


ORIGINAL RESEARCH

Emergency Medical Services

The association of job demands and resources with burnout among emergency medical services professionals

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Abstract

Objective: Although burnout has been linked to negative workplace-level effects, prior studies have primarily focused on individuals rather than job-related characteristics. This study sought to evaluate variation in burnout between agencies and to quantify the relationship between burnout and job-related demands/resources among emergency medical services (EMS) professionals.

Methods: An electronic questionnaire was sent to all licensed, practicing EMS professionals in South Carolina. Work-related burnout was measured using the Copenhagen Burnout Inventory. Multivariable generalized estimating equations were used to estimate odds ratios (ORs) for specific job demands and resources while adjusting for confounding variables. Composite scores were used to simultaneously assess the relationship between burnout and job-related demands and resources.

Results: Among 1271 EMS professionals working at 248 EMS agencies, the median agency-level burnout was 35% (interquartile range [IQR]: 13% to 50%). Job-related demands, including time pressure, were associated with increased burnout. Traditional job-related resources, including pay and benefits, were associated with reduced burnout. Less tangible job resources, including autonomy, clinical performance feedback, social support, and adequate training demonstrated strong associations with reduced burnout. EMS professionals facing high job demands and low job resources demonstrated nearly a 10-fold increase in odds of burnout compared with those exposed to low demands and high resources (adjusted OR [aOR]: 9.50, 95% confidence interval [CI]: 6.39–14.10). High job resources attenuated the impact of high job demands.

Conclusion: The proportion of EMS professionals experiencing burnout varied substantially across EMS agencies. Job resources, including those reflective of organizational

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culture, were associated with reduced burnout. Collectively, these findings suggest an opportunity to address burnout at the EMS agency level.

KEYWORDS

burnout, copenhagen burnout inventory, emergency medical services, job characteristics, paramedic

1 | INTRODUCTION

1.1 | Background

Approximately a third of paramedics and a quarter of emergency medical technicians (EMTs) are affected by work-related burnout.¹ Occupational burnout, defined as extreme physical and emotional exhaustion directly attributed to one's work, may be exhibited as disengagement or loss of commitment to the job.² Individuals suffering from burnout may experience negative health effects, such as sleeplessness, depression, and hypertension.³⁻⁵ In addition to the negative clinical impacts on individuals, burnout negatively affects workplace organizations. In general, burnout among health care providers has been linked to increased absenteeism and attrition, as well as reduced quality of care and more frequent medical errors, potentially compromising patient safety.⁶⁻⁹

According to the Job Demands-Resources Theory, burnout most often results from a prolonged, ongoing imbalance between work demands and job-related resources, whereby work demands significantly exceed job-related resources.¹⁰ Job demands are defined as physical, social, or organizational aspects that require sustained physical or mental effort (eg, physical workload, time pressure, physical environment). On the other hand, job resources are aspects that help achieve work goals, reduce physiological or psychological costs of job demands, and/or stimulate personal growth, learning, and development (eg, feedback, rewards, autonomy). Employees performing comparable job functions at the same workplace generally experience similar job demands and share perceptions of workplace resources.¹¹

1.2 | Importance

In emergency medical services (EMS), burnout has been linked to higher absenteeism and turnover.¹ Failure to identify and address the underlying causes of burnout may result in shortages of healthy, trained EMS professionals and could negatively impact patient care. Although the Job Demands-Resources Theory has been used to study and mediate burnout at the workplace level in other occupations, burnout has largely been studied at the individual level among EMS professionals. More specifically, the respective roles of job demands and resources on burnout at the workplace level in EMS have not been thoroughly evaluated. Identifying specific job demands and resources will help inform agency-level interventions that may have a larger

impact on preventing and reducing burnout compared to targeting and treating affected individuals alone.

1.3 | Goals of this investigation

The primary objective of this study was to assess for variation in burnout levels when comparing different EMS agencies and identify specific job-related characteristics associated with burnout among EMS professionals. The secondary objective was to evaluate the combined relationship of job resources and work-related demands with burnout in EMS.

2 | METHODS

2.1 | Study design and setting

For this cross-sectional evaluation, the target population consisted of all licensed, practicing EMS professionals in South Carolina. The South Carolina Department of Health and Environmental Control regulates and monitors the credentials for all EMS personnel, ambulances, and agencies operating within the state. Per state legislation, each EMS agency is required to maintain an up-to-date roster of all EMS providers.¹² At the time of this study, there were over 200 EMS agencies in the state. These agencies encompass a variety of practice settings, ranging from densely populated urban locales to extremely rural environments. This project was approved by the institutional review board at the American Institutes for Research.

