
The impact of gender and institutional factors on depression and suicidality in urology residents

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Introduction: Surgical trainees experience high rates of depression and suicidal ideation (SI). However, there remain a gap in knowledge on the drivers of depression and SI in trainees, especially within the field of urology.

Materials and methods: We conducted a national study of urology trainees using a 50-item questionnaire in May 2018. The survey included demographic, depression (Patient Health Questionnaire-9 (PHQ-9)), burnout (Maslach Burnout Inventory (MBI)), and quality of life (QoL) questions.

Results: Overall, 37 (17.6%) endorsed depression; 24 residents endorsed SI (11%). SI was higher in those with depression ($p < 0.001$). Burnout was also higher among depressed residents (97.3% versus 61.8%, $p < 0.001$) and those endorsing SI (16.1% versus 1.5%, $p < 0.001$). Depression was associated with female gender (29.2%

versus 12.4%, $p = 0.005$), fatigue (29.5% versus 7.8%, $p < 0.001$), and lack of structured mentorship (23.7% versus 9.8%, $p = 0.010$). Access to mental health services was protective ($p = 0.016$). Older age, low QoL, dissatisfaction with work-life-balance (WLB), and fatigue were associated with SI.

On adjusted analysis, gender (OR 3.1 [95%CI 1.4-6.9], $p = 0.006$), fatigue (OR 3.8 [95%CI 1.6-9.0], $p = 0.002$), and burnout (OR 16.7 [95%CI 2.2-127.5], $p = 0.007$) increased the odds of depression. On exploratory analysis, self-reported burnout alone was predictive of SI (OR 7.6 [95%CI 2.5-23]), and performed similarly to an adjusted model (AUC Area 0.718 [95%CI 0.634-0.802] versus 0.825 [0.753-0.897]).

Conclusions: Urology trainees experience high rates of depression and SI. Female residents have significantly higher risk of depression. A single-item appears useful to screen for SI. Further investigation is needed to understand and promote urology resident wellness.

Key Words: depression, burnout, well-being, medical education, residency, job satisfaction

Introduction

Physician well-being has come into increasing focus in recent years due to high physician burnout and

depression and the negative impact they have on the health of physicians, patients, and entire healthcare organizations.^{1,2} The rates of both burnout and depression among physicians appear to be significantly higher than in the general population and physician depression has increased since 2011.³⁻⁵ Similarly, the prevalence of depression among residents is estimated to increase throughout residency.⁶

Studies indicate that depression is a significant risk factor for suicidal ideation (SI), a finding that is concerning given the already increased risk of suicide

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for physicians relative to the general population.³ SI among general surgery residents, for example, is over three times higher than that of the public (11% versus 3%, respectively) with female physicians at higher risk.^{4,7} Given that up to 50% of those endorsing SI may attempt suicide, physician depression and suicidality represent an epidemic that warrants serious investigation.³

Surgeons experience the highest rates of depression and SI likely secondary to extensive work hours, increasing amounts of administrative work, stressful work environments, patient care demands, chronic sleep deprivation, and barriers or reluctance to seek mental health care.^{3,6-10} This problem appears even more pronounced in urology: a recent Medscape national survey placed distress in practicing urologists as one of the highest among all specialties with 17% of responding urologists screening positive for depression.⁹ Similarly, a national survey of 3588 residents showed urology residents to have the highest burnout of any specialty.¹¹

However, no data exists on the prevalence of depression and SI among urology trainees. Given the high prevalence of depression among practicing urologists and SI among surgical specialties, we conducted a national survey on the prevalence of depression, SI, and burnout in urology trainees. We also explored the individual, program, and institutional drivers of depression and SI to help elucidate contributing factors and associations.

