

EFFECTS OF MINDFULNESS ON ANESTHESIA PROVIDER BURNOUT

by

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Jamie Christine Aquino titled Effects of Mindfulness Strategies on Anesthesia Provider Burnout and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.



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ABSTRACT

Background: Anesthesia provider burnout levels are rising across the United States. Evidence shows mindfulness-based interventions reduce stress among healthcare providers, which can aid in decreasing burnout levels. A burnout survey was distributed among anesthesia providers (anesthesiologists and certified registered nurse anesthetists) to determine level of burnout prior and following an evidence-based mindfulness intervention.

Objective: The purpose of this project is to determine how the use of an online, self-administered mindfulness-based intervention affects anesthesia provider burnout.

Design: This is a quality improvement that evaluated the efficacy of a mindfulness based intervention. The project assessed anesthesia provider burnout using the Maslach Burnout Inventory (MBI) survey and then evaluated effects of an intervention consisting of an educational Microsoft PowerPoint and supplemental handout provided to participants. A follow up MBI survey performed one month after intervention was used to assess impact on provider burnout.

Participants: The recruitment pool consisted of 78 anesthesiologists and CRNAs from a two-site local health care facility in Tucson, Arizona.

Measurements: The MBI survey was administered anonymously to assess three dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment. An online, asynchronous, evidenced-based educational mindfulness Microsoft PowerPoint and supplemental handout was disseminated through email for anesthesia providers to administer at their convenience. After a four-week period, the same follow-up MBI survey was administered. Results of surveys were automatically transferred to Qualtrics, maintained anonymity and linked

pre- and post-surveys. All data was anonymous, and no demographic data was collected to ensure anonymity.

Results:

Four providers completed the pre-intervention burnout survey. The results demonstrate composite MBI emotional exhaustion score of 13.8 +/- 10.4, depersonalization score of 0.8 +/- 1.0, and personal accomplishment score of 32.8 +/- 7.4, indicating low burnout among those completing this survey. Zero providers completed post-intervention survey. The efficacy of this intervention could not be determined due to no post-intervention survey participants.

Conclusion:

Only four participants completed pre-intervention burnout survey, with no follow up after the intervention. As no participants completed post-intervention survey, effectiveness of this intervention could not be evaluated. Multiple factors may play a role in the limited participation and are discussed with recommendations to improve future participation.

INTRODUCTION

Burnout and suicide among healthcare providers has become a national epidemic. Evidence-based interventions to reduce and mitigate burnout are essential. Burnout has a negative impact on the health of healthcare providers and patients, and more recently, there is a focus to spread wellness among healthcare providers to prevent burnout from occurring. Unresolved burnout symptoms can lead to depression, which puts many healthcare providers at risk for suicide (Dos Santos, 2017). Over 400 hundred physicians have committed suicide in 2016, equating to over one physician dying every day (Dos Santos, 2017). A study on student registered nurse anesthetists' shows that 47.3% admit to being depressed and 21.3% report suicidal ideation at some point during their education (Chipas et al., 2012). With the population increasing, the need for healthcare providers increases.

Greater than half of providers have a least one symptom of burnout, with higher rates reported among certain specialties, including anesthesia providers (American Society of Anesthesiologists, 2018). A specialty that has had recent growth in burnout in the United States (US) is the certified registered nurse anesthetist (CRNA) (Del Grosso & Boyd, 2019). CRNAs deliver anesthesia to over 34 million patients every year in the USA, and they provide the majority of rural anesthesia care (North Carolina Association of Nurse Anesthetists, 2017). As the demand for anesthesia services increases, there is a concern that the supply of CRNAs may be inadequate to meet the growing needs of the population (Boyd & Poghosyan, 2017). However, most research on provider burnout is specific to either physicians or the CRNA-equivalent in other countries.

Background Knowledge

Many healthcare providers, including physicians, advanced practitioners, and nurses, have symptoms of burnout, and most continue working without assistance, leading to long-term ill effects for the provider, patient, and organization (Bridgeman, Bridgeman, & Barone, 2018). Symptoms of burnout include exhaustion, cognitive weariness, sleep disturbance, low mood, and similar symptoms seen with depression, which are related to work-related stress. Untreated burnout leads to decreased quality and safety in patient care, reduced quality of life, low morale, increased use of alcohol and drugs, and increased suicide rates (Dos Santos, 2017; Dyrbye et al., 2019; Maslach & Jackson, 1981). Excessive exhaustion, a symptom of burnout, is associated with an elevated inflammatory response to stress and hypothalamic-pituitary-adrenocortical (HPA) axis activity suppression; The HPA axis normally helps to regulate the body's response to stress and bodily functions (Garg, 2020). Excessive exhaustion is also linked to an increased incidence of the cardiac arrhythmia, atrial fibrillation (Garg, 2020). These adverse effects of excessive fatigue put healthcare providers at risk for illness and poor health. Healthcare providers, in general, tend to experience burnout more than other types of workers due to inherent personality traits, such as guilt, compulsiveness, working in a culture that stresses perfectionism, and denial of personal vulnerability (Gazelle, Liebschutz, & Riess, 2015).

Burnout awareness, prevention, and mitigation is vital to healthcare providers and the public because burnout contributes to decreased quality of patient care, the well-being of providers, job satisfaction, work productivity, and increased medical errors and safety issues, turnover, cost, early retirement, failure of the healthcare system, and suicide (Dyrbye et al., 2019; Moss, Good, Gozal, Kleinpell, & Sessler, 2016). Unfortunately, as healthcare is rapidly

changing, burnout is also rapidly increasing. Reports show a 25% increase in provider burnout from 2013 to 2017, a considerable increase from the previous four years studied (Peckham, 2017). One way to prevent and mitigate burnout is to find out where the problems exist, measure the problem, develop and provide individual-based and organizational-based interventions recommended by evidence-based research, and re-assess post-intervention (Del Grosso & Boyd, 2019). Successful interventions must be shared via publications and among institutions as this is a national and international problem.

Provider burnout is the result of many factors, including personal, environmental, and organizational factors (Langbelle, 2010). Research on burnout has studied these factors, and more research is discovering the effects of individual and organizational interventions to address the rise in burnout among providers. Work-related factors include increased workload, long shifts, frequent call duties, the potential for malpractice lawsuits, type of specialty, and methods used to cope with patient illness and death (Langbelle, 2010; Patel, Bachu, Adikey, Malik, & Shah, 2018). Other work-related factors associated with burnout are decreased autonomy, less control over the working environment, increased administrative work requirements, and lack of support from colleagues (Moss et al., 2016; Patel et al., 2018).

Nationwide, provider burnout is a problem due to an imbalance of increased workload, and lack of resources and self-care to overcome stress and increase in workload over time. Ongoing changes in the US healthcare system create even more external pressure and stress among healthcare providers at work. For example, studies show that healthcare providers who use electronic health records (EHRs) and computerized order entry (CPOEs) are less satisfied with work due to increased time spent on clerical work (e.g., documentation, billing,

administration) (Shanafelt et al., 2016). Increased use of electronic records correlates with increased reported exhaustion compared to non-electronic record systems (Shanafelt et al., 2016). Exhaustion related to EHRs is a concerning factor because an increasing amount of hospitals and medical centers use EHRs and CPOEs, and as such, increase workload (e.g., unnecessary required charting and increased rate of errors).

The Institute for Healthcare Improvement's (IHI) *Triple of Aim for Populations*, is an approach towards improving health system performance and consists of improving the patient experience, improving health of populations, and cost reduction (Institute of Healthcare Improvement [IHI], 2019b). The US healthcare industry continues to make changes to improve the quality of care while decreasing per capita cost (IHI, 2019b). Many healthcare system changes, both political and governmental, come with increased work demands and stress among highly specialized advanced practitioners, including CRNAs and anesthesiologists to decrease cost (Del Grosso & Boyd, 2019). Anesthesia providers are pressed for quick turn-over time by institutions and surgeons to decrease costs associated with time not spent in surgery. The stress of completing comprehensive pre-operative exams and interviews quickly leads to added pressure in financially driven healthcare. Often in pre-operative exams and interviews, unexpected concerns arise that cause delays (e.g., inadequate fasting and diagnostics). These delays are largely not taken into consideration when institutions track turn-over time and complete efficiency evaluations. Evaluation based on scores that do not consider such delays result in negative feedback and a skewed reflection of appropriate and due diligent care. Due to the rising stressors among anesthesia providers, it

is critical to determine the level of burnout in this population and implement evidence-based measures to prevent and mitigate stressors that lead to burnout.

Personal factors that contribute to provider burnout include lack of helpful coping mechanisms, poor sleep, over-commitment, perfectionism, negative attitude, self-critical attitude, work-life imbalance, and lack of support system outside of work (Shanafelt, 2009). On the other hand, protective personal factors include being extroverted, conscientious, open-mindedness, and agreeable in nature (Moss et al., 2016). Recent studies suggest that younger healthcare providers have almost twice the risk of stress compared to their older colleagues, even as early as residency training for physicians (Dyrbye et al., 2019). Female providers are also likely to be more at risk of experiencing fatigue compared to men, usually due to work-home conflicts and emotional exhaustion, leading to reduced personal accomplishment (Langbelle, 2010). Burnout is a well-researched topic, but measures to address it are lacking among organizations (Medical Management Association, 2019).

Noteworthy to burnout in anesthesiology is the high level of responsibility and the presence of life-threatening scenarios that increase stress (Sanfilippo et al., 2017). In addition to experiencing stressful situations regularly, the work pattern is perceived as more stressful due to overnight shifts and weekend requirements (Sanfilippo et al., 2017). Notable workplace findings that contribute to professional burnout for CRNAs is incivility and workplace aggression (Boyd & Poghosyan, 2017). Another source of job dissatisfaction is the restriction to the scope of practice and limited autonomy, decreasing the variety of procedures the CRNA can perform at a given site (Mahoney, Lea, Schumann, & Jillson, 2020). Role conflict between CRNAs and anesthesiologists increases occupational stress and decreases job

satisfaction (Boyd & Poghosyan, 2017). Further, as job demands increase for the remaining CRNAs, increased workload will negatively impact patient satisfaction (Mahoney et al., 2020).

Ways to improve job satisfaction include policy changes and organizational changes to decrease conflict, promote professional identities, and encourage collaboration (Gregory, Mensor, & Gregory, 2018; MacKinnon & Murray, 2018; Panagioti, 2016). Additional organizational protective factors against burnout for CRNAs include improving job satisfaction, reduced workload and hours, and personal support (Mahoney et al., 2020). Interventions to minimize occupational stress, work overload, increase job satisfaction, and improve communication are crucial, whether individual or organizational (Boyd & Poghosyan, 2017). Individualized interventions to reduce stress are shown to be affordable, convenient, and effective. Examples of individual interventions include use of mindfulness-based strategies, yoga, deep-breathing exercises, techniques for improving communication and relationships with co-workers and stress reduction (West, Dyrbye, & Shanafelt, 2018; Boyd & Poghosyan, 2017; Spijkerman, Pots, & Bohlmeijer, 2016).

An internationally used assessment tool for measuring burnout among healthcare providers is the Maslach Burnout Inventory (MBI) survey. Christina Maslach, an expert in occupational burnout, established that burnout is a psychological condition consisting of three dimensions: emotional exhaustion; depersonalization; and a decreased sense of personal accomplishment in routine work (Maslach & Jackson, 1981). Among healthcare providers, emotional exhaustion consists of overexertion and depletion of one's own physical and emotional reserves, leading to feeling "drained." These feelings can lead to depersonalization,

which is a disconnected feeling towards patients brought on by negative and unsympathetic responses, and cynicism (Maslach & Jackson, 1981). Decreased personal accomplishment refers to a negative attitude of self-achievement, incompetence, and inefficiency related to one's work (Maslach, Jackson, & Leiter, 1996).

Definition of Terms

This paper addresses concepts that be unfamiliar to the reader. These terms are defined to facilitate understanding:

- Burnout: A psychological syndrome resulting from a long-term response to interpersonal stressors on the job (Maslach & Leiter, 2016).
- Depersonalization: A distant or indifferent attitude towards one's work (Maslach & Jackson, 1981).
- Emotional exhaustion: Feelings of being overwhelmed, used up, and fatigued by the work environment (Maslach & Jackson, 1981).
- Job satisfaction: Pleasurable emotions from the appraisal of one's job as achieving or facilitating the achievement of one's job values (Locke, 1969).
- Mindfulness: Intentional present-moment awareness without judgment.
- Occupational stress: When job-related factors interact with the individual, resulting in a change of the individual's psychological and physiological state (Richardson & Rothstein, 2008)
 - Personal accomplishment: Feelings of competence and achievement in one's work. (Maslach & Leiter, 2016)

- Stress: Psychological or physiological response to environmental and personal stressors. (Anisman & Merali, 1999)
- Stressors: Events or situations that produce stress. (Mayo Foundation for Medical Education and Research, 2021)

Local Problem

Findings report a growing need for physicians and CRNAs in Arizona. Arizona ranks 40 in the US for active primary care physicians and general surgeons per 100,000 of the population (Association of American Medical Colleges, [AAMC] 2019). In Arizona, there are only 73 primary care physicians per 100,000 persons (AAMC, 2019). To maintain current primary care utilization rates to meet the demand of the aging population, population growth, and the number of insured, Arizona will need an additional 1,941 primary care physicians by 2030, which is a 50% increase from 2010 (Robert Graham Center, n.d.). Out of 1,061 anesthesiologists in Arizona, 34.6% of them are over 60 years old, and only 22% are females (AAMC, 2019). It is suspected that the overall employment of advanced practice registered nurses, including CRNAs, is to grow 45% from 2019 to 2029 due to the demand the aging population. Therefore, it is important to the well-being of the nation that APRNs practice to their full extent to accommodate growing need for care (U.S. Bureau of Labor Statistics, 2020). Ways to retain anesthesia providers is to combat the burnout crisis by promoting healthy coping strategies and lifestyles, providing support, and respect for their work during high demands and patient workload.

An example of a local organizational intervention to address physician burnout is Banner University Medical Center in Phoenix opened a wellness center to target physician

burnout (Roberts, 2019). The wellness center allows medical students and residents a convenient place to practice self-care and develop healthy habits early on in their careers to meet the ever-challenging demands of the healthcare setting. The site includes a workout center, yoga studio, kitchen, lounge, showers, quiet rooms, and ping-pong table. Easy access to a place where providers can care for their mental, physical, and emotional health is helpful. Even though other hospitals in Arizona may have similar programs, not all programs are consistent across organizations, and this option may not be financially possible for many institutions. Additionally, organizational interventions and wellness centers should include wellness interventions to all staff at high-risk for stress and burnout, not just geared towards physicians, but this is often not the case at most facilities. The site of the proposed intervention distributes a yearly satisfaction survey to anesthesiologists and CRNAs, but data is unavailable to the public. However, there is a paucity of research on anesthesia provider burnout as a rising problem in the US.