2.2 | Survey instrument development and measures

Data for this study were collected via an electronic questionnaire. Previously validated items from the Longitudinal EMT Attributes and Demographics Study (LEADS) were used to collect demographic information.¹³ Burnout was measured using the seven-item work-related burnout subscale of the Copenhagen Burnout Inventory.¹⁴ Participants were asked to recall the past 4 weeks and rate each item using a five-point behavioral frequency scale: always/almost always, often, sometimes, seldom, and never/almost never. This instrument has previously demonstrated good reliability among EMS professionals (Cronbach's alpha = 0.89).¹

A series of items was developed to assess specific EMS job-related characteristics using categories of job demands and resources proposed by Demerouti et al as a foundation.¹⁰ Categories of job demands included: (1) physical workload, (2) time pressure, (3) patient contact, (4) physical environment, and (5) shift work. Meanwhile, job resource categories included: (1) performance feedback, (2) rewards, (3) job control, (4) participatory environment, (5) supportive environment, and (6) knowledge. Items to assess the categories of time pressure, feedback, participatory environment, supportive environment, and knowledge were adapted from the previously validated EMS Safety Attitudes Questionnaire (SAQ),¹⁵ and an EMS safety culture instrument based on the Agency for Healthcare Research and Quality (AHRQ) Surveys On Patient Safety Culture (SOPS).¹⁶ For all other categories of job demands and resources, items were developed with input and consensus from the study investigators.

To assess face validity and consistent interpretation of all newly developed survey items, the investigators conducted cognitive interviews with eight practicing EMTs and paramedics from fire-based, private, and municipal EMS agencies. The survey instrument can be accessed via the supplementary material.

2.3 | Data collection

One week before data collection, the South Carolina Bureau of EMS Chief sent a pre-notification e-mail to all EMS professionals in the state to generate awareness of the study and to encourage participation. Prior work has shown that notifications from authoritative sources may increase survey response rates.¹⁷ In November 2017, survey invitations were sent via e-mail to all 8057 licensed EMS professionals in South Carolina who had appeared on 1 or more agency rosters in October 2017. Data were collected using the electronic questionnaire platform by SurveyGizmo (Widgix, LLC).

Following the tailored Dillman methodology, reminder e-mails were sent to those who had not yet participated in the questionnaire at 7 and 14 days following the initial invitation.¹⁸ As an incentive to participate, respondents were entered in a raffle to win 1 of 10 Amazon gift cards worth \$100 each. Nevertheless, due to the low response rates commonly observed with electronic surveys, an abbreviated survey was designed a priori to be administered to those who had not responded following close of the full-length survey. This abbreviated questionnaire was designed to take 2–4 minutes to complete and contained items from the main questionnaire related to key demographics including sex, certification level (eg, EMT, paramedic), years of EMS experience, and employment status (full-time/part-time). The work-related subscale of the Copenhagen Burnout Inventory was also included to evaluate for any differences in burnout scores between full-length survey respondents and abbreviated survey respondents. All EMS professionals who did not respond to the full questionnaire were sent an invitation and 2 reminder e-mails to participate in the shortened survey. Responses to the abbreviated questionnaire were used to help evaluate the direction and magnitude of potential response bias.

The Bottom Line

Burnout is common in health care professionals. This study of 1,271 EMS professionals evaluated the job-related demands and resources, finding that high job demands and low resources were associated with a ten-fold increase in odds of burnout among EMS professionals.

2.4 | Analysis

Analysis inclusion criteria consisted of practicing EMS professionals who were certified at the EMT, advanced emergency medical technician, or paramedic levels and appeared on one or more patient care records in the 30 days preceding the study start. EMS professionals certified at the emergency medical responder level were excluded because South Carolina does not license this level of EMS professional and individuals certified at this level often practice in non-traditional settings where EMS work is not their primary occupation.¹⁹ Characteristics of full survey respondents were compared to those of abbreviated survey participants using chi-square tests. All other analyses were conducted using responses from full-length survey respondents only.

A dichotomous measure of work-related burnout was calculated following the Copenhagen Burnout Inventory guidelines.²⁰ Responses to each of the seven items were assigned the following point values: always/almost always = 100; often = 75; sometimes = 50; seldom = 25; and never/almost never = 0. In turn, a mean composite score was calculated by summing the values for each answered item and dividing by the total number of items answered. Composite scores were not calculated for respondents who answered less than three items of the scale. Mean composite scores were dichotomized to those classified as demonstrating burnout (50 or more points) and those who did not demonstrate burnout (less than 50 points) to better facilitate direct comparisons with previously published work.^{1,20}

Agency-level burnout was calculated as the proportion of providers classified as experiencing burnout divided by the total number of EMS professionals who answered the survey from each EMS agency. EMS professionals working for multiple agencies were included in the respective estimates for each agency they worked for at the time of this study, because without intervention, burnout is a stable condition, and an individual experiencing burnout at one work location will likely continue to experience burnout at other work settings.²¹ Median agency-level burnout was compared by agency characteristics using Wilcoxon rank-sum and Kruskal-Wallis tests.

