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Predictors of failure in the Advanced Trauma Life Support course

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Abstract

BACKGROUND: Over 1 million healthcare providers have participated in the Advanced Trauma Life Support course. No studies have evaluated factors that predict course performance. This study aims to identify these predictors.

METHODS: All participants taking the course at 2 centers over a 4-year period were identified. Demographics, background, and performance data were extracted. Participants who failed were compared with those who did not. Stepwise logistic regression analysis was used to identify independent risk factors for failure.

RESULTS: Seven hundred forty-four healthcare providers participated in the course; 89.5% passed and 10.5% failed. Failure rates were lowest (.0%) among Trauma/Surgical Critical Care (SCC) providers and highest among pediatric providers (28.6%). Stepwise logistic regression identified age greater than 55, English as a second language, pretest score less than 75, and non-Trauma/SCC and non-Emergency Medicine background as predictors of failure.

CONCLUSIONS: A failure rate of 10.5% was demonstrated among the course participants. Age greater than 55, English as second language, pretest score less than 75, and non-Trauma/SCC and non-Emergency Medicine backgrounds were associated with failure. These subgroups may benefit from performance improvement measures.

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Table 1 Demographic and professional background data between study groups

	Total (n = 744)	Failed (n = 78)	Passed (n = 666)	*P* value
Age (years) > 55, n (%)	32 (4.3)	7 (9.0)	25 (3.8)	<.001*
Male, n (%)	531 (71.4)	53 (67.9)	478 (71.8)	.480
M.D. or D.O., n (%)	709 (95.3)	71 (91.0)	638 (95.8)	.068
ESL, n (%)	81 (10.9)	25 (32.1)	56 (8.4)	<.001*
Refresher course, n (%)	185 (24.9)	8 (10.3)	177 (26.6)	.002*
Pretest score, mean ± SD	80.5 ± 11.0	73.7 ± 12.4	81.3 ± 10.6	<.001*
Pretest score ≥ 75%, n (%)	486 (68.1)	31 (41.9)	455 (71.1)	<.001*
Resident, n (%)	345 (60.5)	40 (76.9)	305 (58.9)	.011*
Fellow, n (%)	12 (2.1)	0 (.0)	12 (2.3)	.267
Attending, n (%)	213 (37.4)	12 (23.1)	201 (38.8)	.025*

The *P* values for categorical variables were derived from chi-square or Fisher's exact tests; *P* values for continuous variables were derived from unpaired Student *t* or Mann–Whitney *U* tests. In the analysis of failure rates according to the level of training, a total of 570 M.D. or D.O. with available data were included in the analysis.

D.O. = Doctor of Osteopathy; ESL = English as second language; M.D. = Doctor of Medicine; SD = standard deviation.

**P* values are significantly different ($P < .05$).

Since its introduction in 1978, the Advanced Trauma Life Support (ATLS) course has been taught to over one million doctors in more than 60 countries worldwide. In the United States alone, over 500,000 healthcare providers from various specialties and diverse medical backgrounds have taken the course.[1] The goal of this course is to provide an effective, safe, and structured approach to management of patients who have sustained traumatic injuries. In previous examinations, the implementation of an ATLS program has been shown to improve trauma patient outcomes in a variety of trauma systems both within the United States and worldwide.[2–4] More recently, competence in ATLS has become a core component of certain postgraduate healthcare curricula.[5] ATLS certification is now required for starting postgraduate training among some surgical and nonsurgical training programs including general surgery, orthopedics, emergency medicine, family practice, and pediatrics. For trauma care providers, the course offers a unique opportunity to enhance academic and practical knowledge on trauma patient resuscitation, initial management, and workup.

As the pool and diversity of prospective applicants expand, it is important to identify factors associated with successful performance and those that may suggest an impediment. A review of the current literature failed to identify contemporary studies that have assessed participant variables associated with failure in the ATLS course. Identification of these factors may allow for preventive strategies to maximize participant success. Hence, the purpose of this study was to identify predictors of failure in the ATLS course.

Patients and Methods

A retrospective review of all ATLS participant courses sponsored by the Arizona and California state's American College of Surgeons Committee on Trauma at 2 distinct sites (University of Arizona Medical Center [UMC], Tucson, AZ, and Loma Linda University [LLU] Medical Center, Loma Linda, CA) was performed. All participants taking the ATLS course between January 1, 2007 and December 31, 2011 were enrolled.

The ATLS course is composed of a cognitive skill test including 40 multiple choice questions constructed by trauma experts and a clinical skills assessment in which 2 standardized trauma patient scenarios using live patient models are presented. These patient encounters last 15 minutes each during which the testees are judged by their appropriateness and thoroughness to trauma workup by a checklist system.

Data including sex, age, citizenship status, first spoken language, academic degrees, fellowships, current employment, and course participant performance were extracted. Failure in the ATLS participant course was defined as a written test score less than 75% or a performance below standards in the simulated practical section scored by an ATLS-certified instructor. Participants who failed ATLS course were compared with those who did not. Dichotomous variables were compared using chi-square or Fisher's exact tests, while continuous variables were compared using unpaired Student *t* or Mann–Whitney *U* tests. Values are reported as means ± standard deviation for continuous variables and as percentage for categorical variables.

Factors potentially associated with failure in the ATLS course were examined for their effect using bivariate analysis. To identify independent risk factors for failure in the ATLS course, factors with *P* value less than .2 on bivariate analysis were entered in a stepwise logistic regression. The summary data are presented as a raw percentage or mean ± standard deviation. The *P* values were significantly different at *P* less than .05.

All analyses were performed using the Statistical Package for Social Sciences (SPSS Mac), version 18.0 (SPSS, Inc, Chicago, IL).