

The Educational Climate in Surgical Theaters: Perspectives from Trainees at a Tertiary Care Hospital in Pakistan”

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Abstract: -

Background: Satisfaction of surgical trainees with their training programs and regimens is crucial for the development of their surgical skills. Thus, it is necessary to evaluate the perception of trainees regarding the educational environment in surgical theaters.

Objectives: To evaluate the perception of the educational environment in surgical theaters by surgical residents of DHQ Gujranwala using the STEEM questionnaire.

Methods: This cross-sectional study included 80 surgical residents of DHQ Gujranwala conducted in 2020 using the STEEM questionnaire. The validity and reliability of the questionnaire were confirmed by experts. The lowest possible score on the questionnaire is 40 and the highest is 200. A score of at least 120 out of 200 was considered favorable.

Results: Among the 80 participants, 49 were males and 31 were females. The overall STEEM score was 137 out of 200, indicating a favorable perception of the educational environment in surgical theaters by the residents.

Conclusion: The questionnaire was found to be a reliable, easy, and practical tool for assessing the perception of the educational environment in surgical theaters.

Keywords: Educational environment, Surgical Residents, Operating theaters, STEEM questionnaire.

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Introduction

The learning environment, as defined by the American Medical Association, is a social system that includes the learner and the people they interact with, the purpose of interaction, and the principles controlling it [1]. The educational environment is central to identifying effective curriculum quality, teaching quality, and student achievements and satisfaction [2, 3, 4].

It plays a vital role in producing efficient medical professionals during both undergraduate and post-graduate clinical training [5, 6, 7]. Post-graduate surgical residency training occurs in operating theaters where patient-centered and evidence-based planned teaching environments are provided [8, 9]. Different aspects of the educational environment (EE) include physical, psychological, social, and educational domains of a teaching program, which play a vital role in the development of trainees [10]. It is the duty of training institutions to regularly evaluate the learning environment in surgical theaters [11].

Assessing any learning or educational environment means outlining its strengths and weaknesses, recognizing the domains where it can be rectified, and implementing changes where required [12, 13]. Therefore, it is important to assess the trainees'

perception of the educational environment as it may help with quality assurance of the medical institute by improving the curricular achievements of the students [14]. Numerous measures of the environment of health professional educational programs have been published and discussed in the literature to assess its perception. Examples include Clinical Learning Environment (CLE), Students' Evaluation of Clinical Educational Environment (SECEE), Clinical Learning Educational Diagnostic Inventory (CLEDI), Clinical Learning Educational Inventory (CLEI), Surgical Theatre Educational Environmental Inventory (STEEM), Postgraduate Hospital Education Environmental Measure (PHEEM), and Dundee Ready Education Environment Measure (DREEM) [15, 16].

To equip the trainees with an effective educational environment, it is vital to have an assessment tool to know how they perceive their training and what changes might be needed to make it more efficient [17]. Cassar developed The Surgical Theatre Educational Environmental Measure (STEEM) questionnaire to measure the learning environment in the operating theater for postgraduate students [18].

To the best of the authors' knowledge, no such study has been conducted in DHQ-Teaching Hospital Gujranwala, where post-

graduate training is provided in various medical and surgical disciplines, including General Surgery, Obstetrics & Gynaecology, Otorhinolaryngology, Neurosurgery, Orthopaedics, Urology, and Ophthalmology. Therefore, this research aims to identify the perception of trainees towards the educational environment of operating theaters in DHQ Gujranwala.

Literature Review

A literature review on the perception of the educational environment in surgical operating theatres by residents reveals varied results across different settings, reflecting the quality of the educational environment and the emphasis placed on it. The STEEM questionnaire was utilized as a reliable measuring tool.

