

## Theatrical performance in medical education: A fast-track differential approach of emergency cases

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### Abstract

**Introduction:** The idea of implementing theatrical acts in medical education has recently been gaining attention, with the inclusion of art-based programs in medical curricula being a growing trend. This study aimed to present an innovative pilot program of presenting medical emergencies through theatrical presentation.

**Materials and Methods:** Students-members of the theatrical team of Democritus University of Thrace and the Scientific Society of Hellenic Medical Students were appointed into eight groups, supervised by a clinical tutor. The groups were given four weeks to prepare scenarios for eight different medical emergencies and organize a theatrical sketch accordingly. A 25-item questionnaire was formed and distributed to the audience. Each theatrical act lasted 10 min, followed by a 10 min discussion between the tutors and the audience. After the event, the impressions of the attendees were documented in the questionnaire as responses on a Likert scale from one (strongly disagree) to five (strongly agree).

**Results:** Two hundred and thirty-two fully completed questionnaires were returned. The contribution of theatrical presentation to medical education was widely acknowledged (Likert score  $4.14 \pm 0.68$ ). Theatrical seminars were not deemed insufficient to provide medical information (disagreed or strongly disagreed 53.8 % and 12.1 %, respectively). Most students were optimistic about the long-term maintenance of the theatrical-aided knowledge, with the majority of attendees (52.1 %) adapting a more favorable response after the seminar ( $p < 0.001$ ). The students' efficacy to recognize medical emergencies was improved (from 2.96 to 3.43,  $p < 0.001$ ).

**Conclusion:** Students find the theatrical approach of emergency cases entertaining and educational, facilitating teaching in medicine and enhancing their efficacy to recognize medical emergencies and the commonest pitfalls in their diagnosis and management. Such events may be established as a supplementary educational tools to the classical amphitheatric didactic lectures. Future studies with specific objective tools are needed to validate the abovementioned tasks. HIPPOKRATIA 2020, 24(3): 127-132.

**Key words:** Undergraduate education, emergency medicine, theatrical acts, pilot program, evaluation, communication skills, decision-making

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### Introduction

The idea of implementing theatrical acts in medical education has only recently been gaining attention, with the inclusion of art-based programs in medical curricula being a growing trend<sup>1-4</sup>. Undergraduate medical students support such events, stating that theatrical performance facilitates understanding of specific medical topics<sup>1</sup>. Although medicine is a practical profession where knowledge is the basis of patient's management, an arts-based component may contribute to self-awareness and self-presentation of future physicians, and enhance the establishment of a successful doctor-patient relationship, according to Whitham et al<sup>5</sup>. Students consider that art-based teaching and learning can make a significant contribution to the medical curriculum and reduce "performance anxiety" in situations

such as examinations and presentations<sup>2</sup>.

Emergency medicine is a subject currently lacking from most of the undergraduate curricula of the Greek Medical Schools<sup>6</sup>. Since early postgraduate doctors often claim inadequate experience in resuscitation and emergency medicine, focusing on these aspects during undergraduate training gains more and more attention, with problem-based learning or simulation training being effective teaching methods<sup>7-9</sup>.

The Authors believe that the implementation of theatrical acting to draw attention to emergency cases and observe the most usual pitfalls in diagnosis and treatment can be perceived well by medical students, raise their interest and enhance their self-confidence towards medical challenges. The Medical School of Democritus University of Thrace (DUTH) constantly supports such initiatives, and

we present herein an effort organized and conducted by the Theatrical Team of DUTH (TTDUTH) in association with the Scientific Society of Hellenic Medical Students (SSHMS) in Alexandroupolis, Greece and supervised by their academic tutors and the clinical personnel of DUTH Medical School. The students' feedback on the event was evaluated with a questionnaire on a Likert scale.

## Materials and Methods

### *Organizing the event*

This survey took place in 2015. Eight Groups were appointed, each involving four to five volunteers, members of the TTDUTH (two to three members) and the SSHMS - Alexandroupolis section (two members) as well as a clinical tutor from the academic personnel of the Medical School of DUTH.

