

Prevalence and Predictors of Burnout in Athletic Training Students: A Comparison of Undergraduate and Graduate Students

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Context: Burnout is a psychological syndrome consisting of increased emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA). To date, examinations of burnout among athletic training students (ATS) is limited.

Objective: To determine prevalence and antecedents of burnout among ATS.

Design: Cross-sectional study.

Setting: Web-based survey.

Patients or Other Participants: Students enrolled in athletic training programs (ATP).

Intervention(s): A survey assessed demographics, stressors, and burnout measured by the Maslach Burnout Inventory–Human Services Survey.

Main Outcome Measure(s): Multiple regression analyses were used to determine relationships between variables.

Results: A total of 725 students participated. Most respondents were undergraduates ($n = 582$, 80%), female ($n = 518$, 71%), Caucasian ($n = 564$, 78%), and single ($n = 422$, 58%). Mean burnout scores for EE, DP, and PA were 33 ± 10 , 17 ± 4.5 , and 39 ± 5.8 , respectively. Survey responses showed that 70.8% of undergraduate and 62.9% of graduate students reported high EE. All the students (100%) in both samples reported high DP. Undergraduates pursuing internships or residencies ($b = -7.69$, $P < .001$) and who were currently enrolled in non-Division I institutions ($b = -2.90$, $P < .01$) had decreased EE. Increased stress revealed increased EE (overall stress: $b = 3.11$, $P < .001$; social stress: $b = 1.32$, $P < .05$; class stress: $b = 1.45$, $P < .05$). Increases in clinical hours also related to increased EE ($b = 1.49$, $P < .001$). Those pursuing internships or residencies ($b = -2.10$, $P < .05$) and who were female ($b = -2.10$, $P < .05$) reported decreased DP. Being married ($b = 2.87$, $P < .01$), increased clinical hours ($b = 0.77$, $P < .001$), and social stress ($b = 0.59$, $P < .05$) resulted in increased DP. Increased PA was seen in students intending to pursue graduate education ($b = 1.76$, $P < .05$) and female students ($b = 1.17$, $P < .05$). Graduate students' stress levels revealed increased EE ($b = 6.57$, $P < .01$) and DP ($b = 0.98$, $P < .05$).

Conclusions: Differences exist between undergraduate and graduate burnout scores and associated predictors. Further research is needed to identify student responses to burnout.

Key Words: Retention, stress, career intentions

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KEY POINTS

- Undergraduate athletic training students (ATS) demonstrated higher scores on the EE and DP dimensions of burnout than graduate ATS enrolled in athletic training programs.
- The ATS reported higher levels of burnout than other professional health care students and professionals.
- Demographic and situational variables such as the number of clinical hours, postgraduation career intentions, relationship status, gender, and National Collegiate Athletic Association division were predictive of ATS burnout.

INTRODUCTION

Burnout is a psychological syndrome consisting of 3 constructs: increased emotional exhaustion (EE), depersonalization (DP), and decreased personal accomplishment (PA).¹ Descriptions of EE include emotional overload, overextension, and being overwhelmed by the emotional demands imposed by others in the workplace.² DP is described as developing a poor opinion of others, detachment, or negative feeling toward others.² Thoughts of decreased PA include inadequacy in the workplace, decreased ability to relate to others, and self-imposed thoughts of failure.² Burnout has been extensively researched among individuals who work in human services (eg, counselors, social workers) and more recently among medical professionals including physicians,³ nurses,⁴ physician assistants,⁵ and athletic trainers (ATs).⁶ Studies with these health professionals have reported burnout prevalence rates as high as 51% of physicians,³ 43% of nurses,⁴ 38% of ATs,⁶ and similar rates among physician assistants.⁵ Burnout has been associated with negative personal well-being and reduced-quality patient care.⁷

Student Burnout

Whereas the incidence of burnout has been established in health care professionals, there is a general lack of understanding on when burnout begins and how to prevent it. In some health professions such as medicine, burnout is identified early within the education and training process, with nearly 44% of a sample of over 16 000 medical students indicating that they suffer from burnout.⁸ In addition, a study with a sample comprising physician assistant students revealed that nearly 77% of them reported burnout symptoms.⁹ Dental and dental hygiene students also appear to be susceptible to burnout, with nearly 34% of students meeting cutoff scores for burnout.¹⁰ Burnout among health care students is also associated with negative outcomes. A relationship between burnout and serious consideration of dropping out of medical school has been established, raising the question of whether burnout within health care students has implications for student retention.¹¹

Burnout in Athletic Training Students

Retention, graduation, and subsequent employment of athletic training students (ATS) is imperative to meet the increases in patient demands from upsurges in employment settings for ATs. Because burnout has been positively correlated with increased dropout rates of medical students,¹¹ examination of burnout rates among ATS may be essential to determine students' career intentions and current levels of burnout before entering the profession. To date, only 2 qualitative studies^{12,13} and 2 quantitative studies^{14,15} examining burnout among ATS have been published. Riter et al¹⁴ MBI reported a mean EE score of 17.0 and a DP score of 5.7 in a sample of 51 undergraduate ATS.¹⁴ In addition, Bryant et al¹⁵ explored burnout among a sample of first- and second-year professional master's ATS across 1 academic semester. Students in this sample reported a higher mean EE score in October (20.00) than in December (19.00).¹⁴ For reference, scores above 27 for EE, above 10 for DP, and below 33 for PA are classified as high levels of burnout on the Maslach burnout Inventory, Human Services Edition (MBI-HSS), the most commonly outlined measure of burnout in human service professionals.¹⁶

Predictors of Burnout

Although the presence of burnout has been extensively researched, further research is needed to identify early indicators of burnout to identify "high risk" individuals and to develop interventions to prevent the onset of burnout.¹⁷ Within ATS literature, increased burnout has been associated with the length of time in athletic training programs (ATP),¹⁴ relationship status,¹⁴ and increased levels of stress.^{14,15} Among medical students, the following have also revealed relationships with burnout reports: gender, geographic location, stress, financial strain, and workload.⁸ In addition, student age, year level in school, hours of study, and self-care techniques were associated with burnout scores in a study of occupational therapy students.¹⁸ Further research is needed to identify antecedents and potential consequences of burnout within ATS populations. Therefore, the purpose of this study was to determine the prevalence of burnout among ATS enrolled in undergraduate and graduate ATPs accredited by the Commission on Accreditation of Athletic Training Education (CAATE) and to further identify predictors of student burnout.

