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## Discussion

## NURSE: Five Micropractices to Reduce Stress

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## A B S T R A C T

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Stress  
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The Coronavirus pandemic affected patients' health and heightened stress among the frontline care-givers, especially radiology nurses. Although there is literature on the effects of stress on nurses, there is a gap on interventions to mitigate the impact of stress. There are evidence-based mindful interventions to maintain balance in stressful situations and reduce perceived stress in sports, neuroscience, and positive psychology. Studies show that even brief periods of self-care reduce stress and cortisol levels. Nurses work long hours and have personal, family, and community responsibilities. Nurses may not have the luxury of extra time to devote to self-care. Therefore, this essay summarizes what stress does to the body; the tangible and intangible costs associated with unmanaged stress among nurses. Five self-care micropractices requiring no additional time called NURSE are offered. When practiced consistently, these micropractices can enhance nurses' well-being, leading to the retention of nursing talent and improved patient care.

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## Introduction

During the Coronavirus 2019 (COVID-19) outbreak radiology nurses experienced a higher risk of infection due to invasive procedures on high acuity patients (Ayyala et al., 2020). Radiology nurses experienced high levels of stress similar to nurses in the emergency department, intensive care, medical-surgical units, and all frontline workers during the pandemic (Couper et al., 2022; Williams et al., 2022). The effects of unprecedented stress experienced by nurses have been reflected in the elevated national intention to leave rates (Dyrbye et al., 2019). Stressful events are a constant in nursing yet nurses receive little training to deal with workplace stress (Onieva-Zafra et al., 2020). Unmanaged chronic stress can lead to changes in neurobiological pathways that can affect workplace satisfaction, quality of care, and personal well-being (Morera et al., 2020). However, consistent positive actions activate reward centers in the brain, decrease cortisol levels, and increase well-being (Jackson et al., 2021). Although nurses understand the benefits of self-care, we do not practice them due to a lack of time, energy, and motivation (Williams et al., 2022). This essay

presents tangible and intangible costs of current stress experienced by nurses, the effects of brief mindful self-care practices based on the theory of neuroplasticity, and recommend five micropractices known by the acronym NURSE. These micropractices are effective, can be performed whenever needed, particularly in stressful times, and will require no additional time (Fessell & Cherniss, 2020). With consistent practice these tools can become sustained self-care routines and prevent stress-related disease.

## Current state of stress experienced by nurses

Radiology nurses serve a unique role. They possess a high degree of knowledge and clinical skills to work independently or with interdisciplinary teams. They administer moderate sedation, use advanced equipment, and care for patients of varying acuity in all departments (Blevins, 1994; Werthman et al., 2020). Due to the COVID-19 pandemic, radiology nurses' stress was heightened due to inconsistencies in the protocol, lack of personal protective equipment, inadequate staffing, and inadequate workers' compensation (Ayyala et al., 2020). Similarly, 27.9 million nurses globally (including 3.7 million in the United States) experienced increased patient acuity, census, and workload contributing to nurses' high stress (Specht et al., 2021; World Health Organization, 2020). Due to increased stress nurses' intent to leave their current job is 18% in Germany (Schug et al., 2022), 37.8% in the United Kingdom, and 40% to 54% in the United States (Kelly et al., 2021;

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2022; Taylor-Clark et al., 2022). Stress has tangible and intangible costs to nurses and the healthcare system.

### Tangible costs

An average US hospital spends 3 months and an average of \$48,050 to fill one nurse vacancy, with costs of replacement ranging from \$4.4 million to \$6.9 million annually (Jun et al., 2021). These costs include advertisement recruitment interviews, background checks, orientation, and new staff training (Lockhart, 2020). In addition, according to the American Institute of Stress (AIS) the cost of unmanaged work-related stress to all US businesses is \$300 billion due to reduced productivity, accidents, and absenteeism (AIS, 2022). The cost to provide healthcare for stress-related occurrences is \$190 billion (AIS, 2022).