A cross-sectional study was conducted at Liaquat National Hospital, Karachi, from August 2015 to February 2016 by Shahzaib Habib Soomro, Syed Sheraz Ur Rehman, and Farhad Hussain. The objective was to evaluate the perception of the educational environment in operating theatres by trainees using the STEEM questionnaire. Of the 103 participants who completed the questionnaire, 52 were males and 51 females. The results indicated a favorable operating theatre educational environment with a total score of 129. The overall reliability was calculated to be 0.97. Male residents perceived the environment more favorably than females. The questionnaire proved to be a reliable tool for measuring the perception of the operating theatre educational environment [17].

Similarly, a teaching hospital-based cross-sectional study was conducted by Rizwana Kamran, Mohamed Al-Eraky, Faisal Izhaar, and Khalid Mahmood Anjum at Fatima Memorial Hospital College of Medicine and Dentistry, Lahore, from January 2017 to June 2017. The mini-STEEM questionnaire was used to evaluate the perception of the educational environment in operating theatres by trainees. The questionnaire was completed by all 134 students, with a response rate of 100%. The mini-STEEM was shown to be a reliable tool for measuring the overall learning environment in the surgical theatre at FMH College of Medicine and Dentistry. The overall mini-STEEM mean score was 37.66, which was below the midpoint score of 39. Students rated two subscales, namely 'Atmosphere' and 'Operating Experience,' particularly low. The Discrimination subscale showed high ratings, as no significant differences in perceptions were found between male and female participants. Medical undergraduates perceived the educational environment within the surgical theatre of FMH College of Medicine and Dentistry as below satisfactory. The study results implied that the environment required multiple measures for improvement to promote surgical education among undergraduate medical students [20].

A similar cross-sectional study among urology residents in Saudi Arabia used the STEEM questionnaire, conducted by Saleh Binsaleh and Khalid Madbouly. The purpose was to evaluate the perception of the surgical theatre learning environment among urology residents in Saudi Arabia. Of the 72 registered residents, 33 (45.8%) completed the questionnaire. The residents perceived their environment as less than acceptable (135.9 ± 16.7 , 67.95%). No significant differences in perception were found among residents of different program stages, different sectors of the healthcare system, or different regions in Saudi Arabia. Residents from the eastern region perceived the training and teaching domain better ($p = 0.025$). The inventory showed high internal consistency

with a Cronbach's α of 0.862. Urology residents in Saudi Arabia perceived the theatre learning environment as less than ideal [21].

In 2018, a cross-sectional study using the validated Surgical Theater Educational Environment Measure (STEEM) questionnaire was conducted to assess the OR learning environment among UAE obstetrics and gynecology residents. The study was carried out in two hospitals in Abu Dhabi by Ebtehal Al Ramsi and Neha Gami. Thirty-one residents completed the questionnaire (18 at Corniche Hospital and 13 at Al Ain Hospital). The overall average STEEM score was 142.1. The score for residents at Corniche Hospital was 134.9, while at Al Ain Hospital, it was 152.2, with better overall scores on three STEEM domains at Al Ain Hospital. The overall score was compared using Student's t-test between the two institutions. The study showed that obstetrics and gynecology residents in the UAE had a positive perception of their operative learning environment [22].

In 2015, a quantitative study using the STEEM questionnaire via an online tool was utilized for podiatrists working within podiatric surgery, podiatric surgical trainees, and podiatric surgeons working towards the Certificate of Completion of Podiatric Surgery Training (CCPST) to assess the educational environment within the podiatric surgical theatre in the UK. The study, conducted by Thomas Austen and Simon Otter, showed 16 out of 33 responses, with a response rate of 48.4%. The overall STEEM mean score was 122/160. Four subscales, including teaching and training, learning opportunities, atmosphere, and workload/supervision/support, were measured. The overall mean score of 76.73% suggests the learning environment may be considered satisfactory; however, areas for potential improvement were identifiable. The results revealed strengths, such as a non-discriminatory surgical theatre atmosphere on racial grounds. The perception was of a very satisfactory atmosphere within the theatre [23].