Burnout also leads to financial strain on the healthcare system. When a physician leaves an organization, it can cost up to \$1 million to train and recruit a replacement physician (Moss et al., 2016). Research findings suggest that even modest investments for burnout reduction programs will produce economic value (Han et al., 2019). Other advanced practice nurses, such as CRNAs, are also difficult, expensive, and inconvenient to replace (Mahoney et al., 2020). To address burnout at a local level, it is imperative first to evaluate a baseline level of burnout, intervene using an evidence-based strategy, and evaluate the intervention.

Stakeholders for this quality improvement (QI) project include CRNAs, anesthesiologists, department heads of anesthesia, chief CRNA, hospital administrators,

patients and their families. These stakeholders have a vested interest in their health and careers, the safety of the public, and the organization.

Intended Improvement

The goal of this QI was to evaluate the level of anesthesia provider burnout at a local clinical site, including both CRNAs and anesthesiologists. The MBI was distributed to anesthesia providers to determine a baseline burnout level at Banner University Medical Center in Tucson, Arizona (BUMCT). The MBI was chosen as it is the leading tool for measuring burnout over the past decade and is a validated and reliable tool to measure burnout. (Del Grosso & Boyd, 2019). Several studies support its internal reliability and its three-factor structure (Iwanicki & Scwab, 1981; Gold, 1984). An educational mindfulness intervention was administered to improve coping mechanisms and stress management to aid in burnout prevention and mitigation. Evidence suggests that mindfulness strategies are shown by evidence to improve stress and burnout effectively (Fendel, Burkle, & Goritz, 2019; Farber, 2015; Hozel et al., 2011).

Project Purpose

The purpose of this QI project was to assess the level of burnout among anesthesia care providers at a local site using the MBI survey before and after implementation of an evidence-based mindfulness intervention.

Project Question

How does providing a mindfulness intervention as compared to usual practice affect anesthesia provider burnout levels over a four-week period?

Project Objectives and Specific Aims

A pre-intervention survey was required to determine the baseline level of burnout and assess how burnout levels are affected after the intervention. Four-weeks after the intervention, the post-MBI survey was issued among participants to evaluate how burnout levels have changed. The specific aims of this project are the following:

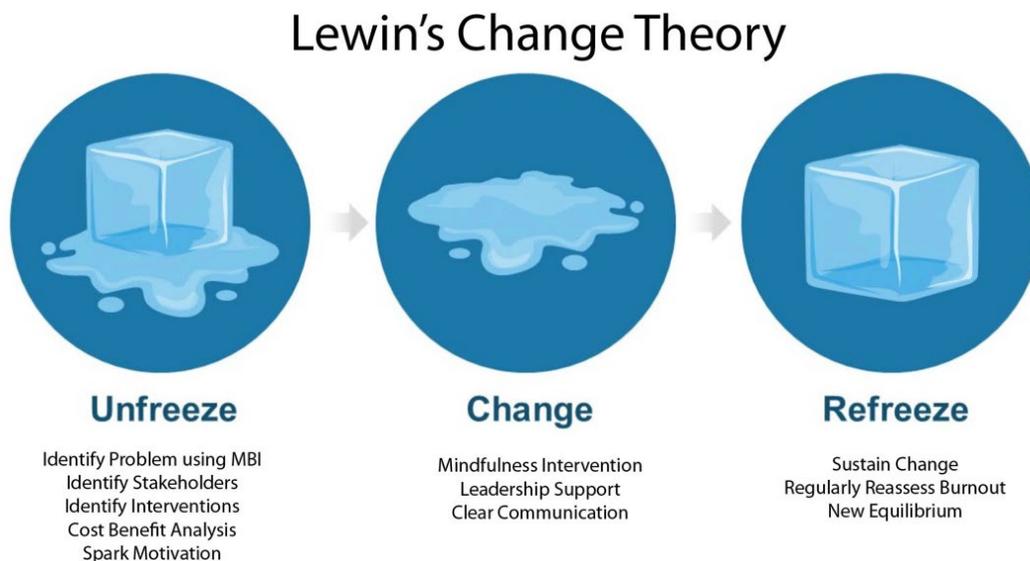
Aim 1: Perform a needs assessment using the MBI scale to determine the level of burnout among anesthesia providers at BUMCT.

Aim 2: Analyze pre- and post-intervention MBI data to determine how an evidence-based mindfulness intervention impacts levels of burnout in anesthesia providers.

Theoretical Framework

Lewin's Change Theory

The theoretical framework to guide this project is Lewin's Change Theory (LCT) and its three-stage model. The application of a conceptual framework serves as a basis of the methodology for the DNP project because it is based on established ideas and research findings and is easily applied to clinical practice. The LCT theoretical framework involves recognition of a need for change, identification of individual factors or forces that affect change, and offers support of proposed evidence-based strategies to promote a successful change. Figure 1 includes an illustration of this theoretical framework personalized to this DNP project.

Figure 1*Lewin's Change Theory*

Adapted from Lewin's Change Model PowerPoint Template. Copyright 2021 by SlideModel. Retrieved from www.slidemodel.com

Tenants of Theory

Kurt Lewin, known as a leader in field theory of behavior, established the force field analysis (FFA) framework in 1951. The FFA is a tool used for identifying factors and forces which influence a situation, specifically in implementing a change in an organization (Lewin, 1951). This concept can also be applied to a specific population, as many forces are present in the implementation of an evidence-based mindfulness intervention. The FFA specifies forces which either help drive movement towards a goal, called driving forces, or forces that act as a restraint and hinder movement towards the desired goal, called restraining forces (Lewin, 1951). Identification of forces is vital in disrupting the equilibrium, to move away from the status quo, and support change. Lewin called this state of stagnancy the quasi-stationary equilibrium. When this is equilibrium shifts, the comfort of staying the same is disturbed (Lewin, 1951). Successful

identification of the driving and restraining forces towards a change makes it possible to understand why individuals and organizations act as they do, and what forces need to either be diminished or strengthened to promote change (Lewin, 1951). The FFA is the foundation of Lewin's three-phase model of planned change, which includes unfreezing, moving, and refreezing.

Application to Project

Literature suggests that burnout levels are rising in anesthesia providers and that currently there is a lack of burnout prevention and mitigation interventions among facilities. Interventions to prevent and alleviate burnout can help prevent and/or reduce negative and devastating consequences of burnout. It is important to evaluate provider burnout at this institution, as there is no publicly available information on burnout levels at this institution and burnout is often overlooked as a reason for turnover. LCT provides a guide for implementing a successful change, by identifying forces to support and restrain change, sparking this change among the key stakeholders, institution, and anesthesia providers, and methodically implementing the intervention to change behavior and status quo.

LCT supports the importance of acknowledging the driving and restraining forces of the proposed change. Driving forces include promotion and knowledge of evidence-based strategies to prevent and mitigate burnout. Strategies include mindfulness-based implementations, including, deep breathing exercises, yoga, and gratitude. Awareness of burnout and interventions to reduce it can improve provider job satisfaction and health, patient safety and outcomes, cost-savings, and short and long-term burnout levels. Examples of restraining forces include lack of knowledge of a need to reduce burnout, negative attitudes related to change, fear of the

unknown, breaking old routines, disruptive routines (e.g., complicated technologies, lack of resources), and inadequate peer and leadership support. Per Lewin, when driving forces are stronger than restraining forces, a change is more likely to occur (Lewin, 1951).

The first stage of change, unfreezing, involves a change agent (e.g., nurse leader) who recognizes a need for change, and mobilizes others to see and desire the necessary change and letting go of old patterns. This process involves a needs assessment to identify areas of improvement between the current and desired stage; in this case, a baseline burnout level is obtained (Shirey, 2013). A critical component of this stage involves creating a sense of urgency to spark stakeholder and staff motivation and psychological safety to go beyond the status quo. Unfreezing addresses the FFA framework by pinpointing specific forces that will either help create or work against change (Lewin, 1997). The inclusion of a cost-benefit analysis will support the efforts of this project and create incentive, interest, and inspiration among stakeholders to help drive change. Awareness of potential health and staff satisfaction benefits and improved patient safety will also strengthen driving forces. Evidence that disconfirms old beliefs that resist change will strengthen the driving forces of change (Schein, 1996). As such, promoting awareness that burnout is a potential threat to the health of anesthesia providers and patients will help to mobilize change.

The second stage is the transitioning period, during which the mindfulness educational intervention takes place, and individuals react to the intervention. The promotion and education of an evidenced-based mindfulness intervention to improve burnout involves restraining forces, as does any change from equilibrium. The previously described restraining forces will decrease and driving forces will increase by providing awareness, education, and support. These forces

will improve knowledge, reduce fear of change, decrease learning anxiety, and promote positive attitudes towards change. Education also includes how this intervention improves the health of providers and safety for their patients, and the potential ill effects of no change. This stage requires the previous unfreezing stage, as individuals are then able to move towards a new routine, and eventually a new culture (Lewin, 1997). Uncertainty can set in in this stage, requiring clear communication among leaders to help overcome the fear of change, help individuals to adjust, and to help others avoid losing sight of the new goal and the needed improvement (Shirey, 2013). Specifically, for stakeholders and those who have a financial interest, it is important to remind management of the long-term financial gains that result from improved retention rates and better patient care resulting from this change.

The last stage, refreezing, requires embedding the new intervention into the system. This change involves changing routines, practices, and culture (Shirey, 2013). Nurse leaders strive to create long-lasting change by continuously facilitating stronger driving forces and counteracting barrier forces that hinder change. For refreezing to successfully occur, the new behavior must be congruent with the new environment, therefore intervening on groups, versus individuals, about the vision and need for change, helps create a culture of the new normal (Kotter, 2007). Groups are more likely to adapt to change when actively involved in decision-making and teamwork (Schein, 1996). Eventually, a new equilibrium is the new normal, which effortlessly resists further change. This stage is vital for sustainability over time (Lewin, 1997). Long-term reassessment is important to determine the sustainment of continued goals and if further interventions are necessary in the future.

A change is necessary among institutions and providers to utilize best evidence-based strategies to prevent and mitigate burnout among anesthesia providers. Attitudes and behaviors greatly affect change, and it is important to understand the values and experiences of the populations affected, mainly the stakeholders, and provide an evidence-based intervention specific to anesthesia providers. Application of an evidenced-based intervention through utilizing an established theoretical framework supports these interventions, helps to identify the forces for and against change, and overall improve its rate of success. By analyzing these forces, promoting a change and decisions towards change become more powerful.

Literature Synthesis

A thorough literature search provides a comprehensive overview of the research completed on this topic. The student used four primary databases to search the clinical topic, PubMed, Embase, Cumulative Index of Nursing (CINAHL), and Google Scholar. The search included studies completed within the past five years, high levels of evidence, such as, systematic reviews, meta-analyses, randomized control trials (RCTs), and manuscripts written in English. References within those studies were reviewed to obtain original primary sources, independent of publication date. Keywords and search terms included in the literature search were certified registered nurse anesthetist, CRNA, anesthesiologist, physician, burnout, stress, safety, prevention, interventions, mindfulness, health care, job satisfaction, risk assessment, survey, questionnaire, psychologic, turnover, MBI, dissatisfaction, well-being, suicide, organizational change, healthcare, and dissatisfaction. A total of 45 selected articles out of approximately 120 were reviewed on this topic and were chosen based on the criteria above. Appendix F is a summary of the findings of each study and support for this project.

Themes

Research shows that burnout among anesthesia providers is a growing problem (Del Grosso & Boyd, 2019; Shanafelt et al., 2015). Research also shows that lack of interventions to prevent and mitigate burnout leads to depression, fatigue, poor health among providers, suicidal ideation, absenteeism, increased turnover, increased medical errors, and financial strain on healthcare institutions (Chiron, Michinov, Olivier-Chiron, Laffon, & Rusch, 2010; Del Grosso & Boyd, 2019; Hyman et al., 2017; Melnyk, 2020; Metlaine et al., 2018; Salyers et al., 2017; Tawfik et al., 2018). Studies show that awareness of burnout, and interventions geared towards preventing and reducing burnout make a positive difference in the health and wellness of providers and better outcomes for patients and organizations (Maslach & Leiter, 2016; Salyers et al., 2017). Therefore, it is imperative to find ways to improve anesthesia provider well-being for both themselves and patients. Tangible and intangible common themes were identified among the articles and are described below, further supporting validity of the research.

Organizational and Structural Factors

One of the most common themes in the literature is the need for organizational changes to improve job satisfaction. Healthy work environments correlate with improved retention rates, job satisfaction, and improved patient outcomes (Montgomery, Panagopoulou, Esmail, Richards, & Maslach, 2019). Some organizational factors that compound burnout are inadequate work-flow systems, a significant increase in non-value-added work, production pressure, and increased use of complicated technology, including complex electronic health records (EHRs) (Melnick et al., 2019; Sikka, Morath, & Leape, 2015). The pressures of decreasing reimbursement and

increasing demanding tasks can hinder the quality of care and time spent on the provider-patient relationship (Del Grosso & Boyd, 2019; Sikka et al., 2015).

Another independent factor of burnout is insufficient time for professional development. Several studies showed that lack of involvement in decision-making and a low sense of control in the work environment contribute to burnout for healthcare providers. Improvements in the healthcare system to prevent burnout will improve professional well-being (Gregory, Menser, & Gregory, 2018; Olson et al., 2019). The goals of the triple aim of healthcare, which include improving individualized care, improving the health of populations, and reducing cost, does not include the provider's well-being (Gregory et al., 2018).

Personal Factors

Even though occupational stress is unavoidable in the healthcare industry, using appropriate coping strategies can help increase motivation to face challenging situations (Del Grosso & Boyd, 2019). Coping strategies, such as mindfulness-based stress reduction and self-care, are protective against burnout (Golub & Johns, 2018; West, Dyrbye, & Shanafelt, 2018). Burnout can lead to unprofessional behavior, worsening the cycle of burnout if personal interventions are omitted (Dyrbye et al., 2019). Another personal factor is aligning values with those of the organization when the two are aligned, engagement, and job satisfaction rise. The disconnection between values can lead to burnout. Struggles with work-life balance are also commonly seen as a correlation to burnout (Shanafelt et al., 2015). Better alignment between work schedule and personal life needs can correct this potential risk to burnout. There is also associated increased levels of burnout in younger providers and those with children (Sanfilippo et al., 2017).

Meaning and Purpose in Work

Studies show that when providers perceive their work as meaningful, they feel an intrinsic reward for putting out good work. The sense of the importance of work lends itself to feel accomplishment and meaning in contributions to work (Sikka et al., 2015). While healthcare providers must act in the best interest of patients, providers can become burned out by the increasing demands of the job. With increasing job demands, including administrative work, sophisticated technology, time-consuming electronic health recording, and urgency to rush through patient care, the meaning behind the work dampens, mainly due to less time spent with patients. Absence of joy and meaning also comes from threats of psychological and physical harm in the work environment, such as lack of respect, bullying, assault, and physical work-related injury (Sikka et al., 2015). Protective factors against burnout include providers who feel mastery over their work, feel respected by peers, receive intrinsic and extrinsic rewards, such as meaning in work and professional recognition, and practice strategies to increase coping mechanisms, such as mindfulness-based strategies (Renger, Miche, & Casini, 2019).

