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Examining The Association Between Emotional Intelligence, Meaning In Life, Stress, And Burnout Among Preâ??medical Students In The United States

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EXAMINING THE ASSOCIATION BETWEEN EMOTIONAL INTELLIGENCE, MEANING

IN LIFE, STRESS, AND BURNOUT AMONG PRE-MEDICAL STUDENTS IN THE

UNITED STATES

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Dedication

This thesis is dedicated to all the people who have loved me, and I have loved during this

beautiful and life-changing journey. You know who you are.

And to my younger self, for fearlessly following her heart and taking the road less traveled.

Your courage and passion have made all the difference.

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by

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Abstract

Background and significance: The Association of American Medical Colleges (AAMC) has estimated that by 2034 there will be a physician shortage of around 124,000 physicians. With burnout being one of the main drivers, it is crucial to assess it. Burnout is characterized by high levels of emotional exhaustion and cynicism and low levels of academic efficacy.

There has been substantial research on burnout among healthcare providers across different levels of training; however, few studies have examined burnout among undergraduate students who wish to pursue a graduate degree in healthcare. Given the shortage of healthcare providers in the United States, it is important to identify burnout not only among practicing healthcare providers but also among emerging healthcare providers (i.e., pre-medical students). Moreover, it is important to examine factors that are protective of burnout syndrome to promote well-being and ensure the retention of essential healthcare providers. Based on previous literature, meaning in life and emotional intelligence could be protective factors for the development of burnout.

Objectives: The purpose of this study was to a) identify burnout severity among a sample of pre-medical students; b) determine if burnout dimensions differ across participants' generational status; and c) investigate the relationship between psychological factors, such as meaning in life, emotional intelligence, and perceived stress, and their association with burnout severity.

Hypotheses: It was hypothesized that first-generation students would report higher levels of emotional exhaustion and cynicism and lower levels of academic efficacy than non-first-generation students. Additionally, it was hypothesized that there would be significant associations between meaning in life and emotional intelligence dimensions, stress, and burnout subscales (emotional exhaustion, cynicism, and academic efficacy).

Methods: This cross-sectional study used the Maslach Burnout Inventory-Student Survey to assess burnout in pre-medical students. An ANOVA was conducted to test burnout differences by generational status. Multiple regression analysis was used to identify student factors that may be associated with burnout dimensions (emotional exhaustion, cynicism, and academic efficacy).

Results: The students reported moderate levels of emotional exhaustion, low cynicism, and moderate to high academic efficacy. Additionally, 84.9% of students believe that a career in medicine fulfills their life's purpose. There was no significant difference between generational status and burnout. Regression analysis denoted that for emotional exhaustion, the most influential variables were the use of emotions, regulation of emotions, and perceived stress ($R^2 = .278$, p-value=.045). For cynicism, the use of emotion and year in school were significant factors ($R^2 = .258$, p-=.035). For academic efficacy, the presence of meaning, search for meaning, and GPA played a significant role ($R^2 = .277$, p-=.003).

Conclusion: The pre-medical students in this study did not meet the criteria for burnout, but rather seemed engaged in their studies and displayed high levels of meaning in life and emotional intelligence. Emotional intelligence and meaning in life may be used as preventive tools for burnout in pre-medical students.

Recommendation: Understanding the factors that protect and contribute to future healthcare professionals is crucial for healthcare. Burnout is a public health crisis, and early identification of factors that promote the well-being of pre-medical students is suggested.

Keywords: Burnout, Maslach Burnout Inventory-Student Survey, pre-medical students, healthcare, meaning in life, emotional intelligence, first-generation students

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Chapter 1: Background and Significance

Burnout is a syndrome that arises from chronic exposure to severe stress not managed properly. Although burnout is an epidemic that is rapidly growing in all professions, the nature of the work of health providers makes them more prone to it. In fact, this occupational syndrome was first observed and reported by American psychologist Herbert J. Freudenberger in a clinical setting. Burnout in human service workers influences their affective, psychological, physiological, and behavioral well-being (Lizano, 2015). A study comparing work-related stress across 26 different occupations, placed social service workers among the top 6 with greater severity (Johnson et al., 2005). Besides affecting the individual's health, burnout has extensive and expensive external consequences, including their patients. Additional to burnout, healthcare professionals have a high prevalence of stress, depression, and anxiety. Unlike stress, burnout arises specifically from exposure to work-related stressors. Raising awareness of interventions and approaches that may ease burnout severity in this population is crucial and has high social resonance.

Burnout as a public health crisis

Although exhaustion has always been a characteristic portrayed by medical professionals, in recent years, the alarming level of increase in burnout has called the public's attention. A study comparing the prevalence of burnout between 2011 and 2014, showed a significant increase in doctors reporting at least one symptom of burnout: from 45.5% in 2011 to 54.4% in 2014. The same study showed a decline in physician's satisfaction with their work-life balance going from 48.5% in 2011 to 40.9% in 2014 (P<.001) (Shanafelt et al., 2015). In 2019, healthcare organizations located in Boston, MA got together to make a call to action regarding physician burnout: calling it a public health crisis (Jha et al., 2019). In this report, professionals urge policy

interventions to assist with the reduction of burnout. Only by understanding and recognizing burnout as the danger it is, there may be a way to prevent it (Lazy & Chan, 2018).

Amongst the most alarming social consequences that burnout in this population brings, is its contribution to healthcare provider shortage. Considering the projected physician shortage of 37,800 and 124,000 physicians estimated for 2034 by the Association of American Medical Colleges AAMC, it is crucial to work on efforts to not only retain the current physicians but also best prepare the future generations of doctors. It has been shown that those healthcare professionals that report any level of burnout are more prone to retire early (Dewa et al., 2014). Burnout has been reported at all stages of medical education: in undergraduate education, medical school, residency training, and in practicing physicians. With burnout being a large contributor to the physician shortage, it is important to understand the factors that influence burnout and those that serve as protective factors. Some research has been conducted trying to understand factors that influence burnout and those that serve as protective factors in practicing physicians, residents, and medical students. However, little has been done to understand the experiences of undergraduate pre-medical.

American Medical Association's Statement of Wellness

While physician wellness is crucial for the healthcare system, little efforts are done to address it. The American Medical Association's Code of Medical Ethics offers moral guidance on how to promote doctors' well-being, which is essential for both their own health and the health of their patients.

The code states:

When physician health or wellness is compromised, so may the safety and effectiveness of the medical care provided. To preserve the quality of their performance, physicians have a responsibility to maintain their health and wellness, broadly construed as preventing or treating acute or chronic diseases, including mental illness, disabilities, and occupational stress.

To fulfill this responsibility individually, physicians should:

(a) Maintain their own health and wellness by:

(i) following healthy lifestyle habits;

(ii) ensuring that they have a personal physician whose objectivity is not compromised.

(b) Take appropriate action when their health or wellness is compromised, including:

(i) engaging in honest assessment of their ability to continue practicing safely;

(ii) taking measures to mitigate the problem;

(iii) taking appropriate measures to protect patients, including measures to minimize the risk of transmitting infectious disease commensurate with the seriousness of the disease;

(iv) seeking appropriate help as needed, including help in addressing substance abuse. Physicians should not practice if their ability to do so safely is impaired by the use of a controlled substance, alcohol, other chemical agent, or a health condition.

Collectively, physicians have an obligation to ensure that colleagues can provide safe and effective care, which includes promoting health and wellness among physicians. While this

guidance as to how to behave morally and the actions recommended for the physician, it has been criticized as not being enough, from its lack of resources.

Burnout and the COVID-19 Pandemic

Since its beginning in March of 2020, the COVID-19 pandemic has generated a negative impact on the general population's mental health. When talking about doctors, it only exacerbated the previously existing burnout epidemic; it has exerted an extra amount of pressure on frontline health workers globally (Amanullah & Shankar, 2020). A systematic review and meta-analysis of burnout among healthcare workers during COVID-19 revealed that the overall prevalence of burnout was 52% (Ghahramani et al., 2021).

The mental health toll that this pandemic is having on healthcare professionals needs to be addressed. Burnout is correlated with anxiety, depression, and substance use. These adversities arose from the high demand for work hours, lack of personal protective equipment, and higher risk of contracting the virus (Shah et al., 2020). It is estimated that the high levels of burnout experienced by health professionals will persist even after the pandemic is over (Maunder et al., 2021). Despite the rising numbers of providers experiencing burnout, a study conducted by Dinibutun (2020) showed that primary doctors who felt that their role of caring for COVID-19 patients had a meaning, showed lower levels of burnout.

