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PHYSICIAN BURNOUT: SLOWING THE BURN THROUGH POSITIVE DEVIANCE STRATEGIES

SWAPNA REDDY

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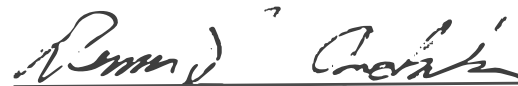
PHYSICIAN BURNOUT:
SLOWING THE BURN THROUGH POSITIVE DEVIANCE STRATEGIES
-DISSERTATION-

by
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SCHOOL OF PUBLIC HEALTH

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2020

DEDICATION

To the memory of Dr. Peter Wertheim, DO, MS.

PHYSICIAN BURNOUT: SLOWING THE BURN THROUGH
POSITIVE DEVIANCE STRATEGIES

by

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for the Degree of

DOCTOR OF PUBLIC HEALTH

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PHYSICIAN BURNOUT: SLOWING THE BURN THROUGH POSITIVE DEVIANCE STRATEGIES

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The University of Texas
School of Public Health, 2020

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Introduction: Affecting 42% of physicians in the United States, “physician burnout” is considered a public health crisis with adverse impacts for personal providers, patients and organizations. Though much research has been devoted to the existence and causes of burnout, to date few studies have been conducted to identify factors associated with physician fulfillment.

Aims: This dissertation research was intended to increase and improve knowledge of factors effective in contributing to physician professional fulfillment utilizing a Positive Deviance based approach. To that end, two studies were conducted: the first, a narrative review of the literature to identify specific correlates of physician fulfillment and lower burnout; and second, a qualitative analysis of physician identified protective factors from burnout, and quantitative analysis of demographic and practice characteristics and their association with fulfillment and burnout from a survey of Arizona physicians.

Methods: In the narrative review, a four-phased approach was utilized. Guided by a Positive Deviance informed Social-Ecological framework, the review examined existing literature, including study design, setting, populations, positive and protective factors, key fulfillment outcomes, association of factors with outcomes and social ecological dimensions. In the qualitative study, physician beliefs about self-protection from burnout were categorized by three

thematic nodes, and emerging nodes by the inductive analysis, as well as subnodes. In the quantitative study, demographic data and practice characteristics were analyzed in which professional fulfillment and burnout were identified. A Chi squared test of significance and multiple logistic regression was conducted to identify associations between demographic data and practice characteristics with professional fulfillment and burnout.

Results: The narrative review identified 18 articles, which showed promising intervention strategies, especially through collaborative approaches across dimensions of the model, for physician fulfillment at: the individual level through mindfulness programs, coping strategies and resilience training; the interpersonal level through team building, strengthening support systems and mentorship; and the organizational level through expanding administrative support, changing incentive structures and workload alleviation. The qualitative analysis found that respondents perceived the most protective factors from burnout to be time away from clinical practice, physician-initiated solutions, reduced clinical effort, professional autonomy and control over clinical practice. An emergent node, “No Knowledge/lack of Awareness” had almost 14 percent of respondents. Quantitative findings suggest that physicians who self-identify as male, are older, own their clinical practice and several years of clinical practice experience have more professional fulfillment, and younger physicians and inpatient physicians have more burnout.

Conclusion: Narrative review findings suggest that correlates and strategies aimed at reducing burnout and increasing physician fulfillment focused on lower levels of the ecological model, representing missed opportunities for examining higher population based levels of the model and indicating a need for future research to fill this gap. The qualitative analysis findings suggest a need for future research of promising strategy approaches at the individual physician and peer interpersonal levels, and how those approaches may be incorporated into organizational based

interventions. Quantitative findings can serve as a foundation to direct future research on causes of professional fulfillment and burnout.

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BACKGROUND

Introduction

Burnout among physicians is a topic gaining increasing attention, often as it relates to career satisfaction and depression for providers (Shanafelt et al., 2017). Currently, physician burnout affects 42 percent of physicians in the U.S. (Kane L. 2020) and of countries examined globally, the range varies from 22 percent of physicians in the United Kingdom up to 37 percent of physicians in Spain (Medscape, 2020). Burnout is a critical issue not just in terms of physician satisfaction, but also as it relates to our ability to meet the health care needs, both in quality and capacity, for a rapidly changing population (Datz, 2019).

Despite decades of research documenting burnout and its causes, many questions persist regarding effective solutions and interventions. Consequences for patients interacting with providers experiencing burnout include lower patient satisfaction and care quality, higher medical error rates and malpractice risk, higher physician and staff turnover, and physician impairment due to substance use or abuse (Shanafelt et al., 2005; Firth-Cozens et al., 1997; Shanafelt et al., 2002; Williams & Skinner, 2003; Gardinger et al., 2005). The cumulative impact of these consequences and others has led numerous major journals and thought leaders in the field to declare physician burnout a public health crisis (Jha et al., 2019).

What is “Physician Burnout?”

The term “physician burnout” refers to the destructive symptoms of depleted physical and emotional motivation to practice medicine, depersonalization or lessened empathy, decreased confidence in the value of one’s work as a physician and loss of work fulfillment (Drummond, 2015; Dyrbye et al., 2017; Amofo et al., 2015). Endemic physician burnout currently affects

almost half of all physicians in the U.S. (42%), the highest reported out of all countries examined globally in the Medscape 2020 report on the subject (Kane 2020). In response to the growing evidence that physician burnout is endemic and affects patient outcomes, The Action Collaborative on Clinician Well-Being and Resilience was launched by the National Academy of Medicine (NAM) in January 2017 to address this significant public health crisis (Dyrbye et al., 2017).

Burnout can impact at the personal provider level, often manifested through depression, on a patient level, manifested through detachment or reduction in quality of care, and at the organizational level, reflected in resentment towards policies and systems and an unwillingness to remain (Amofo et al., 2015). Physician burnout and fatigue are independently associated with double the risk of medical errors and a 17% increased likelihood of involvement in medical malpractice related litigation (Tawfik et al., 2018). Additionally, dissatisfied physicians are two to three times more likely to leave their practice, resulting in access and continuity of care limitations for patients and escalating costs for health care delivery systems (Amofo et al., 2015).

Theoretical Framework: Positive Deviance Approach

This study was rooted in a Positive Deviance theoretical and conceptual framework, which guided the overall study questions and approach. A positive deviance approach posits that “in most settings a few at risk individuals follow uncommon, beneficial practices and consequently experience better outcomes than their neighbors who share similar risks” (Berggren, 2002, p.9). The positive deviance approach utilizes three processes: 1.) *Social Mobilization*, in which participants are motivated by learning about positive individual or group

self-behaviors, instead of criticism, and that a successful solution may already exist within their community; 2.) *Information Gathering*, in which in depth inquiries and community norm studies are used to identify transferable behaviors and enabling factors that are likely to account for the identified individual or group's positive outcome; 3.) *Behavior Change*, in which interventions are suggested that are accessible, acceptable and sustainable, and which are either quickly adoptable or can be implemented incrementally (Berggren, 2002).

Positive deviation innovations among health care professionals use and adapt Berggren's three core actions (Berggren, 2002). Regarding physician burnout, a positive deviance framework identifies innovative practices by physicians and/or organizations, often originated within clinical communities that result in the reduction or avoidance of burnout (Baxter, 2016). This approach favors positive interactions with members involved, to identify areas for improvement for clinicians experiencing burnout.

Public Health Significance

The relationship between physician burnout and the quality of health care may yield serious potential consequences for all patients, but especially those already experiencing challenges to access to care. According to the 2020 Medscape National Report on Physician Burnout and Depression, 42% of physicians in the United States report feeling burned out, while 11% reported they were colloquially depressed, otherwise described as feeling down or blue, and 4% reported clinical depression (Kane, 2020). For reference, 44% of physicians reported burnout in 2019, 42% in 2018, 43.9% in 2017, 54.4% in 2014 and 45.5% in 2011 (Kane, 2019; Shanafelt et al., 2017; Peckham, 2018). The escalating prevalence of “burnout” among physicians is a

significant multi-faceted problem leading to career dissatisfaction, early retirement, depression, and even suicide (Peckham, 2018; Dyrbye et al., 2008).

Burnout has resulted in significant costs to those in the health care industry at the personal, professional and systemic levels, as well as to patients through issues in quality of care, medical care and access to vital services. It is associated with a two-fold increased risk of experiencing suicidal ideations in a population with a suicide rate that is already much higher than the rest of the community (40% higher for males, and 130% higher for female physicians) (Schernhammer, 2005). One recent study conservatively estimates that as much as \$4.6 billion is lost each year to burnout, or \$7,600 per employed physician (Han et al., 2019). As burnout has led to higher rates of attrition by physicians, there are steep economic consequences to the employers of lost physicians; the revenue lost per full-time-equivalent physician is estimated to be roughly \$1 million, and the recruitment process to replace a physician can range from \$500,000 to \$1 million (Shanafelt et al., 2017). Financial losses to hospitals and health care systems at this level further exacerbate strains to limited resources and reduce the capacity for these entities to meet the health care needs of their patients and communities (Shanafelt et al., 2017; Han et al., 2019).

As it relates to physician specialties, primary care specialties reporting the highest rates of burnout include family medicine, obstetrics and gynecology and internal medicine, all of which are of disproportionately high need and low supply in physician shortage areas (Peckham, 2018) (See Appendix A). Physicians experiencing burnout are more likely to leave the field of medicine mid-career, reduce office hours, and refuse new patients, all adding complex roadblocks to access and continuity of care for patients (Greenspoon, 2018). As such, physician

burnout can lead to a decrease in the number of providers, especially primary care, which can stress a system already experiencing challenges to meeting the needs of our population. The impact of physician burnout on access to care and availability of practitioners is especially concerning in states such as Arizona, the focus of this dissertation research, in which 70% of the population live in areas with a shortage of healthcare professionals (Eng, 2011).

The Positive Deviance Approach represents a promising theoretical framework to explore in addressing this public health crisis. Positive deviance has been embraced as a successful approach to improve quality and safety within health care systems and organizations (Marra et al., 2010). This approach is predicated on the concept that many successful interventions are originated and championed by clinical communities themselves, rather than from external stakeholders and as such, identifiable internal stakeholders have tacit knowledge and wisdom that can be generalizable and scalable (Lawton et al., 2014). Physicians experiencing professional fulfillment, or those who experience “happiness or meaningfulness, self-worth, self-efficacy, and satisfaction at work,” are well positioned to “not only to practice the art and science of clinical care, but also to lead the effort to identify and implement much-needed improvements to our systems of care (Bohman et al., 2017).” In this way, focusing on the positive disruptors or factors of deviance that contribute to professional wellness in an effort to identify best practices, policies and approaches that lead to improved physician well-being have a direct impact and benefit for patients and communities.

While physician burnout has gained much attention, most of the scientific literature in this space is focused on measuring burnout or its causes. This dissertation research aimed to move past simply the reporting phase of burnout to focus instead on methods, narratives and

approaches rooted in a positive deviance approach aimed at identifying protective factors against physician burnout and positive factors for the promotion of physician professional fulfillment.

Dissertation Goals, Research Questions and Study Aims

This dissertation research was intended to increase and improve knowledge of factors and approaches that are effective in contributing to physician professional fulfillment and wellbeing through an exploration of existing literature, as well as an analysis of qualitative and quantitative data on the physician perspective of professional fulfillment burnout. This was accomplished through the use of two studies: Study 1 is a narrative review of the literature to identify specific correlates of physician fulfillment and lower burnout; and Study 2 is a secondary analysis of an existing survey of Arizona physicians that included qualitative analysis of physician identified protective factors from burnout, and quantitative analysis of demographic and practice characteristics and their association with fulfillment and burnout.

The specific study aims are organized by each study and are as follows:

Study 1, “A narrative review of the literature on factors associated with lower physician burnout and higher physician well-being.”

1. To identify the protective and positive factors that reduce physician burnout and lead to professional fulfillment and well-being among physicians in the U.S, guided by a positive deviance informed social-ecological framework, via a narrative review of the scientific/peer reviewed literature; and
2. To describe the application of interventions that operationalize positive deviance approaches through various uses of positive and protective factors aimed at reducing

physician burnout and increasing personal fulfillment and well-being via a review of the literature, including types of interventions, populations, study designs and outcomes.

Study 2, “Determining physician perspectives, practices and other factors that lead to professional fulfillment and wellness or decrease burnout.”

1. To identify physician beliefs about self-protection from burnout among a sample of Arizona physicians categorized by three conceptual groupings: Culture of Wellness, Efficiency of Practice and Personal Resilience;
2. To examine the prevalence of physician professional fulfillment and burnout by demographic characteristics such as gender, age, degree, and ethnicity in a sample of physicians practicing in Arizona;
3. To examine the prevalence of physician professional fulfillment and burnout by physician practice characteristics such as work hours, size of practice, employed or owner status, clinical time and years in practice among a sample of physicians practicing in Arizona; and
4. To assess the association of physician demographic and practice characteristics with physician fulfillment and physician burnout in a full model using a multiple logistic regression analytic approach among a sample of physicians practicing in Arizona.

JOURNAL ARTICLE 1

Title of Journal Article: “A narrative review of the literature on factors associated with lower physician burnout and higher physician well-being.”

INTRODUCTION

The term “physician burnout” refers to the destructive symptoms of depleted physical and emotional motivation to practice medicine, depersonalization or lessened empathy, decreased confidence in the value of one’s work as a physician and loss of work fulfillment (Drummond, 2015; Dyrbye et al., 2017; Amofo et al., 2015). Currently, physician burnout affects 42 percent of physicians in the U.S. (Kane, 2020) and of countries examined globally, the range varies from 22 percent of physicians in the United Kingdom up to 37 percent of physicians in Spain (Medscape, 2020). As an indicator of the magnitude of this public health issue, the Action Collaborative on Clinician Well-Being and Resilience was launched by the National Academy of Medicine (NAM) in January 2017 in response to the emerging body of evidence that physician “burnout” is endemic and affects patient outcomes (Dyrbye et al., 2017).

Burnout has adverse impacts at the personal provider level, often manifested through depression; on a patient level, manifested through detachment or reduction in quality of care; and at the organizational level, reflected in resentment towards policies and systems and an unwillingness to remain (Amofo et al., 2015). On a personal level, burnout is defined as an erosion of the soul caused by a deterioration of one's values, dignity, spirit, and will (Maslach & Leiter, 1997). Physician burnout and fatigue are independently associated with double the risk of medical errors and a 17% increased likelihood of involvement in medical malpractice related litigation (Tawfik et al., 2018). Additionally, dissatisfied physicians are two to three times more

likely to leave their practice, resulting in access and continuity of care limitations for patients and escalating costs for health care delivery systems (Amofo et al., 2015). While a growing evidence base has identified physician burnout as a key health concern among physicians (Noseworthy et al., 2017; Dyrbye et al., 2017), to date few studies have been conducted to identify factors associated with physician fulfillment and well-being.

Burnout is a critical issue not just in terms of physician satisfaction, but also as it relates to our ability to meet the health care needs, both in quality and capacity, for a rapidly changing patient population (Shanafelt et al., 2017). Consequences for patients interacting with providers experiencing burnout include lower patient satisfaction and care quality, higher medical error rates and malpractice risk, higher physician and staff turnover, and physician impairment due to substance use or abuse (Dyrbye et al., 2017). The cumulative impact of these consequences and others has led numerous major journals and the lay press to declare physician burnout a public health crisis (Jha et al., 2019; Han et al., 2019; Shanafelt et al., 2017; Noseworthy et al., 2017; Bohman et al., 2017).

While there is an extensive body of literature on the existence of physician burnout and potential causes, less focused attention has been paid to practices and factors that serve to prevent or protect physicians from the issue. In an effort to move past simply the reporting phase of burnout and into the interventions and solutions phase, it is critical to understand current research in order to inform new research methods, narratives and approaches that advance the discussion. In exploring approaches to reduce physician burnout, there has been increasing interest in examining positive and protective factors that lead to personal fulfillment and well-being for physicians, as an antidote to burnout, in the literature (Bohman et al., 2017).

The overarching aim of this narrative review is to identify specific correlates of physician fulfillment and lower burnout for physicians practicing in the United States across medical specialties and in a variety of clinical venues. The goal of the review is to inform future etiologic and intervention research, identify current intervention strategies that may hold promise for future systematic reviews, and to identify gaps in the literature (which may relate to the populations being studied or not, the types of studies available to assess correlates of fulfillments, as well as the measures that have been used) in order to inform future research. The specific aims of this study were as follows: 1.) To identify the protective and positive factors that reduce physician burnout and lead to professional fulfillment and well-being among physicians in the U.S, guided by a positive deviance informed social-ecological framework, via a narrative review of the scientific/peer reviewed literature; and 2.) To describe the application of interventions that operationalize positive deviance approaches through various uses of positive and protective factors aimed at reducing physician burnout and increasing personal fulfillment and well-being via a review of the literature, including types of interventions, populations, study designs and outcomes.

METHODS

This study is guided by a narrative review approach, which consists of reviewing the existing scientific literature on topical or thematic subjects from both theoretical and contextual perspectives (Collins & Fauser, 2005). These types of secondary research reviews consist of a “critical analysis of the literature” (Green et al., 2006) and are useful to address one or more questions on topics in which the narrative voice, or thread, may be lost in the restrictive methodological structure of a traditional systematic review (Pautasso, 2013). Narrative reviews

are also particularly useful in providing rationale for new research and speculation on new types of interventions (Collins & Fauser, 2005). In this way, narrative reviews offer opportunities for a wider scope on a particular research question.

Theoretical Framework

This narrative review was guided by both a positive deviance theoretical orientation as well as a social-ecological conceptual framework. A Positive Deviance approach is one that is predicated on the concept that many successful interventions are originated and championed by clinical communities themselves, rather than from external stakeholders and as such, identifiable internal stakeholders have tacit knowledge and wisdom that can be generalizable and scalable (Lawton & Clay-Williams, 2014). Importantly, positive deviance guides the health planner and researcher from focusing on just the factors associated with ‘the problem’, to identifying the ‘positive deviants’ or those factors associated with the positive health outcome. This approach has been embraced as a successful approach to improve quality and safety within health care systems and organizations (Marra et al., 2010).

The Social Ecological Model holds promise to assist in guiding the identification of positive factors associated with increased physician fulfillment and well-being at the intrapersonal, interpersonal, organizational, community and societal/public policy levels (Sallis et al., 2006; Sallis and Owen, 2015; Carmack 2019). In this study, both positive factors related to fulfillment and protective factors against burnout are explored. The Social Ecological Model served as a complement to the Positive Deviance approach for the present study by contextualizing individuals’ protective factors against burnout and in support of fulfillment using dimensions including intrapersonal (e.g. knowledge, attitudes, behavior), interpersonal/network

(social networks, social support), organizational (e.g. institutional characteristics, rules and regulations for operation), community (e.g. relationships among organizations/ institutions), and public policy (e.g. local, state, national laws) concepts and provided a framework for describing the interactions between these levels. Identifying factors at these levels and their context in relation to each other regarding physician burnout is key to better understanding a systems approach, including ecosystem influences, for moving the needle forward in developing responsive interventions and solutions. Research by Britt et al. (2017) examined the application of the Social Ecological Model to reduce burnout in advanced practice professionals utilizing a statewide collaborative, and found the approach ensured that various stakeholders recognized that individual clinicians were nested in organizations led by individuals who were impacted by external influences. The results revealed that combined efforts across social ecological dimensions- building from the construct of ‘interactions of influence’ across levels (Sallis & Owen, 2015), rather than efforts focused solely on individuals, enabled collaborative action to address external pressures and learning environments across sites and systems to mitigate burnout (Britt et al., 2017).

Study Procedures

In conducting this narrative review, the general framework for narrative reviews delineated by Liberati, et al., 2009 was followed, which utilizes a four-phased review approach based on an Identification, Screening, Eligibility and Inclusion structure.

