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Depression, burnout, and professional outcomes among PAs

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ABSTRACT

Objective: This study examined the effect of depression and burnout on PA professional fulfillment and medical errors.

Methods: Eight hundred eighty PAs completed an online survey containing the Professional Fulfillment Index, PHQ-2, GAD-7, and demographic questions. Two serial mediation models examined the relationship between depression, burnout, and professional outcomes.

Results: Burnout fully mediated the relationship between depression and outcomes in both models and the present research indicates that burnout plays a stronger role in job satisfaction than symptoms of depression.

Conclusions: Understanding the underpinnings of professional satisfaction may mitigate clinician turnover, which in turn may lead to cost savings for the organization, better resilience and mental health for clinicians, and potentially better patient outcomes.

Keywords: physician assistant, PA, burnout, medical errors, depression, turnover

Burnout and depression in healthcare providers have become topics of increasing interest and research. Despite their importance, and the interplay between the two, little research has examined how these concepts influence professional outcomes, including professional fulfillment and medical errors, in physician assistants (PAs). Given the importance of these outcomes for clinician retention and quality of patient care, this study examined how depression and burnout affect professional outcomes in PAs.

Burnout is a well-established phenomenon in the physician literature. More than half of US physicians demonstrate signs of burnout, and about 40% of physicians are

dissatisfied with work-life balance.^{1,2} Characteristics of burnout include work exhaustion, interpersonal disengagement, and low sense of professional fulfillment.^{3,4} Consequences of burnout in clinicians include increased medical errors, high turnover, suicidal ideation, and substance abuse.⁵⁻⁷ Notably, burnout is linked with suboptimal patient care, lower patient satisfaction, and longer post-discharge recovery times.^{6,8-10} Professional fulfillment and satisfaction show an inverse relationship with burnout.^{11,12} Like burnout, job dissatisfaction is pervasive among the US healthcare workforce, affecting clinician retention.¹

Much less is known about how burnout may be manifested in PAs, with reported burnout prevalence in the range of 64% to 80%.¹³⁻¹⁵ Coplan and colleagues found that 55% of PAs indicate *spending too many hours at work* as an important contributor to work-related stress.¹⁶ Coplan and colleagues also estimated that as many as 15,000 PAs are considering leaving their jobs because of stress, which has major implications for access to, and quality of, care.¹⁶ Burnout also is linked with intention to relocate.¹⁵ Levels of burnout vary by specialty, with oncology, emergency medicine, and family medicine showing rates higher than 60%.^{8,17} Other factors related to burnout in PAs include inadequate administrative support, low perceived control over workload, and working in rural settings.^{14,15} Despite indicating high levels of burnout, some PAs, particularly those in emergency medicine, still reported feeling professionally fulfilled.¹⁸

Although PAs have become an increasingly important part of the US healthcare workforce, mental health factors associated with PA burnout remain a relatively understudied area. Several studies have examined the relationship between burnout, mental health predictors, and professional outcomes in physicians.^{6,11,19-22} Most notably, studies have

