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Rethinking the Culture of Sleep Sacrifice in Medical Education

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Abstract

Sleep is one of the most fundamental biological requirements, yet it is often sacrificed when academic, clinical, and personal responsibilities compete for time. In medical education, this has contributed to a culture in which endurance is valued and fatigue becomes normalized despite growing evidence of the consequences of sleep deprivation. This article examines the biological importance of sleep and the consequences of sleep deprivation, while exploring why sleep sacrifice continues to be accepted within medical education. The persistence of this culture is influenced by several factors, including the history of medical training, the normalization of sleep sacrifice as a demonstration of commitment and endurance, institutional expectations, and the hidden curriculum, all of which can shape professional identity formation. Trainees may observe and internalize behaviors modeled by senior physicians, residents, peers, and institutions, reinforcing the idea that fatigue and sleep deprivation are simply part of medical training. The article also examines approaches to addressing this culture, including resident duty-hour reforms, protected opportunities for sleep and rest, workload management, supportive learning environments, supervision, and the incorporation of sleep health into medical education. However, evidence regarding the effectiveness of existing interventions remains inconsistent, and available research focuses predominantly on resident physicians, with comparatively less attention to medical students. Addressing sleep sacrifice therefore requires a multifactorial approach involving individual awareness, institutional commitment, supportive educational environments, and evidence-informed policy. Healthy sleep should be recognized not as a barrier to professional excellence, but as a prerequisite for effective learning, healthcare professional well-being, and safe patient care.

Keywords: Hidden curriculum, medical education, patient safety, professional identity, sleep deprivation, sleep physiology, sleep sacrifice

1. Introduction

Sleep is essential for maintaining optimal health and well-being. However, it is often sacrificed by health professionals when pressed for time. In medical education, this compromise has evolved into a culture in which endurance is admired and fatigue becomes normalized despite growing scientific evidence of its consequences. Why does a profession grounded in scientific evidence continue to accept a practice that contradicts its own understanding of sleep? This article examines the biological importance of sleep and explores why sleep sacrifice remains embedded within medical education.

2. Sleep: Biological Importance and Consequences of Deprivation

Sleep is a reversible physiological state of reduced consciousness

comprising two major stages: non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. NREM sleep supports physical restoration, energy conservation, and memory processing, whereas REM sleep contributes to emotional regulation and higher cognitive functions. Although sleep appears to be a state of rest, the brain remains active, carrying out restorative processes essential for normal neurological function¹.

Sleep facilitates glymphatic clearance, promoting the removal of neurotoxic metabolites such as β -amyloid from the brain². It also supports memory consolidation and synaptic plasticity and restores neurotransmitter balance and circadian rhythm³. Together, these processes optimize learning, attention, emotional regulation, and cognitive performance.

Disruption of these restorative processes has neurocognitive consequences. Sleep deprivation affects the prefrontal cortex, hippocampus, amygdala, and neocortex, impairing attention, memory,

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executive function, and emotional regulation. Experimental studies demonstrate impaired vigilance, slower reaction time, and reduced cognitive flexibility. Heightened amygdala activity together with reduced prefrontal regulation contributes to impulsivity, mood instability, and diminished resilience⁴. These effects are concerning in medical education, where students and trainees must integrate scientific knowledge with clinical reasoning, acquire procedural skills, and make timely decisions affecting patient care. Adequate sleep supports learning, judgment, and clinical performance, whereas chronic sleep deprivation and cumulative sleep debt may impair well-being, contribute to burnout, and increase the risk of fatigue-related errors⁵.

3. Origins and Persistence of Sleep Sacrifice Culture

Despite growing recognition of the importance of sleep, sleep sacrifice has become embedded within medical education. Medical trainees are expected to balance academic learning, clinical responsibilities, research, teamwork, and well-being while preparing to provide safe patient care. While facing these competing demands, sleep often becomes one of the first necessities to be compromised, normalizing fatigue as an expected part of training rather than a preventable risk⁶.