A cross-sectional study was conducted among Australasian surgical trainees by Adam Mahoney, Philip J. Crowe, and Peter Harris, published in 2010. The study aimed to validate the STEEM questionnaire and explore Australasian surgical trainees' satisfaction with the operating theatre learning environment. The STEEM was distributed electronically to all 1500 Royal Australasian College of Surgeons trainees in Australia and New Zealand. Three hundred fifty-six responses were received. The STEEM's original subscales were not supported by the data; empirically grounded subscales were identified for further analysis. Most trainees were satisfied with their operating theatre environment, and satisfaction was higher among senior than junior trainees. Trainees' relationships with their supervisors correlated most strongly with overall satisfaction. Less positively, only half of the trainees reported discussing their operative role with their supervisors prior to surgery. The majority of trainees reported high levels of satisfaction [24].

Methodology

Study Design: Observational cross-sectional study.

Study Duration: One month (July 2020-August 2020).

Study Area: District Head Quarters Hospital Gujranwala.

Study Sample: Surgical residents of surgical and allied departments of DHQ Hospital Gujranwala.

Data Collection Procedure:

Approval was obtained from the ethical committee and the respective Heads of Departments. The STEEM questionnaire was then distributed to surgical residents, allowing them a three-day window to complete it. Participants were provided with an explanation of the research objectives and the importance of the study. Confidentiality was maintained, and participation was voluntary. The completed questionnaires were collected and scored. The STEEM questionnaire was used as the data collection tool.

STEEM Questionnaire:

The STEEM questionnaire, developed in 2004 by Cassar, contains 40 questions. Responses are calculated using a five-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree." The minimum possible score is 40, while the maximum is 200. The questionnaire includes subscales that measure the perception of the trainer and training, learning opportunities, atmosphere in the operating theater, supervision, workload, and support.

Data Analysis:

Data entry and analysis will be conducted using suitable tools. Charts and graphs will be utilized as needed to effectively present the data.

Inclusion & Exclusion Criteria:

The inclusion criteria for the study consisted of post-graduate residents from the General Surgery and Surgery & Allied departments at DHQ Gujranwala. The exclusion criteria encompassed non-surgical residents, teaching staff and professors, administrative staff, and undergraduate medical students.

Results

Of the 80 participants, 49 (61.3%) were males and 31 (38.7%) were females. The response rate was 100%. Departments represented included Ophthalmology (10%), ENT (1.25%), Orthopaedics (15%), Urology (15%), Gynaecology and Obstetrics (21.25%), and General Surgery (38%). The highest rated statement was "My trainer's surgical skills are very good" and the lowest rated was "I feel discriminated against in theatre because of my race."

Table 1**STEEM Survey Scores:**

Subscales	Mean	Standard Deviation
Trainees' Perception of their trainer and training (Q1-Q13)	57.11	5.31
Trainees' Perception of learning opportunities (Q14-Q24)	37.96	4.78
Trainees' Perception of atmosphere in the operating theater (Q25-Q32)	23.86	3.95
Trainees' Perception of supervision, workload, and support (Q33-Q40)	18.12	5.18
STEEM overall global score (Q1-Q40)	137.06	12.09

Table 02**Comparison with Liaquat National Hospital:**

Subscales	Mean	Standard Deviation
Trainees' Perception of their trainer and training (Q1-Q13)	48	10.63
Trainees' Perception of learning opportunities (Q14-Q24)	36	6.56
Trainees' Perception of atmosphere in the operating theater (Q25-Q32)	26	3.06
Trainees' Perception of supervision, workload, and support (Q33-Q40)	25	6.26
STEEM overall global score (Q1-Q40)	136	21.42

Gender Ratio:

Males: 49 (61.25%), Females: 31 (38.7%)

