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Psychobiology of Resilience

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Abstract

Nurse managers experience high levels of stress due to the complex bureaucratic and chaotic nature of the job, which can lead to burnout. In nurse managers, burnout negatively impacts the ability to meet the strategic goals of the quadruple aim: patient quality, patient satisfaction, cost savings, and employee well-being. Strategies to address burnout include minimizing or removing unnecessary causes of stress and provide the skills to protect against burnout. Resilience is a competency nurse leaders must have to withstand overwhelming job-related stress. Resilience-enhancing strategies have psychobiologic underpinnings and can be easily incorporated into nurse managers' work schedules.

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Nurse managers have a crucial role in operationalizing organizational strategic goals into practice. These goals center around meeting the quadruple aim: patient safety, patient satisfaction, optimizing costs, and employee well-being.[1,2] Managers have 24/7 responsibility for staffing; managing productivity and budgets; building and fostering collaborative relationships with other disciplines and departments; implementing and supporting regulatory requirements; designing, creating, and executing new initiatives; and performing administrative and bureaucratic tasks required to maintain daily operations.[3] To add to the complexity, the work environment is constantly shifting and, at times, chaotic. Nurse managers must adapt and respond to these shifts. Although this work can be rewarding, it is stressful and can lead to burnout and resignation from the job or, even worse, leaving the nursing profession completely.

The suffering due to burnout can be significant and long-lasting. In a systematic review, Salvagioni et al. found that burnout was a predictor of several conditions.[4] Psychological

consequences of burnout include insomnia, depression, use of psychotropic and antidepressant medicines, and hospitalization due to mental disorders. Physical consequences include hypercholesterolemia, type 2 diabetes, heart disease, headaches, fatigue, and hospitalization. Occupational consequences include job dissatisfaction, absenteeism, and disability.[4] These factors lead to an increased risk of omission of care, medical errors, and malpractice, which may have a financial impact on organizations, not to mention the individual patients who suffer from substandard patient care.[5] Feelings of exhaustion, cynicism, and inadequacy do not automatically stop when leaving work.[6] Burnout carries over into home life where family and friends may suffer from this negative *spillover* effect.[6]

In a survey of 291 nurse managers throughout the United States, 70% were satisfied or very satisfied in their role.[7] Despite this, 72% of the nurse managers surveyed indicated they had plans to leave their current position in the next 5 years, with burnout as the top reason (30%) for leaving. Interestingly, a career change was the second most cited reason (27%) for leaving, which suggests they may leave the profession altogether.[7]

Call to Action

There is a worldwide call to action to address burnout and well-being in healthcare. The World Health Organization recognizes burnout as an occupational phenomenon and added it to the International Classification of Diseases used by doctors and health insurers.[8] The Institute for Healthcare Improvement's (IHI) white paper, *IHI Framework for Improving Joy in Work*, addresses burnout in healthcare and promotes individual wellness in healthcare professionals.[9] The IHI issued a guide to help leaders support their staff in response to additional stressors due to the COVID-19 pandemic.[10] The Joint Commission states that organizations have a responsibility to support their staff and address the workplace causes that contribute to burnout.[11]

The National Academy of Medicine (NAM) appointed a committee to address the alarming rise in rates of stress, burnout, and suicide.[5] These organizations support implementing strategies to reduce organizational causes of workplace stress and burnout and implement programs to promote wellness and resilience.[5,8-11]

Resilience and Psychobiologic Underpinnings

Psychobiology is the biological approach to studying psychology[12] and provides the framework for how resilience-enhancing strategies work to counter stress and burnout. The American Psychological Association (APA) defines resilience as the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress.[13] Although genetics factors into one's ability to be resilient, individual responses to stress are largely determined by one's general state of physical health and how one perceives a situation.[14] While healthy sleep, exercise, nutrition practices, and having positive social support are well-known strategies that promote health, they are beyond the scope of this paper.[15] This paper focuses on strategies to address the perception of a situation.

The Stress Response

The human body is continuously challenged by stressors to maintain homeostasis, which is how the body adapts to the changes happening within the body and the external environment to survive.[16] More precisely, the body tries to achieve eustasis, which is the optimal body equilibrium, or baseline, for a given individual.[17] The concept of homeostasis applies to both emotional and physical states, and the body's response to stress is an integrated effort by neuroendocrine, cellular, and molecular structures and systems.[18]

Acute Stress Response

The acute stress response evolved to allow humans to respond to life-threatening emergencies in the environment.[15] When an individual perceives a threat, the brain activates the sympathetic nervous system (SNS) and hypothalamus-pituitary-adrenal (HPA) axis.[16] When triggered, the SNS releases norepinephrine and epinephrine. Norepinephrine activates internal organs, such as the heart, lungs, eyes, and digestive system, to prepare the individual for *fight or flight* to address the threat. This response is rapid and intense.[16] Physical triggers, such as surgery or an infection, can activate the stress response directly without going through the brain to activate the SNS.[19, 20] The response should be relative to the level of disruption to homeostasis caused by the physical trigger.[18, 20]

Seconds after the SNS system is activated, the HPA axis is stimulated beginning with the hypothalamus, which secretes corticotropin-releasing hormone (CRH).[19, 21, 22] CRH increases SNS activity and signals the pituitary gland to release adrenocorticotropic hormone (ACTH). ACTH stimulates the adrenal cortex to produce cortisol, which is responsible for mobilizing energy stores needed by the body to cope with the stressor. The cortisol response peaks 20-40 minutes from the time of the perceived threat and returns to baselines 40-60 minutes, on average, after the threat has abated.[22] Once the situation is no longer appraised as a threat, the body attempts to return to eustasis.