Burnout research in nursing health professions

While 54% of physicians report burnout, 34% of nursing professionals also report it. Despite a larger percentage of physicians reporting burnout, the research conducted to understand this syndrome is significantly more extensive and diverse among nursing health professionals. Although both professions live similar experiences, it is important to expand the research conducted in physicians. There is a gap in the medical professions that must be addressed,

investing in the understanding of the factors that contribute to this word-related syndrome could help to develop targeted interventions. The current study seeks to add to the gaps in the literature. Like prevalence of burnout varying depending on medical specialty, nurses in different areas may be at higher risk of burnout e.g., 26% of emergency nurses suffered from burnout (Adriaenssens et al., 2015).

An example of how expanding the research in physicians could help would be by mimicking a systematic review conducted to assess the global prevalence of burnout symptoms. This review showed that 11.23% of nurses present symptoms of burnout (Woo et al., 2020). Up to this day, there are no studies exploring the global prevalence of burnout in physicians, making a point that there is still a gap in the literature regarding burnout in physicians. Replicating a systematic review like this one would allow for a broader and more comprehensive picture of burnout worldwide and the specialties that require greater attention.

Burnout

Burnout Origin

After observations in a clinical setting, American psychologist Herbert J. Freudenberger was the first to talk about burnout, describing it is a syndrome that arises after chronic exposure to stress. Later work by Maslach and Jackson (1981) yielded three symptoms of burnout: emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment. High levels of emotional exhaustion and depersonalization, and low levels of personal accomplishment characterize burnout.

- *Emotional exhaustion.* Emotional exhaustion refers to feelings of being overextended and the depletion of one's emotional and physical resources, making them feel drained and "used up (Patel et al., 2018). Emotional exhaustion is called the central of burnout since its presence shows the highest harm to the individual (Welp et al, 2015).

- *Depersonalization and cynicism*, in which individuals disengage from relationships to avoid dealing with emotions related to their occupation. Also characterized by a disconnection from personal thoughts and feelings, also described as dehumanization.

- *Personal efficacy:* in which individuals show low levels of the widely studied psychological term of self-efficacy (Bandura 1977), yielding a feeling of no longer being able to fulfill their work's expectations.

Although not classified as a medical condition, burnout has been recently recognized as an occupational phenomenon by the World Health Organization and introduced to the International Classification of Diseases (ICD-11). The lack of a clinical diagnosis is a contributor to vague statistics on burnout and its prevalence (Rotenstein et al., 2018).

Job Demands-Resources (JD-R) Model

The job Demands-Resources (JD-R) Model proposed by Bakker & Demerouti 2014 is used to explain factors related to the emergence of burnout. This framework explains that burnout can arise when the job demands are high, and the resources are limited. According to the model, emotional exhaustion is inversely related to an individual's resources and directly related to the demands they face. While this model was originally created to explain the emergence of burnout in the working context, an extension of the model has been adapted to student populations, naming it the study-demand resources model (SD-R) (Lesener et al., 2020).

The JDR model has been used to explain burnout in healthcare students and professionals,

proving that symptoms of burnout come from exacerbated job and study demands and diminished access to personal resources. Research has shown that burnout is inversely correlated with surgical residents' assessment of their jobs' resources (Lindeman et al., 2017). This framework is also useful for the prediction of burnout in higher education, making it the best framework for the current study (Jagodics & Szabó, 2022).

In this study, meaning in life and emotional intelligence will be explored as personal resources that can prevent stress and exhaustion from study demands.

Risk factors for burnout

Sex

The literature is consistent showing that females are more likely to burn out than their male counterparts. In general, historically established gender roles play an important influence in this difference. Women are more affected by work-home conflicts and assume greater parental responsibilities than their male counterparts, placing them at higher risk of burnout (Artz et al., 2022).

In the medical context, the prevalence of burnout in female physicians is greater than in their male counterparts. Interestingly, women who report burnout are more likely to suffer from emotional exhaustion and men from depersonalization. Female physician suicide is 130 % higher than non-physician females, while male physicians' is only 40% higher than non-physician males (Center et al., 2003). Among female surgeons, 43.4% reported burnout, versus 39% male surgeons (P-value= 0.008) (Dyrbye et al., 2011). This trend has been seen around the world, a study conducted among emergency physicians in Qatar showed a significant difference of burnout between female (22.6%) and male (2.3%) physicians (Aziz et al., 2018).

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Studies conducted on undergraduate pre-medical students have also shown steeper declines in medical interest in women compared to men potentially putting women at more risk to switch careers (Grace, 2018).

Personal Characteristics

Individual characteristics are key factors that determine the vulnerability to burnout. In his book "*Burnout- the high cost of high achievement*, Dr. Freudenberger (1980) states that individuals who experience burnout most of the timeshare characteristics like compulsiveness, perfectionism, failure to set boundaries and limitations, and high expectations, among others. A 12-year longitudinal study found that learning styles and personality types are causes of later developing burnout (MacManus et al., 2004). Recent studies have confirmed Dr. Freudenberg's statements that those who are perfectionists are at higher risk of burnout, being that their personality styles perpetuate the symptoms of chronic fatigue that characterize burnout.

Among practicing physicians, risk factors vary depending on their specialty. For example, medical oncologists face exposure to death and suffering from their terminal patients. Emergency physicians who were on the front lines since the beginning of the COVID-19 pandemic in 2020 faced work overload (Riches et al., 2021).

Work-place environment and other organizational risk factors

With burnout being an occupational syndrome, the work environment is a crucial risk factor. Increased administrative burden & number of hours worked are among the top contributors to burnout.

The administrative burden given to doctors in recent years, along with the implementation of the electronic health record (EHR) have been factors that have caused a spike in physician burnout numbers (Kroth et al, 2019). This record requires doctors to input the patient's information

and this transition from paper to electronic records takes two to six times longer to complete. The implementation of the EHR has increased the clerical duties of doctors, who have voiced that they take the records home to finish, making it hard to balance their work-life and reporting lower work-life satisfaction (Robertson et al., 2017). higher rates of burnout (1.9 times) were reported among physicians who spent extra time on the EHR at home than those who did not (Gardner et al., 2019). Physicians also report that the use of these electronic records has created a communication barrier when talking to patients since they must be charting as they talk (Olson et al., 2019). This barrier plays a role in the dissatisfaction and the development of depersonalization witnessed since it interferes with a healthy patient-doctor interaction which is often among the reasons why doctors pursue this career. Spending time completing clerical work is a contributor to the loss of meaning (Shanafelt et al., 2012).

In a study conducted using a sample of Finnish physicians, time pressure was placed as the most important predictor of emotional exhaustion (Gluschkoff et al., 2022). An average of 44% of physicians work more than 60 hours a week, compared to only 8% of the general working population in the United States (Shanafelt et al., 2015). While residents have a limited capacity of hours per week (80 hours), physicians do not. A study looking at burnout and medical errors in surgeons showed that surgeons who reported a medical error worked 4.6 more hours per week, including more nights on call and more time spent in the operating room (Shanafelt et al., 2010).

Burnout in medical doctors and residents

Studies show that 54.4% of doctors in the US have reported at least one symptom of burnout. Persistent burnout may lead to suicidal ideation and the completion of suicide, in fact 14% of doctors report suicidal ideations (Shanafelt et al, 2014). Alarmingly, only one-third of the

ones experiencing suicidal ideations sought treatment. It is estimated that around 400 physicians die by suicide every year.

Since each specialty varies in the type of work, the prevalence of burnout varies among them. According to the 2020 Medscape National Physician Burnout and Suicide Report, those who specialize in emergency medicine, neurology, urology, family medicine, and internal medicine appear to be at the greatest risk of exhibiting signs of burnout. Primary care physicians report often having feelings of burnout at a somewhat higher rate than specialists do. Burnout in American surgeons was shown to be the major predictor of career satisfaction (Shanafelt et al., 2009).

A study comparing medicinal residencies (medical doctors who are pursuing their specialty training) reported that emergency medicine residents had a prevalence of 76%, placing them among the highest rates of burnout compared to other residencies (Lin et al., 2019).