METHODS

Participants

A total of 823 students enrolled in ATPs accredited by the CAATE initiated our survey. Participants who were not currently enrolled in a CAATE-accredited program or those not completing the portions of the survey needed for statistical analyses were excluded from the study. This resulted in a total

of 725 student respondents in the final analysis. This study was submitted to and approved by the institutional review board of the sponsoring institution.

Procedures

We recruited ATS to participate in the study by e-mailing program directors of CAATE-accredited ATPs at their publicly accessible e-mail addresses. The e-mail provided background information on the study and requested that the program directors forward a recruiting e-mail to their students that included a link to the survey. The online survey contained 63 questions. The survey was generated in Qualtrics (Provo, UT) using previously validated survey instruments outlined in the rest of this section. A follow-up e-mail was sent 2 weeks after the initial e-mail to program directors asking them to remind students about participation in the study.

Questionnaire

The online questionnaire comprised a variety of scales that measured each of the following variables of interest for our study.

Demographic and Situational Factors. Demographic questions included personal and situational factors such as gender, degree type, year in school, and socioeconomic status. Additional introductory questions were derived from previously established studies related to ATS retention,¹⁹ stress,²⁰ clinical experience,²¹ and daily stressors.²² The students' level of education was assessed by asking "What level of professional athletic training education program are you currently enrolled in?" Responses for this question included "bachelor's degree" or "master's degree" options. Furthermore, students' year within their program was assessed by asking "How many years have you been in your professional education program?" Responses for this question included 1, 2, 3, or 4+. Stress and types of stressors were assessed by asking students "Please rate the following stressors according to how much stress each stressor causes you in the following areas during a typical school day." Response items were divided into individual questions including classes and homework, the need to make money, employment, family, friends, the need to fit in, self-image stress, and overall stress.²² Each item was ranked on a Likert scale from 1 to 5, with 1 indicating *extremely low stress* and 5 indicating *extremely high stress*. Students' intentions to enter the profession were assessed by asking "What are your intentions following graduation from your professional athletic training education program?" Response items included "part-time work as an athletic trainer (while pursuing graduate school or part time only)," "pursue a career as a full-time athletic trainer," "pursue an internship or residency," or "intentions to not enter athletic training." Students' average reported number of clinical education hours was assessed with the question "What is the average number of hours you spend at your clinical education site each week?" Response items included hour ranges such as "0–10," "10–15," and "30+."

Burnout. The Maslach Burnout Inventory–Health Human Services Edition (MBI-HHS) was used to assess burnout among participants.¹⁶ The MBI-HHS is the most widely used measure of burnout among health care professionals and students in the literature. The MBI-HHS is a 22-item scale that measures the 3 constructs of burnout (ie, EE, DP, and

PA).¹⁶ Nine items of the survey measure EE, 5 measure DP, and 8 measure PA constructs. The EE scale includes statements such as "I feel emotionally drained from my work." The DP scale includes statements such as "I feel I treat some patients as if they were impersonal objects." Last, the PA scale includes statements such as "I feel I'm positively influencing other people's lives through my work." Responses for each item are provided on a 7-point Likert scale ranging from *never* = 0 to *every day* = 6. Item scores are summed to create a score for each dimension of burnout.¹⁶ Higher scores on the EE and DP burnout scales indicate an increased level of burnout, whereas a lower score on PA is considered an increased level of burnout because PA is considered a positive attribute.¹⁶ Individuals are considered to be suffering from a high level of burnout if their scores exceed 27 for EE, exceed 10 for DP, or drop below 33 for PA.¹⁶ Internal consistency coefficients of 0.89 (EE), 0.74 (PA), and 0.77 (DP) have been reported for this scale.¹⁶

Statistical Analysis

Statistical analyses were conducted using R, version 3.6.0 (R Core Team, <https://www.R-project.org>). Multiple linear regression models were used to determine the relationship between the independent variables and the 3 MBI-HHS scales (EE, DP, and PA). Surveys were considered incomplete if ATS failed to answer more than 1 question in each of the MBI-HHS scales. Listwise deletion was used to address missingness in surveys that were determined incomplete. Linearity was assessed by plotting the observed versus predicted scores. Autocorrelation and Durbin-Watson tests were used to identify independence of the residuals. Histograms of the distributions of the residuals were used to assess skewness and kurtosis. Shapiro-Wilk tests and Q-Q plots were used to assess normality of the variables. Independent samples *t* tests were performed to determine whether significant differences existed between undergraduate and graduate ATS reports of EE, DP, and PA scores. Linear regression modeling was used to assess which independent variables (ie, gender, clinical education hour weekly average, student relationship status, socioeconomic status, clinical education site, degree type, National Collegiate Athletic Association (NCAA) division, year in ATP, student-reported stress level, and intentions to not enter the profession) increased or decreased the likelihood that a participant had higher levels of burnout for each dependent variable (ie, EE, DP, and PA).

