SVOA Medical Research
ISSN: 2977-3644

ScienceVolks Open Access

Research Article

Toward a Model of Burnout in Medical Professionals: The Role of Empathy, Compassion Satisfaction, and Secondary Traumatic Stress — A Structural Equation Modeling Study

Elissa Dawkins, PhD[1]*, Pearl Seo, MD MPH[2]

[1]Senior Project Manager in the Clinical Research Services Education and Training Department at the Sylvester Comprehensive Cancer Center at the University of Miami Miller School of Medicine, University of Miami, USA.

[2]Assistant Professor, Division of Medical Oncology, Department of Medicine, Miller School of Medicine, University of Miami, USA.

*Corresponding Author: Elissa Dawkins, Senior Project Manager in the Clinical Research Services Education and Training Department at the Sylvester Comprehensive Cancer Center at the University of Miami Miller School of Medicine. She is also Part-time Faculty at Capella University in the School of Public Service and Leadership; Adjunct Faculty at American College of Education; and Contributing Faculty at Walden University, USA.

https://doi.org/10.58624/SVOAMR.2025.03.014

Received: November 22, 2024

Published: July 08, 2025

Citation: Dawkins E, Seo P. Toward a Model of Burnout in Medical Professionals: The Role of Empathy, Compassion Satisfaction, and Secondary Traumatic Stress — A Structural Equation Modeling Study. *SVOA Medical Research 2025,* 3:4, 106-137. doi: 10.58624/SVOAMR.2025.03.014

Abstract

Purpose: This study was designed to provide a better understanding of the potential direct and indirect effects that cognitive and affective empathy had on burnout (BO), and whether the effects, if any, were mediated by secondary traumatic stress (STS) and compassion satisfaction (CS). There is a paucity of research in the literature detailing the potential direct and indirect effects these constructs may have on a population of medical professionals spanning multiple specialties, centers, and geographical regions.

Methods: This study sought to gather this information using the Jefferson Scale of Empathy for Health Professionals (JSE-HP), the Interpersonal Reactivity Index (IRI), and the Professional Quality of Life (ProQOL-5) via an anonymous survey on the Survey Monkey platform. Statistical analyses were employed using Structural Equation Modeling (SEM) with covariances to assess the direct and indirect effects of the variables presented in the path analysis model on a sample of medical professionals (N = 165).

Results: The total effects (TE) between affective empathy and BO (TE = .133, SE = .062, p = .015), and STS and burnout (TE = .491, SE = .065, p = .005) were significant. CS (DE = -.792, SE = .051, p = .003) and affective empathy had a direct effect on BO (DE = -.116, SE = .054, p = .020); lower 95% CI = -.226, upper 95% CI = -.010); affective empathy also had an indirect effect (IE) on BO (IE = .249, SE = .047, p = .005). While the TE between cognitive empathy and burnout was not significant (TE = -.350, SE = .080, p = .171), nor was the direct effect (DE) (DE = -.063, SE = .048, p = .238), cognitive empathy did have an IE on BO (IE = -.287, SE = .065, p = .003) As well as STS (IE = .105, SE = .051, p = .050). Although gender was not a moderating variable between cognitive empathy and STS (F (1, 163) = 1.472, p = .233), it was between cognitive empathy and CS (p < .0001), affective empathy and BO (p < .0001), affective empathy and STS (p = 049), and affective empathy and CS (p < .0001). As affective empathy increased in females, BO decreased; whereas in males as affective empathy increased, BO also increased. In addition, the results showed in both males and females, the higher the affective empathy score, the more STS caregivers will experience. However, STS was higher in males who exuded more affective empathy.

Conclusions: Empathy should be introduced early on in medical education curricula to reduce the probability of developing burnout later in one's medical career. Empathy-focused interventions should be incorporated within the medical environment where empathy can be taught and cultivated to improve workplace and organizational outcomes. Participating in Balint groups, empathy training, and learning stress-coping measures are all important to lowering the risk of developing burnout. Future research should not only explore the direct and indirect effects of empathy in a large sample of medical professionals, but why and how empathy decreases, and if alexithymia might play an integral role in these changes over time.