Burnout in medical students

This issue is also witnessed in medical students as they pursue their medical education. A recent systematic review looking at burnout in students before their residency showed a prevalence to be 44.2% [33.4%–55.0%] estimating that one out of two students suffer from burnout (Frajerman et al., 2019). Longitudinal studies following medical students' journeys have documented that burnout increases as time spent in school increases (Ranasinghe, 2022). Medical school has been called a potential risk factor for students' mental health. Because of burnout, medical students have shown increased susceptibility to engage in risky coping mechanisms. They are at higher risk to develop alcohol abuse or dependence, as compared to their non-medical student counterparts. In a study conducted among 4, 402 medical students, 33% met the criteria for alcohol abuse, making those who were burned out more susceptible to it (Jackson et al., 2016).

Additionally, 11% of medical students use psychostimulants, drugs that have a high potential for abuse and dependence (Emanuel et al., 2013).

The quality of care they provide to their patients is also affected because of decreased empathy and compassion (Burks & Kobus, 2012). Among the biggest concerns about the presence of burnout in medical students, is the perpetuation of this exhaustion after medical school and into residency training. A multi-institutional study conducted comparing five medical schools showed that thoughts of dropping out from medical schools are associated with burnout (Dyerbye et al., 2010). Additionally, those students who experience high levels of stress, have poor coping skills, and engage in risky behaviors are more likely to drop out of medical school, contributing to the physician shortage (Rogers et al., 2016).

Burnout in Pre-medical students

Although there is extensive literature examining the experiences of medical students and resident physicians, little research has been conducted trying to understand the experiences of undergraduate pre-medical students.

Mental health adversities have been widely documented among college students, including depression and anxiety. Unfortunately, undergraduate pre-medical students are not the exception. Besides the demanding academic curriculum of the university, pre-medical students face additional and unique pressures that contribute to their mental health adversities. With the national average for medical school acceptance being 41%, pre-medical students must work hard to create a competitive profile. Pre-medical students face student burnout that arises from strenuous academic demands, in addition to the extra-curricular work required to be a strong and competent applicant for graduate school (Lin et al., 2013). It is of high significance to understand the factors

that affect the health of pre-medical students as their behaviors are likely to continue throughout their medical training.

The first research effort taken to understand the relationship of burnout to pre-medical students took place at the University of San Diego. In this study, researchers compared burnout levels of pre-medical and non-premedical students. Results showed higher levels of burnout in those who reported a pre-medical status (Fang et al., 2012).

Additionally, studies have shown that the presence of burnout may lead to reductions in medical career interest, with a potential contribution to the projected shortage of physicians in the United States (Grace, 2018). Pre-medical students who are connected to their life's calling are at lower risk of developing burnout, contributing to the reasons why the present study is being conducted. Additionally, burnout is a contributor to students changing careers. One study showed that a low sense of calling was correlated with their propensity to change careers and potentially add to the physician shortage previously discussed (Grace, 2018).

Finding out these factors may yield answers as to how to increase student retention and create preventive measures for burnout, depression, stress, suicide, and other syndromes that may impact student well-being. The investment of research efforts in this student population may not only retain students but also increase the number of students who are connected to their purpose of pursuing medicine and be protected against the previously mentioned. Understanding the factors that contribute to and protect from burnout in pre-medical students is key to ensuring a successful career for our future health providers.

Impact and consequences

The consequences of burnout go from the individual's health to organizational and economic expenses. Burnout in human service workers influences the individual's affective, psychological, physiological, and behavioral well-being.

Psychological wellbeing

The components of burnout include emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment that can be further broken into smaller pieces and greater impact on their personal health and relationships. Research has demonstrated that the prevalence of psychiatric diseases is higher in physicians compared to the general population (Tyssen, 2007). Feelings of burnout may lead to depression, substance use, and eventually suicide in some cases (Shanafelt et al, 2014). Doctor's suicide rates are placed among the highest compared to other professions. Components of burnout have also shown marital problems that could lead to divorce.

Physical wellbeing

Additional to the previous consequences, burnout is also a predictor of physical ones, putting the individual's health at risk. A systematic review looking at the physical, psychological, and occupational consequences of job burnout made a call to action to understand the deeper impact of burnout on the individual's health. With burnout being a product of prolonged exposure to stress, the physical impacts of it relate to those of the latter including an over-activation of the hypothalamic-pituitary-adrenal (HPA) axis. Results showed that burnout was a significant predictor of type 2 diabetes and hypercholesterolemia (total cholesterol >220 mg/dl). Among other physical consequences, reduced immunity, inflammation, gastrointestinal issues, increased risk of cardiovascular diseases and musculoskeletal pain were found (Salvagioni et al., 2017).

Patient safety

Exhausted doctors may deliver poorer health care and therefore negatively affect patient's health and satisfaction. Having exhausted doctors makes them more prone to medical errors that could put the patient's safety at risk (Yates, 2020). Medical errors could lead to medical malpractice lawsuits that could cost hospitals additional money and, in some cases, even the physician's license. A recent study conducted by researchers at Johns Hopkins has reported that there are on average 250,000 deaths (9.5 % deaths) every year due to medical errors, making medical malpractice the third leading cause of death in the United States (Makary & Daniel, 2016).

Economic Impact

Additionally, healthcare organizations face a significant economic impact. Burnout is a large contributor to healthcare worker turnover (Willard-Grace et al., 2019). It is estimated that physician burnout costs $4.6 billion a year, coming from increased physician turnover and reduced clinical productivity (Han et al., 2019). This problem is not only affecting the current economic factors but if the problem persists, this will only add to the physician shortage in the United States.

Medical Education

As part of their medical training, medical students need to rotate in teaching hospitals. With the high prevalence of burnout, students are likely to be taught by doctors who face depersonalization from their careers, compromising medical education. Witnessing physician burnout may lead students to change careers also contributing to the physician shortage.

Barriers to care among medical professionals experiencing Burnout

Stigma

The stigma surrounding mental health and illness has created barriers that forbid individuals from seeking help, including health providers. Despite wide access to mental health services, these individuals often face challenges when reaching for help regarding their

psychological health. To renew their license, physicians must complete a set of questions from the medical licensure application which includes questions about mental health, which are often not answered with the truth being that doctors fear the consequences that their mental health may have pertained their medical licensure. A study showed that nearly 40% of doctors were reluctant to looking for help due to this fear (Dyrbye et al., 2017).

Besides the high demand that medical school poses and the negative impact it has on students' mental health, stigma also plays a role in their poor mental health. Medical students are less likely than their non-medical counterparts to seek help and receive treatment are. Among the reasons for their reluctance to seek care is the fear of being seen as weak and less adequate to be enrolled in medical school (Schwenk et al., 2010). Fear of discrimination by residency programs also contributes to medical student's reluctance to seek help. A study looking at help-seeking behaviors of medical students with burnout showed that of those students, only a third sought help (Dyrbye et al., 2015).

Meaning in life

Description and diagnosis

The alarming prevalence of burnout has brought up collaborative efforts to understand potential protective factors. With burnout arising from chronic exposure to stress, researchers have turned to existential psychology to look for answers.

The study of what gives life meaning has been one of the factors explored in recent years. Meaning in life refers to the capacity of individuals to find sense in their own life and believe that what they do is significant (Steger, 2009). The presence of meaning in life and purpose have been positively correlated with good health. Whereas when it is absent, it shows a decline in the individual's overall well-being, especially mental health. Studies have shown that when lacking

purpose people tend to be more depressed. Additionally, awareness of meaning in life has been shown to be a protective factor for the engagement in risky behaviors such as substance use, unsafe sex, and lack of exercise and diet control (Brassai et al., 2011) as well as for depression and suicidal ideation (Lew et al., 2020). Besides serving as a protective factor, meaning in life plays a role in enhancing health. A study conducted among adults with coronary disease showed reduced risk of myocardial infarction in those who reported higher purpose and meaning in life scores (Kim et al., 2013). Meaning in life is also correlated with a longer lifespan.

Among the efforts to understand, the role of meaning in life in burnout was conducted among firefighters. Although firefighters are not considered healthcare workers, they are social workers who face adversities that may trigger psychological responses like burnout. In this population, meaning in life served as a buffer for burnout (Krok, 2016).