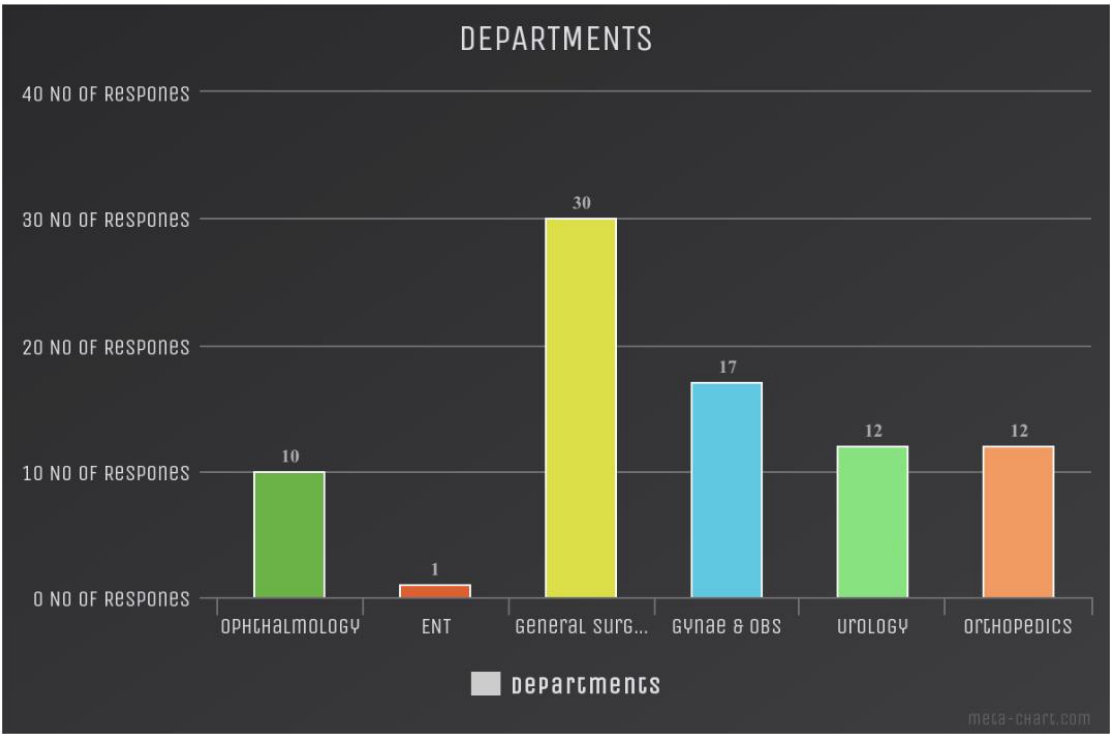
Table 03



Department Representation

Ophthalmology, ENT, General Surgery, Gynaecology and Obstetrics, Urology, Orthopaedics.

Table 04



Discussion

The overall score of 137 out of 200 (68.5%) demonstrates a general satisfaction among the participants. A score exceeding 60% indicates a satisfactory learning environment; however, the goal should be to achieve a very satisfactory rate of 80% or higher [25]. Resident evaluations are crucial for residency accreditation and serve as strong predictors of satisfaction [26]. A positive learning environment corresponds favorably with the trainees' perceptions, significantly impacting their learning experiences and outcomes [27].

The STEEM questionnaire proved to be a reliable tool for evaluating the surgical theater educational environment at DHQ Hospital Gujranwala. The study results were comparable to those from Liaquat National Hospital, identifying both strengths and limitations. The greatest strength was the novelty of the study, being the first of its kind at DHQ Gujranwala. This pioneering effort provides a baseline for future research and underscores the importance of assessing and improving the educational environment in surgical theaters.

However, the study also highlighted several limitations. One significant limitation was the single hospital setting, which may limit the generalizability of the findings to other institutions. Additionally, difficulties in conducting face-to-face interactions due to clinical duties posed challenges for data collection and participant engagement. Despite these challenges, the study managed to gather valuable insights into the educational environment, revealing areas that require improvement and highlighting aspects that are performing well.

