

## Science & Society

### Resident physician depression: systemic challenges and possible solutions

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**Resident physicians face intense stressors that significantly heighten their depression risk. This article discusses research findings on critical factors contributing to depression among resident physicians. Understanding these factors is essential to developing targeted interventions, fostering healthy work environments, and ultimately improving physician wellbeing and patient care.**

Embarking on the path to becoming a practicing physician inherently involves navigating numerous stressors. Resident physicians must stay updated with rapidly advancing scientific knowledge, make critical decisions under uncertain circumstances, and regularly confront human suffering. While these challenges are integral to the medical profession, residency training often compounds them with extremely long work hours, sleep deprivation, and limited flexibility in the face of important life events. The impact of the chronic exposure to these stressful conditions can be profound. While the baseline prevalence of depression among incoming residents mirrors that of their age-related peers in the general population, their depressive symptoms increase dramatically once they begin residency training [1]. In fact, longitudinal studies estimate that depression rates among resident physicians increase by fivefold once

residency begins. Importantly, the high prevalence of depression among resident physicians has been linked to negative outcomes for residents, healthcare systems, and patients. Understanding the main drivers of this issue is critical to inform future research and evidence-based measures to prevent depression among these professionals.

#### Factors contributing to resident depression

As evidenced by the rapid shift from low depression rates to high depression rates upon starting residency, systemic factors are a key driver of resident depression. Among systemic factors contributing to depressive symptoms in resident physicians, long work hours stand out. Integral to the US healthcare system, resident physicians endure rigorous schedules that often exceed 80 h/week when combining patient care responsibilities with the need to study and prepare for exams. Numerous studies have identified long work hours as the strongest risk factor in the development of depressive symptoms among resident physicians, with recent evidence demonstrating a dose–response relationship between the two variables. Specifically, using an emulated trial design to analyze data from over 17 000 first-year resident physicians nationwide, researchers found that the increase in depressive symptom scores was nearly three times higher in those working over 90 h/week, compared with those working 40–45 h/week [2]. In line with this, a temporal trends analysis over a 13-year period demonstrated a 24% reduction in the increase of depressive symptoms associated with residency from 2007 to 2019, which corresponded with an average weekly work hour reduction of about 8 h [3]. Despite these improvements, depression rates among resident physicians remain markedly elevated, and further reduction in work hours are very likely to further improve depression and overall wellbeing. Long work hours can lead to depression through multiple pathways, but

perhaps most perniciously through the exacerbation of other common life and residency training stressors. Indeed, when resident physicians are required to work up to 80 h/week, it becomes exceedingly difficult to find time for adequate sleep, meaningful family interactions, mental health care, or maintaining social support networks. Importantly, reducing work hours must be accompanied by a genuine decrease in the workload to avoid the detrimental effects of work compression, where residents are expected to complete the same amount of work in less time. Among possible solutions supported by prior research, investments on hiring assistance with documentation and clerical tasks have been found to improve physician productivity and wellbeing [4]. Although the initial investment in these policies would be significant, given the high cost of physician depression to healthcare systems, physicians, and their patients, the long-term benefits would almost certainly outweigh the costs. Moreover, given the association between physician depression and medical errors, reducing resident work hours also holds promise for enhancing physician and patient safety outcomes. In fact, a prospective study of 4826 second-year resident physicians demonstrated that working over 48 h/week was associated with increased risk for medical errors, preventable adverse events, fatal preventable adverse events, near-miss crashes, occupational exposures, percutaneous injuries, and attentional failures among resident physicians [5].

In addition to long work hours, work–family conflict significantly increases with the start of residency training. Notably, while work–family conflict contributes to depressive symptoms in all residents, research shows that accounting for this variable reduces the sex disparity in depressive symptoms by 36% [6]. This suggests that policies addressing work–family conflict, such as improved parental leave and child-care support, could foster supportive work environments that support residents

in balancing their work and personal responsibilities, reduce depressive symptoms, and mitigate gender disparities in mental health outcomes among resident physicians. Sleep and circadian rhythms are also critical factors to consider when designing resident work schedules. Indeed, prior research has shown that the start of residency training often leads to reduced total sleep time and increased variability in sleep duration and schedule, which was shown to be associated with a higher increase in depressive symptoms [7]. Additionally, the learning environment of residency programs plays a critical role in resident depression, with some programs consistently exhibiting high rates of depressive symptoms while others consistently show low rates year after year [8]. In a study of 54 internal medicine residency programs, program-level factors such as inadequate faculty feedback, high program work hours, poor inpatient learning experiences, and higher institutional research rankings were found to explain a high proportion of the variance in depressive symptom changes at the program level [8].