Materials and methods

Eligible participants for this study included all resident trainees enrolled in ACGME accredited non-military urology residency programs in the United States. Program directors and coordinators were contacted by email with a request to distribute an electronic survey to their residents in May 2018 for that academic year. Programs where email delivery was unsuccessful were excluded. Email reminders were sent 7 and 14 days after initial email contact. The survey was closed and data were collected in June 2018. All individual and program specific data were kept anonymous and de-identified using REDCap electronic data capture. IRB exemption was obtained prior to study initiation.

A 50-question survey was devised to assess prevalence of and associations with urology resident burnout and depression. Burnout was assessed using the Maslach Burnout Inventory (MBI) depression and SI were assessed using the Patient Health Questionnaire 9 (PHQ9), and 26 questions were

included to assess sociodemographic, program-specific, and personal characteristics.¹² A PHQ-9 ≥ 10 was defined as moderate-to-severe depression (hereinto known as "depression"). Fatigue was assessed using a single item on a linear 10-point Likert scale with a response of 7 representing "fatigue associated with impairment".¹³ Quality of life (QoL) was assessed with the linear analogue self-assessment (LASA) single-item on a 5-point Likert scale in accordance with convention.¹⁴

Primary resident characteristics included gender, relationship status, and resident training level (i.e. intern, junior, or senior). Interns were defined as residents in their first year of residency training, junior residents were those in their 1st or 2nd year of urology residency, and senior residents were those in subsequent training years. Lifestyle factors such as level of coffee/energy-drink and alcohol consumption were catalogued. Preferred techniques utilized by residents to improve well-being (e.g. exercise, meditation) were assessed. Program-specific characteristics included the number of residents accepted per year, hours worked per week, nights-on-call per week, and weekends-on-call per month. Institutional factors included access to mental health services, health record platform (electronic, paper, hybrid), and the presence of structured mentorship programs.

All survey responses were analyzed within a single database. The mean age of the US cohort and AUA cohort were compared with a z-test. Categorical variables were compared using Fisher's exact test and continuous variable were compared using the Mann-Whitney U Test. Depression was modeled using a multivariable logistic regression. Because of sample size limitations, the covariates of gender, fatigue, and burnout were selected based on preexisting research and practicality in assessment. An exploratory analysis of self-reported burnout and suicidal ideation was performed. Model performance and measure performance were assessed using receiver operator characteristic (ROC). An assessment of effect modification using interaction terms was not possible due to the small sample size. Finally, our cohort was compared to the AUA Census data using univariate analysis. Statistical analysis was performed using Stata 14.2 (StataCorp, College Station, TX, USA).

Results

Among the 1304 eligible urology residents, 293 were excluded due to failed delivery of the initial

TABLE 1. Distribution compared to AUA census

	US cohort n = 210	AUA data n = 1516	p value
Age, mean (SD)	30.51 (3.03)	31.39 (2.69)	0.83
Gender, n (%)			0.086
Male	145 (69)	1131 (75)	
Female	65 (31)	385 (25)	
Number of residents per year, %			0.54
1	4%	6%	
2	30%	30%	
3	47%	43%	
≥ 4	19%	21%	

email to program directors at those institutions. Of the remaining 1,001 residents, 20.8% responded (n = 210). Our survey cohort did not differ significantly from AUA census data, Table 1. Within this group, 17.6% (n = 37) of respondents met criteria for depression and 24 (11.4%) endorsed SI as demonstrated in Table 2. Burnout on MBI was present in 143 residents (68.1%), and burnout was self-reported in 94 residents (44.8%). In our cohort, self-reported burnout had good ability to discriminate for burnout demonstrated on the MBI (ROC Area = 0.7096 [95%CI 0.64934-0.76982]).

Female residents had higher rates of depression than male residents (29.2% versus 12.4%, p = 0.005), Table 2. As demonstrated in Table 2 depression was further associated with poor reported QoL and WLB. Spending time with family/friends was associated with lower rates of depression. Residents with burnout had a depression rate of 25.2% versus 1.5% among those without burnout (p < 0.001).