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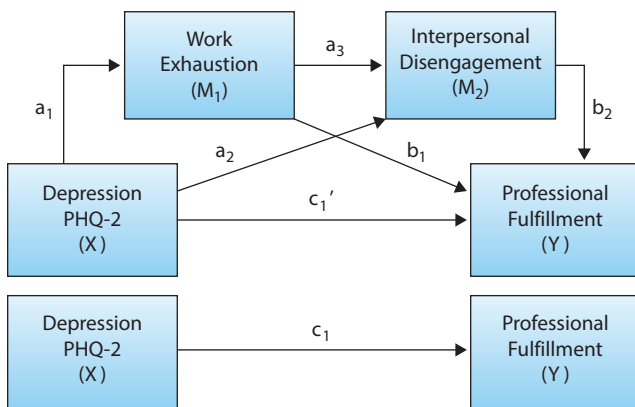
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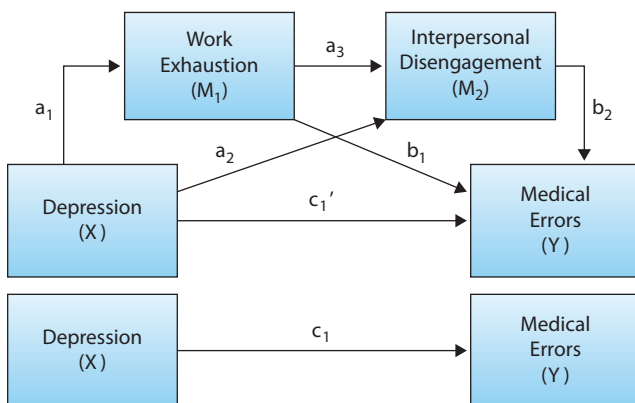
shown a strong association between depression, burnout, and adverse practice outcomes.^{6,11,19-22} Depression is common among medical trainees and depression can continue to affect trainees after they are practicing physicians.¹⁹ Depression can impair cognitive function, impairing visual attention and slowing a clinician's reasoning, which can be harmful to patient care.^{20,21} Additionally, depression increases the risk of burnout in medical residents.⁶ In studies of anesthesiology residents, 17% of participants were identified as high risk for burnout and depression; these residents were less likely to uphold best practice standards, were less vigilant, and were more likely to make medical errors.^{21,22} A study of residents in obstetrics and gynecology found that 34% met criteria for depression; depression was strongly related to the exhaustion dimension of burnout, which was a concern for malpractice.¹¹

FIGURE 1. Serial multiple mediation models

A. Work exhaustion and interpersonal disengagement as proposed mediators of depression on professional fulfillment



B. Emotional exhaustion and interpersonal disengagement as proposed mediators of depression on medical errors



a—pathway between depression and mediators
 b—association between mediators and outcome
 c—total effects (controlling for mediators)
 c'— total direct effects

Two studies have examined the relationship between depression and burnout in PAs.^{15,23} Thommasen and colleagues found depression to be associated with work exhaustion and interpersonal disengagement.¹⁵ Depression and burnout were inversely related with professional fulfillment and positively associated with intention to relocate.¹⁵ Varner and Fautch found that 84% of Air Force PAs in family medicine self-reported symptoms of at least mild depression, 59% had at least medium levels of emotional exhaustion, and 34% had at least medium levels of depersonalization.²³ The interaction of depression and burnout was not assessed, demonstrating the need for additional research on these topics in the wider PA profession. Although the presentations of burnout and depression overlap, research has demonstrated discriminant validity of burnout with regard to depression.²⁴ These studies have concluded that although depression and burnout are similar, they are not identical constructs. Furthermore, unlike the physician literature that has demonstrated a relationship between burnout and medical errors, no research to date shows that relationship among PAs.

Given that research in physicians has shown a link between depression and burnout, and that these factors negatively affect performance including medical errors and patient outcomes, exploring these same issues in PAs can elucidate valuable information about healthcare delivery.^{3,5-7,11,19,22,25,26} To address this gap in the literature, this study examined

- work exhaustion and interpersonal disengagement as mediators of depression and professional fulfillment among PAs in the United States
- work exhaustion and interpersonal disengagement as mediators of depression and medical errors.

We hypothesized that depression would be associated with higher levels of burnout; further, we predicted that burnout would mediate the relationship between depression and professional fulfillment and medical errors.

METHODS

Participants and design As part of an unrelated study being conducted by the American Academy of PAs (AAPA), 1,507 PAs were randomly solicited to take part in a 10- to 15-minute survey related to burnout and professional fulfillment. The survey was run by James Madison University and approved by the university's institutional review board. As part of the study, PAs consented to not only complete the survey but to allow AAPA to share their primary role, work setting, specialty, employer type, years of experience, sex, race, ethnicity, and state and county of practice with the university partner. In exchange for participation, PAs were entered into a gift-card drawing. Of those sampled, 860 provided informed consent and provided at least partial responses, for a response rate of 57.1%.