Healthy Professional Relationships and Support

Healthy interpersonal relationships with colleagues directly combat stress by providing social support and teamwork necessary to promote resilience. Destructive and unhealthy relationships in and outside work are a source of stress that intensifies burnout. Improving civility and respectful social encounters in the workplace can lead to a reduction in burnout. The literature recommends that a greater emphasis on healthy social dynamics of the healthcare team during academic and supervised practice help newer clinicians navigate and recover from negative interactions faced in their new career (Maslach & Leiter, 2017). Increased support for

clinical work also reduces burnout (West et al., 2018). Teamwork and healthy work environments are fostered by interventions that help to cultivate a culture of gratitude and positivity (Tawfik, Sexton, Adair, Kaplan, & Profit, 2017).

Mindfulness-based Interventions

An evidenced-based solution that addresses the common themes of burnout is the inclusion of mindfulness strategies and techniques to reduce levels of stress that leads to burnout. An increasing number of studies show that mindfulness-based interventions (MBIs), including deep-breathing exercises, expressing gratitude, meditation, and pausing, improve personal coping strategies by promoting awareness in the present moment (Fendel, Burkle, & Goritz, 2019). Although the mechanism is not fully known, the benefits of mindfulness have been shown in research in many populations, including in participants of stressful healthcare occupations and healthy populations (Kang et al., 2019). MBIs are especially helpful in busy healthcare settings due to their flexibility of usage (Kang et al., 2019). Mindfulness in the workplace can also help improve healthy work relationships and promote healthy work environments by promoting awareness of self and others, and fostering resilience (Aggarwal, Deutsch, Medina, & Kothari, 2017; Kang et al., 2019).

Providing education of the use of MBIs to physicians and CRNAs for use on-the-job and outside of work is highly recommended; MBIs correlate with stress reduction and increase job satisfaction and meaning in one's work (Gauthier, Meyer, Grefe, & Gold, 2015; Ireland et al., 2017). A meta-analysis of online MBIs interventions to improve burnout suggests that MBIs are promising for addressing mental health concerns related to stress, especially due to its ease of accessibility and low cost (Spijkerman, Pots, & Bohlmeijer, 2016). Expressing gratitude

improves meaning and joy in work. These strategies are low-cost, practical, effective, and applicable to anyone experiencing stressors on the job and in their personal lives.

Strengths of Evidence

Most research on burnout uses the same standardized, well-characterized MBI survey (Chiron et al., 2010). For this reason, the MBI survey was chosen as the assessment tool for this project. Different groups are comparable because of the use of this survey, such as comparing burnout studies done on anesthesiologists compared to CRNAs, as well as comparing burnout studies done on other types of healthcare providers. Articles contain both individual and system-wide interventions to mitigate burnout. Interventions are similar in other countries, and may be considered in the US. Another strength is the large number of high-level evidence studies, represented by systematic, meta-analysis studies, and randomized controlled trials (RCTs), included in Appendix F.

Weaknesses of Evidence

There were several weaknesses among these studies. Most of the reviewed studies include a small population size and one site in a single location; therefore, potential problems with anonymity and confidentiality may skew data. Small studies and participation rates can also falsely magnify the impact of the intervention. Also, there are a limited number of prospective trials to evaluate the efficacy of the interventions adequately. Overall, the great majority of anesthesia-related burnout research is on physicians. There is a need for more burnout research in anesthesiology as it is one of the most stressful medical disciplines (Sanfilippo et al., 2017).

Research on CRNA burnout in the US is severely lacking. Only three articles identified on CRNA burnout; most conclusions regarding CRNA burnout are based on the CRNA

equivalent research from other countries (Del Grosso & Boyd, 2019). Interventions done in other countries may not have the same outcome as they would in the US and may affect generalizability. Similarly, studies use different types of OR environments, which may alter specific organizational-type stressors. For example, there are the anesthesia care team (ACT) models (a physician anesthesiologist oversees one or more CRNAs), independent CRNA model, all physician model, and the combined physician and CRNA model.

Gaps and Limitations

A significant gap in research is that research done on CRNA burnout is very limited, especially in the US, and more research is recommended in this population (Del Grosso & Boyd, 2019). A number of studies show that personal and individual interventions do not show the same long-term results as organizational changes. However, many studies support that the regular use of mindfulness interventions yield long-term benefits related to stress and burnout. Retrospective studies also contain potential bias among participants, which threatens trustworthiness and validity of data. Overall, research supports the assessment of burnout among these populations and the application of mindfulness-based interventions as a cost-effective, meaningful way to mitigate burnout (West, Dyrbye, Erwin, & Shanafelt, 2016)

METHODS

This DNP project was intended to measure the level of burnout by analyzing the results of a pre- and post-intervention MBI survey after implementing a four-week educational mindfulness intervention aimed at decreasing stress. The description of the specific methods of this DNP project is detailed below.

Project Design

The project design for this doctoral project is a quality improvement (QI) project. The project includes the collection of quantitative pre-intervention survey data and post-intervention survey data utilizing the MBI burnout survey to determine levels of burnout before and after an educational mindfulness intervention. For each of the 22 statements in the survey, the participant selected a frequency of each statement via a Likert scale a number from 0 to 6. The score of '0' meaning never, '1' meaning a few times a year or less, '2' meaning once a month or less, '3' meaning a few times a month, '4' meaning once a week, '5' meaning a few times a week, and '6' meaning every day. The scores are calculated using the MBI survey scoring guide. Each of the three dimensions of burnout was calculated collectively.

Model for Implementation

The Institute for Healthcare Improvement's (IHI) *Model for Improvement*, the plan-do-study-act (PDSA) model is utilized to provide structure for the implementation process, see the illustration (Figure 2). The PSDA model helps to appropriately implement and evaluate quality improvements in a variety of settings (Langley, Moen, Nolan, & Nolan, 2009). Before beginning the four-stages, the answers to three questions are considered; what is to be accomplished, how will we know a change is an improvement, and what change can be made to result in an improvement (Model for Improvement, 2019a). The goal of the project was to evaluate how burnout level is affected after a mindfulness-based intervention implementation. The MBI survey results were intended to show how the intervention affected burnout levels. The specific change is using mindfulness strategies in practice compared to usual practice.

The first stage (plan) is to identify a problem and make a specific action on how to improve this problem. Anesthesia provider burnout is a problem across the US and internationally, with growing stresses and complexities of healthcare. The importance of burnout prevention and mitigation interventions shows to have a positive impact on burnout levels of providers. Evidence-based research shows that mindfulness-based interventions improve stress, which can reduce burnout. All improvements require change, therefore developing, testing, and implementing changes is imperative for making improvements (Model for Improvement, 2019a). The plan was to implement this project at a level one trauma center in Tucson, Arizona via an online format. The goal was to evaluate how the implementation of a mindfulness intervention impacts burnout levels of anesthesia providers.

Figure 2

Model for Implementation



The second stage (do) consists of implementing the intervention, pre- and post-intervention data collection, and documentation of observations. Implementation includes the distribution of the MBI burnout assessment survey to the participants to evaluate the level of provider burnout before the mindfulness intervention. This phase also includes dissemination of the educational mindfulness Microsoft PowerPoint and supplemental handout. During a four-week period, participants were to use what they learned and apply mindfulness strategies to practice. After the four weeks, the same MBI survey was distributed to the participants to evaluate post-intervention burnout scores. A projected timeline helped guide the process. Pre-implementation and post-implementation survey data was collected electronically via Qualtrics at the convenience of each participant's schedule to increase the participation rate. Any problems and concerns during the implementation period were noted.

The third stage (study) included studying and evaluating the pre- and post- intervention data to number of participants, level of burnout before and after intervention, and determine how the mindfulness intervention affected burnout levels.

The last stage (act) included the distribution of results and evaluation of ways to increase the effectiveness of this project in the future. The results of this project were formally presented online to providers, stakeholders, and those of interest. The PSDA cycles are used to test change on a small scale first to look for an improvement; once an improvement is found, they can be gradually incorporated to larger samples (Model for Improvement, 2019a).

Setting and Stakeholders

The site of this project is Banner University Medical Center (BUMC) in Tucson, Arizona. There are two locations in Tucson; this project was implemented at both sites, main and

south, to increase participation rates. This organization is a private, non-profit, approximately 480-bed acute-care hospital in Southern Arizona. This location in Tucson is a teaching hospital and level-one trauma center, with approximately 40 operating and procedure rooms between both campuses. Surgeries include trauma, neurosurgical, cardiothoracic, transplantation, vascular, obstetrics, pediatrics, gastrointestinal, and ambulatory. There are approximately 40 anesthesia providers, which includes nurse anesthetists as well as clinical faculty of the anesthesiology department of the University of Arizona. Due to the restrictions placed upon the institution during the COVID-19 pandemic, this implementation was done solely online and asynchronously via the participants work email for ease of convenience. The email was sent anonymously through an email database.

Stakeholders include anesthesiologists and CRNAs as they have a vested interest in the health and safety of themselves and their patients. The department heads of anesthesia and hospital administrators are stakeholders as they have a vested interest in health and safety and financial interest in the organization. Studies show that burnout leads to expenses related to medical errors, absences, and costs related to replacing providers due to poor retention, high turnover, and early retirement. Lastly, patients and their families are stakeholders because they place trust in their providers to give them safe, vigilant, affordable healthcare.

Planning the Intervention

The intervention consists of two parts, a burnout survey to determine level of provider burnout, and education on mindfulness using a PowerPoint and handout supplement. The PowerPoint includes what mindfulness is, the impact of practicing mindfulness on stress, the importance of stress reduction, and simple, convenient ways to apply mindfulness on the job.

The purpose of the PowerPoint and supplemental handout is to increase awareness on mindfulness and its effect on stress reduction, and how mindfulness techniques can be applied to everyday practice. The presentation was delivered online and viewed asynchronously to improve participation rates and delivered conveniently via a Listserv to enforce anonymity. The mindfulness supplemental handout includes 10 convenient ways to include mindfulness strategies in the healthcare environment and is provided.

The participants were educated on mindfulness strategies to use in practice over a period of four weeks. The selection of an educational PowerPoint and supplemental handout is to provide a convenient, cost-effective, practical, and simple medium that is easily accessible to the participants. All education and instructions were provided in the recruitment email. Contact information was provided to participants. Details and step-by-step planning and timeline of the plan are included in a later section of this paper and are abbreviated in Appendix E.

Participants and Recruitment

The participants are anesthesia providers, both anesthesiologists and CRNAs, who currently work in the perioperative setting. A total of 78 providers (49 per diem & full-time anesthesiologists, & 29 CRNAs) were in the email database used by the secretary of the Department of Anesthesiology. Both anesthesiologists and CRNAs were included to improve participation rates. According to research, both are at high risk for burnout and may have an interest in participating in this project. The number of anesthesia providers is relatively low compared to the total number of employees at the institution, the student is anticipating a sample size of approximately 20 participants. Due to the small population of anesthesia providers, it is the decision of the student to not collect any demographic information. The purpose of this

project is to assess the effect of the mindfulness intervention on burnout; however, it is critical to gather the most accurate assessment of burnout possible. Demographic data will not be collected given a small target sample size, collecting specific demographic data could result in participant identification. To receive the most honest burnout score and secure anonymity, it is important not to collect any data that might breach their privacy.

The inclusion criteria include anesthesiologists and CRNAs at Banner in Tucson, Arizona. Exclusion criteria include incomplete or non-return of all project materials. A recruitment email will be sent to all potential participants (Appendix B). An electronic disclosure statement will be included in the pre-intervention survey, indicating that completion of the survey implies informed consent. Stakeholders, including chief CRNA and department head of anesthesiology, will be aware of the project to help improve participation rates.

Consent and Ethical Considerations

Ethical issues to consider are safety, beneficence, respect, and full disclosure (Polit, 2017). There was no identifiable demographic or protected medical information (PMI) collected. As the student and project lead, it is essential to note that anesthesia providers are entitled to protection and confidentiality. Protection includes that the purpose of this DNP project be fully explained with full disclosure, and informed consent is obtained without influence or coercion. An electronic disclosure statement was included in the survey indicating there was implied consent after completion of the survey. The data collected was used for the intention of this DNP project. Ethically, the student honors all agreements made with the participants. Additionally, it was explained to participants of the right to refuse, the role of the student, as well as disclosure of the risks and benefits of participation.

Each participant was assigned a unique identifier through Qualtrics to pair the pre-intervention survey results to the post-intervention survey results. This data was kept on a password-protected personal computer in a locked office of the student. Risks include that this population is potentially vulnerable if survey data is linked to their name, reinforcing strict anonymity and data protection. The only person to have access to this data will be the student, and the data will be presented as a pooled population, and no individual results will be disclosed.

After the proposal was defended and approved, the Determination of Human Subjects form was completed before implementation. Institutional Review Board (IRB) from both Banner and the university (Appendix A) approved the project and data collection began. After the successful completion and conclusion of this DNP project, the remaining data will only be located in the College of Nursing password-protected cloud.

Benefits for providers, department heads, and hospital administrators are a potential improvement in the health of providers and staff, and additional potential benefits include increased safety for patients, reduced medical errors, improved health, and job satisfaction. Potential benefits for participants include enhancing the personal growth, knowledge, and stress reduction. Furthermore, the data collected may contribute towards the development of hospital-wide interventions to reduce and prevent burnout, as well as expand knowledge of the medical community. There is no risk to this intervention. Though an inconvenience to this intervention is filling out a before and after survey, the survey should only take about ten minutes to complete.

Timeline

Appendix E provides an anticipated timeline for completion of this project. Approval to legally use the online MBI for *Human Services Survey for Medical Personnel* tool was gained by

the student after purchase (Appendix G) via the *Mind Garden* website, which owns the copyright to this tool. Following successful DNP project proposal defense to the DNP committee, the project was submitted to Banner's evidence-based practice (EBP) committee to review the proposed project. Banner approved the project, and the proposal sent to the appropriate IRB. After IRB approval, facility approval, and project chair permission, the implementation process began. A recruitment email (Appendix B) was submitted to all anesthesia provider staff at BUMC main and south campuses asking for anesthesia providers to participate in a mindfulness intervention QIP. This recruitment email was approved by Banner Health leadership. A summary of the goals of this project were included. This email included the pre-intervention MBI survey (Appendix C) link to be completed online. The start date of implementation was October 22, 2020. The initial email with the pre-intervention survey, educational Microsoft PowerPoint, and supplemental handout (Appendix D) was sent out on this date.