Program-specific factors revealed that residents who worked > 80 hours had high rates of depression (30.3%). Greater weekends on call per month and nights on call per week were not significantly associated with depression. The presence of fatigue was associated with depression (29.5% versus 7.8%, p < 0.001).

Institutional factors associated with depression included a lack of a structured resident mentorship program (23.7% versus 9.8%, p = 0.010), and having no access (26.5%) or difficult access (19%) to mental health services relative to institutions where those resources are readily available (8.9%, p = 0.016).

Residents with depression also reported significant issues with scheduling doctor visits,

seeing family/friends, engaging in self-care activity, and maintaining a romantic relationship, Table 3. Depressed residents were less likely to choose urology as a career choice again (p = 0.002). Importantly, the presence of depression was highly associated with SI with 37.8% of depressed residents reporting SI versus 5.8% of residents without depression (p < 0.0001).

Factors associated with SI were older age (p = 0.022), reported low QoL (p < 0.001), dissatisfaction with WLB (p = 0.031), and fatigue (p = 0.009). As with depression, spending time with family/friends was associated with decreased SI (p = 0.031). Higher rates of SI in females did not reach significance. Residents with burnout demonstrated a dramatically higher rate of SI (16.1% versus 1.5%, p < 0.001), and this was consistent in self-reported burnout (21.3% versus 3.4%, p < 0.001), EE (19.8% versus 3.7%, p < 0.001), and DP (16.8% versus 4.4%, p = 0.007).

On adjusted analysis, gender (OR 3.1 [95%CI 1.4-6.9], p = 0.006), fatigue (OR 3.8 [95%CI 1.6-9.0], p = 0.002), and burnout (OR 16.7 [95%CI 2.2-127.5], p = 0.007) significantly increased the odds of depression, Table 4. In our exploratory analysis, we found model performance in the prediction of depression was similar between our adjusted model using self-reported burnout compared to MBI, Figure 1. The strongest predictor of SI was depression, while gender and fatigue were not associated with SI. The increased odds of SI in those with burnout by MBI was not significant (5.9 [0.7-47.7]). Self-reported burnout was significantly associated with SI in an adjusted model (OR 4.0 [95%CI 1.2-13.4]) and alone (OR 7.6 [95%CI 2.5-23] and was able to discriminate for SI (AUC 0.718 [95%CI 0.634-0.802]).