Identification. This narrative review began with the “Identification” phase, a systematic search of the literature to locate articles that studied physician burnout and related protective and positive

factors. Published studies were identified through searches of the following electronic bibliographic databases with the assistance of a university librarian: PUBMED, Medline and Google Scholar between January 2000 and December 2019. The following keywords were selected for the database search: “physician burnout,” "positive deviance," "protective factors," "physician resilience," "physician wellness," "Maslach," "Personal Fulfillment Index," "physician suicide," and "physician depression.” These key search terms were intended to capture the breadth of the literature examining positive and protective factors for physician burnout that lead to professional fulfillment (*Figure 1*). Search strategies also encompassed oversight from a university librarian and the use of database filters. Of the initial articles produced through the search, duplicates were removed. Remaining articles went on to the second phase of narrative review.

Figure 1: Detailed search terms for study identification, “A narrative review of the literature on factors that contribute to lower physician burnout and higher physician well-being.” (Template adapted from Mehtala et al., 2014).

Database	Search Terms
PUBMED	(physician burnout) AND (positive deviance) OR (physician burnout) AND (protective factors) OR (physician burnout) AND (physician resilience) OR (physician burnout) AND (physician wellness) OR (physician burnout) AND (Maslach) OR (physician burnout) AND (Personal Fulfillment Index) OR (physician burnout) AND (physician suicide) OR (physician burnout) AND (physician depression)
	Limiters: Language (English)
Medline	(physician burnout) AND (positive deviance) OR (physician burnout) AND (protective factors) OR (physician burnout) AND (physician resilience) OR (physician burnout) AND (physician wellness) OR (physician burnout) AND (Maslach) OR (physician burnout) AND (Personal Fulfillment Index) OR (physician burnout) AND (physician suicide) OR (physician burnout) AND (physician depression)
	Limiters: Language (English)
Google Scholar	(physician burnout) AND (positive deviance) OR (physician burnout) AND (protective factors) OR (physician burnout) AND (physician resilience) OR (physician burnout) AND (physician wellness) OR (physician burnout) AND (Maslach) OR (physician burnout) AND (Personal Fulfillment Index) OR (physician burnout) AND (physician suicide) OR (physician burnout) AND (physician depression)
	Limiters: Time (2000-2019)
Total References Retrieved: 105	

Screening. To be eligible for the second phase of the narrative review, the “Screening” phase, titles and abstracts were screened based upon inclusion and exclusion criteria regarding restrictions on: a.) the types of studies (i.e. peer reviewed articles including original research, systematic reviews and grey literature including reports, white papers, government documents); b.) publication date (between January 2000 and December 2019); and c.) location of study

(United States). Location was specified as it was determined that although burnout exists in other countries, the American healthcare system, its challenges and causes for burnout are too specific to the experiences of practicing medicine in the United States to be able to generalize research and findings from other nations. Unpublished manuscripts and dissertations were excluded. Studies focusing exclusively on the incidence or causes of physician burnout were also excluded. Remaining articles continued to the third phase of the narrative review.

Eligibility. Within the Eligibility phase, the third phase of the narrative review, the remaining articles were examined to confirm that the full articles that were available met inclusion/exclusion criteria upon full article review. As for the articles in which the full text was not available, they were excluded in this phase. Furthermore, articles that were inaccessible due to private publications were also excluded in this phase. Lastly, the remaining full articles were reviewed in entirety to confirm applicability as defined by the inclusion criteria for the narrative review. The relevance in relation to inclusion/exclusion criteria and scientific integrity of these articles were examined as the standards of final inclusion.

Inclusion. For the final phase of the narrative review, the Inclusion stage, the articles selected for final inclusion were reviewed and evaluated with the use of a summary evidence table. Each article was reviewed under the ten domains of the summary evidence table (Reference, Study Design, Setting, Sample, Positive and Protective Factor(s), Conclusion, Comments, Key Fulfillment Outcomes, Association of Factors with Outcomes and Social Ecological Dimension). A key intention of this process was to include articles that were solutions or interventions focused, rather than simply describing the incidence or causes of physician burnout.

The author is a principal investigator on the study, a collaboration with the Arizona State University's College of Health Solutions (CHS). The study was reviewed and declared exempt for Internal Review of the UTHHealth Committee for the Protection of Human Subjects.

RESULTS

Identification

The Identification phase of the narrative review resulted in 105 records, of which 7 duplicate records across were excluded, resulting in 98 titles and abstracts for the “screening” phase of the review (*Figure 2*).

Screening

The Screening phase of the narrative review began with 98 titles and abstracts for review of inclusion criteria. Of those, 64 titles and abstracts were excluded for not meeting the inclusion criteria for the following reasons: 37 were not published in the United States, 26 were not applicable to the subject matter and 5 were incorrect study type. As such, 30 full articles were subsequently reviewed in the “Eligibility” phase (*Figure 2*).

Eligibility

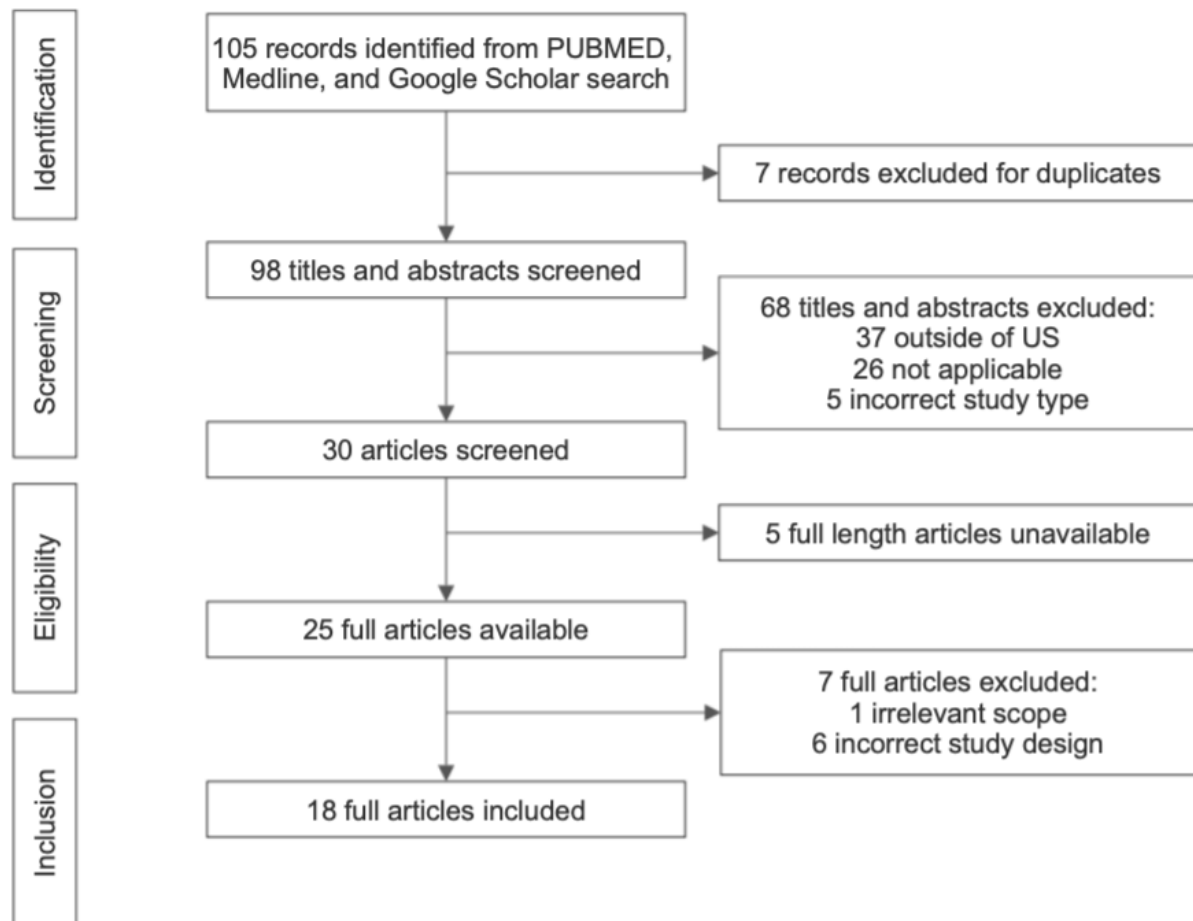
The Eligibility phase of the narrative review began with an effort to review 30 full articles for review of eligibility criteria. Of those, 5 articles were excluded for not meeting the eligibility criteria as the complete articles were not available. As such 25 full articles subsequently reviewed in the “Inclusion” phase (*Figure 2*).

Inclusion

The Inclusion phase of the narrative review began with 25 full articles for review of inclusion criteria. Of those, 7 articles were excluded for not meeting the inclusion criteria for the

following reasons: 1 for an inapplicable scope (focusing on causes rather than solutions to burnout) and 6 for their non-applicable study design (discussions, commentaries, opinions, and personal viewpoints). As such, 18 full articles remained and were included in the narrative review (*Figure 2*).

Figure 2: Flow diagram for study selection, “A narrative review of the literature on factors that contribute to lower physician burnout and higher physician well-being.” (Template adapted from Liberati et al., 2009).



Descriptive Characteristics of Studies Reviewed

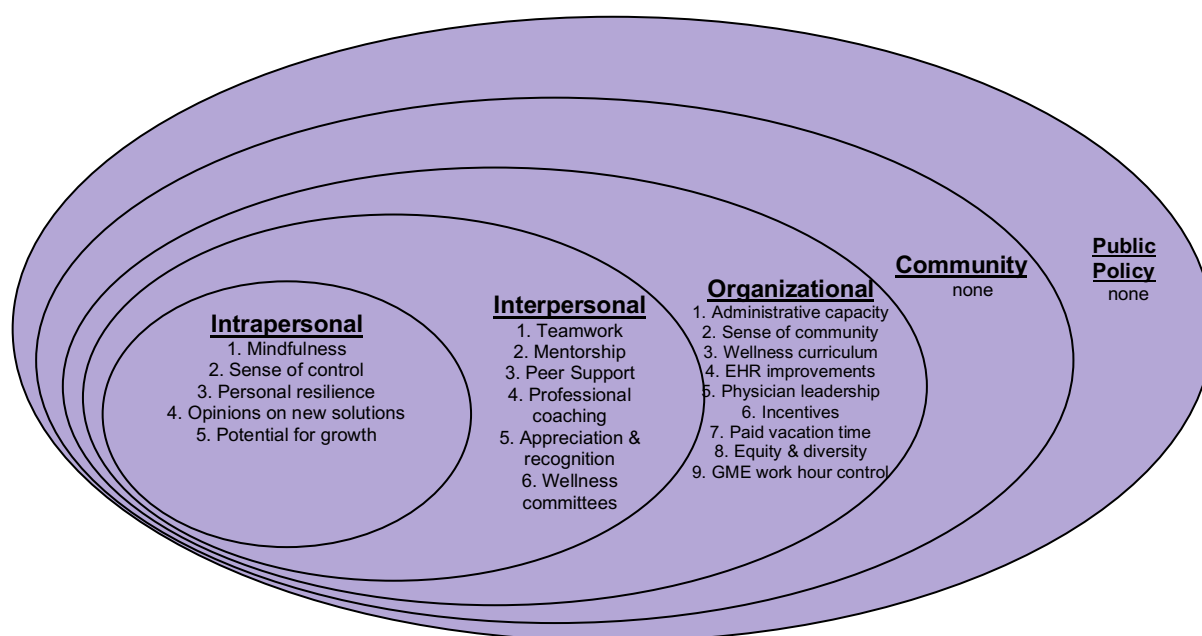
All included 18 articles for review were identified by their study design, setting, sample and positive and protective factors. An extraction table was utilized to identify these elements for each article, as well as draw conclusions and comments regarding each article and approach (*See Appendix B*). Studies reviewed comprised various study designs, including scoping reviews (n=7), cross-sectional studies (n=6), randomized clinical trials (n=2), a systematic review (n=1), a literature review (n=1), and a consensus review (n=1). Studies were primarily based at academic medical centers (n=7), yet several did not have a setting specified or necessitated relative to the study design. The remaining studies were set at a large research institution (n=1), national professional organization (n=1), and large integrated health care system (n=1). Medical specialties observed including family medicine (n=2 studies), psychiatry (n=1 study), internal medicine (n=1), pediatrics (n=1 study), as well as a study including multiple specialties (n=1). Several studies did not specify the subjects (n=14).

Positive and Protective Factors

Positive and protective factors associated with increased physician fulfillment and well-being in each of the included articles were then identified, followed by a listing of key fulfillment outcomes, the association of identified positive and protective factors with outcomes and the applicable dimensions of the Social Ecological Model, intrapersonal, interpersonal, organizational, community and/or public policy (*Table 1*). Utilizing a positive deviance approach and guided by the Social Ecological Model, the factors in the published literature were grouped by these five dimensions to better recognize and contextualize those that emerged, as well as recognize those that did not, through the positive and protective factors, and their interaction for

the purpose of identifying those factors which hold the highest promise for successful interventions and where gaps remain in the literature (*Figure 3*).

Figure 3: Social Ecological Model diagram for theoretical contextualization, dimensions and positive and protective factors examined in order of frequency, “A narrative review of the literature on factors that contribute to lower physician burnout and higher physician well-being.” (Figure template adapted from McLeroy et al., 1988; Lawton & Clay-Williams, 2014).



Intrapersonal Level Factors (10 articles). One of the most common domains represented in the review was that of intrapersonal level factors, or those that involve individual knowledge, attitudes and personal behaviors. Strategies used to target the intrapersonal factor of individual knowledge involved avoiding ambivalence (Sotile et al. 2019) and gaining a sense of balance (Chetlen et al., 2018). The majority of strategies in this review that addressed intrapersonal level

factors, targeted the factor of attitudes. These strategies included perceived sense of control (Miller et al., 2010; Anandarajah et al., 2018; Chetlen et al., 2018; Olson et al., 2019), personal resilience (Taku K., 2014; Sotile et al., 2019; Buck et al., 2019), perceived sense of control (Miller et al., 2010; Anandarajah et al., 2018; Chetlen et al., 2018; Olson et al., 2019), individual opinions on new solutions (Wei, et al., 2016), perceived potential for growth (Taku K., 2014) and perceptions of self-pride (Eckleberry-Hunt, et al., 2017). Many studies utilized the strategy of mindfulness, targeting the factor of attitudes, though the strategy was never a specific intervention, rather always incorporated within other intervention approaches (Buck et al., 2019; Chetlen et al., 2018; Miller et al., 2010; Patel et al., 2019; Sotile et al., 2019; Wei et al., 2016). To target the factor of personal behaviors, strategies utilized empathy towards patients (Eckleberry-Hunt, et al., 2017) and participation in scholarly activities (Anandarajah et al., 2018).

Interpersonal Level Factors (6 articles). Another domain represented in the review was that of interpersonal level factors, or those involving social networks and social support. Strategies used in the literature to target the interpersonal level factor of social networks included peer support programming (Olson et al., 2019; Patel et al., 2019), professional coaching (Gazelle et al., 2015; Patel et al., 2019) and wellness committee activities (Chetlen et al., 2018). To address the factor of social support, strategies utilized were teamwork (Chetlen et al., 2018; Anandarajah et al., 2018), mentorship (Chetlen et al., 2018; Miller et al., 2010) and appreciation and recognition (Olson et al., 2019).

Organizational Level Factors (14 articles). The most common domain represented through the review was that of organizational level factors, or those that apply to institutional

characteristics or rules and regulations for operation. Strategies to target the organizational factor of institutional characteristics included increasing administrative capacity (Anandarajah et al., 2018; Gregory et al., 2018; Patel et al., 2019; Rosenstein AH, 2012; Sotile et al., 2019) fostering sense of community across the organization (Olson et al., 2019; Sotile et al., 2019; Swensen et al., 2017; Wei et al., 2016; West C, 2017), wellness based curriculums (Buck et al., 2019; Rosenstein AH, 2012; Siedsma et al., 2015), solicitation of physician feedback across an organization (Swensen et al., 2017; Sotile et al., 2019; Wei et al., 2016), wellness culture promotion (Rosenstein AH, 2012; Sotile et al. 2019; Swensen et al., 2017), physician leadership (Chetlen et al., 2018; Henson JW, 2016), equity and diversity efforts (Olson et al., 2019) and improved conditions for physician trainees (Patel et al., 2019). Strategies to target the organizational factor of rules and regulation for operation were electronic health record improvements (Olson et al., 2019; Rosenstein AH, 2012; Chetlen et al., 2018), incentives (MacKinnon et al., 2018; Miller et al., 2010) and increasing reimbursed vacation time (Patel et al., 2019; Rosenstein AH, 2012).

Community Level Factors (0 articles). The community level domain, or factors examining relationships among and between organizations and institutions and the broader community, was not represented in this review through any of the included articles.

Public Policy Level Factors (0 articles). The public policy level domain, or factors examining local, state or national laws and systems, was not represented in this review through any of the included articles.

Table 1: Summary Evidence Table for “A narrative review of the literature on factors that contribute to lower physician burnout and higher physician well-being.”

1	2	3	4	5	6	7	8	9	10
Reference	Study Design	Setting	Sample	Positive/Protective Factors	Conclusion	Comments	Key Fulfillment Outcomes	Association of Factors with Outcomes	Dimensions of Social Ecological Model
Anandarajah, A. P., Quill, T. E., & Privitera, M. R. (2018). Adopting the Quadruple Aim: The University of Rochester Medical Center Experience: Moving from Physician Burnout to Physician Resilience. The American Journal of Medicine, 131(8), 979–986.	Cross-sectional	Academic medical center-Strong Memorial Hospital/University of Rochester	528 Academic physicians-Neurology Psychiatry & Internal Medicine	Participation in patient care, teamwork, scholarly activities, autonomy.	Increase the role of institutions in developing a wellness structure and a business model that provides support for physicians such as: 1.) hiring medical assistants and scribes, 2.) expanding and enhancing the role of nurses, 3.) adequate training for support staff to assist with clerical needs.	Primarily easing administrative burden and developing teamwork so that physicians can focus on clinical practice.	Factors related to sustaining a sense of meaning: clinical care (53%), teamwork (24%), scholarship/research (19%), teaching (19%), respect (11%), autonomy (8%), medicine as calling (4%).	Collaboration between physicians and health care organizations to acquire new skills that strengthen resilience, enhance teamwork, and improve efficiency results in high-quality patient care and improved job satisfaction.	Intrapersonal Interpersonal Organizational
Buck, K., Williamson, M., Ogbeide, S., & Norberg, B. (2019). Family Physician Burnout and Resilience: A Cross-Sectional Analysis. Family Medicine, 51(8), 657–663.	Cross-sectional	Residency Research Network of Texas	295 Family med physicians & residents from 11 residency programs	Psychological flexibility, resilience.	Organizational practice change is needed through evolved workplace policies, individual-level wellness programming, curricula for family medicine residents and faculty to impact provider wellness.	Focuses on individual behaviors and traits that enhance resilience and enhanced organizational curriculum.	No statistically significant predictive values found for resilience.	Reflects the current state of resilience as a somewhat nebulous concept, and may also reflect the difficulties experienced across residencies of putting resilience education into a practical framework.	Intrapersonal Organizational

