Annals of Middle Eastern Medicine

ORIGINAL ARTICLE

# Balancing patient safety and resident education: the perceived impact of critical care response teams on clinical autonomy and training

Norah Alajmi[1], Sahar Aldakhil[2], Enar Alotaibi[3]*, Amal Alfarhan[4], Saad Alsaawy[5], Ibrahim Albabtain[6], Abdulla Alsayyari[7]
†Deceased

## ABSTRACT

**Background:** The critical care response team (CCRT) supports the management of hospitalized patients with acute clinical deterioration; however, its perceived impact on resident education and clinical autonomy remains uncertain.

**Objective:** To evaluate residents' perceptions of the CCRT regarding clinical learning, professional autonomy, collaborative decision-making, and preparedness to manage clinically deteriorating patients.

**Methods:** A cross-sectional survey was conducted at a tertiary hospital in Riyadh from July 2017 to July 2018 among residents from medical and surgical specialties. Participants completed a 28-item questionnaire that included 20 statements rated on a 5-point Likert scale. Descriptive analyses and subgroup comparisons using Fisher's exact test were performed.

**Results:** Of 211 eligible residents invited, 128 responded (response rate, 60.6%). After excluding 18 respondents without relevant CCRT exposure, 110 residents were included. Most respondents (82.7%) perceived working with the CCRT as a valuable educational experience, 52.7% disagreed that the CCRT reduced opportunities to care for unstable patients, and 7.3% perceived decreased autonomy. In the gender comparison, male residents more often reported collaborative treatment decision-making with the CCRT than female residents (81.2% *vs.* 65.9%; $p = 0.0369$), whereas female residents more often disagreed that the CCRT decreased their autonomy ($p = 0.0405$).

**Conclusion:** Residents generally perceived the CCRT favorably with respect to patient safety, education, and professional autonomy. These findings reflect residents' perceptions and should not be interpreted as evidence of objective improvements in clinical competence, autonomy, or patient outcomes.

**Keywords:** Clinical competence, internship and residency, medical education, patient safety, rapid response team, Saudi Arabia.

## Introduction

Critical care response teams (CCRTs), also referred to as rapid response teams, were established to facilitate early recognition and intervention for deteriorating ward patients [1]. Evidence indicates that rapid response systems may reduce in-hospital cardiac arrest and mortality [2]. However, their role in academic centers has raised concerns that team involvement could reduce resident autonomy or limit opportunities to manage critically ill patients. This study assessed residents' perceptions of the impact of CCRTs on education, professional autonomy, and clinical decision-making at a tertiary care center in Riyadh, Saudi Arabia.

**Correspondence to:** Enar Alotaibi
*College of Medicine, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia.
**Email:** enmot2023@gmail.com
*Full list of author information is available at the end of the article.*
**Received:** 25 August 2026 | **Accepted:** 06 October 2026

OPEN ACCESS
This is an open access article distributed in accordance with the Creative Commons Attribution (CC BY 4.0) license: https://creativecommons.org/licenses/by/4.0/) which permits any use, Share — copy and redistribute the material in any medium or format, Adapt — remix, transform, and build upon the material for any purpose, as long as the authors and the original source are properly cited. © The Author(s) 2026.