TABLE 2. Resident characteristics, depression, and suicidality

	No or mild depression n = 174 (82.4%)	Moderate to severe depression n = 37 (17.6%)	p value	No suicidal ideation n = 186 (88.6%)	Suicidal ideation n = 24 (11.4%)	p value
Age, mean (SD)	30.5 (3.2)	30.6 (2.3)	0.17	30.3 (2.5)	32 (5.3)	0.022
Gender, n (%)			0.005			0.1
Male	127 (87.6)	18 (12.4)		132 (91.0)	13 (9.0)	
Female	46 (70.8)	19 (29.2)		54 (83.1)	11 (16.9)	
Relationship status, n (%)			0.5			0.08
Single	41 (78.8)	11 (21.2)		42 (80.8)	10 (19.2)	
Not single	132 (83.5)	26 (16.5)		144 (91.1)	14 (8.9)	
Training year, n (%)			0.07			0.2
Intern	19 (79.2)	5 (20.8)		22 (91.7)	2 (8.3)	
Junior	75 (89.3)	9 (10.7)		78 (92.9)	6 (7.1)	
Senior	77 (77.0)	23 (23.0)		85 (85.0)	15 (15.0)	
Work hours, n (%)			0.003			0.07
< 60 hours	14 (82.4)	3 (17.6)		17 (58.6)	12 (41.4)	
60-80 hours	113 (89.0)	14 (11.0)		115 (90.6)	12 (9.4)	
> 80 hours	46 (69.7)	20 (30.3)		54 (69.2)	24 (30.8)	
Call nights/week, n (%)			0.055			0.2
1	60 (83.3)	12 (16.7)		66 (91.7)	6 (8.3)	
2	53 (82.8)	11 (17.2)		56 (87.5)	8 (12.5)	
3	34 (81.0)	8 (19.0)		36 (85.7)	6 (14.3)	
4	13 (72.2)	5 (27.8)		13 (81.3)	3 (18.8)	
≥ 5	5 (12.2)	36 (87.8)		7 (23.3)	23 (76.7)	
Call weekends/month, n (%)			0.307			0.8
1	76 (79.2)	20 (20.8)		86 (89.6)	10 (10.4)	
2	78 (84.8)	14 (15.2)		79 (85.9)	13 (14.1)	
3	11 (91.7)	1 (8.3)		11 (91.7)	1 (8.3)	
4	1 (50.0)	1 (50.0)		2 (7.7)	24 (92.3)	
Reported QoL, n (%)			< 0.001			< 0.001
As bad as it can be	2 (40.0)	3 (60.0)		2 (40.0)	3 (60.0)	
Somewhat bad	28 (59.6)	19 (40.4)		37 (78.7)	10 (21.3)	
Neutral	37 (84.1)	7 (15.9)		38 (86.4)	6 (13.6)	
Somewhat good	82 (91.1)	8 (8.9)		85 (94.4)	5 (5.6)	
As good as it can be	23 (38.3)	37 (61.7)		23 (48.9)	24 (51.1)	
Satisfaction with work-life-balance, n (%)			< 0.001			0.031
Dissatisfied	64 (69.6)	28 (30.4)		76 (82.6)	16 (17.4)	
Neutral	35 (94.6)	2 (5.4)		33 (89.2)	4 (10.8)	
Satisfied	74 (91.4)	7 (8.6)		77 (95.1)	4 (4.9)	
Fatigued, n (%)			< 0.001			0.009
No	106 (92.2)	9 (7.8)		108 (93.9)	7 (6.1)	
Yes	67 (70.5)	28 (29.5)		78 (82.1)	17 (17.9)	
Structured mentorship, n (%)			0.01			0.4
No or don't know	90 (76.3)	28 (23.7)		102 (86.4)	16 (13.6)	
Yes	83 (90.2)	9 (9.8)		84 (91.3)	8 (8.7)	

TABLE 2 (Cont'd). Resident characteristics, depression, and suicidality

	No or mild depression n = 174 (82.4%)	Moderate to severe depression n = 37 (17.6%)	p value	No suicidal ideation n = 186 (88.6%)	Suicidal ideation n = 24 (11.4%)	p value
Access to mental health services, n (%)			0.016			0.1
Readily available	72 (91.1)	7 (8.9)		74 (93.7)	5 (6.3)	
Available, but difficult to access	51 (81.0)	12 (19.0)		55 (87.3)	8 (12.7)	
Not available or don't know	50 (73.5)	18 (26.5)		57 (83.8)	11 (16.2)	
Exercise for relaxation, n (%)			0.017			0.3
No	73 (75.3)	24 (24.7)		83 (85.6)	14 (14.4)	
Yes	100 (88.5)	13 (11.5)		103 (91.2)	10 (8.8)	
Spend time with friends/family for relaxation, n (%)			< 0.001			0.031
No	26 (61.9)	16 (38.1)		33 (78.6)	9 (21.4)	
Yes	147 (87.5)	21 (12.5)		153 (91.1)	15 (8.9)	
Coffee or energy drinks consumed per day, n (%)			< 0.001			0.1
None	19 (73.1)	7 (26.9)		20 (76.9)	6 (23.1)	
1-2 drinks	122 (89.7)	14 (10.3)		125 (91.9)	11 (8.1)	
3-4 drinks	30 (71.4)	12 (28.6)		36 (85.7)	6 (14.3)	
≥ 5 drinks	2 (33.3)	4 (66.7)		5 (83.3)	1 (16.7)	
Alcoholic drink consumed/week n (%)			0.1			0.7
None	27 (81.8)	6 (18.2)		28 (84.8)	5 (15.2)	
1-4 drinks	84 (88.4)	11 (11.6)		86 (90.5)	9 (9.5)	
5-8 drinks	43 (72.9)	16 (27.1)		53 (89.8)	6 (10.2)	
≥ 9 drinks	17 (81.0)	4 (19.0)		18 (85.7)	3 (14.3)	
Emotional exhaustion, n (%)			< 0.001			< 0.001
No	103 (94.5)	6 (5.5)		105 (96.3)	4 (3.7)	
Yes	70 (69.3)	31 (30.7)		81 (80.2)	20 (19.8)	
Depersonalization, n (%)			0.003			0.007
No	83 (91.2)	8 (8.8)		87 (95.6)	4 (4.4)	
Yes	90 (75.6)	29 (24.4)		99 (83.2)	20 (16.8)	
Burnout, n (%)			< 0.001			< 0.001
No	66 (98.5)	1 (1.5)		66 (98.5)	1 (1.5)	
Yes	107 (74.8)	36 (25.2)		120 (83.9)	23 (16.1)	
Self-reported burnout, n (%)			< 0.001			< 0.001
No	111 (95.7)	5 (4.3)		112 (96.6)	4 (3.4)	
Yes	62 (66.0)	32 (34.0)		74 (78.7)	20 (21.3)	

