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# Understanding Program Attrition: The Influence of Entry Requirements and Student Resources

Shea L. van den Bergh MPH[1], Jacob C. Kamholz MPH, NRP[1,2], Jonathan R. Powell MPA, NRP[1,3,4], Christopher B. Gage MHS, NRP[1,3], Lisa Collard[5], Michael G. Miller EdD, RN[5], Ashish R. Panchal MD, PhD[1,3,6]

[1]*National Registry of Emergency Medical Technicians, Columbus, Ohio, USA*
[2]*Division of Health Services Management & Policy, The Ohio State University College of Public Health, Columbus, Ohio, USA*
[3]*Division of Epidemiology, The Ohio State University College of Public Health, Columbus, Ohio, USA*
[4]*ImageTrend Inc., Clinical and Research Services, Egan, Minnesota, USA*
[5]*Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions, Rowlett, Texas, USA*
[6]*Department of Emergency Medicine, The Ohio State University Wexner Medical Center, Columbus, Ohio, USA*

**Correspondence**

Shea L. van den Bergh, MPH, National Registry of Emergency Medical Technicians, 6610 Busch Boulevard, Columbus, OH 43229, USA. Email: sheab@nremt.org

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## Abstract

**Objectives:** Paramedic educational program attrition contributes to a loss of potential clinicians from the emergency medical services (EMS) workforce. Programs have developed entry requirements and resources to enhance retention, although their impact is unclear. Our objective is to evaluate program entry requirements and resources and their association with high educational program attrition.

**Methods:** We conducted a cross-sectional survey evaluating program entry requirements, benefits, resources, and attrition in paramedic educational programs using the 2023 Committee on Accreditation of Educational Programs for the EMS Professions (CoAEMSP) annual report. Included are all paramedic programs that reported >4 enrolled students with at least 1 graduating cohort in 2021. Descriptive statistics were calculated (median and IQR), and proportional differences (PDs) were used to evaluate differences in prevalence between attrition groups.

**Results:** We included 629 programs. The median attrition rate was 20% (10.6%-28.6%), with 148 programs (23.5%) reporting high attrition. Programs with high attrition were more likely to have open enrollment policies (PD, −10.9%; 95% CI, −20.0 to −1.7). In contrast, low-attrition programs more frequently required preadmission interviews (PD, 10.3%; 95% CI, 1.6 to 19.1), medical knowledge exams (PD, 11.5%; 95% CI, 3.2 to 19.8), and medical prescreens (PD, 11.6%; 95% CI, 2.7 to 20.5) and offered daycare (PD, 4.6%; 95% CI, 1.4 to 7.8).

*abstract continues*

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**Abstract (continued)**

Conclusion: We found substantial variability in baseline program entry requirements and the availability of common student resources. Paramedic educational programs should consider the combined impact of entry requirements and student support systems when developing strategies to improve retention.

Keywords: *emergency medical services, paramedic education, certification, attrition, accreditation*

## 1 INTRODUCTION

### 1.1 Background

In the United States , paramedics hold the highest nationally recognized certification for emergency medical service (EMS) clinicians providing advanced life support in prehospital settings.[1] They serve as an important link in the continuum of healthcare by delivering timely and critical interventions that can significantly impact patient outcomes.[2,3] In preparation for this role, paramedic educational programs train new learners through an intensive program, which is followed by a national certification and licensure process.[1,4,5] These paramedic educational programs must be accredited and have consistent annual evaluations to maintain a high-quality training experience to prepare learners.[6]

### 1.2 Importance

However, one challenge across paramedic educational programs in the United States is the attrition of learners from these programs.[7–9] Previous studies have found that nearly 25% of paramedic programs experience high attrition, which is known to represent the largest loss of the potential EMS workforce.[3,10] Although the reasons for individual attrition are often unknown, many paramedic educational programs have implemented entry requirements as well as offering additional support and resources to help reduce attrition.[11] This is an approach utilized by other allied health fields with improvement in retention.[12,13] Although educational standards exist for content and program structure, standards regarding student entry, benefits, or resources do not exist.[1,6] Additionally, it is unclear whether these strategies impact paramedic educational program attrition.