Each participant's survey results were automatically and electronically transfer to Qualtrics for data collection. After the pre-intervention data collection and educational implementation, four-weeks was given for participants to utilize and practice the mindfulness-based stress reduction techniques. Four weeks after the intervention period was completed, a second email (Appendix F) was provided to all anesthesia providers on November 19, 2020 to allow for appropriate utilization of technique and adequate response time for the survey. The second email included the online post-intervention MBI survey link and was distributed to the same contact list of providers to maintain anonymity. The survey data was electronically and automatically transferred to Qualtrics, similar to the pre-intervention data, however there was no data for the second survey. Reminder emails to complete survey were sent one and two weeks

after initial emails. After the collection period was concluded on December 18th, 2020, the data was analyzed to determine if the burnout level decreased, specifically the emotional exhaustion component of the MBI survey, which deals with stress and working with others. However, due to zero participation in the follow-up survey, student unable to determine if intervention effected burnout levels. The post-intervention survey was available for four weeks. The results were synthesized and analyzed in January 2021.

Data Collection

It is critical to determine the level of burnout by the use of a validated scale before an intervention. The scale is designed specifically for the human services professions. The MBI scale consists of 22 statements that the surveyors will rate via a Likert scale, which assesses the three dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment (Maslach & Jackson, 1981). The data was collected using the data collection cloud-based software Qualtrics. Participants received a hyperlink in the initial pre-intervention emails that took them directly to the pre-intervention MBI survey. Data was collected similarly for the post-intervention data, through a hyperlink using Qualtrics as the data-collection and management platform. The data is only accessible by the student, and an automatic unique identifier was used to pair the data anonymously. Storage of this data will was through Qualtrics and transferred to an Excel sheet on the student's personal password-protected computer in a secured office. The data will be stored for six years at the University of Arizona's College of Nursing following the conclusion of the project. The online, electronic nature of this tool was chosen to promote anonymity, honesty of answers, and increase participation rates by allowing

participants to complete the tool and utilize the educational pamphlet anytime and anywhere, at their convenience.

Data Analysis

Data on survey results were collected and imported to a Microsoft Excel spreadsheet. The results of the surveys were evaluated for the level of burnout using the scoring guidelines included in the MBI survey (Appendix C), which uses a Likert scale (Maslach, Jackson, & Leiter, 1996). Initial MBI surveys is presented as pre- and post-individual and aggregate scores, as well as each of the three sub-sections, emotional exhaustion, depersonalization, and personal accomplishment. The Maslach Burnout Inventory (MBI) reports that the power of statistical analysis is heightened when using the numerical score, versus comparing the categorical level (Maslach, Jackson, & Leiter, 1996). Data is presented as a mean plus or minus standard deviation, median, and range of results. Each of the three categories of the MBI results was to be compared using a paired sample t-test. A paired sample t-test was chosen as it is useful for comparing two sets of data (before & after) for each participant. These differences were to be analyzed, however due to insufficient follow-up data a t-test was not done.

Regarding scientific rigor, there is little potential for selection bias as this survey was sent to all anesthesia providers at both sites of the same organization. The same recruitment method took place at both locations. However, there was a potential for response bias; this is why it was essential to keep the surveys anonymous and without demographic data, as the sample size was likely to be small. If providers felt that they would be identified, they may not answer honestly. Additionally, if there is a small sample size, this could decrease power and reduce the ability to detect an effect within the study even if there is an effect (Polit, 2017). Some other challenges to

scientific rigor, include temporal ambiguity. Hawthorne effect may cause participants to choose an answer they want others to see because of fear of breach of confidentiality. As changes may occur just before and during project history bias may also exist. There may be other reasons that degrees of the burnout levels change outside of the mindfulness intervention; there is no way to pinpoint that this intervention was the sole result of improved burnout. Another threat to internal validity is maturation, in which the providers increased knowledge or experience over time may affect scores outside of this intervention (Polit, 2017).

RESULTS

Outcomes

Four participants submitted the pre-intervention survey completely, however no participants completed the post-intervention survey. No difficulties were noted during the collection period. No outcome regarding the effectiveness of this brief mindfulness intervention could be determined because no one participated in the second survey.

Of the 78 potential subjects recruited to participate in this project, 4 providers completed the pre-intervention survey (approximately 5% participation rate). The results of the pre-intervention MBI surveys are summarized in Table 1. The three dimensions of burnout, emotional exhaustion, depersonalization, and personal accomplishment subscales were also analyzed (Table 2).

Table 1*Results*

	Average	Standard Deviation	Median
I feel emotionally drained from my work	2.0	1.4	2.5
I feel used up by the end of the workday.	2.8	1.7	2.5
I feel fatigued when I get up in the morning and have to face another day on the job.	2.5	1.9	2.0
I can easily understand how my patients feel about things.	4.8	0.5	5.0
I feel I treat some patients as if they were impersonal objects.	0.0	0.0	0.0
Working with people all day is a real strain for me.	0.3	0.5	0.0
I deal very effectively with the problems of my patients.	4.8	1.3	5.0
I feel burned out from my work.	1.8	1.5	2.0
I feel I am positively influencing other people's lives through my work.	5.5	0.6	5.5
I've become more callous since I took this job.	0.3	0.5	0.0
I worry that this job is hardening me emotionally.	0.5	1.0	0.0
I feel very energetic.	4.0	2.0	5.0
I feel frustrated by my job.	1.8	2.1	1.5
I feel I am working too hard on my job.	1.5	1.3	1.5
I don't really care what happens to some patients.	0.0	0.0	0.0
Working with people directly puts too much stress on me.	0.0	0.0	0.0
I can easily create a relaxed atmosphere with my patients.	5.3	0.5	5.0
I feel exhilarated after working closely with my patients.	4.3	1.0	4.5
I have accomplished many worthwhile things in this job.	4.3	2.2	5.0
I feel like I'm at the end of my rope.	1.0	1.4	0.5
In my work, I deal with emotional problems very calmly.	4.3	1.0	4.5
I feel my patients blame me for some of their problems.	0.5	0.6	0.5

DISCUSSION

Summary

Due to insufficient data no conclusions can be made about the effectiveness of this mindfulness intervention. The lack of participation highlights the difficulties in accurately assessing provider burnout. The initial participation rate was 5%. This is unlikely to be a representative sample of the anesthesia providers in this entire group. Prior to evaluating any intervention, the problem must be accurately assessed. Future participation may be improved by using an in-person venue to distribute the survey and intervention, providing incentives to participate, greater encouragement among leadership to participate in this type of study, and studying a group of providers at an outside institution to ensure anonymity.

Interpretation

Results demonstrate that low levels of burnout exist among this small group of participants. For emotional exhaustion (EE), the average pooled total score was 13.8, which is interpreted as a low level of burnout. The cutoff for low level of EE is 0-18, moderate is 19-26, and high is ≥ 27 . For depersonalization (DP), the average pooled total score was 0.8 indicating a low level of burnout. The cutoff for low level of DP is 0-5, moderate is 6-9, and high is ≥ 10 . For personal accomplishment (PA), the average pooled total score was 32.8, which was considered high, but just making cutoff. The cutoff for high PA is 0-33, moderate is 34-39, and low is ≥ 40 . Although the averages show low burnout, some levels of moderate and high levels of burnout may exist on an individual basis. The subscale of PA showed the highest levels of burnout in this group. Due to the very low number of participants, it cannot be generalized to this organization or provide any meaningful data for other institutions. Participants with burnout are less likely to

fill out a burnout survey. Although results from the four providers provided a baseline assessment of burnout, the mindfulness intervention was not analyzed due to no post-intervention survey submissions.

Table 2

Three Dimensions of Burnout Subscales

Subscales	Average	Standard Deviation	Median
Emotional Exhaustion	13.8	10.4	12.0
Depersonalization	0.8	1.0	0.5
Personal Accomplishment	32.8	7.4	35.5

Implications

Interventions to assess, prevent, and mitigate burnout are necessary now more than ever, during increased times of stress, depression, anxiety, insomnia, increased suicidal ideation and early retirement of healthcare providers as a result of the pandemic (Zhang et al., 2020; Shanfelt, Ripp, & Trockel, 2020). Burnout existed before the pandemic and stressors have only increased since this novel virus effected healthcare and our entire world. Anesthesia providers specifically have had increased stress due to changes to their duties since the pandemic. Many anesthesia providers went from working in the operating room to treating COVID patients in intensive care units, using their expertise on intubation, ventilator/respiratory management, and resuscitation for end-organ failure. The limited personal protective equipment (PPE) has also increased stress due to fear of contracting the virus and spreading it to their families. Anesthesia providers are now frequently and increasingly exposed to the airborne virus, and because of this some have been separated from their families, and many have acquired the virus. Cancellation of elective

surgeries has decreased volume of cases by almost 50%, causing a huge financial hit (ASA, 2020).

Offering support during this increased time of stress, fear, and anxiety, including wellness interventions, psychological/psychiatric help, and institutional help with childcare due to school closures, offering anesthesia providers to rank preference for sites/schedule/hours to allow for flexibility, and providing adequate access to PPE and regular screening and testing for COVID is recommended (Almeida & DeCavalcante, 2021). Studies on anesthesiology and critical care provider burnout during the COVID-19 pandemic, show increased anxiety and fear among providers increased their rates of emotional exhaustion and likely effect performance (Fleisher et al., 2020). Interventions that acknowledge burnout, promotion of physical and mental health, showing support, improving communication, and appreciation among leaders for frontline providers, like anesthesia providers, are recommended (Fleisher et al., 2020).

Unfortunately poor participant follow-up limited the ability to evaluate the intervention used in this project. Although limited participation may highlight a problem with provider burnout, it is also important to understand the factors resulting in the low levels of burnout measured in the providers that initially participated. Strategies to increase participation in this type of study are necessary to evaluate the impact of burnout on anesthesia providers and design interventions to mitigate the problem.

Limitations

The overwhelming limitation to my project is that there was no participation in the follow-up survey. This could be due to many factors. Project participation was voluntary leaving little incentive for people to spend time completing the survey. The student was also unable to

attend any in person venue, such weekly as conference, to promote the importance of this survey due to physical limitations from the COVID-19 pandemic. For this reason the survey and intervention were entirely administered online, which may have also effected participation. During implementation to this quality improvement project, the student completing the project was on an away clinical rotation, limiting the ability to encourage participation among providers. Another reason for possible lack of participation was little encouragement from leadership to have providers participate. This is understandable as the project administered a burnout survey, not a work fulfillment survey. The negative sounding connotation of the primary assessment tool may be discouraging to management and using an assessment that sounded positive may change perception of the project. Due to the sensitive nature of many questions in the MBI survey, many volunteers may not have participated due to fear of breach of confidentiality and retaliation. This was addressed in the current project by keeping survey results anonymous and not collecting demographic data that could identify participants in the small group being studied. Finally, studies show that lack of understanding of study benefits could be a reason for lack of participation (Syanzila, Michelo, & Mweemba, 2013).

DNP Essentials Addressed

The American Association of Colleges of Nursing (AACN) published *Essentials of Doctoral Education for Advanced Practice Nursing* in 2006 to address the multifaceted needs of modern-day healthcare system (AACN, 2006). In accordance with the completion of this the DNP project, the essentials addressed in this project are as follows. *DNP Essential I, Scientific Underpinnings for Practice, DNP Essential II, Organizational and Systems Leadership for Quality Improvement and Systems Thinking, and DNP Essential VIII, Advanced Nursing*

Practice are addressed by researching and finding a significant current and future need within the nurse anesthesia specialty, formulating an intervention, and evaluating results of the project. Nurse theories are used as a guide for the project timeline and progression of implementation. Student analyzes cost-effectiveness of the project and demonstrated sensitivity to populations, including providers.

DNP Essential III, Clinical Scholarship and Analytical Methods for Evidenced-Based Practice, DNP Essential IV, Information Systems/Technology for the Improvement and Transformation of Health Care, and DNP Essential V, Health Care Policy for Advocacy of Health Care are addressed through appraisal of literature to implement evidence-based intervention, use of information technology to identify gaps in practice and generate evidence, education of patient care outcomes, and dissemination of findings. *DNP Essential VI, Interprofessional Collaboration for Improving Patient and Population Health Outcomes* through effective communication with interprofessional and intraprofessional leaders to determine an appropriate intervention. *DNP Essential VII, Clinical Prevention and Population Health for Improving the Nation's Health* is met by analyzing data for a specific population and evaluating strategies to improve occupational and community health.

Conclusions

Burnout among anesthesia providers is a problem across the nation according to research. More research is needed to determine cost-effective strategies to decrease burnout. Strategies such as mindfulness-based interventions had been shown to decrease stress, and in the long-term have good health benefits among healthcare providers. QI projects that address burnout are important because they have the ability to make change. Due to lack of participation, no

conclusions can be made about this intervention, but studies show that these interventions do make a difference in health care personnel. It is suggested that this DNP project be repeated or altered to improve participation in the future to determine if an intervention like this can be a convenient, affordable way to reduce stress and help mitigate and prevent burnout in this population.

Plan for Sustainability

The subject of burnout is important and should not be ignored. It is recommended that this intervention, or one similar, be carried out in the future and determine if participation is increased by the previously suggested recommendations, such as a project promoted and disseminated in person and/or providing incentives to participants and physical reminders to participate. Burnout is an ongoing problem, and effective ways to prevent it should be supported by institutions for the long-run, through providing on-going awareness, support, free, accessible ways to support well-being.

Plan for Dissemination

The findings will be formally presented during a final presentation of committee members and to those of interest. A copy of the findings will be presented to the institution. A final project poster will be publicly presented.

Funding

The student applied for and was approved for remote online instrument use of the MBI survey tool purchased by the student. This allowed for temporary use of the tool for this project for up to 50 participants. The cost of the tool was \$100.00 with a student discount. Due to the online nature of the tool, there were no other expenses to complete this project.

APPENDIX A:

BANNER EMAIL SITE APPROVAL / MASLACH BURNOUT INVENTORY PERMISSION /
BANNER IRB AND UA IRB AUTHORIZATION LETTERS

Support for DNP Project Inbox x

Arzouman, Jill Jill.Arzouman@bannerhealth.com via bannerhealth.onmicrosoft.com
to me ▾

Oct 7, 2019, 1:48 PM ☆ ↶ ⋮

Hi Jamie,

As per our discussion on Friday 10/4 and again today 10/7, I am supportive of you moving forward with your DNP capstone project on provider burnout in the department of Anesthesia at BUMCT and BUMCS. I look forward to reviewing your proposal after it is developed.

Sincerely,

Jill

Jill Arzouman, DNP,RN,ACNS,BC,CMSRN
Director of Professional Practice
Banner-University Medical Center-South and Tucson Campuses
520-694-6026



We exist to make a difference in people's lives through excellent patient care

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Maslach Burnout Inventory™

Instruments and Scoring Keys

Includes MBI Forms:

**Human Services - MBI-HSS Medical Personnel - MBI-HSS (MP)
Educators - MBI-ES General - MBI-GS Students - MBI-GS (S)**

Christina Maslach Susan E. Jackson Michael P. Leiter Wilmar B. Schaufeli Richard L. Schwab

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September 11, 2020

Jamie Aquino

RE: NRDUC Project:

Protocol Number: 2007819375: Effects of Mindfulness on Anesthesia Provider Burnout
New Project UA Determination of Human Research Application Version Aug 2019;

forwarded to Non-Research Data Use Committee on 7/15/2020

Non-Research Data Use Committee Evaluation: Approved on 9/10/2020

Dear Jamie Aquino,

Thank you for your submission of the UA Determination of Human Research Form which outlined the above noted project. On 7/15/2020 UA IRB concluded that this project was not research and subsequently forwarded it to the Banner Health Non-Research Data Use Committee (NRDUC) for oversight and review.

