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Perseverance, faith and stoicism: a qualitative study of medical student perspectives on managing fatigue

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Introduction

Workplace fatigue is ubiquitous among medical trainees and physicians¹⁻⁶. There is good reason to be concerned about its impact on patient safety and provider wellbeing^{7,8}. Across many international jurisdictions, work hour regulations remain the primary solution to the problem of fatigued physicians⁹⁻¹¹. However, these restrictions have largely fallen short of expectations due to unintended consequences^{12,13} and inconsistent evidence of benefit¹⁴⁻¹⁷. Literature examining the impact of work hour restrictions is fraught with limitations. Laboratory research that attempts to capture the impact of fatigue on performance often fails to replicate the complexity of providing patient care in dynamic teams¹⁸. In situ studies lack well-rested controls, since most trainees are chronically sleep deprived¹⁹. Finally, most studies assume that fatigue is strictly a result of acute sleep deprivation and consecutive work hours without considering other dimensions of fatigue, such as chronic sleep deprivation, work compression, emotional exhaustion and cognitive overload²⁰.

In light of the conflicting literature, Canadian policy-makers have decided against legislated work hours in favour of Fatigue Risk Management as an alternative solution to this problem²¹. Fatigue Risk Management (FRM) originated in other high reliability organizations, such as military, aviation and transportation, as part of an occupational health and safety strategy intended to minimize the risk that an employee will commit a

fatigue-related error²². Dawson et al. offer a comprehensive conceptual framing of FRM, based on Reason's Hazard Framework²². The first layers of defense focus on preventing a fatigued individual from being in the workplace. The regulator must create schedules that allow for sufficient rest while the employee is expected to arrive fit-for-duty by obtaining sufficient off-duty rest and using caffeine or other fatigue countermeasures as necessary. This framework accepts that these initial measures will sometimes fail. Thus, fatigue-proofing represents another defense-layer that focuses on preventing a fatigued individual from committing an error that leads to a "fatigue-related incident". Fatigue-proofing deliberately shifts the focus away from the individual and seeks to modify the workplace to mitigate the effects of fatigue-related impairment. Examples of such strategies in other contexts include task buffering in aviation, whereby the declaration of fatigue from either the pilot or co-pilot prompts the crew to begin the descent checklist at an earlier altitude²². Across various industries, these fatigue-proofing strategies tend to be implicit, which makes them difficult to challenge, assess or change^{23,24}. The final layer of defense involves a robust reporting system that captures fatigue-related incidents and uses information from these events to inform and reinforce the preceding levels of the framework.

While it has been proven effective in other fields²³, there are two potential limitations to implementing FRM within the medical training context. First, FRM focuses exclusively on ensuring workplace safety while overlooking the potential holistic impact of fatigue on employee wellbeing beyond the workplace. Yet it is well-established that long work hours, overnight shifts, and emotional fatigue during medical training and practice put providers at risk of exhaustion, depression, and burnout, while impairing learning^{3,8}.

Second, FRM assumes a shared understanding of fatigue as hazardous²². For example, experts within aviation have shed previously held assumptions that “fatigue was a state of mind and that the effects of self-induced sleep deprivation could be overcome with professionalism, training or motivation.”²⁵ Instead they assert that “it is now clear that people cannot adapt to insufficient sleep despite their beliefs to the contrary.”²⁵ However, in our previous research that explored fatigue as a social construct, we found that residents tend to believe that fatigue is surmountable, rather than hazardous, and that learning how to overcome fatigue is part of becoming a competent physician²⁶. It remains unclear when and how such problematic notions of fatigue, which are incongruent with FRM assumptions, are adopted by medical trainees. Given that existing literature has largely overlooked medical students’ perspectives on fatigue, we currently lack an understanding of whether they share similar beliefs about fatigue. Thus, we set out to answer the following research question: how do third-year medical students understand and manage the workplace fatigue they experience during their first year of clinical rotations?

Methods

We chose a constructivist grounded theory approach to qualitative research because we sought to understand medical students’ perspectives of fatigue as a socially-situated experience²⁷. We conducted 22 individual, semi-structured interviews with third-year medical students enrolled at a single academic training center in Ontario, Canada. Recruitment, data collection, and analysis took place between June 2018 and August 2018.