Discussion

In our study, more than 10% of urology trainees endorsed SI. This is a rate higher than 6.4% reported in a national cohort of general surgeons and more than three times higher than the general population.^{15,16} Of the residents who endorsed SI, 79% reported difficult

to access or no access to mental health services. This is alarming considering a five-decade long study showed suicide to be the only cause of death for which the risk was higher for physicians than the general population.¹⁷

At the same time, nearly one in five urology trainees screened positive for depression. Of them,

TABLE 3. Impacts of depression

	No depression or mild depression n = 173 (82.4%)	Moderate to severe depression n = 37 (17.6%)	p value
Suicidality, n (%)			< 0.001
No	163 (0.9)	23 (0.6)	
Yes	10 (0.1)	14 (0.4)	
Difficulty scheduling doctor visits, n (%)			0.047
No	17 (9.8)	37 (100)	
Yes	156 (90.2)		
Difficulty seeing friends & family, n (%)			0.004
No	45 (26)	2 (5.4)	
Yes	128 (74)	35 (94.6)	
Difficulty exercising, n (%)			0.247
No	34 (19.7)	4 (10.8)	
Yes	139 (80.4)	33 (89.2)	
Difficulty engaging in self-care activities, n (%)			0.007
No	44 (25.4)	2 (5.4)	
Yes	129 (74.6)	35 (94.6)	
Difficulty maintaining a relationship, n (%)			< 0.001
No	116 (67.1)	10 (27)	
Yes	57 (33)	27 (73)	
Greatest source of dissatisfaction, n (%)			0.2
Financial compensation	28 (16.2)	2 (5.4)	
Work hours/fatigue	31 (17.9)	11 (29.7)	
Work/life balance	68 (39.3)	12 (32.4)	
Lack of mentorship	5 (2.9)	2 (5.4)	
Medical record entry	5 (2.9)	6 (16.2)	
Program director or chairman	3 (1.7)	2 (5.4)	
Work environment	16 (9.3)	2 (5.4)	
Devalue personal needs	11 (6.4)	37 (100)	
Other/non work related	6 (3.5)		
Reflection of career choice, n (%)			0.002
Urology	126 (73.3)	16 (43.2)	
Different surgical field	8 (4.7)	2 (5.4)	
Non-surgical field	4 (2.3)	3 (8.1)	
Non-medical	34 (19.8)	16 (43.2)	
Plans for fellowship, n (%)			1.0
No	41 (23.7)	9 (24.3)	
Yes	79 (45.7)	16 (43.2)	
Unsure	53 (30.6)	12 (32.4)	
Job plans after training, n (%)			1.0
Academic medicine	36 (20.9)	7 (18.9)	
Private practice	64 (37.2)	14 (37.8)	
Hybrid	72 (41.9)	16 (43.2)	