Keywords: Model of Burnout, Medical Professionals, Secondary Traumatic Stress (STS)

Introduction

Empathy originated from the German word "Einfuhlung" meaning the "feeling within" a person [1]. It is defined as a predominantly cognitive attribute that involves understanding a patient's concerns, pain, and sufferings, combined with the ability to communicate these issues with an intention to help them; empathy has also been described as the pathway to an optimal physician-patient relationship, and an overall component of overall physician competence [2]. Numerous definitions of empathy have emerged over the last decade, but recent advances in cognitive neuroscience have pinpointed key components that help make up empathy [3]. Empathy is comprised of four subjectively experienced components: (1) affective response, (2) self-other awareness, (3) perspective taking, and (4) emotion regulation [4]. This definition helps to differentiate between empathy, sympathy, and compassion.

When physicians view and discuss patients objectively it does not imply unkindness, but can lead to detached, non-humanistic ways [25]. This is referred to as 'othering' and differs from other directedness expressed in altruistic behaviors because medical professionals unintentionally perceive, feel, and behave in disconnected ways with their patients, and/or medical students [5]. Othering can occur as a result of burnout and/or secondary traumatic stress. Burnout may result from the burden of educational demands, long working hours, lack of autonomy, work-life imbalance, and a lack of social resources [7]. There is speculation that high levels of empathy coupled with work demands (i.e. feelings of not being able to help patients to their best ability) are related to burnout. This then may lead to empathy suppression (intentional and unintentional) to avoid additional feelings of helplessness and personal distress [5].

Background to the Problem

Clinician empathy helps to create and maintain social relationships and bonds by allowing physicians and their patients to comprehend, share, and respond to the emotions, gestures, thoughts, and experiences of others [6]. Many studies agree that empathy is vital for effective clinical practice, and positive therapeutic outcomes [7,8]. It is important to explore empathy where there may be a significant predictive value to understand the relationships that they suggest [6]. Studies indicate that doctors learn to suppress their curiosity when interacting with patients to notate rapid, standardized histories, as opposed to telling patients first person accounts of illness after listening to their stories [8]. This pressure in turn makes it difficult at times to be empathetic toward their patients. Theoretical and empirical research are necessary in investigating and addressing these barriers in practicing genuine empathy [10]. A growing number of research studies indicate that enhanced practitioner empathy can reduce pain and anxiety, improve general quality of care, increases patient satisfaction, may benefit the growing number of multi-morbid patients [11] and increase practitioner wellbeing by reducing stress and burnout [10]. Research shows that doctors who regularly include the psychosocial dimensions of care communicate better with their patients overall. Increasing physician empathy could improve the clinical encounter and patients' adherence to recommendations [9].

Burnout slowly develops over time as healthy defenses are worn down from an overwhelming number of emotional demands, frustrating job setbacks, or difficult situations or individuals [12] burnout has also been shown to lead to a lack of organizational commitment which then leads to higher staff turnover and lower productivity [6]. When physicians have a lack of commitment to their profession or is experiencing boredom are at a higher risk for burnout. Signs of when a physician may be suffering from burnout include chronic tardiness, missing work, poor completion rates, low performance, work errors, or isolation from other colleagues [6]. Certain work environments summons burnout because of high work demands, and difficulty with the staff (medical assistants, nurses, etc.). A disconnect with supervisors or coworkers also prompts a higher risk of burnout [6].

Secondary traumatic stress (STS) is a condition that is characterized by fatigue and occurs from witnessing or listening to stories of disturbing, or traumatic events [6]. STS's symptoms are similar to the symptoms of posttraumatic stress disorder (PTSD). Symptoms include hopelessness, the inability to embrace, avoidance of patients or others, fear, physicals ailments, and minimizing problems and guilt; a at least one symptom of STS is prevalent among 70% of practitioners [6]. A Kuwait study showed that those with higher stress are more empathic than those with lower stress [13]. However, more recent studies suggest that structured methods to reducing stress and burnout should take place with both the individual and organization [6]. The individual should participate in training and education, skill development, fostering relaxation and social support, and increasing personal coping skills; organization-directed approaches should incorporate changes in work processes, supervisory relationship evaluation and modification, and increased job control and decision making [6]. Practitioners and organizations must make concerted efforts to focus on preventing burnout rather than treating it after it has already happened.