Study Context

Each participant had completed a minimum of 7 months of workplace-based training as a third-year medical student (known in Canada as their clerkship year) as per our inclusion criteria. The medical program at this institution is 4 years in duration, with the first two years consisting mostly of in-class learning followed by two years of workplace-based training across multiple surgical and non-surgical disciplines situated at one of three academic hospitals and various community distributed sites. During this time, students' work hour arrangements often mirror the residents with whom they are working; trainee duty hours are not legislated in Canada. Medical students routinely complete 24-hour call shifts (maximum frequency of 1 night in four) or up to 4 days of consecutive 15-hour overnight call shifts. In this context "Post-call" is the off-duty time that follows a completed overnight call shift. While on call, medical students are often the first responders for patient assessment, depending on the rotation, which involves conducting a focused history and physical exam then deciding on a treatment plan in co-ordination with the team. Participants were approximately 8-10 months away from graduation from the MD program at the time of their interview and had completed various rotations in both surgical and non-surgical domains.

Recruitment

Students were invited to participate through a mass email sent to the entire third year class. The email contained information about the research team, a brief description of the study objective, and the letter of information. Students were invited to contact co-investigator A.R. if they were interested in participating in an interview. Participation in the study was voluntary and the students did not receive compensation, nor were there any academic

consequences for their training based on their decision to participate in the study. Interviews were conducted in person or over the phone at the participants' convenience. Interviews ranged from 16 minutes to 52 minutes with an average length of 34 minutes.

Sampling & Data Collection

Our initial semi-structured interview guide was piloted and subsequently revised with input from a third-year medical student who has qualitative research experience. Students were initially sampled through convenience sampling, in that the first few students who met inclusion criteria and responded to our invitation were interviewed. We constructed initial codes based on analysis of these initial interviews. As our analysis evolved from the initial codes and iterative analysis of the data, we revised our interview guide successively to allow purposive and theoretical sampling within each subsequent interview (see Appendix for initial version and most recent version)²⁷. This allowed us to explore certain co-constructed themes in greater depth with each subsequent interview.

Reflexivity

One co-investigator (A.R., a 2nd year medical student) conducted the interviews. Each interview was audio recorded, transcribed verbatim and then anonymized. As a near-peer to the participants, A.R. made regular memos and field notes to remain reflexively aware of how her insider-outsider experience informed the entire research process²⁸. Principal investigator T.T. is a practicing obstetrician-gynecologist who assisted in the analysis of the anonymized interviews, rather than conducting interviews, due to an existing power differential with participants. T.T. brings her own lived experience of workplace fatigue, having previously been a medical student and a resident and now an academic clinician who

routinely does extended (> 24 hour) in-hospital call shifts. T.T. led all stages of the research process. She also led previous research exploring fatigue as a social construct in residency training, which inspired the current study. This sensitized her to consider similarities and differences between the participant groups, which primarily shaped the more conceptual levels of analysis. Co-investigator L.L. is a rhetorician and qualitative researcher within the field of medical education; she was involved with early protocol design and provided insights during the interpretive stage of analysis when the codes were more stabilized.

Analysis

We began the analysis of the transcripts with initial coding using gerunds²⁷ (e.g. “losing autonomy”, “tagging along”), to remain open to and grounded in the data while ensuring active interpretation. A.R. led this initial inductive approach to coding and met regularly with T.T. to discuss. We conducted constant comparative analysis among codes within and between transcripts that also incorporated memos and field notes written by A.R.; in this way, initial codes were coalesced into larger categories and ultimately higher order themes that captured the relationships between categories. We followed an iterative process of data collection and analysis using this constant comparative method, which led to a more conceptual coding framework²⁷. NVivo qualitative analysis software (version 12.2.0, QSR International, Burlington, MA) was used to organize and support the coding process. This study was approved by the institutional Research Ethics Board (#111821)

Limitations

Our chosen methodology affords both strengths and limitations. It allows for an in-depth and thoughtful analysis of participants’ re-telling of their lived experiences within the local

training culture. Participation was voluntary and our study focus was transparent during recruitment, so we suspect that students who feel most strongly about fatigue, whether positively or negatively, would have been more inclined to participate. Thus, students who were too exhausted to participate or those who feel that fatigue is irrelevant to the training experience may not have been represented in our sample. We ensured that all interviews were conducted by a medical student to try and facilitate more candid discussions with near-peer participants. Yet we realize that some participants may have wanted to avoid seeming vulnerable and save-face in the presence of a more junior peer or conversely, may have exaggerated certain challenges of training as a well-intended warning. We also recognize that, as an interview-based study, our semi-structured interview format may have illuminated some aspects of medical student fatigue during training, while overlooking others. Previous research with residents suggested that fatigue remains a taboo topic²⁶, thus we were deliberately more direct in how we asked about it to try and normalize the experience.