The groups were given four weeks to prepare and write the script for eight medical scenarios dealing with common medical emergencies from different medical specialties (acute limb ischemia, subarachnoid hemorrhage, pneumothorax, acute coronary syndrome, stroke, cauda equina syndrome, trauma, and upper gastrointestinal bleeding). Each script involved students-members of TTDUTH who volunteered to play the role of the patients, the patients' relatives, the examining physician(s), and/or the paramedical personnel.

In the first meeting, the tutor responsible for each medical scenario presented and discussed with the actors the objectives of the presentation, focusing on the most common mistakes made by physicians in clinical practice during the differential diagnosis and treatment. Accordingly, the team members worked together during the following weeks (second and third meeting) to write the script and have rehearsals. Three to four meetings took place in order to understand and set the goals of the script, write the scenario and perform rehearsals before the final act. Meanwhile, the organizing team worked on technical details (lighting, sound check, stage) of the event, emphasizing creating an appropriate ambiance to draw the audience's attention. Printed programs were distributed in advance, giving only clues of the emergency cases (funny titles of the acts) without revealing or implying the exact nature of the case.

Each theatrical act lasted 10 min and focused on the interaction between the actor-"patient" and the actor-"examiner" (Figure 1A). The second part of each performance involved a 10 min-lasting interactive discussion between the tutors-in-charge and the audience in the form of questions and answers focusing on the differential diagnosis and treatment algorithms. The latter was facilitated with slide presentations in the background of the stage (Figure 1B). The municipal theater of Alexandroupolis was set as the venue to host the event. The event lasted 3.5 hours and was attended by more than 300 medical students. Ethical approval was waived by the Medical School Committee since no patients were involved and the questionnaires were completed anonymously.

### *Conducting the survey*

A 25-item questionnaire was prepared before the event by

a group of two medical student-members of TTDUTH, two members of SSHMS and an academic tutor-in-charge (Table 1). The participants' responses/opinions were expressed as discrete options on a Likert scale from one to five; 1 for "Fully Disagree", 2 for "Disagree", 3 for "Not Sure/Undecided", 4 for "Agree", and 5 for "Fully Agree". The questionnaire (Q 1-25) was printed, distributed upon attendance, and anonymously completed. Participants were instructed to answer the first five questions before entering the auditorium, while answers in questions Q6-Q25 were filled after completion of the event. Two hundred and thirty-two fully completed questionnaires were returned to the Organizing Committee.

### *Statistical Analysis*

For statistical analysis, the IBM SPSS Statistics for Windows, Version 19.0 (IBM Corp., Armonk, NY, USA) was used, and for each question, the mean  $\pm$  standard deviation was calculated. The non-parametric Wilcoxon test was used to compare the change in identical or similar Likert-questions answered before and after completion of the event. Furthermore, the shift in the attendees' opinion towards a more or less favorable response on the Likert scale was assessed with the Marginal Homogeneity test. For both tests, statistical significance was considered with p-values less than 0.05. The study was conducted according to the principles of the Declaration of Helsinki.

## Results

### *Impressions of the audience before the seminar*

Fourth-grade and 5<sup>th</sup>-grade students comprised almost half of the audience. Only 3.5 % of the attendees were 6<sup>th</sup>-grade students, whereas preclinical students (1<sup>st</sup> and 2<sup>nd</sup> year of Medical studies) equaled 30.4 %. The results of the survey are presented in Table 2.

The vast majority of participants in the survey approved the idea of blending theatrical acting with medical knowledge (Q2) as a valuable educational mean (agree or fully agree 47.3 % and 46.5 %, respectively). Interestingly, 47 % disagree that theatrical acting cannot provide medical information (Q3), whereas approximately one-third (36.1 %) had neither positive nor negative impression. Only 7.5 % expressed the idea as mentioned above. The majority of students (43 %) were uncertain whether they could clearly identify the emergency in the presented case (Q4), i.e., need for direct submission to the hospital. In comparison, 27 % of the participants considered themselves capable of recognizing the emergent nature of the presented cases (22.4 % agree and 4.6 % strongly agree, respectively). Most interestingly, one-fourth of the attendees believed that they would not be able to recall after a while the educational points derived from the presented cases (Q5) (disagree and strongly disagree 21.2 % and 3.7 %, respectively); the opposite opinion was almost equally expressed (agree or strongly agree 29.5 % and 4.1 %, respectively). The remainder 40.2 % expressed a neutral position.