Large of the literature in meaning roots in the work of Austrian psychiatrist Victor Frankl. As a holocaust survivor, he created logotherapy and the study of what gives life meaning. In his book "Man's Search for meaning", Frankl states that through the search for meaning in their life, individuals can overcome and endure anything. Frankl states that when one is not connected to their sense of meaning, one embarks in a state he calls an "existential vacuum": characterized by boredom, apathy, loss of interest in relationships, and exhaustion. Using the logotherapy framework, failure in the existential quest for meaning hence the existential vacuum is the root cause of burnout (Riethof & Bob, 2019). Components of the existential vacuum go hand in hand with depersonalization and emotional exhaustion that characterize burnout (Langle. 2003). The opposite of existential vacuum is existential fulfillment, has been explored in teacher populations, confirming Langle and Frankl's predictions that being in a state of fulfillment provides protection against burnout (Tomic & Tomic, 2008).

Considering the COVID-19 pandemic and the mental health consequences previously discussed, it is of high social importance to search for ways to manage adversities. The meaning-making model has been suggested to help find meaning in negative life events (O' Connor, 2003). A longitudinal study in China showed that finding meaning in the COVID-19 pandemic serves as an effective strategy to cope with stressful events (Yang et al., 2021).

Meaning in life in medical doctors as a protective factor

In the context of medical professionals, meaning in life also plays a role as a protective factor for burnout (Hooker et al., 2020). Emergency physicians, due to the nature of their work, are among the specialties that experience higher rates of burnout, along with family medicine and internal medicine (Shanafel et al., 2012). A study conducted to understand the role of meaning in emergency physicians showed that those physicians who felt that their work was significant reported greater show satisfaction and lower burnout severity (Ben-Itzhak et al., 2015).

A study conducted among university students also showed that higher meaning in life yields higher psychological health (Bano, 2014)**.** These outcomes give rise to the question: is meaning in life a protective factor for burnout in pre-medical students?

Emotional intelligence as a protective factor

In search of potential factors that may protect against burnout, emotional intelligence has been researched. According to Dave Goleman (2007), emotional intelligence (EI) is defined as the ability to recognize and manage our emotions and to recognize, understand and influence the emotions of others. Emotional intelligence has been shown to improve psychological health among different populations. In students, several dimensions of emotional intelligence are correlated with academic success (Parker et al., 2003). Proper management of emotions is associated with healthy coping mechanisms as well as stress management among female college students (Jayalakshmi &

Magdalin, 2015). Studies aiming to understand the relationship between burnout and emotional intelligence have also been conducted among medical professionals. In a study conducted among Malaysian medical students, emotional intelligence had a significant effect on lowering burnout (Yussof et al., 2021). As well as meaning in life, emotional intelligence has been understudied in pre-medical students. The current study seeks to add to the understanding of the relationship between emotional intelligence and burnout.

Chapter 2: Purpose of the study

The purpose of this study is to examine the relationship between protective psychological factors such as emotional intelligence, meaning in life, and stress with burnout among pre-medical students. The main objectives are to a) determine the levels of burnout severity among pre-medical students and b) examine the relationship between protective psychological factors, such as emotional intelligence, meaning in life, perceived stress, and burnout severity. The findings of this cross-sectional study will hopefully contribute to the development of preventive strategies to avoid the risk of developing burnout symptoms in pre-medical students and serve as a model to explore other protective factors that may serve as personal resources.

Although there has been growing literature trying to understand the factors that impact the three subscales of burnout: emotional exhaustion, cynicism, and academic efficacy, little has been done to understand the role of the two subscales of the meaning in life measure: the presence of meaning and search for meaning and emotional intelligence on burnout. Additionally, the role of individual factors will be looked at hoping to provide an overview of protective and risk individual factors.

Chapter 3: Study aims and hypotheses

<u>**Aims**</u>

1) Identify burnout severity in the sample of pre-medical students.

2) Determine if burnout subscales differ across participants' generational status.

3) Determine if there is an association between emotional intelligence dimensions ((1) self-emotional appraisal (SEA), others' emotional appraisal (OEA), use of emotion (UOE), and regulation of emotion (ROE)), meaning in life dimensions (presence of meaning and search for meaning), perceived stress, and burnout subscales (emotional exhaustion, cynicism, and academic efficacy).

<u>**Hypotheses**</u>

H1. First-generation students will report higher levels of emotional exhaustion and cynicism, and lower levels of academic efficacy than non-first-generation students.

H2. The combination of meaning in life, emotional intelligence, and their dimensions will be associated with emotional exhaustion, cynicism, and academic efficacy among pre-medical students.

H2.1 Meaning in life and emotional intelligence subscales will be negatively associated with emotional exhaustion, while perceived stress will be positively associated.

H2.2 Meaning in life and emotional intelligence subscales will be negatively associated with cynicism, while perceived stress will be positively associated with it.

H2.3 Meaning in life and emotional intelligence subscales will be positively associated with academic efficacy, while perceived stress will be negatively associated with it.

Chapter 4: Methods

Study Design

The current study was a cross-sectional survey. The purpose of the current study was to examine the relationship between meaning in life, emotional intelligence, and stress among pre-medical students.

Sample Size

A power analysis assuming a small effect (r = .30), determined that approximately 85 participants were required to achieve at least 80% power to detect an effect. All variables were inspected to ensure their distribution conforms to normality assumptions. Skewness and kurtosis were assessed.

Participants and procedure

A total of 105 participants who identify as pre-medical students were recruited to take an online survey via UTEP QuestionPro. Recruitment took place in a variety of ways: 1) The pre-medical advisors at UTEP were contacted to request pre-medical student's email and were sent a massive email 2) social media was used to recruit pre-medical students from around the United States. Platforms included Facebook, and Instagram 3) Pre-medical organizations at UTEP were contacted to invite students to participate in the survey. The survey was administered between 01/2023 and 03/2023.

Upon access to the survey link, all participants were provided with an electronic consent form that they had to authorize to proceed to the survey. Participants completed the survey online using their personal computers, phones, or tablets. The estimated time for the survey completion was 25 minutes. Upon completion of the survey, students were redirected to another page where they were asked for their initials, email, and date of survey completion. Participants who provided

their information were entered into a raffle to win one of the four available $25 Amazon e-gift cards.

The first two questions of the survey verified eligibility criteria, specifically that participants were pre-medical students over the age of 18 enrolled in an institution in the United States as undergraduate or graduate students.

Measures

Demographic Questions. Demographic questions to understand more about the individual were collected including: "What is your ethnicity" with answer choices: *(1) Asian,(2) White or Caucasian,(3) Hispanic/ Latino, (4) Black or African American, (5) Other*, "What is your biological sex?" with answer choices: *(1) female, (2) male*, "What terms best express how you describe your gender identity?" answer choices (1)"Is your major considered part of STEM (Science, Technology, Engineering, and Mathematics)? (these majors include biology, neuroscience, chemistry, math) with answer choices: *(1)yes,(2) no* , "Year in college" with answer choices*(1) freshman (2) sophomore, (3) junior, (4) senior*, graduate student (5) and "Are you currently working?*" answer choices: *(1) yes, (2) no* "if yes, how do you classify your job?" answer choices: *(1) full-time employment (35 hours or more), (2) part-time (less than 30 hours, (3) Not employed.*

Covariates

"What is your age?" & "What is your current Grade Point Average" were continuous variables. These two were controlled for in the multiple regression analysis.

Additionally, questions to assess the impact of parental expectations on the individual's choice to pursue medicine were included. Questions of this nature were included because it has been documented that parental expectations play a role in the performance of the student. Students

who feel that their parents expect them to be doctors may be more at risk of developing burnout in the long term (Griffin & Hu, 2019). "Are either of your parents involved in the medical profession?", "Is becoming a medical doctor someone else's expectation of you?" with answer choices: *(1) Yes, (2) No and (3) I don't know.* A final question was asked to assess the perception of their "Do you feel that a career in medicine fulfills your life's purpose?"

Dependent variable

Measuring burnout. There are currently several versions of the MBI, including the Human Services survey and the general survey. However, without the use of clinical criteria, none of the MBI versions can be used to "diagnose" burnout. Instead, they can be viewed as screening tools that help identify those who are at risk of getting burnout. In this study, the Maslach Burnout Inventory- Student Survey (MBI-SS) was used. The license for the questionnaire MBI-SS was obtained directly from Mind Garden (Menlo Park, CA, USA). This version of the MBI was selected being that the study population would be students who are enrolled in their undergraduate year. The MBI-SS was developed to assess academic burnout, making it the perfect fit for the current project. This measure consists of 15 items that measure 3 dimensions of burnout: emotional exhaustion (EX, five items, e.g. 'I feel emotionally drained by my studies'), cynicism (CY, four items, e.g. 'I have become less interested in my studies since my enrollment'), and professional/ academic efficacy (AE, six items, e.g. 'I feel I am making an effective contribution in class'). This measure consisted originally of 16 items, while the current measure contains four items to measure cynicism, the previous version contains five. Question 13 ('I just want to get my work done and not be bothered') of the original 16-item survey got deleted (Obregon et al., 2020). This question pertained to cynicism. The reliability and validity have been established.