The project information you provided was reviewed and approved on September 10, 2020 by the BH NRDUC. Should you have any questions or concerns please feel free to reach out to the NRDUC chair at any time.

PLEASE NOTE

The NRDUC determination is based on the information you provided to the committee on your application version Aug 2019 and supporting documents forwarded to the NRDUC on 7/15/2020. If the project is modified in any way, including re-analysis of data, the determination is no longer valid. You must resubmit the project to the NRDUC for review and approval.

Please note: As part of continuing process improvement, random audits could be conducted to assess compliance and adherence with submitted/approved applications.

FYI - to be a considered a "quality improvement" activity under HIPAA, information needs to be provided back to Banner for quality/performance improvement purposes. Please make sure you work with the appropriate Banner internal owner or applicable Banner committee to share results.

A copy of this letter will be placed in the NRDUC project file.

Sincerely,

A handwritten signature in black ink that reads "Kristen Eversole".

Kristen Eversole, BS, RHIA, CHPC
Banner Health Privacy Sr. Director/Chief Privacy Officer, NRDUC Chair


 Human Subjects
 Protection Program

 1618 E. Helen St.
 P.O.Box 245137
 Tucson, AZ 85724-5137
 Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>

Date: July 15, 2020

Principal Investigator: Jamie Christine Aquino

Protocol Number: 2007819375

Protocol Title: Effects of Mindfulness on Anesthesia Provider Burnout

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:

HSPF Forms/Correspondence: *IRBDetermination6-JA.pdf*

Other Approvals and Authorizations: *Banner Letter of Support.pdf*

Other Approvals and Authorizations: *NRDUC supplemental questionnaire-JA.pdf*

Regulatory Determinations/Comments:

- Not Research as defined by 45 CFR 46.102(1): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX B:
RECRUITMENT MATERIAL (INITIAL RECRUITMENT EMAIL / SECOND EMAIL TO
PARTICIPANTS)

Greetings!

I am a student registered nurse anesthetist (SRNA) at The University of Arizona. I am looking for anesthesia providers (Anesthesiologists and CRNAs) to participate in a quality improvement project to evaluate if a brief mindfulness-based intervention improves stress and reduces burnout.

This study includes a pre- and post- intervention burnout survey that takes approximately ten minutes to complete. Your answers are completely anonymous, your name and email address are not linked to your answers when I receive the data from Qualtrics. To ensure anonymity, no demographic or personal information will be collected. All data will be stored in a password protected electronic anonymous format in the project lead's password protected, locked personal computer. Implied consent is assumed upon completion of the pre-assessment survey. Participation of this survey is not a condition of employment at Banner Health and your participation/non-participation will not affect any future care or employee's current or future employment status at Banner Health. You may complete this survey at work or on your own time, but you will not be paid for your time spent on participation.

After taking the survey, please review the attached PowerPoint and handout on convenient mindfulness-based strategies that have been shown to improve stress levels. A link with the post-intervention survey will be emailed in four weeks.

You do not have to participate. You may choose to not participate in the project by not submitting the survey. Once the survey is submitted, the data is completely anonymous and cannot be linked to an individual or removed from the data pool. The results of this study will be used for scholarly purposes only.

I appreciate your time and participation. Above all, I appreciate what you do every day to take excellent care of patients. Please click on this link **ADD LINK** to complete the pre-intervention burnout survey. If you have any questions, please feel free to contact me.

Sincerely,

Jamie Aquino (Project lead)

C. Aquino RN, BSN, CCRN
DNP – Nurse Anesthesia Student
The University of Arizona, Class of 2021
(928) 301-6069
Jamieaquino@email.arizona.edu

Hello anesthesia providers,

I hope you are doing well! This is the post-mindfulness intervention survey email. Please complete the survey if you completed the pre-intervention survey in January and viewed the educational PowerPoint. Just click on the link provided in this email, which will take you to the survey. As in the first survey, all of your answers will be anonymous.

Thank you again for your time and participation.

Sincerely,
Jamie Aquino (Project lead)

Jamie C. Aquino RN, BSN, CCRN
DNP – Nurse Anesthesia Student
The University of Arizona, Class of 2021
(928) 301-6069
Jamieaquino@email.arizona.edu

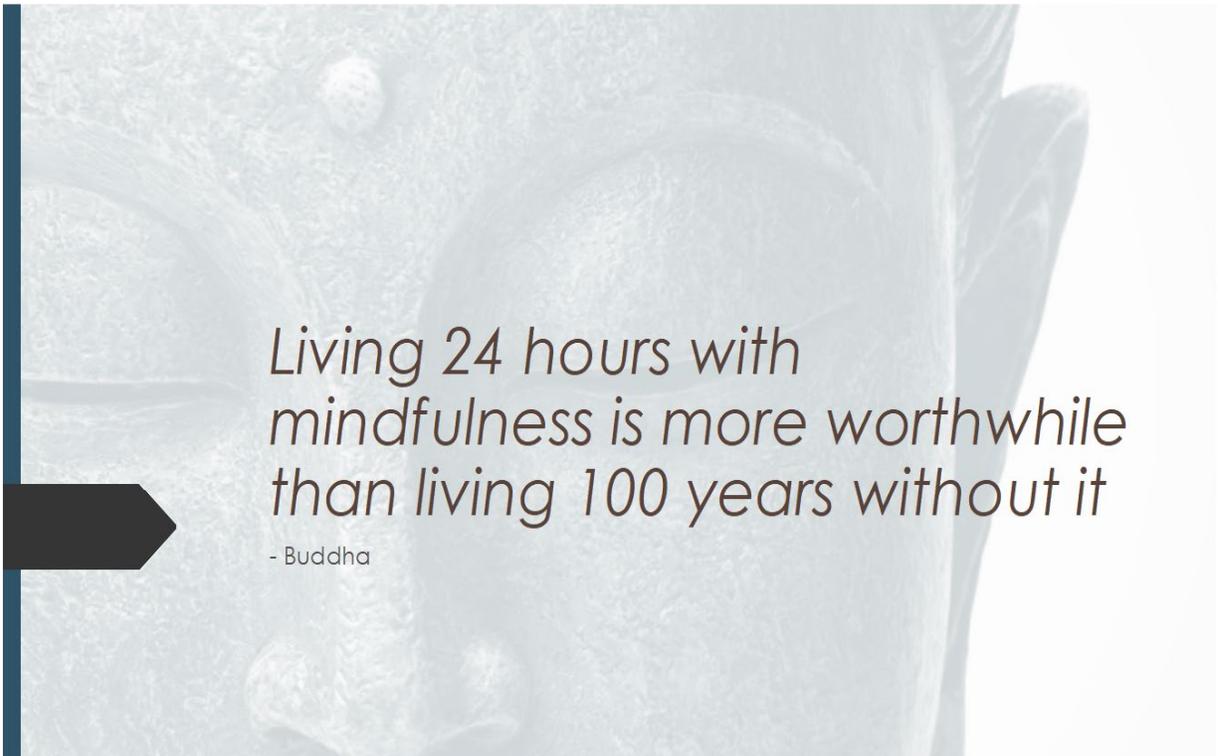
APPENDIX C:

PARTICIPANT MATERIAL (POWERPOINT PRESENTATION / 10 MINDFULNESS
EXERCISES FOR THE HEALTH CARE WORKPLACE)

Mindfulness to Reduce Stress

Jamie Aquino, BSN, RN,
CCRN

Doctorate of Nursing-
Nurse Anesthesia
Specialty Student



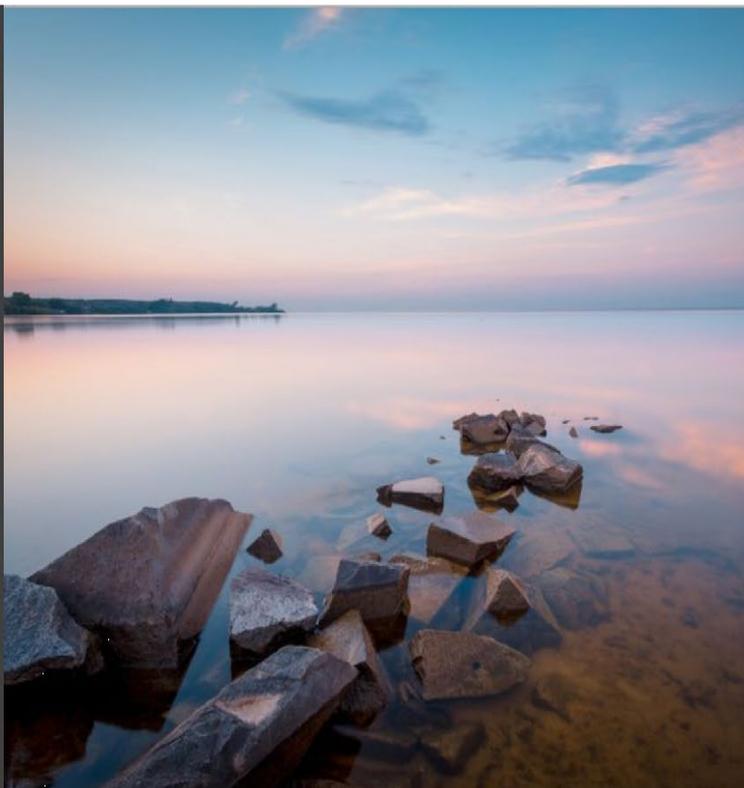
*Living 24 hours with
mindfulness is more worthwhile
than living 100 years without it*

- Buddha

What is Mindfulness?

- ▶ A state of active attention in the present
- ▶ Awareness of the present moment and accepting it as it is, devoid of judgement.
- ▶ A way to promote resilience, and reduce stress and burnout

Photo: Stone36/Shutterstock



Why is Mindfulness Useful to Me?



Anesthesia care providers deal with complex, stressful situations that can lead to burnout



Burnout leads to reduced job satisfaction, patient satisfaction, health, and patient safety

Mindfulness has been shown in evidence-based studies to:



- Reduce stress
- Improve sleep
- Improve cognitive function
- Increase resiliency
- Reduce maladaptive coping mechanisms

(Montanari, 2019 Raab et al., 2015, Spijkerman & Bohlmeijer, 2015)

Image: Dawid Zawita
<https://unsplash.com/photos/zb2V6aHY82l>

Simple Mindfulness Techniques to Apply During and Outside of Practice

- Become aware of the present moment by
 - Paying attention to your senses (e.g., notice the texture of the soap and the water temperature when washing hands). Embrace your senses, not your thoughts
 - During a break, close your eyes and listen to the sounds in the room
- Use deep breathing techniques by
 - Pausing between activities to perform deliberate comfortable, deep breaths. Try counting to three on inhale and exhale, or any rate comfortable to you
 - Looking at a picture or closing your eyes and picturing someone or something you love during this breathing exercise
 - Before a patient interview or an important interaction with a coworker try deep breathing and taking a few moments to establish positive intentions for the interaction

(Institute for Healthcare Improvement, 2020)

Thank You!



References

- Institute for Healthcare Improvement. (2018, January). *10 Mindfulness exercises for the health care workplace*. Retrieved from <http://www.ihl.org/communities/blogs/10-mindfulness-exercises-for-the-health-care-workplace>
- Montanari, K.M., Bowe, C.L., Chesak, S.S., & Cutshall, S.M. (2019). Assessing the feasibility of a pilot intervention to reduce stress and burnout. *Journal of Holistic Nursing*, 37(2), 175-188. doi: 10.1177/089010118793465
- Raab, K., Sogge, K., Parker, N., & Flament, M. (2015). Mindfulness-based stress reduction and self-compassion among mental healthcare professionals: A pilot study. *Mental Health, Religion & Culture*, Vol. 18(6), 503-512.
- Spijkerman, P.P.J., Potts, W.T.M., & Bholmeijer, E.T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 45, 102-114. doi: <http://dx.doi.org/10.1016/j.cpr.2016.03.009>

10 Mindfulness Exercises for the Health Care Workplace

For the busy health care worker, it's not always easy to prioritize self-care. But the ability to pause and reset one's focus is almost essential. Studies associate mindfulness — that is, the act of paying deliberate attention to the present moment, with an attitude of non-judgment, acceptance, and awareness — with improvements in empathy, cognitive performance, and health and well-being.

Use the 10 exercises below to begin incorporating mindfulness into your daily life. Each exercise is quick and can be done at work. Try spacing them throughout the day.

- 1. Pause when you first arrive at your computer.** Feel the weight of your legs in the chair and the pressure of your feet as they contact the floor. Take a few calming breaths. Gently deepen your inhale and lengthen your exhale. Try counting to three on the inhale and on the exhale. Adjust the timing so that it feels most calming for your body.
- 2. As you approach a patient's room,** let your attention move to your feet walking down the hallway. Pay attention to each foot as it comes in contact with the floor, one step at a time. Slow down, and let your breath and movement connect. Let your attention rest there. Check in with your overall state of being. Ask yourself, "What does it feel like in my feet right now?" Whatever you notice in your feet or in your body, bring acceptance to that experience. Take a clearing breath: breathing in for four, pausing for two, and exhaling slowly.
- 3. During handwashing,** stand still and pause. Pay attention to the moment: reaching for the soap, spreading it on your hands; the motion, the feel of the soap, the temperature, the texture. Stay with the experience and not your thoughts. Take a clearing breath, and allow the physical sensations in your hands to remind you to be present for the next interaction.
- 4. When you first approach someone,** notice some details about this person, such as the color of their eyes, the expression on their face, or how they are standing. As you are noticing these details, take a few breaths and feel sensations in your body as you arrive in the connection of the interaction. Then bring your full attention to the interaction. If your mind wanders to another experience, notice that with acceptance, and bring it back to the person or the people you are with and the feelings in your own body.
- 5. If there is time before an important interaction,** intentionally pause for 30 seconds or so. Take some calming breaths and feel your body. Then establish an intention to come to the interaction with presence and care.
- 6. When you are doing a focused task for an extended period** (e.g., reading, working on the computer, handling samples), look up periodically and allow your peripheral vision to become wide. Take a few calming breaths and notice any feelings of rest in your body.
- 7. Periodically throughout your day,** pause, close your eyes, open your ears, and listen to sounds in the distance. This is like widening your peripheral vision: Just use your hearing instead. Allow

the sounds to come and go without engaging in the story of what the sounds are. In particular, notice and enjoy any pleasant experience of spaciousness as you listen to sounds in the distance.

8. When you notice yourself feeling tense, if possible, remove yourself from the situation for a minute or two. (Bathrooms are a great place to do this.) Validate your experience with compassion, telling yourself, “It’s understandable that I would feel this way.” Place your hand on your heart or in a soothing position, breathe, and repeat your compassionate phrase a few times.