The findings emphasize the need for ongoing assessment and enhancement of the educational environment in surgical theaters. By addressing the identified limitations and building on the strengths, future studies can provide more comprehensive insights and contribute to the development of more effective educational strategies. Ensuring a very satisfactory learning environment is essential for maximizing the educational experiences and outcomes for surgical residents, ultimately leading to better-trained professionals and improved patient care.

Overall, the use of the STEEM questionnaire at DHQ Hospital Gujranwala has laid the groundwork for future research and improvement initiatives. By continuing to evaluate and enhance the educational environment, institutions can ensure that they are providing the highest quality training for their surgical residents, fostering a culture of continuous improvement and excellence in surgical education.

Conclusion

This cross-sectional study assessed the satisfaction of trainees with their educational environment in surgical theaters of DHQ Gujranwala. The overall STEEM score was 137/200, indicating good satisfaction of trainees with their training programs.

Recommendation

Future research should include proper face-to-face interactive sessions between researchers and participants to bridge communication gaps and produce better results.

Limitations

The study's limitation was its single DHQ setup, making the findings non-generalizable. The ongoing COVID pandemic also hindered adequate face-to-face interactions.

References

1. Faruque, M., Haque, M., Islam, S., Shihab, S. F., & Kamal, Z. M. (2017). Outpatient Educational Environment of Dental-Medical Colleges of Bangladesh Utilizing ACLEEM Questionnaire. *J Global Pharm Tech*, 9, 41-47.
2. Bassaw, B., Roff, S., McAleer, S., Roopnarinesingh, S., De Lisle, J., Teelucksingh, S., & Gopaul, S. (2003). Students' perspectives on the educational environment, Faculty of Medical Sciences, Trinidad. *Medical teacher*, 25(5), 522-526.
3. O'Brien, A. P., Chan, T. M. F., & Cho, M. A. A. (2008). Investigating nursing students' perceptions of the changes in a nursing curriculum by means of the Dundee Ready Education Environment Measure (DREEM) inventory: results of a cluster analysis. *International journal of nursing education scholarship*, 5(1), 000010220215489231503.
4. Mayya, S. S., & Roff, S. U. E. (2004). Students' perceptions of educational environment: a comparison of academic achievers and under-achievers at kasturba medical college, India. *Education for health*, 17(3), 280-291.
5. Dyrbye, L. N., Thomas, M. R., Harper, W., Massie Jr, F. S., Power, D. V., Eacker, A., ... & Shanafelt, T. D. (2009). The learning environment and medical student burnout: a multicentre study. *Medical education*, 43(3), 274-282.
6. Bakhshialiabad, H., Bakhshi, M., & Hassanshahi, G. (2015). Students' perceptions of the academic learning environment in seven medical sciences courses based on DREEM. *Advances in medical education and practice*, 195-203.
7. Jennings, M. L., & Slavin, S. J. (2015). Resident wellness matters: optimizing resident education and wellness through the learning environment. *Academic Medicine*, 90(9), 1246-1250.
8. Glassman, D., Yiasemidou, M., Venkateswaran, B., Sivakumar, R., Majumder, S., & Biyani, C. S. (2016). A multi-specialty surgical course for residents transitioning from early to intermediate training. *International Journal of Medical Education*, 7, 130.
9. Alam S, Prasad OP, Ranjan P, Madhu M. (2019). COMPETENCY BASED SURGICAL EDUCATION. *Global Journal For Research Analysis*. 8(2).
10. Colbert-Getz, J. M., Kim, S., Goode, V. H., Shochet, R. B., & Wright, S. M. (2014). Assessing medical students' and residents' perceptions of the learning environment: exploring validity evidence for the interpretation of scores from existing tools. *Academic Medicine*, 89(12), 1687-1693.