Results

Of the 22 third-year medical students who participated in our study, twelve were female, 2 were married and one was a parent. Salient quotations from interview transcripts are identified by anonymous participant code (###)

Our results suggest that participants found their clerkship experience to be particularly fatiguing, not only because of unprecedented levels of sleep deprivation (“...it just makes any other experience of being tired feel like I was never tired at all” (002)), but also as a

result of the “mental and emotional tolls of uncertainty and confusion” (003). Drawing on their clerkship experiences, participants generally understood workplace fatigue as a problem that threatens (1) personal health, (2) patient care and (3) professional reputation. We were also struck by their descriptions of how they variably attempted to manage these threats, through (1) perseverance, (2) faith in the system and (3) stoicism, respectively. Because participants’ descriptions of how they manage fatigue shed light on how they understand it, we have organized the results to both elaborate on the three threats and describe medical students’ reported management strategies using salient quotations from the interview transcripts.

Threat to personal health

Participants spoke emphatically when describing how fatigue has the potential to threaten many dimensions of their own health and well-being. Long shifts were particularly problematic as they left many students feeling detached from the rest of the world. When reflecting about periods of prolonged sleep deprivation, one student reflected, “that very much impacted my mood because I was just waking up, doing this really long shift, eating, barely showering and then falling asleep” (018). They also highlighted how fatigue interferes with their physical health: “I kind of let go of the stuff that kept me feeling good, like eating healthy and exercising... because I was just so tired at the end of the day” (015). Some described situations where they were diagnosed with new illnesses that they attributed to the fatigue they were experiencing in clerkship:

I’ve been quite healthy all my life, but I was getting bad acid reflux ... So I think that culminated from not eating at proper times, and then also coming home and having

three hours to cook dinner, eat dinner, and then exercise. So I didn't sleep... So, physically, I definitely felt an effect from the fatigue and the stress of clerkship (020)

Finally, students also shared how fatigue-related impairment manifested in frightening close-calls while driving home from the hospital: "Fatigue hits you ... when you're driving home. I have felt unsafe driving home" (016).

Medical students generally dismissed the wellness advice they received during their orientation to workplace training, perceiving that while it "comes from a good place" (018) it is also "100% useless" (018). Partly, this arose from a sense that such guidance was "pretty obvious, like, 'exercise is important'" (013) and generic ("...take care of yourself" (017)) without the acknowledgement that such efforts require "a sacrifice of other things" (019). In lieu of these recommendations, some students attempted to manage threats to their personal health due to fatigue by relying on positive self-talk that allowed them to persevere:

I try to remind myself that it's not torture. I'm not at the hospital for my own pain. I'm at the hospital because it's a learning experience. So, that will usually be a little kick in the pants to brighten me up. (002)

Others drew on mantras and described repeatedly telling themselves, "...this is one year and it will be over and then I'll treat myself better in residency..." (021) in an attempt to reframe their experience.

Not every student felt that perseverance was the answer. Instead, for some, fatigue was seen as a symptom that warranted prompt attention, rather than positive self-talk:

“I don’t think that you get better at working through fatigue. I think that people...need to actually manage their expectations and realize that fatigue is a sign that you need a break and you need some rest, not that you need to learn to deal better with it.” (010)

Threat to patients

Participants also expressed a belief that workplace fatigue had the potential to negatively impact patient care. As one student considered when asked if their fatigue might put their patients at risk, “I think that in the middle of the night, I’m obviously a little bit concerned for patient safety, because I think everyone is a bit tired.” (001) In spite of this concern, many students assumed that *their own* workplace fatigue was irrelevant to patient care. They maintained this belief by trusting that the existing system would compensate for any fatigue-related impairment, at least while they were medical students:

