



Teaching and Learning Activities in Critical Care: Resident's Perspective in a Developing Country

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ABSTRACT

Background: the need for critical care services has increased tremendously specially after the current coronavirus disease 2019 pandemic. It has flounced whole world, posing a high pressure on critical care unit due to large number of patients needing critical care. Although the resources are already reduced due to lack of awareness and less recognized fellowship units in critical care. The dire need has raised concerns over training of residents in critical care especially in Pakistan. The rationale of this study is to improve the training of critical care residents by focusing on the teaching and learning activities and behaviors of teaching physicians which greatly impact the residents in critical care departments. No studies addressing this area have been reported in Pakistan.

Method: The study was conducted in Public and Private sector Hospitals of Rawalpindi and Islamabad Pakistan, over a period of ten months from May 2020 till February 2021. An online survey was developed based on a validated tool which was circulated to all residents in critical care all over the twin cities of Pakistan. A 33 items questionnaire was developed derived from prior studies. Internal medicine post graduate training and residents completed an online survey on google forms rating the importance of behaviors and teaching strategies of attending physicians in Critical Care Unit.

Results: A total of 173 (101 female, 72 male) residents responded to this study. The behaviors of attending physicians most commonly rated as "very important" to trainees (as quantified by the highest number of 5s on the Likert scale) were (1) Consultant shows enthusiasm for the topics discussed on rounds (2) Consultant share professional experience with the residents. (3) Consultant enjoys teaching residents (4) Consultant explains clinical reasoning and differential diagnosis in critically ill patients and (5) Consultant promotes interest in Research.

Conclusion: The results provide novel information to the teaching physicians since they have an immense impact on resident's education. This study revealed that trait our residents valued most is that Consultant shows enthusiasm for the topics discussed on rounds the other studies have revealed that trainees most valued the ability to explain clinical reasoning and problem-solving approach which leads to differential diagnoses by Consultant whereas other international literature reported most valued behavior was sharing personal information with learners.

KEYWORDS: Teaching and learning; critical care; Resident's perspective

INTRODUCTION

Few Critical care unit services exist in developing countries like Pakistan and even those are often hampered by a shortage of

human and structural resources, leading to high morbidity and mortality rates. Attending physicians and learners (residents, house officers) are the primary health care providers in critical care units

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along with the nursing and ancillary staff [1,2]. Teaching physicians are considered to be essential mentors for learner's medical education through clinical as well as communication skills and role modelling [3]. Medical education and teaching are an important part of training to improve the behaviors of residents. This shows that outstanding attending physicians are of great significance to the academic community [3]. Teaching physicians often focuses on behaviors which they perceive to be important, rather than knowing what behaviors are most valued by the learners. A few studies in the past have attempted to examine such behaviors in the outdoor patient setting [4] as well as on ward rounds. Previously published studies have only addressed internal medicine residents' perception of qualities that they most value in attending physicians [5,6].

However, none of these studies focused on attending physicians in the intensive care unit (ICU). A Critical care physician is responsible for demonstrating physical examination skills at the same time ensuring patient safety along with delivering high-quality patient care and teaching clinical decision-making. The difficult challenge is to apply the clinical skills on highly complicated and critically ill patients. Different situations face to handle various people to deal. However, to teach trainees about challenging situations, procedures, interpersonal communication skills and counselling on rounds or at the bedside patients and their families is their main task [7,8]. This learning environment may be challenging for trainees as with the broad horizon of critical care medicine and reduced duty hours of trainees which fails to do justice with the training required [8].

It is our prime responsibility as medical educationists to ensure competent professional health care professionals to provide high quality care to our critically ill patients. It is imperative to find suitable teaching and learning strategies for trainees aligned with providing health facilities in critical care settings. We look forward to exploring the teaching and learning strategies currently employed in the stressful and challenging environment of critical care units from the learners' perspective. In order to have robust training it is important for the attending physician to be aware of the behaviors which influence the learner's perception.

AIMS AND OBJECTIVES

Aim: This multi-center study sought to evaluate the teaching behaviours of consultants/Physicians in Critical care unit that learners/residents perceive valuable in their training.

Objective: To evaluate the teaching behaviour of attending Physicians/Consultants by the learners/Residents in Critical Care settings from May 2020 to February 2021

Methodology: The study was a cross-sectional, multi-institutional survey performed at Public and Private sector Hospitals of Rawalpindi and Islamabad. Participants of the study were from the following institutions Rawalpindi Medical University, Holy Family Hospital, Benazir Bhutto Shaheed Hospital, PAEC Hospital, DHQ Rawalpindi, Shifa International, Maroof Hospital, Fauji foundation, Pakistan Air Force Hospital and Combined Military Hospital.