Chronic Stress Response

McEwen describes chronic stress as the "cumulative load of minor, day-to-day stresses" (p. 171).[23] This can be due to chronic activation of a defense/vigilance response related to perseverative cognition, such as worrying and negative emotions.[24, 25] Chronic activation of the acute stress response, where the neuroendocrine systems are overused or malfunction, causes *wear and tear* effect on the brain.[16] Normally, when cortisol levels increase, there is negative

feedback to the HPA axis to decrease the cortisol levels. Unlike acute stress situations, where cortisol levels return to baseline, cortisol levels remain elevated in chronic stress for prolonged periods. Elevated cortisol levels can be neurotoxic to the hippocampus, which regulates the HPA-axis. Prolonged elevated cortisol levels can suppress or dysregulate the HPA-axis, which further worsens the neuroendocrine system's ability to respond to stress.[26] The hippocampus is also important for memory, learning and providing context to events that have a strong emotional bias, which is beneficial for future responses to a given threat.[23] The neurotoxic effects may be reversed if the duration of stress is relatively short; however, if it lasts months or years, the damage may cause permanent loss of memory and learning capability.[23] Other maladaptive results of long-term cortisol exposure include metabolic syndrome, obesity, cancer, cardiovascular disease, mental health disorders, and increased susceptibility to infection.[27]

Threat Perception

For this paper, *the threat* is used to indicate a range of stressors from low-level annoyances to life-threatening ones. An example of a low-level stressor is spam mail that clogs emails. A life-threatening example is presence of an active shooter in the hospital. Both contribute to stress, and the response to either situation may vary according to an individual's ability to address the stressor.[26] The perception of the threat controls the intensity and duration of the stress response. A threat to one person may not be a threat to another person. For example, having to address the barrage of unnecessary emails may be the tipping point for someone on the brink of burnout. Where the presence of an active shooter may cause one to panic, another may remain calm under pressure. Other threats or everyday stressors nurse leaders face are workloads, chaotic work environments, and staffing challenges. Some become overwhelmed and burn out, while others can adapt and work through these challenges.[26]

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Resilience-enhancing strategies aim to eliminate or minimize unnecessary threats or stressors.[26, 28] Modulating the threat, curbs the stress response. Mindfulness and cognitive reframing are two practical techniques to modify the level of threats.

Mindfulness

Kabat-Zinn, an early pioneer of mindful meditation, recognized mindfulness as an effective strategy to decrease pain and anxiety.[29, 30] He describes mindfulness as being in the present, focusing attention on what is happening in the current moment without assigning judgment to what is happening.[29] Many studies have validated that mindfulness effectively treats stress-related disorders.[31] By being present and not assigning judgment, one avoids negative emotions and perseverative cognition, such as worrying, fretting, or ruminating, thereby avoiding unnecessary stress. Meditation, yoga, tai chi, and coloring books are specific mindfulness techniques.[29] The easiest to learn, but not necessarily easy to do, is simply breathing slowly and focusing on the breathing itself. The mind will wander, and if it does, it is okay. The goal is to bring the attention back to breathing.

Cognitive Reframing

How often do people create their stress by worrying unnecessarily? It is human nature to jump to the worst-case scenario which was necessary to survive. In the jungle, sudden noises trigger a fight-or-flight response, initially suspecting a potentially dangerous animal. However, that sound could have also been caused by a falling branch. Using this survival mindset to respond to everyday work can be stressful and cause burnout.

Several studies have successfully used cognitive reframing as a strategy to decrease stress or enhance resilience.[32-35] Cognitive reframing is reassessing a given emotional response to the situation.[36] A given situation is reevaluated for relevant and irrelevant negative information and reappraised without the irrelevant negative information, with a focus on positive.[26, 37] The goal is to remove unnecessary negative emotions from the situation. Relevant negative information should be addressed accordingly. Consider when someone does not respond to a text. Is the response to think that individual is rude or is there another reason the person did not respond, such as being out of cell-service range? The goal is to avoid jumping to negative conclusions.

Gratitude

Gratitude deserves mention here as a strategy that has been shown to improve well-being and resilience in healthcare workers.[38-40] Emmons and McCullough define gratitude as a positive emotion in response to receiving a gift.[41] Little is known about the specific psychobiological mechanisms of gratitude; however, it is thought to increase activity in the reward center in the brain.[42] The thought is if the brain is focusing on positive thoughts, it has less room for negative ones. A strategy to practice gratitude is to enter three good things that happened during the day into a journal. Although it may be difficult to ignore the negative as the events of the day are reviewed, the goal is to intentionally think of the positive things that happened. In a journal, title the event, describe the event (what happened, who was involved, what was said), and describe the emotional response to the event.[39]

Practice

Mindfulness, cognitive reframing, and gratitude are simple strategies to incorporate into the workday. These skills are not necessarily easy to do in the beginning—the mind may wander when practicing mindfulness or focus on the negative during cognitive reframing and gratitude

exercises—however, they get easier to do with practice.[26] To reap the benefits of resilience and well-being, like other skills, they must be performed regularly.

Conclusions

Psychobiologic sciences illustrate the deleterious effects of stress and burnout and the benefits of resilience. Nurse leaders endure tremendous amounts of stress at work, which can lead to burnout, turnover, and leaving the nursing profession completely. To be successful, they must develop competencies in budgeting, staffing, productivity, project management, and leadership skills to keep patients safe and staff engaged. Resilience is a necessary competency to promote nurse leaders' well-being, so they can be engaged and effective.

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