The nice thing about clerkship is that there’s so many levels of checks and balances on all your work, all your orders... so that if you do miss something on a history, you do miss something on a physical, someone else is going to pick it up (004)

The rationalization became less relevant, however, when participants imagined the impact of their fatigue in the future as they take on more responsibility with less of a “safety net” (006). With reduced oversight, many feared that their fatigue would manifest as a patient safety threat: “I definitely see the potential like when you’re maybe a more senior medical student or a more senior resident when you don’t have someone co-signing your orders and checking your work... ” (010) In addition to less oversight, medical students also

expected that their level of fatigue would intensify as they continue with their training, further amplifying the safety risk to patients:

I don't think that med students really ever are in a situation where they're so tired that they're putting patients in an unsafe situation... But I can definitely see in residency that it will be more difficult because you have more pressure, more call and more responsibility. (005)

Our participants had little insight into how their senior colleagues mitigate this potential safety threat. One student confessed, "...If the same level of fatigue was being experienced by a resident, I would be more scared, especially a senior resident, but somehow they manage." (021) Similarly, few students felt equipped to manage the future threat of fatigue: "If I had an idea of how I'd manage it then, I'd probably be doing that now. I don't know what I'll do..." (013) For others, the future solution was simple and straightforward: "I might be tired, but my patients are sick, so I'm going to put it aside and I'm going to do my absolute best..." (004)

Threat to professional reputation

As a result of pervasive messages within the learning environment, participants believed that fatigue, or more specifically, expressions of fatigue posed a threat to their desired reputation as committed, motivated learners. Admitting to fatigue was potentially risky and meant that "someone superior to you will think less of you." (009) There was a strongly held perception that students were expected to work through their fatigue to prove they could handle it: "There's certainly that worry that if you do ask for a break... that you're going to

be seen as weak.” (004) Because of this, opportunities to sleep were not always welcomed: “I know sometimes on night shift your senior resident will let you sleep and sometimes you don’t want to because you don’t want to look like you’re not working hard” (010). Conversations and interactions witnessed by the students further reinforced the importance of denying fatigue and maintaining stoicism to manage this threat:

...I’ve definitely seen unfortunates like elective students... complain about being tired in front of a resident and getting a very inflammatory response from that. So, I think that’s something we don’t do because of those reasons. (019).

Others learned this more implicitly, by observing how their role models persevered through sleep deprivation, seemingly without complaint:

I personally don’t feel like I ever saw my consultants have fatigue. I’ve never even seen them tired. These people are amazing. I know they work hard because they work unbelievable hours, but they manage so flawlessly. Maybe that’s bad because they are struggling and all you see is perfection, so you’re holding yourself to a standard that’s nonexistent. (016)

As the most junior team member, medical students felt especially uncomfortable acknowledging their fatigue: “I felt bad saying I was fatigued if my senior was post-call and had operated all night and was going to operate all of the next day too” (012). Not only was acknowledging fatigue seen as an undesirable quality, but it was also perceived as a futile exercise for some students who understood fatigue as an immutable reality of the clerkship experience:

People will like lament about it with each other...but not to excess because we're all in the same boat... Sort of like, well everyone is tired and we're all still doing it, which is also bad because that's the subculture of medicine is like we all made it through all this so you all should too so everyone just like put your woes back in your own mouth and don't talk about it. (007)

Discussion

When reflecting on their workplace-based training, the third-year medical students in our study described fatigue as a threat to their personal health, to patients and to their professional reputation. They described attempting to manage these threats through perseverance, faith in the health care system and stoicism. Using a constructivist grounded theory approach to this research moved our analysis beyond simple characterisations of how fatigue felt or manifested for our participants. Instead, we remained attuned to the socially-mediated dimensions of fatigue to capture how students made sense of and grappled with the fatigue they experienced, which led to the final co-constructed theory.