While system-level factors are the major drivers of depression among residents, individual factors play a role as well [3]. For instance, residents with high neuroticism (a personality trait that reflects how often individuals experience negative emotions and how stable or reactive their emotions are), a history of depression and lower subjective wellbeing are at higher risk of developing depression during residency. Incoming residents with these risk factors could consider preventative strategies to maximize wellbeing during training.

The predictable dramatic increase in stress that comes with residency has allowed investigators to follow individuals' progress from normal mood to depression to understand genetic variation and depression risk. A prospective study with resident physicians demonstrated that polygenic scores for major depressive disorder (MDD) were

particularly effective in predicting resilience under high-stress conditions [9]. Further, studies with resident physicians have elucidated the interplay of genomic predisposition and specific environmental triggers in the development of depression. In a study involving a cohort of incoming resident physicians transitioning to the stressful internship environment, individuals with a high MDD polygenic score were the most sensitive to the loss of social support, but also benefited the most from gaining social support [10]. Further research into how genetic variation affects individual susceptibility to different stressors can contribute to developing a more personalized approach to preventing depression among individuals at risk.

Interventions aimed at preventing depressive symptoms among residents and physicians have targeted both systemic and individual-level factors. Evidence shows that, since 2007, resident work hours have been reduced by approximately 8 h/week, mental health treatment rates and sleep duration have increased, and the quality of the learning environment has improved [3]. These improvements were likely the major drivers of the 24% reduction in the increase in depressive symptoms associated with residency, with reduced work hours having the largest effect [3]. Although depression rates among resident physicians remain high, the success in enhancing work conditions and access to treatment suggests that targeting these factors through a broader public health approach holds promise for preventing depression among resident physicians and could likely be generalized to prevent depression in the general population. Other systemic and individual-level interventions have also shown a smaller, but still significant effect on physician wellbeing. Examples of such systemic interventions include employing scribes to reduce physician electronic health record (EHR) workload, adding clerical support staff, and reassigning tasks from physicians to other healthcare professionals [4,11].

Regarding individual-level interventions, a meta-analysis of mindfulness-based interventions found a small but significant effect on physician wellbeing, although most studies were rated as having a high risk of bias and limited quality evidence [12]. Importantly, the large body of evidence from studies in the general population demonstrating a moderate effect of mindfulness-based therapies, cognitive behavioral therapy, and exercise interventions in preventing depression warrants further investigation into the potential success of these interventions among resident physicians.

### Barriers to mental health care

While the proportion of residents with depressive symptoms seeking mental health care increased over the last 15 years, more than half the residents screening positive for depression still do not receive treatment [3]. Major barriers include lack of time, avoidance or denial, and fear of stigma and career consequences.

Long work hours and limited flexibility of resident schedules do not easily accommodate necessary appointments. In addition to the critical need to reduce work hours, residency programs should ensure that residents have access to different modalities of confidential, evidence-based treatment, including in-person, telehealth, and internet-delivered options. Programs should also consider residents' varied preferences and concerns about mental health care by offering a diverse range of affordable options, such as in-house services, insurance-based care, outside-system referrals, and remote app-based care. Additionally, future research is needed to explore differences in efficacy and adherence across different mental health care modalities and settings among resident physicians.

Prior research findings also highlight the importance of continuing to counter the legacy of a medical residency culture that normalizes depressive symptoms, such

as trouble sleeping, lack of energy, or feeling down about oneself during training. For instance, the level of depressive symptom severity that residents viewed as functionally impairing during residency increased markedly compared with pre-residency levels [13]. Further, more than half of resident physicians and three quarters of attending physicians underestimated the true prevalence of residents screening positive for depression in their programs [14]. Residency programs should encourage open discussions about mental health, educate residents on recognizing symptoms and when to seek treatment, and provide free access to confidential screening tools and evidence-based mental health resources.

Further work is also needed to ensure that residents do not face career consequences of seeking mental health treatment. As of 2022, in the USA, only three out of 55 state and territory medical boards fully met all the Federation of State Medical Boards (FSMB) recommendations for compliance with the Americans with Disabilities Act (ADA) and promotion of physician wellness on medical licensing applications [15]. Notably, the least followed recommendations were the use of supportive language and safe haven non-reporting during licensing.

### Concluding remarks

Addressing the high prevalence of depression among resident physicians requires a multifaceted approach targeting individual and systemic factors. Key strategies include reducing work hours, enhancing schedule flexibility through systemic changes such as improved parental leave and childcare policies, and reducing barriers to receiving evidence-based mental health care. Addressing these factors has the potential to create a more supportive environment for resident physicians, ultimately leading to better health outcomes for physicians and their patients.

### Declaration of interests

The authors declare no competing interests.

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