RESULTS

Demographics

Undergraduate Students. A total of 582 survey participants represented undergraduate ATS. A majority of these students were women ($n = 413$, 71%), Caucasian ($n = 459$, 79%), and single ($n = 343$, 59%). The majority of students were localized to District 4 ($n = 171$, 29%) of the National Athletic Trainers' Association (NATA) regional classification system of membership; however, 9 of the 10 districts were represented within this sample. Table 1 further outlines the demographic information, including district breakdowns, for our sample. Mean burnout scores for EE, DP, and PA among undergraduate ATS were 34 ± 10 (range, 9–61), 17 ± 4.7 (range, 12–34), and 39 ± 5.6 (range, 17–49), respectively. For reference, scores above 27 for EE, above 10 for DP, and

Table 1. Demographic Variable Percentages and Mean \pm Standard Deviations for EE, DP, and PA Scores

Variable	Bachelor's (n = 582)	Master's (n = 143)	Total (n = 725)
Gender, n (%)			
Male	169 (29)	38 (27)	207 (29)
Female	413 (71)	105 (73)	518 (71)
Race, n (%)			
Caucasian	459 (79)	105 (73)	564 (78)
African American	34 (6)	11 (8)	45 (6)
Hispanic	49 (8)	9 (6)	58 (8)
Asian/Pacific Islander	40 (7)	18 (13)	58 (8)
Relationship status, n (%)			
Single, never married	343 (59)	79 (55)	422 (58)
Committed relationship	220 (38)	57 (40)	277 (38)
Married	19 (3)	7 (5)	26 (4)
NATA district, n (%)			
1 (CT, ME, MA, NH, RI, VT)	16 (3)	0 (0)	16 (2)
2 (DE, NJ, NY, PA)	76 (13)	25 (17)	101 (14)
3 (DC, MD, NC, SC, VA, WV)	72 (12)	5 (3)	77 (11)
4 (IL, IN, MI, MN, OH, WI)	171 (29)	33 (23)	204 (28)
5 (IA, KS, MO, NE, ND, OK, SD)	49 (8)	21 (15)	70 (10)
6 (AK, TX)	44 (8)	25 (17)	69 (10)
7 (AZ, CO, NM, UT, WY)	52 (9)	3 (2)	55 (8)
8 (CA, Guam, American Samoa, HI, NV)	14 (2)	14 (10)	28 (4)
9 (AL, FL, GA, Puerto Rico, Virgin Islands, KY, LA, MS, TN)	88 (15)	9 (6)	97 (13)
10 (AK, ID, MT, OR, WA)	0 (0)	8 (6)	8 (1)
Emotional exhaustion, Mean \pm SD	34 \pm 10	31 \pm 9.8	33 \pm 10
Depersonalization, Mean \pm SD	17 \pm 4.7	16 \pm 3.5	17 \pm 4.5
Personal accomplishment, Mean \pm SD	39 \pm 5.6	39 \pm 6.6	39 \pm 5.8

below 33 for PA were classified as high levels of burnout.¹⁶ As demonstrated in Figure 1, a total of 70.8% (n = 502) of undergraduate students reported high EE and 100% reported high DP. Only 13.6% (n = 109) of undergraduate students reported low levels of PA.

Graduate Students. A total of 143 graduate ATS were included in the final data analysis. Of the graduate students represented in the sample, most respondents were women (n = 105, 73%), Caucasian (n = 105, 73%), and single (n = 79, 55%). Graduate respondents also represented a nationwide sample

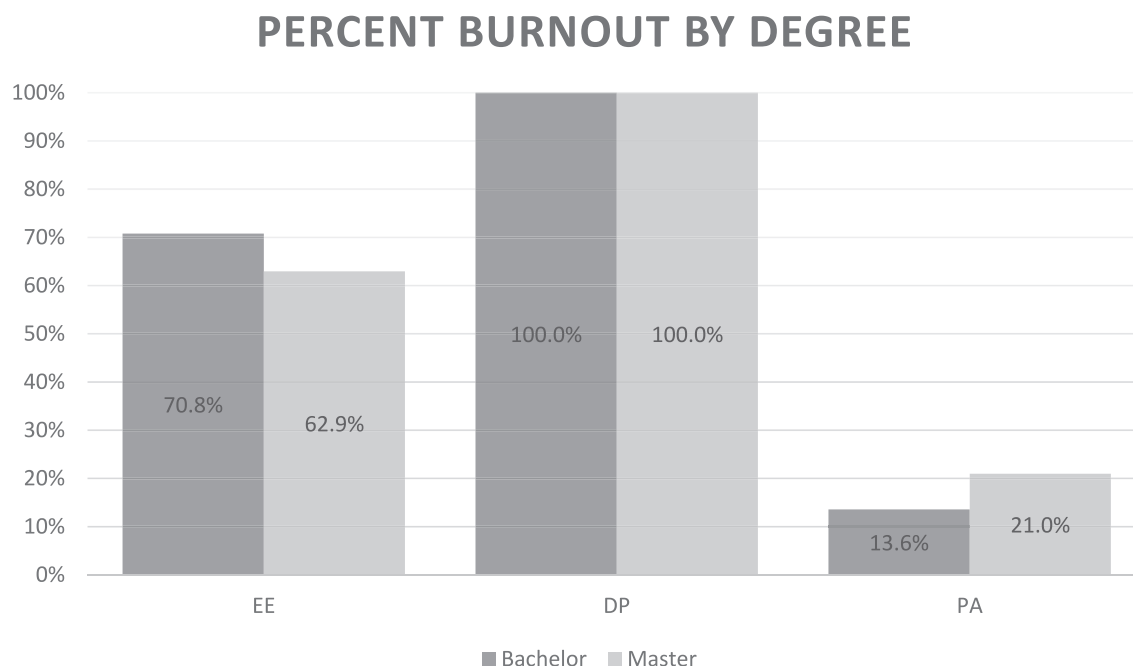
Figure 1. Percentage burnout among bachelor's and master's athletic training degrees.