Our students' perception of fatigue as a threat to their personal health reflects existing literature that links fatigue, sleep deprivation and burnout in the medical profession at large^{3,7,8}. Our participants questioned the relevance of espoused wellness strategies intended to protect them from these negative outcomes. Their collective skepticism seems to echo an emerging discourse in medical education that challenges approaches that place the onus on the individual without addressing how the workplace makes it difficult to

remain well²⁹. This discourse is supported by research demonstrating that organization-focused interventions outperform individual-focused interventions aimed at improving physician wellness³⁰. Yet, our participants remained focused at the individual level by relying on mantras and positive self-talk, or simply setting aside fatigue, which enabled them to persevere. The lack of organization-focused interventions may simply reflect our participants' newcomer status within the clinical workplace. The "short term pain for long term gain" mentality evoked in many of our students' mantras is reminiscent of previous work in the postgraduate medical education context, in which residents believed that residency was a time of temporary imbalance and this belief allowed them to endure personal sacrifice³¹. Although this idea might genuinely help residents and medical students to persevere in the face of unfavourable circumstances during training, the existing literature would suggest that physician wellbeing does not necessarily improve upon graduation³². The belief that it eventually improves may set up medical students and more senior trainees to perpetually postpone dealing with fatigue and other threats to wellbeing, until such threats are an accepted, embodied part of their existence³³.

When considering the issue of patient safety as it pertains to fatigue, our students largely absolved themselves from the need to respond to fatigue as a safety threat at present. Many of our participants were concerned, however, about the impact of their fatigue during residency and beyond, as they gained more responsibility and independence. Some students managed this dilemma by simply hoping that their future self will develop the ability to withstand prolonged sleep deprivation without impairment, despite the lack of empirical evidence to support such a notion²⁵. In a previous study, residents managed

the patient safety dilemma through their belief that fatigue impairment could be overcome if sufficiently motivated or energized from an adrenaline surge²⁶. We are left to speculate whether this slight, but critical, shift in perspective arises out of necessity as students transition from medical school to residency. Without explicit acknowledgement to the contrary, it is understandable why many medical students in our study reasoned that fatigue must become less of a threat with continued exposure and experience. At face value, it seems intuitive. Highly complex tasks, such as driving a car, become easier with experience. Yet, no matter how experienced the driver, driving after 24 hours of wakefulness is dangerous and a criminal offense in some jurisdictions³⁴. Furthermore, the idea that experience or training can compensate for fatigue is considered outdated in the aviation industry, which is lauded for its commitment to safety²⁵. It may also be that medical students must eventually relinquish the idea that fatigue poses a safety threat to patients since fatigue seems unavoidable and the notion of compromised patient safety is both incongruent with the professional ethos and a source of moral distress³⁵.

Although the medical students we interviewed presently rely on the system to capture any oversights they might make due to fatigue, they are bound by their training culture to present a stoic professional face. Medical students' concern for their professional reputation is understandable but problematic, as it yields a major predicament in the context of fatigue risk management. If students are culturally constrained from declaring their own fatigue-related impairment, then there is no impetus for the system to safeguard against the impact of student and trainee fatigue. The pressure to appear indefatigable is not only problematic from the standpoint of fatigue risk management but also may be a

catalyst for trainee burnout. As Baigent and Baigent point out, "... a predisposition to perfectionism may be a formula for professional fragility that leads to crisis when unacknowledged beliefs of omnipotence combine with work demands and patients who do not do so well."³⁶ This may be mitigated through exposure to senior colleagues who willingly allow students to see their vulnerability and fallibility^{37,38}. In the context of fatigue, this might include senior colleagues role-modeling behaviours such as explicit statements of fatigue self-assessment, open discussions of fatigue mitigation strategies, or acknowledging fatigue as a risk factor during analysis of near-misses and safety incidents. As long as the taboo of fatigue impairment persists in medical education, efforts to implement fatigue risk management are likely to fall short of expectations.

In light of our findings, future research is needed to explore how faculty in various practice settings and disciplines understand fatigue in the workplace, since they often dictate cultural norms within the clinical training workplace. Further research is also needed to clarify whether more senior trainees are engaging in fatigue-proofing strategies without identifying them as such.

Conclusions

We set out to explore how third-year medical students at one academic institution understand and manage the fatigue they experience during their workplace-based training. This research adds the medical student voice to the important, ongoing scholarly conversation about fatigue risk management in medical education. Our findings highlight a major challenge for these students, relative newcomers to the clinical workplace. They are

at once experiencing newfound levels of sleep deprivation, alongside pressure to perform and appear resilient to the effects of this fatigue. As the discourse shifts away from work hour restrictions towards fatigue risk management strategies, this pressure to appear indefatigable is likely to impede implementation of FRM as it has been conceptualized in other industries.

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