Chetlen, A. L., Chan, T. L., Ballard, D. H., Frigini, L. A., Hildebrand, A., Kim, S., Brian, J. M., Krupinski, E. A., & Ganeshan, D. (2018). Addressing burnout in radiologists. Elsevier, 26(4), 526–533.	Systematic review	National Cancer Institute, National Institutes of Health	N/A	Restoring balance (physical, emotional, work/life, relationships), mindfulness, cognitive behavioral therapies, mental health support, confidence/communication education, small group sessions, transparent leadership, routine wellness checks, mentorship, workflow autonomy, EMR/PACS support, team huddles, wellness committee, organizational resources	1. Physician-directed interventions (i.e. mindfulness, social/mental support) and 2. organization-directed interventions (i.e. transparent and communicative leadership, mentorship) are necessary to improve physician well-being.	Proposes wide array of methods to address burnout at several dimensions from personal care, team support/leadership, and organizational and structural support.	N/A (Outcomes not studied)	N/A (Outcomes not studied)	Intrapersonal Interpersonal Organizational
Eckleberry-Hunt, J., Kirkpatrick, H., Taku, K., & Hunt, R. (2017). Self-Report Study of Predictors of Physician Wellness, Burnout, and Quality of Patient Care. Southern Medical Journal, 110(4), 244–248.	Cross-sectional	American Academy of Family Physicians	444 family physicians	More flexible thinking, lower emotional distress, greater feelings of pride about work, less cynicism about patients, and higher reported quality of patient care	Self-reported mental health is the strongest predictor of physician well-being in their career, concluding that "when physicians believe their emotional health is good, they feel better about those they work with and the quality of their work."	Direct correlation noted of perceived well-being and actual wellbeing, but proposals to improve such were not suggested.	Leading predictors of stronger career meaning and wellbeing are 1.) higher physician self-rated mental health 2.) ability to manage workload, and 3.) more hours worked.	Mental health is a greater predictor of physician resilience and wellbeing than physical health.	Intrapersonal
Gazelle, G., Liebschutz, J. M., & Riess, H. (2015). Physician burnout: Coaching a way out. Springer, 30(4), 508–513.	Scoping review	N/A	N/A	Professional coaching (partnering with clients in a thought-provoking and creative process that inspires them to maximize their personal and professional potential)	Professional coaching to improve self-awareness, satisfaction, and support may promote resilience against the demanding field of medicine from an internal locus of control (does not address external locus of control).	Proposes social support solution to physician burnout (professional coaching). Notes a need for more research on the topic.	Seven to nine coaching sessions decreased burnout and increased life satisfaction. Recent meta-analyses of coaching in non-healthcare corporate settings showed improvement in well-being, self-efficacy, and goal-directed self-regulation.	Professional coaching has scant supporting evidence, though recent studies with small populations and heterogeneity showed improved outcomes (although applicability is limited by quality of studies).	Interpersonal
Gregory, S. T., Menser, T., & Gregory, B. T. (2018). An organizational intervention to reduce physician burnout. LLW, 63(5),	Cross-sectional	8 primary care clinics of a large, urban, integrated healthcare delivery system	112 physicians (unspecified)	(1) Establish personal work limits, (2) protect family time, (3) exercise, (4) practice relaxation, and (5) engage in humor	Organizational changes to reduce stress and administrative practices are recommended to combat physician burnout via workload interventions, as self-care interventions only increase capacity to endure stress rather than address the	Focuses on the organizational potential to ameliorate the stressful work environments that produce burnt-out physicians through institutional intervention strategies and reducing workload	The results of the analysis show a significant effect of the intervention: an improvement in workload of 0.61 units and a decrease in emotional exhaustion of 6.989 units among physicians in clinics receiving the intervention. The improvement in work-	These findings suggest two possibilities regarding the durability of the intervention: (1) The intervention had a short dose-response type of impact on the participants, or (2) there was an underlying temporal trend in workload that over time would reduce the impact	Organizational

338–352.					organizational issues at hand.		load occurs in the first follow-up period only—3 months after initiation of the intervention—and is not significant at the 6-month follow-up.	of the intervention.	
Henson, J. W. (2016). Reducing physician burnout through engagement. LLW, 61(2), 86–89.	Literature review	N/A	N/A	Strong, transparent, and supportive physician leadership	Choose physician leaders with great care and ensure that these leaders attend to the professional needs of those they lead by 1. supporting, 2. positioning, 3. empowering, and 4. engaging their staff.	Proposes a method to address burnout by focusing on the potential of strong leadership to adequately support physicians.	The leadership qualities of physician supervisors appear to impact the well-being and satisfaction of individual physicians working in health care organizations.	By redefining burnout as low engagement, physician leaders are better equipped to address dissatisfaction by encouraging and facilitating engagement and support at work.	Organizational
MacKinnon, M., & Murray, S. (2018). Reframing physician burnout as an organizational problem: A novel pragmatic approach to physician burnout. Springer, 42(1), 123–128.	Scoping review	N/A	N/A	Reframing burnout and depression as organizational problems.	Reframe physician burnout as an organizational problem. Suggested that healthcare organizations must be provided the proper incentives to enact workplace improvements for physicians	Encourages organizational accountability and increased engagement in combating burnout.	Changing from a 4-week attending rotation schedule to a 2-week schedule (i.e., reducing work overload and adding weekend breaks to previously continuous work schedules led to a decreased physician emotional exhaustion and burnout and moderate reduction in stress.	Organizational changes of workload and hours has been shown in multiple studies to reduce burnout.	Organizational
Miller, M. N., & McGowen, R. (2010). Strategies to avoid burnout in professional practice: Some practical suggestions. UBM LLC, 27(2), 25–25.	Scoping review	N/A	N/A	Age and experience (older/more experienced) due to developed protective defenses	Individual and interpersonal changes are encouraged to increase personal strength and wellbeing and social support systems through 1. Increased sense of control through engaging leadership, 2. group support, 3. mindfulness, 4. mentorship. Organizations need to be financially incentivized to address burnout.	Mainly focuses on individual positive practices and leadership/mentorship to share learned protective factors to foster a positive work experience.	Findings from a literature review indicate that a variety of factors may contribute to physician burnout. These include personal traits, such as perfectionism or obsessive worrying; the culture of medicine that promotes unbalanced lifestyles, expectations for personal invulnerability, and denial of personal needs; and recurring exposure to emotionally intense experiences, such as patient pain, suffering, and mortality.	Although external stressors themselves cannot always be changed, healthy approaches to lessen the stresses of medicine and avoid burnout can be learned at any age. The protective defenses that may be helpful include such strategies as learning to compartmentalize so that work can be left behind when there is time to relax. Use of such healthy defenses may help doctors avoid lapsing into depersonalization and distancing behaviors that are characteristic of burnout	Interpersonal Intrapersonal Organizational

Olson, K., Marchalik, D., Farley, H., Dean, S. M., Lawrence, E. C., Hamidi, M. S., Rowe, S., McCool, J. M., O'Donovan, C. A., Micek, M. A., & Stewart, M. T. (2019). Organizational strategies to reduce physician burnout and improve professional fulfillment. Current Problems in Pediatric and Adolescent Health Care, 49(12), 100664.	Consensus review	N/A	N/A	Shared common mission with leaders; feel valued, empowered, engaged by supervisors, feel part of effective team; sense of belonging/community; confident in importance of work; feel workplace is effective in service to profession	Organizational changes to improve wellbeing include: Strong leadership; Increase control/autonomy; Foster community; Appreciation/recognition; Equity/diversity efforts; Improve EHR; Encourage efficiency; Support healthy lifestyles; and. Peer support programs.	Primarily developing social support (improving culture of wellbeing, efficiency of practice, and personal resilience)	Control and autonomy, organizational equity efforts, and self-care prioritization all were shown to reduce burnout amongst physicians.	Physician burnout is an intersectional issue that requires efforts on all dimensions to improve wellbeing and job satisfaction, particularly regarding engagement, community, and support.	Intrapersonal Interpersonal Organizational
Patel, R. S., Sekhri, S., Bhimanadham, N. N., Imran, S., & Hossain, S. (2019). A Review on Strategies to Manage Physician Burnout. Cureus, 11(6), e4805.	Scoping review	N/A	N/A	Physician-directed interventions (personal coping strategies i.e. mindfulness), organization-directed interventions (workload alleviation)	Professional coaching and stress reduction programs; Social team building activities; Hospital protocols for work duty division and structured roles; Paid leave/time off; Funding for team building activities; Strict following of ACGME work-hour restriction guidelines are shown to develop a healthier generation of providers.	Propose wide array of potential solutions, does not give definitive answers. Conclusion focuses on organizational duties to improve job satisfaction and alleviate typical stressors	Top strategies to reduce physician burnout would be increasing financial compensation which would in turn decrease stress related to expenditures, introducing flexible schedules/.	Interventions to improve working conditions and mental health alleviate physician burnout.	Intrapersonal Interpersonal Organizational
Rosenstein, A. H. (2012). Physician stress and burnout: What can we do? American Association for Physician Leadership, 38(6), 22.	Cross-sectional	N/A	Over 2,000 practicing physicians nationwide across multiple specialties	Current organizational practices noted (most to least prevalent): wellness initiatives, coping education, on-site exercise classes, counseling, mentoring, social events, work accommodations, ancillary support, time off, gym memberships, concierge services	Physicians desire organizational support with (most to least demanded): ancillary support, on-site exercise classes, wellness initiatives, coping workshops, mentoring, administrative involvement, more paid vacation, better compensation, adequate staffing, better EMR, better	Does not note effectiveness of existing protective practices, only the prevalence of such and physician suggestions	N/A (Outcomes not studied)	N/A (Outcomes not studied)	Organizational

					call coverage, wellness resources.				
Siedsma, M., & Emlert, L. (2015). Physician burnout: Can we make a difference together? Springer, 19(1), 273.	Randomized clinical trial	Academic Medical Center-Department of Internal Medicine	75 physician trial participants 350 non trial participants in control group	Facilitated small group discussions-elements of mindfulness, reflection, shared experience and small group learning	Small-group curriculum improved meaning and engagement in work and reduced depersonalization, with sustained results 12 months after the study.	Organizational level wellness program	An intervention for physicians based on a facilitated small-group curriculum improved meaning and engagement in work and reduced depersonalization, with sustained results 12 months after the study.	Rates of depersonalization, emotional exhaustion, and overall burnout decreased substantially in the trial intervention arm, showing significant evidence that small-group support combats burnout.	Organizational
Sotile, W. M., Fallon, R. S., & Simonds, G. R. (2019). Moving From Physician Burnout to Resilience. Clinical Obstetrics and Gynecology, 62(3), 480-490.	Scoping review	N/A	N/A	Organizational: administrative support, survey staff, alleviate workload and improve efficiency, support programs and services, facilitate collab., adjust compensation, resilience training, solicit input and support. accept responsibility, detect changes in engagement, increase clinician activation, promote wellness culture, highlight resources. Individual (resilience challenge): beware of ambivalence, mindfulness, discuss issues, celebrate/uplift, work/life balance, deepen relationships, create support/ work community	Organizational engagement needed for all dimensions of the healthcare institution, as organizations hold the most control over physician/employee wellbeing. Intrapersonal efforts to promote resilience are only addressing the symptoms, whereas the organization can address the stressors at the root cause of burnout.	States that organizations are responsible for 90% or burnout, and 10% that individual physicians' responsibility.	Only 4 interventions have empirical support for curbing physician burnout at least 10%: small group curricula, stress management and self-care training, mindfulness training, and communication skills training.	Organizational support is necessary in most solutions to address burnout across all dimensions, evidenced by the need of organizational training in individual intervention practices.	Intrapersonal Organizational
Swensen, S. J., & Shanafelt, T. (2017). An organizational framework to reduce professional burnout and bring back joy in	Scoping review	Academic Medical Center-The Mayo Clinic	N/A	Design Organizational Systems to Address Human Needs; Develop Leaders with Participative Management Competency; Build Social Community; Remove Sources of Frustration and Inefficiency; Reduce Preventable Patient Harm and Support	Satisfied human social and psychological needs, eliminated or mitigated structural and functional drivers of burnout, and strengthened individual resilience	Focuses on organizational opportunities to create a physician-supportive work environment and bring joy in practice.	Two recent systematic reviews indicate that organization-directed structural and functional interventions, as well as individual- focused strategies, can result in meaningful reduction in professional burnout.	Organizational support is necessary in providing a healthy and supportive work environment for physician well-being.	Organizational

practice. Elsevier, 43(6), 308–313.				Second Victims; Bolster Individual Wellness					
Taku, K. (2014). Relationship among perceived psychological growth, resilience and burnout in physicians. Elsevier, 59, 120–123.	Cross sectional	Academic Medical Center-Department of Psychology Oakland University	289 physicians (field unspecified)	Higher perceived growth, personal resiliency.	In addition to enhancing resilience and social support, this study adds the element of perceived growth, which can empower physicians to experience growth and potentially alleviate burnout, especially when there is low family support or low resiliency.	Focuses on physician self-perception as an instigator of resilience	Perceived growth significantly reduced burnout, over and above the role of resilience and perceived family support, however, the moderating effects varied among the burnout domains.	Outcome showed perceived growth as beneficial in some domains, but not all in improving physician well-being.	Intrapersonal
Wei, J., Rosen, P., & Greenspan, J. S. (2016). Physician burnout: What can chairs, chiefs, and institutions do? Elsevier.	Scoping review	Academic Medical Center-Department of Pediatrics	Attending physicians at the pediatric health system-number unspecified	Reflection, discussions, education on how to maximize individual wellness, mindfulness, adaptability, effective use of EMR, adequate primary care office resourcing	Use a measurement tool to measure burnout of faculty; Build a coalition of support for tackling burnout that spans the organization; Ask physicians to identify the primary factors affecting them and invite them to propose their own solutions; and Publicize the project wins, ask for feedback, measure burnout levels again.	Notes observed successful preventative measures at individual level and discusses suggested organizational efforts to combat burnout (primarily social support)	N/A (Outcomes not studied)	N/A (Outcomes not studied)	Intrapersonal Organizational
West, C. (2017). The Mayo Clinic Program on Physician Well-Being: Studying Solutions to Physician Burnout. Society of General Internal Medicine, 40(4).	Randomized clinical trial	The Mayo Clinic Department of Medicine	6-10 physicians per group (total groups unspecified)	Facilitated physician engagement groups promoting and maintaining satisfaction to check in, dialogue, and build relationships.	Small-group support programs to engage physicians showed success after a 6-month trial period. Most physicians desired a continuous program to maintain these relations and support. Time allotment during the work day, flexibility in group assignments, discussion questions/topics, and reimbursement were provided.	Organizational level wellness program	Over 95% of groups were found to be valuable and there was a plan to continue with them.	Facilitated small group support programs for communal engagement prove beneficial to physicians.	Organizational

DISCUSSION

The aims of this narrative review were to identify the protective and positive factors that reduce physician burnout and lead to professional fulfillment and well-being among physicians in the U.S., guided by a positive deviance informed social-ecological framework, via a narrative review of the scientific/peer reviewed literature. In addition, this review aimed to describe the application of interventions that operationalize positive deviance approaches through various uses of positive and protective factors aimed at reducing physician burnout and increasing personal fulfillment and well-being via a review of the literature, including types of interventions, populations, study designs and outcomes.

Promising intervention strategies for physician fulfillment at the individual level identified in this review included mindfulness programs (Chetlan et al., 2018), coping strategies (Patel et al., 2019) and resilience training (Sotile et al., 2019). Successful interpersonal strategies included team building (Olson et al., 2019), strengthening support systems (Chetlan et al., 2018) and mentorship (Miller et al., 2010). Organizational strategies with positive outcomes included expanding administrative support (Anandarajah et al., 2018), changing incentive structures (Miller et al., 2010), workload alleviation (Patel et al., 2019).

Factors associated with positive outcomes related to lower physician burnout and higher physician fulfillment included: collaborations across two or more dimensions of the model, , most often combining both individual and organizational strategies. This combination of strategies across ecological levels illustrates the concept of *interactions of influence*, a key construct within Social Ecological Models that posits that individual and environmental change will be more impactful when addressing more than one ecological level (Sallis et al., 2006; Sallis

& Owens, 2015). For example in the review, the initiatives described in Anandarajah et al., 2019 illustrated the amplified benefits of developing strategies across dimensions of the model by utilizing organizational initiatives to reduce administrative burden via hiring of medical scribes, interpersonal peer-group programs to promote teamwork and intrapersonal personal skills building workshops to strengthen individual resilience. The combination of these strategies were associated with lower physician burnout and higher fulfillment in this cross-sectional study.

Additionally, when examining the association of factors with positive outcomes related to physician fulfillment and lower burnout from the literature, it appears that strategies guided by a Positive Deviance approach in which successful interventions originated internally by the clinical communities (Miller et al., 2010; Siedsma et al., 2015) were more successful than those introduced by external stakeholders (Sotile et al., 2019). Strategies at the interpersonal and organizational levels, often crafted and championed by physicians or physician leaders themselves, that improved social supports, mental health and clinical capacity resulted in increased fulfillment and well-being. In addition to representing a key dimension of Positive Deviance theoretical perspective (Lawton & Clay-Williams, 2014), indigenous knowledge is a key facet within complex adaptive systems theory and implementation science that posits that organizations have ‘thinking people’ who know better their context and have insights and solutions that result in better outcomes (Hawe et al., 2009; Hawe, 2015; May et al., 2015).

As evidenced by the few experimental or longitudinal studies included in this review, the majority of available research studies were based on cross-sectional studies. Importantly, the review only included two intervention studies. The limited availability of prospective and

experimental research studies utilizing more rigorous methodology represents a gap in the science, as well as missed opportunities to better examine causation (Drybye et al., 2017).

Findings from this narrative review indicate that research on correlates and strategies aimed at reducing burnout and increasing physician well-being have focused on specific lower levels of the ecological model, strategies that are centered on short-term individual level interventions that place much of the onus for change on the physicians themselves. Conversely, there was a dearth of research examining positive and protective factors at the highest levels of the social-ecological model (community and public policy levels). This is reflective of a gap not only in the literature, but also in the absence of these approaches in clinical interventions. Strategies focused especially on individual level approaches place the onus on reducing burnout and increasing fulfillment completely on the physicians themselves, running the risk of ‘victim-blaming,’ rather than addressing root causes.

Failure to examine interventions at higher dimensions of the Social-Ecological Model, specifically the community and public policy levels, may also represent missed opportunities to identify or strengthen tacit knowledge or interests that exist within clinical communities to address these factors, further building on the Positive Deviance approach. Patient relationships as factors associated with fulfillment were not well examined in the studies that were reviewed. Based on the patient-physician relationship, physicians can be uniquely positioned to develop their understanding of the lived experiences of their patients impacting their health, and serve as advocates in their communities or through local or national policies on behalf of their patient populations. Specific physician professional organizations have become increasingly active in advocating for issues impacting the health and lives of their patients’ communities, serving as an

additional opportunity for professional fulfillment (Fleming, D. 2015; Kanter, S. 2011). By not examining the community and public policy levels, the literature fails to consider the role of physicians as advocates, and how participation in that role may be associated with physician fulfillment.

Studies that examine the highest dimensions of the model, Community and Public Policy levels, may be thwarted by factors such as unfamiliarity with population scale interventions by researchers, the complexity related to measurement of larger scale population level outcomes compared to interventions at the individual level, the fact that impacts at population levels tend to be slower to realize than those at the lower dimensions of the model and major funding mechanisms of research, such as the National Institutes of Health, tend to over-focus on individuals. Nevertheless, by not including communities and/or local, state and federal policy options in interventions, health leaders and researchers may be missing valuable opportunities to increase fulfillment by improving relationships with key community members such as patients, as well as influence policies that can address root causes of clinical burnout (e.g. legislative requirements regarding restrictive quality metrics, electronic medical records gridlock, misaligned incentives) and impact larger scale change (Netherland et al., 2019; Law et al., 2016; Daniel et al., 2018).

Limitations

Primary limitations are that due to the nature of a narrative review, or mapping of the literature, this review was not subject to the rigorous methodology employed in systematic reviews. Narrative reviews are also somewhat subjective in nature, can be subject to selection bias regarding which studies were included and experience challenges in determining and

integrating complex interactions (Rumrill et al., 2001, Pae C. 2015). Of the articles identified and included, important health care concepts such as impact on patient outcomes, the role of racial and ethnic diversity, gender, age and years of practice were either under examined or not mentioned at all. While narrative reviews are helpful in describing the literature, future research is needed to more systematically evaluate a given strategy or correlate identified in this review.

Strengths

The primary strengths of this review are that much of the existing literature regarding physician burnout focuses on the causes or measurement of the problem. Far fewer publications delve into factors and strategies for achieving physician fulfillment and well-being in our current health care landscape. By mapping the literature in this space, this review serves to highlight positive and protective factors, many of which are internal to the clinical community, that contribute to professional fulfillment and well-being, thereby helping to identify more effective strategies for future interventions. This map of the literature also serves to transparently reveal important gaps in existing strategies with the intention of highlighting missed opportunities for multidimensional interventions. Subjectivity was limited due to the use of established search strategies and methods, and a clear and methodical exploration of each article included. Additionally, as the study of physician fulfillment and well-being in the context of professional burnout is an emerging area in the science, this narrative review approach better meets the needs of drawing initial conclusions based on the availability of limited and evolving research.

