

The hidden cost of standardized residency training: confronting burnout in medical professional master's students

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Abstract: The integration of professional master's degree education in medicine with standardized residency training has become a pivotal model for cultivating clinical physicians in China. Master's candidates of medical professional programs, who simultaneously face the dual burdens of clinical rotations and graduate academic assessments, constitute a population at high risk for occupational burnout. Burnout, operationalized through the Maslach triad of emotional exhaustion, depersonalization, and diminished personal accomplishment, not only impairs the psychological well-being of residents but also compromises their clinical reasoning abilities and long-term career sustainability. This article provides a comprehensive review of the current prevalence, influencing factors, adverse outcomes, and intervention strategies pertaining to burnout among master's-level medical students engaged in standardized residency training, with the aim of providing evidence for the optimization of residency management and the strengthening of psychological health support systems for trainees.

Keywords: standardized residency training; burnout; medical professional master's students

1 Introduction

Chinese clinical professional master's candidates enrolled in standardized residency training are required to complete a multitude of demanding tasks within a three-year period, encompassing hospital clinical rotations, university coursework, graduation thesis preparation, and the national physician qualification examination. Ultimately, they can simultaneously obtain four credentials: master's degree certificate, graduation certificate, medical practitioner qualification certificate, and residency training completion certificate. This system confers upon this distinctive cohort the dual identity of student and healthcare worker, subjecting them to rigorous assessments in both academic and clinical domains, which results in considerably higher psychological stress than that experienced by ordinary medical students or trainees in other professional fields [1].

Job burnout, a chronic state of psychological exhaustion that develops from prolonged exposure to high-pressure occupational settings, was initially conceptualized by psychologist Herbert Freudenberger and later formally validated through the development of the Maslach Burnout Inventory. It comprises three core dimensions: emotional exhaustion, depersonalization, and diminished personal accomplishment. Emotional exhaustion is characterized by the continual depletion of mental and physical energy; depersonalization manifests as indifference and detachment toward service

recipients, accompanied by a lack of empathy; and reduced personal accomplishment involves a persistent decline in self-worth recognition and the emergence of professional cynicism. These dimensions interact synergistically, and their negative effects progressively amplify over time. Burnout is particularly prevalent in the medical industry, which is typified by high workloads and substantial emotional investment.

Surveys indicate that the incidence of burnout among master's students participating in standardized residency training in China is higher than that among general medical workers [2-3]. In fact, current discussions on burnout specifically targeting this unique group with dual identities are relatively scarce. In light of this, this paper focuses on the cohort of master's students in standardized residency training, systematically reviews the current status, underlying causes, and practical harms of burnout, and explores targeted mitigation strategies, aiming to provide theoretical and practical support for optimizing residency training management and alleviating the burnout predicament of young physicians.

2 The prevalence characteristics of burnout among medical specialty graduate students undergoing residency training

Numerous studies have reported that master's students in standardized residency training experience burnout at varying levels, with discrepancies across studies possibly attributable to differences in survey methods and sample sizes. A 2019 survey conducted at West China Hospital on clinical professional master's students showed that 23.85% exhibited some degree of burnout [4], and by 2025 this detection rate had risen to nearly 30%. Long-term high-intensity clinical on-call duties, irregular night shifts, and heavy medical documentation work predispose trainees to fatigue, anxiety, depression, and other negative emotions.

From the perspective of training stages, senior trainees report higher burnout levels than junior ones [2, 4, 5], mainly because senior students face the compounded pressures of intensive clinical rotations, research paper requirements, final assessments, and job hunting—culminating in the peak stress load of the entire training cycle.

In terms of specialty differences, burnout rates are highest among trainees in high-intensity departments such as general practice, obstetrics and gynecology. Regarding demographic characteristics, professional master's students from low-income families, without stable housing, unmarried, or with insufficient sleep are at higher burnout risk; conversely, those with proactive personality traits, family emotional support, high training satisfaction, and sustained supervisor support exhibit lower burnout levels [6].

3 Factors influencing burnout among professional master's students in standardized residency training

3.1 Training system and healthcare environment factors

The standardized residency training system binds together clinical training, postgraduate education, and physician licensure, compressing the triple objectives of clinical practice, research, and degree attainment into a three-year period, creating a level of pressure that cannot be alleviated through individual adjustment alone. In some training bases, the responsibilities of teaching, research, and human resources departments are fragmented, and channels for professional master's students to voice their concerns are obstructed; rest and rotation policies are poorly enforced, mechanisms for compensatory leave and shift adjustments are inadequate, and standardized mental health support systems are lacking.

The high intensity, high risk, and heavy workload of clinical work constitute a major external environment that fosters burnout. As the most fundamental front-line workforce in the hospital, professional master's students routinely undertake a large volume of clinical tasks, including medical record writing, ward rounds, basic nursing care, and auxiliary diagnostic and therapeutic procedures—tasks that are trivial, complex, time-consuming, and physically demanding. At the same time, their supervising physicians are often occupied with busy clinical schedules, leaving insufficient structured time for

mentorship and limited attention to the students' psychological well-being. Finally, these students also face intense assessment pressures. Annual skill evaluations, rotation-exit examinations, final residency completion assessments, research evaluations, and the national medical licensing examination are all concentrated within the training period, and the results directly affect graduation and employment prospects. This sustained stress readily triggers emotional exhaustion.

3.2 Individual psychological and occupational cognition factors

Individual psychological traits and professional cognition are important influencing factors of burnout [7]. Most professional master's students in standardized residency training are young, with limited social experience and relatively underdeveloped psychological adjustment and stress-coping capacities. Those with low proactive personality, high neuroticism, or low self-efficacy are more prone to feelings of helplessness when facing clinical setbacks; in contrast, individuals with strong psychological resilience and effective stress management skills can buffer the negative impact of work [8-10].

