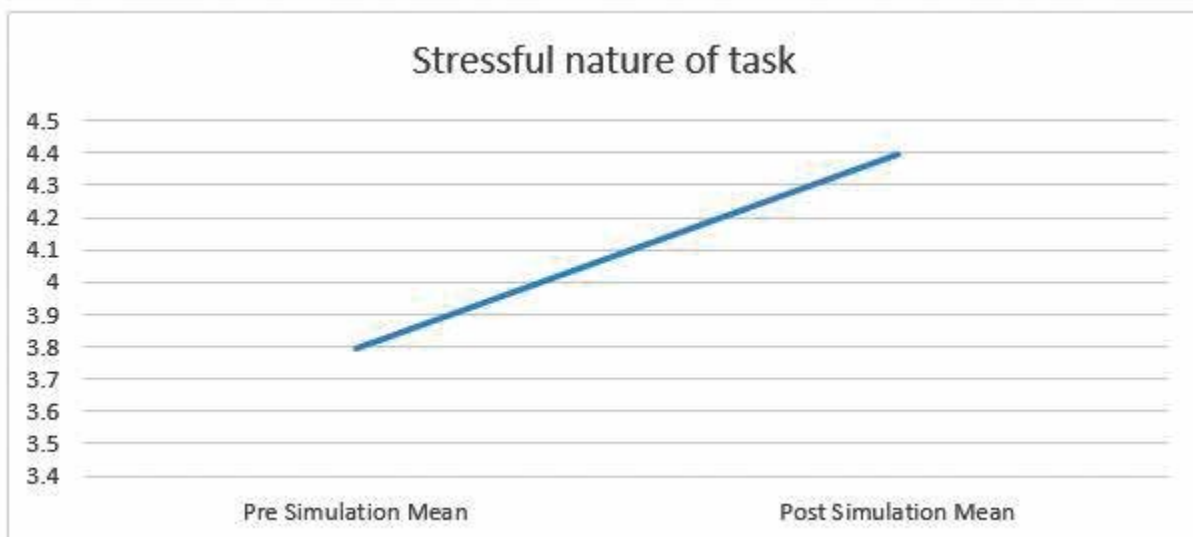


Figure 2

As shown in fig.2, the participants found the simulation task to be more stressful than their expectation. This could be attributed to the stress, caused due to a new experience, as this was their first exposure to simulation.

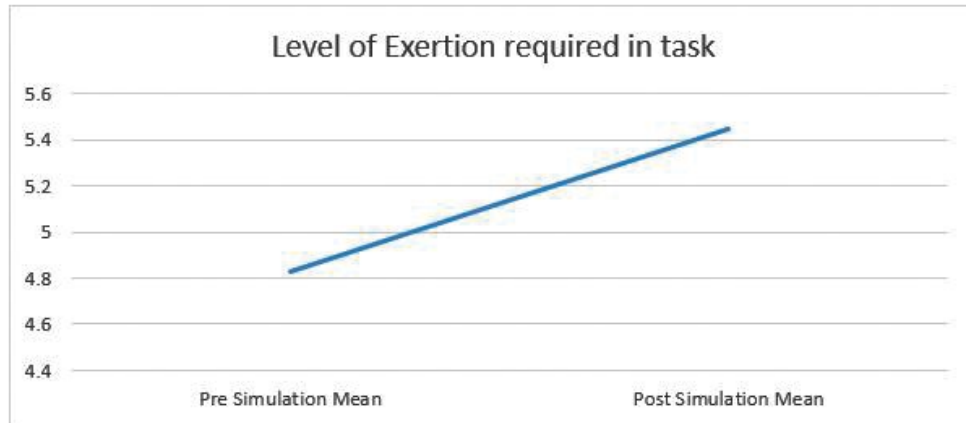


Figure 3

As shown in figure. 3, the participants realized that they need to exert a greater deal after the exposure to simulation.

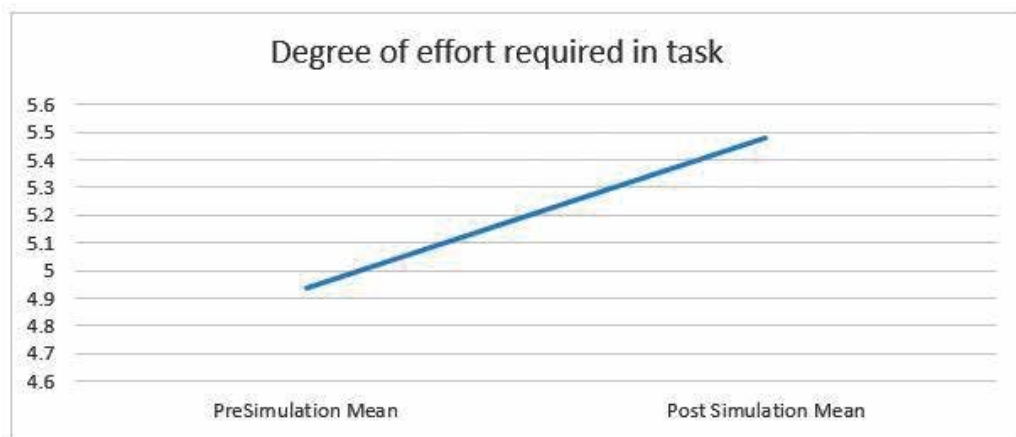


Figure 4

Figure. 4, depicts that the participants opinion on the degree of effort required to be spent both at mental and physical level increased drastically after the session.