### 1.3 Goals

As the entry of new EMS clinicians is critical to the overall health of the workforce, identifying strategies to mitigate loss through attrition is critical. Our objective is to evaluate the relationship between program entry requirements, student resources, and high attrition rates in paramedic educational programs.

## 2 METHODS

### 2.1 Design, Setting, and Selection of Programs

We conducted a cross-sectional evaluation of paramedic educational program attrition using the 2023 Committee on Accreditation of Educational Programs for the EMS Professions (CoAEMSP) annual report.[14] The standard annual report asks questions pertaining to program characteristics and outcomes.[15] In addition to the standard report, programs are asked additional questions that vary annually. The questions pertaining to this survey focused on program entry requirements and student resources offered to determine whether there is an association between these and program attrition (Supplementary Appendix 1). The American Institutes of Research Institutional Review Board (Arlington, Virginia) evaluated this study and determined it to be exempt (EX00440).

Program directors are required to complete this annual report in its entirety. Included in this study were all paramedic educational programs that enrolled students in 2021, with either accreditation from the Commission on Accreditation of Allied Health Education Programs (CAAHEP; Seminole, Florida) or a Letter of Review (LOR), issued by CoAEMSP, which indicates that a program is on the pathway to accreditation. This accreditation process maintains a requirement of a 100% response rate for all paramedic educational programs because failure of timely submission may result in penalties such as fees or administrative probation.[14] The annual report is collected 2 years after completion of the educational year to ensure that all candidates have the requisite 2-year certification testing period. Therefore, the 2023 CoAEMSP Annual Report captured data for the paramedic educational programs with graduates in 2021, reported to CoAEMSP in 2023. For this analysis, we included programs reporting at least one graduating cohort, with at least 5 students enrolled from the 2021 cohort.

Every annual report contains a set of standard program demographic questions, previously described, along with a unique set of survey questions that differ by year.[15] In this annual survey, the unique set of survey questions evaluated program entry requirements and student resources that may support student retention (eg, open enrollment, transportation,

## The Bottom Line

Paramedic educational programs are an important part of the entry of emergency medical services (EMS) clinicians into the EMS workforce. Programs have developed entry requirements and offered benefits and resources to help enhance retention. We evaluated 629 programs' entry requirements, benefits, and resources, and their proportional differences between programs with high or low attrition. We found that open enrollment, as well as some entry requirements, and resources differed between programs with high or low attrition. Programs should consider the impact of entry requirements, benefits, and resources when developing strategies to improve retention.

daycare, and tutoring). Programs also report their Resource Assessment Matrix (RAM) annually. This matrix measures the resource availability of 10 educational program components (faculty, medical director, support personnel, curriculum, financial resources, facilities, clinical resources, field internship resources, learning resources, and physician interaction).[9,16] Although no formal standards exist to determine high-performing programs, those with a RAM of 80% or higher are generally seen as programs with enough resources to ensure a well-functioning program.[3]

### 2.2 Measurements/Outcomes

The primary outcome of this study was the percent proportional difference between programs with high attrition, defined as ≥30% of enrolled students in a cohort not graduating from the educational program, and low attrition, defined as <30% of enrolled students in a cohort not graduating from the educational program, for each program resource and requirement. This cutoff was set to remain in line with the benchmark retention threshold set by CoAEMSP at 70% and used in the literature previously.[3,6,11,17]

Exposures for our analysis were paramedic educational program entry requirements and resources available to students and were measured dichotomously (yes and no). Survey questions asked programs which entry requirements they had, including minimum language proficiency, math level, reading level, medical skills, physical ability level, medical knowledge exam, minimum aptitude test, minimum grade point average (GPA), medical prescreen, preadmission interview, orientation, and none of the above. Programs were asked if they provided any of the following resources at no additional cost: career planning, daycare, counseling services, meals, physical fitness assistance, transportation assistance, uniform allowance, tutoring, paid employment, health benefits, tuition assistance, or health maintenance. Health maintenance was defined as access to primary and acute care services. Additionally, programs were also asked to indicate if they had an open enrollment policy. Open enrollment is defined as programs that accept all applicants without selective admission criteria.