11. Bakhshialiabad, H., Bakhshi, M., & Hassanshahi, G. (2015). Students' perceptions of the academic learning environment in seven medical sciences courses based on DREEM. *Advances in medical education and practice*, 195-203.
12. Lempp, H., & Seale, C. (2004). The hidden curriculum in undergraduate medical education: qualitative study of medical students' perceptions of teaching. *Bmj*, 329(7469), 770-773.
13. Finn, Y., Avalos, G., & Dunne, F. (2014). Positive changes in the medical educational environment following introduction of a new systems-based curriculum: DREEM or reality? Curricular change and the Environment. *Irish journal of medical science*, 183, 253-258.
14. Sunkad, M. A., Javali, S., Shivapur, Y., & Wantamutte, A. (2015). Health sciences students' perception of the educational environment of KLE University, India as measured with the Dundee Ready Educational Environment Measure (DREEM). *J Educ Eval Health Prof*, 12(12), 37.
15. Nicotera, R., Altini, P., & Dimonte, V. (2017). A comparison of the most used instruments to assess the quality of clinical learning environments of nursing students. *Assistenza Infermieristica e Ricerca: AIR*, 36(1), 31-40.
16. Patil, A. A., & Chaudhari, V. L. (2016). Students' perception of the educational environment in medical college: a study based on DREEM questionnaire. *Korean journal of medical education*, 28(3), 281.
17. Soomro, S. H., Rehman, S. S. U., & Hussain, F. (1864). Perception of educational environment in the operating theatre by surgical residents, a single-centre prospective study'. *JPMA*, 67.
18. Soomro, S. H., Rehman, S. S. U., & Hussain, F. (1864). Perception of educational environment in the operating theatre by surgical residents, a single-centre prospective study'. *JPMA*, 67.
19. Cassar, K. (2004). Development of an instrument to measure the surgical operating theatre learning environment as perceived by basic surgical trainees. *Medical teacher*, 26(3), 260-264.
20. Kamran, R., Al-Eraky, M., Izhaar, F., & Anjum, K. M. (2018). EDUCATIONAL ENVIRONMENT;: MEDICAL STUDENTS' PERCEPTIONS OF THE EDUCATIONAL ENVIRONMENT IN THE SURGICAL THEATER. *The Professional Medical Journal*, 25(08), 1270-1276.
21. Binsaleh, S., Babaeer, A., Rabah, D., & Madbouly, K. (2015). Evaluation of urology residents' perception of surgical theater educational environment. *Journal of Surgical Education*, 72(1), 73-79.
22. Ramsi, E. A., & Gami, N. (2019). Evaluation of operating room learning environment for UAE obstetrics and gynecology residents using STEEM. *Journal of graduate medical education*, 11(4s), 100-103.
23. Austen, T., & Otter, S. (2019). The podiatric surgery theatre environment in the UK; is it conducive to learning? A quantitative study using the surgical theatre educational environment measure (STEEM). *Journal of Foot and Ankle Research*, 12, 1-7.
24. Mahoney, A., Crowe, P. J., & Harris, P. (2010). Exploring Australasian surgical trainees' satisfaction with operating theatre learning using the 'surgical theatre educational environment measure'. *ANZ journal of surgery*, 80(12), 884-889.
25. Rotem, A., Godwin, P., & Du, J. (1995). Learning in hospital settings. *Teaching and Learning in Medicine: An International Journal*, 7(4), 211-217.
26. Holt, K. D., Miller, R. S., Philibert, I., Heard, J. K., & Nasca, T. J. (2010). Residents' perspectives on the learning environment: data from the Accreditation Council for Graduate Medical Education resident survey. *Academic Medicine*, 85(3), 512-518.
27. Pololi, L., & Price, J. (2000). Validation and use of an instrument to measure the learning environment as perceived by medical students. *Teaching and learning in Medicine*, 12(4), 201-207.