



Transforming the Healthcare Simulation Spectrum: Now, Next and Beyond

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Use of screen based simulation to teach physiological mechanisms underlying different types of shock among first year medical students – A pilot study.



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Background / rationale

- With the implementation of CBME curriculum in India, medical education has **emphasised more on student driven methods** of teaching like early clinical exposure, small group discussion, problem based learning etc.
- Use of simulation based education (SBE) is limited in subjects like Physiology **barring the exceptions of few selective skill training** exercises like cardio pulmonary resuscitation (CPR) and blood pressure measurement.
- The **aim of this study** was to see the effectiveness of screen based simulation teaching intervention for the topic “Physiological mechanisms in different types of shock” which is conventionally taught as a didactic lecture.

Description of teaching learning intervention



12 students who volunteered to participate in the study were invited to skills lab. Physiology of shock was taught to the students as didactic lecture before this intervention.

After initial recap on the definition and types of shock , students were given case scenarios of different types (hypovolemic, distributive, obstructive, and cardiogenic) of shock and deranged physiological parameters were depicted using screen simulations using sim-man 2G I leap software along with a mannequin ⁽¹⁾. The facilitator directed the discussion on

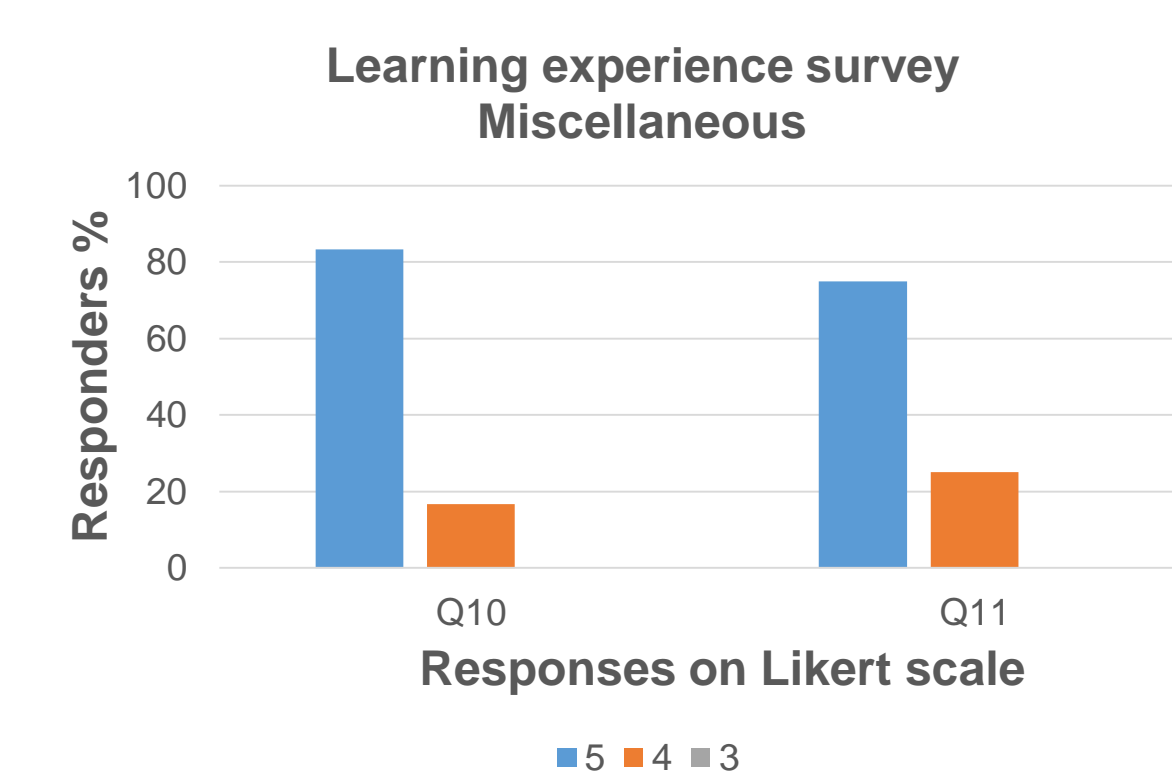
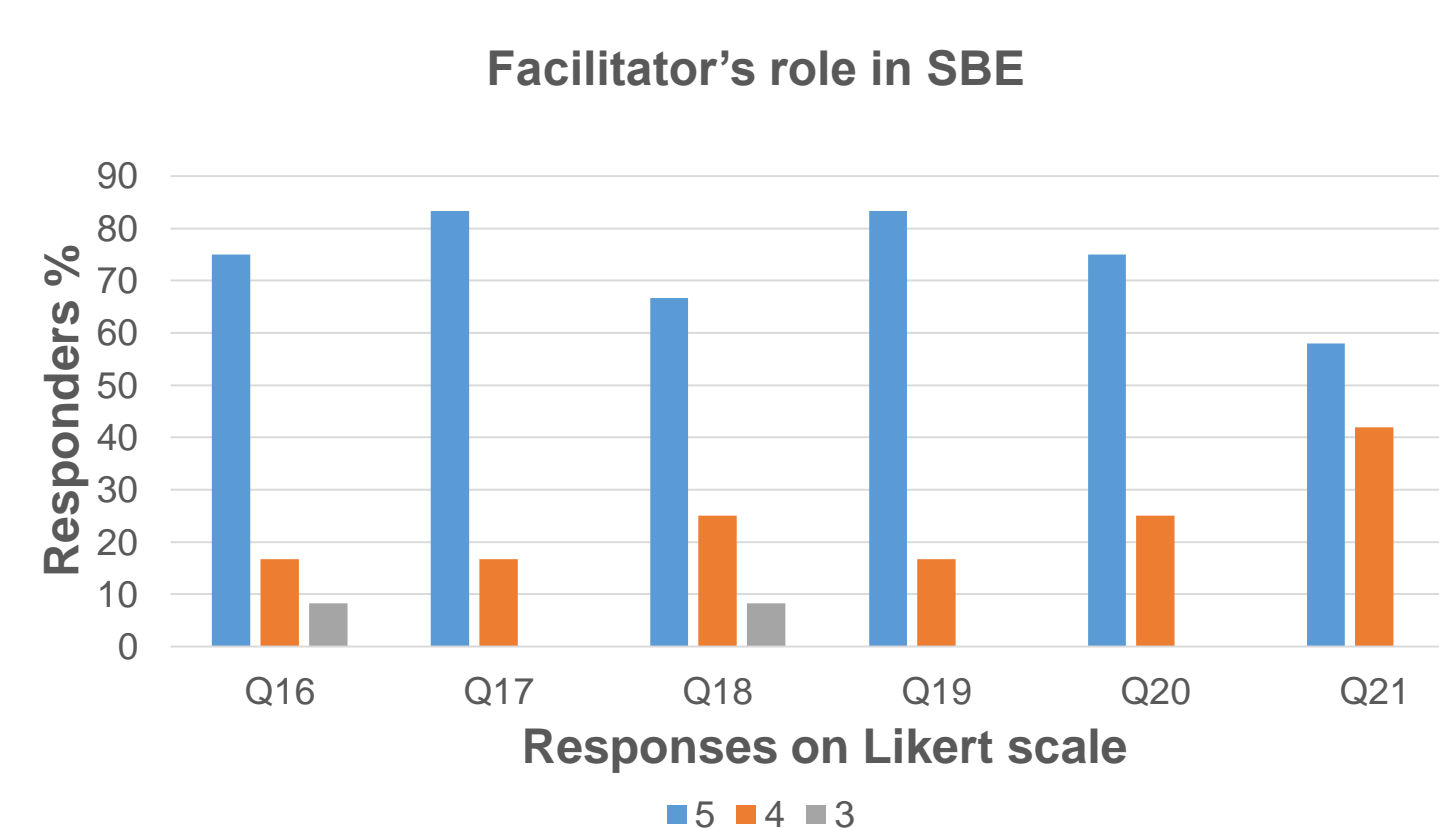
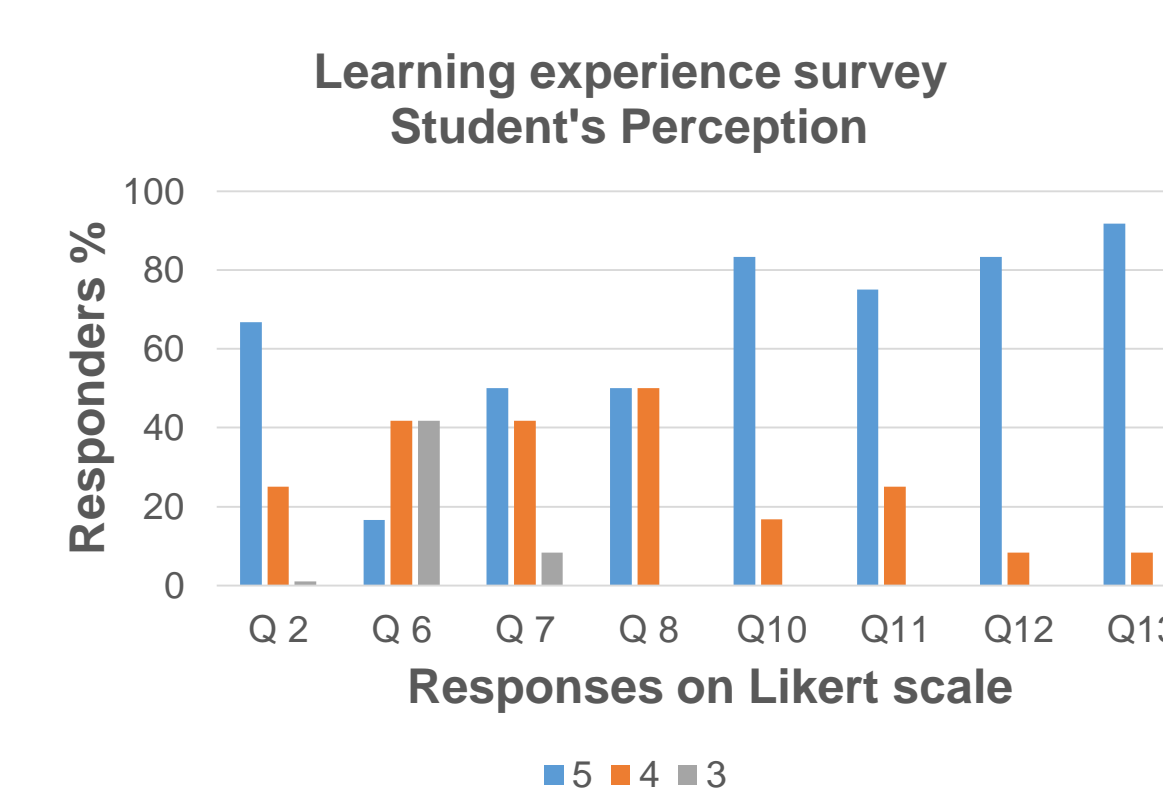
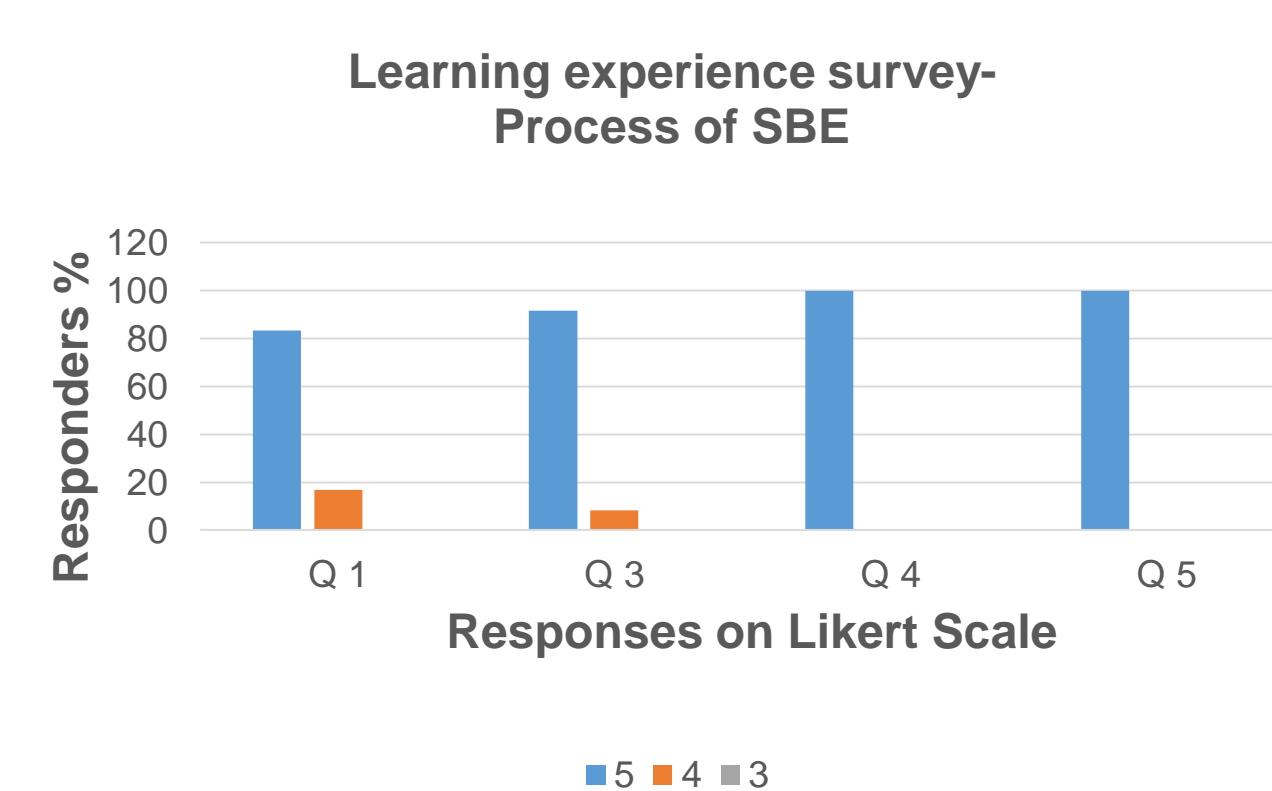
- **Identifying the type of shock**
- **Compensatory mechanisms**
- **Physiological basis of signs and symptoms**
- **Treatment rationale.**