Although EMS professionals working at the same agency are likely to share similar experiences regarding job demands and resources, these characteristics are perceived on an individual level. For example, it is possible that one person perceives a supervisor's behavior as disrespectful, whereas another person at the same workplace does not. Multivariable generalized estimating equation models were used to quantify the individual relationship between each job-related demand or resource and burnout. To control for agency-level clustering effects in

the generalized estimating equation models, EMS professionals were assigned to a cluster based on the agency with which they were listed on the most patient care records in the 30 days preceding the survey (main EMS agency). Previous work has linked paramedic certification level, increased years of EMS experience, full-time employment status, and non-fire-based agency type to higher odds of burnout.¹ Further, previous work has shown that job resources and demands differ substantially between urban and rural settings.²² Based on this research, confounding variables were selected a priori and included in each model: certification level, years of EMS experience, full-time work status, EMS agency type, and community size. Separate models were created for each job characteristic, controlling for agency and the selected confounding variables. A working exchangeable correlation structure and Huber-White sandwich variance estimates were used.²³ Adjusted odds ratios (aOR) and 95% confidence intervals (95% CI) are reported.

The combined effects of job demands and resources were assessed following an approach similar to that undertaken in the Whitehall II study.²⁴ Briefly, a composite score was created for total job demands by assigning point values to each survey response option for each job demand and summing response values (see online Table S1). The median total job demand score was then calculated. EMS professionals were classified as having “high” job demands if their total job demand score exceeded the median or “low” job demands if below the median. A similar approach was undertaken to generate a composite score along with high and low categories for job resources (see Table S2). Based on these classifications, four quadrants of job characteristics were constructed: (1) low demands/high resources, (2) low demands/low resources, (3) high demands/low resources, and (4) high demands/high resources. The most favorable situation of low job demands with high job resources was used as the reference group. A multivariable generalized estimating equation model was used to estimate the odds of burnout based on demands/resources quadrant, while controlling for agency cluster and the confounding variables previously mentioned. All analyses were carried out using STATA IC version 12.1 (StataCorp LP).

3 | RESULTS

3.1 | Characteristics of study participants

A total of 1490 EMS professionals (19% of those listed on statewide rosters) completed the survey, representing 254 of the 267 (95%) agencies in the state. There were 1271 (85% of respondents) who met inclusion criteria (Figure 1). Most respondents were men (74%) and 58% were certified at the paramedic level. Over one-third (38%) had greater than 15 years of EMS experience (Table 1). Survey response rates per EMS agency ranged from 4% to 50% with a median agency-level response of 20% (interquartile range [IQR]: 13% to 27%). After excluding agencies with no respondents meeting inclusion criteria ($n = 6$), 248/254 (98%) EMS agencies remained in the analyses. Approximately one-third (34%) of agencies were classified as private and 24% were fire-based. Thirty percent of agencies operated in rural communities (Table 2). No differences were found between

TABLE 1 Characteristics of EMS professionals included in the analyses ($N = 1271$)

	n	%
Sex		
Female	327	26.1
Male	924	73.9
Age		
Range	19–75	
Median (IQR)	40 (31–49)	
Years of EMS experience		
<5 y	233	18.4
5–15 y	555	43.9
>15 y	477	37.7
Certification level		
EMT	455	36.0
AEMT/EMT-I	76	6.0
Paramedic	734	58.0
Number of EMS agencies		
1	816	64.2
2 or more	455	35.8
Employment status at main EMS agency ^a		
Full-time	1086	86.2
Part-time	174	13.8
Length of employment at main EMS agency ^a		
<3 y	419	33.2
3–10 y	502	39.8
>10 y	342	27.1
Call volume past 30 days (all agencies)		
0	315	24.8
1–10	254	20.0
11–50	397	31.2
51–100	214	16.8
>100	91	7.2

^aMain EMS agency: agency with which the EMS professional was listed on the greatest number of patient care records for 30 days before study start.

Abbreviations: EMS, emergency medical services; EMT, emergency medical technician; AEMT, advanced emergency medical technician; EMT-I, EMT-Intermediate.

respondents and those who answered the non-respondent survey in terms of sex, employment status, EMS experience, and work-related burnout. EMTs and advanced emergency medical technicians were less likely to respond to the full survey (Table 3).