### Intangible costs

The COVID-19 epidemic caused radiology nurses to experience reduced satisfaction with work, increased psychological distress, and the intent to leave work (Williams et al., 2022). The intangible costs of such stress are loss of work productivity, impact on family and community, increased medical costs, workers' compensation, and loss of wages and tax dollars (AIS, 2022). Unmanaged stress leads to increased obesity, hypertension, high cholesterol, anxiety, and anger (Jordan et al., 2016). High stress can also lead to depression, suboptimal mental, decreased physical well-being, that can lead to burnout (Dyrbye et al., 2019; Melnyk et al., 2018). Work-related stress is positively linked to high rates of substance abuse among nurses (Batalla et al., 2019; Ivey, 2015). Additionally, the risk of the suicide rate for nurses increases five-fold when professional stress is compounded by personal stress (Hooley et al., 2014; Quarshie et al., 2019).

### Neurobiology of stress

Experiences of radiology staff during COVID-19 increased their anxiety, fear, and stress. These experiences affected nurses' health, patient safety, and work efficiency (Huang et al., 2020). Basic neurobiology is offered to understand the impact of stress on personal and professional outcomes. The brain is the organ that manages responses to stimuli through personal, behavioral, and physiological responses (McEwen et al., 2015). When frontline nurses face constant stress at work, cortisol levels rise and can stay elevated for several hours. Repeated exposure to stress causes damage to the body and brain (Alhawatemeh et al., 2022). Untreated stress can cause structural changes in the amygdala, hippocampus, and prefrontal cortex which can lead to stress-related diseases (Ortiz & Conrad, 2018). Brain, or neural changes, result in decreased ability to retain knowledge impacting short-term memory storage and retrieval which are critical for the profession of nursing (Shaffer and Curtin, 2020; Quaedflieg & Schwabe, 2018). Thus, chronic exposure to stress impacts our mental, physical, and emotional health and general well-being (Nabizadeh-Gharghozar et al., 2020; Yao et al., 2018). Less than optimum health in nurses is linked to falls, secondary needle sticks, medication errors, decreased quality of care, and increased healthcare costs (Bakhamis et al., 2019; Chesak et al., 2019; Melnyk et al., 2018). As the response to stress is uniquely personal, developing healthy behavioral and cognitive self-care practices can positively affect one's neurobiology leading to better coping stress control, well-being, and resilience (McEwen et al., 2015; Tabibnia & Radecki, 2018).

### Ripple effects of self-care behaviors

The difficulty of nurses in practicing healthy self-care behaviors is complex and includes a lack of time, money, motivation, and support (Riegel et al., 2021; Ross et al., 2017). Sapolsky (2004) points out that zebras are stressed as they run away from predators. At the end of the chase their stress is gone as they are either dead or go back to grazing. Humans, on the other hand, ruminate on stressful events long after the events have ended (Sapolsky, 2004). Nurses face many stressful and uncontrollable situations during the workday. Without consistent self-care we may not be fully present for ourselves or our patients and loved ones (Williams et al., 2022). Nursing theorist Dr. Dorothea Orem calls self-care a cornerstone of nursing science where nurses are both the benefactors and the recipients of such care (Denyes et al., 2001). Furthermore, Dr. Jean Watson emphasizes that mindful, loving, compassionate, self-care is the foundation for caring for others and can result in a more fulfilled work and life (Sitzman & Watson, 2018). Additionally, Williams et al. (2022) caution that if nurses neglect self-care we can potentially become patients in need of specialized care.

Self-care through mindfulness practices has captured the interest of the scientific community in the last 2 decades. Researchers find that mindfulness practices are effective in reducing depression, chronic pain, anxiety, and stress. Mindful practices improve emotional well-being and work performance, in fields of business, education, sports, and medicine (Alhawatemeh et al., 2022; Goodman & Howard, 2022). Knowledge of self-care is one thing. However, the current state of affairs has some nurses asking if self-care is enough (Laker, 2022). Systemic changes that support nurses' well-being practices can create an atmosphere of self-care. However, the systemic changes cannot take away personal responses to the perceived stressors faced by nurses daily (Wei et al., 2019). Empowering a few nurses can ripple the healing effect on nurses, their patients, families, and communities (Sitzman & Watson, 2018; Sitzman, 2022). To assist nurses in the practice of evidenced-based micro-practices, that take only moments to practice, but have positive lasting healing effects on the neurobiology are presented below. These quick tools can help nurses respond to the constant stress present in our profession (Fessell & Cherniss, 2020; Ortiz & Conrad, 2018).