In order to reduce burnout and stress, practitioners should set goals and boundaries with regard to taking breaks at work and balancing the workload, promoting health and wellness in patient care has also been suggested to reduce the risk of burnout [6].

Compassion satisfaction is the positive feelings about people's ability to assist and relates to quality of work life [6]. Compassion satisfaction is unlike burnout and STS. A physician's sense of achievement, sustained motivation, and enjoyment from emotionally demanding patient care can promote compassion satisfaction [6]. When practitioners see that their patients are listening to their medical advice, are compliant with medication, and see that their patients' medical conditions are improving they can share these positive experiences with other colleagues [14]. This gives practitioners a sense of great accomplishment, and a positive attitude about work.

Relevant Theories

Hoffman's Theory of Moral Development

Hoffman's theory of moral development provides the most comprehensive view of empathy; the theory includes five mechanisms to explain how an observer becomes distressed when "taking on" the suffering of another [53]. This is referred to as compassion fatigue. The five mechanisms are (1) mimicry; (2) classical conditioning; (3) direct association; (4) mediated association; and (5) role-taking (Wondra and Ellsworth, 2015). Although the five mechanisms are discussed separately, they do overlap. For all of them the observer's vicarious emotional experience stems from imitating emotional expressions or recalling emotional memories; the differences lie in whether the observer must observe the target's emotion directly (mimicry and direct association), infer from them indirectly (mediated association and role-taking), and whether the observer put in the effort to empathize (role-taking), or not (the other four) [53].

Mimicry. Exuding empathy through mimicry involves verbal and non-verbal communication. It is the ability to understand facial expression and postures even when verbal cues are not given [75].

Classical conditioning. With classical conditioning certain situations make us feel emotional even when we have never experienced them before. For example, one might feel scared when approached by a cat if they were previously scratched by one. After experiencing this emotional situation, we learn that certain cues are a sign that it is going to happen again (i.e. a cat approaching with its claws protruding). In the first version of classical conditioning individuals are emotional from a personal level. In the second version of classical conditioning, individuals are emotional for others (i.e. cat approaching a stranger with claws protruding) [76].

Direct Association. The observer can see the target's emotional expression and it may remind them of their own past emotional experiences; and as a result, that evokes emotions that they felt during the original experiences [77].

Mediated Association. With mediated association observers learn about target's experiences through verbal communication. At that point the observers imagine the target's emotional expressions and mimic them, remember their past experiences and feel the emotions from the memories. This is based on memories, and not direct association [78].

Role-taking. The observers imagine themselves in the target's shoes or imagine how the target feels. Role-taking involves concerted efforts to understand a target by bringing emotional memories or imagined emotional expressions to mind [79, 80].

Parental Investment Theory

The parental investment theory was considered an explanation for higher empathy scores among women. Hypotheses for this phenomenon include: (1) extrinsic factors (role expected by society); and (2) intrinsic factors (biological characteristics including correlation with neurological findings) [70]. This theory explains that mothers are expected to develop a stronger sense of caring and to be more skilled in nurturing and understanding their children's emotions and needs in order to ensure their survival [71]. Additionally, studies show that women more likely to be more receptive to emotions [72, 73]. Although humans are born with mirror neurons, modeling is required from parental figures to instill prosocial behaviors that begin from infancy to 14 months of age; modeling, or nurturing is required to bring prosocial behaviors forward [74]. Women are more likely to develop and value interpersonal relationships, and to offer more emotional support than men which results in more humanistic attitudes, greater social sensitivity, and greater care [70]. Men exhibit attitudes of justice, independence, and control which may lend to why their empathy scores are lower in most empathy studies [81].

Empathy-Altruism Theory

The empathy-altruism theory proposes that prosocial motivation evoked by empathy is directed toward the ultimate goal of increasing the welfare of a person in need [54]. Altruistic acts are reinforced by different motivations, but empathy is considered one of the strongest [55.] Research shows that those who feel high levels of empathy are more likely to portray altruistic behavior [56]. Studies have shown that medical students that progress through their education experience declines in empathy [54]. The extent of this decline is unknown. Medical professionals can experience increased professional satisfaction in their careers when they engage in empathy; participants reported that empathy not only improved their relationships with patients, but also made the practice of medicine more rewarding, interesting, less frustrating, and more pleasurable, "a way of making medicine feel more human" [57]. When physicians experience burnout, or 'empathy strain' this could lead to indecisiveness, or the inability to communicate effectively with patients [58,59]. The model (see Figure 1) illustrates how the concepts from cognitive and affective empathy, social psychology research, social neuroscience research of empathy and compassion intermingle; many are co-activated and dynamically influence the others in a non-linear fashion [60].