Program characteristics were collected for the graduating cohorts. Total student enrollment per program was treated as a continuous variable. Total months to completion of the paramedic educational program were grouped into 3 categories (<12 months, 12 months, and >12 months). Total instructional hours were measured as a continuous variable and represented the cumulative sum of didactic, laboratory, field experience, clinical experience, and capstone internship hours. RAM was defined as a dichotomous variable (yes/no) if the program met the 80% RAM minimum in 10 different program resource categories. National certification pass rates, measured as a continuous variable, were collected as first-attempt and cumulative third-attempt for the program. Pass rates were calculated by each program for students who attempted the national certification exam and were reported by each program in the survey. Program locations were defined using National Association of State Emergency Medical Services Officials (NASEMSO) regions (East, South, Great Lakes, Western Plains, and West).

### 2.3 Data Analysis

Descriptive statistics, including median and IQR, were calculated for program characteristics. Proportional differences with 95% CIs, presented in percentages, were used to evaluate the item-level differences in prevalence between attrition groups, comparing programs with low attrition to programs with high attrition, offering interpretable estimates of how each characteristic differs between groups.[18–20]

## 3 RESULTS

A total of 629 paramedic educational programs (88.6%) met inclusion criteria for this study (Fig). The overall median attrition rate was 20.0%, with 148 programs (23.4%) experiencing the outcome of interest—high attrition (Table 1). Programs with low attrition (<30%) had a median enrollment of 20 students (IQR, 12-31), with the program lasting for >12 months (41.4%), and a median total instruction time of 1200 hours (IQR, 1008-1347 hours). Programs with high attrition (≥30%) had a median enrollment of 16 students (IQR, 11-28), with most programs lasting for >12 months (57.4%). The median first-attempt pass rates were similar between programs with low and high attrition (73.0%

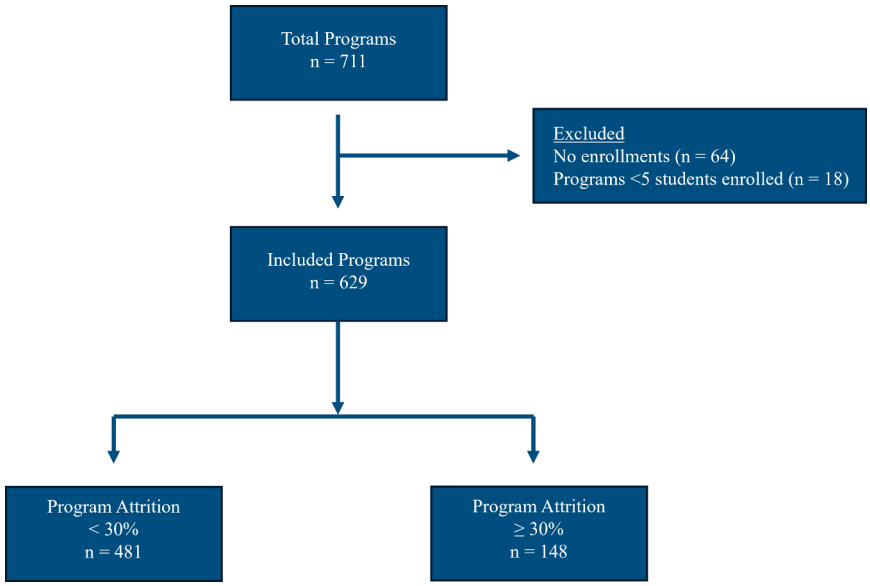


**FIGURE.** Flowchart showing total programs surveyed with included and excluded programs.

[IQR,58.0%-86.0%] and 74% [IQR, 50.0%-88.0%], respectively) (Table 1). This pattern held true for cumulative third-attempt pass rates as well (median, 0.91, [IQR, 0.79-1.00]; median, 0.91, [IQR, 0.75-1.00]). Regions with the highest proportion of program attrition ≥30% were located in the East and South regions, whereas the lowest was in the West.