Each student was given a pre-test consisting of **20 single response MCQ and 6 extended matching items** before, and again after the simulation based teaching session. A survey of their learning experience on a **Likert scale** of 5-1 where 5- Strongly agree (%), 4- Agree (%), 3- Undecided (%), 2- Disagree (%), 1- Strongly disagree (%) consisting 21 questions divided into four main domains

1. Process of SBE (Q 1,3,4,5)
2. Student perception (Q 2, 6,7,8,10,11,12,13)
3. Facilitator’s role in SBE (Q 9,16,17,18,19,20,21)
4. Miscellaneous (Q 10,11)

Results

There was **marked improvement** in test scores after the simulation based teaching session. The mean score of the pre-test is 18.58 while that of post-test is 21.42. On application of Student’s t test the difference **is found to be statistically significant (p-value- .03)**.



Discussion

- Most of the students thought SBE was more enjoyable (83%) and made them more involved (91.6%) when compared to didactic classes.
- 91.6% of the students preferred to learn other topics in Physiology through this modality of teaching as they could visualise **real-time changes depicted on the screen and understand the relevance of the topic.** ⁽²⁾
- Feedback was collected from the students about the facilitators and students felt (83%) that the facilitator made the class more interactive while most students felt they were allowed to participate in the session

Limitations

- Small sample size as it is a pilot study.
- No active intervention by the student during SBE.

Conclusions

Simulation based teaching for the given clinically relevant topic **was more effective** when compared to didactic mode. Students enjoyed this modality of teaching when compared to didactic mode. Based on these findings an active intervention with mannequin is designed.

References

- 1)Tan GM, Ti LK, Suresh S, Ho BS, Lee TL. Teaching first-year medical students physiology: does the human patient simulator allow for more effective teaching?. Singapore medical journal. 2002 May 1;43(5):238-42.
- 2) Gordon JA, Wilkerson WM, Shaffer DW, Armstrong KG. “Practicing” medicine without risk: Students’ and educators’ responses to high-fidelity patient simulation. Acad Med 2001; 76:469-72