### *Perspectives of the audience after the seminar*

After completion of the theatrical sketches, the vast

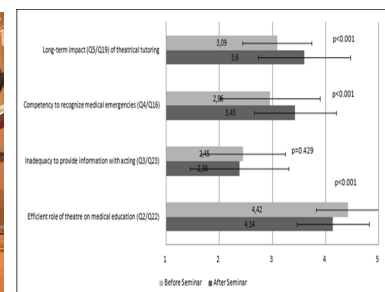
**Table 1:** The questionnaire used in the presented survey.

Q1	Year of studies:								
<b>BEFORE THE SEMINAR:</b>					1	2	3	4	5
Q2	I consider the idea of combining theatrical acting and medical science to be of beneficial tutorial means.								
Q3	I think that the theatrical presentation of medical cases cannot provide adequate medical information.								
Q4	I consider myself competent to recognize properly whether a medical case is urgent or emergent needing immediate admission to a hospital.								
Q5	I am afraid that I will not be able to recall the medical information perceived from the theatrical sketches in the future.								
<b>AFTER THE SEMINAR:</b>					1	2	3	4	5
Q6	The presentation of the case (script, direction) helped me to understand the emergent nature of the case.								
Q7	The actors consorted sufficiently with the requisites of their role.								
Q8	The duration of theory tutoring outweighed the clinical acting.								
Q9	I was left with unanswered queries after the completion of the case presentation.								
Q10	I was given a chance to ask my questions after the presentation.								
Q11	The presented differential diagnosis of the cases helped me delineate my queries.								
Q12	The presentation time for each case was adequate for its comprehension.								
Q13	The theatrical presentations of cases were more representative of "real world" scenarios compared to training in medical wards.								
Q14	The information I received could be easily retrieved either online or from a textbook.								
Q15	I find it necessary for a medical student to attend such an event.								
Q16	After the presentation, I find myself competent to decide whether a case needs urgent admission to a hospital								
Q17	The participation of medical professionals as actors was catalytic for the proper presentation of the cases.								
Q18	The knowledge I perceived during this seminar will help me perform better in my exams.								
Q19	The knowledge I perceived will be long-lasting.								
Q20	The seminar was entertaining enough to keep my attention.								
Q21	The interactive presentation was more theatrics than education.								
Q22	The impact of theatrical means in medical education can be efficient.								
Q23	The theatrical nature of the presentations overshadowed the medical information that would be otherwise provided by standard medical lectures/tutorials.								
Q24	I think that this theatrical presentation was a waste of time.								
Q25	The duration of the seminar was too long.								

1: Fully disagree, 2: Disagree, 3: Not sure, 4: Agree, 5: Fully agree.



**Figure 1:** A) Theatrical act on stage, B) Projection-aided lecturing following completion of the act.



**Figure 2:** Comparisons on audience's assessment of the educational role of the seminar before and upon completion of the seminar.