3.2 | Variation in agency-level burnout among respondents

At 50 of the 248 included agencies (20%), none of the EMS professionals who responded were experiencing burnout, and at 21 agencies (8%), all of the EMS professionals who responded were experiencing

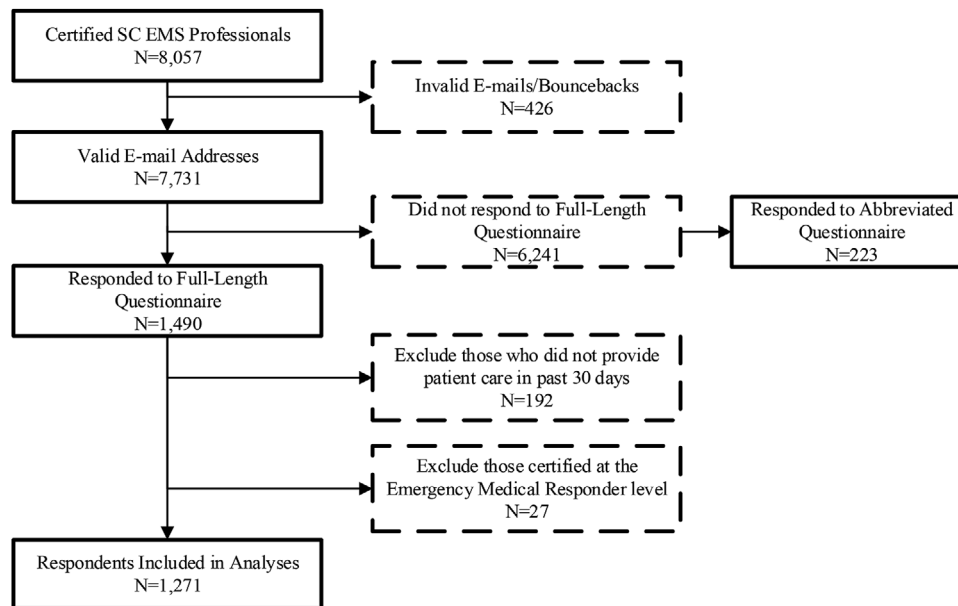


FIGURE 1 Inclusion of respondents for analyses. Abbreviation: SC, South Carolina

burnout (Figure 2). Among all included agencies, the median agency-level burnout among respondents was 35% (IQR: 13% to 50%). The median agency-level burnout did not differ by service level, agency type, community size, annual call volume, or number of employees (Table 2).

3.3 | Job demands and job resources associated with burnout

Overall, increased job demands were associated with increased odds of burnout. Time pressure was reported by most respondents (72%), and this item was associated with more than a 4-fold increase in odds of work-related burnout (aOR: 4.40, 95% CI: 3.26–5.93). Frequently waiting to respond in an emergency vehicle, rather than a base station (“posting”), was reported by 28% of respondents and was associated with greater than a 2-fold increase in odds of burnout (aOR: 2.26, 95% CI: 1.72–2.98). Lacking access to specific aspects of the physical work environment, including a place to eat or prepare food, shower, store belongings, exercise, or relax, was also associated with increased odds of burnout (Table 4).

In general, job resources were associated with reduced odds of burnout. Among respondents, 35% reported that they did not depend on overtime pay to “make ends meet,” which was associated with 63% reduced odds of burnout (aOR: 0.37, 95% CI: 0.28–0.48). Approximately one-third (34%) of respondents reported receiving performance feedback from a medical director, which was associated with 54% reduced odds of burnout (aOR: 0.46, 95% CI: 0.34–0.61). For the 59% of EMS professionals who received performance feedback from a supervisor, there was a 64% reduction in odds of experiencing burnout (aOR: 0.36, 95% CI: 0.28–0.47). Adequate orientation training was reported by 59% and this factor was linked to a 64% reduction in odds of burnout (aOR: 0.36, 95% CI: 0.28–0.45). Job autonomy (aOR:

0.34, 95% CI: 0.26–0.44) and elements of a participatory (aOR: 0.25, 95% CI: 0.20–0.33) or supportive (aOR: 0.20, 95% CI: 0.15–0.27) work environment were also associated with significantly reduced odds of burnout (Table 5).

3.4 | Association of high/low job demands and high/low job resources with burnout

When assigned a composite score, the median total points allotted for job demands was 12 (IQR: 9–14) out of a possible 26 points. For job resources, the median composite score was 26 (IQR: 20–31) out of a possible 42 points. Figure 3 displays the cross-tabulation for EMS professionals experiencing high and low job-related demands and high and low resources based on the composite scores. Approximately one-third (32%) of EMS professionals experienced the more favorable condition of low job demands with high job resources. In contrast, 30% experienced the least desirable work condition of high job demands met with low job resources. After adjusting for confounding variables, when comparing those having the high job demands and low job resources condition with those in more favorable environments (low job demands and high job resources), there was nearly a 10-fold increase in the odds of work-related burnout (aOR: 9.50, 95% CI: 6.39–14.10). At the same time, among those who faced high job demands, but simultaneously had high job-related resources, there was less than a 2-fold increase in the odds of burnout (aOR: 1.91, 95% CI: 1.32–2.76) (Figure 3).