An open enrollment policy requirement was reported by 258 programs (41.0%) (Table 2). In programs with high attrition, there was a higher prevalence of programs with open enrollment (PD, −10.9%; CI, −20.0% to −1.7%). Additionally, over half of the programs reporting open enrollment (149, 57.8%) also reported having 3 or more entry requirements (Table S1).

Entry requirements were variable based on type. A minimum reading competency level was the most common entry requirement, reported by 400 programs (63.6%). Approximately half of the programs required a minimum math competency level (371, 59.0%), a program orientation (349, 55.5%), a minimum level of language

**TABLE 1.** Program demographics and characteristics of study population by attrition level.

| | **Program attrition, <30% *N* = 481** | **Program attrition, ≥30% *N* = 148** |
|---|---|---|
| Total students enrolled, median (IQR) | 20 (12-31) | 16 (11-28) |
| Total months to completion, *n* (%) | | |
| <12 mo | 124 (25.8) | 19 (12.8) |
| Exactly 12 mo | 158 (32.8) | 44 (29.7) |
| >12 mo | 199 (41.4) | 85 (57.4) |
| Meets 80% RAM, *n* (%) | 356 (74.0) | 96 (64.9) |
| Total hours of instruction, median (IQR) | 1200 (1088-1347) | 1168 (1086-1295) |
| First attempt pass rate (%), median (IQR) | 73 (58-86) | 74 (50-88) |
| Cumulative third attempt pass rate (%), median (IQR) | 91 (79-100) | 91 (75-100) |
| NASEMSO region (row percent), *n* (%) | | |
| East | 75 (69.4) | 33 (30.6) |
| South | 172 (69.4) | 76 (30.7) |
| Great Lakes | 107 (83.0) | 22 (17.1) |
| Western Plains | 61 (85.9) | 10 (14.1) |
| West | 66 (90.4) | 7 (9.6) |

NASEMSO, National Association of State Emergency Medical Services Officials; RAM, Resource Assessment Matrix.

**TABLE 2.** Entry requirements by attrition level with proportional differences, presented in percentages, comparing programs with low attrition to programs with high attrition.

| | Program attrition, <30% N = 481 | Program attrition, ≥30% N = 148 | PD (95% CI) |
|---|---|---|---|
| Open enrollment policy, *n* (%) | 185 (38.5) | 73 (49.3) | −10.9% (−20.0% to −1.7%) |
| Entry requirements, *n* (%) | | | |
| Evidence of English fluency | 241 (50.1) | 74 (50.0) | 0.1% (−9.1% to 9.3%) |
| Evidence of mathematics proficiency | 284 (59.0) | 87 (58.8) | 0.3% (−8.8% to 9.3%) |
| Evidence of reading proficiency | 306 (63.6) | 94 (63.5) | 0.1% (−8.8% to 9.0%) |
| Medical knowledge examination | 182 (37.8) | 39 (26.4) | 11.5% (3.2% to 19.8%) |
| Medical prescreen | 228 (47.4) | 53 (35.8) | 11.6% (2.7% to 20.5%) |
| Medical skills examination | 67 (13.9) | 16 (10.8) | 3.1% (−2.8% to 9.0%) |
| Minimum aptitude test score | 106 (22.0) | 34 (23.0) | −0.9% (−8.7% to 6.8%) |
| Minimum GPA | 116 (24.1) | 28 (18.9) | 5.2% (−2.2% to 12.6%) |
| None of the above | 40 (8.3) | 13 (8.8) | −0.5% (−5.7% to 4.7%) |
| Orientation | 273 (56.8) | 75 (50.7) | 6.1% (−3.1% to 15.3%) |
| Physical abilities | 33 (6.9) | 11 (7.4) | −0.6% (−5.4% to 4.2%) |
| Preadmission interview | 209 (43.5) | 49 (33.1) | 10.3% (1.6% to 19.1%) |