Table 2. Regression Analysis—Bachelor's^a

Coefficient	Emotional Exhaustion		Depersonalization		Personal Achievement	
	Estimates	95% CI	Estimates	95% CI	Estimates	95% CI
Intercept	19.81^d	14.94, 24.68	14.23^d	11.73, 16.72	36.51^d	33.36, 39.66
Gender	1.16	−0.42, 2.75	− 1.43^d	−2.24, −0.61	1.17^b	0.15, 2.20
Clinical hours	1.49^d	0.81, 2.16	0.77^d	0.42, 1.12	0.06	−0.38, 0.49
Full-time graduate AT	− 6.56^d	−8.92, −4.20	− 1.61^d	−2.82, −0.40	1.76^c	0.23, 3.29
Intern/Resident AT	− 7.69^d	−10.90, −4.49	− 2.10^b	−3.74, −0.46	1.26	−0.82, 3.33
No AT	− 4.07^c	−6.66, −1.47	−0.63	−1.96, 0.69	0.84	−0.84, 2.51
Dating	0.98	−0.56, 2.51	1.13^c	0.34, 1.91	−0.15	−1.14, 0.85
Married	−0.50	−4.68, 3.68	2.87^d	0.74, 5.01	−0.10	−2.80, 2.61
SES	0.33	−0.63, 1.30	0.05	−0.44, 0.55	0.16	−0.46, 0.79
Clinical Ed: Division II, III	2.04	−0.52, 4.59	0.96	−0.35, 2.27	0.44	−1.22, 2.09
Clinical Ed: HS	0.46	−1.60, 2.52	0.36	−0.70, 1.41	−0.26	−1.59, 1.08
Clinical Ed: ES	2.39	−0.70, 5.47	0.28	−1.30, 1.86	0.46	−1.54, 2.46
Clinical Ed: Other	1.39	−2.25, 5.04	0.28	−1.58, 2.15	−0.66	−3.02, 1.70
NCAA Division II, III	− 2.90^c	−5.02, −0.77	−0.63	−1.72, 0.46	−0.17	−1.54, 1.21
Program year	0.22	−0.62, 1.06	−0.13	−0.56, 0.30	0.40	−0.15, 0.94
Overall stress	3.11^d	2.07, 4.16	0.40	−0.13, 0.93	−0.25	−0.93, 0.42
Class stress	1.45^b	0.34, 2.56	0.06	−0.51, 0.63	0.41	−0.31, 1.13
Financial stress	0.68	−0.15, 1.51	0.04	−0.39, 0.46	0.02	−0.52, 0.55
Employment stress	0.32	−0.47, 1.11	0.29	−0.12, 0.69	−0.27	−0.78, 0.24
Friend stress	0.12	−0.85, 1.08	0.44	−0.05, 0.94	−0.30	−0.92, 0.33
Family stress	0.81	0.00, 1.62	−0.02	−0.44, 0.40	0.14	−0.38, 0.67
Social stress	1.32^c	0.44, 2.21	0.59^b	0.14, 1.05	−0.23	−0.80, 0.35
Image stress	−0.28	−1.12, 0.56	0.15	−0.28, 0.58	−0.14	−0.68, 0.41
Observations	582		582		582	
R^2 , F , P values	.314, 11.63, <.001		.154, 4.62, <.001		.040, 1.05, .397	

Abbreviations: AT, athletic trainer; HS, high school; NCAA, National Collegiate Athletic Association; SES, socioeconomic status.

^a Bold numbers indicate variables that were statistically significant. Level of significance further classified by accompanied superscripts.

^b $P < .05$.

^c $P < .01$.

^d $P < .001$.

with all 10 NATA districts being represented. NATA District 4 had the highest representation ($n = 33$, 23%), followed by District 2 ($n = 25$, 17%). Table 1 further outlines the demographic information, including district breakdowns, for our sample. Mean burnout scores for EE, DP, and PA were 31 ± 9.8 (range, 9–61), 16 ± 3.5 (range, 12–34), and 39 ± 6.6 (range, 17–49), respectively. As demonstrated in Figure 1, 62.9% of graduate students reported high EE and 100% of students reported high DP. In the graduate sample, 21% of students reported low levels of PA. An independent samples t test revealed that a significant difference existed between undergraduate (mean, 34 ± 10) and graduate (mean, 31 ± 9.8) EE scores ($t_{723} = 3.19$, $P < .001$). Similar findings were seen between undergraduate (mean, 17 ± 4.7) and graduate (mean, 16 ± 3.5) DP scores ($t_{723} = 2.89$, $P < .001$). The difference between undergraduate (mean, 39 ± 5.6) and graduate (mean, 39 ± 6.5) PA scores was not significant ($t_{723} = 0.48$, $P = .63$).

Multiple Regression Analyses

Undergraduate Student EE. Linear regression analyses (Table 2) demonstrated that student intentions to pursue an internship or residency in athletic training upon entering the profession were associated with decreased EE scores, holding all other variables in the model constant ($b = -7.69$; $P < .001$; 95% CI = −10.90, −4.49). In addition, student enrollment

within a NCAA Division II or III university was associated with decreased EE scores ($b = -2.90$; $P < .01$; 95% CI = −5.02, −0.77). Increased overall stress was also associated with increased EE scores, holding all other variables constant ($b = 3.11$; $P < .001$; 95% CI = 2.07, 4.16). Specific breakdowns of stress reports by social stress ($b = 1.32$; $P < .01$; 95% CI = 0.44, 2.21) and stress from classes ($b = 1.45$; $P < .05$; 95% CI = 0.34, 2.56) were also associated with increased EE scores. Finally, increased reports of clinical education hours were associated with increased EE scores ($b = 1.49$; $P < .001$; 95% CI = 0.74, 2.16). All independent variables entered into the final model for bachelor's student EE can be viewed in Table 2. The combined variables explained 31% of the variance in EE scores ($R^2 = .31$).

Undergraduate Student DP. Intentions to pursue an internship or residency program after graduation again represented the largest relationship with decreased DP scores ($b = -2.10$; $P < .05$; 95% CI = 0.34, 2.56). Being female ($b = -1.43$; $P < .001$; 95% CI = −3.74, −0.46) was also associated with decreased DP. Being married ($b = 2.87$; $P < .01$; 95% CI = 0.74, 5.01), increases in clinical education hours ($b = 0.77$; $P < .001$; 95% CI = 0.42, 1.12), and reports of increased social stress ($b = 0.59$; $P < .05$; 95% CI = 0.14, 1.05) were associated with increases in DP scores. All independent variables entered into the final model for bachelor's student DP can be viewed in Table 2. The combined variables explained 15% of the variance in DP scores ($R^2 = .15$).

