Citation for published version:

Publication date:
2022

Link to publication

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Psychophysiological fidelity: A comparative study of stress responses to real and simulated clinical emergencies
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Clinicians experience stress in acute emergencies, reflected in psychophysiological responses measurable by self-report and cardiovascular monitoring. The biopsychosocial model of challenge and threat proposes that stress responses are modulated by cognitive appraisal of demands and resources, which may in turn affect performance.1 Simulation training is used extensively to prepare clinicians to manage emergencies, with fidelity generally considered in terms of accurate representation of real-world cues and stimuli.2 It is unknown whether simulation generates similar psychophysiological responses to normal clinical practice.

In this within-subjects study, challenge-threat appraisals, anxiety and heart rate variability (HRV) were recorded using validated tools in simulated and real neonatal emergencies. Linear mixed models were used to analyse parameters by time-point (baseline, anticipation, during the event, recovery) and setting (real, simulation). Twelve participants took part in 61 events. Significant differences were identified between settings. Simulation led to greater reported anxiety and increased likelihood of threat appraisal. High frequency power, a component of HRV associated with parasympathetic tone, reduced less and tended towards earlier recovery in simulation.

Withdrawal of parasympathetic tone is educationally and clinically significant, given associations with cognitive performance, social functioning and emotional and health regulation.3 Possible mechanisms for observed differences include learner expectations and the effect of debrief and feedback in simulation. While simulation may facilitate interventions to optimise stress responses, it will be important to confirm findings in real clinical settings.

REFERENCES