***Table 1.*** *Participant characteristics, CCRT exposure, and survey responses (N = 110).*

| Variable | Statistics N (%) |
|---|---|
| 1. In what department are you a resident? | |
| Medical | 47 (42.73%) |
| Surgical | 63 (57.27%) |
| 2. In what year of post-graduate training are you? | |
| Lower level | 34 (30.91%) |
| Upper level | 76 (69.09%) |
| 3. What is your gender? | |
| Male | 69 (62.73%) |
| Female | 41 (37.27%) |
| 4. Did you have exposure to CCRT? | |
| No | 5 (4.55%) |
| Yes | 105 (95.45%) |
| 5. Has the CCRT ever been involved in the care of one of your patients at KAMC? | |
| No | 9 (8.18%) |
| Yes | 101 (91.82%) |
| 6. Have you ever initiated a call to the CCRT at KAMC hospital yourself? | |
| No | 33 (30%) |
| Yes | 77 (70%) |
| 7. How many times has the CCRT been called, either by yourself OR the patient's nurse, to assist in the care of one of your patients at KAMC? | |
| 1 time | 22 (20%) |
| 2-5 times | 35 (31.82%) |
| 5-10 times | 17 (15.45%) |
| >10 times | 28 (25.45%) |
| None | 8 (7.27%) |
| 8. I feel comfortable managing an unstable patient without the assistance of the CCRT. | |
| Disagree | 66 (60%) |
| Neutral | 29 (26.36%) |
| Agree | 15 (13.64%) |
| 9. I know the objective criteria for calling the CCRT. | |
| Disagree | 15 (13.64%) |
| Neutral | 19 (17.27%) |
| Agree | 76 (69.09%) |
| 10. I am willing to call the CCRT if I require assistance in managing an unstable patient. | |
| Disagree | 5 (4.55%) |
| Neutral | 4 (3.64%) |
| Agree | 101 (91.82%) |
| 11. I have been discouraged from calling the CCRT by a supervising resident. | |
| Disagree | 82 (74.55%) |
| Neutral | 18 (16.36%) |
| Agree | 10 (9.09%) |
| 12. I have been discouraged from calling the CCRT by an attending. | |
| Disagree | 83 (75.45%) |
| Neutral | 21 (19.09%) |
| Agree | 6 (5.45%) |
| 13. Nurses caring for an unstable patient should always contact me prior to contacting the CCRT. | |
| Disagree | 40 (36.36%) |
| Neutral | 24 (21.82%) |
| Agree | 46 (41.82%) |
| 14. If a nurse contacted the CCRT prior to contacting me, I would be displeased. | |
| Disagree | 60 (54.55%) |
| Neutral | 20 (18.18%) |
| Agree | 30 (27.27%) |
| 15. The CCRT and I work together to make treatment decisions for unstable patients. | |
| Disagree | 8 (7.27%) |
| Neutral | 19 (17.27%) |
| Agree | 83 (75.45%) |
| 16. My initial management plan is consistent with the CCRT treatment decision. | |
| Disagree | 1 (0.91%) |
| Neutral | 41 (37.27%) |
| Agree | 68 (61.82%) |
| 17. Contacting the CCRT leads to the unnecessary transfer of some patients to the intensive care unit. | |
| Disagree | 88 (80%) |
| Neutral | 16 (14.55%) |
| Agree | 6 (5.45%) |
| 18. The presence of a CCRT decreases my autonomy as a physician. | |
| Disagree | 82 (74.55%) |
| Neutral | 20 (18.18%) |
| Agree | 8 (7.27%) |
| 19. Working with the CCRT in managing an unstable patient is a valuable educational experience. | |
| Disagree | 8 (7.27%) |
| Neutral | 11 (10%) |
| Agree | 91 (82.73%) |
| 20. I have fewer opportunities to care for unstable floor patients because of the CCRT. | |
| Disagree | 58 (52.73%) |
| Neutral | 33 (30%) |
| Agree | 19 (17.27%) |
| 21. I feel less prepared to care for unstable floor patients because of the CCRT. | |
| Disagree | 55 (50%) |
| Neutral | 34 (30.91%) |
| Agree | 21 (19.09%) |
| 22. The CCRT improves the quality of care given to unstable floor patients. | |
| Disagree | 1 (0.91%) |
| Neutral | 10 (9.09%) |
| Agree | 99 (90%) |
| 23. The CCRT increases the safety of inpatient care. | |
| Neutral | 8 (7.27%) |
| Agree | 102 (92.73%) |
| 24. The CCRT has helped prevent Code Blue activations on my patients. | |
| Disagree | 8 (7.27%) |
| Neutral | 28 (25.45%) |
| Agree | 74 (67.27%) |

(*Continue*)

(*Continue*)

| Variable | Statistics N (%) |
|---|---|
| 25. I find the CCRT cooperative with the primary care team. | |
| Disagree | 3 (2.73%) |
| Neutral | 22 (20%) |
| Agree | 85 (77.27%) |
| 26. Having a CCRT at KAMC has contributed to my job satisfaction as a resident. | |
| Disagree | 9 (8.18%) |
| Neutral | 24 (21.82%) |
| Agree | 77 (70%) |
| 27. I prefer to work at a hospital that has a CCRT. | |
| Neutral | 9 (8.18%) |
| Agree | 101 (91.82%) |
| 28. If my family member were in the hospital, I would want them to be in a hospital that had a CCRT. | |
| Neutral | 7 (6.36%) |
| Agree | 103 (93.64%) |

## Methods

### *Ethics statement*

Ethical approval for this study was obtained from the Institutional Review Board of King Abdullah International Medical Research Center, Riyadh, Saudi Arabia (approval no. RC16/121/R) on 19 September 2016. Participation was voluntary, and informed consent was obtained from all participants before completion of the survey. Survey responses were collected anonymously.