**Table 2:** Responses of the audience to each item of the questionnaire.

(Likert scale)		1	2	3	4	5	
BEFORE THE SEMINAR:		% of total answers					Mean $\pm$ SD
Q2	Beneficial role of theatre on medical education	0.0	0.8	4.1	47.3	46.5	4.42 $\pm$ 0.60
Q3	Inadequacy to provide information with acting	8.3	46.9	36.1	5.4	2.1	2.45 $\pm$ 0.79
Q4	Competency to recognize medical emergencies	7.1	21.2	43.6	22.4	4.6	2.96 $\pm$ 0.94
Q5	Long-term impact of theatrical tutoring	3.7	21.2	40.2	29.5	4.1	3.09 $\pm$ 0.89
AFTER THE SEMINAR:							
Q6	Focus on emergencies was satisfactory	0.0	1.7	8.7	56	32.4	4.21 $\pm$ 0.65
Q7	Acting was successful	0.0	2.1	12.9	57.9	25.8	4.09 $\pm$ 0.67
Q8	Theoretical part too long	7.1	50.8	29.6	9.6	1.7	2.47 $\pm$ 0.81
Q9	I was left with unanswered queries	11.3	43.1	26.4	17.2	0.8	2.52 $\pm$ 0.92
Q10	Time left for questions	0.0	4.6	11.2	46.9	36.1	4.17 $\pm$ 0.79
Q11	Value of differential diagnosis	0.0	1.7	14.6	71.3	11.3	3.94 $\pm$ 0.55
Q12	Duration of case presentation	0.0	1.3	10	67.1	20.4	4.09 $\pm$ 0.58
Q13	“Real-world” simulation	3.0	26.6	45.5	18	5.6	2.96 $\pm$ 0.88
Q14	Information could be retrieved classically	2.9	31.7	32.5	24.6	7.1	3.01 $\pm$ 0.98
Q15	Value of attending such event	2.5	9.2	21.7	41.3	24.2	3.77 $\pm$ 0.99
Q16	I feel competent to recognize medical emergencies	0.8	8.8	44.4	37.2	7.5	3.43 $\pm$ 0.77
Q17	Participation of medical professionals essential	0.0	1.3	4.6	38.8	54.2	4.49 $\pm$ 0.63
Q18	Theatre improves performance in exams	2.1	5.4	20.4	57.9	12.9	3.76 $\pm$ 0.81
Q19	Long-term impact of theatrical tutoring	2.5	7.9	28.3	48.8	11.3	3.60 $\pm$ 0.87
Q20	Seminar was entertaining	0.8	1.7	6.3	60.8	29.2	4.18 $\pm$ 0.66
Q21	Presentation more theatrics than education	5.8	54.6	26.7	8.8	2.9	2.47 $\pm$ 0.83
Q22	Impact of theatre on medical education	0.8	1.7	8.8	59.6	27.9	4.14 $\pm$ 0.68
Q23	Inadequacy of acting to provide information	12.1	53.8	19.2	10.4	3.3	2.38 $\pm$ 0.93
Q24	Theatrical presentation was waste of time	58.3	32.5	3.3	2.1	2.5	1.55 $\pm$ 0.84
Q25	Seminar overall duration too long	7.5	52.1	22.9	11.3	5.0	2.53 $\pm$ 0.95

The questions reported in this Table are abbreviations of the fully developed questionnaire presented in Table 1. Values represent percentages of Likert scale for each item and on the right column means  $\pm$  standard deviation for each item. SD: standard deviation, Likert scale: 1: Fully disagree, 2: Disagree, 3: Not sure, 4: Agree, 5: Fully agree.

majority (mean response 4.21 on the Likert scale) stated (Q6) that the scenarios and presentations focused successfully on the emergent scope of the presented case (56 % and 32.4 % on the 4- and 5-Likert scales, respectively), also appreciating the performance of actors (Q7) as helpful and successful (mean response 4.09 on the Likert scale).

Only 11.3 % of the respondents regarded the post-act discussions' duration as over-extended (Q8; Likert mean response 2.47). There was enough time for addressing questions from the audience (Q10; Likert mean response 4.17), according to 83 % of the participants, leaving only 18 % (Q9) with a vague feeling of unanswered questions and queries. The majority (82.6 %) of the participants recognized the importance and value of the differential diagnosis -discussed during the post-act theoretical presentation- as a means to comprehend the emergency presented case (Q11; Likert response 3.94  $\pm$  0.55). Overall, the audience was pleased with the duration of the cases' presentations (sketch and theory), finding it adequate in 87.5% (Q12; Likert score 4.09  $\pm$  0.58).

