The Use of PPE During Pediatric Resuscitation: Which Tasks Are Most Affected? The Results of a Survey During a Simulation Trial

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Background

- Personal protective equipment (PPE) is worn by healthcare providers (HCPs) to protect them from toxic or infectious agents during clinical care
- Little is known about the impact of the use of PPE on clinical performance during care of critically ill children
- The rarity of clinical events warranting the use of PPE in pediatrics means that few pediatric HCPs have had any clinical experience in PPE use

Hypothesis

HCPs will report different levels of comfort for PPE use during simulated resuscitation based on clinical background and specific psychomotor tasks.

Methods

- Prospective multicenter observational study
- HCPs completed two study sessions separated by at least two weeks
  - Session 1: Normal attire
  - Session 2: Full PPE
- Subjects completed a set of psychomotor tasks simulating care of a critically ill patient
  - BVM, intubation, defibrillation, IV placement, fluid administration via push-pull, and CPR
- Tasks were assigned based on scope of practice.
- Time to completion of each task was documented
- Following each study session, subjects completed Likert-scaled questions regarding their perceived comfort or difficulty
- They were also asked to rank tasks according to difficulty
- Responses to survey questions are expressed as medians and interquartile ranges (IQR); rankings of procedures by level of difficulty are reported descriptively
- Univariate analysis between hospital and preshospital HCP groups was done using nonparametric methods (Wilcoxon rank sum)

Results

	Baseline Pre-hospital	PPE Pre-hospital	Baseline hospital	PPE hospital
1.I believe/felt nonsterile gloves interfere with procedures	1.0 (1.0,2.0)	4.0 (2.5,4.0)	2.0 (1.0,2.0)	2.0 (2.0,3.0)
2.I believe/felt that full body PPE suits interfere with procedures	4.0 (3.0,5.0)	4.0 (3.5,4.0)	4.0 (4.0,4.0)	4.0 (3.0,4.0)
3.I find/felt PPE makes it hard for me to focus on my procedure	3.0 (2.0,4.0)	2.0 (2.0,4.0)	3.0 (2.0,4.0)	3.0 (2.0,4.0)
4.I find PPE claustrophobic	1.0 (1.0,2.0)	1.5 (1.0,2.0)	3.0 (2.0,4.0)	2.0 (2.0,3.0)
5.I believe/felt I will be/was slower performing procedures in full-body PPE	4.0 (4.0,5.0)	4.0 (4.0,5.0)	4.0 (4.0,5.0)	4.0 (3.0,4.0)
6.I feel/felt prepared to appropriately don PPE	5.0 (4.0,5.0)	5.0 (4.0,5.0)	4.0 (3.0,5.0)	4.0 (4.0,5.0)

1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree

- 109 subjects completed both study sessions
- Survey question responses are shown stratified by provider group and study session
- Among all HCPs, CPR was most frequently ranked as most difficult
- At baseline 89 (70.1%) of HCPs agreed or strongly agreed with the statement regarding preparedness to wear PPE.
  - Of these 89 subjects, 72 provided survey responses during their second visit
  - 18/72 (17%) of these subjects reported lower preparedness than during the first study session
- Prehospital HCPs reported significantly greater preparedness for donning PPE than hospital level HCPs (median 5 versus 4, $p < 0.001$)

Conclusions and Next Steps

- We identified that PPE, regardless of HCP background, was felt to interfere with acute care procedures in simulated pediatric patients
- CPR was most frequently reported as the most challenging procedure to perform in PPE
- Prehospital HCPs reported greater confidence in their preparedness to don PPE than hospital providers
- This data suggests further efforts are needed to prepare HCPs for PPE use and to address preconceptions that these clinicians may have that would impact patient care

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