### *Study design and setting*

A cross-sectional, web-based survey was conducted at a tertiary hospital in Riyadh, Saudi Arabia, between July 2017 and July 2018. The study aimed to assess residents' perceptions of the impact of the CCRT on education, professional autonomy, clinical decision-making, and preparedness to manage clinically deteriorating patients.

### *Participants and survey administration*

Eligible participants were residents from internal medicine and surgical specialties who could have been exposed to CCRT activations during their clinical training. Residents in pediatrics, radiology, and emergency medicine were excluded because these specialties did not routinely use CCRT services at the study institution.

The web-based survey was distributed to eligible residents through their institutional email addresses. Participation was voluntary, and responses were collected anonymously. No reminder emails were sent. The analytic dataset had been screened for potential duplicate submissions using IP-address information before analysis; however, a separate audit count of screened duplicate entries was not retained.

A total of 211 eligible residents were invited to participate, of whom 128 responded, yielding a response rate of 60.6%. Eighteen respondents without relevant CCRT exposure were subsequently excluded, resulting in a final analytic sample of 110 residents.

### *Survey instrument*

The questionnaire was adapted from a previously validated survey developed by Butcher et al. [3], and formal permission to use the instrument was obtained from the original authors before data collection. The questionnaire contained 28 items, including 20 statements specifically assessing the perceived impact of the CCRT on resident education, professional autonomy, and preparedness to manage unstable patients. Responses to these statements were recorded using a 5-point Likert scale ranging from "Strongly disagree" to "Strongly agree."

### *Statistical analysis*

Data were analyzed using SPSS version 21. For analysis, Likert-scale responses were grouped into three categories: agree, neutral, and disagree. Fisher's exact test was used for subgroup comparisons, with $p < 0.05$ considered statistically significant. The subgroup comparison presented in Table 2 is stratified by gender.

## Results

### *Participant flow and response rate*

A total of 211 potential respondents were invited to participate in the study, of whom 128 agreed, yielding a response rate of 60.6%. Eighteen respondents were excluded from the analysis because the CCRT had not been involved in the care of their patients.

### *Demographics and clinical exposure*

As detailed in Table 1, the cohort was predominantly composed of surgical residents (57.3%) and upper-level trainees (69.1%). Overall, 91.8% of residents reported that the CCRT had been involved in the care of one of their patients, and 70.0% had personally initiated a CCRT call. In the full analytic sample, 69.1% reported knowing the objective criteria for CCRT activation. Regarding frequency of use, 25.5% of respondents reported more than 10 CCRT activations involving their patients.

### *Perceptions of safety and quality of care*

Overall, residents perceived the CCRT positively. No participant disagreed with the statement that the CCRT increased patient safety, and 90.0% agreed that the CCRT improved the quality of care provided to unstable ward patients. Furthermore, 67.3% agreed that the CCRT had helped prevent Code Blue activations among their patients. No participant indicated a preference for having a family member treated at a hospital without a CCRT.

### *Impact on education and autonomy*

Overall, 82.7% of respondents considered working with the CCRT to be a valuable educational experience. Half (50.0%) disagreed that CCRT involvement left them less prepared to care for unstable patients, and 52.7% disagreed that it reduced their opportunities to care