The roots of this culture can be traced to the apprenticeship model of medical training, in which residents lived within hospitals and assumed prolonged responsibility for patient care. Long working hours, availability, and learning through immersion were regarded as integral to professional development. Although medical education has evolved, values like endurance, self-sacrifice, and commitment continue to shape expectations of professionalism⁷.

Beyond the formal curriculum, trainees learn through the hidden curriculum i.e., the unwritten values, attitudes, and behaviors acquired by observing senior physicians, residents, peers, and institutional practices. While it can reinforce empathy, teamwork, and accountability, it may normalize sleep sacrifice when fatigue is modeled or rewarded within the clinical environment⁸.

Repeated exposure to these expectations contributes to professional identity formation. Behaviors that are repeatedly observed and practiced become internalized as characteristics of a competent physician. Within medicine's hierarchical structure, these values are transmitted across generations through role modeling, supervision, and feedback, allowing sleep sacrifice to evolve from an individual behavior into a cultural norm⁹.

4. Addressing the Culture of Sleep Sacrifice

Recognition of the adverse effects of sleep deprivation has prompted strategies to reduce fatigue during medical training. Among the most significant have been resident duty-hour reforms. Evidence linking prolonged wakefulness with cognitive impairment and fatigue-related medical errors led the Accreditation Council for Graduate Medical Education (ACGME) to limit resident duty hours to an average of 80 hours per week and recommend protected sleep opportunities during prolonged duty periods¹⁰.

However, scheduling reforms alone may be insufficient. When clinical responsibilities remain unchanged despite shorter duty hours, workload intensity may increase, reducing the benefits. Meaningful change also requires supervision, feedback, handovers, balanced workload distribution, fatigue risk management, and supportive learning environments^{11,12}.

Sleep health remains underemphasized within many medical curricula despite its importance for learning, clinical performance, and

physician well-being. Incorporating sleep health education may help challenge the normalization of sleep sacrifice. Therefore, institutions should recognize healthy sleep as a prerequisite for effective learning and safe patient care¹³.

5. Current Evidence and Future Directions

Although the detrimental effects of sleep deprivation are well established, evidence regarding interventions to reduce it remains inconsistent. While some studies report improvements in fatigue and physician well-being following duty-hour reforms, others demonstrate limited benefits for educational outcomes or patient safety, suggesting that scheduling changes alone cannot transform a culture shaped by longstanding institutional expectations^{14,15}.

Most available evidence focuses on resident physicians, whereas sleep deprivation among medical students, particularly during clinical clerkships, has received comparatively less attention^{16,17}. Future research should further examine the distinct effects of acute sleep deprivation and chronic partial sleep restriction, as their physiological consequences and long-term effects may differ.

Future research should evaluate interventions across different stages of medical education while considering workload, learning environments, institutional culture, and individual variability in sleep needs.

6. Conclusion

The persistence of sleep sacrifice in medical education reflects influences that extend beyond individual choice. It is shaped by the culture of medical training and reinforced by longstanding institutional and professional norms. Addressing this issue therefore requires a multifaceted approach that combines individual awareness, supportive learning environments, institutional commitment, and evidence-informed policy. As medical education continues to evolve, healthy sleep should be recognized not as a barrier to professionalism but as a prerequisite for effective learning, physician well-being, and safe patient care. Promoting a culture that values healthy sleep alongside professional excellence may ultimately benefit both healthcare professionals and the patients they serve.

Disclosure of AI Use

ChatGPT (OpenAI, GPT-5.5) was used during the preparation and revision of the manuscript for language editing, grammatical correction, stylistic refinement, and improving clarity and presentation. AI was not used to generate the scientific content, arguments, or interpretations presented in the manuscript. The scientific content and supporting literature were developed based on relevant academic sources. The final manuscript was reviewed and finalized by the author.

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