GPA, grade point average; PD, proportional difference.

proficiency (315, 50.1%), a medical prescreen (282, 44.8%), and/or a preadmission interview (259, 41.2%). A minimum competency of medical skills was the least common requirement, reported by only 83 programs (13.2%). In programs with low attrition, there was a higher prevalence of the following entry requirements and resources: preadmission interviews (median: 10.3%; IQR: 1.6%-19.1%), a medical knowledge exam (median: 11.5%; IQR: 3.2%-19.8%), and a medical prescreen (median: 11.6%; IQR: 2.7%-20.5%).

Among programs that offered benefits, paid employment was the most offered benefit, with 333 programs (53.0%) reporting offering paid employment (Table 3). Tutoring was the most frequently reported resource offered among the programs (532, 85.6%), although not ubiquitous. Health insurance was the least benefit offered (240, 38.2%), and daycare was the least frequently offered resource by programs (35, 5.6%). There was no proportional difference between attrition groups for any of the benefits. In programs with high attrition, there was a greater prevalence of offering daycare (median: 4.6%; IQR: 1.4%-7.8%).

## 4 LIMITATIONS

This study faced several limitations. Data were self-reported by each program and collected 2 years after the graduating cohort completed their initial EMS educational program, which may introduce recall bias or misclassification. Additionally, programs with no graduating students in their 2021 cohort and those with <5 students enrolled were excluded, potentially limiting generalizability. Because we do not collect student-level data in this analysis, we do not know how many graduates failed to take the national certification exam. Lastly, estimates of attrition are based on program-reported summaries rather than individual-level student data, limiting the ability to assess nuanced patterns or reasons for attrition at the student level.

## 5 DISCUSSION

In this national evaluation of paramedic educational programs, we found that open enrollment policies, as well as some entry requirements, and 1 resource offered by programs differed between programs with high attrition and low attrition. Among entry requirements, having preadmission interviews, a medical knowledge exam, and a medical prescreen showed differences between attrition groups, whereas offering daycare was the only resource found to be different between groups. There were no differences between attrition groups for any of the benefits in this study. These findings highlight critical points of intervention that may support student retention in paramedic education.

High attrition within paramedic programs represents a significant challenge to entry into the EMS workforce, with nearly 1 in 3 paramedic students lost due to attrition during education or failure to certify after course completion.[3,21] Although student attrition is not a new phenomenon in education, it is a recognized challenge to achieving ideal program educational outcomes. Attrition is multifactorial and depends not only on student decisions and competency but also on program training infrastructure and support.[11] Prior studies have primarily focused on student-level predictors of success, such as exam pass rates, but there is limited literature focused on program-level exposures.[3,22–24] Our study adds to the body of work by identifying structural and admission-related factors—such as open enrollment and student-resource

**TABLE 3.** Benefits and resources by attrition level with proportional differences presented in percentages, comparing programs with low attrition to programs with high attrition.