CONCLUSION

This review reflects not only the emerging benefits of capitalizing on the internal strengths at the intrapersonal, interpersonal and organizational levels of the clinical community

in increasing physician fulfillment and wellness, but also highlights specific gaps in the literature and the need for further research to inform successful interventions. Key gaps and opportunities for future research lay in examining community and public policy level approaches to not only impact fulfillment and well-being for physicians, but also to improve the health of their patients and the health care systems in which they serve.

Future Research Directions

Findings also highlight the need for future research to further examine factors identified as promising in reducing burnout and increasing professional fulfillment, as well as address gaps in the literature. Specific future research directions include:

1. Building off the demonstrated initial successes of strategies at the intrapersonal and interpersonal levels of the Social Ecological Model, further research is warranted to examine if protective factors at these lower levels would be also be efficacious if tailored, amplified and championed at the organizational levels, to the benefit of larger physician populations.
2. Examining strategies at the higher dimensions of the Social Ecological Model, the community and public policy levels to further explore the impact of physician involvement with community initiatives, advocacy and influencing policies for the benefit of their patients on physician fulfillment and burnout.
3. Conducting intervention and experimental studies examining factors impacting professional fulfillment within the clinical setting, as well as evaluations of these strategies.

Journal Article 2

Title of Journal Article: “Determining physician perspectives, practices and other factors that lead to professional fulfillment and wellness or decrease burnout.”

INTRODUCTION

The term “physician burnout” refers to the destructive symptoms of depleted physical and emotional motivation to practice medicine, depersonalization or lessened empathy, decreased confidence in the value of one’s work as a physician and loss of work fulfillment (Drummond, 2015; Dyrbye et al., 2017; Amofo et al., 2015). Occupational “burnout” is a complex phenomenon that can manifest in a variety of ways, and the crisis has not gone unrecognized. The Action Collaborative on Clinician Well-Being and Resilience was launched by the National Academy of Medicine (NAM) in January 2017 in response to the emerging body of evidence that physician “burnout” is endemic and affects patient outcomes (Dyrbye et al., 2017).

Burnout can impact at the personal provider level, often manifested through depression, can impact patients, manifested through detachment or reduction in quality of care, and can impact organizations, reflected in resentment towards policies and systems and an unwillingness for physicians to remain practicing in their organizations (Amofo et al., 2015). On a personal level, burnout is defined as an erosion of the soul caused by a deterioration of one's values, dignity, spirit, and will (Maslach & Leiter, 1997). Physician burnout and fatigue are independently associated with double the risk of medical errors and a 17% increased likelihood of involvement in medical malpractice related litigation (Tawfik et al., 2018), both of which also have negative consequences to quality of care, costs, and capacity for patients, colleagues and health delivery systems. Additionally, dissatisfied physicians are two to three times more likely to leave their practice, resulting in access and continuity of care limitations for patients,

increased burden of responsibilities for colleagues and escalating costs for health care delivery systems (Amoafo et al., 2015).

While a growing evidence base has identified physician burnout as a key health concern among physicians (Noseworthy et al., 2017; Dyrbye et al., 2017), to date few studies have been conducted to identify factors associated with physician fulfillment and well-being. To shift the narrative on physician burnout, we must move beyond simply measuring its occurrence and towards an approach that considers the positive and protective factors for physicians with the aim of developing effective interventions that lead to well-being (Baxter et al., 2016; Berggren & Wray, 2002; Marra et al., 2010; Lawton, 2014; Sternin & Choo, 2000; Tuhus-Dubrow, 2009).

Recent research has focused on assessing physician well-being as a function of the positive rewards intrinsic to the practice of medicine (e.g., engagement, happiness, meaningful contributions, feeling worthwhile, professional self-efficacy) (Shanafelt et al., 2015). In an effort to move the needle forward, it is important for research in this space to not only measure burnout, but also examine the factors that contribute to professional fulfillment and well being. An example of an emerging research tool to assist in meeting this goal is the recent Stanford Professional Fulfillment Index (PFI), which measures burnout indicators such as work exhaustion and personal disengagement, *but also factors leading to professional fulfillment* (Shanafelt et al., 2012; Trockel et al., 2018). The PFI offers a stark contrast to the commonly utilized “Maslach Index” (MBI), which is solely focused on burnout measurement (Maslach & Jackson, 1981; Dyrbye et al., 2014), by assessing the negative aspects of the role and work of physicians (i.e., burnout) as well as positive aspects of practicing medicine (i.e., professional fulfillment) (Trockel et al., 2018). Research in the areas of physician fulfillment and well being

can be a useful tool for health programmers aiming to mute the contributing factors of burnout and reduce its impacts on the professional and personal health of physicians, which also has downstream negative impacts on colleagues, capacity and costs for health systems and quality and access to care for patients and communities (Bohman et al., 2017).

Drivers of physician fulfillment

Bohman et al. (2017) posited that drivers of physician professional fulfillment fall under three primary domains: the *efficiency of practice*, *culture of wellness*, and *personal resilience*. This development in identifying three reciprocal domains, or categories, of professional fulfillment and well-being is an important shift in understanding physician burnout since the scant existing research on physician well-being has largely stressed only personal resilience, which tends to re-direct fulfillment as primarily the responsibility of individual physicians, seldom addressing organizational issues that act as significant contributors to burnout and that thwart fulfillment (Bohman et al., 2017; Brown & Gunderman, 2006; Shanafelt et al., 2017). The two domains of efficiency of practice and a culture of wellness are primarily organizational responsibilities, while developing and maintaining personal resilience is primarily the obligation of the individual physician (Bohman et al., 2017).

The need for physician-defined drivers of professional fulfillment

While Bohman et al. (2017) provide a promising framework for categorizing potential drivers of professional fulfillment, research is needed to better understand physician-identified factors and themes that can further describe and operationalize these domains. Existing qualitative studies performed in the United States tend to be specialty specific and tend to focus on the causes of burnout, rather than positive and protective factors to lessen the impact

(Miyasaki et al., 2016; Lafayer et al., 2018; Weiner et al., 2001). Notably, the majority of existing articles that have focused on the positive and protective mitigating factors tend to be conducted outside of the United States, but many of those findings are difficult to generalize to the American experience due to significant differences in health care systems, reimbursement models, medical education debt and professional expectations related to work hours, electronic medical records and liability reduction experienced by physicians in the United States compared to those in most developed nations (Linzer et al., 2002; Wiederhold et al., 2018). In addition to the need for further understanding of physician-defined factors that may drive fulfillment, there is a gap in research regarding the demographic and practice-related factors that are associated not only with burnout, but also with physician fulfillment.

Demographic Characteristics

To date, few studies have explored the role and relationship of demographic characteristics, such as gender, age, ethnicity and professional degree, with physician burnout in general and especially how these characteristics relate to well-being and professional fulfillment in the profession. Demographically, gender and especially the experience of women in medicine experiencing higher rates of burnout have been studied more than other demographic characteristics (McMurray et al., 2000; Templeton et al., 2019; Robinson, 2003). Understanding disparities in burnout and physician fulfillment by demographic characteristics is an important first step to identifying groups who are at increased risk for burnout, as well as those groups experiencing higher levels of fulfillment. By doing so, health researchers and programmers can better learn about contributors to fulfillment, with the goal of crafting targeted intervention efforts.

Practice Characteristics

Similarly, few studies have explored the role and relationship of practice characteristics with physician burnout, such as work hours, size of practice, employed or owner, clinical time and years in practice (Amofo et al., 2015; Blechter et al., 2018; Creager et al., 2019; Dyrbye et al., 2014), and especially how these characteristics relate to well-being and professional fulfillment in the profession. The majority of the literature in this area has been focused on the increased incidence of burnout in physicians with fewer years of clinical practice experience (Dyrbye et al., 2014) and whether physicians had autonomy over their clinical practice (Creager et al., 2019; Blechter et al., 2018).

Existing Strategies to Reduce Burnout

There is significantly less literature regarding factors that have reduced burnout or contributed to wellness. Existing literature primarily focuses on strategies such as reducing work hours that sometimes leads to switching to part-time employment (Shanafelt et al., 2016; Glauser, 2018). These options are not always financially feasible for all physicians, especially those whose compensation is tied to patient volume or clinical productivity. Reduced hours also create potential implications for colleagues who may have to take on additional workloads and reduced access to care for patients.

In addressing current gaps in the literature regarding physician perspectives and practices that reduce burnout, this study aims to further broaden our understanding of factors associated with professional fulfillment and well-being among physicians. To this end, this study explores protective practices against burnout via the lens of physicians. To date, very few qualitative

studies with a physician perspective focus have been conducted, especially as they relate to organizational factors contributing to well-being and reducing burnout.

Specifically, this study aims to generate further insights about demographic and organizational factors related to physician fulfillment, well-being and burnout via a survey conducted with physicians in Arizona. The study utilizes a positive deviance-informed approach to identify which demographics and practice characteristics are associated with physicians experiencing more fulfillment and well-being and less burnout, thereby informing how to direct the focus of future studies and develop targeted and responsive interventions. The specific aims of this study were as follows: 1.) To identify physician beliefs about self-protection from burnout among a sample of Arizona physicians categorized by three conceptual groupings: Culture of Wellness, Efficiency of Practice and Personal Resilience; 2.) To examine the prevalence of physician professional fulfillment and burnout by demographic characteristics such as gender, age, degree, and ethnicity in a sample of physicians practicing in Arizona; 3.) To examine the prevalence of physician professional fulfillment and burnout by physician practice characteristics such as work hours, size of practice, employed or owner status, clinical time and years in practice among a sample of physicians practicing in Arizona; and 4.) To assess the association of physician demographic and practice characteristics with physician fulfillment and physician burnout in a full model using a multiple logistic regression analytic approach among a sample of physicians practicing in Arizona.

METHODS

This study is based on a secondary analysis of cross-sectional data from the “Slowing the Burn of Physician Burnout: Identifying Root Causes to Inform Policy Solutions” research study.

The study was based on a self-administered survey with qualitative and quantitative measures aimed at measuring burnout and fulfillment in Arizona-based allopathic (MD) and osteopathic (DO) physicians. In recruiting participants, two large state physician medical associations disseminated the survey to their physician member base via a series of newsletter emails and social media posts. Participation in the study was voluntary and confidential. The primary data collection was conducted in the fall of 2018, with the final data collection completed in February 2019. In total, 316 surveys were completed among physicians from 44 discrete clinical organizations (ranging from solo physician practices to large hospital systems) and 26 cities of Arizona. As the surveys were sent out in newsletter blasts and on social media posts, the respondent rate cannot be calculated. The completion rate for respondent physicians who initiated the survey was 92%.

Data for the “Slowing the Burn” study were collected with a self-administered questionnaire (Appendix C). Items for the questionnaire were developed based on the Professional Fulfillment Index (PFI), a 16-item instrument, and divided into two sections: 1.) Demographic (gender, age range, race/ethnicity, medical education (MD or DO)) and practice characteristics (practice size, employment status, medical specialty, location, inpatient or outpatient clinical practice, duration of medical experience); and 2.) Professional Fulfillment Index, a 16 number item index that measures professional fulfillment (n=6 items) and burnout (n=10 items). One demographic question was added to differentiate between MD and DO, and open-ended questions were added to explore burnout and protective factors (Appendix C).

This study is based on a collaboration between a state institution and a state physician medical organization, with the primary author serving as the principal investigator. The primary

study was approved by the Internal Review Board at the state institution. The study was reviewed and declared exempt for Internal Review of the UTHHealth School of Public Health Committee for the Protection of Human Subjects. Funding for the “Slowing the Burn” study was provided by the Arizona Osteopathic Medical Organization.

Measures and Study Variables

Measures for Aim 1 (Identify physician beliefs about self-protection from burnout)

For study aim 1 (qualitative analysis), data were retrieved from a single open-ended question that asked physician respondents: “Within your organization, how do you protect yourself from burnout and what do you do when you recognize signs of burnout in your colleagues?” This question aimed to explore dual themes related to both physician practices to protect themselves from burnout as well as actions physicians take upon recognizing signs of burnout in their colleagues.

Measures & Study Variables for Aims 2-4 (Demographic factors and practices related to physician burnout and fulfillment)

For study aims 2 thru 4 (quantitative analysis), the primary dependent variables were *physician professional fulfillment* and *physician burnout*, and the primary independent variables were *demographic and physician practices*. The two dependent variables from the PFI (*professional fulfillment* and *burnout*) have been tested for reliability and validity (Trockel et al., 2018). Convergent validity was found for the PFI when compared to the previously validated measure of the MBI, using Pearson’s correlation coefficient. Convergent and discriminant validity of the PFI was confirmed using principal component analysis. Concurrent validity was shown with Pearson’s *r* correlation coefficient of the PFI scales and previously validated burnout

measures. Good internal consistency and test-retest reliability was indicated with Cronbach's alpha and test-retest reliability estimates (Trockel et al., 2018).

Physician Professional Fulfillment. The *professional fulfillment* dependent variable was based on a composite variable comprised of six items from the Slowing the Burn survey that asked respondents to rate on a five-point Likert style scale how much they agreed with statements such as "I feel happy at work" and "My work is meaningful to me," with response options ranging from 0 (not at all) to 4 (extremely). For the current study, a dichotomous variable was created, with respondents who scored a mean of 3.0 or higher (range 3.0 to 4.0) representing 'professional fulfillment', and respondents scoring less than 3.0 (range 0 to 2.99) defined as 'no professional fulfillment,' as previously defined and delineated (Trockel et al., 2018). This cut off score of 3.0 has been found to have both convergent and discriminant validity, when compared to the Maslach Burnout Inventory (Trockel et al., 2018).

Physician Burnout. The *physician burnout* dependent variable was based on a composite of ten items from two questions from the Slowing the Burn survey that asked respondents to rate on a five-point Likert style scale how much they agreed with statements such as "Physically exhausted at work," "Lack of enthusiasm at work," "Less empathetic with my patients" or "Less connected with my colleagues," with response options ranging from 0 (not at all) to 4 (extremely). For the current study, a dichotomous variable was created, with respondents who scored a mean of score lower than 1.33 (range 0 to 1.32) representing 'no burnout,' and respondents scoring a mean score of 1.33 or greater (range 1.33 to 4.0) defined as 'burnout' as previously defined and delineated (Trockel et al., 2018). The cutoff score of 1.33 was found to

have both convergent and discriminant validity, when compared to the Maslach Burnout Inventory (Trockel et al., 2018).

Demographic and Physician Practices. The independent variables for *demographic characteristics* included *gender, age, ethnicity* and *educational degree*. The independent variables for *practice characteristics* are *hours worked, size of practice, employed or owner, clinical time (inpatient or outpatient)* and *years in practice*. (Table 9 for details on categories of independent variables).

ANALYSIS

Aim 1

A qualitative content analysis was performed based on one open-ended question from the “Slowing the Burn” survey. Content analysis was conducted to identify and compare common themes using the NVivo software package (QSR International Pty Ltd. Version 12, 2018). All data from the open-ended question was imported into NVivo from the Survey Monkey platform. A deductive approach guided by the questionnaire item and the three category framework developed by Bohman et al. was utilized, with the aim of identifying key themes related to culture of wellness, efficiency of practice and personal resilience (Bohman et al., 2017, Mayring, 2000). The research team utilized these three themes as an initial framework, while remaining open to the possibility that one or more additional themes may emerge through this deductive process. Responses were initially grouped in three domains of physician well-being: culture of wellness, efficiency of practice and personal resilience with corresponding definitions (Bohman et al., 2017, Olson et al., 2019). Search terms were determined for each initial node (Table 2). Initial nodes were populated by applying the search terms to the free text responses and

categorizing to each of the three nodes. Additional subcategories, or subnodes, emerged through this process by each node. A second analysis repeated the coding agenda to remove bias and gain inter-coder reliability (MacPhail et al., 2015). Discordance was coded using a third independent analyst, choosing between the two categories (MacPhail et al., 2015).

Table 2. Initial categorical definitions for guiding content analysis of the “Slowing the Burn” Arizona physician survey, based on the survey results of the open-ended question, February 2019, n=253.

Node	Definition (per Bohman, et al., 2017 article)	Search Terms
<i>Culture of Wellness</i>	Normative values, attitudes and behaviors that promote self-care, personal and professional growth and compassion for colleagues, patients and self.	Colleagues, group support, community building, social cohesion, Wellness Officer
<i>Efficiency of Practice</i>	Value added clinical work accomplished divided by time and energy spent.	Staffing, EMR, processes, workflow, work volume, work hours, nature of work
<i>Personal Resilience</i>	Participating in activities related to medicine, but not routine clinical care.	Stress relief, personal health, external activities, personal advocacy, mental health care, participation in professional societies/organizations

Aim 2 and 3

Basic descriptive statistics (frequencies and percentages) were used to describe the prevalence of dependent variables (physician fulfillment and burnout) and independent variables (demographic and practice characteristics). In addition, chi-square tests of significance were conducted to examine differences in professional fulfillment (professional fulfillment question mean of 3.0 to 4.0, professional fulfillment question mean of 0 to 2.99) and burnout (burnout

question mean of 0 to 1.32, burnout question mean 1.33 to 4.0) by demographic factors (gender, age, ethnicity, degree), and practice characteristic (hours worked, size of practice, employed or owner, clinical time (inpatient or outpatient) and years in practice). Statistical significance was set at $p < .05$, and IBM SPSS Statistics Version 27.0 (Armonk, NY: IBM Corp.) was utilized for the statistical analysis.

Aim 4

Multiple logistic regression analyses were conducted to assess the association of physician demographic and practice characteristics (independent variables) with physician professional fulfillment and burnout (dependent variables). In conducting the analyses, a simultaneous regression analysis approach was used. The first regression analysis assessed the association between the independent variables of physician demographics (gender, age, ethnicity, degree) and physician practice characteristics (hours worked, size of practice, employed or owner, inpatient or outpatient clinical time and years in practice) with the dependent variable of professional fulfillment (professional fulfillment question mean of 3.0 to 4.0, professional fulfillment mean of 0 to 2.99).

The second regression analysis assessed the association between independent variables of physician demographics (gender, age, ethnicity, degree) and physician practice characteristics (hours worked, size of practice, employed or owner, inpatient or outpatient clinical time and years in practice) with the dependent variable of burnout (burnout question mean of 0 to 1.32, burnout question mean 1.33 to 4.0). All analyses were conducted using IBM SPSS Statistics version 27.0. (Armonk, NY: IBM Corp.), with statistical significance set at $p < .05$.

RESULTS

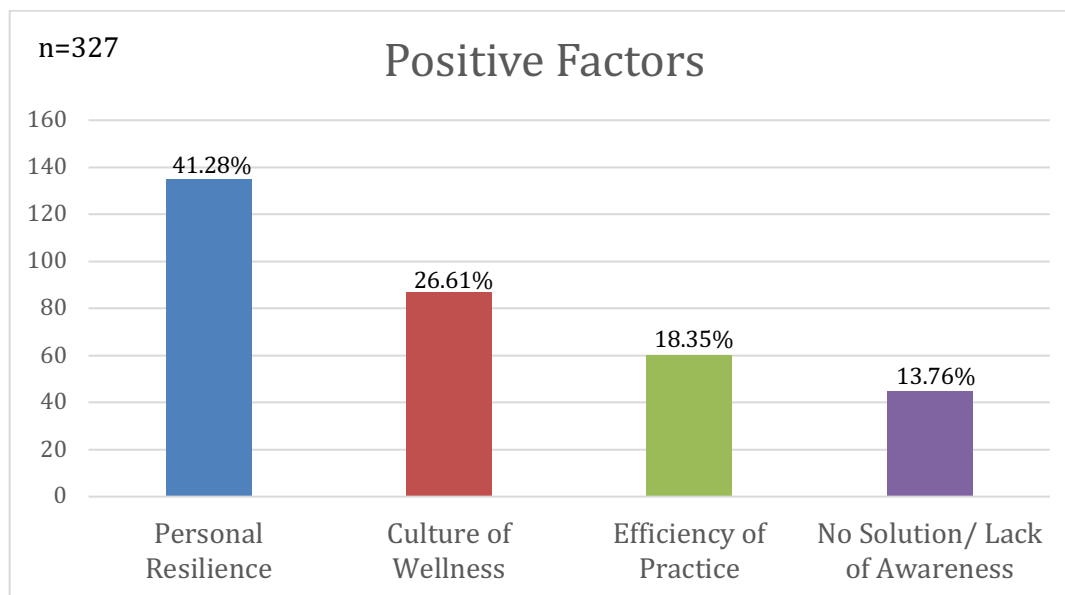
Aim 1

A total of 253 (out of 316) physicians responded to the open-ended question, “How do you protect yourself from burnout.” In the process of applying the search terms to the free text responses and grouping in by code, it became clear that a fourth node emerged since many responses did not fit within the initial deductive nodes. The fourth node, “No Solution/Lack of Awareness” emerged based on answers that indicated that respondents did not have any strategies to protect themselves from burnout, did not perceive that their organizations offered solutions or were not aware of any strategies. Subsequent subnodes also emerged in the development of this fourth node.