Design and Duration: The design was cross sectional study which was conducted from May 2020 to February 2021.

Sample Size and Setting: It was a multicenter study with sample size of 173 from Public and Private sector Hospitals of Rawalpindi and Islamabad.

Sampling Technique: Convenient sampling technique was used for participants.

Inclusion Criteria: Participants were residents having 30 days' rotation in Critical Care unit/ICU.

Exclusion Criteria: Residents having less than 30 days' rotation in critical care units.

Data Collection Tool: The data was collected through a modified validated tool. The tool was based on the two major prior studies in this field [6,7] and also from the Clinician Teaching Program from the Stanford Faculty Development Center for Medical Teachers [9,10]. While developing the survey, we initially included all questions from these three sources, later some questions were edited to avoid repetition. In addition to collecting demographic information, in total there were 33 questions prospectively clustered under three broad domains: interpersonal and clinical skills; teaching skills and research; educational training; and patient interactions. The 33 study variables were ranked from strongly agree (Very Important) to strongly disagree (Not important at all). On a Likert Scale. Number of 5s (meaning "very important") on the Likert scale. The questionnaire was validated by experts (Medical Educationists with years of experience in Critical care). Participants were asked to indicate their institution and level of training (from first- to final-year residents and those who have completed their residency). The questions asked in the survey including the three broad domains are displayed in Table 1. The questionnaire made on Google Forms was sent via social media (WhatsApp, Facebook, Twitter, Instagram, and email) to accessible participants. All participants were requested to complete a survey keeping in view the attending physicians in their departments of Critical care.

Data Analysis: Data was analysed by using SPSS version 20. Both descriptive and inferential statistics were applied. The Likert scale was used to evaluate the preferred and most important teaching behaviors in critical care unit from residents/learner's perspective.

Ethical considerations:

1. Written approval was taken from the Rawalpindi Medical College and Hospital ethical review board.
2. Written consent was obtained to the participants.
3. Data was confidential and used for the purpose of the study.
4. There was no financial compensation to the participants of this study.

RESULTS

A total of 173 (101 females, 72 male) resident's/study participants responded to this study. The mean age of the respondents was 33.59 (Std. Deviation 7.9, minimum age 24 and maximum age 64). The 33 questions of this study were categorized into the 3 main domains of clinical and interpersonal skills, teaching and research skills, and educational training. The top five behaviors most commonly rated as very important (strongly agree) to trainees (as quantified by the highest number of 5s on the Likert scale). The most valuable trait was that the Consultant shows enthusiasm for the topics discussed on rounds (57/173 strongly agree), Consultant shares professional experiences with residents (50/173 strongly agree), Consultant enjoys teaching residents (49/173 strongly agree), Consultant explains clinical reasoning and differential diagnosis in critically ill patient (47/173

strongly agree), Consultant promotes an interest in research (43/173 strongly agree) and Consultant is skilled at performing and teaching procedures to trainees (43/173 strongly agree) as shown in Table 1. The teaching methods most appreciated were PBL (problem based learning) (32/173), Activated demonstrations (If the learner is unaware of patients problem they are trained by observing the consultant) (30/173 strongly agree) and Small group discussion (Consultants use group discussions to generate ideas and promote learning through each other)(29/173 strongly agree) while least commonly identified as important by 173 respondents were the Flipped Classroom (Learning material is introduced before class online and during class concepts are deepened

through discussions with the Consultant) (10/173), Teaching Scripts (Consultant use scripts containing detailed information regarding learner, goal of session, specific teaching points, and educational strategies according to the level of learner) (14/173) and Simulated training (Consultants use models, computer based simulations and simulated patients to train residents) (18/173). The three domains Teaching and Research skills (Mean 3.82, Std. Deviation .70), Clinical and Interpersonal Skills (Mean 3.75, Std. Deviation .62), Educational training (Mean 3.47, Std. Deviation .73) are ranked as most important on Likert scale on the bases of mean scores as shown in Figure 1.

Table 1: Variables ranked by importance (No. of 5s*).