The gap between career expectations and reality is another key individual trigger for burnout. Many professional master's students enter the program with insufficient anticipation of the high-intensity clinical workload. During training, they encounter repetitive basic diagnostic and therapeutic tasks, high-risk medical scenarios fraught with uncertainty, and voluminous documentation work, all of which shatter their early career aspirations. Coupled with the uncertainty of future job prospects, these factors easily give rise to career choice regret [11].

3.3 Social support factors

First, the persistent stress from doctor-patient relationships remains a significant issue. In outpatient clinics and wards, trainees frequently encounter patient questioning, complaints, and emotional venting. Lacking mature communication skills, professional master's students are chronically exposed to negative emotions, which can trigger depersonalization, manifested as indifference toward patients and avoidance of communication. Second, the level of financial support is relatively low. The stipends for professional master's students during training are provided jointly by the university and the training base, yet the total income falls below the local average salary. They face considerable financial pressure from rent, daily living expenses, and study-related costs, while married trainees also bear family economic burdens; the work-family conflict further exacerbates burnout risk [12]. Third, there is insufficient social recognition. The public has limited understanding of the training duration and the value of the work performed by residents in standardized training. Negative media coverage amplifies the adverse image of healthcare workers, weakening the professional honor and sense of identity among professional master's students, leading to a continuous decline in personal accomplishment.

4 Consequences of burnout among students

4.1 Impairment of students' mental health and professional development

Severe burnout significantly increases the risk of developing anxiety and depression. Prolonged emotional exhaustion is accompanied by somatization symptoms such as headaches, gastrointestinal disorders, and endocrine disturbances; depersonalization leads to interpersonal alienation and impaired communication with peers and family members; and reduced personal accomplishment tends to foster self-denial and even self-harm ideation. Long-term occupational burnout also diminishes learning efficacy [13], hindering the acquisition of standardized clinical skills during the critical residency training period.

4.2 Compromised quality of clinical care and patient safety

Burnout directly impairs clinical judgment and the capacity for empathic medical care. Trainees experiencing burnout are more prone to inadequate doctor-patient communication and an elevated risk of medical errors. Concurrently, depersonalization manifests as rigid and indifferent communication with patients, increasing the likelihood of complaints

and disputes, reducing patient satisfaction with medical services, and creating a negative feedback loop in the healthcare environment that amplifies the probability of doctor-patient conflicts.

4.3 Causing attrition of medical talent

Occupational burnout can trigger turnover intentions among clinicians during the critical phase of training [14]. Early departure of young clinicians exacerbates the shortage of frontline healthcare personnel, raises hospital training costs, undermines the stability of the clinical workforce pipeline, and poses long-term risks to the development of regional medical service capacity.

5 Effective intervention strategies

5.1 Optimization of training systems

First, balance the intensity of clinical rotations with research assignments. Universities and teaching hospitals should collaboratively develop differentiated training programs for professional master's students, reduce the frequency of overtime in high-intensity departments, limit working hours, and set aside fixed weekly protected time for research and thesis writing. Second, implement a standardized dual-supervisor system: assign separate clinical and research supervisors, clarify responsibilities for clinical and academic guidance, establish regular channels for student feedback, and promptly address unreasonable training arrangements. Third, decentralize the assessment schedule to alleviate anxiety about elimination. Break down annual examinations into routine rotation-based evaluations to reduce the pressure of large-scale centralized exams; establish a research support platform to provide statistical and writing guidance for students with weak academic foundations, thereby alleviating the dual anxiety over research and academic requirements.

5.2 Enhancement of psychological support systems

At the hospital level, establish free, dedicated psychological counseling clinics for trainees, regularly conduct burnout screening using the Maslach Burnout Inventory, implement early interventions for high-risk groups, and normalize mental health services. Given the dual pressures faced by professional master's students, provide career planning education, professional cognition guidance, and mental health education to enhance resilience, rebuild professional identity and sense of mission, and reduce negative emotions.

At the university level, medical schools should offer pre-training career expectation adjustment courses before residency begins, helping students develop a realistic understanding of clinical work and reducing professional alienation caused by expectation gaps. Incorporate mental health guidance into mandatory graduate courses to improve psychological resilience and lower burnout risks associated with neurotic personality traits. Encourage students to build stable family and peer support networks, fully leveraging the buffering effect of social support against prolonged training stress.

5.3 Improvement of compensation and welfare system

Financial security is a key protective factor against burnout [15]. To this end, it is crucial to optimize the welfare system and reasonably increase subsidy standards for professional master's students, including improving housing, meals, and on-call allowances to alleviate financial pressures. Additionally, establish rest areas, cafeterias, and recreational facilities for trainees, enhance the working and living environment, and strengthen their sense of professional belonging and well-being [16].

6 Conclusion

Burnout among professional master's degree students in clinical medicine during standardized residency training arises from the interplay of institutional structures, environmental pressures, and individual characteristics, constituting a common challenge that cannot be overlooked in China's current medical talent development process. Mitigating such burnout requires concerted efforts from universities, teaching hospitals, administrative bodies, and the trainees themselves.

Only by optimizing the integrated residency training system, improving mental health and rights protection mechanisms, strengthening individual psychological development and career guidance, and establishing positive incentive structures can we effectively relieve trainees' stress, dispel burnout, and restore their professional identity. Ultimately, safeguarding the physical and mental well-being of young resident physicians and refining the medical talent cultivation system are essential to building a stable reserve workforce of healthcare professionals and laying a solid talent foundation for the high-quality development of the healthcare sector.

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Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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