Procedures Before being recruited to join the study, participants completed the aforementioned unrelated study by the AAPA. A random sample of those PAs were invited to participate in this study, and following informed consent, participants responded to a battery of measures. The measures included the 7-item Generalized Anxiety Disorder Scale (GAD-7); the 16-item Stanford Professional Fulfillment Index (PFI, consisting of three subscales of professional fulfillment, work exhaustion, and interpersonal disengagement); a 4-item self-report of medical errors; and the 2-item Patient Health Questionnaire-2 (PHQ-2), a depression measure.^{3,27,28} Finally, participants were asked to report their clinical specialty, satisfaction with their collaborating physician, and if they ever transitioned into new area of clinical practice. The PFI has been validated as a measure of burnout and professional fulfillment in clinicians and has been shown to correlate highly with their equivalents on the Maslach Burnout Inventory (MBI), a commonly used indicator of burnout.³ The PFI uses the *work exhaustion* subscale as opposed to the MBI's *emotional exhaustion* ($r = .71$). Interpersonal disengagement is assessed instead of depersonalization, with a slightly lower correlation between the MBI and PFI constructs ($r = .56$). This lower correlation between the PFI and MBI is thought to be a result of the PFI's inclusion of disengagement from professional colleagues in addition to patients. Despite this, the correlation indicates interpersonal disengagement is an acceptable proxy of the MBI's depersonalization.³

Serial mediation methods Our first hypothesis (H1) stated that depression scores (X) will indirectly influence professional fulfillment (Y) through multiple mediators: work exhaustion (M_1) and interpersonal disengagement (M_2 ; **Figure 1a**). Our second hypotheses (H2) stated that depression scores (X) will indirectly influence medical errors (Y) through multiple mediators: work exhaustion (M_1) and interpersonal disengagement (M_2 ; **Figure 1b**).

Two serial mediation analyses, also referred to as multiple-step multiple mediation, were conducted using the SPSS macro PROCESS with the two burnout variables (subscales from the PFI) as mediators.²⁹ The "a" paths represent the association between the predictor (depression) and the mediating variables (work exhaustion and interpersonal disengagement). The "b" paths represent the association between the mediating variables and the outcome variables (model 1: professional fulfillment and model 2: medical errors). Path "c" represents the total effect of depression on the outcome variable, after controlling for indirect effects. All paths for the full process model are illustrated in **Figure 1**. The serial multiple mediation procedure uses an ordinary-least-squares path analysis to estimate the coefficients in the model in order to determine the direct and indirect effects. Bootstrapping, a method that does not rely on the assumption of a normally distributed sampling distribution of the indirect effect, was implemented in these analyses to

obtain bias-corrected 95% confidence intervals for making statistical inference about specific and total indirect effects.³⁰ Data were analyzed using IBM SPSS.

Covariates were included in each mediation model for all analyses testing the proposed hypotheses. We included demographic variables that were significantly related to depression in bivariate analyses ($P < .25$): sex, years of clinical experience, and relationship with collaborating physician. A cutoff value of $P < .25$ was used as an inclusion criterion for covariates because more traditional values such as $P < .05$ can fail to detect important variables.³¹ Anxiety as assessed by the GAD-7 was included in both models as covariates because of the strong link between depression and anxiety. In the final mediation models, a cutoff of $P < .05$ was used in evaluating significance.