***Table 2.*** *Comparison of CCRT survey responses by gender.*

| Variable | Male N (%) | Female N (%) | p value |
|---|---|---|---|
| 1. Did you have exposure to CCRT? | | | |
| No | 2 (2.9%) | 3 (7.32%) | 0.3594 |
| Yes | 67 (97.1%) | 38 (92.68%) | |
| 2. Has the CCRT ever been involved in the care of one of your patients at KAMC? | | | |
| No | 5 (7.25%) | 4 (9.76%) | 0.7248 |
| Yes | 64 (92.75%) | 37 (90.24%) | |
| 3. Have you ever initiated a call to the CCRT at KAMC hospital yourself? | | | |
| No | 16 (23.19%) | 17 (41.46%) | 0.0539 |
| Yes | 53 (76.81%) | 24 (58.54%) | |
| 4. How many times has the CCRT been called, either by yourself OR the patient's nurse, to assist in the care of one of your patients at KAMC? | | | |
| 1 time | 12 (17.39%) | 10 (24.39%) | 0.6229 |
| 2-5 times | 21 (30.43%) | 14 (34.15%) | |
| 5-10 times | 12 (17.39%) | 5 (12.2%) | |
| >10 times | 20 (28.99%) | 8 (19.51%) | |
| None | 4 (5.8%) | 4 (9.76%) | |
| 5. I feel comfortable managing an unstable patient without the assistance of the CCRT. | | | |
| Disagree | 36 (52.17%) | 30 (73.17%) | 0.0592 |
| Neutral | 23 (33.33%) | 6 (14.63%) | |
| Agree | 10 (14.49%) | 5 (12.2%) | |
| 6. I know the objective criteria for calling the CCRT. | | | |
| Disagree | 6 (8.7%) | 9 (21.95%) | 0.0508 |
| Neutral | 10 (14.49%) | 9 (21.95%) | |
| Agree | 53 (76.81%) | 23 (56.1%) | |
| 7. I am willing to call the CCRT if I require assistance in managing an unstable patient. | | | |
| Disagree | 2 (2.9%) | 3 (7.32%) | 0.4703 |
| Neutral | 2 (2.9%) | 2 (4.88%) | |
| Agree | 65 (94.2%) | 36 (87.8%) | |
| 8. I have been discouraged from calling the CCRT by a supervising resident. | | | |
| Disagree | 53 (76.81%) | 29 (70.73%) | 0.3355 |
| Neutral | 12 (17.39%) | 6 (14.63%) | |
| Agree | 4 (5.8%) | 6 (14.63%) | |
| 9. I have been discouraged from calling the CCRT by an attending. | | | |
| Disagree | 56 (81.16%) | 27 (65.85%) | 0.1914 |
| Neutral | 10 (14.49%) | 11 (26.83%) | |
| Agree | 3 (4.35%) | 3 (7.32%) | |
| 10. Nurses caring for an unstable patient should always contact me prior to contacting the CCRT. | | | |
| Disagree | 26 (37.68%) | 14 (34.15%) | 0.9668 |
| Neutral | 15 (21.74%) | 9 (21.95%) | |
| Agree | 28 (40.58%) | 18 (43.9%) | |
| 11. If a nurse contacted the CCRT prior to contacting me, I would be displeased. | | | |
| Disagree | 39 (56.52%) | 21 (51.22%) | 0.7457 |
| Neutral | 13 (18.84%) | 7 (17.07%) | |
| Agree | 17 (24.64%) | 13 (31.71%) | |
| 12. The CCRT and I work together to make treatment decisions for unstable patients. | | | |
| Disagree | 6 (8.7%) | 2 (4.88%) | 0.0369* |
| Neutral | 7 (10.14%) | 12 (29.27%) | |
| Agree | 56 (81.16%) | 27 (65.85%) | |
| 13. My initial management plan is consistent with the CCRT treatment decision. | | | |
| Disagree | 0 (0%) | 1 (2.44%) | 0.3393 |
| Neutral | 24 (34.78%) | 17 (41.46%) | |
| Agree | 45 (65.22%) | 23 (56.1%) | |

(*Continue*)

