Survey of ICU teaching rounds: secrets to improve learner satisfaction

Jingyuan Xu, Hui Chen, Bo Xie, Zhihao Zhou, Zhendan Peng, Yi Yang

1) Jingyuan Xu, M.D., Jiangsu Provincial Key Laboratory of Critical Care Medicine, Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. xujingyuanmail@163.com

2) Hui Chen, M.D., Jiangsu Provincial Key Laboratory of Critical Care Medicine, Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. 15905162429@163.com

3) Bo Xie, Scientific research and education Department, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. boxxie80@163.com

4) Zhihao Zhou, M.D., Emergency department, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. xgg751116@126.com

5) Zhendan Peng, M.D., Anesthesiology department, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. qianliuwang@163.com

6) Yi Yang, Jiangsu Provincial Key Laboratory of Critical Care Medicine, Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China. yiyiyang2004@163.com

Correspondence to:
Yi Yang, M.D., Ph.D, Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing 210009, Jiangsu, China. E-mail: yiyiyang2004@163.com

Phone: 00862583262550

This work should be attributed to: Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, 210009, P.R., China.
Abstract

**Background:** Unique challenges of teaching in the ICU come from the complexity of critically ill patients. This study was designed to examine the different teaching patterns and learners’ emotion load to achieve learners satisfaction on rounds.

**Methods:** The survey of learners was performed on their practices and perceptions of rounds using social media.

**Results:** A total of 82 learners with 195 responses were received. Pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience were top three teaching behaviors on rounds, in addition, interesting and storytelling presentation, and evidence-based medicine were significantly correlated with learner satisfaction. However, the leaners still have the expectations for further improvement of some teaching behaviors. During rounding, tense, calm, nervous, relaxed and excited were the most top learners’ emotions, only excited was significantly correlated with learners satisfaction.

**Conclusions:** Pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience are top three teaching behaviors during the rounding, however, learners might be dissatisfied barely with these teaching pattens. Teachers should focus on key skills on rounds to enhance satisfaction.

Key words: teaching patterns, rounds, learners satisfaction
Background

Unique challenges of teaching in the ICU come from the complexity of critically ill patients, the limited time pressure, the diverse levels and professions of learners [1], while the critical care requires the attention and understanding of interdisciplinary team members such as fellows, residents, nurse to integrate the opinions. To overcome these hurdles, a scheduled moment for teams to share information and make decisions are important to improve patient safety and therpay efficiency on rounds [2]. Few studies focused on the high-impact teaching strategies on rounds [3], let alone on ICU rounds. Although learners preferrd attendings who enjoyed teaching and demonstrated enthusiasm, stimulate clinical reasoning and critical thinking, treated members respectfully, only certain practices were associated with the outcomes of rounds. Daily checklists, goal setting, and clinician prompting were used frequently, but not associated with in-hospital mortality [4], with potential explanations of questionable care processes to specified patients. Little opportunity to impart clinical knowledge, and to elicit clinical reasoning on disease pathophysiology on goal setting by decrease time spent on teaching [5] urging teaching features with maximal impact in minimal time to achieve learners satisfaction. Meanwhile, as emotions experienced during training are associated with cognitive load and learning outcomes, it is important to investigate learners’ emotion load on rounds. This study was designed to examine the different teaching patterns and learners’ emotion load to achieve learners satisfaction on rounds.
Methods

Setting

The survey was conducted in the intensive care unit of a tertiary teaching hospital with 4 districts, 73 beds. Informed consent was given by each participant in the questionnaire (See Supplementary material). All methods were carried out in accordance with relevant guidelines and regulations. The study protocol was approved by the Ethics Committee of Zhongda Hospital, School of Medicine, Southeast University.

Data collection

Investigators get permission from the doctors who in charge of the rounds to allow survey. Immediately after rounds concluded, Wenjuanxing, an online crowdsourcing platform in mainland China, which provides functions equivalent to Amazon Mechanical Turk, recruited participants from the WeChat groups. The term “learner” was used to broadly encompass all the types of learners, including fellows, residents, visiting doctors, medical postgraduate students. Learners were asked to share the top three experiences and emotions during the rounding episode, as well as the expectations of further improvement, and responding to each item using a Likert scale of one (strongly disagree) through four (strongly agree).

Items focused on learners satisfaction and strategies to improve rounds were built based on literature search and expert opinion. The items included (I) pathophysiology-based analysis on worsened conditions, (II) problem-based teaching and feedback, (III) discussion about past experience, (IV) interesting and storytelling
presentation, (V) evidence-based medicine, (VI) protocolized therapy on specific disease.