RESULTS

Table 1 summarizes respondent demographic data and specialty results. The most represented specialties in the sample were a surgical specialty ($n = 215, 24.9\%$) followed by primary care ($n = 182, 21.1\%$). PA workforce data show that these are the most common specialties nationally.³² No significant differences in professional fulfillment or burnout were found between specialties in the sample. About half of clinicians ($n = 452, 52.2\%$) reported transitioning into a different clinical specialty at some point in their career. Clinicians reported the county in which they practice, which was coded into rural and urban practice areas using a standard convention method.³³ For the work exhaustion burnout subscale, PA scores ranged from 0 to 16, with a mean score of 5.6 ($SD = 3.59$). For the interpersonal disengagement scale, scores ranged from 0 to 24, with a mean score of 5.6 ($SD = 4.49$). Higher scores indicate higher exhaustion and disengagement. Using cutoff scores set by Trockel and colleagues, with a mean of 1.33 per item, 34.3% ($n = 295$) met criteria for overall burnout, 45.9% ($n = 393$) for work exhaustion, and 30.2% ($n = 259$) for interpersonal disengagement.³ Professional fulfillment scores ranged from 0 to 24 with a mean of 14.51 ($SD = 5.3$), with 31.7% ($n = 271$) meeting PFI criteria. However, 53% of participants reported at least moderate professional fulfillment in all measured aspects. Medical error scores ranged from 0 to 20 with a mean of 3.53 ($SD = 3.15$). Depression and anxiety scores ranged from 0 to 6 ($M = 0.79, SD = 1.19$) and 0 to 12 ($M = 4.50, SD = 4.37$), respectively. Six percent ($n = 52$) of the sample met criteria for depression outlined by the PHQ; 12.6% ($n = 108$) met criteria for moderate to severe anxiety.

Serial multiple mediation analysis for professional fulfillment We first tested (H1) whether work exhaustion and interpersonal disengagement sequentially mediate the influence of depression on PAs' professional fulfillment. A serial mediation analysis (model 6 in PROCESS) was conducted with bootstrap methods.²⁹ All paths for the full process model are illustrated in **Figure 1** and their corresponding

coefficients are provided in Table 2. The total effect (c) of depression on professional fulfillment was significant ($\beta = -0.77$, $t = -4.75$, $P < .0001$). When the effect of the mediators was added, total direct effect (c') was not significant ($\beta = -0.18$, $t = -1.1$, $P = .2368$). The total indi-

rect effect, the sum of the specific indirect effects, was significant with a point estimate of -0.59 and a 95% CI between -0.81 and -0.39 . The specific indirect effect through work exhaustion was significant ($a_1b_1 = -0.37$; CI = -0.54 to -0.23); however, the specific indirect effect through interpersonal disengagement was not significant ($a_2b_2 = -0.06$; CI = -0.15 to 0.01). Yet, when testing serial multiple mediation, the specific indirect effect of depression through both work exhaustion and interpersonal disengagement ($a_1a_3b_2$) was significant, supporting H1, with a point estimate of -0.15 and 95% CI between -0.24 and -0.08 . This suggests a moderate negative relationship between depression and professional fulfillment when accounting for work exhaustion and interpersonal disengagement.

Serial multiple mediation analysis for medical errors

Our second hypothesis (H2) tested whether work exhaustion and interpersonal disengagement sequentially mediate the influence of depression on PAs' medical errors. All paths for the full process model are illustrated in Figure 1b and their corresponding coefficients are provided in Table 2. The total effect (c) of depression on medical errors was not significant ($\beta = -0.09$, $t = -0.79$, $P = .43$). When the effect of the mediators was added, total direct effect (c') was not significant ($\beta = -0.18$, $t = -1.59$, $P = .11$). The total indirect effect, the sum of the specific indirect effects, was significant with a point estimate of 0.09 and a 95% CI between 0.01 and 0.19 . The specific indirect effect through work exhaustion was significant ($a_1b_1 = -0.08$; 95% CI = -0.16 to -0.01); however, the specific indirect effect through interpersonal disengagement was not significant ($a_2b_2 = 0.05$; 95% CI = 0 to 0.12). The test for serial multiple mediation, the specific indirect effect of depression through both work exhaustion and interpersonal disengagement ($a_1a_3b_2$) was significant, supporting hypothesis 2, with a point estimate of 0.12 and 95% CI between 0.07 and 0.19 . This suggests a moderate positive relationship between depression and medical errors when accounting for work exhaustion and interpersonal disengagement.