Table 3. Regression Analysis—Master's^a

Coefficient	Emotional Exhaustion		Depersonalization		Personal Achievement	
	Estimates	95% CI	Estimates	95% CI	Estimates	95% CI
Intercept	21.53^d	10.16, 32.90	14.07^d	9.45, 18.70	40.22^d	31.21, 49.23
Gender	1.60	−2.22, 5.42	−0.88	−2.43, 0.67	1.75	−1.28, 4.78
Clinical hours	−0.60	−1.88, 0.67	0.52	0.00, 1.04	0.21	−0.80, 1.22
Full-time graduate AT	−6.38	−15.71, 2.95	0.26	−3.53, 4.06	1.97	−5.42, 9.37
Intern/Resident AT	−6.28	−14.95, 2.38	−2.50	−6.02, 1.02	−0.39	−7.26, 6.48
No AT	−3.73	−10.90, 3.44	−1.26	−4.17, 1.66	−1.32	−7.00, 4.37
Dating	1.51	−1.67, 4.69	−0.07	−1.36, 1.22	1.23	−1.29, 3.75
Married	1.48	−5.62, 8.58	−1.32	−4.20, 1.57	4.08	−1.55, 9.71
SES	−0.63	−2.47, 1.22	0.19	−0.56, 0.94	−0.95	−2.41, 0.52
Clinical Ed: Division II, III	−2.74	−7.01, 1.54	0.68	−1.06, 2.42	−2.11	−5.51, 1.28
Clinical Ed: HS	−3.69	−7.55, 0.18	−0.08	−1.66, 1.49	−0.73	−3.80, 2.33
Clinical Ed: ES	−1.98	−9.69, 5.73	−0.49	−3.62, 2.65	0.34	−5.77, 6.46
Clinical Ed: Other	−3.79	−10.17, 2.60	−0.44	−3.03, 2.16	2.48	−2.58, 7.54
NCAA Division II, III	2.80	−0.52, 6.12	0.79	−0.56, 2.14	−1.66	−4.29, 0.97
Program year	0.78	−1.04, 2.59	−0.14	−0.88, 0.60	−0.13	−1.57, 1.31
Overall stress	3.34^c	1.15, 5.53	0.98^b	0.09, 1.87	−0.15	−1.89, 1.59
Class stress	1.88	−0.45, 4.22	−0.22	−1.17, 0.73	0.38	−1.47, 2.24
Financial stress	0.41	−1.52, 2.34	−0.54	−1.33, 0.24	1.06	−0.46, 2.59
Employment stress	−0.19	−1.85, 1.46	0.36	−0.31, 1.03	−0.66	−1.97, 0.65
Friend stress	0.64	−1.80, 3.08	0.41	−0.58, 1.40	−0.25	−2.19, 1.69
Family stress	0.55	−1.06, 2.16	0.15	−0.51, 0.80	−0.36	−1.64, 0.91
Social stress	1.31	−0.91, 3.54	0.58	−0.33, 1.48	0.15	−1.61, 1.92
Image stress	0.55	−1.20, 2.29	0.01	−0.70, 0.71	−0.83	−2.21, 0.55
Observations	143		143		143	
R^2 , F , P values	.384, 3.40, <.001		.223, 1.57, .065		.143, 0.91, .582	

Abbreviations: AT, athletic trainer; Ed, education; ES, elementary school; HS, high school; NCAA, National Collegiate Athletic Association; SES, socioeconomic status.

^a Bold numbers indicate variables that were statistically significant. Level of significance further classified by accompanied superscripts.

^b $P < .05$.

^c $P < .01$.

^d $P < .001$.

Undergraduate Student PA. Intentions to work full time while pursuing further education after graduation ($b = 1.76$; $P < .05$; 95% CI = 0.23, 3.29) and being female ($b = 1.17$; $P < .05$; 95% CI = 0.15, 2.20) were the only variables significantly associated with increases in PA scores, holding all other variables constant. All independent variables entered into the final model for bachelor's student PA can be viewed in Table 2. The combined variables explained 4% of the variance in responses ($R^2 = .04$).

Graduate Student EE. Linear regression analyses in Table 3 demonstrated that overall stress ($b = 6.57$; $P < .01$; 95% CI = 1.15, 5.53) was associated with increased EE among graduate ATS, holding all other variables in the model constant. All independent variables entered into the final model for master's student EE can be viewed in Table 3. The combined variables explained 38% of the variance in responses ($R^2 = .38$).

Graduate Student DP. Overall stress was also associated with increased DP scores, holding all other variables in the model constant. All independent variables entered into the final model for master's student DP can be viewed in Table 3. The combined variables explained 22% of the variance in responses ($R^2 = .22$).