To assess emotion during rounding, descriptors of emotion were recorded, which were dichotomized into positive or negative, tense/calm, nervous/relaxed, stressed/serene, upset/contented, sad/happy, depressed/elated, lethargic/excited, and bored/alert.

Data analysis

Learner satisfaction was measured and averaged across the learners by the Likert scale. Continuous variable with normal distribution was presented as mean ± standard deviation (SD), while skewed distribution was presented with median (interquartile range, IQR). Pearson correlations were performed between the frequencies of each teaching activity and learner satisfaction scores. The data were computerized and analyzed by IBM SPSS Statistic Package. A 2-tailed threshold of 0.05 was considered as statistical significance.
Results

A total of 82 learners were enrolled in 20 rounding episodes. Among the learner, the median age was 32 (26 - 35), 34 (41%) were males, 28 (34%) were postgraduate students, 72 (88%) working in the ICU less than ten years. Median overall learner satisfaction with teaching (Likert scale of 1 - 4) was 3. Baseline respondent characteristics are shown in Table 1.

Table 1. Baseline characteristics of learners

| Baseline characteristics            | Total (n = 82) |
|-------------------------------------|---------------|
| Age, years                          | 32 (26 - 35)  |
| Gender n, (%)                       | 34 male (41)  |
| Education (%)                       |               |
| Bachelor degree                     | 26 (32)       |
| Master degree                       | 21 (26)       |
| Doctor's Degree                     | 7  (9)        |
| Postgraduate student                | 28 (34)       |
| Type n, (%)                         |               |
| Postgraduate student                | 18 (22)       |
| Resident                            | 14 (17)       |
| Fellows                             | 13 (16)       |
| Visiting doctors                    | 37 (45)       |
| Major n, (%)                        |               |
| Intensivist                         | 56 (68)       |
| Category                              | Count |
|--------------------------------------|-------|
| Non-intensivist                      | 26 (32) |

**Working experience in ICU, years**

| Experience Level | Count |
|------------------|-------|
| <1               | 35 (43) |
| 2-10             | 37 (45) |
| >10              | 10 (12) |

**Overall learner satisfaction with teaching**

3 (2 - 4) (Likert scale of 1 - 4)

ICU, intensive care unit
Nine attending doctors who in charge of the rounds were enrolled, the median age was 40 (39 - 45), 4 (44%) were males, all of them working in the ICU for more than ten years. Among patients, 42% of them were critically ill patients who need multi-disciplinary team discussions, the median Acute Physiology and Chronic Health Evaluation II score was 21 (17-25).
A total of 195 responses were received. Top three experiences and expectations on the rounding episode are shown in Table 2.

| Teaching behaviors on rounds                              | Frequency | Correlation | p value | Degree (Likert scale of 1 - 4) | Correlation | p value |
|-----------------------------------------------------------|-----------|-------------|---------|--------------------------------|-------------|---------|
| Pathophysiology-based analysis on worsened conditions     | 170 (87)  | 0.075       | 0.295   | 4 (3 - 4)                      | 0.305       | 0.000   |
| Problem-based teaching and feedback                       | 120 (62)  | 0.210       | 0.003   | 3 (1 - 4)                      | 0.332       | 0.000   |
| Discussion about past experience                          | 109 (56)  | 0.140       | 0.051   | 3 (1 - 4)                      | 0.247       | 0.001   |
| Interesting and storytelling presentation                 | 43 (22)   | 0.185       | 0.010   | 1 (1 - 3)                      | 0.178       | 0.013   |
| Evidence-based medicine                                   | 30 (15)   | 0.166       | 0.020   | 1 (1 - 1)                      | 0.210       | 0.003   |
| Protocolized therapy on specific disease                  | 25 (13)   | 0.099       | 0.167   | 1 (1 - 1)                      | 0.134       | 0.062   |
| Total behaviors in rounding                               | 2 (2 - 3) | 0.295       | 0.000   | 2 (1 - 3)                      | 0.353       | 0.000   |

Behaviors need further improvement

| Frequency | Degree |
|-----------|--------|
| Pathophysiology-based analysis on worsened conditions     | 53 (27) | 4 (3 - 4)   |
| Problem-based teaching and feedback                       | 73 (37) | 3 (1 - 4)   |
| Discussion about past experience                          | 69 (35) | 3 (1 - 4)   |
| Interesting and storytelling presentation                 | 53 (27) | 1 (1 - 3)   |
| Evidence-based medicine                                   | 44 (23) | 1 (1 - 1)   |
| Protocolized therapy on specific disease | 37 (19) | 1 (1 - 1) |
Pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience are top three teaching behaviors during the rounding (Figure 1. A), however, problem-based teaching and feedback, interesting and storytelling presentation, and evidence-based medicine were significantly correlated with learner satisfaction. Moreover, the leaners still have the expectations for further improvement of some teaching behaviors, eg. pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience (Figure 1. B).