4 | LIMITATIONS

Limitations to this study include the potential for response bias. Specifically, it is always possible that non-respondents to the survey would answer differently. Nevertheless, the results of the abbreviated

TABLE 2 Characteristics of EMS agencies included in the analyses (N = 248) and comparisons of median agency-level burnout by agency characteristics

	All agencies n (%)	Median agency-level work-related burnout % (IQR)	P value
Agency-level burnout			
Median (IQR)	248 (100)	34.5 (12.5 to 50.0)	
Agency service level			0.254 ^a
BLS-only	95 (38.3)	33.3 (0.0 to 50)	
ALS-BLS	153 (61.7)	38.7 (20.0 to 50.0)	
Agency type			0.094 ^b
Governmental, non-fire	36 (14.5)	41.2 (30.3 to 55.1)	
Private, non-hospital	84 (33.9)	40.0 (12.5 to 50.0)	
Fire department	59 (23.8)	33.3 (0.0 to 50.0)	
Hospital	22 (8.9)	38.1 (16.7 to 50.0)	
Community, non-profit	47 (19.0)	28.6 (0.0 to 50.0)	
Community size			0.680 ^a
Urban	170 (70.5)	39.4 (12.5 to 50.0)	
Rural	71 (29.5)	33.3 (15.4 to 50.0)	
Agency 2016 call volume			0.149 ^b
0–2500	140 (57.1)	33.3 (0.0 to 50.0)	
2501–5000	39 (15.9)	40.0 (15.4 to 50.0)	
5001–10,000	29 (11.8)	38.9 (25.0 to 55.6)	
>10,000	37 (15.1)	40.8 (26.7 to 48.0)	
Number of EMS employees			0.358 ^b
1–20	95 (38.3)	33.3 (0.0 to 50.0)	
21–50	83 (33.5)	40.0 (25.0 to 50.0)	
51–100	48 (19.3)	33.3 (19.0 to 45.3)	
>100	22 (8.9)	40.0 (33.3 to 47.8)	

^aWilcoxon rank-sum test.

^bKruskal-Wallis test.

Abbreviations: EMS, emergency medical services; ALS, advanced life support; BLS, basic life support; IQR, interquartile range.

survey showed no statistically significant difference in burnout prevalence between respondents and late respondents (Table 3). The number of respondents and response rate varied across EMS agencies. Although it would be possible to remove agencies with a small number of respondents to generate more stable estimates, this could result in systematic exclusion of smaller agencies in rural settings. Non-response to the survey could result in either under-estimation or over-estimation of the prevalence of burnout; however, this study did not seek to provide an estimate of true burnout prevalence at each agency. Instead, this study sought to determine whether or not the proportion of EMS professionals experiencing burnout varies across agencies. If burnout levels were similar across EMS agencies, we would expect the estimates among respondents grouped by EMS agency to be relatively consistent. While we are unable to estimate agency-level

TABLE 3 Comparison of full-length survey and abbreviated survey participant characteristics

	Full-length survey participants col % (n) (N = 1490)	Abbreviated survey participants col % (n) (N = 223)	P value ^a
Sex			0.60
Female	26.6 (391)	28.3 (63)	
Male	73.4 (1081)	71.8 (160)	
Currently working in EMS			0.77
Yes	94.2 (1401)	93.7 (209)	
No	5.8 (86)	6.3 (14)	
Employment status			0.74
Full-time	15.6 (215)	14.6 (30)	
Part-time	84.5 (1168)	85.4 (175)	
Years of EMS experience			0.95
<5 years	17.8 (250)	18.6 (39)	
5–15 years	42.4 (596)	42.4 (89)	
>15 years	39.9 (561)	39.1 (82)	
Certification level			<0.01
EMT	36.6 (502)	45.5 (91)	
AEMT/EMT-I	5.8 (80)	9.5 (19)	
Paramedic	57.5 (788)	45.0 (90)	
Work-related burnout			0.11
Yes	63.1 (864)	57.4 (117)	
No	36.9 (505)	42.7 (87)	

^aChi-square test.

Abbreviations: EMS, emergency medical services; EMT, emergency medical technician; AEMT, advanced emergency medical technician; EMT-I, emergency medical technician-intermediate.

burnout prevalence, the wide variation observed among respondents grouped by EMS agency in this study suggests that burnout is linked to workplace-level factors. When assessing the association between job characteristics and burnout, multivariable analyses were used to control for variables previously associated with response rate, such as certification level, and to adjust for the clustering effect of responses from individuals working for the same EMS agency.

With regard to the strategy undertaken to generate composite scores for job resources and demands, psychometric scale development analyses were not conducted. Instead, a point value was assigned to each response option for each inventory item. These point values were not intended to be used as weights related to the importance of each job resource or demand, but rather the varying point values were intended to help distinguish between the highest and lowest response levels for each item. Rather than seek to develop a repeatable scale to score job demands and resources, the goal of this study was to evaluate the relationship between burnout and levels of job demands and resources in composite.