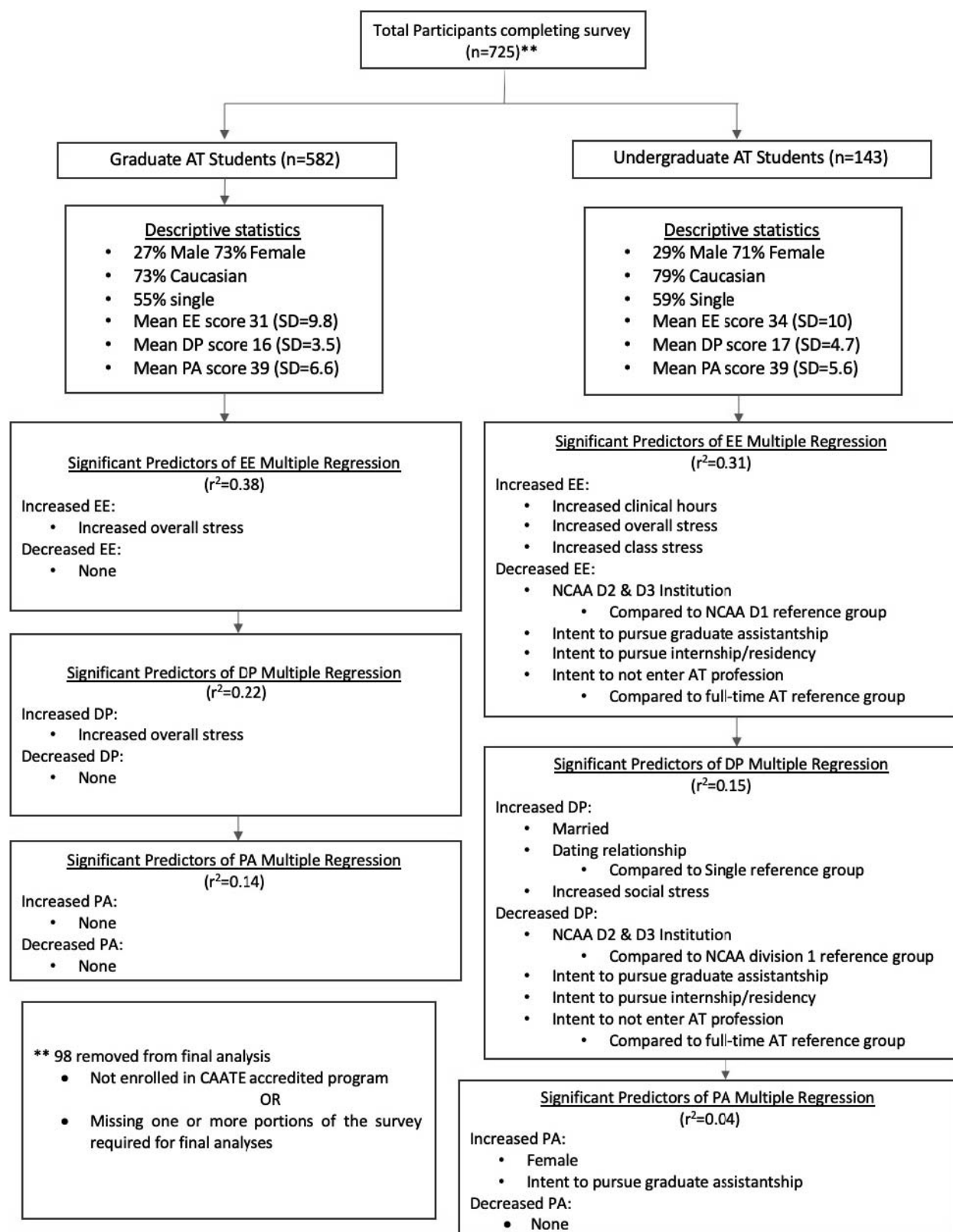
Graduate Student PA. There were no significant independent variables that individually accounted for variance in PA

scores among graduate ATS. However, when considering all independent variables entered in the model, the model for PA explained 14% of the variance in PA scores ($R^2 = .143$). All independent variables entered into the final model for master's student PA can be viewed in Table 3.

DISCUSSION

The objective of our study was to further determine the prevalence and predictors of burnout within ATS. The most recent CAATE analytic report reveals that the majority of ATPs (approximately 69%) are designated as bachelor's degree programs.²⁴ Whereas the athletic training profession is currently undergoing a phaseout of professional bachelor's-level education programs, a call for continued research during the transition of programs to the professional master's degree-level exists.²⁵ Therefore, we decided it was important to determine the prevalence and predictors of burnout within both undergraduate- and graduate-level ATS to explore differences that exist between the current levels of education represented in athletic training education. Therefore, the remainder of this discussion will break down findings within both the undergraduate and graduate ATS samples studied. Figure 2 is a flowchart that provides a breakdown of the data analyses run for both undergraduate and graduate student samples.

Figure 2. Sample size breakdown, analyses, and descriptions of significant findings of undergraduate and graduate students sampled.



Prevalence

Within our sample of ATS surveyed, 70.6% of undergraduate and 62.9% of graduate students reported EE scores higher than 26, indicating high levels of EE burnout.¹⁶ In addition,

100% of both undergraduate and graduate ATS scored higher than 10 on the DP scale, indicating high levels of DP.¹⁶ However, our sample demonstrated a low rate of PA burnout, with only 13.6% of undergraduate and 21% of graduate students reporting low PA scores. Undergraduate students

revealed a higher mean EE score (34 ± 10) than graduate students (31 ± 9.8). Similar results were found for DP scores in which the undergraduate mean was 17 ± 4.7 and the graduate mean was 16 ± 3.5 . The mean PA score for undergraduate students (39 ± 5.6) was similar to that of graduate students (39 ± 6.6). These findings are of interest because the decrease in EE and DP burnout scores may suggest that moving to the master's degree is a potential way to reduce burnout in ATS and therefore may have beneficial implications for ATS retention.

Both undergraduate and graduate results revealed higher mean burnout scores than did previous reports on ATS. Riter et al¹⁴ reported a mean EE score of 17 and a DP mean of 5.7 in a sample of 51 undergraduate ATS. Although the mean scores within this sample were lower than those of our current sample, a similar mean PA score (38) was seen in the Riter et al¹⁴ sample. Emotional exhaustion is considered the key component of burnout; therefore, it is often viewed as the primary outcome measure to assess burnout.²³ A more recent study conducted by Bryant et al¹⁵ explored burnout longitudinally in a sample of 41 first- and second-year professional master's ATS. Reported means for this sample revealed higher EE scores in October (20) than in December (19) during 1 academic semester.¹⁵ Similar findings were seen in reported DP scores, with a mean of 12 reported in October and a mean of 11 reported in December. Whereas decreased burnout was reported from October to December, increases in PA burnout were seen in December (mean = 29) relative to October (mean = 32). The PA scale of burnout is measured inversely to the EE and DP scales, given that increased reports of PA are considered positive and indicative of decreased levels of burnout.¹⁶ When comparing these original reports of burnout among both graduate and undergraduate samples of ATS, our sample demonstrated higher mean EE and DP burnout scores than found in previous reports on ATS. Considering the Bryant et al¹⁵ study provided an updated report of ATS burnout since the original report by Riter et al¹⁴ in 2008, our sample expands on these 2 studies by providing a large, nationwide representation of ATS by including participants from institutions spread across all 10 NATA districts.