| Variable | Male N (%) | Female N (%) | p value |
|---|---|---|---|
| 14. Contacting the CCRT leads to the unnecessary transfer of some patients to the intensive care unit. | | | |
| Disagree | 56 (81.16%) | 32 (78.05%) | 0.2977 |
| Neutral | 11 (15.94%) | 5 (12.2%) | |
| Agree | 2 (2.9%) | 4 (9.76%) | |
| 15. The presence of a CCRT decreases my autonomy as a physician. | | | |
| Disagree | 46 (66.67%) | 36 (87.8%) | 0.0405* |
| Neutral | 17 (24.64%) | 3 (7.32%) | |
| Agree | 6 (8.7%) | 2 (4.88%) | |
| 16. Working with the CCRT in managing an unstable patient is a valuable educational experience. | | | |
| Disagree | 4 (5.8%) | 4 (9.76%) | 0.3702 |
| Neutral | 9 (13.04%) | 2 (4.88%) | |
| Agree | 56 (81.16%) | 35 (85.37%) | |
| 17. I have fewer opportunities to care for unstable floor patients because of the CCRT. | | | |
| Disagree | 40 (57.97%) | 18 (43.9%) | 0.1398 |
| Neutral | 16 (23.19%) | 17 (41.46%) | |
| Agree | 13 (18.84%) | 6 (14.63%) | |
| 18. I feel less prepared to care for unstable floor patients because of the CCRT. | | | |
| Disagree | 40 (57.97%) | 15 (36.59%) | 0.0844 |
| Neutral | 17 (24.64%) | 17 (41.46%) | |
| Agree | 12 (17.39%) | 9 (21.95%) | |
| 19. The CCRT improves the quality of care given to unstable floor patients. | | | |
| Disagree | 1 (1.45%) | 0 (0%) | 0.1701 |
| Neutral | 4 (5.8%) | 6 (14.63%) | |
| Agree | 64 (92.75%) | 35 (85.37%) | |
| 20. The CCRT increases the safety of inpatient care. | | | |
| Neutral | 3 (4.35%) | 5 (12.2%) | 0.146 |
| Agree | 66 (95.65%) | 36 (87.8%) | |
| 21. The CCRT has helped prevent Code Blue activations on my patients. | | | |
| Disagree | 5 (7.25%) | 3 (7.32%) | 0.9478 |
| Neutral | 17 (24.64%) | 11 (26.83%) | |
| Agree | 47 (68.12%) | 27 (65.85%) | |
| 22. I find the CCRT cooperative with the primary care team. | | | |
| Disagree | 2 (2.9%) | 1 (2.44%) | 0.3451 |
| Neutral | 11 (15.94%) | 11 (26.83%) | |
| Agree | 56 (81.16%) | 29 (70.73%) | |
| 23. Having a CCRT at KAMC has contributed to my job satisfaction as a resident. | | | |
| Disagree | 6 (8.7%) | 3 (7.32%) | 1 |
| Neutral | 15 (21.74%) | 9 (21.95%) | |
| Agree | 48 (69.57%) | 29 (70.73%) | |

Values are presented as *n* (%). *p* values were calculated using Fisher's exact test. KAMC, King Abdulaziz Medical City.

*$p < 0.05$.

for such patients. Professional autonomy was largely preserved, with only 7.3% reporting that the CCRT decreased their autonomy. Furthermore, 41.8% agreed that nurses should always contact the primary team before activating the CCRT; medical residents were more likely than surgical residents to support this approach, although the difference was not statistically significant ($p = 0.07$). In contrast, 54.5% disagreed that they would be displeased if a nurse activated the CCRT before contacting them.

### *Subgroup analyses*

The gender-based subgroup analysis is presented in Table 2.

1. Training level: Upper-level residents were significantly more likely than first-year residents to initiate a CCRT call ($p = 0.0002$) and to report collaborative decision-making with the CCRT ($p = 0.0048$). First-year residents were significantly less familiar with the objective activation criteria ($p =$

0.0294) and reported lower preparedness to manage unstable patients independently ($p = 0.0429$).

2. Gender: Male residents reported higher levels of collaborative management of critically ill patients than female residents (81.2% *vs.* 65.9%, $p = 0.0369$), whereas female residents were significantly more likely to disagree that the CCRT decreased their autonomy ($p = 0.0405$).
3. Specialty: No statistically significant differences were identified between medical and surgical residents in perceptions of patient safety, educational value, or professional autonomy (all $p > 0.05$). A nonsignificant trend toward greater job satisfaction associated with CCRT presence was observed among surgical residents (74.6% *vs.* 63.8%, $p = 0.056$).

## Discussion

This study evaluated residents' perceptions of the CCRT in relation to patient safety, education, professional autonomy, and clinical decision-making. Overall, respondents viewed the CCRT favorably: most considered CCRT involvement educationally valuable, and relatively few perceived reduced autonomy or fewer opportunities to care for unstable patients. These findings describe residents' perceptions only and do not establish an objective educational or patient-outcome benefit.