Variables	No. of 5s*	Mean
Consultant shows enthusiasm for the topics discussed on rounds	57	3.96
Consultant shares professional experiences with residents	50	4.08
Consultant enjoys teaching residents	49	3.79
Consultant explains clinical reasoning and differential diagnosis in critically ill patient	47	4.04
Consultant promotes an interest in research	43	3.72
Consultant is skilled at performing and teaching procedures to trainees	43	3.88
Consultant directs teaching according to learners needs	41	3.73
Consultant engages in and promotes quality improvement in ICU	39	3.86
Consultant makes clear salient teaching points during rounds	38	3.9
Consultant performs physical exam teaching at bedside	38	3.68
Consultant frequently promotes Evidence Based Medicine (cites latest research and sends out pertinent articles	38	3.78
Consultant gives in depth positive and constructive feedback to team members	37	3.65
Consultant is easily available for hands on assistance to the team	37	3.7
Consultant explains concepts to patients and families without using medical jargon	36	3.81
Bedside teaching (Clinical teaching by Consultant in which the patient is involved and is enriched with by visuals, auditory and tactile experiences)	35	3.76
Consultant ensures effective communication with team members	35	3.89
Consultant sets an agenda and manages rounds efficiently	34	3.8
Consultant creates a conducive environment for rounds	34	3.84
PBL (Problem Based Learning)	32	3.62
Consultant uses adverse events or medical errors as learning opportunities	32	3.65
Activated Demonstrations (If the learner is unaware of patient's problem, they are trained by observing the consultant)	30	3.81
Consultant uses learner's names	30	3.69
Small group discussion (Consultants use group discussions to generate ideas and promote learning through each other)	29	3.67
Consultant promotes learning through educational conferences	28	3.73
Consultant allows residents and fellows significant autonomy	24	3.68
Mini Lectures (Consultants give 10-15 minutes presentation to give an overview of topic quickly and efficiently to improve the understanding of learners)	24	3.27
One Minute Preceptor (Does the consultant evaluates the level of your knowledge, provides feedback and assigns further research)	21	3.56
Two Minutes Observation (Does the consultant briefly notes two to three positive things and later communicates them to you)	20	3.45
Consultant is skilled at performing family meetings in the ICU	20	3.32

Consultant debriefs the team after code blue or other difficult events	20	3.24
Simulated training (Consultants use models, computer-based simulations and simulated patients to train residents).	18	3.15
Teaching Scripts (Consultant use scripts containing detailed information regarding learner, goal of session, specific teaching points, and educational strategies according to the level of learner)	14	3.26
Flipped Classroom (Learning material is introduced before class online and during class concepts are deepened through discussions with the Consultant)	10	3.11

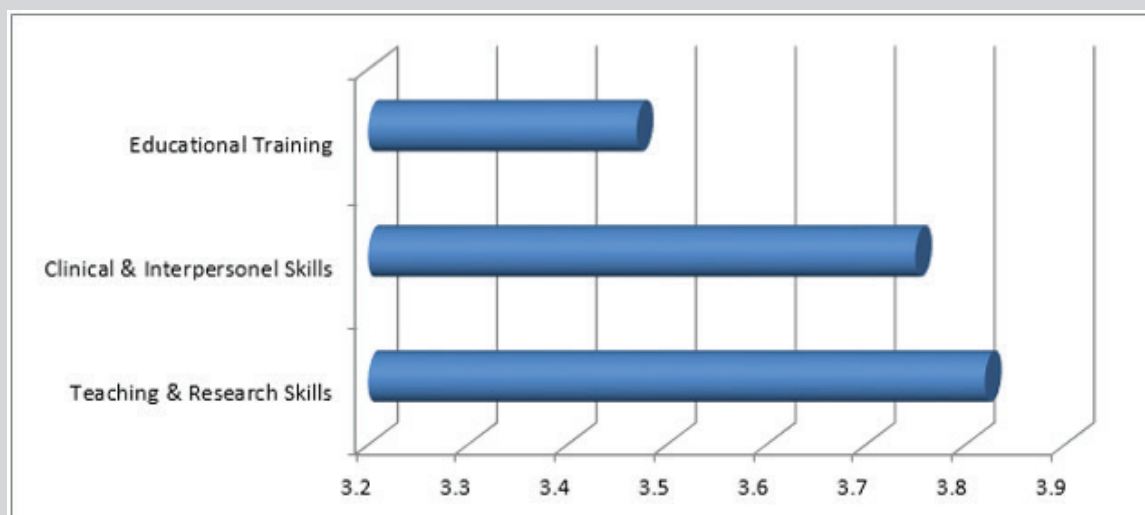


Figure 1: Mean Likert scores across three domains.

DISCUSSION

This study included the sampling of a multicentre and diverse residents group from Rawalpindi and Islamabad. Most of the previously published studies/surveys focused on teaching behaviors of consultants in general medicine only, whereas this study focused specifically on teaching behaviors of consultants/physicians in the critical care unit. Moreover, this study focused on querying residents on teaching behaviors of consultants/physicians in three specific domains (interpersonal and clinical skills; teaching skills and research; educational training and patient interactions).