This ordinal variable is measured based on a 7-point Likert scale. Frequency scales are:

Never (0), A few times a year or less (1), Once a month or less (2), A few times a month (3), Once a week (4), A few times a week (5) Every day (6). Burnout is suggested by high scores for emotional exhaustion and cynicism and low scores for academic efficacy. Total possible scores ranged from 0 to 30 for the Emotional Exhaustion scale, 0 to 24 for the Cynicism scale, and 0 to 36 for the Personal Efficacy scale. The MBI-SS Burnout Inventory does not include a global score, however, there are classifications for burnout severity. Based on the literature, the classification of severity includes the following guidelines: EE low ≤ 13, moderate 14–22, high ≥ 23; CY low ≤ 10, moderate 11–17, high ≥ 18; PA low ≤ 16, moderate 17–26, high ≥ 27 (Faye-Dumanget et al., 2018). The Cronbach alpha coefficients for the present study were: α=.899 for emotional exhaustion, .841 for depersonalization, and .722 for personal accomplishment.

Variables of interest

Generational status

Questions about parent's generational status were included: "Did your mother complete 4-year university?" & "Father completed 4-year university" with answer choices: *(1) Yes, (2) No, (3) I do not know and (4) Not applicable. To assess* the student's parental education status, the answers to these two questions were recoded *into (1) First Generation, (2) Mixed status and (3) Non-First Generation.* Questions about parental educational status were deemed important being that it is known the student's generational status and the impact the student's educational outcomes. The National Center for Education Statistics (NCES) defines first-generation students as "students whose parents have not completed a bachelor's degree or higher."

Measuring meaning in life. Originally developed by Steger in 2006, the Meaning in Life Questionnaire (MLQ) (Steger, Frazier, Oishi, & Kaler, 2006) consists of 10 questions, including two subscales: presence of meaning (POM) in life (how much individuals feel their lives have

meaning) and search for meaning (SOM) in life (how much respondents strive to find meaning and understanding in their lives), which allow measuring the sense of meaning in life in the present and in the future. This ordinal variable is measured based on a 7-point Likert scale with answers ranging from *Absolutely True (1) to Absolutely Untrue (6)*. Scores for both subscales range from 5- 35. Steger et al. (2006) reported that internal consistency coefficients are between .83 and .85 for the "search" subscale, and between .83 and .88 for "presence" subscale. The Cronbach values for the present study were α=.884 and α=.89, respectively.

Measuring Emotional Intelligence. The Wong and Law Emotional Intelligence Scale (WLEIS) is a self-report scale designed by Wong and Law (2002) to measure EI based on 16 items grouped into four factors (four items per factor): self-emotion appraisal (SEA), others' emotion appraisal (OEA), use of emotion (UOE), and regulation of emotion (ROE). This ordinal variable is measured based on a 7-point Likert scale. Frequency scales are *(1) Strongly Disagree, (2) Disagree, (3) Slightly Disagree, (4) Neither Agree nor Disagree (5) Slightly Agree and (6) Agree and (7) Strongly Agree.* Higher scores indicate higher emotional intelligence.

 Self-Emotion Appraisal (SEA). SEA is the ability of an individual to understand and express their feelings in a natural way (Davies et al., 1998). Others' Emotion Appraisal (OEA). OEA is the ability of an individual to sense and comprehend the emotions of others around them (Davies et al., 1998). Use of Emotion (UOE). An individual can channel their emotions into productive activities and personal performance that enable the individual to continually motivate themselves for desirable outcomes (Davies et al., 1998). Regulation of Emotion (ROE). As defined by Davies et al. (1998), ROE is an individual's ability to control emotions by monitoring, evaluating, and acting on their mood, allowing the individual to recover faster from psychological distress.

The Cronbach values for the present study were α=.899, .841, and .722 for self-emotion appraisal

(SEA), Others' Emotion Appraisal (OEA), Use of emotion (UOE), and Regulation of emotion (ROE), respectively.

Measuring Perceived Stress. The Perceived Stress Scale is a 10-item questionnaire designed to evaluate the self-reported amount of stress in the participants by assessing thoughts and feelings in the previous month. This ordinal variable is measured based on a 5-point Likert scale. Frequency scales are *(0) Never, (1) Almost Never, (2) Sometimes, (3) Fairly Often, and (4) Very Often (never).* Scores range from 0 to 40, with higher composite scores indicative of greater perceived stress. The Cronbach value for perceived stress for the present study was $\alpha=.741$.

Data Cleaning

A total of 147 responses were received. Those answers that were counted as "test responses" by SPSS were excluded, along with those in which the participants did not meet the inclusion criteria, leaving 105 valid responses. SPSS data software was used for data management and statistical analysis. P-value was set at .05 and confidence intervals for parameters were estimated.

Statistical analysis

Descriptive statistics including frequencies and means were computed to describe the sample. To test the proposed hypotheses, SPSS ® version 25, (Statistical Package for the Social Sciences [SPSS], 2013) was used. For hypothesis 1- An analysis of variance (ANOVA) was used to compare groups and test interactions. Components of the Maslach Burnout Inventory-Student Survey subscales for Emotional Exhaustion, Cynicism, and Academic efficacy were analyzed for generational status.

For hypothesis 2- Multiple regression models were conducted to examine the relationships between burnout subscales (emotional exhaustion, cynicism, and academic efficacy) and the

independent variables (Search for meaning, presence of meaning, emotional intelligence, and

perceived stress) while controlling for age, grade point average and year in school.

Chapter 5: Results

Mean scores were calculated for the MBI-SS dimensions: emotional exhaustion (EE), cynicism (CY), and academic efficacy (AE). A one-way ANOVA was performed to compare the effect of generational status on burnout subscales, separately. Bivariate correlations helped determine the presence and direction of the association. Multiple regression analysis was used to identify the association between student factors and burnout dimensions in pre-medical students.

Student Demographics

The sample characteristics in **Table 1** show that the data sample analyzed consisted of 105 adult (18 years or older) pre-medical students. Predominantly, the sample population was 84.6% Hispanic, 86.3% located in Texas, and 76.9% female. The average age was 22.49(SD=4.678) and the Grade Point Average was 3.69(SD= .353). Most students were seniors (38.8%) followed by graduate students (22.3%). Of these, 91.3% consider their field of study to be STEM (Science, technology, engineering, and mathematics) and 51% have a part-time job.

There was a similar distribution of students in terms of their generational status, 44 students were first-generation, 23 mixed, and 37 non-first generation. A large portion of the sample, 56 students, reported that becoming a medical doctor was not someone else's expectation of them, while 21 said yes. Most students (84.9%) feel that a career in medicine fulfills their life purpose.

According to the cut-off scores for burnout severity previously mentioned. The MBI descriptive table (**Table 2**) shows that the study sample presented levels of *moderate* emotional exhaustion 16.89(7.22), *low* cynicism 7.38(5.93), and *moderate* academic efficacy 25.54(6.37).

A one-way ANOVA was performed to compare the effect of generational status on burnout subscales, separately. Results showed that on emotional exhaustion $(F_{(2,94)} = [.430], p = .652)$,

cynicism groups (F (2,87) = [.561], p =.573]) nor academic efficacy (F(2,94) = [1.940], p =.149])

did not differ across generational status (i.e., first-generation, mixed, and non-first-generation).

Bivariate correlations (**Table 4**) show that there are some significant associations between variables. Emotional exhaustion had a negative significant association with the presence of meaning and use of with the use of emotions and a positive correlation with the search for meaning and perceived stress. Cynicism had a negative correlation with all the subscales of emotional intelligence. Finally, academic efficacy had a positive correlation with the presence of meaning and use of emotions.

Model 1-Emotional Exhaustion

A multiple regression was conducted to examine the association between emotional exhaustion and independent variables (search for meaning, presence of meaning, perceived stress, and the dimensions of emotional intelligence: self-emotional appraisal, others' emotional appraisal, regulation of emotion, and use of emotion). This regression was adjusted for age, GPA, and year in school. The association between the variables was statistically significant F (10, 75) = 2.892, p < .004, R^2 = .278. Twenty-seven percent of the variance was explained by the independent variables. Variables contributing the most to this association included the use of emotions *(β=-.557, p-value=.011)*, regulation of emotions *(β =.459, p-value=.037)*, and perceived stress *(β=1.141, p-value=.045).*

The error term for model 1 was = 41.08, thus an indication that the model is not a good fit in explaining the relationship between the independent variables and emotional exhaustion even if the R^2 = .278.