TABLE 4. Regression of depression and suicidality

	Depression		Suicidal ideation		
	MBI	Self-reported BO	MBI	Self-reported BO	Self-reported BO only
Female gender	3.1 [1.4-6.9]**	2.2 [1-5.1]	1.4 [0.5-3.6]		
Fatigue	3.8 [1.6-9]**	3.0 [1.2-7.3]*	1.7 [0.6-4.7]		
Burnout	16.7 [2.2-127.5]**		5.9 [0.7-47.7]		
Self-reported burnout Depression		7.0 [2.5-19.7]***	5.6 [2-15.1]***	4.0 [1.2-13.4]*	7.6 [2.5-23]***
ROC area	0.803 [0.738-0.868]	0.807 [0.73-0.883]	0.825 [0.753-0.897]	0.815 [0.733-0.897]	0.718 [0.634-0.802]

*p < 0.05; **p < 0.01; ***p < 0.001

BO = burnout; MBI = Maslach Burnout Inventory

81% had limited-to-no access to mental health services (versus 62% for the cohort as a whole). These rates of depression screening are consistent with a recent meta-analysis of 54 studies demonstrating the summary prevalence of depression to be 28.8% among trainees, with a rate of 20.9% in studies where the PHQ-9 was used.⁶ However, no gender-specific rates for depression were assessed.

In our cohort, there was a female predominance in screening positive for depression with 29.2% of female versus 12.4% of male trainees meeting criteria.

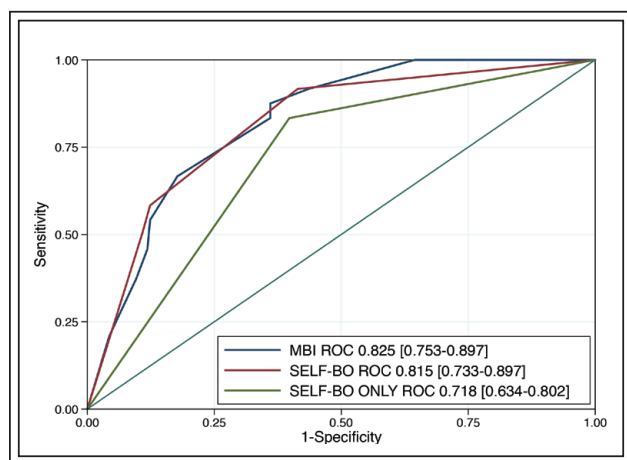


Figure 1. Exploratory analysis modeling performance in prediction of suicidal ideation (SI) by burnout reported on the Maslach Burnout Inventory compared to self-report. Receiver operator characteristics demonstrate the ability of one question self-reported burnout (Self-BO ROC) and 13-question MBI burnout score (MBI ROC) to predict SI.

These rates are consistent with previously published data which reveal depression in practicing female physicians to be nearly double that of male physicians (19.5% versus 12.8%, respectively).¹⁰

A national study of 3,121 interns revealed the impact of training to be particularly difficult for female physicians. Despite having similar baselines to male residents, female residents demonstrated a 72% increase in depression scores six months after beginning their internships in comparison to a 58% increase for male trainees.¹⁸

The effect of gender on depression could be compounded as female gender has been shown to be a risk factor for burnout.⁵ After all, the negative impact of burnout on depression has been previously established with residents exhibiting burnout having a three-fold higher likelihood of experiencing a self-reported depressive episode during their training.¹⁹ While patient expectations, work-life conflicts, and childcare-related issues may all be contributors to this gender discrepancy, robust studies elucidating the role of gender on burnout are still lacking.²⁰⁻³¹

Fatigue was an important factor associated with depression in our cohort. Although the impact of fatigue on resident well-being has been previously demonstrated, its relationship with burnout and depression has not been well assessed.²⁴ Importantly, fatigue was associated with depression even when controlling for work hours and PGY level, suggesting that factors beyond work load were contributing to this effect.