While almost one-third (24.6 % and 7.1 % on a 4- and 5-Likert scales, respectively) admitted that the provided knowledge and information could also be retrieved from

more “traditional” sources like Internet and handbooks (Q14), another one-third (2.9 % and 31.7 % on a 1- and 2-Likert scales, respectively) stated the perceived information could not be reached from the aforementioned conventional sources. Finally, the remainder one-third of the participants (32.5 %) adopted a neutral position. However, two-thirds of the audience (65.5 %) found it essential to attend such event (41.3 % and 24.2 % on a 4- and 5-Likert scales, respectively) and would recommend it to other students; 11.7 % had the opposite impression, leaving the remainder 21.7 % with a neutral position (Q15; Likert response 3.77  $\pm$  0.99). Comparing to 44.4 % of the audience that expressed uncertainty (i.e., neither positive nor negative impression, on a 3-Likert scale), another 44.7% felt competent to identify the emergency nature of the “patient’s” complaints after the seminar (Q16).

According to most participants, the participation of medical professionals on stage, either as role-players or exclusively as tutors teaching the theoretical part afterward, was deemed necessary (Q17; Likert score 4.49  $\pm$  0.63). A significant percentage of the participating students believe that the knowledge obtained from this theatrical tutoring would enhance their performance in forth-

coming exams (Q18; agree or strongly agree 57.9 % and 12.9 %, respectively). After the seminar, an augmented impression prevailed that the knowledge perceived would not be forgotten soon (Q19; agree or strongly agree 48.8 % and 11.3 %, respectively). Most respondents praised the entertaining nature of the seminar (Q20; Likert score  $4.18 \pm 0.66$ ). The majority did not share the impression that the seminar was “more theatrics than education” (Q21; disagree or strongly disagree 54.6 % and 5.8 %, respectively, Likert score  $2.47 \pm 0.83$ ).

The vast majority of attendees acknowledged the contribution of theatrical presentation on medical education (Q22; agree or strongly agree 59.6 % and 27.9 %, respectively, Likert score  $4.14 \pm 0.68$ ). Also, they did not share either the impression that such theatrical seminar is insufficient to provide medical information (Q23; disagree or strongly disagree 53.8 % and 12.1 %, respectively, Likert score  $2.38 \pm 0.93$ ) or that it was a “waste of time” (Q24; disagree or strongly disagree 32.5 % and 58.3 %, respectively, Likert score  $1.55 \pm 0.84$ ).

#### *Comparisons after the seminar*

Most participants in the survey felt confident regarding the longevity (Q5/Q19) of the theatrical-acquired knowledge (Figure 2), since a favorable response (i.e., shifting to the right on the Likert scale) was seen in 52.1 %, whereas an unfavorable response was documented in only 19.9 % ( $p < 0.001$ ). Accordingly, the seminar improved the efficacy of students to recognize and feel familiar with the medical emergencies presented (Q4/Q16) since a more favorable response was observed in 45.3 %, with an unfavorable shift recorded in only 10.1 % ( $p < 0.001$ ). Upon completion of the seminar, the percentage of the students favoring its beneficial role remained high at 33.9% (Q2/Q22; mean Likert score from 4.42 to 4.14,  $p < 0.001$ ), while 9.7% of the attendees adopted a negative response after the seminar ( $p < 0.001$ ). Finally, regarding the inadequacy of theatrical acts to disseminate medical knowledge (Q3/Q23), only a tiny proportion of attendees retained such an opinion after the seminar with comparable favorable and unfavorable opinion shifts (36.4 % vs. 26.7 %,  $p = 0.369$ ).

#### **Discussion**

The use of theatrical play has been described to be an integral part of a broader concept of arts implementation in medical education, aiming to develop a “humanist ethos” and practical wisdom (“phronesis”) in physicians<sup>10-15</sup>. According to Salmon et al, the value of “communication skills” needs to be taught holistically during medical education, and Theater and Arts can help students develop a personalized approach and build “creative clinical communication skills”<sup>15</sup>. Moreover, techniques provided by theater seem to be effective tools for teaching “difficult-to-teach” concepts concerning communication skills<sup>16</sup>.

The idea of the described seminar was to bring into play a modern, fast-track manner of teaching medical emergencies. Recruitment of actors to facilitate the teaching of trauma

cases has been in use for years, and the effectiveness of this method has been well perceived and recognized<sup>17</sup>.