### NURSE: five brief self-care micropractices

Radiology nurses face unique challenges during COVID-19 such as exposure to infections, radiation, lifting, and performing invasive procedures on high acuity patients with inadequate help. Such working conditions can lead to infections, and physical and moral injury in nurses (Ayyala et al., 2020; Williams et al., 2022). Many nurses report that working long hours and family responsibilities do not afford them the luxury of time for self-care activities (Williams et al., 2022). Based on neuroplasticity, even brief mindfulness self-care strategies can help reduce the intensity of stress and help develop an adaptive response to perceived threat stimuli (Aguilar-Raab et al., 2018; Bottaccioli et al., 2019). Just as stress affects the whole body, mindful self-care activities should involve our whole being, spirit, mind, heart, and body (Sitzman & Watson, 2018). Evidence demonstrates that a brief mindful practice effectively reduces stress, pain, and cortisol levels (Bottaccioli et al., 2019; Tang et al., 2015; Wu et al., 2019). Additionally, these brief practices promote physical, spiritual, and emotional wellness by decreasing stress, pain, fear, anxiety, and depression (Deng, 2019). The following acronym NURSE stands for *notice, unconditional, response, strengths, and empower*. NURSE practices are offered as stress relief tools that can be practiced by radiology and all nurses (Table 1). If practiced with regular intervals multiple times a day, micropractices can add up to several minutes a day and promote well-being (Sitzman, 2022).

**Table 1**  
NURSE micropractices

Notice without judgement Observe behaviors that work and that do not work (Coyne et al., 2020)	Micropractice To become more aware of ourselves and surroundings (a) Take 3 deep nourishing breaths while (b) Completely relaxing your body tension These actions help us respond better to our environment
Unconditional acceptance Accept, evaluate situation without exaggeration. Respond with self-kindness (Neff et al., 2020)	Micropractice Place our hand on our heart and acknowledge, “I feel anxious/sad/exhausted/stressed” (a) Unconditionally accept the content of our feeling (b) Choose to respond with self-kindness in the form of any positive thoughts about ourselves
Response-able Use special phrases to create a gap between the difficult circumstances and our automatic responses (Covey, 2020)	Micropractices Take control of how we respond verbally and in your thinking. Like elite athletes we can pick our favorite chant: “I am a good nurse,” “I make a difference,” or any empowering quote allowing us to do the following: (a) First pause and (b) Then respond to situations and acknowledge our full abilities
Strengths focused We can flourish under challenging situations by focusing on our strengths (Seligman, 2002)	Micropractice Making a list of positive personal strengths. Use existing task time to do this. (a) While walking or getting dressed (b) At a stop light (c) Before going into a patient’s room (d) While washing your hands (e) At the end of the shift Allow this knowing to radiate a sense of pride and accomplishment
Empowered Brief self-compassionate physical actions build inner strength (Andersen et al., 2022; Neff & Germer, 2018)	Micropractice The Tree yoga pose can be practiced quickly and helps build core strength. (a) Stand with our feet shoulder-width apart (b) Take a slow deep breath while lifting the hands above our heads towards the sky. Lift the heels off the floor if comfortable. (c) Hold the position for a few seconds then gently bring our arms back to our side while exhaling completely. Yoga improves anabolic, lymphatic, and metabolic health

### Notice without Judgement

The first step to changing behaviors is to notice practices that work and ones that do not (Coyne et al., 2020). For example, by consciously observing breathing patterns and muscle tension one can acknowledge that breath or muscle tension increases in response to increased stress/cortisol levels (Giannakakis et al., 2019). *Micropractice*: Consciously taking three deep nourishing breaths every few minutes while completely relaxing the body tension has significantly reduced compassion fatigue in nurses (Sitzman & Craven, 2021; Owens et al., 2020). Focused deep breathing allows for the more profound exchange of oxygen activation of the parasympathetic system increase in oxytocin and reductions in cortisol help one to respond better to current stressful stimuli (Drigas & Mitsea, 2021; Pascoe et al., 2017; Yuliana, 2021).