Emotional Exhaustion= -1.237 + -.133 (*presence of meaning*) + .159 (*search for meaning*) + .128 (*self-emotion appraisal*) + -.236 (*others' emotion appraisal*) + -.557 (*use of emotion*) *+ .459 (*regulation of emotion*) *+ .123 (*age*)+ 1.355 (*GPA*)+ .201 (*year in school*).

Model 2- Cynicism

Multiple regression was conducted to examine the association between cynicism and independent variables (search for meaning, presence of meaning, perceived stress, and the dimensions of emotional intelligence: self-emotional appraisal, others' emotional appraisal, regulation of emotion, and use of emotion). This regression was adjusted for age, GPA, and year in school. The association between the variables was statistically significant $F_{(10, 68)} = 2.360$, p < .018, R^2= .258. Although it is significant, only twenty-five of the variance was explained by the independent variables**.** Variables contributing the most to this association include the use of emotion *(β -.397=.274, p-value=.020)* and year in school *(β =-1.173, p-=.035).*

The error term for model 2 was = 23.88, thus an indication that the model was not a good fit in explaining the relationship between the independent variables and cynicism even if the R^2 = .258.

Cynicism = .564+ 0.028 (*presence of meaning*) + .022 (*search for meaning*) + -.111(*self-emotion appraisal*) + -.05(*others' emotion appraisal*) +-.397(*use of emotion*) *+ .165 (*regulation of emotion*) +.685(*perceived stress*) + .165 (*regulation of emotion*) + 0.202 (*age*)+ .905 (*GPA*)+ -1.173 (*year in school*) *.

Model 3- Academic efficacy

A multiple regression was conducted to examine the association between academic efficacy and independent variables (search for meaning, presence of meaning, perceived stress, and the dimensions of emotional intelligence: self-emotional appraisal, others' emotional appraisal,

regulation of emotion, and use of emotion). This regression was adjusted for age, GPA, and year in school. The association between the variables was statistically significant $F_{(10, 75)} = 2.867$, p < .04, R^2 =.277. However, only twenty-seven percent of the variance was explained by the independent variables. Variables contributing the most to this association include the presence of meaning *(β=.338, p-value=.011)*, search for meaning *(β=.258, p-value=.021)*, and GPA *(β =5.337, p-=.003)*.

The error term for model 3 was = 31.460, thus an indication that the model is not a good fit in explaining the relationship between the independent variables and cynicism even if the R^2 =.277.

Academic Efficacy=-8.036+.338 (*presence of meaning*) *+ .0258 (*search for meaning*) *+ -.304 (*self-emotion appraisal*) + .057(*others' emotion appraisal*) +.231(*use of emotion*) *+ .123(*regulation of emotion*) + -.371(*perceived stress*) + -.049(*age*)+ 5.337(*GPA*)*+ .153(*year in school*).

Chapter 6: Discussion

The purpose of this study was to examine the relationship between psychological factors such as emotional intelligence, meaning in life, and stress with burnout among pre-medical students. This research study showed that the relationship between meaning in life, emotional intelligence, perceived stress, and each of the burnout dependent variables (i.e., emotional exhaustion, cynicism, and academic efficacy) was statistically significant. However, the R^2 indicated that the independent variables explained a moderate but not a large percentage of the burnout dimensions. In addition, the descriptive statistics showed that most students (78.49%) feel that a career in medicine fulfills their life purpose. Furthermore, most pre-medical students reported a moderate level of emotional exhaustion (41%), low levels of cynicism (68.9%), and moderate (46%) to high (45%) levels of academic efficacy.

Burnout severity

The first aim of this study was to describe burnout severity. The sample showed levels of *moderate* emotional exhaustion 16.89(7.22), *low* cynicism 7.38(5.93), and *moderate to high* academic efficacy 25.54(6.37). With burnout being represented by high emotional exhaustion and cynicism and low academic efficacy, it can be said that this sample overall did not meet to criteria for being at risk for burnout.

Burnout experts Leiter and Maslach (2016) proposed that the other side of burnout is engagement, characterized by low emotional and low cynicism, and high academic efficacy. It can be said that this sample of pre-medical students is more represented by engagement than by burnout. Meaning in life may be one of the factors contributing to this level of engagement. The scores for the dimensions of meaning in life search for meaning were 26.80(5.735) and the presence of meaning 27.34(6.812). According to Steger (2010), scores above 24 in each subscale

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indicate a high level of the dimension. Perhaps the population in this study is an example of how meaning in life and emotional intelligence serve as protective factors against burnout.

Generational Status and burnout

To assess hypothesis one, an ANOVA was conducted. Although the differences in means were not significant in the current study, there is an observable trend between their generational status and the scores in burnout subscales (**Figures 1-3**).

In terms of emotional exhaustion, first-generation students exhibit slightly larger emotional exhaustion than mixed-status and non-first-generation students. Stress arising from academic pressure and not having the resources to cope with the demands of school may be contributing to emotional exhaustion in these students. Additionally, pursuing higher education as the first member of your family can be emotionally taxing. Students with

For cynicism, the levels appear to be similar. However, cynicism may arise from different sources in these two groups. Cynicism in first-generation students may arise from a feeling of distrust as they face an unfamiliar educational system and experience unexpected obstacles. While non-first-generation students are familiar with the educational system, they may experience cynicism from the perception of meeting the parental expectations of their academic success.

The opposite is true for academic efficacy, where non-first-generation students show higher levels of academic efficacy when compared to mixed and first-generation students. Additionally, first-generation students may experience feelings of not belonging to the academic setting and this may yield an increase in feelings of inadequacy and the development of "impostor syndrome". All of this may manifest as feelings of self-doubt and academic inefficacy (Canning et al, 2020). It has been shown that parental educational status influences student performance. The trend witnessed in this study is expected as first-generation students may not have their parents

as a resource to assist them in their education. Previous studies conducted among undergraduate students have shown that higher-education parents were linked to less psychological distress (Nerdrum et al., 2006).

Burnout among first-generation students is a significant and often overlooked issue in higher education. They frequently have difficulties and demands that might cause burnout. According to the National Center for Education Statistics (NCES), data from 2016 reveals 37% of undergraduate college students came from first-generation backgrounds. Notably, among these students, 43% were not only first-generation college attendees but also first-generation immigrants. Students who identify as Hispanic or Latino/a, Black, Native Hawaiian or Pacific Islander, American Indian, or Alaska Native are more likely to be first-generation than students of other races. The understanding of the experiences of this student population is relevant to the contribution of a diverse physician workforce (Romero et al., 2020). Such initiatives will result in a diversified physician workforce that is better prepared to offer culturally sensitive patient care and will possibly lessen health inequalities in a US patient population that is becoming more diverse.

Associations between variables

The correlation matrix in **Table 4** shows that while the presence of meaning is negatively correlated with emotional exhaustion, the search for meaning is positively correlated. This aligns with literature stating that both dimensions of meaning in life may behave differently depending on the context. The presence of meaning may reduce emotional exhaustion, while the active search for meaning may lead to emotional exhaustion (Krok, 2016).

Emotional Exhaustion- a dimension of burnout

Significant variables in model 1 for emotional exhaustion were the use of emotions, regulation of emotions, and perceived stress. As expected, the strongest association of emotional exhaustion was perceived stress. Emotional exhaustion arises after prolonged exposure to excessive stress. Besides emotional exhaustion arising from stress, emotional exhaustion may also exacerbate stress because when someone experiences it, they cannot cope with challenging and overwhelming situations. Higher levels of perceived stress can contribute to emotional exhaustion, and emotional exhaustion can, in turn, intensify the perception of stress, leading to a cyclical relationship.

As expected, the use of emotions had a negative association with emotional exhaustion. This suggests that individuals who effectively use their emotions to cope with stress or manage challenging situations are less likely to experience emotional exhaustion. Such individuals might be better equipped to regulate their emotions, leading to reduced feelings of exhaustion.

