



Prevalence and Effect of Simulation Substitution on Paramedic Educational Program Success: A National Examination

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Introduction: Paramedic education programs require sufficient rigor to prepare students to perform complex, life-saving skills. Often, exposure to direct clinical experiences is not available and simulation is substituted. However, the extent of simulation substitution and its effect on program outcomes are unknown. Our objective was to describe the prevalence of simulation substitution for clinical skills and its effect on paramedic educational program success.

Methods: This is a cross-sectional evaluation of all paramedic educational programs graduating students in 2019, using annual report data from The Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP). This dataset includes detailed program metrics, outcomes, as well as training and administrative infrastructure. Descriptive statistics were calculated. Simulation substitution was assessed using a composite of 11 commonly taught adult/pediatric clinical skills during clinical and field internships. A multivariable logistic regression model (OR, 95% CI) was used to describe the effect of the program characteristics on first-time certifying exam success, defined as a program pass rate above 75%. The model was adjusted for the number of full-time faculty, class size, attrition rate, hours of instruction, and frequency of simulation substitution.

Results: A total of 690 Commission on Accreditation of Allied Health Education Programs accredited programs or those holding the CoAEMSP's Letter of Review responded to the survey, with 640 programs meeting inclusion criterion. More than 60% (407/640) reported using simulation to substitute for at least one clinical skill. Simulation was substituted in all 11 skill categories, at least in-part, by 21% (133/640) of programs. Odds of programs reporting a first-time certifying exam pass rate above 75% increased with a class size larger than 12-17 students (18-29 students: 2.39, 1.49-3.83; 30+ students: 2.23, 1.36-3.65). Odds decreased with simulation substitution of greater than 5 skills (6-7 skills: 0.47, 0.28-0.77; 8-10 skills: 0.55, 0.34-0.90; 11 skills: 0.56, 0.36-0.88).

Conclusion: The use of simulation as a substitute for clinical skills is widespread in paramedic educational programs and may lead to decreased odds of first-time program examination success if used frequently. Future research should examine individual outcomes to assess the effect of simulation substitution on entry-level competency.