Below are key findings from responses to this question as organized by the following thematic content areas which emerged through the analysis: *Personal Resilience, Culture of Wellness, Efficiency of Practice and No Solution/Lack of Awareness (Figure 4)*. The most populated node was Personal Resilience, followed by Culture of Wellness, then Efficiency of Practice and finally, No Solution/Lack of Awareness. The subnodes of Personal Resilience, in decreasing frequency, were: time off from work, regular physical activity, emotional and mental well being, non-clinical personal interests, work life balance, identifying meaning in work, respites in clinical day, setting boundaries, time with family and religion/faith. The subnodes of Culture of Wellness, in decreasing frequency were: Increasing communication with colleagues, assisting colleagues with tasks, meeting/socializing with colleagues, formal organizational interventions, sharing frustrations with colleagues, recommending time off to colleagues and positive encouragement for colleagues. The subnodes of Efficiency of Practice, in decreasing

frequency, were: work less, control of the schedule and structural or organizational changes. The subnodes of No Solution/Lack of Awareness, in decreasing frequency, were: no assistance was offered and no knowledge.

Figure 4. Percentage of physician responses of perceived strategies to address physician burnout by thematic category, results from qualitative analysis of the “Slowing the Burn” Arizona physician survey; based on the results of the open ended question “How do you protect yourself from burnout,” February 2019, n=253.



Personal Resilience. The category of personal resilience included 135 responses (Figure 5).

Themes that emerged in this node were, in order of decreasing frequency: time off from work, regular physical activity, emotional and mental well being, non-clinical personal interests, work life balance, identifying meaning in work, respites in clinical day, setting boundaries, time with family and religion/faith (Figure 5). The two most common answers from respondents that emerged indicating or strengthening personal resilience included taking time off work and

regular physical activity, combined representing 44% of the response themes. The two least common answers, combined representing 7% of the response themes by respondents, included time with family and leaning on religion or faith. Representative quotes from respondents which were utilized to determine themes and subnodes are below (Table 3).

Figure 5. Thematic content results under the Personal Resilience node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=135.

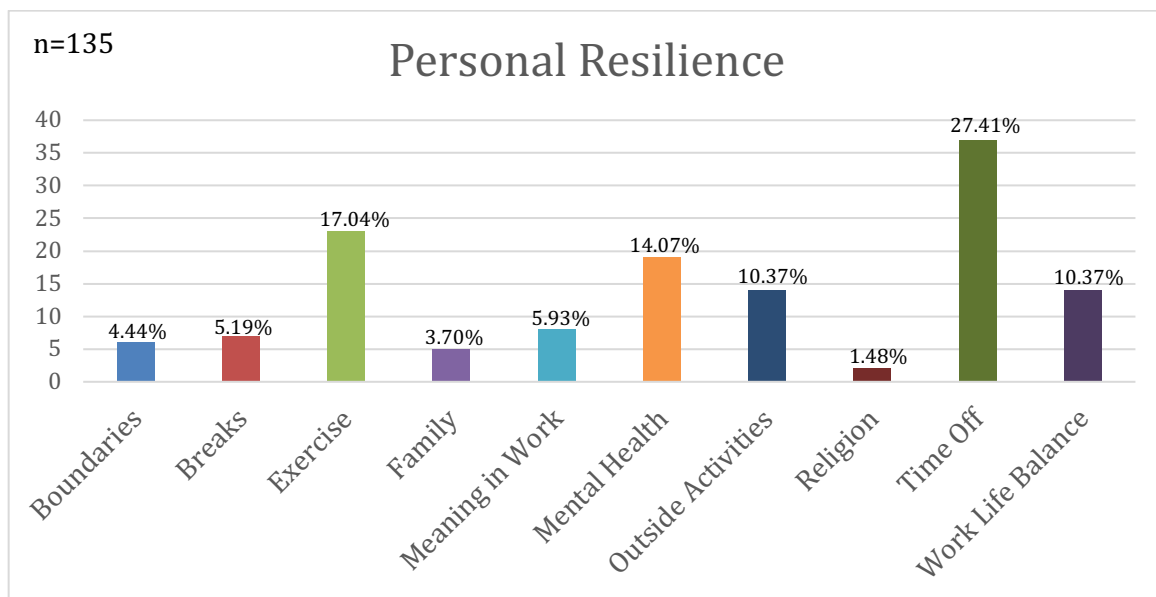


Table 3: Representative quotes per subnode within the Personal Resilience node, from qualitative analysis of the “Slowing the Burn” Arizona physician survey, based on the survey results of the open ended question ”How do you protect yourself from burnout,” February 2019, n=135.
(Template adapted from Steven, et al., 2019).

Node: Personal Resilience	
<u>Subnode</u>	<u>Representative Quotes</u>
Time Off From Work	<ul style="list-style-type: none"> • “Vacation” • “Travel” • “Try to take PTO” • “I take some days off and completely disconnect- not check emails”
Regular Physical Activity	<ul style="list-style-type: none"> • “Daily exercise” • “Physical activity” • “Exercise during the work week”
Emotional and Mental Well Being	<ul style="list-style-type: none"> • “Mindful meditation” • “Remain grounded” • “We try to do a self-care activity monthly” • “Seek counseling myself” • “Daily meditation”
Non-Clinical Personal Interests	<ul style="list-style-type: none"> • “Nonmedical hobbies” • “Outside activities when available” • “Make sure I have lots of rewarding non-medical hobbies”
Work Life Balance	<ul style="list-style-type: none"> • “Disconnect myself from work” • “Try not to take work home” • “I try not to bring issues at work home” • “We focus on work life balance”
Identifying Meaning in Work	<ul style="list-style-type: none"> • “Focusing more on patients” • “Teach more” • “Try to keep finding meaning in my work” • “Focus on the patient encounters that remind me of why I elected to be a physician”
Respite in Clinical Day	<ul style="list-style-type: none"> • “Breaks” • “Take my own breaks”

	<ul style="list-style-type: none"> • “Allow time to rest in the day”
Setting Boundaries	<ul style="list-style-type: none"> • “Say NO” • “Leaving medicine” • “Move to another practice” • “I try not to place myself in situations where I compare myself to others”
Time with Family	<ul style="list-style-type: none"> • “Family” • “Home life” • “Use family” • “Enjoy time with family” • “I have home life as my happiness”
Religion/Faith	<ul style="list-style-type: none"> • “Pray” • “I lean on and trust in my rock Jesus Christ”

Culture of Wellness. The category of culture of wellness included 87 responses (Figure 6). Themes that emerged from this node were, in order of decreasing frequency: increasing communication with colleagues, assisting colleagues with tasks, meeting/socializing with colleagues, formal organizational interventions, sharing frustrations with colleagues, recommending time off to colleagues, positive encouragement for colleagues. The two most common answers from respondents that indicated a positive contribution to a culture of wellness included increasing communication with colleagues and assisting colleagues with tasks, combined representing 65% of the response themes. The two least common responses, representing a combined 10% of the response themes, included recommending time off for colleagues and positive encouragement for colleagues. Representative quotes from respondents which were utilized to determine themes and subnodes are below (*Table 4*).

Figure 6. Thematic content results under the Culture of Wellness node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=87.

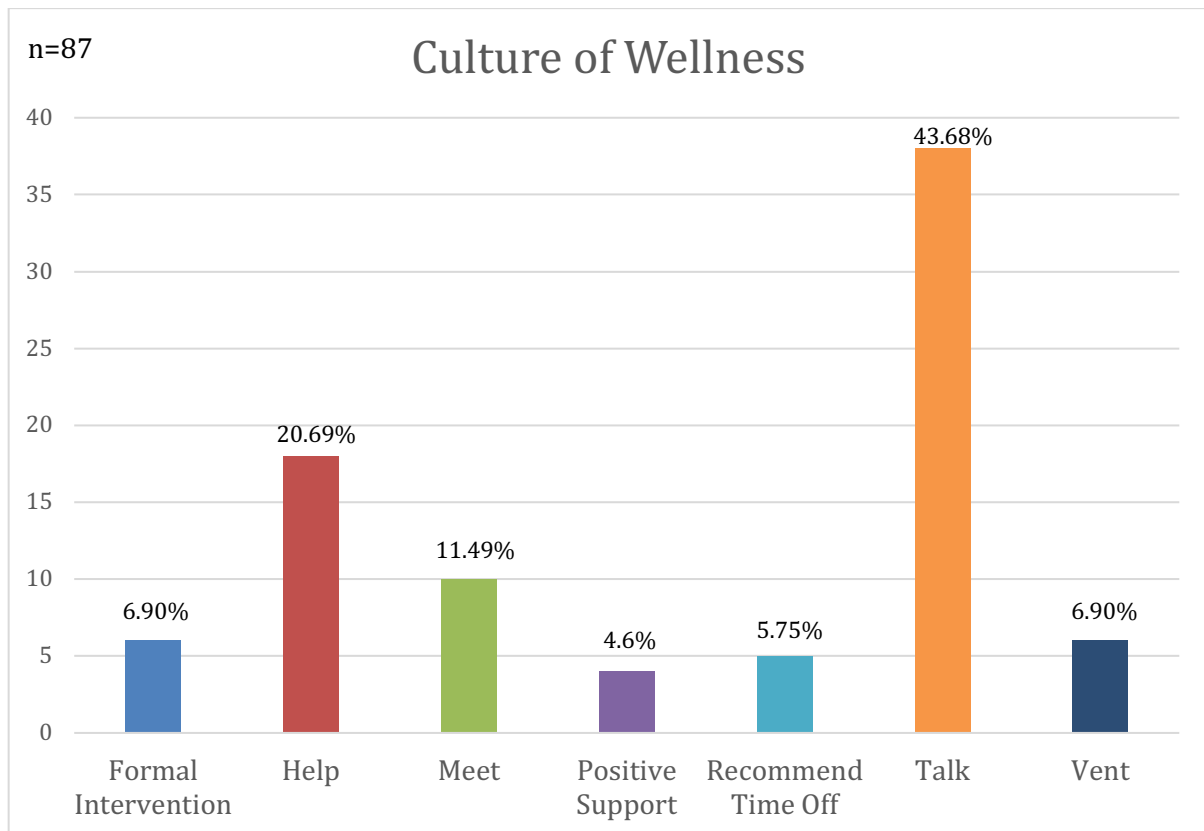


Table 4: Representative quotes per subnode within the Culture of Wellness node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=87. (Template adapted from Steven, et al., 2019).

Node: Culture of Wellness	
Subnode	Representative Quotes
Increasing Communication with Colleagues	<ul style="list-style-type: none"> • “Speak with my colleagues” • “Just talk to them and listen” • “Listen to colleagues’ thoughts”
Assisting Colleagues with Tasks	<ul style="list-style-type: none"> • “Offer support for colleagues” • “Help others” • “We help each other at work” • “Offer a helping hand”
Meeting/Socializing with Colleagues	<ul style="list-style-type: none"> • “Having coffee with a colleague” • “Meet socially as a group fairly frequently” • “We have started meeting 1-2 times a month” • “Ask to go to coffee”
Formal Organizational Interventions	<ul style="list-style-type: none"> • “Our organization has done several programs and is developing” resources and mentors” • “Organizational counseling” • “Offer resources” • “We have access to employee assistance programs”
Sharing Frustrations with Colleagues	<ul style="list-style-type: none"> • “Vent to colleagues” • “Discuss concerns” • “Let them vent” • “Venting to others that have similar complaints”
Recommending Time Off to Colleagues	<ul style="list-style-type: none"> • “Recommend PTO” • “Encourage time away”
Positive Encouragement for Colleagues	<ul style="list-style-type: none"> • “Give them positive support” • “Encourage them”

Efficiency of Practice. The category of efficiency of practice included 60 responses (Figure 7). The three themes that emerged from this node were, in order of decreasing frequency:

work less, control of the schedule and structural or organizational changes. The most common answers from respondents that indicated a positive contribution to efficiency of practice in the health care setting was working fewer hours, representing 42% of the response themes. The least common answer provided to improve the efficiency of clinical practice, representing 28% of the response themes by respondents, was related to structural or organizational changes.

Representative quotes from respondents which were utilized to determine themes and sub nodes are below (*Table 5*).

Figure 7. Thematic content results under the Efficiency of Practice node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=60.

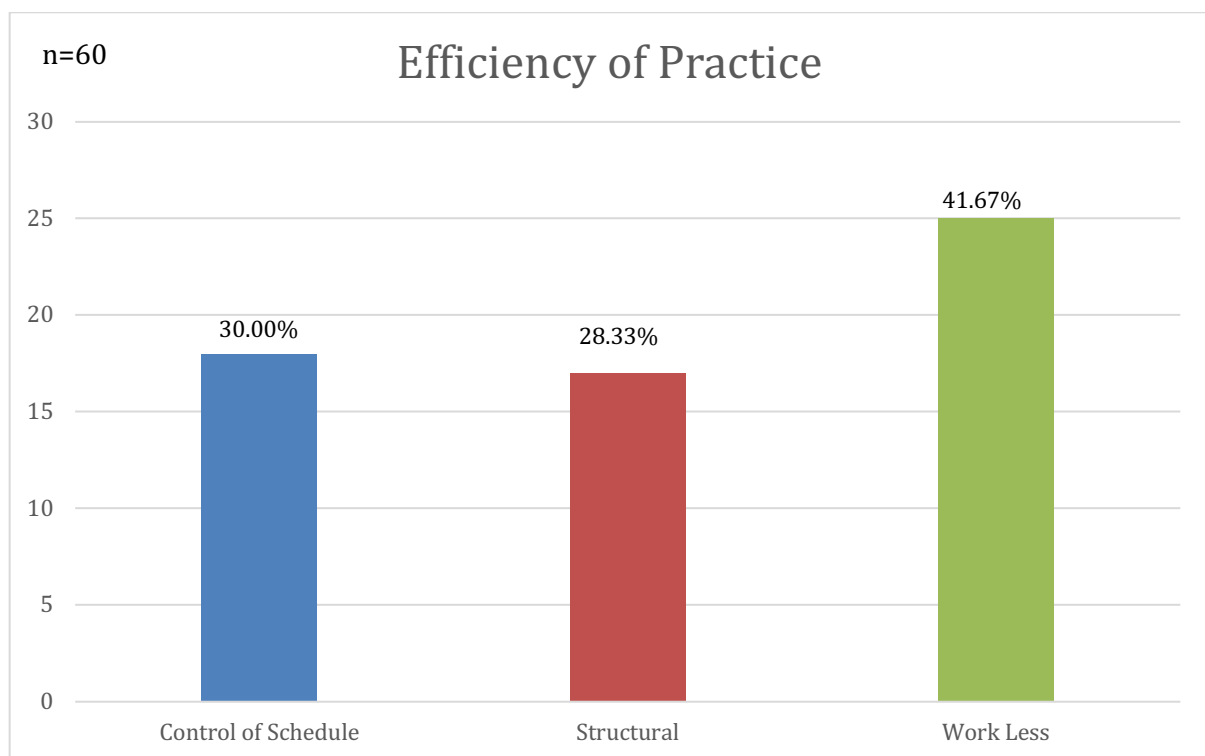


Table 5: Representative quotes per sub node within the Efficiency of Practice node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking ”How do you protect yourself from burnout,” February 2019, n=60. (Template adapted from Steven, et al., 2019).

Node: Efficiency of Practice	
Subnode	Representative Quotes
Work Less	<ul style="list-style-type: none"> • “Working part time” • “Working part time has been a tremendous protection” • “I have chosen to work fewer hours” • “I don’t work full time which provides some protection from burnout”
Control of the Schedule	<ul style="list-style-type: none"> • “I try to manage my work schedule” • “I limit my schedule so I see patients every 30 minutes in the office” • “Create protected time”
Structural or Organizational Changes	<ul style="list-style-type: none"> • “Being part of management” • “Advocate for systems level solutions” • “Fight within my organization for appropriate attention to problems”

No Solutions/Lack of Awareness. The node that emerged through the process of deductive content analysis was that of No Solution/Lack of Awareness, defined as when respondents indicated that the physician is doing nothing, nothing is being provided for them by the organization to serve as a positive or protect factor to improve their fulfillment or well being, or lack of awareness of assistance or services provided (*Figure 8*). The two themes that emerged from this node were, “No Assistance was Offered” and “No Knowledge.” Among these responses, 53.33% of the responses led to the emergence of the subnode “No Assistance was Offered.”. Another 46.6% of the responses led to the emergence of the subnode “No

Knowledge.” Representative quotes from respondents which were utilized to determine themes and subnodes are below (*Table 6*).

Figure 8. Thematic content results under the No Solution node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=45.

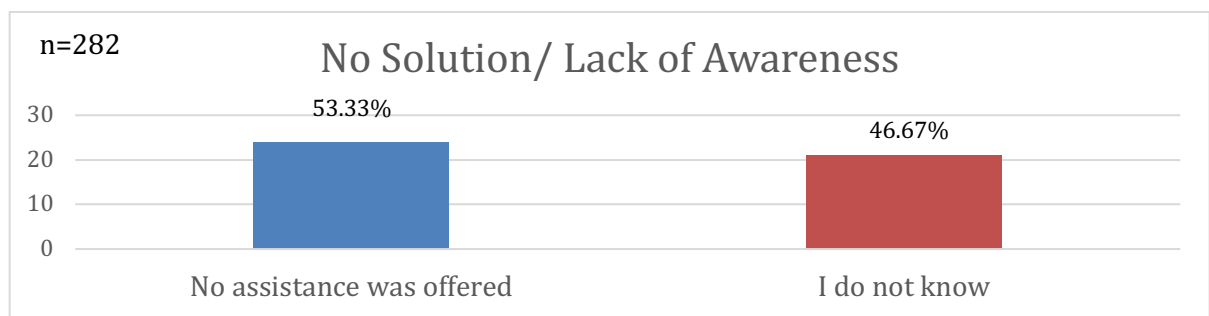


Table 6: Representative quotes per subnode within the No Solution/Lack of Awareness node, from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=45. (Template adapted from Steven, et al., 2019).

Node: No Solution/Lack of Awareness	
Subnode	Representative Quotes
No Assistance was Offered	<ul style="list-style-type: none"> • “There is no respite, no protection, the hospital does not care” • “We do nothing” • “No interest by the organization” • “There are no mechanisms and measures to deal with (burnout),”
No Knowledge	<ul style="list-style-type: none"> • “I don’t know” • “Not sure” • “Not sure” • “?”

Table 7 presents a summary of the qualitative results, the four nodes and subnodes with representative quotes.

Table 7. Nodes, sub nodes and frequencies from qualitative analysis of the “Slowing the burn” Arizona physician survey, based on the survey results of the open ended question asking “How do you protect yourself from burnout,” February 2019, n=253.