Contrary to the findings, this model showed that the regulation of emotion has a positive association with emotional exhaustion. This may be explained by the individual needing to make more use of the regulation of emotions when living with emotional exhaustion. For example, if one experiences emotional exhaustion this may lead to the person garnering emotional regulation to cope with the exhaustion.

Cynicism a dimension of burnout

Significant variables in model 2 for cynicism were the use of emotion and the year in school. As previously expected, the use of emotion negatively predicted cynicism. This suggests that cynicism is less common in students who successfully use their emotions to deal with stress or difficult situations. Effectively managing emotions might contribute to a more positive outlook, reducing feelings of cynicism. Additionally, years in school were also negatively associated with

cynicism. These findings suggest that there is a decline in cynicism levels as students advance in their academic careers. A better knowledge of their educational environment, age, or experience may be responsible for this decrease.

Academic efficacy a dimension of burnout

Significant variables in model 3 for emotional exhaustion were the presence of meaning, a search for meaning, and GPA. Both dimensions of meaning in life, presence, and search for meaning, positively predicted academic efficacy. The presence of meaning is a significant positive contributor to academic efficacy being that it allows the student to have a motivation and a purpose to keep going in their academic endeavors. The presence of meaning may also be one of the contributors to the students' positive behaviors in school and a motivator. Search for meaning can lead to increased academic effectiveness by encouraging a sense of purpose and intrinsic motivation. Actively exploring the significance of their studies may increase the likelihood that students will get a better knowledge of the subject, improving learning outcomes and academic achievement.

Grade Point Average showed a significant positive association with academic efficacy, this may be due to the contribution of a good GPA on the student's belief in their academic efficacy, serving as a motivator to keep improving. The same is true for the opposite, the lower the student's academic outcomes in terms of GPA may lead to decreases in their academic efficacy.

Overall, these findings highlight the importance of garnering personal resources at the pre-medical level to prevent burnout once the student has entered the medical system. Understanding and fostering these elements can support the development of future medical professionals' well-being and have a positive impact on the healthcare system. Further research efforts ad interventions

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focused on enhancing these factors are crucial to the understanding of mental health and success of pre-medicals students.

Policy implications

It is necessary that policymakers intervene in the experience of burnout among early medical career-seeking students and existing medical professionals by making structural and organizational changes to improve current and future physician well-being. Pertaining to the pre-medical population, institutions must invest in the preparation of these students to withhold the high demands that medical education entails. Investment in educational pipelines that incorporate fostering of protective factors such as meaning in life and emotional intelligence is recommended.

Strengths

This study has several strengths. The first is the contribution to the research seeking to understand burnout in pre-medical students. The present study will hopefully encourage the investigation of protective factors for burnout and how to harvest them to prepare the future generations of working professionals to cope with adversities and prolonged stress. Investing time and resources in better equipment for future professionals will hopefully help reduce the physician shortage.

Additionally, this study used the Maslach Burnout Inventory-Student Survey (MBI-SS), adapted specifically to target burnout in a student population.

Limitations

Despite the extensive data available for burnout in medical doctors and students, to our knowledge, this is among the first studies seeking to understand burnout and protective factors in pre-medical students. Due to the lack of literature on this topic, the results could not be compared

to another research. Caution is recommended when comparing pre-medical students to other health professionals being that they are living in different stages and are facing different challenges.

Although the year in their schooling was collected, there is no way to know at what stage of their medical school preparation students are. This is important to consider because of the level of academic and life loads that the students may have. One example is that students in upper-level classes may be preparing to take the Medical Admissions Test (MCAT), potentially exacerbating exhaustion. Another limitation is that younger students, from freshman and sophomore classifications, may not be sure that healthcare is their career path.

With our sample participants being mainly located in Texas and including a convenient sample, this study is not representative of the United States population, therefore a generalization of these findings cannot be assumed. With this study being cross-sectional, it is not possible to establish a causal relationship between burnout and meaning in life. Further research is needed to understand this relationship.

Future directions

It is recommended that future research efforts further explore the drivers of meaning in life as a protective factor in different student populations. In this study, most students were Hispanic females therefore results cannot be generalized. Future research could expand on how cultural backgrounds and socioeconomic factors intersect with burnout and protective factors among diverse student populations. The cross-sectional nature of this study does not allow for causality, future work could include conducting longitudinal studies to track protective factors and burnout over time to expand on the relationship between variables and identify patterns of change among pre-medical students. Additionally, comparative studies between pre-medical students and other

health professional students could help understand unique stressors and protective factors specific to pre-medical education.

Chapter 7: Conclusion

In conclusion, this study investigated the relationship between psychological factors such as emotional intelligence, meaning in life, and stress and burnout among pre-medical students. To our knowledge, this is the first study to look at this relationship. The results indicated statistically significant associations between these variables and burnout dimensions, although the independent variables explained only a moderate proportion of the variance in burnout. The sample displayed characteristics of engagement rather than burnout, potentially influenced by the presence of meaning in life and emotional intelligence. The study also explored generational status and burnout, showing observable trends, though not statistically significant, suggesting that first-generation students might experience distinct burnout patterns. First-generation students showed slightly higher emotional exhaustion, while non-first-generation students displayed greater academic efficacy.

This research emphasizes the importance of nurturing protective factors to mitigate burnout risk among future medical professionals. Policymakers and educational institutions should invest in enhancing these factors to support the well-being of pre-medical students and subsequently address the physician shortage. However, the study has limitations in terms of sample representation and cross-sectional design, warranting further research to establish causal relationships and improve the understanding of burnout dynamics in this context.

Despite the limitations, the present work makes an important contribution to the understanding of behavior in pre-medical students. Burnout is a public health crisis, and early identification of factors that promote the well-being of pre-medical students is suggested.

Table 1. Student demographics, n=10

Variable		n	% of correspondents
Hispanic, Latino/a, or Spanish origin			
	Yes	88	83.8
	No	16	15.2
	Missing	1	1.0
Located in Texas			
	Yes	88	83.8
	No	14	13.3
	Missing	3	2.9
Biological Sex			
	Female	80	76.2
	Male	24	22.9
	Missing	1	1
Gender Identity			
	Man	24	22.9
	Woman	79	75.2
	Non-binary	1	1.0
	Missing	1	1
Race			
	Asian	9	7.9
	Black or African American	6	5.26
	Indigenous Ancestry	4	3.51
	Native Hawaiian or Other Pacific Islander	2	1.75
	White	80	70.18
	Other-	13	11.4
Age			22.49(4.678)
	Missing	1	1
Year in School			
	Freshman	10	9.5
	Sophomore	10	9.5
	Junior	20	19.0
	Senior	40	38.1
	Graduate Student	23	21.9
	Missing	2	1.9
STEM Major			
	Yes	94	89.5
	No	9	8.6
	Missing	2	1.9
GPA			3.69(.353)
	Missing		
Employment Status			
	Not employed	37	35.2

Part-time employment (less than 35 hours)	53	50.5
Full-time employment (35 hours or more)	14	13.3
Missing		
Mother completed 4-year university		
Yes	45	47.7
No	41	51.2
Missing		
Father completed 4-year university		
Yes	41	47.7
No	44	51.2
I don't know	1	1.2
Missing		
Parents involved in medical profession		
Yes	23	21.9
No	81	77.1
Missing		
A career in medicine fulfills your life's purpose		
Yes	73	69.5
No	1	1.0
I don't know	19	18.1
Missing	1	
Becoming a medical doctor is someone else's expectation of them		
Yes	21	20.0
No	56	53.3
I don't know	9	8.6
Missing	19	18.1
Generational Status		
Non-First Generation	37	35.2
Mixed	23	21.9
First-Generation	44	41.9
Missing	1	1.0

Note: Categorical variables are given as n (%).
Continuous variables are given as mean (SD).