Figure 1. Experiences and expectations on teaching behaviors. A. Frequency and degree of teaching behaviors on rounds. B. Expectations for further improvement of teaching behaviors.
Item are as follows: (I) pathophysiology-based analysis on worsened conditions, (II) problem-based teaching and feedback, (III) discussion about past experience, (IV) interesting and storytelling presentation, (V) evidence-based medicine, (VI) protocolized therapy on specific disease.

Learners’ emotion during rounding are shown in Table 3. Tense, calm, nervous, relaxed and excited were the most top learners’ emotions during rounding. Only excited was significantly correlated with learners satisfaction.

| Learners’ emotion on rounds (n= 195 responders) | Emotion, n (%) | Correlation | p value |
|-------------------------------------------------|----------------|-------------|---------|
| Tense                                           | 144 (74)       | 0.030       | 0.678   |
| Emotion   | Count (Percentage) | Valence   | Arousal   |
|-----------|--------------------|-----------|-----------|
| Calm      | 78 (40)            | -0.132    | 0.065     |
| Nervous   | 67 (34)            | 0.019     | 0.794     |
| Relaxed   | 65 (33)            | -0.128    | 0.075     |
| Excited   | 65 (33)            | 0.244     | **0.001** |
| Stressed  | 61 (31)            | 0.019     | 0.796     |
| Upset     | 22 (11)            | -0.013    | 0.857     |
| Depressed | 4 (2)              | 0.002     | 0.983     |
| Serene    | 0 (0)              | -         | -         |
| Lethargic | 0 (0)              | -         | -         |
| Sad       | 0 (0)              | -         | -         |
| Happy     | 0 (0)              | -         | -         |
| Elated    | 0 (0)              | -         | -         |
| Contented | 0 (0)              | -         | -         |
| Bored     | 0 (0)              | -         | -         |
| Alert     | 0 (0)              | -         | -         |
Discussion

Critical care rounds are quite complex and baffling. Integrating a myriad of information, applying ‘classroom’ knowledge and rationalizing data to clinical situation, in order to reach a logical explanation and treatment plan are challenging for learners. Therefore, teaching in rounds are quite important, however, studies showed that more than half of the learners were dissatisfied with teaching [3], implying that ineffective teaching is common, and there would be substantial room to improve the teaching strategies during rounds.

Many papers summarize different tips to improve teaching during rounds [6-12], which offer strategies creating structured rounding system, or with clear delineation of expectations. However, previously described teaching models have been built based on expert opinion, surveys of excellent clinical teachers. Feelings between teachers and learners might vary widely. Although teachers try to actively engage learners, promoting bidirectional communication and getting positive feedback in Chinese is hard [13-15].

We aimed to hit what teaching behaviors and emotion load could correlate with high learner satisfaction, and found pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience are top three teaching behaviors on rounds, in addition, interesting and storytelling presentation, and evidence-based medicine were significantly correlated with learner satisfaction. However, the leaners still have the expectations for further improvement of some teaching behaviors.
Studies showed that emotions experienced during training are associated with cognitive load and learning outcomes [16-17], which are consistent with the psychology studies on the effects of emotion on task performance [18-20]. We investigated emotions during rounding, and found tense, calm, nervous, relaxed and excited were the most top learners’ emotions, only excited was significantly correlated with learners satisfaction.

This study has some limitations. Firstly, this was a single-center study of one group of learners during short time, which limits the generalizability of the findings. Teaching patterns might vary based on the level of learners. Secondly, the learners were asked to assess satisfied teaching patterns and emotion load during rounds subjectively, and teaching behaviors were identified whether correlated with learner satisfaction, the actual learning effectiveness was not measured objectively.

Conclusion

Pathophysiology-based analysis on worsened conditions, problem-based teaching and feedback, discussion about past experience are top three teaching behaviors during the rounding, however, learners might be dissatisfied barely with these teaching patterns. Teachers should focus on key skills on rounds to enhance satisfaction.
Declarations

Ethics approval and consent to participate

All methods were carried out in accordance with relevant guidelines and regulations. The study protocol was approved by the Ethics Committee of Zhongda Hospital, School of Medicine, Southeast University. Informed consent was given by each participant in the questionnaire.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors’ contributions

JYX carried out the analysis and interpretation of data and participated in drafting, editing and submitting the manuscript. HC and ZHZ carried out the analysis and interpretation of data and participated in drafting the manuscript. BX and ZDP carried out the analysis and interpretation of data, YY was responsible for conception and design, and revising the manuscript for important intellectual content. All authors read and approved the final manuscript.

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