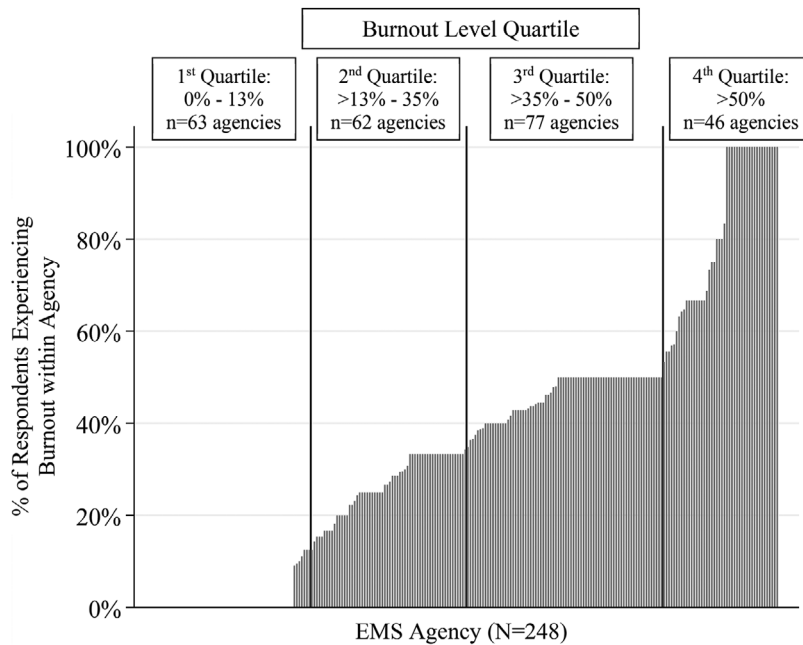


FIGURE 2 Percentage of respondents experiencing work-related burnout grouped by emergency medical services (EMS) agency (N = 248); each bar corresponds to a single EMS agency. Median agency-level burnout = 35% (interquartile range [IQR]: 13% to 50%)

Another limitation stemming from the study of EMS professionals within a single state is the question of whether or not these findings hold true in other settings. However, having a statewide study encompassing various types of EMS systems and EMS professionals at differing levels of certification makes this study a useful starting point and a possible prototype for future evaluations of agency-level characteristics and burnout.

Last, the use of cross-sectional data innately precludes causal inference because it is not possible to determine whether burnout was present before exposure to the job demands or resources. Nevertheless, reverse causality does not seem to be plausible, because high levels of burnout would not likely result in a reduction of job resources. Prospective research is needed to establish any direct causal effects of modifying job resources and demands on burnout.

5 | DISCUSSION

To combat burnout among EMS professionals, efforts to identify and address the condition's root causes are necessary. Current initiatives to reduce burnout have often focused on finding ways to help the individual EMS professional improve coping mechanisms. This practice of targeting the individual for intervention may inadvertently place the responsibility on the victim. Meaningful and lasting change will require that burnout be intervened upon at multiple levels. Agency-level changes have the potential to affect more EMS professionals at once and could result in a larger positive impact. In this study, burnout varied widely across respondents working for different EMS agencies. Specific job demands, including time pressure, were associated with increased burnout. Meanwhile job resources, such as feedback and a supportive environment, were associated with a protective effect against burnout. When evaluated collectively, having

increased job resources mitigated burnout even in the face of high job demands.

The finding that the median agency-level burnout among respondents was 35% is not surprising as EMS professionals routinely face physically and emotionally demanding situations. A national study of EMS professionals demonstrated that 19% of EMTs and 30% of paramedics met criteria for burnout.¹ However, this previous study was not able to link EMS professionals to their agencies. In the present study, the proportion of EMS professionals experiencing burnout at a given agency ranged from 0% to 100%. At one-quarter of the included agencies, 50% or more of the affiliated EMS professionals who responded were experiencing burnout. The wide variation in burnout between respondents affiliated with different EMS agencies suggests that workplace-level factors could have an important impact on the development of this condition.

Job demands were associated with increased odds of experiencing burnout. The job demand that demonstrated the strongest effect was time pressure. Providing emergency care innately exposes EMS professionals to time pressure to make important clinical decisions and perform life-saving interventions; however, this type of time pressure was not assessed in this study. The item assessing time pressure asked respondents to indicate whether EMS personnel have to hurry between runs because they have too much work to do. The majority of respondents agreed with this item. Between calls, EMS professionals must perform a variety of necessary tasks, such as providing hand-off reports, completing patient care records, and cleaning and restocking the response vehicle. Nevertheless, downtime between calls is important for reducing the effects of fatigue and related risks in EMS.^{25,26} Further, a qualitative study of EMS professionals indicated that a "time-out" period was perceived as one of the most important interventions to mitigate the effects of stress after such a critical incident.^{27,28} Elements of an EMS work culture that stigmatizes

TABLE 4 Job demands reported by respondents and their association with work-related burnout