The majority of the seminar’s audience found it entertaining with successful “message-delivering” acting and praised the participation of medical professionals as tutors or actors. At the same time, the “emergency nature” of each presented case was sufficiently underscored and presented at each act and adequately analyzed during the subsequent theoretical presentations, with adequate time planned for questions by the audience, and to augment discussion, keeping a tight time frame. An objective met for the Organizing Team was to keep punctual timewise each presented case (sketch/tutoring/discussion); this was successfully achieved and resulted in positive responses by the audience regarding the entire seminar’s duration and each separate act. Positive remarks were also expressed for the adequacy of time dedicated for tutoring, questions, and discussion; therefore, the described seminar’s features were neither characterized as exhausting nor too short. They made a positive impression on the audience so that two-thirds of them found it absolutely necessary to attend such an event and would also recommend it to other students.

The most crucial point recorded was that most participants acknowledged the power of theatrics in providing medical information and recognized its role as an educational tool. Additionally, there was an “optimistic” shift with regard to whether the acquired knowledge would sustain a long-standing effect. Most participants were able to confirm the statement above upon completion of the seminar. This reassuring statement may serve to develop better-structured, medically oriented theatrical performances, possibly implemented within undergraduate curricula, either as a core or as an elective subject.

Interestingly, a significant percentage questioned the effective simulation of “real-world” scenarios on stage. There was a great discrepancy concerning the “realistic presentation” of the cases (Q13); 26.6 % and 3.0 % disagreed or strongly disagreed, respectively, with the efficiency of such “simulation”, 45.5 % had a rather neutral position while 18 % and 5.6 % recognized or strongly agreed, respectively, that the presented theatrical acts were mimicking the “real-world” situations. Grierson et al discriminate between high-fidelity and low-fidelity simulations in medical education<sup>18</sup>. Simulations that present highly realistic performance characteristics, contexts, and scenarios are referred to as “high-fidelity” (highly-realistic), whereas simulations that reduce the skills-to-be-learned to simpler constructs of constituent parts are referred to as “low-fidelity”. High-fidelity represents the efficiency of a simulation to look like the criterion context with little regard for what features of the simulation are relevant to the skill that the educator attempts to teach<sup>18</sup>.

Therefore, a problem-based balance between the i) clinical skills, ii) differential diagnosis, and iii) most common mistakes and pitfalls should constitute the cornerstone of such educational attempt, where the theatrics constitute the means rather than the task itself<sup>18,19</sup>. Nonetheless, the significant role of this tool in the development

of the professional character of future doctors should not be underestimated, since the imagination and communication tactics recruited by the role players/actors and perceived by the audience facilitate the students' reflection on action, help them develop communicational skills and respond more empathetically to patients<sup>20,21</sup>.

### Limitations

Our study carries certain limitations. Although the students' feedback approved and promoted the theatrical presentation of medical emergencies, this neither implies nor suggests superiority over classical teaching methods since there was no control group to compare. Moreover, the theoretical advantage of theatrical teaching should be validated by comparing the results in relevant exams between the participants and students not attending the event. For the time being, the absence of a separate, core "emergency medicine" subject in the undergraduate curriculum of our Medical School precludes such comparison. Therefore, since certain teaching hospitals (like ours) do not support the care and management of great number of patients attending the emergency department, alternative teaching in Emergencies is necessary. However, the positive response evoked by this event encourages further organizing and conducting of similar events in the future.

The evaluation of the project relies entirely on the attendant students' perceptions and does not feature an analysis of how participants took up the intervention. A deeper analysis of the curriculum's process and outcomes is needed to foster understanding of learning via the theatrical arts, which is a topic of future research in our Medical School<sup>22,23</sup>.

### Conclusion

The theatrical approach of emergency cases conducted and performed by students and supervised by academic personnel efficiently promotes the teaching of emergency scenarios in medicine and enhances the students' efficacy to recognize medical emergencies. Students are keen to attend such events, which should be further supported and augmented as a supplementary educational tool complementary to the classical amphitheatric/online didactic lectures. Future studies with specific objective tools are needed to validate the abovementioned tasks.

### Conflict of interest

Authors declare no conflict of interest.

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