9. Before, during, or after a difficult situation, pause. Feel your feet firmly grounded and repeat this phrase as you link it to your breath. Come up with a calming phrase, such as “Breathing in I calm my body, breathing out I relax.”

10. At least once or twice throughout your day, look at something simple that you find beautiful. This could be the sky, a flower, or a picture of a loved one. Intentionally take a few moments to notice this beauty and savor the enjoyment for at least a few moments.

The list above is directly from the Institute for Healthcare Improvement (2018, January). Retrieved from <http://www.ihi.org/communities/blogs/10-mindfulness-exercises-for-the-health-care-workplace>

APPENDIX D:
MASLACH BURNOUT INVENTORY

Maslach Burnout Inventory

0= Never, 1=A few times per year, 2= Once per month, 3= A few times per month, 4= Once per week, 5= A few times per week, 6= Daily

How often 0-6

Section A Statements:

1. _____ I feel emotionally drained from my work.
2. _____ Working with people all day is really a strain for me.
3. _____ I feel like my work is breaking me down.
4. _____ I feel frustrated by my work.
5. _____ I feel I'm working too hard on my job.
6. _____ It stresses me too much to work in direct contact with people.
7. _____ I feel I am at the end of my rope.

Section B Statements

1. _____ I feel I look after certain patients/clients impersonally, as if they are objects.
2. _____ I feel fatigued when I get up in the morning and have to face another day on the job.
3. _____ I feel patients blame me for some of their problems.
4. _____ I am at the end of my patience at the end of my workday.
5. _____ I really don't care about what happens to some of my patients/clients.
6. _____ I've become more callous toward people since I took this job.
7. _____ I'm afraid this job is making me uncaring.

Section C Statements

1. _____ I accomplish many worthwhile things in this job.
2. _____ I feel very energetic.
3. _____ I can easily understand how my patients feel about things.
4. _____ I deal very effectively with the problems of my patients.
5. _____ In my work, I handle emotional problems very calmly.
6. _____ I feel I'm positively influencing other people's lives through my work.
7. _____ I can easily create a relaxed atmosphere with my patients.
8. _____ I feel exhilarated after working closely with my patients.

APPENDIX E:
PROJECT TIMELINE

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
10/2019	Project development; contact site/facility	Letter of support from Director of Professional Practice at Banner.		
6/30/2020	Prepare proposal, documents, and presentation; Schedule a time to defend proposal.	Formal DNP project proposal defense to the DNP committee.		
8/3/2020	Prepare documents.	IRB determination submission for Banner and University of Arizona. Approval before implementation.		
1/4/2021	Email anesthesia providers from BUMC department of anesthesia via Listserv.	Prepare email and educational material. Discuss plans with stakeholders. Fix any problems that arise.	Recruitment email distribution with pre-intervention survey and educational PowerPoint.	Track number of participants via Qualtrics. Intervene on any problems or concerns.
1/4/2021-1/11/2021		Keep stakeholders updated.	Pre-implementation data collection	Organize data and interpret findings on pre-intervention data on Qualtrics.
2/1/2021-2/15/2021		Keep stakeholders updated.	Distribute post-intervention survey. Post-intervention data collection.	Track number of participants via Qualtrics. Intervene on any problems.
2/15/2021-4/1/2021		Keep stakeholders updated.	Analyze results.	Analyze pre- and post-intervention data. Create poster to disseminate findings.

APPENDIX F:
LITERATURE REVIEW GRID

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
2020 Mahoney, Lea, Schumann, & Jilson	Turnover, burnout, and job satisfaction of certified registered nurse anesthetists in the United States: Role of job characteristics and personality	Cross-sectional study	<ul style="list-style-type: none"> • Finding support that employers should structure CRNA jobs to include more skill variety and autonomy to increase job satisfaction, reduce burnout, and decrease turnover intentions. • A change in autonomy and skill variety decreases burnout (-0.17). Autonomy has greater than twice the impact on job satisfaction, an increase of 0.36. • The greatest reason CRNAs leave their job, regardless of years or experience is for better working conditions- 43.3%. 	<ul style="list-style-type: none"> • Risk factors and protective factors studied to support DNP project. • There is a growing need for interventions to reduce burnout in CRNAs.
2019 Del Grosso & Boyd)	Burnout and the nurse anesthetist	Systematic review	<ul style="list-style-type: none"> • Most burnout research has been done on anesthesiologists and the CRNA equivalent in other countries. • More research is needed on CRNA burnout as this is a growing profession. • Burnout has a widespread negative impact for providers and healthcare. • CRNA well-being is vital to maintain cost-effective and high-quality care. • Regarding MBI: Internal consistency coefficient from 0.71 to 0.90. Validity studies found Emotional Exhaustion negatively correlated with job satisfaction and control and positively correlated with various work factors (workload). 	<ul style="list-style-type: none"> • The US healthcare system, has resulted in collateral damage to healthcare providers, including CRNAs.

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
2019 Montgomery, Panagopoulou, Esmail, Richards, & Maslach	Burnout in healthcare: the case for organizational change	Peer-reviewed article, expert opinion	<ul style="list-style-type: none"> • Burnout is a social phenomenon and occupational problem rooted in the relationships that people share in work teams (not a medical diagnosis) • Prevention is enabled by a healthy workplace approach that includes both continuous evidence-based assessment of burnout and action on the structural drivers of burnout tailored to staff experience and co-designed with input from patients 	<ul style="list-style-type: none"> • Support for use of MBI • Supports idea for social and organizational interventions to prevent burnout • Recommends that staff and patients be included in developing actions to reduce and prevent burnout • Supports that measurement of burnout can provide an early signal of a problem • Toxic environments lead to burnout
2019 Olson et al.	Organizational strategies to reduce physician burnout and improve professional fulfillment	Consensus review of leaders	<ul style="list-style-type: none"> • A review of evidence-based literature by leaders across multiple institutions to present strategies and tactics the organizations can utilize to address burnout and promote professional well-being. • Three main domains and 10 strategies included (leadership development, control and autonomy, teamwork, collegiality and community, appreciation, equality, diversity, and inclusion, electronic health record, workplace efficiency, supporting healthy lifestyle behaviors, and peer support. 	<ul style="list-style-type: none"> • Supports organizational strategies to improve provider well-being. • Investment in physician well-being should be made a priority and efforts to prevent and mitigate burnout should be evidence-based and outcome-driven.
2018 Gregory, Menser, & Gregory	An organizational intervention to reduce physician burnout	Pre/post quasi experimental design	<ul style="list-style-type: none"> • Current levels of burnout are unsustainable considering consequences regarding all stakeholders, organizations, physicians, and patients 	<ul style="list-style-type: none"> • Supports use of organization interventions to reduce burnout among caregiving professions

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			<ul style="list-style-type: none"> • More emphasis needed on organizational level issues that deplete resources, as well as individual interventions to improve resilience • This study observed changes in primary care providers' burnout pre and post implementation of a workload intervention that changed the work process within primary care clinics. Four clinics received the intervention, while four others served as comparisons. Among physicians receiving the intervention, the results show significant impacts, with an improvement in workload of 0.61 units ($p = 0.037$) and a decrease in the emotional exhaustion dimension of burnout of 6.989 units ($p = 0.039$). 	<ul style="list-style-type: none"> • Acceptance of the Triple Aim guarantees future concern for burnout and caregiver well-being • Evidence on burnout should be shared with policy makers, leaders, and patients
2018 MacKinnon & Murray	Reframing physician burnout as an organizational problem: A novel pragmatic approach to physician burnout	Peer-reviewed article. Expert opinion with literature review	<ul style="list-style-type: none"> • Impaired productivity, decreased patient-customer satisfaction, and deteriorations in quality of care associated with provider burnout and depression • More research needed to quantify financial losses associated with discontent-related impaired productivity and patient dissatisfaction 	<ul style="list-style-type: none"> • Supports organizational changes to aid in provider burnout
2018	Physician burnout, well-	Population based survey of US physicians	<ul style="list-style-type: none"> • Physicians reporting errors were more likely to have symptoms of 	<ul style="list-style-type: none"> • Supports idea that physician burnout, fatigue, and work unit safety grades

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Tawfik, Profit, Morgenthaler, Satele, Sinsky, Dyrbye, Tutty, West, & Shanafelt	being, and work unit safety grades in relationship to reported medical errors	-Large, national study	<p>burnout, fatigue, and recent suicidal ideation</p> <ul style="list-style-type: none"> • In multivariate modeling, perceived errors were independently more likely to be reported by physicians with burnout or fatigue and those with worse work unit safety grades • 6586 physicians provided information. 3574 (54.3%) reported symptoms of burnout, 2163 (32.8%) reported excessive fatigue, and 427 (6.5%) reported recent suicidal ideation, with 255/6563 (3.9%) reporting a poor or failing patient safety grade in their usual work area and 691/6586 (10.5%) reporting a major medical error in the prior 3 months. Physicians reporting errors were more likely to have symptoms of burnout (77.6% vs 51.5%; $P < .001$), fatigue (46.6% vs 31.2%; $P < .001$), and recent suicidal ideation (12.7% vs 5.8%; $P < .001$). In multivariate modeling, perceived errors were independently more likely to be reported by physicians with burnout (odds ratio [OR], 2.22; 95% CI, 1.79-2.76) or fatigue (OR, 1.38; 95% CI, 1.15-1.65) and those with incrementally worse work unit safety grades (OR, 1.70; 95% CI, 1.36-2.12; OR, 1.92; 95% CI, 1.48-2.49; OR, 3.12; 95% CI, 2.13-4.58; 	<p>are independently associated with major medical errors</p> <ul style="list-style-type: none"> • Interventions to reduce rates of medical errors must address both physician well-being and work unit safety

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			and OR, 4.37; 95% CI, 2.06-9.28 for grades of B, C, D, and F, respectively).	
2018 West, Dyrbye, & Shanafelt	Physician burnout: contributors, consequences and solutions	Systematic review	<ul style="list-style-type: none"> • Organizational interventions (e.g., locally developed practice modifications and increased support for clinical work) demonstrate to have benefits for reducing burnout • Individual-focused solutions (e.g., mindfulness-based stress reduction and small-group programs to promote community, connectedness and meaning have are also effective • Intervention literature has demonstrated reductions in the number of physicians with burnout symptoms of 14% for emotional exhaustion, 4% for depersonalization and 10% for overall burnout symptoms as defined by the presence of emotional exhaustion and/or depersonalization. 	<ul style="list-style-type: none"> • Supports idea that all stakeholders in healthcare delivery must work collectively to develop and implement effective strategies to address physician burnout • Supports that physician burnout is best addressed when viewed as a shared responsibility of both healthcare systems and individual physicians • Implications for CRNAs
2017 Boyd & Poghosyan	Certified registered nurse anesthetist working conditions and outcomes: A review of the literature	Systematic review	<ul style="list-style-type: none"> • Job satisfaction, occupational stress, incivility, burnout, workplace aggression, and intent to leave are prevalent outcomes of working conditions. • Following specific inclusion criteria, peer-reviewed research articles published from 2001 to 2015 were 	<ul style="list-style-type: none"> • Supports need for research on ways to reduces the negative impact of working conditions. • Organizations, CRNAs, patients and families would benefit from improved outcomes.

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			<p>included. Data were abstracted from 13 studies and were synthesized.</p> <ul style="list-style-type: none"> • Poor communication: Results showed that quality of collaboration and communication (CC) was higher among clinician groups than between clinician groups. Anesthesiologists rated quality of their CC with each other at 96%, surgeons rated it at 84%, CRNAs rated it at 75%, & OR nurses rated it at 63%. Similar findings observed with CRNAs rating the quality of their CC with each other at 93%, anesthesiologists rated it at 92%, surgeons at 87%, and OR nurses rated it at 68%. • One study showed, 38% of CRNAs felt powerless in dealing with physicians, with 17% of CRNAs compromising their ethical values and 30% fearing termination related to ethical decision making. Because of ethical issues, 9% considered leaving the nurse anesthesia specialty, and 10% of CRNAs considered leaving the nursing profession overall. • Workplace aggression: Another study showed 92% CRNAs reportedly experienced active aggression, 90% experienced verbal aggression, and 83% experienced physical aggression from supervising 	

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			<p>physicians, including surgeons and anesthesiologists. Female CRNAs experienced all forms of aggression more than male CRNAs. This same study showed a statistically significant positive correlation with workplace aggression increasing workplace stress, and qualitative results, indicating that workplace aggression may lead to CRNA job dissatisfaction and turnover while having a negative effect on patient safety.</p> <ul style="list-style-type: none"> • Stress: One study showed average daily stress of 4.3 on a 10-point Likert scale (0 meaning no stress and 10 indicating maximum stress), with 50% of daily stress being attributed to occupational stress. The self-reported stress of CRNAs was slightly less than administrators or military CRNAs, whose mean stress scores were 5.1 and 4.9, respectively. The highest-ranking personal stressors among CRNAs were changing jobs (28%), followed by relocating (23%). 	
2017 Hyman, Shotwell, Michaels, Han, Card,	A survey evaluating burnout, health status, depression,	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • Males scored worse on depersonalization and personal accomplishment • Residents scored worse on depersonalization 	<ul style="list-style-type: none"> • Personal and professional support were associated with work satisfaction and professional support • Association between burnout and substance use not strongly associated

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Morse, Schildcrout, Mercaldo, & Weinger	reported alcohol and substance use, and social support of anesthesiologists	-Population mainly anesthesiologists, (98.6%), 2 registered nurses	<ul style="list-style-type: none"> • Respondents generally satisfied financially, but felt less control at work and felt that job kept them from friends and family • Many anesthesiologists show some high-risk burnout characteristics, associated with lower mental health scores 	<ul style="list-style-type: none"> • Supports use of MBI-HSS
2017 Ireland et al.	A randomized controlled trial of mindfulness to reduce stress and burnout among intern medical practitioners	RCT	<ul style="list-style-type: none"> • Participants of the MBI program has greater improvements in stress and burnout compared to control group. • Simple effects analysis showed changes over time for the control condition in stress ($F=1.25, p = 0.302, \eta^2 = 0.08$) or burnout ($F = 1.58, p = 0.222, \eta^2 = 0.10$) were not significant. • Changes over time for the intervention condition were significant for stress ($F= 5.88, p=0.007, \eta^2 = 0.28$) and marginally significant for burnout ($F=2.88, p= 0.072, \eta^2 =0.16$). 	<ul style="list-style-type: none"> • MBIs may provide practitioners with effective ways to manage stress, burnout, and experience of these symptoms.
2017 Maslach & Leiter	New insights into burnout and health care: Strategies for improving civility and alleviating burnout	Expert opinion	<ul style="list-style-type: none"> • Improving balance of civil and respectful social encounters that occur during the workday helps to alleviate burnout 	<ul style="list-style-type: none"> • Greater emphasis on social dynamics in health care teams will support avoidance of potential pitfalls and unavoidable strains experienced by new physicians