Job demands	% (n)	Adjusted OR (95% CI) ^a
Workload		
Provider call volume past 30 days		
Median (IQR)	16 (1–49)	1.00 (1.00–1.00)
Call volume category		
0	24.8 (315)	1.52 (0.98–2.37)
1–10	20.0 (254)	1.12 (0.68–1.86)
11–50	31.2 (397)	1.31 (0.91–1.89)
51–100	16.8 (214)	1.58 (1.02–2.44)
>100	7.2 (91)	1.35 (0.84–2.19)
Time pressure		
Have to hurry between calls (Yes)	71.7 (908)	4.40 (3.26–5.93)*
Physical environment		
Post in emergency vehicle		
Never/seldom/sometimes	72.2 (916)	Referent
Often/always	27.8 (353)	2.26 (1.72–2.98)*
Work environment does NOT include a place to		
Sleep	30.4 (386)	1.14 (0.84–1.54)
Shower	22.1 (281)	2.40 (1.72–3.34)*
Eat/prepare food	12.7 (161)	2.79 (1.82–4.29)*
Store belongings	26.0 (329)	1.75 (1.33–2.28)*
Exercise	63.2 (802)	2.98 (2.21–4.02)*
Relax	11.6 (147)	2.46 (1.64–3.69)*
Shift work		
Number of shifts ≥24 h in past 30 d		
None	42.0 (529)	Referent
1–3	9.4 (118)	1.25 (0.75–2.08)
4–9	15.5 (196)	0.96 (0.60–1.53)
10–12	23.5 (297)	1.47 (0.98–2.20)
>12	9.6 (121)	2.26 (1.29–3.97)*
Number of overnight shifts in past 30 d		
None	28.8 (364)	Referent
1–3	9.0 (114)	1.13 (0.70–1.83)
4–9	17.6 (222)	0.87 (0.58–1.30)
10–12	25.9 (327)	1.30 (0.87–1.94)
>12	18.7 (237)	1.50 (0.95–2.37)

^aA separate model was used to evaluate each job demand and adjust for: certification level, EMS experience, work status, provider monthly call volume, main EMS agency type, and community size.

* $P < 0.05$

Abbreviations: OR, odds ratio; 95% CI, 95% confidence interval; EMS, emergency medical services.

vulnerable emotions and fear of appearing weak were cited as major barriers to taking a brief time-out period after such exposures.²⁹ In this manner, organizational and cultural shifts are needed to prioritize the physical and psychological well-being of the EMS professional.

TABLE 5 Job resources reported by respondents and their association with work-related burnout

Job resources	% (n)	Adjusted OR (95% CI) ^a
Rewards		
Benefits at main EMS job (Yes)	83.3 (1059)	1.11 (0.67–1.84)
Paid vacation		
Paid sick leave	76.7(972)	0.93 (0.65–1.33)
Health insurance	81.9 (1039)	0.93 (0.59–1.45)
Dental insurance	80.4 (1020)	0.80 (0.52–1.24)
Vision insurance	76.4 (970)	0.76 (0.52–1.11)
Uniform allowance	32.9 (416)	0.79 (0.61–1.02)
Paid uniforms	80.8 (1021)	0.54 (0.39–0.76)*
Tuition assistance	42.1 (530)	0.62 (0.48–0.79)*
Retirement plan	79.5 (1005)	0.99 (0.64–1.54)
Depend on overtime pay (No)	35.4 (449)	0.37 (0.28–0.48)*
Performance feedback		
Medical director (Yes)	33.6 (425)	0.46 (0.34–0.61)*
Supervisor (Yes)	58.5 (740)	0.36 (0.28–0.47)*
Job control		
Job autonomy (Yes)	73.1 (926)	0.34 (0.26–0.44)*
Control over schedule (Yes)	55.9 (708)	0.30 (0.23–0.40)*
Participatory environment		
Personnel input is well received (Yes)	60.4 (764)	0.25 (0.20–0.33)*
Supportive environment		
Management support (Yes)	67.1 (848)	0.20 (0.15–0.27)*
Respect from supervisor (Yes)	87.0 (1101)	0.19 (0.13–0.28)*
Respect from co-workers (Yes)	93.3 (1178)	0.22 (0.13–0.36)*
Knowledge		
Adequate orientation (Yes)	58.5 (741)	0.36 (0.28–0.45)*
Adequate training (Yes)	67.6 (856)	0.35 (0.27–0.45)*

^aA separate model was used to evaluate each job resource and adjust for: certification level, EMS experience, work status, main EMS agency type, and community size.

* $P < 0.05$.

Abbreviations: OR, odds ratio; 95% CI, 95% confidence interval; EMS, emergency medical services.

Generally, job resources were associated with reduced odds of burnout. Rather than request that respondents disclose their annual income, which is subject to reporting bias and would require adjustment for variation in the cost of living between regions of the state, adequate pay was assessed by asking whether or not overtime pay was perceived as a necessity. Approximately two-thirds of respondents reported having to depend on overtime pay to make ends meet. EMS professionals who did not depend on overtime pay demonstrated significantly reduced odds of burnout. Ensuring adequate pay and education related to financial management skills to effectively manage money have been linked to reduced burnout in other professions.³⁰ Accordingly, further research to confirm the same impact of these job resources in EMS is warranted.