Graduate Health Care Student Comparisons

In comparison with graduate students among other health care professions, graduate ATS seem to experience high levels of burnout. Frajerman et al⁸ reported that 40.8%, 35.1%, and 27.4% of 17 431 medical students reported high levels of EE, DP, and PA dimensions of burnout, respectively. In comparison, 62.9%, 100%, and 21% of our graduate ATS sample revealed high levels of burnout in the respective EE, DP, and PA scales, indicating that graduate ATS have a higher prevalence of burnout in 2 of the 3 burnout subscales.⁸ Although differences exist between the level of degree attainment between graduate medical students and ATS (doctoral degree vs master's degree), these findings provide value because they indicate that a high proportion of burnout prevalence exists across a range of graduate health care student populations. In a recent report of burnout among 320 physician assistant students, 79.69% of students revealed high levels of EE and 56.56% of students reported high levels of DP.¹⁰ Whereas our graduate sample of ATS had a slightly lower prevalence of EE, our sample demonstrated a higher

prevalence of DP than physician assistant students.⁹ Educational requirements of physician assistants require students to obtain a master's degree in physician assistant studies prior to entering clinical practice. However, percentages of burnout prevalence among all 3 of these graduate health care programs (medical, physician assistant, and AT) are higher than working professionals in these fields (51% of physicians,³ 64% of physician assistants,⁵ and 38% of ATs⁶).

Undergraduate Health Care Student Comparisons

Nursing is one of the remaining health care professions that does not require a graduate degree for students to enter the profession. Therefore, burnout reports among nursing student samples allow for comparisons between nongraduate health care students and undergraduate ATS. One longitudinal study among a sample of 73 nursing students reported mean burnout scores of 15.0 ± 7.5 for EE, 3.9 ± 4.1 for DP, and 37.1 ± 6.5 initially and 13.9 ± 7.7 for EE, 3.5 ± 3.9 for DP, and 39.0 ± 5.1 for PA a year later within their academic program.²⁶ In comparison, our sample of undergraduate ATS reported mean burnout scores of 34 ± 10 for EE, 17 ± 4.7 for DP, and 39 ± 5.6 for PA. Therefore, our sample revealed higher mean burnout scores compared with nursing students for the EE and DP burnout scales. Another study analyzing burnout reports of undergraduate occupational therapy students reported mean burnout scores of 17.58 ± 6.36 for EE, 5.77 ± 5.05 for DP, and 26.55 ± 5.33 for PA. Similar to the comparison between nursing students and ATS, a higher mean EE and DP score was seen. However, ATS again appeared to have better PA scores than both nursing (at time of initial study) and occupational therapy students. Dental hygiene is another health care profession that does not require a graduate degree. A recent sample of 119 dental hygiene students revealed that 22% of the sample reported high burnout scores in both the EE and DP subscales, whereas 25% of students reported cutoff scores for decreased PA.¹⁰ In comparison, 70.8% of our ATS sample met classifications for high levels of EE, whereas 100% of students reported high DP. These results indicate that undergraduate ATS have a higher prevalence of high EE and DP dimensions of burnout than dental hygiene students. We found it interesting that although ATS reported higher prevalence of high EE and DP, only 13.6% of undergraduate students reported low levels of PA, indicating that ATS report greater perceptions of PA than do dental hygiene students.

Whereas mean scores were reported for the sample of nursing and occupational therapy students, overall percentages of students meeting the cutoff scores for each category of the MBI-HHS were not provided, limiting the ability to compare overall prevalence rates between the 2 samples and those of ATS. However, percentages of high levels of burnout among dental hygiene students, occupational therapy students, and ATS indicate multiple undergraduate health care student groups demonstrate a high prevalence of burnout as compared with working professionals in their fields (43.5% of occupational therapists,²⁷ 15% of dental hygienists,²⁸ and 38% of ATs).⁶

Antecedents of Burnout

Within the ATS literature, associations between the length of time in ATPs,¹⁴ relationship status,¹⁴ and increased levels of

stress have been associated with reports of burnout.^{14,15} Among medical students, geographic location, stress, financial strain, and workload have been reported as predictors of burnout.⁸ In addition, student age, year level within school, hours of study, and self-care techniques were associated with burnout scores within a study of occupational therapy students.¹⁸ Our study adds to previous research by discovering additional antecedents influencing burnout reports including career intentions, school NCAA division, and clinical education hours. The results of multiple regression analyses for the EE, DP, and PA models for our sample of undergraduate and graduate students are described in Tables 2 and 3, respectively.

Similar to previous reports,^{14,15} our study found stress to be associated with increased burnout scores in both undergraduate and graduate ATS. In the undergraduate students' responses, overall stress revealed a significant relationship with increased EE burnout scores ($b = 3.11$, $P < .001$, 95% CI = 2.07, 4.16). When breaking down types of stressors among undergraduate students, social stress was a significant predictor of EE burnout, holding all other variables constant ($b = 1.32$; $P < .01$; 95% CI = 0.44, 2.21). Within the DP model, social stress was the only significant stressor reported among undergraduate ATS ($b = 0.69$; $P < .05$; 95% CI = 0.14, 1.05). In the responses of master's students, overall stress represented the only significant association in the model created for EE ($b = 3.34$; $P < .01$; 95% CI = 1.15, 5.53) and DP ($b = 0.98$; $P < .05$; 95% CI = 0.09, 1.87) levels of burnout. The relationships found between student reports of stress corroborate previous findings of the predictive nature of stress and reported burnout symptoms among undergraduate¹⁴ and graduate¹⁵ ATS as well as other health care students.¹¹

Furthermore, our study found a correlation between relationship status and increased DP burnout scores. Student reports of being in a dating ($b = 1.13$; $P < .01$; 95% CI = 0.34, 1.91) or marriage relationship ($b = 2.87$; $P < .01$; 95% CI = 0.74, 5.01) were associated with increased burnout scores among undergraduate students. These findings are similar to earlier reports among ATS by Riter et al,¹⁴ who reported that female ATS responding as being in a serious relationship had higher EE and DP burnout scores than male ATS who were in a relationship. We found it interesting that whereas our sample found a relationship between reports of being in a relationship and increased DP scores, the relationship between increased EE scores and relationship status was not significant.