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2017 Misiolek, Gil- Monte, & Misiolek	Prevalence of burnout in Polish anesthesiologists and anesthetist nursing professionals: A comparative non- randomized cross-sectional study	Peer-reviewed article, prospective cross-sectional study -Polish nurses and physicians	<ul style="list-style-type: none"> Statistically significant difference on burnout global score (i.e., the mean of the 15 items from the subscales of Enthusiasm toward the job (reversed), Psychological exhaustion, and Indolence) ($F = 4.25$, $p < .05$; $\eta^2 = .016$; observed power = .743), Enthusiasm toward the job ($F = 19.84$, $p < .001$; $\eta^2 = .070$; observed power = 1), Psychological exhaustion ($F = 4.14$, $p < .05$; $\eta^2 = .015$; observed power = .731), and Indolence subscales ($F = 5.97$, $p = .01$; $\eta^2 = .022$; observed power = .880) between nurses and physicians. But on Guilt subscale, significant differences were not found ($F = 1.92$, $p = .148$; $\eta^2 = .007$; observed power = .398). According to the homogeneity of variance test, homogeneity of variance was obtained in all tests except for the variable Enthusiasm toward the job (Levene's test, $F = 9.97$, $p < .001$). High burnout level was found in 18.63% nurses and 12.06% anesthesiologists, and critical level in 3.74% nurses and 5.90% anesthetists 	<ul style="list-style-type: none"> Civility can be increased at work and doing so will lead to reduction in burnout among healthcare providers High and critical levels of burnout exist for physicians and nurses

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			<ul style="list-style-type: none"> No significant differences were found between sexes in any variables. 	
2017 Salyers, Bonfils, Luther, Firmin, White, Adams, & Rollins	The relationship between professional burnout and quality and safety in healthcare: A meta-analysis	Meta-analysis	<ul style="list-style-type: none"> Provider burnout shows consistent negative relationships with perceived quality (including patient satisfaction), quality indicators, and perceptions of safety Statistically significant negative relationships present between burnout and quality ($r=-0.26$, 95 % CI [-0.29, -0.23]) and safety ($r=-0.23$, 95 % CI [-0.28, -0.17]). The negative relationship implies greater burnout among healthcare providers was associated with poorer-quality healthcare and reduced safety for patients. 	<ul style="list-style-type: none"> Findings support the importance of effective burnout interventions for healthcare providers
2017 Sanfilippo, Noto, Foresta, Santonocito, Palumbo, Arcadipane, Maybauer, & Maybauer	Incidence and factors associated with burnout in anesthesiology: A systematic review	Systemic review	<ul style="list-style-type: none"> Factors most consistently associated with burnout: strained working pattern, working as younger consultant, and having children No consistent relationship between burnout and hospital characteristics, gender, or marital status 15 studies reported burnout in anesthesia staff and all used either the full MBI questionnaire or one of its shorter forms. The high heterogeneity of their methods warrants high caution in looking at 	<ul style="list-style-type: none"> Supports use of MBI for provider burnout Burnout prevalence among anesthesiologists is relatively high across career stages Certain factors are consistent with higher levels of burnout <ul style="list-style-type: none"> Supports need for burnout awareness and prevention interventions

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			<p>prevalence of burnout and in drawing conclusions. The results should be interpreted not only in the context of the different country and healthcare system where anesthesia staff was surveyed, but carefully looking at the cut-offs of MBI used for defying the risk of burnout as well. In general, we found different MBI cut-offs for high risk of burnout used across the retrieved studies, ranging from >23 [44] to >29 [38, 43] for EE, from >8 [35, 44] to >14 [36] for DP, and from <24 [36] to <34 [35, 43] for PA.</p>	
2016 Maslach & Leiter	Understanding the burnout experience: recent research and its implications for psychiatry	Expert opinion	<ul style="list-style-type: none"> • Healthcare provider self-care important for preventing burnout • Diversifying work and evaluating workload frequently to reduce risk of burnout suggested • Most studies on burnout are a single intervention group of volunteer participants, burnout research is lacking in RCTs • Authors point out that is unclear whether burnout is generally susceptible to a range of strategies or if it vital to fit the strategy to the specific context of a workplace to be effective. 	<ul style="list-style-type: none"> • Psychiatry could make an important contribution by identifying strategies to reduce burnout and help workers be more successful at their job • Supports models for burnout • Psychiatric-based treatments may be relevant to burnout (e.g., return to work for those experiencing severe burnout)

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2016 Panagioti et al.	Controlled interventions to reduce burnout in physicians	Systematic review and meta-analysis	<ul style="list-style-type: none"> Individual interventions were found beneficial, especially when combined with organizational approaches. 20 independent comparisons from 19 studies included (n = 1550 physicians; mean [SD] age, 40.3 [9.5] years; 49% male. Interventions were associated with small significant decreases in burnout (standardized mean difference [SMD] = -0.29; 95% CI, -0.42 to -0.16 	<ul style="list-style-type: none"> Supports that burnout is a problem of the whole organization, not just the individuals.
2016 Schroeder et al.	A brief mindfulness-based intervention for primary care physicians: A pilot randomized control trial	RCT	<ul style="list-style-type: none"> Physicians who participated in the MBI showed improvements in stress, mindfulness, emotional exhaustion, and depersonalization compared to the control group where there were no improvements. Mindful medicine curriculum (MMC) participants group reported significant improvements in stress (P < .001), mindfulness (P = .05), emotional exhaustion (P = .004), and depersonalization (P = .01). In the control group, there were no improvements on these outcomes. 	<ul style="list-style-type: none"> Supports use of MBI tool to improve provider well-being and enhance patient care. Supports use for mindfulness interventions in the reduction of burnout.
2016 Shanafelt, Dyrbye, West, & Sinsky	Potential impact of burnout on the US physician workforce	Longitudinal study, observational, peer-reviewed article	<ul style="list-style-type: none"> The increase in burnout observed in US physicians between 2011 and 2014 can be translated into approximately a 1% reduction in the 	<ul style="list-style-type: none"> Supports need to implement burnout prevention and mitigation strategies to improve retention of physician anesthesiologists

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			professional effort of the US physician workforce <ul style="list-style-type: none"> Reducing work hours is an effective individual strategy to reduce burnout for many physicians 	
2016 Spijkerman & Bohlmeijer	Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomized controlled trials.	Systematic review and meta-analysis	<ul style="list-style-type: none"> MBIs have a beneficial impact on depression ($g = 0.29$), anxiety ($g = 0.22$), well-being ($g = 0.23$), and mindfulness ($g = 0.32$), with the largest effect on stress ($g = 0.51$). For stress and mindfulness, exploratory subgroup analyses showed significantly increased effect sizes for guided online MBIs versus unguided online MBIs. 	<ul style="list-style-type: none"> Online MBIs can improve mental health outcomes, especially stress.
2016 West, Dyrbye, Erwin, & Shanafelt	Interventions to prevent and reduce physician burnout: A systematic review and meta-analysis	Systematic review & meta-analysis	<ul style="list-style-type: none"> Interventions, from 15 RCTs and 37 cohort studies, to prevent and reduce physician burnout showed decreases in overall burnout, emotional exhaustion score, and depersonalization score Overall burnout decreased with burnout prevention and mitigation interventions from 54% to 44% (difference 10% [95% CI 5–14]; $p < 0.0001$; $n = 15$; 14 studies), emotional exhaustion score decreased from 23.82 points to 21.17 points (2.65 points [1.67–3.64]; $p < 0.0001$; $n = 82$; 40 studies), and depersonalization score 	<ul style="list-style-type: none"> Supports need for physician burnout reduction and prevention strategies as physician burnout has reached epidemic levels Both person-focused and structural or organizational strategies can result in clinically significant reductions in burnout among physicians

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2015 Shanafelt, Gorringe, Menaker, Storz, Reeves, Buskirk, Sloan, & Swensen	Impact of organizational leadership on physician burnout and satisfaction	Peer-reviewed article, prospective cross-sectional study	<p>decreased from 9.05 to 8.41 (0.64 points [0.15–1.14]; $p=0.01$; =58%; 36 studies). High emotional exhaustion decreased from 38% to 24% (14% [11–18]; $p<0.0001$; =0%; 21 studies) and high depersonalization decreased from 38% to 34% (4% [0–8]; $p=0.04$; =0%; 16 studies).</p> <ul style="list-style-type: none"> • Leadership qualities of physician supervisors appear to impact the well-being and satisfaction of individual physicians working in health care organizations. • Out the 3896 physicians surveyed, 2813 (72.2%) responded. Supervisor scores in each of the 12 leadership dimensions and composite leadership score strongly correlated with the burnout and satisfaction scores of individual physicians (all $P<.001$). • The mean composite leadership rating of each division/department chair ($n=128$) also correlated with the prevalence of burnout (correlation=-0.330; $r(2)=0.11$; $P<.001$) and satisfaction (correlation=0.684; $r(2)=0.47$; $P<.001$) at the division/department level. 	<ul style="list-style-type: none"> • Supports idea that organizational factors affect physician well-being greatly, especially supervisor leadership

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			<ul style="list-style-type: none"> • Important implications for the selection and training of physician leaders exist. 	
2015 Shanafelt, Hasan, Dyrbye, Sinsky, Satele, Sloan, & West	Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • Significant differences burnout and satisfaction rates with work-life balance observed by physician specialty • In contrast to the trends in physicians, minimal changes in burnout or work-life balance satisfaction were observed between 2011 and 2014 in probability-based samples of other working US adults • Increasing disparity in burnout and satisfaction with work-life balance in physicians relative to the general US working population • After pooled multivariate analysis adjusting for age, sex, relationship status, and hours worked per week., physicians remained at an increased risk of burnout • Out of 35,922 physicians who received an invitation to participate, 6880 (19.2%) completed surveys. Using the Maslach Burnout Inventory, 54.4% (n=3680) of the physicians reported at least 1 symptom of burnout in 2014 compared with 45.5% (n=3310) in 2011 (P<.001). Satisfaction with work-life balance also declined in 	<ul style="list-style-type: none"> • Supports use of MBI survey • Burnout is a trending problem in the US (More than half of US physicians are now experiencing professional burnout)

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			physicians between 2011 and 2014 (48.5% vs 40.9%; $P < .001$).	
2014 Elmblad, Kodjebacheva, & Lebeck	Workplace incivility affecting CRNAs: a study of prevalence, severity, and consequences with proposed interventions	Peer reviewed article, observational study (cross-sectional design)	<ul style="list-style-type: none"> • A statistically significant factor contributing to professional burnout is workplace incivility, independent of other factors • The correlation between workplace incivility and professional burnout was statistically significant ($P < .0001$). Workplace incivility was linked with burnout when controlling for gender, type of employment arrangement, type of employment group, hours worked per week, and years in the CRNA profession ($P < .001$). No controlled factors were associated with professional burnout. 	<ul style="list-style-type: none"> • Workplace incivility, which is a factor for burnout, is a major concern among CRNAs • A zero-tolerance policy is recommended regardless of title or role in employment situations
2013 De Oliveira, Chang, Fitzgerald, Almeida, Castro-Alves, Ahmad, & McCarthy	The prevalence of burnout and depression and their association with adherence to safety and practice standards: a survey of United States anesthesiology trainees	Peer-reviewed article, observational study (cross-sectional design)	<ul style="list-style-type: none"> • 41% anesthesiology trainees high risk of burnout and depression • Increased burnout risk: > 70 working hours/week, female, and drinking > 5 drinks/week • 33% of respondents with high burnout and depression risk reported multiple medication errors in the last year compared with 0.7% of low-risk responders 	<ul style="list-style-type: none"> • Burnout, depression, and suicidal ideation are very prevalent in anesthesiology residents • Burnout and depression of anesthesiology trainees may also affect patient care and safety

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2011 Hyman, Michaels, Berry, Schildcrout, Mercaldo, & Weinger	Risk of burnout in perioperative clinicians: A survey study and literature review	Peer-reviewed article, prospective cross-sectional study -Population of all members of one perioperative unit	<ul style="list-style-type: none"> • Physicians (especially residents) had the largest global burnout scores, leading to higher risk of burnout compared to other personnel in the perioperative unit (nurses, nurse anesthetists and other personnel) • Of the 145 participants, 46.2% were physicians (22.8% residents), 43.4% were nurses or nurse anesthetists, and 10.3% were other personnel. After adjusting for sex and age, residents scored higher than other physicians on the following (expected change [95% confidence interval]): global score (1.12 [0.43–1.82]), emotional exhaustion (1.54 [0.44–2.60]), and depersonalization (1.09 [0.23–1.95]). Compared with nonphysicians, residents were 1 U or more higher on these items ($P < 0.05$ in all cases). Residents had higher health (1.49 [0.48–2.50]) and workload (1.23 [0.07–2.40]) values compared with physicians. Better health, personal support, and work satisfaction scores were related to decreased global scores ($P < 0.05$). • Health and personal support scores for residents were at least 1 U higher than those for other nonphysician roles ($P < 0.05$), and results were nearly as strong for the workload item. Residents scored 1.29 (0.36- 	<ul style="list-style-type: none"> • Supports idea that improving health, increasing personal support, and work satisfaction may reduce burnout among perioperative team members • Supports use of online MBI-HS survey

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2011 Meeusen, Van Dam, Brown- Mahoney, Van Zundert, & Knape	No differences in job perceptions amongst Dutch nurse anaesthetists with and without nursing background	Peer-reviewed article, prospective cross-sectional study	<p data-bbox="1014 391 1360 448">2.22) U higher than nurse anesthetists on work satisfaction.</p> <ul data-bbox="968 488 1402 724" style="list-style-type: none"> No significant differences between nurse anesthetists with and those without nursing backgrounds in regard to work context, job satisfaction, work climate, psychosomatic symptoms, burnout, sickness absence, general health and turnover. 	<ul data-bbox="1444 488 1881 789" style="list-style-type: none"> Dutch nurse anesthetists with and without nursing backgrounds reported similar perceptions of and information about, job satisfaction, psychosomatic symptoms, burnout, sickness absence, general health and turnover intention. Both academic tracks appeared to produce individuals who functioned similarly as professionals.
2011 Meeusen, Van Dam, Brown- Mahoney, Van Zundert, & Knape	Work climate related to job satisfaction among Dutch nurse anesthetists	Peer-reviewed article, prospective cross-sectional study -Dutch nurse anesthetists	<ul data-bbox="968 824 1402 1406" style="list-style-type: none"> All work climate characteristics had statistically significant correlations to job satisfaction and explained 20% of the variance in job satisfaction. To achieve greater job satisfaction among nurse anesthetists, it is necessary to improve work climate characteristics, (e.g., making the nurse anesthetist feel an important part of the organization's mission statement, discussing progress at work, giving recognition for delivered work, encouraging development, and providing sufficient opportunities to learn and to grow. Perceived general health had a significant correlation ($r = .20$, $P < .01$) with work climate and job 	<ul data-bbox="1444 824 1881 976" style="list-style-type: none"> Supports understanding that a healthy work environment and management-directed interventions help improve job satisfaction, which helps to reduce and prevent burnout