DISCUSSION

This study examined the role of work exhaustion and interpersonal disengagement as mediators of depression and job satisfaction and of depression and medical errors. Most PAs (53%) reported moderate to high levels of professional fulfillment, but 30.2% reported interpersonal disengagement, 45.9% reported work exhaustion, and 34.3% reported overall burnout. Conversely, 80% reported at least one medical error during their career, a mean of 3.5. In terms of mental health, 6.1% reported moderate to severe depression and 12.6% reported moderate to severe anxiety. Although depression influences feelings of professional fulfillment, it is mediated by symptoms of burnout, namely work exhaustion and interpersonal disengagement. Similarly, we found that although depression influences self-reported medical errors, it is mediated by

TABLE 1. Participant characteristics

Variable	Mean \pm SD or n (%)
Age; mean \pm SD (min-max)	38.9 (11.1) (22, 72)
Years of clinical practice; mean \pm SD (min-max)	10.6 (11.1) (1, 46)
Burnout prevalence	34.3 (295)
Work exhaustion	45.9 (393)
Interpersonal disengagement	30.2 (259)
Depression	6.1 (52)
Anxiety (moderate to severe)	12.6 (108)
Sex	
Female	609 (70.6)
Male	248 (28.8)
Specialty	
Primary care	182 (21.1)
Internal medicine	117 (13.6)
Pediatrics	16 (1.9)
Surgical	215 (24.9)
Emergency	80 (9.3)
All other	223 (25.9)
No specialty	28 (3.2)
Transitioned into a different clinical practice	
Yes	452 (52.4)
No	407 (47.2)
Satisfaction with supervising physician	
Extremely satisfied	413 (47.9)
Somewhat satisfied	282 (32.8)
Neither	72 (8.4)
Somewhat dissatisfied	68 (7.9)
Extremely dissatisfied	24 (2.8)
Percentage of time spent in direct patient care	
<25%	37 (4.3)
20%-50%	60 (7)
51%-75%	131 (15.2)
>75%	624 (72.5)
County location of clinical practice	
Urban	746 (90.2)
Rural	81 (9.8)

symptoms of burnout, namely work exhaustion and interpersonal disengagement.

These data support the literature that burnout is a growing problem for PAs. The next steps may include research on which systems factors are contributing to work exhaustion, interpersonal disengagement, and burnout overall as well as what protective factors are buffering PAs from the same. Among physicians, professional fulfillment and satisfaction is correlated with the ability to provide high-quality care, and obstacles include inadequate professional support from leadership and barriers to payment.³⁴ Research is emerging on factors related to physician burnout, but little is known about how PAs may be affected by stressors in the same healthcare systems.^{13,34-37}

Several factors unique to the PA profession could be examined in future research. First, although PAs are trained in the broad scope of primary care, they have career flexibility to move between specialties without further training or certification.¹³ Additionally, PA scope of practice largely is determined by that of the collaborating physician, laws of the state in which the PA is practicing, and availability of positions. Closely tied to this is physicians' confidence in PA abilities, which can affect leadership and workplace environment, which have been shown to influence burnout and professional fulfillment.¹⁴ Although we controlled for specialty and relationship with collaborating physician, it may be worth examining these factors in greater depth in the future.

Some protective factors for burnout have been noted in the literature, and may warrant exploration. PAs are trained to practice team-based medicine, which can foster an environment protective against burnout. For example, compared with clinicians who did not work in teams, primary care PAs noted less work exhaustion when paired with a medical assistant.³⁸ Teaching also may be protective: PAs practicing in emergency medicine whose responsibilities included teaching reported less burnout than PAs in emergency medicine who did not teach.⁸ Finally, the expanding role of PAs may counteract burnout because it energizes the profession.¹³

LIMITATIONS

Despite efforts to recruit a diverse sample, self-selection bias is a limitation to this study. PAs who already have an interest in this topic may have been more inclined to participate. However, our sample demographics were consistent with national proportions, increasing the generalizability of results.