This study provides new information to teaching consultants/physicians determined to influence resident education focusing on critical care units, behaviors, such as Consultant shows enthusiasm for the topics discussed on rounds, Consultant shares professional experiences with residents, Consultant explains clinical reasoning, and Consultant promotes an interest in research were most important and influential teaching and learning behaviors among

faculty residents working in critical care units (Table 1).

The results of this study revealed that three out of top five ranked (on Likert scale) teaching and learning behaviors perceived by residents were similar to the previously multicentre study published in 2017 by Lekshmi Santhosh and colleagues focusing on Intensive Care Unit Educators and Evaluation of Behaviors Residents Value in Attending Physicians [11]. The comparison between the top five (on Likert scale) teaching and learning behaviors in critical care unit from resident's perspective versus previously published multicentre study by Lekshmi Santhosh and colleagues is shown in (Table 2). These findings may reflect a new generation of learners/residents, difference between learning behaviors in critical care unit versus ward teaching, institutional and most importantly regional variations. Some prior published data also demonstrated that learners valued attending physicians sharing personal information with residents, our study did not replicate this [12].

Table 2: Comparison of top five most important behaviors (No. of 5s, most important on Likert scale) of this study and study published in 2017 by Lekshmi Santhosh and colleagues.

Article Published in 2017 by Lekshmi Santhosh and colleagues	This Multicenter study findings
Attending physician enjoys teaching house staff	Consultant shows enthusiasm for the topics discussed on rounds
Attending physician demonstrates empathy and compassion with patients and families	Consultant shares professional experiences with residents
Attending physician explains clinical reasoning & differential diagnoses in the critically ill patient	Consultant enjoys teaching residents
Attending physician treats non-M.D. members of the staff (R.N., P.T., R.T., O.T., N.P.) respectfully	Consultant explains clinical reasoning and differential diagnosis in critically ill patient
Attending physician shows enthusiasm for the topics discussed on rounds	Consultant promotes an interest in research

The behaviors that this study found to be most important among residents in critical care units could be useful for educational interventions. Consultants/Physicians can be trained and taught behaviors which can influence trainees and improve teaching skills across all three main domains (interpersonal and clinical skills; teaching skills and research; educational training and patient interactions) of teaching and learning behaviors in critical care units. The Teaching and Research skills were found most important domain (on the bases of Mean) from resident's perspective according to the findings of this study. It could be a very worthwhile and effective behavior for consultants/physicians to show residents how much they enjoy teaching them in the critical care unit. The other most important teaching behaviors in critical care unit such as showing enthusiasm for the topics discussed on rounds, sharing professional experiences with residents, explaining clinical reasoning and differential diagnosis in critically ill patient, and promoting an interest in research can be very useful and effective in training of consultants/physicians for better medical education interventions. The consultants/physicians can employ those teaching/learning strategies which have a high impact on residents learning similarly this study also highlights interpersonal behaviors between a resident/trainee and consultants/physicians which can influence the overall working environment of critical care units.

Although the findings of this study can contribute towards improving the training programs in critical care units but to validate the findings more studies are required.

STRENGTHS AND LIMITATIONS OF THE STUDY

This is the first research in the local context to the best of the researchers' knowledge to enhance training in Critical Care Units. There were several limitations in this study. The study was conducted on a small number of participants in two cities and the results cannot be generalized. The limited participant's response rate, limited resources and time constraint were the limitations of this study, which could affect the validity of our results and conclusions. The study participants/residents may not be familiar with the past behaviors of the consultants/physicians, such as teaching and research activities, interpersonal skills, or participation in formal teaching training that could have affected the responses.

Finally, the findings of this study represent an observational study. There is not enough evidence that improvement in these specific most valued teaching behaviors by residents will improve resident's clinical skills or communication skills in the critical care unit. It is also not necessary that perception of the residents may translate into teaching effectiveness.

The assessment of the impact of teaching skills development of consultants/physicians in critical care unit on the most important

behaviours that are identified in this study, as meaningful to residents would be another useful study.

CONCLUSION

This multicentre study adds to the literature about teaching role modelling, while focusing specifically on teaching skills of consultants and physicians in the critical care unit. The study will help to understand what residents perceive as important behaviours of consultants/physicians in critical care units. The residents/learners value attending physicians/consultants who enjoy teaching residents, show enthusiasm for the topics discussed on rounds, and share professional experiences with residents. Many of these important teaching behaviours are adaptable that consultants/attending physicians in the critical care unit can develop to improve the Critical Care training especially in Pakistan.

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