### *Perceived patient safety and quality of care*

Residents reported positive perceptions of the CCRT's contribution to patient care. Most agreed that the CCRT increased inpatient safety and improved care for unstable ward patients, and approximately two-thirds perceived that CCRT involvement had helped prevent Code Blue activations. These perceptions are broadly consistent with prior studies of rapid response systems [3,4] and systematic reviews reporting associations with reduced in-hospital cardiac arrest and mortality [2,5,6].

### *Educational value and resident autonomy*

Most respondents (82.7%) considered working with the CCRT a valuable educational experience. More than half (52.7%) disagreed that the CCRT reduced opportunities to care for unstable patients, and only 7.3% perceived decreased professional autonomy. Similar favorable perceptions of rapid response teams have been reported previously [3,4]. These results indicate that respondents generally perceived CCRT involvement as compatible with training and autonomy; they should not be interpreted as evidence of improved competence or independent decision-making.

### *Collaborative decision-making and professional autonomy*

Most residents reported collaborative treatment decision-making with the CCRT, while professional autonomy was generally perceived to be preserved. In the gender-based analysis, male residents more often reported collaborative management, whereas female residents more often disagreed that the CCRT decreased their autonomy. These exploratory subgroup findings should be interpreted cautiously because the study was not designed or powered specifically to evaluate gender differences.

### *Limitations*

This study has several limitations. It was conducted at a single tertiary hospital, which limits generalizability. The study relied on self-reported perceptions rather than objective measures of resident performance, autonomy, or patient outcomes. The response rate was 60.6%, so nonresponse bias is possible. Subgroup analyses involved relatively small numbers and should be considered exploratory.

The data reflect resident experiences during 2017-2018 within one intensivist-led CCRT model; team structures and residency practices may differ across institutions and may have evolved since data collection. Multicenter studies incorporating objective educational and patient-level outcomes are needed to clarify the relationship between rapid response systems and postgraduate medical training.

## Conclusion

Residents generally perceived the CCRT favorably with respect to patient safety, educational experience, and professional autonomy. Because this was a single-center perception survey, the findings should be interpreted as self-reported views rather than evidence that the CCRT objectively improves clinical competence, autonomy, or patient outcomes.

**List of Abbreviations**

| | |
|---|---|
| CCRT | Critical care response team |
| ICU | Intensive care unit |
| IP | Internet protocol |
| IRB | Institutional Review Board |
| KAMC | King Abdulaziz Medical City |
| SPSS | Statistical Package for the Social Sciences |

**Conflicts of interest**
The authors declare no conflict of interest.

**Funding**
No funding was received for this study.

**Consent for publication**
Informed consent was obtained from all participants before participation in this cross-sectional survey study. Participation was voluntary, and responses were collected anonymously.

**Ethical approval**
Ethical approval for this study was obtained from the Institutional Review Board of King Abdullah International Medical Research Center, Riyadh, Saudi Arabia (Approval No. RC16/121/R) on 19 September 2016.

**Authors' contributions**
Sahar Aldakhil: Conceptualization, methodology, investigation, writing – original draft, writing – review and editing.

Norah Alajmi: Methodology, investigation, data curation, writing – review and editing.
Enar Alotaibi: Investigation, data curation, writing – original draft, writing – review and editing.
Amal Alfarhan: Investigation, data curation, writing – review and editing.
Saad Alsaawy: Methodology, formal analysis, writing – review and editing.
Ibrahim Albabtain: Conceptualization, methodology, supervision, writing – review and editing.
Abdulla Alsayyari: Conceptualization, methodology, supervision, project administration, writing – review and editing.

**Data availability**

The anonymized datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

**Declaration of Generative AI and AI-Assisted Technologies in the Writing Process**

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to assist with language editing, improving clarity and readability, and formatting. The AI tool was not used to generate or analyze study data or to make scientific or clinical interpretations. All AI-assisted content was reviewed and edited by the authors, who take full responsibility for the final content of the manuscript.