Second, social desirability bias is a concern because the study measures included sensitive topics, specifically medical errors, depression, and anxiety. Additionally, because the survey was not randomized, results may have been subject to priming bias. All participants viewed the survey in a fixed order, so initial questionnaires may have influenced participants' responses on subsequent questionnaires.

TABLE 2. Path coefficients, indirect effect, and 95% CI predicting professional fulfillment and medical errors

Coefficients represent the unstandardized coefficients.
SE = standard error.

Model 1: Professional fulfillment			
Path	Effect (SE)±	Lower CI	Upper CI
Total effect (c)	-0.76* (0.16)	-1.08	-0.45
Direct effect (c')	-0.18 (0.15)	-0.59	-0.33
a ₁	0.78* (0.09)	0.6	0.97
a ₂	0.25** (0.11)	0.03	0.48
a ₃	0.78* (0.04)	0.7	0.86
b ₁	-0.46* (0.06)	-0.59	-0.33
b ₂	-0.25* (0.04)	-0.34	-0.16
Model 2: Medical errors			
Total effect (c)	-0.08 (0.1)	-0.3	0.12
Direct effect (c')	-0.17 (0.11)	-0.39	0.04
a ₁	0.78* (0.09)	0.6	0.97
a ₂	0.25* (0.11)	0.03	0.48
a ₃	0.78* (0.04)	0.7	0.86
b ₁	-0.1** (0.04)	-0.19	-0.01
b ₂	0.2* (0.03)	0.13	0.26

P* < .001, *P* < .05

Although many different instruments are available to assess depression and anxiety, the GAD-7 and the PHQ-2 were selected. Other measures may provide a more comprehensive evaluation of these constructs, but these specific measures were chosen to reduce survey burden and fatigue. The PFI used to measure work exhaustion, interpersonal disengagement, and professional fulfillment is time-sensitive, and therefore limited. In it, respondents are asked to reflect on the past 2 weeks; what respondents were feeling at the time of the survey may not reflect their experiences a month earlier or a month later. Finally, additional mediators may be important to further understand the relationship between depression and professional fulfillment; however, this study focused on work exhaustion and interpersonal disengagement before examining any additional mediators. Future research is needed to examine additional mediators.

CONCLUSIONS

Implications for practice can be drawn from these data, specifically the importance of prevention and early identification of clinician burnout. Burnout may affect healthcare systems in three areas: patient care, clinician health, and systems outcomes.³⁶ In terms of patient care, research has shown the negative relationship between feelings of burnout and quality of patient care, patient satisfaction, and recovery times.^{6,8,10,39,40} In addition to the negative effect burnout has on patient care, clinicians may

experience changes in their mental health, substance abuse, poor self-care, motor vehicle accidents, and even suicidal ideation.^{6,8-10,39,40} Clinician burnout also affects the health-care system through reduced clinician productivity and increased turnover, which leads to reduced patient access and increased system costs.¹³ In 2019, researchers estimated the annual cost of US physician burnout to be between \$2.6 billion and \$6.3 billion.⁴¹ Add in the costs of other clinicians such as PAs and NPs, as well as other affiliated staff, and the healthcare system clearly has an incentive to reduce clinician burnout.

This study provides evidence supporting the need to address burnout in PAs, who continue to be of growing importance in the healthcare system.⁴² Our results demonstrate the effects of burnout on professional outcomes important to clinician retention and quality patient care. Further, these results show that PA depression, although important, does not fully explain professional fulfillment and medical errors; in fact, the prevalence of depression in our sample was lower than rates previously established in physicians, as well as the general population.^{6,22,28} Work exhaustion and interpersonal disengagement explain more of the variation in these outcomes across clinicians. Although many studies in other medical professionals have described the role of depression in care quality and outcomes, these results suggest that addressing burnout in the PA profession should be a priority for PAs and to healthcare administrators.^{11,15,22} A better understanding of factors contributing to burnout and professional outcomes beyond individual clinician mental health can provide critical information in the future. **JAAPA**

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