The relationship between burnout and depression has been previously noted, yet the two phenomena are distinct.²⁵ In our cohort, the EE domain of burnout appeared to be closely associated with depression,

which is consistent with previous observations that depression maps well across the EE domain.²⁶

Of note, residents who screened positive for depression were more likely to exhibit career regret with only 43% of depressed residents reporting they would pursue urology again if given the choice. This is consistent with prior reports detailing the impact of distress on increased career regret and desire of surgical trainees to leave academic settings following graduation.^{11,27} Clearly, this has vast potential implications for the field of academic urology. Residents with depression were also more likely to experience a variety of associated negative QOL sequelae, including having trouble scheduling doctor visits, seeing family/friends, engaging in self-care activities, and maintaining romantic relationships.

Spending time with family/friends, satisfaction with WLB, good reported QoL, and the absence of fatigue were associated with decreased rates of depression and SI. This likely points to the known WLB problem endemic in the medical profession and its potential impact on time set aside for activities related to social support.⁵ These relationships play a crucial role in resident well-being as lower levels of perceived social support have been shown to increase the risk of depression more than tenfold.²⁸ Overall, these findings help illuminate the general feeling of being overworked experienced by trainees and its impact on their rates of depression and SI.

Interestingly, the presence of structured mentorship and access to mental health services, which have previously been associated with lower rates of burnout, were also associated with lower rates of depression.^{29,30} A similar relationship was seen between these factors and rates of SI, but the associations did not reach significance. We believe that these structured initiatives point to an overall nurturing culture of the program and as such have a major impact on resident training experience.

A major limitation of instruments used to screen for depression and burnout is the length of the instruments themselves. This often leads to poor response rates which may omit certain individuals most affected by the conditions these instruments seek to identify. As such, a major goal of our study was to develop a simple method of screening residents for SI. We tested three models: 1) including gender, the screen for fatigue, the MBI and the PHQ-9; 2) including the PHQ-9 and the single item self-reported burnout measure; and 3) utilizing only the self-reported burnout measure. In our study, the use of a single question to screen for self-reported burnout, regardless of gender, showed good ability to predict the presence of SI. Residents

who endorsed self-reported burnout were more than seven times more likely to also endorse SI. This is an important finding as it creates a highly actionable approach for SI screening in residents.

Our study is subject to several other limitations. Chief among these is the low response rate of 20.8%. Although response rates < 20% are consistent with other national studies, it increases the risk for response bias.⁴⁻⁶ We attempted to mitigate this by comparing the study cohort to the national urology resident complement. The analysis revealed no statistically significant differences between the two groups across age, gender, and proportions of residents enrolled in programs of various size. Additionally, because of reliance on program directors and coordinators for survey distribution, response bias may have been due to differences in distribution. The presence of depression or SI may have also influenced an individual's desire to complete the survey. Furthermore, the survey is cross-sectional, and it is unclear how depression and burnout might change throughout the year and throughout training and it is difficult to assess the directionality of associations. Due to the small cohort, our multivariable model was limited. Lastly, because the analysis is largely exploratory, these associations do not imply causality and require validation.

Conclusion

The rate of depression, suicidal ideation, and burnout is alarmingly high in US urology residents; it is important to understand how demographic and institutional factors influence burnout to protect residents at risk. The odds of depression were three times higher among female residents compared to their male counterparts. Furthermore, our study indicates that a single question burnout questionnaire is a valuable screening tool institutions can use to monitor burnout in residents with good predictive value in assessing SI, imperative to resident safety and well-being. Institutions must invest in mental health services for trainees, and devote time and resources in understanding what factors impact burnout to make changes for the health of trainees. □

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