We included measures assessing student class stress and clinical education hours into regression analyses for EE, DP, and PA dimensions of burnout in both the undergraduate and graduate ATS samples to determine whether workload-related stressors or time commitments of clinical education requirements revealed a relationship with increases in burnout scores. Although these variables have not been quantitatively assessed within previous literature pertaining to ATS burnout,^{14,15} increased student workloads in other health care student populations have been associated with increased burnout.⁸ Within the undergraduate AT sample, class stress was associated with increased EE burnout scores ($b = 1.32$; $P < .01$; 95% CI = 0.44, 2.21). Similarly, clinical education hours were also associated with undergraduate ATS EE scores ($b = 1.49$; $P < .001$; 95% CI = 0.81, 2.16) and DP scores ($b = 0.77$,

$P < .001$, 95% CI = 0.42, 1.12). Class stress and clinical education hours were not significant predictors of burnout scores within the graduate AT sample.

To our knowledge, our study is the first to explore burnout in ATS across multiple institutions. This approach allowed us to determine whether students' affiliated NCAA division was predictive of increased burnout scores. In our study, students reporting affiliations with NCAA Division II and III schools ($b = -2.90$; $P < .01$; 95% CI = -5.02, -0.77) had decreased burnout scores compared with students reporting affiliations with Division I institutions.

It is interesting that the career intentions of undergraduate ATS after graduation affected the variation in burnout scores. Intentions to pursue a graduate assistantship as an AT while completing graduate education ($b = -6.56$; $P < .001$; 95% CI = -8.92, -4.20), pursuit of an internship or residency ($b = -7.69$; $P < .001$; 95% CI = -10.90, -4.49), or intention to not work as an AT in any form or fashion ($b = -4.07$; $P < .01$; 95% CI = -6.66, -1.47) after graduation were associated with decreased EE burnout scores compared with students who reported intent to pursue full-time employment in AT upon graduation (reference variable). Similar findings were found for students intending to pursue a graduate assistantship as an AT while completing graduate education ($b = -1.61$; $P < .01$; 95% CI = -2.83, -0.40) and intentions of completing an internship or residency program ($b = -2.10$; $P < .01$; 95% CI = -3.74, -0.46) and decreased DP scores. To our knowledge, this is the first report of burnout within ATS to reveal a relationship between student career intentions and burnout. Our results suggest that students intending to practice athletic training full time upon graduation have increased burnout scores compared with those with other career intentions. This could have long-term implications for ATS and professional retention. Therefore, faculty members should consider providing education and prevention resources to their students to help reduce the potential burden of burnout in students and to foster improved retention in the AT profession upon entering the field. A similar study assessing the prevalence of burnout within physician assistant students identified that students expressed interest in a wellness intervention program to reduce stress and burnout.⁹ Therefore, the provision of educational resources regarding these issues could be beneficial to ATS.

Limitations

This study was limited to a 1-time, cross-sectional sampling of burnout in ATS. The reported scores may have been affected by the time of year in which sampling occurred. Surveys were conducted in the middle of a spring semester when academic classes and clinical education are likely at their peak of required time commitments. Students might have reported different levels of burnout if sampled at a different time point such as the beginning or end of the semester. In addition, a response bias may have been present, resulting in students who were feeling symptoms of burnout not taking the time to complete this survey. Differences between the sample sizes of undergraduate and graduate ATS limits the ability to make substantial inferences between the differences between burnout prevalence and associated predictors between the 2 samples. Furthermore, the approaching change to solely

professional graduate-level ATPs will limit the importance of findings within undergraduate samples. Therefore, a continued focus on factors related to graduate ATS is imperative moving forward.

Future Directions

Future research should consider longitudinal approaches to assess differences in burnout scores among ATS and factors that may affect these scores over time. Furthermore, burnout research among other professions has identified coping strategies and personality factors to affect burnout scores.⁸ Future studies among ATS should seek to identify coping mechanisms that students use to deal with high levels of stress and burnout and also look toward educational programming and intervention methods that may provide students with information and resources to better manage stress and avoid burnout. In addition, future research should focus on the prevalence, antecedents, effects, and alleviation of burnout within graduate ATS specifically, due to the coming change to graduate-level-only professional ATP.

CONCLUSIONS

Burnout is a psychological syndrome that has been studied across many health care professionals including athletic training.^{1,4-6} High levels of burnout have been associated with negative outcomes including increased number of patient safety incidents among professionals and dropout intentions among students.¹¹ This study reveals high levels of burnout among both undergraduate and graduate ATS. Undergraduate students revealed higher scores of EE and DP than did graduate students.⁸⁻¹⁰ These findings suggest that the move to a graduate-level education requirement before entering the athletic training profession may have beneficial implications for ATS retention due to the decreased burnout scores seen within graduate students. However, both undergraduate and graduate ATS revealed higher levels of burnout than did other samples of health care students. Therefore, a continued need for further research into alleviating burnout within ATS is imperative. Our study adds to previous literature studying burnout within ATS by providing a diverse nationwide sample and indicating additional antecedents of burnout within undergraduate ATS (ie, types of stressors, clinical education hours, and career intentions). Whereas multiple antecedents of burnout were found within undergraduate students, the only variable significantly related to burnout scores in graduate students was overall stress. This finding is likely due to the fact that our undergraduate sample was significantly larger than our graduate sample. Due to the finding that stress plays a significant role in explaining the variance of burnout within both undergraduate and graduate ATS, education and wellness intervention programs may be a beneficial approach to alleviating burnout within ATS, similar to suggestions within physician assistant students.⁹ Faculty members should be aware of the presence of stress and burnout among undergraduate and graduate ATS, identify ways to educate students on the prevalence of burnout, and identify resources that may alleviate burnout within ATS such as providing social support and educational resources for their students.

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