**Author details**

Norah Alajmi[1], Sahar Aldakhil[2], Enar Alotaibi[3], Amal Alfarhan[4], Saad Alsaawy[5], Ibrahim Albabtain[6], Abdulla Alsayyari[7]

1. Assistant Consultant, Department of Otorhinolaryngology Head, Neck Surgery Security Forces Hospital, Riyadh, Saudi Arabia
2. Assistant Consultant, Department of Orthopedic Surgery, Assistant Consultant National Guard Hospital, Riyadh, Saudi Arabia
3. College of Medicine, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia
4. Department of Pediatric Anesthesia, King Abdullah Specialized Children Hospital, Riyadh, Saudi Arabia
5. Assistant Professor of Surgery/Consultant Colorectal Surgery at Prince Sattam bin Abdulaziz University, Kharj, Saudi Arabia
6. Consultant Trauma & Acute Care Surgery, Laparoscopic and Abdominal Wall Reconstruction, Hernia Expert, Director of Trauma Research Program at National Guard Hospital, Riyadh, Saudi Arabia
7. Head of Nephrology, Transplantation at the King Abdulaziz Medical City, Riyadh, Saudi Arabia

*Supplementary content (If any) is available online.*

**References**

1. Jung B, Daurat A, De Jong A, Chanques G, Mahul M, Monnin M, et al. Rapid response team and hospital mortality in hospitalized patients. Intensive Care Med. 2016;42(4):494–504. https://doi.org/10.1007/s00134-016-4254-2
2. Maharaj R, Raffaele I, Wendon J. Rapid response systems: a systematic review and meta-analysis. Crit Care. 2015;19(1):254. https://doi.org/10.1186/s13054-015-0973-y
3. Butcher BW, Quist CE, Harrison JD, Ranji SR. The effect of a rapid response team on resident perceptions of education and autonomy. J Hosp Med. 2015;10(1):8–12. https://doi.org/10.1002/jhm.2270
4. Sarani B, Sonnad S, Bergey MR, Phillips J, Fitzpatrick MK, Chalian AA, et al. Resident and RN perceptions of the impact of a medical emergency team on education and patient safety in an academic medical center. Crit Care Med. 2009;37(12):3091–6. https://doi.org/10.1097/CCM.0b013e3181b09027
5. Winters BD, Weaver SJ, Pfoh ER, Yang T, Pham JC, Dy SM. Rapid-response systems as a patient safety strategy: a systematic review. Ann Intern Med. 2013;158(5 Pt 2):417–25. https://doi.org/10.7326/0003-4819-158-5-201303051-00009
6. Solomon RS, Corwin GS, Barclay DC, Quddusi SF, Dannenberg MD. Effectiveness of rapid response teams on rates of in-hospital cardiopulmonary arrest and mortality: a systematic review and meta-analysis. J Hosp Med. 2016;11(6):438–45. https://doi.org/10.1002/jhm.2554
7. Vygotsky LS. Mind in society: the development of higher psychological processes. Cambridge, MA: Harvard University Press; 1978.
8. Kilminster S, Cottrell D, Grant J, Jolly B. AMEE Guide No. 27: effective educational and clinical supervision. Med Teach. 2007;29(1):2–19. https://doi.org/10.1080/01421590701210907
9. Conner SM, Choi N, Fuller J, Daya S, Barish P, Rennke S, et al. Trainee autonomy and supervision in the inpatient clinical learning environment. Clin Teach. 2025;22(1):e13844. https://doi.org/10.1111/tct.13844
10. Dubov A, Fraenkel L, Seng E. The importance of fostering ownership during medical training. Am J Bioeth. 2016;16(9):3–12. https://doi.org/10.1080/15265161.2016.1197338
11. Cooper A, Allen SL. Resident autonomy. London, UK: IntechOpen; 2019. https://doi.org/10.5772/intechopen.84235.
12. Crockett C, Joshi C, Rosenbaum M, Suneja M. Learning to drive: resident physicians' perceptions of how attending physicians promote and undermine autonomy. BMC Med Educ. 2019;19(1):293. https://doi.org/10.1186/s12909-019-1732-6
13. Olmos-Vega FM, Dolmans DH, Vargas-Castro N, Stalmeijer RE. Dealing with the tension: how residents seek autonomy and participation in the workplace. Med Educ. 2017;51(7):699–707. https://doi.org/10.1111/medu.13326
14. Shim S, Kim H, Lee YM. Scoping review: exploring residents' views of supervisor entrustment and its effect on learning and professional development. Korean J Med Educ. 2024;36(1):81–98. https://doi.org/10.3946/kjme.2024.286
15. Landsperger JS, Semler MW, Wang L, Byrne DW, Wheeler AP. Outcomes of nurse practitioner-delivered critical care: a prospective cohort study. Chest. 2016;149(5):1146–54. https://doi.org/10.1016/j.chest.2015.12.015