<u>Node</u>	<u>Subnode</u>	<u>Representative Quotes</u>	<u>Frequency (percentage)</u>
Personal Resilience			Total: 135/327 (41.3%)
	<u>Time Off Work</u>	<ul style="list-style-type: none"> ● “Vacation,” ● “Travel,” ● “Try to take PTO,” ● “I take some days off and completely disconnect- not check emails” 	37/135 (27.4%)
	<u>Regular Physical Activity</u>	<ul style="list-style-type: none"> ● “Daily exercise” ● “Physical activity” ● “Exercise during the work week” 	23/135 (17.0%)
	<u>Emotional and Mental Well Being</u>	<ul style="list-style-type: none"> ● “Mindful meditation” ● “Remain grounded” ● “We try to do a self-care activity monthly” ● “Seek counseling myself” ● “Daily meditation” 	19/135 (14.1%)
	<u>Non-Clinical Personal Interests</u>	<ul style="list-style-type: none"> ● “Nonmedical hobbies” ● “Outside activities when available” ● “Make sure I have lots of rewarding non-medical hobbies” 	14/135 (10.4%)

	<u>Work-Life Balance</u>	<ul style="list-style-type: none"> ● “Disconnect myself from work” ● “Try not to take work home” ● “I try not to bring issues at work home” ● “We focus on work life balance” 	14/135 (10.4%)
	<u>Identifying Meaning in Work</u>	<ul style="list-style-type: none"> ● “Focusing more on patients” ● “Teach more” ● “Try to keep finding meaning in my work” ● “Focus on the patient encounters that remind me of why I elected to be a physician” 	8/135 (5.9%)
	<u>Respite in Clinical Day</u>	<ul style="list-style-type: none"> ● “Breaks” ● “Take my own breaks” ● “Allow time to rest in the day” 	7/135 (5.2%)
	<u>Setting Boundaries</u>	<ul style="list-style-type: none"> ● “Say NO” ● “Leaving medicine” ● “Move to another practice” ● “I try not to place myself in situations where I compare myself to others” 	6/135 (4.4%)
	<u>Time with Family</u>	<ul style="list-style-type: none"> ● “Family” ● “Home life” ● “Use family” ● “Enjoy time with family” ● “I have home life as my happiness” 	5/135 (3.7%)
	<u>Religion/Faith</u>	<ul style="list-style-type: none"> ● “Pray” ● “I lean on and trust in my rock Jesus Christ” 	2/135 (1.5%)
Culture of Wellness			Total: 87/327 (26.6%)
	<u>Increasing Communication with Colleagues</u>	<ul style="list-style-type: none"> ● “Speak with my colleagues” ● “Just talk to them and listen” ● “Listen to colleagues’ thoughts” 	38/87 (43.7%)

	<u>Assisting Colleagues with Tasks</u>	<ul style="list-style-type: none"> ● “Offer support for colleagues” ● “Help others” ● “We help each other at work” ● “Offer a helping hand” 	18/87 (20.7%)
	<u>Meeting/Socializing with Colleagues</u>	<ul style="list-style-type: none"> ● “Having coffee with a colleague” ● “Meet socially as a group fairly frequently” ● “We have started meeting 1-2 times a month” ● “Ask to go to coffee” 	10/87 (11.5%)
	<u>Formal Organizational Interventions</u>	<ul style="list-style-type: none"> ● “Our organization has done several programs and is developing resources and mentors” ● “Organizational counseling” ● “Offer resources” ● “We have access to employee assistance programs” 	6/87 (6.9%)
	<u>Sharing Frustrations with Colleagues</u>	<ul style="list-style-type: none"> ● “Vent to colleagues” ● “Discuss concerns” ● “Let them vent” ● “Venting to others that have similar complaints” 	6/87 (6.9%)
	<u>Recommending Time Off to Colleagues</u>	<ul style="list-style-type: none"> ● “Recommend PTO” ● “Encourage time away” 	5/87 (5.8%)
	<u>Positive Encouragement for Colleagues</u>	<ul style="list-style-type: none"> ● “Give them positive support” ● “Encourage them” 	4/87 (4.6%)
Efficiency of Practice			Total: 60/327 (18.4%)
	<u>Work Less</u>	<ul style="list-style-type: none"> ● “Working part time” ● “Working part time has been a tremendous protection” ● “I have chosen to work fewer hours” ● “I don’t work full time which provides some protection from burnout” 	25/60 (41.7%)

	<u>Control of the Schedule</u>	<ul style="list-style-type: none"> ● “I try to manage my work schedule” ● “I limit my schedule so I see patients every 30 minutes in the office” ● “Create protected time” 	18/60 (30.0%)
	<u>Structural or Organizational Changes</u>	<ul style="list-style-type: none"> ● “Being part of management” ● “Advocate for systems level solutions” ● “Fight within my organization for appropriate attention to problems” 	17/60 (28.3%)
No Solution/Lack of Awareness			Total: 45/327 (13.8%)
	<u>No Assistance was Offered</u>	<ul style="list-style-type: none"> ● “There is no respite, no protection, the hospital does not care” ● “We do nothing” ● “No interest by the organization” ● “There are no mechanisms and measures to deal with (burnout)” 	24/45 (53.3%)
	<u>No Knowledge</u>	<ul style="list-style-type: none"> ● “I don’t know” ● “Not sure” ● “Not sure” ● “?” 	21/45 (46.7%)

Aim 2

Descriptive demographic characteristics of the sample are reported in Table 8. Among the study sample, a slight majority identified as male (53.4%) and had an MD degree (51.5%). The majority self-identified ethnicity of participants was White (73.4%), followed by Asian (19.4%), all other self-identified race and ethnicity groups were under 4% each and there were no Indian American respondents. The plurality of participants were in the age range of 40-49 years (31.8%). Of the sample, 114/315 (36.2%) indicated professional fulfillment, while the majority (63.8%) were not professionally fulfilled. Also, just over half of the participants (52.7%)

indicated no burnout, while 47.3% of the sample indicated they were experiencing professional burnout (Table 8).

Table 8. Descriptive demographic characteristics of sample “Slowing the Burn Study,” Arizona physician survey, February 2019, n=309.

Variable	Category	Number	Percentage
Gender	Male	165	53.4%
	Female	144	46.6%
Age	21-29	0	0%
	30-39	77	24.8%
	40-49	99	31.8%
	50-59	66	21.2%
	60 and above	69	22.2%
Degree	DO	147	48.5%
	MD	156	51.5%
Ethnicity	White	223	73.4
	Black or African American	10	3.3%
	American Indian	0	0
	Asian	49	19.4%
	Native Hawaiian or Pacific Islander	1	0.3%
	From Multiple Races/Ethnicities	11	3.6%
Physicians PFI	Fulfilled	114	36.2%
	Unfulfilled	201	63.8%
Physician burnout	No burnout	157	52.7%
	Burnout	141	47.3%

The results comparing the presence of professional fulfillment with demographic characteristics are reported in Table 9. Women reported significantly lower professional fulfillment compared to men ($p<.0001$), as did age groups 30-39 and 40-49 compared to their

older counterparts in age groups 50-59 and 60 and above ($p=.001$). No statistically significant differences in fulfillment were found by professional degree or ethnicity.

Table 9. Prevalence of physician professional fulfillment in demographic characteristics from the “Slowing the burn” Arizona physician survey, based on the survey results of the professional fulfillment questions, February 2019, $n=309$.

Variable	Number with professional fulfillment n(%)	Total n(%)	<i>p</i> value	X² test of independence
<u>Gender</u> Male Female	68 (47.2%) 44 (26.7%)	144 (46.6%) 165 (53.4%)	0.000	X ² = 14.060
<u>Age</u> 21-29 30-39 40-49 50-59 60 and above	0 (0%) 22 (28.6%) 26 (26.3%) 26 (39.4%) 38 (55.1%)	0 (0%) 77 (24.8%) 99 (31.8%) 66 (21.2%) 69 (22.2%)	0.001	X ² = 17.139
<u>Degree</u> MD DO	59 (37.8%) 51 (34.7%)	156 (51.5%) 147 (48.5%)	0.572	X ² = 0.320
<u>Ethnicity</u> White Black or African American American Indian Asian Native Hawaiian or Pacific Islander From multiple races	78 (35.0%) 3 (30.0%) 0 (0%) 25 (42.4%) 1 (100%) 2 (18.2%)	223 (73.4%) 10 (3.3%) 0 (0%) 59 (19.4%) 1 (0.3%) 11 (3.6%)	0.286	Likelihood ratio* = 5.008 *4 cells (40%) have expected count less than 5, hence likelihood ratio is used instead of X ²

The results comparing the presence of burnout with demographic characteristics are reported in Table 10. Among demographic characteristics examined, the only statistically

significant association was found for age, with the age group 40-49 reporting significantly more burnout than other age groups ($p=.002$). No statistically significant differences in burnout were found by gender, professional degree or ethnicity.

Table 10. Prevalence of physician burnout in demographic characteristics from the “Slowing the burn” Arizona physician survey, based on the survey results of the burnout questions, February 2019, $n=309$.

Variable	Number with + burnout n(%)	Total n(%)	<i>p</i> value	X ² test of independence
<u>Gender</u>			0.300	X ² = 1.074
Male	58 (43.6%)	133 (45.5%)		
Female	79 (49.7%)	159 (54.5%)		
<u>Age</u>			0.002	X ² = 14.837
21-29	0 (0%)	0 (0%)		
30-39	34 (47.9%)	71 (24.1%)		
40-49	58 (61.7%)	94 (32.0%)		
50-59	26 (40.6%)	64 (21.8%)		
60 and above	21 (32.3%)	65 (22.1%)		
<u>Degree</u>			0.974	X ² = 0.001
MD	70 (47.3%)	148 (51.7%)		
DO	65 (47.1%)	138 (48.3%)		
<u>Race/Ethnicity</u>			0.574	Likelihood ratio* = 2.905 *3 cells (30%) have expected count less than 5, hence likelihood ratio is used instead of X ²
White	99 (46.9%)	211 (75.4%)		
Black or African American	5 (50.0%)	10 (3.6%)		
American Indian	0 (0%)	0 (0%)		
Asian	20 (42.6%)	47 (16.8%)		
Native Hawaiian or Pacific Islander	0 (0%)	1 (0.4%)		
From multiple races	7 (63.6%)	11 (3.9%)		

Aim 3

Descriptive practice characteristic data are reported in Table 11. Among the study sample, the majority reported working 40 or more hours a week (70.8%). Of those participants (73.1%) were employed physicians and most indicated that they worked in a large (25 or more physicians) size practice (34.4%), followed closely by those that worked in a practice size of 11-24 physicians (31.8%). Respondents were almost evenly distributed for years of practice from less than 5 years to over 21 years, though less than 5 years had a slight plurality (29.8%). The results indicate that the majority of participants spent their clinical time in outpatient care (74.6%). Of the sample, 114/315 (36.2%) indicated professional fulfillment, and the majority at 201/315 (63.8%) were not professionally fulfilled. Also, the majority of participants, 157/315 (52.7%), indicated no burnout, while 141/315 (47.3%) indicated burnout.

Table 11. Descriptive practice characteristics of sample, “Slowing the Burn,” Arizona physician survey, February 2019, n=309.

Variable	Category	Number	Percentage
Hours worked	>40	223	70.8%
	39 or fewer	75	23.8%
	Not employed, looking	1	0.3%
	Not employed, not looking	5	1.6%
	Retired	10	3.2%
	Disabled, not practicing	1	0.3%
Size of Practice (patients)	25+	104	34.4%
	11-24	57	18.9
	3-10	96	31.8%
	2	18	6.0%
	solo	27	8.9%
Employed or Owner	Employed	226	73.1%
	Owner	83	26.9%
Clinical time	Inpatient	79	25.4%
	Outpatient	232	74.6%
Years in Practice	<5	93	29.8%
	5-10	77	24.7%
	11-20	71	22.8%
	21+	71	22.8%
Physicians PFI	Fulfilled	114	36.2%
	Unfulfilled	201	63.8%
Physician burnout	No burnout	157	52.7%
	Burnout	141	47.3%

The results comparing the presence of professional fulfillment by practice characteristics are reported in Table 12. Employed physicians reported significantly lower professional fulfillment compared to owner physicians ($p=.007$), as did physicians <5 years of practice compared to physicians in practice for 21+ years ($p=.003$). Physicians whose clinical practice is made up of inpatient care, reported lower professional fulfillment compared to those who practiced clinical outpatient care, not statistically significant, but trending towards significance

($p=0.059$). No statistically significant differences in professional fulfillment were found by hours worked or size of practice.

Table 12. Prevalence of physician professional fulfillment in practice characteristics from the “Slowing the Burn” Arizona physician survey, based on the survey results of the professional fulfillment question, February 2019, $n=309$.

Variable	Number with professional fulfillment n(%)	Total n(%)	<i>p</i> value	X ² test of independence
<u>Hours worked</u> >40 39 or fewer Not employed, looking Not employed, not looking Retired Disabled	80 (36.2%) 23 (30.7%) 1 (100.0%) 2 (40.0%) 4 (40.0%) 1 (100.0%)	223 (70.8%) 75 (23.8%) 1 (0.3%) 5 (1.6%) 10 (3.2%) 1 (0.3%)	0.393	Likelihood ratio* = 5.193 *7 cells (58.3%) have expected count less than 5, hence likelihood ratio is used instead of X ²
<u>Size of Practice</u> 25+ 11-24 3-10 2 solo	30 (28.8%) 21 (36.8%) 37 (38.5%) 6 (33.3%) 14 (51.9%)	104 (34.4%) 57 (18.9%) 96 (31.8%) 18 (6.0%) 27 (8.9%)	0.231	X ² = 5.606
<u>Employed or Owner</u> Employed Owner	69 (30.5%) 39 (47.0%)	226 (73.1%) 83 (26.9%)	0.007	X ² = 7.231
<u>Clinical Time</u> Inpatient Outpatient	21 (26.6%) 89 (38.4%)	79 (25.4%) 232 (74.6%)	0.059	X ² = 3.577
<u>Years in Practice</u> <5 5-10 11-20 21+	28 (30.1%) 25 (32.5%) 19 (26.8%) 71 (68.3%)	93 (29.8%) 77 (24.7%) 71 (22.8%) 71 (22.8%)	0.003	X ² = 13.964

The results comparing the presence of burnout with practice characteristics are reported in Table 13. Inpatient physicians reported significantly more burnout than outpatient physicians ($p=.009$). Physicians in practice for 11-20 years reported higher burnout, trending towards significance ($p=0.055$). No statistically significant differences in burnout were found by hours worked, size of practice or employed or owner.

Table 13. Prevalence of physician burnout in practice characteristics from the “Slowing the Burn” Arizona physician survey, based on the survey results of the burnout questions, February 2019, $n=309$.

Variable	Number with + burnout n(%)	Total n(%)	<i>p</i> value	X ² test of independence
<u>Hours worked</u> >40 39 or fewer Not employed, looking Not employed, not looking Retired Disabled	103 (48.6%) 31 (41.9%) 0 (0%) 3 (75.0%) 4 (50.0%) 0 (0%)	212 (71.1%) 74 (24.8%) 0 (0%) 4 (1.3%) 8 (2.7%) 0 (0%)	0.510	Likelihood ratio* = 2.311 *4 cells (50%) have expected count less than 5, hence likelihood ratio is used instead of X ²
<u>Size of Practice</u> 25+ 11-24 3-10 2 solo	51 (49.5%) 30 (53.6%) 39 (43.8%) 8 (47.1%) 7 (28.0%)	103 (35.5%) 56 (19.3%) 89 (30.7%) 17 (5.9%) 25 (8.6%)	0.267	X ² = 5.199
<u>Employed or Owner</u> Employed Owner	104 (47.9%) 37 (46.3%)	217 (73.1%) 80 (26.9%)	0.797	X ² = 0.66
<u>Clinical time</u> Inpatient Outpatient	45 (60.0%) 95 (42.6%)	75 (25.2%) 225 (74.8%)	0.009	X ² = 6.821
<u>Years in Practice</u> <5 5-10 11-20 21+	38 (37.3%) 38 (50.7%) 41 (57.7%) 24 (35.3%)	85 (28.4%) 75 (25.1%) 71 (23.7%) 68 (22.7%)	0.055	X ² = 7.611

Aim 4

The results showing the association of demographic and practice characteristics with professional fulfillment based on multiple logistic regression analyses are reported in Table 14. Females were 0.406 (95% CI: 0.253, 0.654) times less likely to have professional fulfillment than males. Ages 30-39 and 40-49 were 0.326 (95% CI: 0.164, 0.647) and 0.291 (95% CI: 0.151, 0.558), respectively, times less likely to have professional fulfillment than age 60 and above. A solo practice was 2.656 (95% CI: 1.117, 2.855) more likely to have professional fulfillment compared to practices with >25 physicians. Owners were 2.017 (95% CI: 1.204, 3.378) more likely to have professional fulfillment than employed physicians. Physicians with 21+ years in practice were 2.673 (95% CI: 1.405, 5.086) times more likely to have professional fulfillment than physicians with 5 years of practice. Inpatient physicians were 0.582 (95% CI: 0.331, 1.024) less likely to have professional fulfillment compared to outpatient physicians, not statistically significant, but trending towards significance ($p=0.060$). No other associations were statistically significant.

Table 14. Association of demographics and practice characteristics (gender, age, ethnicity, degree, hours worked, size of practice, employed or owner, clinical time (inpatient or outpatient) and years in practice) and professional fulfillment, from the “Slowing the Burn” Arizona physician survey, February 2019, $n=309$.

	Odd-Ratio	95% CI	% correct	sig
<u>Gender</u>			63.8	
Male	1.000			
Female	0.406	0.253, 0.654		0.000

<u>Age</u>			66.2	
30-39	0.326	0.164, 0.647		0.001
40-49	0.291	0.151, 0.558		0.000
50-59	0.530	0.267, 1.052		0.069
60 and above	1.000			
<u>Degree</u>			63.7	
MD	1.000			
DO	0.873	0.546, 1.396		0.572
<u>Ethnicity</u>			64.5	
White	1.000			
Black or African American	0.797	0.200, 3.168		0.747
Asian	1.367	0.761, 2.454		0.295
From multiple races	0.413	0.087, 1.959		0.266
<u>Hours worked</u>			64.8	
>40	1.000			
39 or fewer	0.761	0.434, 1.333		0.339
Not employed, not looking	1.146	0.188, 7.003		0.882
Retired	1.146	0.314, 4.182		0.836
<u>Size of Practice</u>			64.6	
25+	1.000			
11-24	1.439	0.725, 6.315		0.298
3-10	1.547	0.857, 3.588		0.148
2	1.233	0.424, 2.792		0.700
solo	2.656	1.117, 2.855		0.027
<u>Employed or Owner</u>			65.0	
Employed	1.000			
Owner	2.017	1.204, 3.378		0.008
<u>Clinical Time</u>			64.6	
Inpatient	0.582	0.331, 1.024		0.060
Outpatient	1.000			
<u>Years in Practice</u>			66.3	
<5	1.000			
5-10	1.116	0.582, 2.140		0.741
11-20	0.848	0.427, 1.687		0.639
21+	2.673	1.405, 5.086		0.003

The results showing the association of demographic and practice characteristics with burnout are reported in Table 15. Physicians aged 40-49 were 3.376 (95% CI: 1.735, 6.569) more likely to have burnout than physicians 60 and above. Physicians 30-39 were 1.925 (95% CI: 0.958, 3.869) to have burnout than physicians age 60 and above, not significant, but trending towards (p=0.066). Inpatient physicians were 2.021 (95% CI: 1.186, 3.443) more likely to have burnout compared to outpatient physicians. No other associations were statistically significant.

Table 15. Association of demographics and practice characteristics (gender, age, ethnicity, degree, hours worked, size of practice, employed or owner, clinical time (inpatient or outpatient) and years in practice) and burnout, from the “Slowing the Burn” Arizona physician survey, February 2019, n=309.

