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Letter to the Editor

Advanced practice providers in critical care improve team performances. A post-hoc analysis of the BASIC trial

To the Editor,

Advanced practice providers (APP), physician assistants and acute care nurse practitioners, in critical care aim to improve quality and continuity in critical care, especially in rural areas where they can overcome physician shortages. We assessed the non-technical skills of APPs and physicians as leaders of rapid response teams (RRT) during simulated scenarios with deteriorating patients of the BASIC trial.¹

The BASIC-trial is a multicenter simulation study evaluating the non-technical skills of 32 leaders of rapid response teams with or without a digital checklist application.¹ The high-fidelity simulation center in the Netherlands assessed these skills in nine ICU residents during 52 scenarios and in four ICU related APPs during 22 scenarios. The number of omitted predetermined critical steps were compared between both groups, such as administering oxygen, fluids and antibiotics. Non-technical skills were evaluated by the Mayo High Performance Teamwork Scale and the FoNTS-Matrix assessing four domains: Situational Awareness, Decision Making, Task Management, and Teamwork each with associated subcategories. In addition, the leaders' performance in these domains was assessed by team members via a questionnaire after each scenario.

The mean years of experience for registered physicians was 2.25 years (range 0.3–5.0) which included an ICU rotation. The four APPs worked as registered critical care APPs for respectively one, three, seven and >10 years.

The residents omitted per scenario one critical step more than APPs ($p = .005$). APPs scored better than the residents in three subcategories of the FoNTS, while the two most experienced APPs scored higher for three of the four domains (Fig. 1). The twenty-six team members assessed that the APPs performed significantly better than residents for situational awareness (3.7 vs 4.2 ($p < .001$)), decision making (3.8 vs 4.2 ($p = .012$)), task management (3.8 vs 4.1 ($p = .011$)) and teamwork (4.1 vs 4.4 ($p = .019$)). APPs scored similar for communication (4.0 vs 4.2 ($p = .09$)).

Recent research on APPs in critical care often focused on the evaluation of clinical patient-related outcomes and performances of these APPs in conjunction with a coordinating medical specialist.^{2–4}

In this study the non-technical skills of APPs and residents as leaders of a RRT were assessed without this additional consultation. APPs performed better than residents in several subcategories and

omitted overall less predefined critical steps. The latter may be explained by their ICU-nursing background with bedside experience. Moreover, their team members assessed their performance to be better in almost all non-technical-skills domains. These differences increased when the residents were compared with the two most experienced APPs. Considering the fact that the emergency care within hospitals is often delivered by junior clinicians, these results suggest that the dedication, continuity of care and bedside experience of APPs in critical care can improve the quality and teamwork of critical care teams. More research on this topic is required to draw firm conclusions as we evaluated a limited number of participants in a simulation environment.

This study implies that APPs in a critical care setting can be a valuable workforce that improves the team performance in contrast to rotating residents. More experienced APPs seem to perform even better in non-technical skills in critical care.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. De Bie Dekker AJR, Dijkmans JJ, Todorovac N, et al. Testing the effects of checklists on team behaviour during emergencies on general wards: An observational study using high-fidelity simulation. *Resuscitation* 2020;157:3–12.
2. Kreeftenberg HG, Aarts JT, Bindels A, van der Meer NJM, van der Voort PHJ. Procedures performed by advanced practice providers compared with medical residents in the ICU: A prospective observational study. *Crit Care Explor* 2020;2:e0101.
3. Kreeftenberg HG, Pouwels S, Bindels A, de Bie A, van der Voort PHJ. Impact of the advanced practice provider in adult critical care: A systematic review and meta-analysis. *Crit Care Med* 2019;47:722–30.
4. Gupta S, Balachandran M, Bolton G, Pratt N, Molloy J, Paul E, et al. Comparison of clinical outcomes between nurse practitioner and registrar-led medical emergency teams: a propensity-matched analysis. *Crit Care* 2021;25:117.

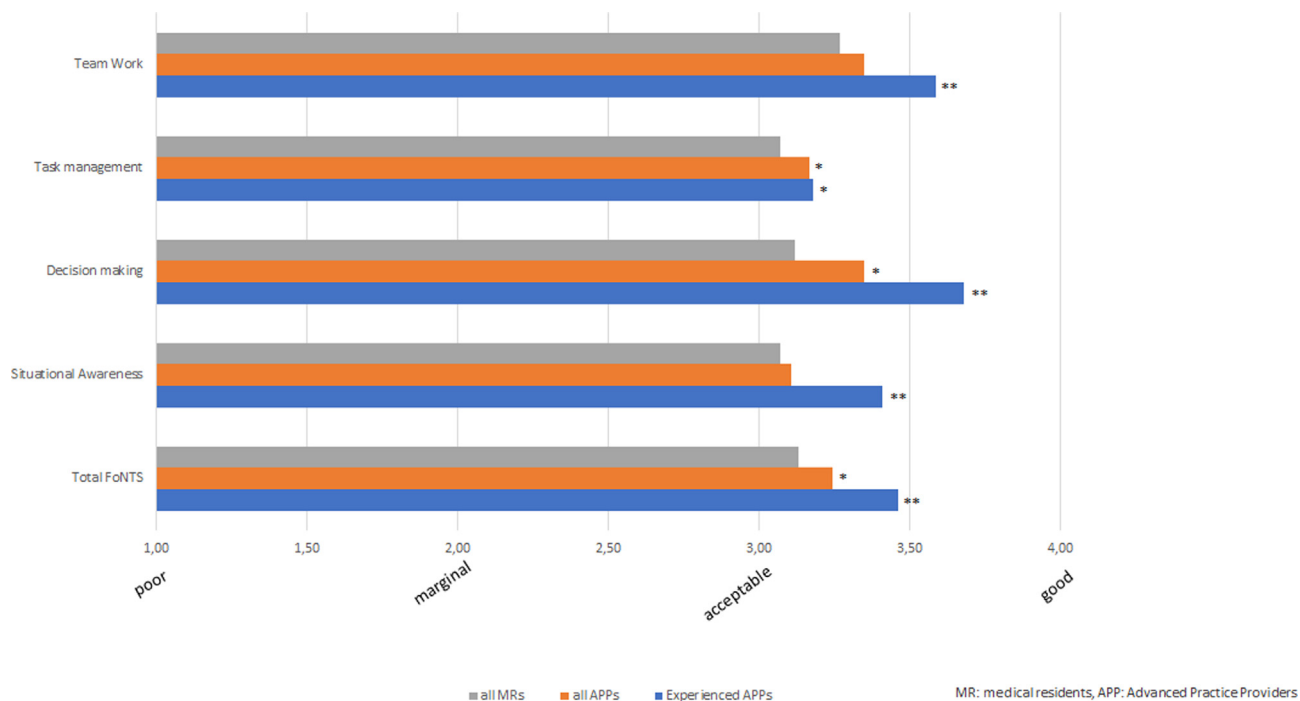


Fig. 1 – Mean FoNTS-matrix performance scores of APPs and physicians. *statistical significance in a subcategory ($p < .05$), ** statistical significance for a complete domain ($p < .05$).

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