Table 2.Descriptive statistics MBI-SS with internal consistency

Total	Mean (SD)	Cronbach's alpha
Emotional exhaustion	16.89(7.22)	.899
Cynicism	7.38(5.93)	.841
Academic Efficacy	25.54(6.37)	.722

Table 3. Descriptive Statistics with internal consistencies

Measure	Items	Minimum	Maximum	Mean (Standard Deviation)	Cronbach's Alpha
Outcome-Burnout					
Emotional Exhaustion	5	1	29	16.89(7.22)	.899
Cynicism	4	1	24	7.38(5.93)	.841
Academic Efficacy	6	9	36	25.54(6.37)	.722
Exposure Variables					
Search for Meaning	5	8	35	26.80(5.735)	.884
Presence of Meaning	5	9	35	27.34(6.812)	.895
Emotional Intelligence					
Self-emotion appraisal(SEA)	4	4	28	19.15(7.124)	.934
Others' Emotion Appraisal (OEA)	4	4	28	20.33(7.523)	.961
Use of emotion (UOE),	4	4	28	20.34 (7.355)	.949
Regulation of emotion (ROE).	4	4	28	17.53 (7.094)	.945
Perceived Stress	4	8	15	8.56(2.440)	.741

Table 4. Bivariate Correlations

	1	2	3	4	5	6	7	8	9	10
1. Emotional Exhaustion	--	.522**	-.045	-.228*	.209*	-.044	-.189	-.214*	-.024	.300*
2. Cynicism		--	.000	0.187	.128	-.292**	-.240*	-.398**	-.277*	.127
3. Academic Efficacy			--	.263*	.145	.143	.202	.263*	.181	-.060
4. Presence of Meaning				--	-.094	.293**	.170	.186	.056	-.130
5. Search for Meaning					--	.191	.161	.129	.166	.338**
6. Self-emotion appraisal(SEA)						--	.672**	.794**	.806**	.226*
7. Others' Emotion Appraisal(OEA)							--	.758**	.727**	.219*
8. Use of emotion (UOE)								---	.859**	.130
9. Regulation of emotion (ROE)									--	.211
10. Perceived Stress										--

Note. *p<.05;**p<.01

Table 5. Regression analysis of MBI-SS Subscales for continuous variables

Exposure Variable	MASLACH BURNOUT INVENTORY -STUDENT SURVEY SUBSCALES								
	Model 1- Emotional Exhaustion			Model 2- Cynicism			Model 3- Academic Efficacy		
	Beta	T	p	Beta	t	p	Beta	t	p
Constant									
Search for Meaning	-.133	-.901	.371	.028	.232	.817	.338	2.620	**.011**
Presence of Meaning	.159	1.268	.209	.022	.213	.832	.258	2.360	**.021**
Self-emotion appraisal(SEA)	.128	.659	.512	-.111	-.719	.474	-.304	-1.784	.078
Others' Emotion Appraisal(OEA)	-.236	-1.425	.158	.050	.378	.707	.057	.396	.693
Use of emotion (UOE)	-.557	-2.606	**.011**	-.397	-2.385	**.020**	.231	1.237	.220
Regulation of emotion (ROE)	.459	2.125	**.037**	.165	.960	.340	.123	.650	.518
Perceived Stress	1.141	2.041	**.045**	.685	1.516	.134	-.371	-.758	.451
Age	.123	.740	.462	.202	1.534	.130	-.049	-.339	.735
GPA	1.355	.688	.494	.905	.542	.589	5.337	3.096	**.003**
Year in School	.201	.294	.769	-1.173	-2.147	**.035**	.153	.256	.799

The three models had an R-Squared of .278, .258, and .277. respectively. The three models were significant (P-value <.001)
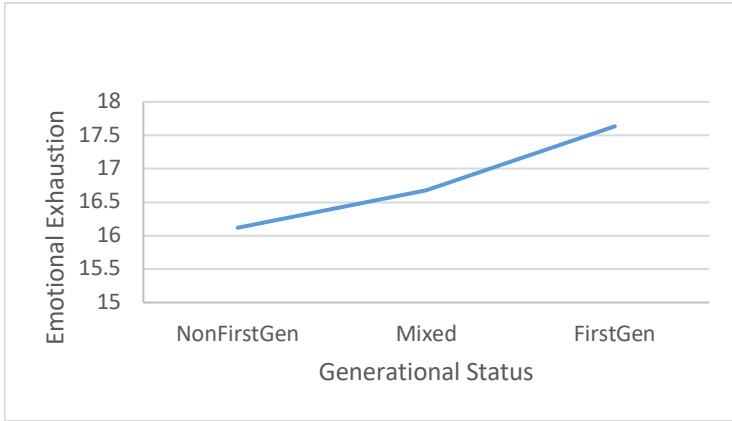
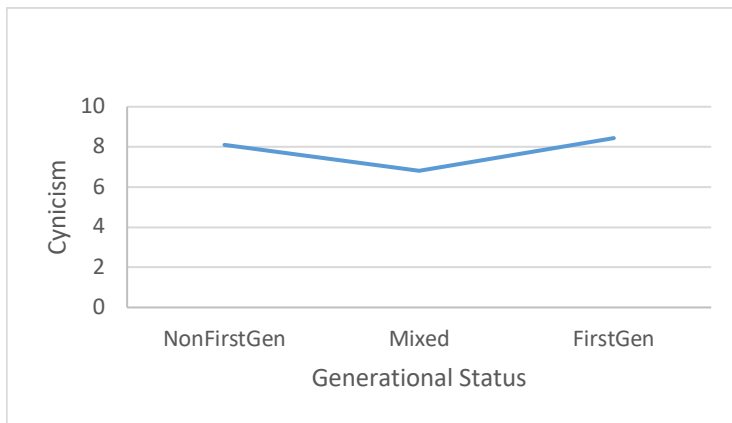Figure 1. Generational Status and Emotional Exhaustion

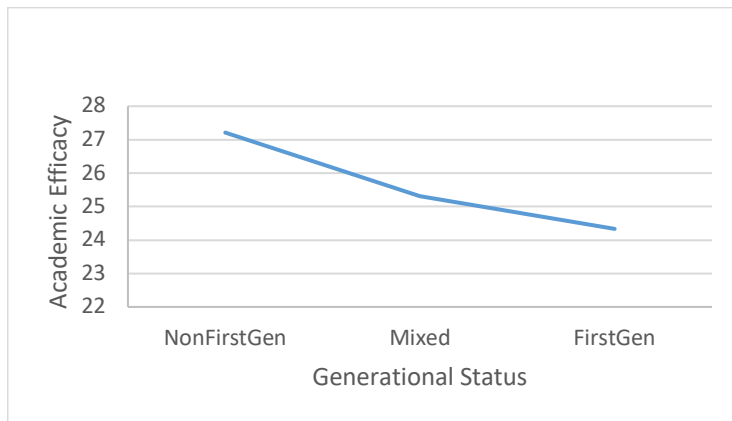Figure 3. Generational Status and Cynicism

Figure 2. Generational Status and Academic Efficacy

MPH Program Foundational Competencies

Evidence-based Approaches to Public Health

2. Select quantitative and qualitative data collection methods appropriate for a given public health context

3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate

4. Interpret results of data analysis for public health research, policy, or practice

B. Public Health & Health Care Systems

5. Compare the organization, structure and function of health care, public health, and regulatory systems across national and international settings

C. Planning & Management to Promote Health

7. Assess population needs, assets and capacities that affect communities' health

8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs

D. Policy in Public Health

13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes

14. Advocate for political, social or economic policies and programs that will improve health in diverse populations

15. Evaluate policies for their impact on public health and health equity

E. Leadership

16. Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision

 making

F. Communication

18. Select communication strategies for different audiences and sectors

19. Communicate audience-appropriate public health content, both in writing and through oral presentation

20. Describe the importance of cultural competence in communicating public health content

G. Inter-professional Practice

21. Perform effectively on inter-professional teams

H. Systems Thinking

22. Apply systems thinking tools to a public health issue

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Vita

Nayla left her hometown of Chihuahua in 2015 to chase her dreams of becoming a medical doctor in the United States. Nayla received her Bachelor of Science in Neuroscience with a minor in Psychology in December 2020 from the University of Texas at El Paso. She then continued her education and received her Master of Public Health Sciences with a concentration in Hispanic and Border Health from the University of Texas at El Paso in August 2023. During her Graduate School career, Nayla served as a Graduate Research Assistant first for UTEP's Leadership and Community Engagement program and then for the Counseling, Special Education, and Educational Psychology Department.

Her key interest in public health is mental health. Specifically, her research interests include the emotional well-being of healthcare students and providers. Her projects and personal goals aim to promote well-being and burnout prevention through education, information, and implementation of self-care and self-compassion techniques. Throughout her academic career, Nayla honored her natural leadership skills through service to the local community and campus and became a well-known mental health advocate as the health and wellness chair for the Medical Professions Organization.

Upon graduation, Nayla plans to work in higher education to improve the mental and emotional well-being of students. She then intends to further her education and pursue a medical degree to later become an endocrinologist and advocate for the importance of a holistic approach to health. Additionally, she plans to for health and justice to combat healthcare disparities.

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