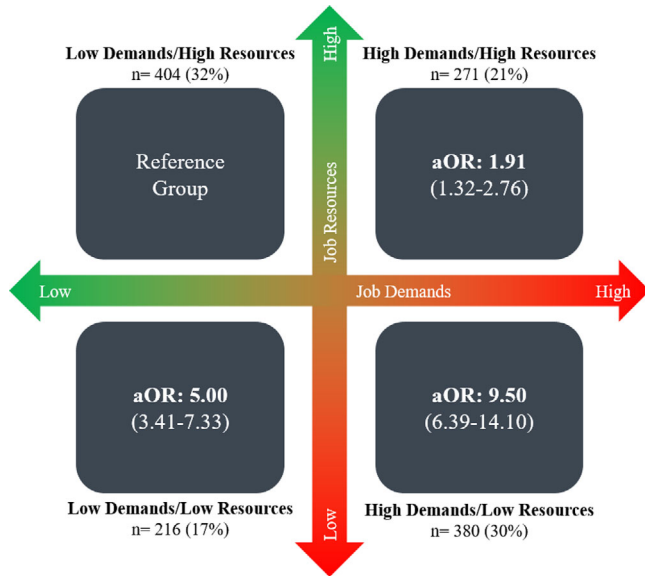


FIGURE 3 Adjusted odds ratios (aORs) for work-related burnout stratified by levels of job demands and job resources. OR adjusted for certification level, emergency medical services (EMS) experience, work status, provider monthly call volume, main EMS agency type, and main EMS agency community size

Other less tangible job resources, often reflective of organizational culture, demonstrated strong associations with reduced burnout including autonomy, participation, social support, and performance feedback. Only one-third of EMS professionals in this study reported receiving appropriate performance feedback from their medical director and just over half reported appropriate feedback from a supervisor. These findings are consistent with those identified from a study of nationally certified EMS professionals where just 20% reported receiving any feedback from a medical director and 60% received feedback from a supervisor.³¹ The strong association between performance feedback and reduced odds of burnout identified in this study is consistent with research examining other healthcare settings.^{32,33} The use of achievable benchmarks, performance feedback reports from supervisors, and facetime with leadership during “walk rounds” have been shown to reduce burnout, increase adherence to clinical protocols, and improve safety outcomes.^{34,35} Implementing regularly scheduled EMS medical director visits that include favorable or constructive performance feedback may, therefore, help reduce EMS professional burnout, promote better quality of care, and improve patient safety.

Collective evaluation of the list of job demands and job resources presented in this study revealed that high job demands coinciding with low job resources were associated with nearly a 10-fold increase in odds of burnout when compared to the more favorable work setting of low job demands and high job resources. Meanwhile, when high job demands were met with high job resources, there was less than a 2-fold increase in odds of burnout. This finding is consistent with results from a study conducted among teachers in Finland where increasing job resources served to boost work engagement in the face

of high job demands.^{11,36} Appreciating that job demands may be much more difficult to change, these findings suggest that increasing job resources may represent a promising target for mitigating burnout, even when job demands are exceptionally high.

In other professions, organization-level interventions have demonstrated a greater impact on reducing burnout than interventions focused towards individuals only.³⁷⁻³⁹ Although strategies aimed at helping individuals are important for the well-being of EMS professionals, initiatives to effectively address and mitigate burnout will require a multi-level approach, including individual and organizational/cultural interventions. The specific job-related demands and resources that demonstrated significant associations with burnout in this sample of EMS professionals represent areas for future prospective investigation, particularly in terms of mitigating and even preventing burnout.

In summary, the percentage of EMS professionals experiencing burnout varied substantially among respondents working for different EMS agencies and exceeded 35% at half of the included agencies. Workplace characteristics classified as demands, such as time pressure, were associated with increased burnout. Meanwhile job resources, including feedback and a supportive environment, were protective against burnout. In the face of non-modifiable job demands, increasing job resources, especially less tangible resources that are often representative of organizational culture, may mitigate the risk for burnout. Collectively, these findings provide support for re-addressing and focusing on burnout as an agency-level concern, rather than solely a problem of individual EMS professionals.

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AUTHOR CONTRIBUTIONS

Study conceptualization and design: AKF, ARF, ARP, MKR, REC, RPC, RW, RRA, SEA, and THH. Literature review: RPC. Data analysis and interpretation of results: AKF, ARF, ARP, MKR, PEP, REC, RPC, RR, RRA, SEA, and THH. Manuscript development: AKF, ARF, ARP, MKR, PEP, REC, RPC, RW, RRA, SEA, and THH.

CONFLICTS OF INTEREST

The authors have no conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

The datasets analyzed during the current study are available from the National Registry of EMTs on reasonable request.

MEETINGS

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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