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			<p>satisfaction ($r = .17, P < .01$). No relationship between sickness absenteeism and work climate, or between sickness absenteeism and job satisfaction.</p> <ul style="list-style-type: none"> • Work climate is positively related to job satisfaction ($P < .001$) 	
2011 Meeusen, Van Dam, Brown- Mahoney, Van Zundert, & Knape	Understanding nurse anesthetists' intention to leave their job: how burnout and job satisfaction mediate the impact of personality and workplace characteristics	Peer-reviewed article, prospective cross-sectional study -Dutch nurse anesthetists	<ul style="list-style-type: none"> • Burnout mediated the relationship between personality dimensions and turnover intention. Burnout ($[\beta] = .24, p < .001$) and job satisfaction ($[\beta] = -.28, p < .001$) showed significant relationships with turnover intention. • Job satisfaction mediated the relationship of work climate and work context factors to turnover intention: task content ($[\beta] = .07, p < .05$), social environment ($[\beta] = .13, p < .001$), supervisor relationship ($[\beta] = .30, p < .001$), and rewards ($[\beta] = .08, p < .05$). 	<ul style="list-style-type: none"> • Supports that healthy work environments and certain personality traits impact burnout, job satisfaction, and ultimately turnover
2010 Awa, Plaumann, & Walter	Burnout prevention: A review of intervention programs	Systemic review	<ul style="list-style-type: none"> • 25 primary intervention studies were reviewed. Seventeen (68%) were person-directed interventions, 2 (8%) were organization-directed and 6 (24%) were a combination of both. • 88% of burnout intervention programs reduced burnout • Combination of person-directed and organizational programs had longer 	<ul style="list-style-type: none"> • While programs reduced burnout, all effects diminish over time • A combination of person-directed and organization directed intervention are more successful than either type of intervention program alone • Organizations should recognize the need for burnout intervention

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			lasting positive effects (12 months and over) than person-programs alone	<p>programs and make them available to employees</p> <ul style="list-style-type: none"> Intervention programs are beneficial and are enhanced with refresher courses
2010 Chiron, Michinov, Olivier- Chiron, Laffon, & Rusch	Job satisfaction, life satisfaction and burnout in French anaesthetists	Peer-reviewed article, observational study (cross-sectional design)	<ul style="list-style-type: none"> Low levels of emotional exhaustion (EE) and depersonalization scores, but high levels of reduced accomplishment. Mean scores for the whole sample were 15.50 (SD = 9.86) for the EE subscale, 5.19 (SD = 4.73) for the depersonalization subscale, and 29.83 (SD = 7.90) for the personal accomplishment subscale. Physician anesthetists has higher levels of burnout than nurse anesthetists (Chi-square = 3.61, p = .05). Specifically, high levels of EE were more common among physician anesthetists than nurse anesthetists (16.2% and 7.8% respectively), and high levels of depersonalization were more common among physicians than nurse anesthetists (17.6% and 5.2%, respectively). For personal accomplishment, low levels were more frequent among physician than nurse anesthetists (13.5% and 6.5% respectively). Female and junior anesthetists reported higher levels of emotional 	<ul style="list-style-type: none"> Supports use of MBI survey for health care provider burnout Implications to reduce burnout symptoms in anesthesia teams discussed: opportunities for part-time work, opportunities to decrease number of working hours, qualified help, improving work-life balance

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			<p>exhaustion and job dissatisfaction than male and senior anesthetists ($\beta = -.20, t = 2.53$).</p> <ul style="list-style-type: none"> • Increased levels of burnout in large-sized teams among physician anesthetists ($p=0.001$). 	
2010 Meeusen, Brown- Mahoney, Van Dam, Van Zundert, & Knappe	Personality dimensions and their relationship with job satisfaction amongst Dutch nurse anaesthetists	Peer-reviewed article, prospective cross-sectional study -Dutch nurse anesthetists	<ul style="list-style-type: none"> • Two personality dimensions – ‘easy going’ and ‘orderly’ - explained 3.5% of the variance in job satisfaction • The personality dimension ‘orderly’ was seen most frequently amongst nurse anaesthetists (M=4.03, SD=0.47), ‘receptive’ was second (M=3.95, SD=0.48), ‘easy going’ third (M=3.92, S=0.55) and ‘compassionate’ was last (M=3.55, SD=0.56). • The personality dimensions ‘easy going’ ($r=0.18, P<0.01$) and ‘orderly’ ($r=0.11, P<0.01$) correlated significantly and positively with job satisfaction. 	<ul style="list-style-type: none"> • It is important to understand the relationship of particular personalities to job satisfaction • It is also important to know which combination of personality traits is likely to create a highly cohesive work group
2010 Meeusen, Van Dam, Brown- Mahoney, Van Zundert, & Knappe	Burnout, psychosomatic symptoms and job satisfaction among Dutch nurse anaesthetists: A survey	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • Burnout and psychosomatic symptoms are negatively associated with job satisfaction <ul style="list-style-type: none"> ◦ Burnout and psychosomatic symptoms predicted 27% of job satisfaction • Perceived health was positive related to job satisfaction ($p<0.001$) 	<ul style="list-style-type: none"> • Supports the importance of healthy psychosocial work environment for promoting job satisfaction • Findings may apply to anesthesiologists as they share many tasks and work closely with nurse anesthetists

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			<ul style="list-style-type: none"> Sickness absence was negatively related to job satisfaction ($p < 0.01$) Older nurse anesthetists had higher burnout incidence compared to younger nurse anesthetists ($p < 0.01$) 	
2010 Meeusen, Van Dam, Van Zundert, & Knape	Job satisfaction amongst Dutch nurse anaesthetists: the influence of emotions on events	Peer-reviewed article, prospective cross-sectional study -Dutch nurse anesthetists	<ul style="list-style-type: none"> Positive emotions at the end of the working day contributed significantly to job satisfaction. Negative emotions did not have a significant effect on job satisfaction. 	<ul style="list-style-type: none"> The mediating role of positive emotions in relation to positive and negative events during the workday should be taken into account in managing job satisfaction
2008 Meeusen, Brown- Mahoney, Van Dam, Van Zundert, & Knape	Discriminating work context factors in the working environment of Dutch nurse anesthetists	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> Four work context factors (career/rewards, relation with supervisor, task contents, and social environment) were relevant towards a healthy work environment explaining 48% of variance in work context; All four factors are considered to be job resources, though not hospital-related. Supervisors view these work context factors different than nurse anesthetists which can result in dissatisfaction of nurse anesthetists. Nurse anesthetists participate more in sub-functions and activities in larger, academic anesthesia departments. Smaller anesthesia departments require nurse anesthetists to be more flexible and perform many different 	<ul style="list-style-type: none"> Supports the idea that there is an increased need to maintain a healthy balance between the nurse anesthetist and the work environment. Job resources play an important role in a healthy work environment.

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			functions within the anesthesia domain.	
2008 Nyssen & Hansen	Stress and burnout in anesthesia	Systematic review	<ul style="list-style-type: none"> • Found evidence that anesthesia is a stressful occupation, even though not more than other medical occupations • Some job characteristics (i.e., job control, job support) are lacking and so are symptoms associated with stress and burnout in anesthetists, especially in young anesthetists • Results suggest that anesthetists may benefit most from interventions that optimize planning their schedules, decreasing workload and increasing social support • Burnout symptoms are not significantly different among countries • Using the MBI, one study found that 25.8% of the anesthetists in Austria to be at risk for burnout and 3.4% of them had developed full-blown burnout syndrome. In Belgium, the median score of burnout was 27, corresponding with a moderate level of burnout. A population of 40.4% was found to be in the high-level burnout group and 44.4 and 15.2% were found in the medium and low-level groups, respectively. In Portugal, the authors found a high percentage of emotional exhaustion 	<ul style="list-style-type: none"> • Supports organization intervention to burnout reduction for anesthesia providers • Supports that successful burnout interventions used in research can be applied to other countries

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			<p>(57.9%), a high percentage of lack of personal accomplishment (44.8%) and 90.9% of depersonalization feeling. In France, one study found that 46.5% of the respondents (n = 978) from a national survey of physicians working in intensive care units (including interns, residents, fellows and attending) suffered from burnout. Among the nursing staff in ICU (n = 2392), Poncet et al. found that 32.8% of the respondents suffered from severe burnout.</p>	
2006 Lederer, Kinzi, Trefalt, Traweger, & Benzer	Significance of working conditions on burnout in anesthetists	Peer-reviewed article, prospective cross-sectional study; university hospital	<ul style="list-style-type: none"> • 25% of anesthetists found to be at risk for burnout and 3% had full-blown burnout syndrome • Most at risk for burnout among anesthetists frequently reported limited complexity of work ($p=0.001$), lacking individual time control, lack of participation possibilities ($p=0.012$), physical complaints ($p=0.017$), and greater job dissatisfaction ($p=0.002$) compared to colleagues with no burnout symptoms. 	<ul style="list-style-type: none"> • Supports use of MBI survey and self-reporting questionnaires in anesthetists • Workplace conditions that provide fewer opportunities and participation contribute to development of burnout syndrome • Communication and contact with colleagues are important in burnout prevention
2006 Morais, Maia, Azevedo, Amaral, & Tavares	Stress and burnout among Portuguese anesthesiologists	Peer-reviewed article, prospective cross-sectional study -Portuguese anesthesiologists	<ul style="list-style-type: none"> • 57.9% of anesthesiologists experienced emotional exhaustion, 44.8% lack of personal accomplishment and 90.9% depersonalization 	<ul style="list-style-type: none"> • Supports use of MBI survey for burnout • Stressful conditions and burnout exist among Portuguese anesthesiologists

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			<ul style="list-style-type: none"> • Lack of personal accomplishment increased with number of children among women but not among men • Depersonalization was more frequent among anesthesiologists working in community hospitals • Anesthesiologists with leadership functions experienced less professional stress • The prevalence of EE was significantly lower among anesthesiologists with > 20 yr. of working experience (P = 0.008); the prevalence of lack of personal accomplishment increased progressively with the number of children among women (30.6% for no children, 39.4% for 1 child, 43.8% for 2 children and 50.0% for 3 or more children, P = 0.09) but not among men (45.5% for no children, 58.3% for 1 child, 51.4% for 2 children and 54.5% for 3 or more children, P = 0.77 for linear trend). Anesthesiologists working in community hospitals showed depersonalization significantly more often (P = 0.03) • Anesthesiologists indicated factors that generated stress, 101 (38.4% of the participants) named strained professional relationships, 101 (38.4%) unskilled leadership by their 	<ul style="list-style-type: none"> • Depersonalization was extremely high in studied sample, indicative of burnout • Emotional exhaustion is partially explained by high perceived-stress and low satisfaction with organization <ul style="list-style-type: none"> ○ Supports that organizational interventions to alleviate burnout may offset emotional exhaustion

Pub. Year Author's Last Name	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			<p>superiors, 101 (38.4%) work overload, 66 (25.1%) indiscipline of surgeons, 54 (20.5%) lack of working conditions (e.g., inappropriate working resources, lack of nursing staff) and 34 (12.9%) technically difficult situations (e.g., airway management).</p>	
2005 Kinzi, Knotzer, Traweger, Lederer, Heidegger, & Benzer	Influence of working conditions on job satisfaction in anaesthetists	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • Anesthetists in leading positions and specialists reported lower job satisfaction than anesthetists in non-leading positions • Job satisfaction associated with better health ($P=0.001$) and emotional well-being ($P=0.005$) • Control over work (e.g. influence on handling tasks ($P= 0.001$), time control ($P=0.002$), and participation ($P=0.001$)) had strong effect on job satisfaction • Task demands and task-related problems did not have any effect on job satisfaction • Anaesthetists in leading positions and specialists reported lower job satisfaction ($P=0.012$) than did anaesthetists in non-leading positions. Job satisfaction was associated with better physical health ($P=0.001$) and better emotional well-being ($P=0.005$). 	<ul style="list-style-type: none"> • High levels of job satisfaction correlate with interesting job demands and more opportunities to contribute ideas and skills • Supports idea that improving work conditions, more control over decision-making, and having more influence over work-place and schedule will improve job satisfaction

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2003 Kluger, Townend, & Laidlaw	Job satisfaction, stress and burnout in Australian specialist anaesthetists	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • Although burnout levels are high in anesthetists, they compare favorably with other medical practitioners • 422 respondents. Female anesthetists reported higher levels of burnout than males ($p=0.006$), but tend to prioritize home/work commitments better than males ($p= 0.05$). • Top ranked stressful job aspects include time constraints (83% agree) and interference with home life (75% agree) • Job satisfaction correlated with high standard of practice and practical aspects and may be a protective factor against burnout for physicians • Dissatisfaction of job correlated with poor recognition (81% agree) and long hours (79% agree) • Low levels of personal achievement were seen most in respect to burnout among respondents (36%) compared to high emotional exhaustion and high levels of depersonalization 	<ul style="list-style-type: none"> • Supports use of MBI survey in Australian anesthetists • Supports the idea that aspects of the anesthetist's job warrant further attention to improve job satisfaction and stress
2003 Nyssen, Hansez, Baele, Lamy,& De Keyser	Occupational stress and burnout in anesthesia	Peer-reviewed article, prospective cross-sectional study	<ul style="list-style-type: none"> • The mean stress level in anesthetists was 50 (not higher in other working populations) • Three main sources of stress: 1) lack of control over time management, 2) work planning, 3) and risks • Anesthetists report high empowerment, high work 	<ul style="list-style-type: none"> • Supports need for burnout prevention due to high levels of stress found in anesthesia providers • Supports organizational interventions (e.g., advice, specialist counsellor when problems occur in work environment), improving social support to help manage stress

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			commitment, high job challenge and high satisfaction <ul style="list-style-type: none"> • 40% of the group suffered from high emotional exhaustion (burnout); Highest rate was in young trainees less than 30 years old 	
2001 Maslach	What have we learned about burnout and health?	Expert opinion	<ul style="list-style-type: none"> • Burnout be identified and distinguished from a normal baseline and other clinical factors. • Burnout may be more significant in mediating job outcomes, such as behaviors (e.g., irritability, uncooperativeness) that affect the quality and efficiency of work 	<ul style="list-style-type: none"> • Situational and organizational factors play a more major role in burnout than individual variables • Supports both a personal and organizational approach for burnout prevention and mitigation measures
2001 Maslach, Schaufeli, & Leiter	Job burnout	Expert opinion	<ul style="list-style-type: none"> • The social focus of burnout and its correlations to work make a valuable contribution to the health and well-being of workers 	<ul style="list-style-type: none"> • Focusing on engagement (the opposite of burnout) yields new perspectives on interventions to alleviate burnout
1989 Hobfoll	Conservation of resources. A new attempt at conceptualizing stress	Peer reviewed article, qualitative study	<ul style="list-style-type: none"> • Weak link exists between current stress models and actual research 	<ul style="list-style-type: none"> • Model of conservation (stress model) is based on the idea that people strive to retain, project, and build resources, and a threat is the potential or loss of these resources • Provides a clear framework to define stress

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