### Unconditional Acceptance

Most nurses are type A personalities who enjoy professional accomplishments but are linked to increased fatigue, stress, depression, irritability, and burnout (Yao et al., 2018). Unconditionally accepting our personal feelings in the present moment allows us to evaluate the situation without exaggeration and respond with self-kindness and compassion (Neff et al., 2020). *Micropractice*: Place our hand on our heart and acknowledge our feelings honestly, “I feel anxious/sad/exhausted/stressed.” It is essential to be mindful of the content of the self-talk as it can help one respond with self-kindness instead of automatic harsh self-judgment (Hardy, Comoutos, & Hatzigeorgiadis, 2018; Neff et al., 2020).

### Response-able

According to Stephen Covey (2020), the short gap between a stimulus and our response can be robust. In this gap, we have the

ability and freedom to respond in a way that either supports growth and our happiness or not. Monitoring one’s responses to situations by consciously practicing positive self-talk can boost self-confidence, improve mood, relax the body, and increase our ability to handle stressful situations (Crane & Ward, 2016). Our profession deals with life and death situations daily. Like elite athletes, we can enhance “our game” by using positive self-talk, imagery, and goal setting to boost self-confidence (Park et al., 2020; Walter et al., 2019). *Micro-practices*: We can adopt favorite chants such like the athletes such as “I choose my reactions,” “I am doing my best with the resources I have,” “I am a good nurse,” and “I have what it takes to make a difference today.” Or adopt a verse from our favorite holy book or favorite teacher that allows us to pause and respond to situations with our full abilities instead of looking for someone to blame (Covey, 2020).

### Strengths Focused

In trying situations, we can stand on the strengths of our interpersonal skills, faith, perseverance, and honesty, and less on what needs to be fixed which allows us the opportunity to flourish under challenging situations (Seligman, 2002). By increasing personal support for our positive attributes, we may be able to improve our health and professional satisfaction and decrease burnout (Crane & Ward, 2016). *Micro-practice*: Making a list of positive personal strengths during the workday or at home during time that finds you waiting for something. By identifying and appreciating unique strengths one can experience positive consequences of happiness and pride as well as a sense of accomplishment at work (Bakker et al., 2019).

### Empowered Mentally and Physically

We can empower and equip ourselves by practicing self-care and health-promoting behaviors before we are faced with

stressful events (Huang et al., 2020). Brief self-compassionate mindfulness actions can build our inner strength (Neff & Germer, 2018). Quick physical exercises can also elevate feelings of vitality, build team spirit, and improve mental and physical functions (Andersen et al., 2022). Improper lifting techniques cause repeated strain within our bodies and when combined with overuse of specific motions and faulty postures, we are more susceptible to microtraumas that need to be addressed (Villafañe et al., 2020). Gentle stretching or yoga can benefit improved blood and lymphatic flow, develop body awareness, muscular strength, and flexibility (Mandal et al., 2021; Narahari et al., 2021). Yoga also improves anabolic and metabolic health (Narahari et al., 2021). *Micro-practice*: The Tree yoga pose can be practiced quickly and helps build core strength (Krucoff et al., 2021). To initiate the Tree pose stand with our feet shoulder-width apart, taking a slow deep breath while lifting the hands above our heads towards the sky. At the same time, lift the heels off the floor if comfortable. Hold the position for a few seconds then gently bring our arms back to our side while exhaling deeply. Several excellent free YouTube channels (Yoga with Adriene or YogaTX) exist for nurses interested in beginning yoga practice.

## Conclusion

Globally, nurses are reporting higher stress due to the effects of COVID-19. Due to their unique working requirements in radiology, nurses face unprecedented stress during this period. Unmanaged stress has long-term adverse health effects and affects nurses' job satisfaction, self-esteem, and general well-being. The tangible costs of chronic stress range in the billions of dollars. However, the intangible costs of loss of passion, talent, and nursing knowledge are immeasurable. Although systematic changes and managerial support are critical to nurses' well-being, they cannot help individual responses to daily stressors. Radiology nurses can positively impact their well-being if they practice any of the five micro-practices throughout their day. Consistent self-care practice can lead to positive changes in neurology. Sustained practice of NURSE micropractices can become automatic habits which reduce stress and improve overall health. These self-care habits can then have ripple effects and can carry well-being from radiology nurses to their interdisciplinary colleagues, patients, and to the larger healthcare community.

## CRedit authorship contribution statement

**Jyoti Valluri**: Conceptualization, Methodology, Writing – original draft. **Karen L. Gorton**: Conceptualization, Methodology, Writing – review & editing.

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