	Odd-Ratio	95% CI	% correct	sig
<u>Gender</u>			53.1	
Male	1.000			
Female	1.277	0.804, 2.028		0.300
<u>Age</u>			60.2	
30-39	1.925	0.958, 3.869		0.066
40-49	3.376	1.735, 6.569		0.000
50-59	1.434	0.697, 2.947		0.327
60 and above	1.000			
<u>Degree</u>			52.8	
MD	1.000			
DO	0.992	0.623, 1.579		0.974
<u>Ethnicity</u>			54.3	
White	1.000			
Black or African American	1.131	0.318, 4.023		0.849
Asian	0.838	0.443, 1.587		0.587
From multiple	1.980	0.563, 6.965		0.287

<u>Hours Worked</u> >40 39 or fewer Not employed, not looking Retired	1.000 0.763 3.175 1.058	0.447, 1.302 0.325, 31.012 0.258, 4.343	53.4	0.321 0.320 0.937
<u>Size of Practice</u> 25+ 11-24 3-10 2 solo	1.000 1.176 0.795 0.906 0.397	0.613, 2.258 0.450, 1.406 0.324, 2.533 0.153, 1.030	54.8	0.625 0.431 0.851 0.058
<u>Employed or Owner</u> Employed Owner	1.000 0.935	0.559, 1.563	52.5	0.797
<u>Clinical Time</u> Inpatient Outpatient	2.021 1.000	1.186, 3.443	58.1	0.010
<u>Years in Practice</u> <5 5-10 11-20 21+	1.000 1.270 1.690 0.675	0.682, 2.368 0.895, 3.193 0.350, 1.300	56.9	0.451 0.106 0.240

DISCUSSION

This secondary analysis aimed to generate further insights about demographic and practice characteristics related to physician fulfillment and burnout, via a survey conducted with physicians in Arizona. This exploratory and innovative study is among the first to apply a positive deviance-informed approach and examine various demographic and practice based correlates of fulfillment and burnout to provide initial insights into these factors. The findings of

this preliminary study can potentially define and focus future directions of research in physician burnout and fulfillment.

The specific aims of this study were first, to identify physician beliefs about self-protection from burnout among a sample of Arizona physicians categorized by initial three conceptual groupings: Culture of Wellness, Efficiency of Practice and Personal Resilience; second, to examine the prevalence of physician professional fulfillment and burnout by demographic characteristics such as gender, age, degree, and race/ethnicity in a sample of physicians practicing in Arizona; third, to examine the prevalence of physician professional fulfillment and burnout by physician practice characteristics such as work hours, size of practice, employed or owner status, clinical time and years in practice among a sample of physicians practicing in Arizona; and fourth, to assess the association of physician demographic and practice characteristics with physician fulfillment and physician burnout in a full model using a multiple logistic regression analytic approach among a sample of physicians practicing in Arizona.

Implications from the Qualitative Analysis

Strengthening Personal Resilience. Findings from the qualitative analysis based on identifying physician beliefs regarding self-protection from burnout showed that the most common theme, or node, that emerged based on physician responses was that of Personal Resilience (42.28%). The concept of building resilience, specifically *within* the clinical context has been examined in the literature as a promising individual level intervention for physician burnout (Buck et al., 2019). The results of this study found the leading subnode of Personal Resilience to be Time off From Work (27.41%), or taking periodic breaks or vacations, and one of the least common subnodes to

be Identifying Meaning at Work (5.93%), or a reconnection with professional purpose in the clinical setting.

These findings suggest that respondents develop the leading protective factor of personal resilience by being physically away from the clinical setting, rather than having identified and used opportunities to build it *within* the clinical context. The findings further suggest either a lack of programs or initiatives to build resilience within respondents' organizations, or that those that exist are not as effective as what respondents gain when they leave the setting. These findings are consistent with existing literature regarding physicians finding resilience when away from the clinical context (Patel et al, 2018). Further research is needed to examine strategies utilizing various approaches within organizations and clinical settings to determine which are most effective at strengthening resilience, so that physicians may access this protective factor in the workplace, not just away from it.

Fostering a Culture of Wellness from Within. The second most common node of the quantitative analysis was Culture of Wellness (26.61%). While the node included several subnodes, all but one, Formal Organizational Interventions (6.90%), involve physicians improving their own culture, without organizational guidance. All of these physician-initiated subnodes involve strengthening interpersonal relationships, or support systems, with colleagues. This is notable as much of the literature that exists on improving culture in the context of physician burnout involves the role of organizational leadership and structure (Amofo et al., 2015). These findings suggest that respondents found more protective benefit from burnout through interpersonal supportive factors, rather than organizational or hospital administration efforts to improve

clinical culture. Further study is warranted to further examine the effectiveness of organizational interventions that operate in concert with promising interpersonal initiatives.

Protective factors identified in the findings such as improving internal communication, social supports and workload assistance efforts between physicians were initiated and enabled by the respondent themselves and represent an indigenous, or tacit, knowledge that resulted in better outcomes than those developed by other stakeholders, such as organizational leadership. These strategies are a key dimension of Positive Deviance based approaches (Lawton & Clay-Williams, 2014.)

Building Efficiency Through Reduced Presence and More Autonomy. The least common node that emerged in the qualitative analysis was that of Efficiency of Practice (18.35%). Of that node, the most common subnode was Work Less (41.67%), which once again in the analysis reflects the perceived protective factor of spending less time in the clinical context. This node refers primarily to reducing overall work effort or switching to part-time practice. While some literature supports the protective benefits from burnout of part-time practice (Glauser, 2018), this option presents limitations for those physicians whose compensation is tied to volume, impacts the workload and capacity of remaining physicians and staff and can exacerbate access to care issues for patients (Glauser, 2018).

Notably, the second most common subnode that emerged was Control of Schedule (30.00%), or when the physician had greater influence or autonomy over their clinical day or week, and the least common subnode was Structural Changes Within the Organization (28.33%), or when administrative leadership create initiatives intended to improve aspects of efficiency

such as workflow. Once again in the analysis, the results suggest that respondents found organizational or health system level factors to be less protective than those initiated and controlled by physicians themselves. These general findings reflect the ‘us against them’ mentality that is pervasive in the current American health care system as it relates to longstanding perceptions of adversarial relationships and misaligned incentives between physicians and health care administrators and organizational leadership (Montgomery, 2016).

A Gap in Solutions and Knowledge. The fourth node, No Solution/Lack of Knowledge, emerged through the qualitative analysis as 13.76% of respondents indicated they were not aware of any solutions to burnout. No assistance was offered by physicians to increase fulfillment or to reduce burnout was coded under the subnode of No Assistance Was Offered (53.33%), and that they had no knowledge of protective factors that were utilized or available, was coded under the subnode of No Knowledge (46.67%). The emergence of this particular node suggests disconnects in communication between physicians and organizational leadership, lack of transparency or education by organizations as to their efforts or a general apathy or malaise by the respondents that has been reflected in previous literature in this space (Arabaci, 2010).

Implications from the Quantitative Analysis

In an effort to examine the prevalence of physician professional fulfillment and burnout by demographic and practice characteristics, as well as assess the association of both with fulfillment and burnout, initial thematic findings emerged in the analyses suggesting implications by demographic and practice characteristics.

An initial overarching finding of the quantitative analysis was that physician burnout and professional fulfillment are not clearly inverse, or opposites, of each other. This is evidenced by demographic or practice characteristic findings in which cohorts demonstrated statistical significance for one dependent variable (burnout or fulfillment), but not necessarily show significance for the other dependent variable.

Gender Based Challenges for Professional Fulfillment. The findings of the analysis showed that of demographics examined, the characteristic of gender was statistically significant for professional fulfillment. Notably, respondents who self-identified as male experienced approximately twice as much professional fulfillment (1.53 – 3.95, 95% CI) than those that self-identified as female. Interestingly, while the disparity by gender was significant as it related to professional fulfillment, the same was not the case for burnout, suggesting burnout and professional fulfillment are not direct opposites.

The literature that has examined experiences related to female physicians consistently point to a wide variety of challenges disproportionately shouldered by women in medicine including: inequitable practices related to reimbursement and promotion, stressors related to greater demands in family life than male counterparts, the need for flexible schedules to balance family related demands, gender based discrimination, microaggressions and unconscious bias in the clinical setting (Adesoye et al, 2017; Jena et al, 2016; Stonnington, 2020). The findings from the analysis show less professional fulfillment by the female respondents and consistent with the literature that points to the myriad of challenges and hurdles present, and difficulty in overcoming them based on systemic and societal barriers.

A Disproportionate Burden by Young and Middle Age Physicians. Age was another demographic characteristic with statistically significant findings in the analysis. Amongst age ranges examined, 30-39 and 40-49 years of age, were statistically significant for having less professional fulfillment, one third as likely (1.55 – 6.10 and 1.79 – 6.62, 95% CI, respectively), compared to respondents 60 years and above. In the analysis respondents aged 40-49 were also found statistically significant to have more burnout, at more than three times odds ratio (1.74 – 6.57, 95% CI). Comparatively, the youngest age group of 30-39 years was not statistically significant for burnout, but trending towards significance ($p=0.066$), with a two times odds ratio (0.96 – 3.87, 95% CI).

Findings regarding the youngest physicians are generally consistent with the results of other published studies that examined burnout in the context of age in physicians and found that younger practicing physicians and physicians in training seem to be experiencing it at higher rates than their older peers (Patel et al, 2018; Shanafelt et al, 2003). Similar to the female respondents examined in this analysis, the findings suggest that professional fulfillment is particularly elusive for younger physicians. Notably, findings for the relationship between 40-49 year old respondents and burnout is similar to that in the recent Medscape National Physician Burnout & Suicide Report 2020 (Kane, 2020), which stated that physicians aged 40-54 were experiencing burnout at higher rates than their older and younger counterparts. These particular findings suggest a possible exacerbation of factors such as challenges in work-life balance, recognizing meaning in work and satisfaction of specialty choice (Daaleman, T. 2018; Dyrbye et al., 2013), that lead to burnout for mid-career physicians and not enough of the positive or

protective factors that contribute to professional fulfillment. Further research is warranted that focuses on factors specifically by stage of career and how they associate with burnout and fulfillment.

Professional Fulfillment and Longer Years in Practice. Findings from the logistic analysis regarding the practice characteristic of *years of practice* and its relationship with professional fulfillment and burnout had similar results to the demographic characteristic of age, though not as significant. Respondent physicians with 21 or more years of clinical experience showed statistically significant greater than two times the professional fulfillment (1.41 – 5.09, 95% CI) compared to physicians with fewer than 5 years of experience. These associations are notable, as the analysis was a simultaneous logistic regression, yet age and years in practice had similar findings. Thereby suggesting protective factors leading to professional fulfillment for physicians with significantly more years of practice, ostensibly also older in age, than those that are relatively newer to clinical practice, and likely also younger.

Autonomy Through Employment Model and Professional Fulfillment. The findings showed that the practice characteristic of whether respondents owned or were employed by their clinical practices also demonstrated a relationship with professional fulfillment. Respondents who were owner physicians had more professional fulfillment, with an odds ratio of two (1.20 – 3.38, 95% CI). Alternatively, employed physicians did not report significantly more burnout than their owner counterparts.

These findings suggest that autonomy in clinical practice, through ownership, may possibly serve as an important protective factor contributing to professional fulfillment (Olson et al., 2019). This finding is consistent with the literature as autonomy is a key protective factor for physicians (Olson et al., 2019). Relationships and associations related to owner or employed status are complicated to accurately determine because of the complex nature of physician professional arrangements. For example, under the traditional business model of private practice, physicians are employed by a private medical group initially and can later become one of the shareholder partners, or owners, of the group. This arrangement at hiring can potentially impact an employed physician's outlook as they expect their position to change towards more autonomy within the group, serving as a protective factor.

Autonomy Through Size of Practice and Professional Fulfillment. Although the practice characteristic Size of Practice was not statistically significant for professional fulfillment of burnout by chi square analysis, the practice characteristic of Solo Practice showed statistical significance in having more professional fulfillment when compared to physicians that practiced within a group of 25 or more peers, by logistic regression (1.12 – 2.86, 95% CI). This once again suggests that autonomy through size of practice, including decision making, practice hours, self-determination of administrative requirements (Olson et al., 2019), serves an important protective role and contributes to physician fulfillment.

Newer Model of Clinical Practice, Increased Burnout and Decreased Fulfillment. Finally, the practice characteristic of Inpatient or Outpatient Clinical Time showed that physicians whose

practice was based on inpatient clinical time had statistically significant higher burnout than those whose practice was primarily outpatient in nature, with an odds ratio of two (1.19 – 3.44, 95% CI). Trending towards statistical significance, inpatient practice also showed less professional fulfillment than outpatient work, suggesting that dimensions of inpatient clinical practice not only contributed to burnout, but also did not contribute enough to professional fulfillment. Further research is warranted with a larger number of physicians to increase the power to detect whether there is a statistical significance between inpatient and outpatient physicians and their associations with factors contributing to professional fulfillment.

As a newer model of medical practice, formally recognized in 1996, (Quinn, 2016; Wachter & Goldman, 1996), inpatient clinical practice and especially its practitioners' experiences with burnout and professional fulfillment have not been extensively examined in the literature. The scant literature in this area has mixed results on the role of inpatient and outpatient clinical practice on burnout or fulfillment (Hinami et al., 2012; Roberts et al., 2013). Examining this professional practice model is complicated by the fact that some physicians spend their clinical time in both inpatient and outpatient care ("Inpatient vs. Outpatient," 2019), thus making it challenging to identify factors contributing to burnout as well as professional fulfillment. The literature would also benefit from studies that stratify physician professional models that are inclusive of inpatient, outpatient or hybrid clinical practice models.

Limitations

This secondary analysis suffers from limitations based on those existing from the original "Slowing the Burn," study, as well as those attributed to the present analysis.

Limitations of the Secondary Analysis Based on the “Slowing the Burn” Study. Limitations include potential biases from the original study in the form of: omission selection bias (Berk, 1983) by not capturing a more racially and ethnically diverse respondent pool; inclusive selection bias (Berk, 1983) as respondents volunteered to participate in the study; and response bias (Hill & Shaw, 2013), as the original study itself was called “Slowing the Burn,” potentially influencing the responses towards reporting burnout.

The original study was distributed by the two medical organizations in the state and though current membership numbers are not known to the investigators, both organizations publicly state that they have 4000 (“Arizona Medical Association”) and 1000 members (“Arizona Osteopathic Medical Organization”). Relying on these unofficial numbers, the original study had a 6.32% response rate at best, which is lower than the published average of 35.7% for organizational research (Baruch & Holtom, 2008). In addition, the 316 respondents represent 1.8% of the 17,356 licensed physicians in Arizona (“Association of American Medical Colleges”), though it is important to note physicians are often licensed in more than one state so this total number does not accurately capture how many were actively practicing in Arizona at the time of the survey.

Additionally, as the survey was distributed via electronic newsletter and social media, it is possible that segments of both memberships who do not access these mediums, less familiar with navigating electronically, not active participants of the organization, or who do not respond to surveys were missed through this process (Boyer et al., 2001). All of these factors would likely reduce the response rate for studies in general that are distributed in this manner. Nevertheless, low response rates can limit the generalizability of the findings (Fincham, 2008).

With the exception of a single additional question regarding type of medical degree, the original close ended questions were created and distributed unaltered from the previously published instrument (Trockel et al, 2018). Using an existing survey instrument for the purposes of a secondary, and originally unintended, analysis can challenge the breath of the data as researchers are limited by the original data collection parameters (Cheng & Phillips, 2014).

The design of the original survey also posed limitations in how certain closed ended questions were worded, thereby limiting the quality of data that was able to be collected. Several questions included binary and discrete options, when multiple, categorical or ordinal options may have been more appropriate, e.g. self-identifying the type of clinical practice as either inpatient or outpatient, when both options should be possible (Maxwell, 2004; “Questionnaire design”). Additionally, the open-ended question utilized for this secondary analysis included two inquiries in one question, which may have impacted the qualitative data captured (“Questionnaire design”).

The study was delivered to only members of Arizona medical organizations, thus limiting the potential respondents to Arizona practicing physicians who were members of the organizations. This could produce a geographic selection bias, which is potentially not generalizable to all physicians in Arizona, or those that practice outside of the state (Allen, 2017).

Limitations Specific to Secondary Analysis. Multiple logistic regression of a cross sectional analysis was utilized as the methodology for Aim 4. A limitation of a cross sectional analysis is that the findings could show correlation, not causation (Martínez, 2018), potentially limiting next

steps and intervention development. The “Slowing the Burn” survey was designed and delivered as an independent study prior to the inception and creation of this analysis. Therefore, the number of participants was not necessarily powered to detect the potential differences in each of the demographic or practice characteristics. This constraint could have directly affected the chi square analysis, which is sensitive to sample size (Bergh, 2015). The limitations of qualitative research include challenges in replicating and verifying the data (Radu, 2019), producing statistically representative results from a cross sectional analysis (Polit & Beck, 2010) and limits in establishing causality (Maxwell, 2004).

These limitations notwithstanding, this study is amongst the first to capture the unique perspectives of physicians regarding protective factors from burnout, while also examining various demographic and practice based correlates of fulfillment and burnout in providing initial insights into these factors. In addition, the respondents were gathered based on outreach from their own statewide medical organizations, representing a positive deviance informed approach focused on internal strengths and solutions; as this study was in partnership with organizations representing physicians, populated by physicians, utilizing the sole voice of physicians, to ultimately create solutions for the benefit of other physicians.

CONCLUSION

The findings of this dissertation research offer an opportunity to better understand increase and improve knowledge of factors and approaches effective in contributing to physician professional fulfillment and reducing burnout. They also offer a strong foundation upon which future research directions can be based in this evolving area of the literature.

The qualitative findings suggest that the physician respondents perceived the most protective factors from burnout to be time away from clinical practice, physician-initiated solutions (independent of organizational or administrative leadership and based on peer supports), reduced clinical effort, professional autonomy and control over clinical practice. In addition, almost 14 percent of respondents indicated they lacked knowledge or did not know how to protect themselves from burnout. These findings represent a wide spectrum of experiences and knowledge at the individual, interpersonal and organizational levels regarding strategies to increase fulfillment and decrease burnout.

Quantitative findings suggest that physicians who self-identify as male, are older in age, own their clinical practice and have several years of clinical practice experience have more professional fulfillment than their peers. Additionally, younger physicians and inpatient physicians have more burnout than their counterparts that are older and practice outpatient clinical care. These results show that key demographics and practice characteristics appear to be experiencing fulfillment and burnout very differently than some of their peers.

Future Research Directions

The findings represent a rich array of opportunities to further examine causative factors, utilize additional research methods and focus on specific demographic and practice characteristics that have demonstrated disproportionate associations with either fulfillment or burnout. Specific future research directions include:

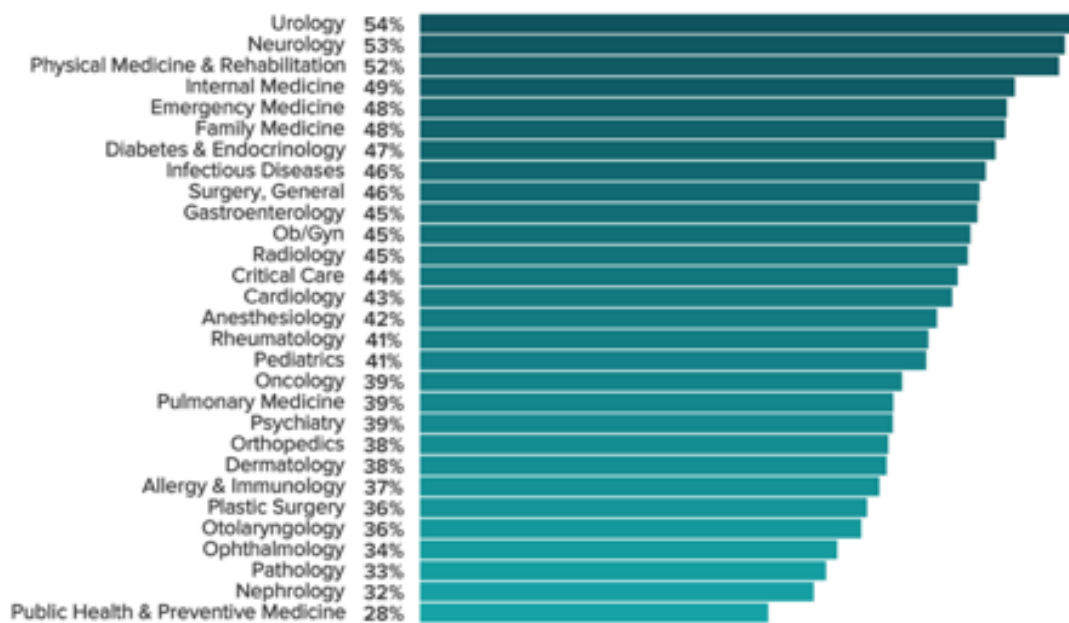
1. Conducting research utilizing prospective research designs such as randomized control trials, crossover trials and cohort studies, can build from the findings reported here to inform targeted intervention strategies for specific subpopulations of focus.