| | Program attrition, <30 *N* = 481 | Program attrition, ≥30 *N* = 148 | PD (95% CI) |
|---|---|---|---|
| Benefits, *n* (%) | | | |
| Health insurance | 191 (40.0) | 49 (33.0) | 6.6% (−2.2% to 15.4%) |
| None of the above | 164 (34.1) | 59 (39.9) | −5.8% (−14.7% to 3.2%) |
| Paid employment | 261 (54.3) | 72 (48.6) | 5.6% (−3.6% to 14.8%) |
| Tuition assistance | 219 (45.5) | 59 (39.9) | 5.7% (−3.4% to 14.7%) |
| Resources, *n* (%) | | | |
| Career planning | 345 (71.7) | 103 (69.6) | 2.1% (−6.3% to 10.6%) |
| Counseling | 347 (72.1) | 100 (67.6) | 4.6% (−4.0% to 13.1%) |
| Daycare | 32 (6.7) | 3 (2.0) | 4.6% (1.4% to 7.8%) |
| Health maintenance | 57 (11.9) | 15 (10.1) | 1.7% (−3.9% to 7.4%) |
| Meals | 122 (25.4) | 31 (20.9) | 4.4% (−3.2% to 12.0%) |
| None of the above | 24 (5.0) | 10 (6.8) | −1.8% (−6.3% to 2.7%) |
| Physical fitness | 120 (24.9) | 44 (29.7) | −4.8% (−13.1% to 3.5%) |
| Transportation | 86 (17.9) | 23 (15.5) | 2.3% (−4.4% to 9.1%) |
| Tutoring | 408 (84.8) | 124 (83.8) | 1.0% (−5.7% to 7.8%) |
| Uniform allowance | 105 (21.8) | 25 (16.9) | 4.9% (−2.1% to 12.0%) |

PD, proportional difference.

availability—that vary between programs with high or low attrition. Investment into program infrastructure, as reflected by meeting RAM expectations, may serve as a marker for overall program quality and appropriate student resource support.[25]

One notable finding was that the use of admission processes, such as interviews and knowledge exams that identified learners most prepared and committed to entering, was reported more often in programs with lower attrition. Importantly, in this evaluation, some academic screening (eg, minimum aptitude test, medical skills exam, and English, math, and reading proficiency evidence) requirements were not different between attrition groups. This contrasts with other allied health professions, where academic benchmarks are often used.[26,27] However, for paramedic educational programs, this suggests that screening for readiness through tailored assessments or personal conversations may better identify candidates likely to succeed compared with traditional academic thresholds alone. This highlights the need for paramedic educational programs to focus initial entry requirements on these factors. Future assessments need to better understand the granular characteristics within interview processes and knowledge exams that define a successful learner.

Understanding the benefits and resources offered at the student level is also important to student attrition. Although no benefits and only 1 resource were different between groups, it is still important to understand the potential value of wraparound support services in promoting student retention. These added support services may come with trade-offs. The availability of such benefits could increase the overall cost of program participation, either through higher tuition or reduced accessibility for students from economically disadvantaged backgrounds. These findings have important implications for policy and practice in EMS education, thereby affecting entry into the workforce. In this study, open enrollment policies were noted in 41% of paramedic educational programs with higher attrition. Although programs may choose to have open enrollment policies due to the demand for EMS clinicians, paramedic educational programs may consider combining these with the implementation of structured admission practices to assist in identifying at-risk students and reducing attrition.[13] Proactively offering services to prepare students for success before entering a paramedic education program and ensuring student support services throughout their education may improve rates of student retention.

This study establishes the importance of considering open enrollment, entry requirements, program resources, and offered benefits for supporting student retention within paramedic educational programs. We found substantial variability in baseline program entry requirements and the availability of common student resources (eg, tutoring). Similar to other higher education fields, educational support and mentoring may provide significant benefit for at-risk students.[12,13] Paramedic educational programs should consider the combined impact of entry requirements and student support systems when developing strategies to improve retention.

## AUTHOR CONTRIBUTIONS

JRP, CBG, LC, MGM, and ARP conceived and designed the study. LC and MGM collected the data. SLvdB, JRP, CBG, and ARP interpreted the data and drafted the manuscript. All authors contributed substantially to the revision of the manuscript. ARP takes responsibility for the paper as a whole.

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## CONFLICT OF INTEREST

All authors have affirmed they have no conflicts of interest to declare.

## ORCID

Shea L. van den Bergh MPH https://orcid.org/0009-0006-8831-4363

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## SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at https://doi.org/10.1016/j.acepjo.2025.100276.

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