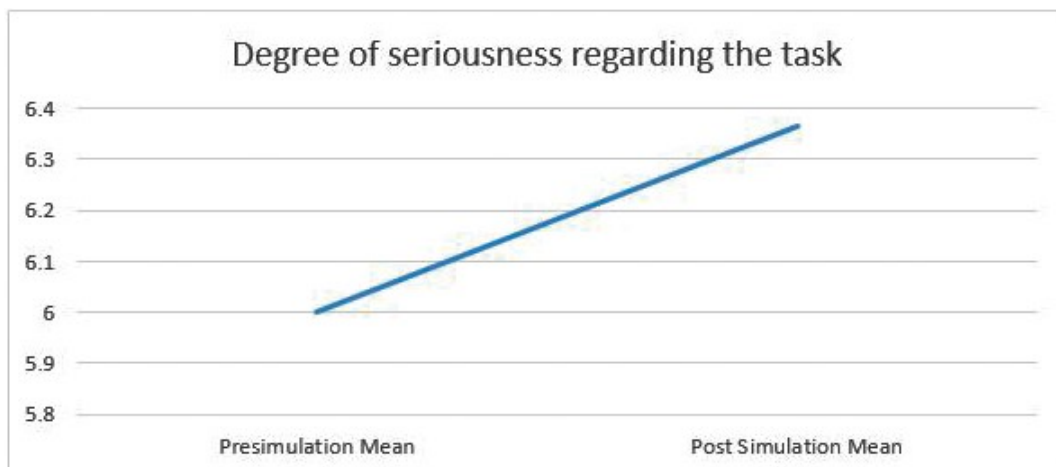


Figure 5

As shown in figure. 5, the participants took the simulation exercise very seriously. This is reflected in the high scores obtained both before and after the simulation session. Simulation acted as a positive stressor as the score obtained on the importance to do well significantly increased after the simulation session.

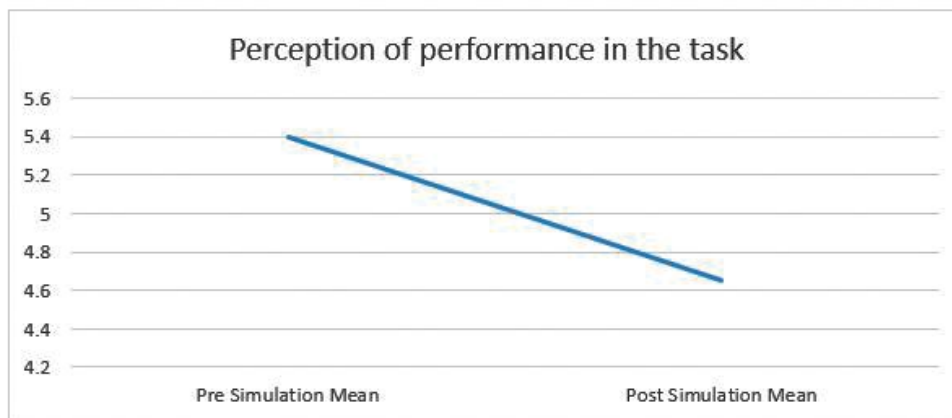


Figure 6

Figure.6 shows that the participants found the simulation task to be difficult which is reflected in their self-appraisal on performance, which deteriorated post simulation session

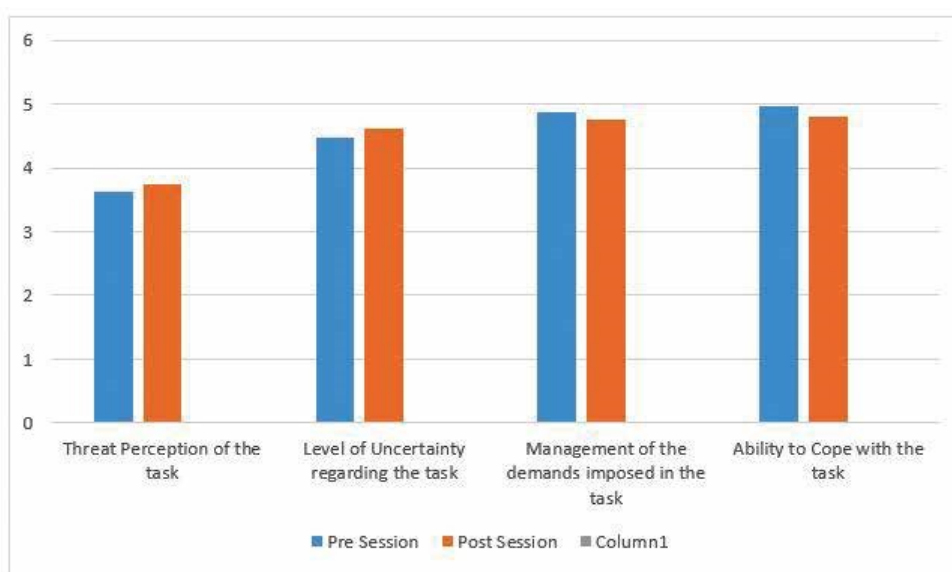


Figure 7

Figure 7. Highlights the following:

1. The threat perception increased after the simulation experience. Yet, the increase was not statistically significant.
2. The level of uncertainty regarding simulation increased marginally after the session.
3. The participants were confident that they would be able to manage the demands imposed on them by the task before the simulation session. This confidence wavered slightly after the task.
4. The participants' perception of the ability to cope with the task decreased marginally after the session.

Conclusion

The participants felt that the simulation session was more stressful than expected. However, this stress was positive in nature as the score obtained on the parameter of importance to do well significantly increased after the simulation session.

Regular exposure to high fidelity simulation may help in channelizing the psychological stress constructively thereby improving the participant performance.

Further elaborate studies are required on this subject.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Clearance: Taken from IEC, SIU

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