2. Examining the particular role of gender in fulfillment, particularly for physicians identifying themselves as female, to better identify which professional and personal factors serve as the largest contributors or barriers and utilize the findings to inform future targeted intervention programs.
3. Examining how physician perceived control of their practice, or autonomy, impacts fulfillment or burnout and if those findings can be utilized by organizations to craft responsive interventions.
4. Studying why older physicians appear to have higher fulfillment than their mid-career and younger peers, with a specific focus on identifying age or experience related protective factors and contributors for career longevity in the profession.
5. Focusing intervention studies to better understand how racial and ethnic minority physicians experience fulfillment and burnout, how that experience compares to their white counterparts, identify variances in experience between minority groups and how to utilize these findings for interventions to support a diversifying health care workforce.

APPENDICES

Appendix A: Which Physicians Are Most Burned Out?

Which Physicians Are Most Burned Out?



Appendix B: Extraction Table utilized in preparation for “A narrative review of the literature on factors that contribute to lower physician burnout and higher physician well-being.”

Authors	Year	Title	Full Article (Y/N)	Applicable (Y/N)	Study Design	Setting	Sample	Positive and Protective Factors	Conclusion	Comments	SEM Dimension
Anandarajah, A. P., Quill, T. E., & Privitera, M. R.	2018	Adopting the Quadruple Aim: The University of Rochester Medical Center Experience: Moving from Physician Burnout to Physician Resilience.	Y	Y	Cross-sectional	Academic medical center-Strong Memorial Hospital/ University of Rochester	528 Academic physicians-Neurology, psychiatry & Internal Medicine	Participation in patient care, teamwork, scholarly activities, autonomy.	Increase the role of institutions in developing a wellness structure and a business model that provides support for physicians such as: 1.) hiring medical assistants and scribes, 2.) expanding and enhancing the role of nurses, 3.)adequate training for support staff to assist with clerical needs.	Primarily easing administrative burden and developing teamwork so that physicians can focus on clinical practice.	Intrapersonal Interpersonal Organizational
Andolsek, K.	2018	Physician Well-Being: Organizational Strategies for Physician Burnout.	N								
Balch, C. M., Freischlag, J. A., & Shanafelt, T. D.	2009	Stress and burnout among surgeons: Understanding and managing the syndrome and avoiding the adverse consequences.	Y	N	Narrative review (primarily focused on causes of burnout)	Department of Surgery, The Johns Hopkins University	N/A	Actively nurture and protect their personal and professional well-being on all levels— physical, emotional, psychological, and spiritual (suggested)	Physicians should proactively avoid burnout in their careers by 1. maintaining personal and professional balance and 2. investing focus on improving personal satisfaction.	Does not address positive and protective factors, mainly is a call to action for more research on the issue	Intrapersonal
Buck, K., Williamson, M., Ogbiede, S., & Norberg, B.	2019	Family Physician Burnout and Resilience: A Cross-Sectional Analysis.	Y	Y	Cross-sectional	Residency Research Network of Texas	295 Family med physicians & residents from 11 residency programs	Psychological flexibility, resilience.	Organizational practice change is needed through evolved workplace policies, individual-level wellness programming, curricula for family medicine residents and faculty to impact provider wellness.	Focuses on individual behaviors and traits that enhance resilience and enhanced organizational curriculum.	Intrapersonal Organizational
Card, A. J.	2018	Physician burnout: Resilience training is only part of the	Y	N	Discussion/ Reflection article						

		solution.									
Chetlen, A. L., Chan, T. L., Ballard, D. H., Frigini, L. A., Hildebrand, A., Kim, S., Brian, J. M., Krupinski, E. A., & Ganeshan, D.	2018	Addressing burnout in radiologists.	Y	Y	Systematic review	National Cancer Institute, National Institutes of Health	N/A	Restoring balance (physical, emotional, work/life, relationships), mindfulness, cognitive behavioral therapies, mental health support, confidence/communi- cation education, small group sessions, transparent leadership, routine wellness checks, mentorship, workflow autonomy, EMR/PACS support, team huddles, wellness committee, organizational resources	1. Physician-directed interventions (i.e. mindfulness, social/mental support) and 2. organization- directed interventions (i.e. transparent and communicative leadership, mentorship) are necessary to improve physician well- being.	Proposes wide array of methods to address burnout at several dimensions from personal care, team support/leadershi- p, and organizational and structural support.	Intrapersonal Interpersonal Organizational
Daniels, A. H., DePasse, J. M., & Kamal, R. N.	2016	Orthopaedic surgeon burnout: Diagnosis, treatment, and prevention.	N								
Dyrbye, L. N., Trockel, M., Frank, E., Olson, K., Linzer, M., Lemaire, J., Swensen, S., Shanafelt, T., & Sinsky, C. A.	2017	Development of a research agenda to identify evidence-based strategies to improve physician wellness and reduce burnout.	N								
Eckleberry- Hunt, J., Kirkpatrick, H., & Hunt, R. B.	2017	Physician burnout and wellness.	N								
Eckleberry- Hunt, J., Kirkpatrick, H., Taku, K., & Hunt, R.	2017	Self-Report Study of Predictors of Physician Wellness, Burnout, and Quality of Patient Care.	Y	Y	Cross- sectional	American Academy of Family Physicians	444 family physicians	More flexible thinking, lower emotional distress, greater feelings of pride about work, less cynicism about patients, and higher reported quality of patient care	Self-reported mental health is the strongest predictor of physician well being in their career, concluding that "when physicians believe their emotional health is good, they feel better about those they work	Direct correlation noted of perceived well being and actual wellbeing, but proposals to improve such were not suggested.	Intrapersonal

									with and the quality of their work."		
Gazelle, G., Liebschutz, J. M., & Riess, H.	2015	Physician burnout: Coaching a way out.	Y	Y	Scoping review	N/A	N/A	Professional coaching (partnering with clients in a thought-provoking and creative process that inspires them to maximize their personal and professional potential)	Professional coaching to improve self-awareness, satisfaction, and support may promote resilience against the demanding field of medicine from an internal locus of control (does not address external locus of control).	Proposes social support solution to physician burnout (professional coaching). Notes a need for more research on the topic.	Interpersonal
Gregory, S. T., Menser, T., & Gregory, B. T.	2018	An organizational intervention to reduce physician burnout.	Y	Y	Cross-sectional	8 primary care clinics of a large, urban, integrated healthcare delivery system	112 physicians (unspecified)	(1) Establish personal work limits, (2) protect family time, (3) exercise, (4) practice relaxation, and (5) engage in humor	Organizational changes to reduce stress and administrative practices are recommended to combat physician burnout via workload interventions, as self-care interventions only increase capacity to endure stress rather than address the organizational issues at hand.	Focuses on the organizational potential to ameliorate the stressful work environments that produce burnt-out physicians through institutional intervention strategies and reducing workload	Organizational
Henson, J. W.	2016	Reducing physician burnout through engagement.	Y	Y	Literature review	N/A	N/A	Strong, transparent, and supportive physician leadership	Choose physician leaders with great care and ensure that these leaders attend to the professional needs of those they lead by 1. supporting, 2. positioning, 3. empowering, and 4. engaging their staff.	Proposes a method to address burnout by focusing on the potential of strong leadership to adequately support physicians.	Organizational
MacKinnon, M., & Murray, S.	2018	Reframing physician burnout as an organizational problem: A novel pragmatic approach to physician burnout.	Y	Y	Scoping review	N/A	N/A	Reframing burnout and depression as organizational problems.	Reframe physician burnout as an organizational problem. Suggested that healthcare organizations must be provided the proper incentives to enact workplace improvements for physicians	Encourages organizational accountability and increased engagement in combating burnout. Article focuses primarily on the problem and causes.	Organizational

Miller, M. N., & McGowen, R.	2010	Strategies to avoid burnout in professional practice: Some practical suggestions.	Y	Y	Scoping review	N/A	N/A	Age and experience (older/more experienced) due to developed protective defenses	Individual and interpersonal changes are encouraged to increase personal strength and wellbeing and social support systems through 1. Increased sense of control through engaging leadership, 2. group support, 3. mindfulness, 4. mentorship. Organizations need to be financially incentivized to address burnout.	Mainly focuses on individual positive practices and leadership/mentorship to share learned protective factors to foster a positive work experience.	Intrapersonal Interpersonal Organizational
Mossabeh, R., & Sowti, K.	2019	Importance of Physician Wellness in Battling Burnout.	N								
Nedrow, A., Steckler, N. A., & Hardman, J.	2013	Physician resilience and burnout: Can you make the switch?	Y	N	This is a commentary/ viewpoint type of piece.						
Olson, K., Marchalik, D., Farley, H., Dean, S. M., Lawrence, E. C., Hamidi, M. S., Rowe, S., McCool, J. M., O'Donovan, C. A., Micek, M. A., & Stewart, M. T.	2019	Organizational strategies to reduce physician burnout and improve professional fulfillment.	Y	Y	Consensus review	N/A	N/A	Shared common mission with leaders; feel valued, empowered, engaged by supervisors, feel part of effective team; sense of belonging/community; confident in importance of work; feel workplace is effective in service to profession	Organizational changes to improve wellbeing include: . Strong leadership; Increase control/autonomy; Foster community; Appreciation/recognition; . Equity/diversity efforts; Improve EHR; Encourage efficiency; Support healthy lifestyles; and. Peer support programs.	Primarily developing social support (improving culture of wellbeing, efficiency of practice, and personal resilience)	Intrapersonal Interpersonal Organizational
Patel, R. S., Sekhri, S., Bhimanadham, N. N., Imran, S., & Hossain, S.	2019	A Review on Strategies to Manage Physician Burnout.	Y	Y	Scoping review	N/A	N/A	Physician-directed interventions (personal coping strategies i.e. mindfulness), organization-directed interventions (workload alleviation,	Professional coaching and stress reduction programs; Social team building activities; Hospital protocols for work duty division and structured roles; Paid leave/time off; Funding for team building activities; Strict following of ACGME work-hour	Propose wide array of potential solutions, does not give definitive answers. Conclusion focuses on organizational duties to improve job satisfaction and alleviate typical stressors	Intrapersonal Interpersonal Organizational

									restriction guidelines are shown to develop a healthier generation of providers.		
Rakesh, G., Pier, K., & Costales, T. L.	2017	A call for action: Cultivating resilience in healthcare providers.	Y	N	Call to Action/ opinion piece.						
Rosenstein, A.	2017	Addressing Physician Stress and Burnout: Impact, Implications, and What We Need to Do.	Y	N	Call to Action/ opinion piece.						
Rosenstein, A. H.	2012	Physician stress and burnout: What can we do?	Y	Y	Cross-sectional	N/A	Over 2,000 practicing physicians nation- wide across multiple specialties	Current organizational practices noted (most to least prevalent): wellness initiatives, coping education, on-site exercise classes, counseling, mentoring, social events, work accommodations, ancillary support, time off, gym memberships, concierge services	Physicians desire organizational support with (most to least demanded): ancillary support, on-site exercise classes, wellness initiatives, coping workshops, mentoring, administrative involvement, more paid vacation, better compensation, adequate staffing, better EMR, better call coverage, wellness resources.	Does not note effectiveness of existing protective practices, only the prevalence of such	Organizational
Shanafelt, T. D., Dyrbye, L. N., & West, C. P.	2017	Addressing physician burnout: The way forward.	Y	N	Viewpoint						
Siedsma, M., & Emlet, L.	2015	Physician burnout: Can we make a difference together?	Y	Y	Randomized clinical trial	Academic Medical Center- Department of Internal Medicine	75 physician trial participants, 350 non trial participants in control group	Facilitated small group discussions- elements of mindfulness, reflection, shared experience and small group learning	Small-group curriculum improved meaning and engagement in work and reduced depersonalization, with sustained results 12 months after the study.	Organizational level wellness program	Organizational

Sotile, W. M., Fallon, R. S., & Simonds, G. R.	2019	Moving From Physician Burnout to Resilience.	Y	Y	Scoping review	N/A	N/A	Organizational: administrative support, survey staff, alleviate workload and improve efficiency, support programs and services, facilitate collab., adjust compensation, resilience training, solicit input and support. accept responsibility, detect changes in engagement, increase clinician activation, promote wellness culture, highlight resources. Individual (resilience challenge): beware of ambivalence, mindfulness, discuss issues, celebrate/uplift, work/life balance, deepen relationships, create support/ work community	Organizational engagement needed for all dimensions of the healthcare institution, as organizations hold the most control over physician/employee wellbeing. Intrapersonal efforts to promote resilience are only addressing the symptoms, whereas the organization can address the stressors at the root cause of burnout.	States that organizations are responsible for 90% or burnout, and 10% that individual physicians' responsibility.	Intrapersonal Organizational
Swensen, S. J., & Shanafelt, T.	2017	An organizational framework to reduce professional burnout and bring back joy in practice.	Y	Y	Scoping review	Academic Medical Center- The Mayo Clinic	N/A	Design Organizational Systems to Address Human Needs; Develop Leaders with Participative Management Competency; Build Social Community; Remove Sources of Frustration and Inefficiency; Reduce Preventable Patient Harm and Support Second Victims; Bolster Individual Wellness	Satisfied human social and psychological needs, eliminated or mitigated structural and functional drivers of burnout, and strengthened individual resilience	Focuses on organizational opportunities to create a physician- supportive work environment and bring joy in practice.	Organizational
Szigethy, E.	2014	Burnout: Strategies to prevent and overcome a common—And dangerous— Problem.	Y	N	Article is not an empirical study- instead a viewpoint/c ommentary publication.						

Taku, K.	2014	Relationships among perceived psychological growth, resilience and burnout in physicians.	Y	Y	Cross sectional	Academic Medical Center-Department of Psychology, Oakland University	289 physicians (field unspecified)	Higher perceived growth, personal resiliency.	In addition to enhancing resilience and social support, this study adds the element of perceived growth, which can empower physicians to experience growth and potentially alleviate burnout, especially when there is low family support or low resiliency.	Focuses on physician self-perception as an instigator of resilience	Intrapersonal
Wei, J., Rosen, P., & Greenspan, J. S.	2016	Physician burnout: What can chairs, chiefs, and institutions do?	Y	Y	Cross sectional	Academic Medical Center-Department of Pediatrics	Attending physicians at pediatric health system. Number unspecified	Reflection, discussions, education on how to maximize individual wellness, mindfulness, adaptability, effective use of EMR, adequate primary care office resourcing	Use a measurement tool to measure burnout of faculty; Build a coalition of support for tackling burnout that spans the organization; Ask physicians to identify the primary factors affecting them and invite them to propose their own solutions; and Publicize the project wins, ask for feedback, measure burnout levels again.	Notes observed successful preventative measures at individual level and discusses suggested organizational efforts to combat burnout (primarily social support)	Intrapersonal Organizational
West, C.	2017	The Mayo Clinic Program on Physician Well-Being: Studying Solutions to Physician Burnout.	Y	Y	Randomized clinical trial	The Mayo Clinic Department of Medicine	6-10 physicians per group (total groups unspecified)	Facilitated physician engagement groups promoting and maintaining satisfaction to check in, dialogue, and build relationships.	Small-group support programs to engage physicians showed success after a 6-month trial period. Most physicians desired a continuous program to maintain these relations and support. Time allotment during the work day, flexibility in group assignments, discussion questions/topics, and reimbursement were provided.	Organizational level wellness program	Organizational

Appendix C: Physician Burnout Survey

Survey Link: <https://www.surveymonkey.com/r/AZPhysicianBurnout>

① What is your gender?

☐ Female

☐ Male

☐ Other (specify)

② Which category below includes your age?

☐ 21-29

☐ 50-59

☐ 30-39

☐ 60 or older

☐ 40-49

④ Which of the following categories best describes your employment status?

③ Are you...

☐ Employed, working 40 or more hours per week

☐ Not employed, NOT looking for work

☐ DO

☐ Employed, working 1-39 hours per week

☐ Retired

☐ MD

☐ Not employed, looking for work

☐ Disabled, not able to work

⑤ Are you White, Black or African-American, American Indian or Alaskan Native, Asian, Native Hawaiian or other Pacific islander, or some other race?

☐ White

☐ Asian

☐ Black or African-American

☐ Native Hawaiian or other Pacific Islander

☐ American Indian or Alaskan Native

☐ From multiple races

☐ Some other race (please specify)

⑥ Are you Mexican, Mexican-American, Chicano, Puerto Rican, Cuban, Cuban-American, or some other Spanish, Hispanic, or Latino group?

☐ I am not Spanish, Hispanic, or Latino

☐ Cuban

☐ Mexican

☐ Cuban-American

☐ Mexican-American

☐ Some other Spanish, Hispanic, or Latino group

☐ Chicano

☐ From multiple Spanish, Hispanic, or Latino groups

☐ Puerto Rican

⑦ What is your speciality?

⑧ What is the name of your practice?

⑩ What is the size of your practice (# physician FTEs)?

☐ Solo

☐ 11-24

☐ Two

☐ 25+

☐ 3-10

⑨ In what city is your practice located?

12 What is your EHR vendor?

<input type="radio"/> allscripts	<input type="radio"/> GE Healthcare
<input type="radio"/> athenahealth	<input type="radio"/> Greenway
<input type="radio"/> Care360	<input type="radio"/> McKesson
<input type="radio"/> Cerner	<input type="radio"/> Nextgen
<input type="radio"/> eClinicalWorks	<input type="radio"/> Practice Fusion
<input type="radio"/> Epic	
<input type="radio"/> Other (please specify)	

11 Employed or owner?

☐ Employed

☐ Owner

13 Where do you spend the majority of your clinical time?

☐ Inpatient

☐ Outpatient

14 Please tell us the number of years in your current role:

☐ <5

☐ 5-10

☐ 11-20

☐ 21+

15 How true do you feel the following statements are about you at work during the past two weeks?

	Not true at all	Somewhat true	Moderately true	Very true	Completely true
I feel happy at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel worthwhile at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My work is satisfying to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel in control when dealing with difficult problems at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My work is meaningful to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm contributing professionally (e.g., patient care, teaching, research, and leadership) in the ways I value most	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 16 To what degree have you experienced the following:
During the past two weeks I have felt...

	Not at all	Very little	Moderately	A lot	Extremely
A sense of dread when I think about work I have to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physically exhausted at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lacking in enthusiasm at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotionally exhausted at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 17 To what degree have you experienced the following:
During the past two weeks my job has contributed to me feeling...

	Not at all	Very little	Moderately	A lot	Extremely
Less empathetic with my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less empathetic with my colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less sensitive to others' feelings/emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less interested in talking with my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less connected with my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Less connected with my colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 18 What do you know about physician burnout? How do you recognize when it is present?

- 19 Within your organization, how do you protect yourself from burnout and what do you do when you recognize signs of burnout in your colleagues?

- 20 What are the barriers that prevent you from doing this or taking these actions all the time?

21 How do administrative practices or policies contribute to the problem?

22 How do information systems (e.g., electronic health records) contribute to the problem?

23 Do you know anyone in your practice or organization who is able to frequently avoid or overcome burnout?

24 Do you have any ideas? If so, what needs to be done to operationalize these ideas?

25 Is there anyone else that needs to be involved in this conversation?

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