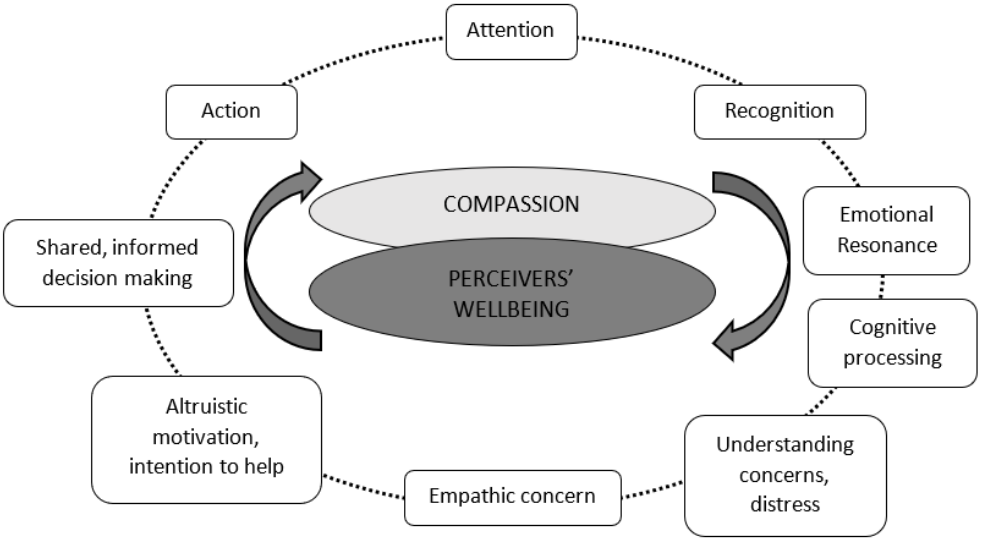

Figure 1. *Relationships and Processes Between Cognitive and Affective Empathy.*

Broaden-and-Build Theory

It is proposed that happy and satisfied employees are more productive than their less happy and stressed colleagues[24]. With the broaden-and-build theory, positive emotions broaden people's momentary thought-action repertoires and build their enduring personal resources; when an individual feels good this ignites the desire to play, try new things, and experiment [61]. As a result, new ideas emerge, with innovative solutions. Employees who experience a positive state of emotional and motivational fulfillment at work are shown to perform better and be more productive than their less engaged peers [62,63].

The Theory of Emotional Dissonance

The theory of emotional dissonance proposes that burnout is associated with diminished empathic capacities; this would originate as a result of alexithymia [37]. Depersonalization is a hypothesis that emphasizes how physicians that experience this tend to objectify their patients; the physician/patient relationship is dehumanized [67].

The Theory of Compassion Fatigue

The theory of compassion fatigue suggests that burnout is associated with excessive empathy [15,68]. Physicians that place themselves in others' shoes and try to "feel too much" increase their chance of emotional exhaustion, leading to compassion fatigue and then burnout [69].

Exploring Clinician Empathy and Compassion Fatigue

Empathy is a core element of a therapeutic relationship between a medical professional and their patient [15], but the appropriate empathic response is not always shown. Emotional contagion is an increase in autonomic arousal, emulating the inner state of the other person; psychological adjustment of arousal states is key to being able to offer a regulated empathic response [16]. Burnout syndrome is widely prevalent in the medical professions field. It is present in between 30 and 70 percent of healthcare professionals [16.] Although it is necessary and vital to report on medical professionals' empathy, it is equally important to understand why empathy levels may be lower than the "norm". For example, healthcare professionals try to be empathic, but they often have to face demands, with some that are impossible to meet [16]. Many researchers suggest empathy training to protect against burnout. If this type of training is not given burnout can have serious repercussions on both the professional and client/patient [16].

When an individual is empathetic, they can see the world as others do—they are not judgmental, they understand the feelings of others, and they are understanding [17]. The clinician/patient relationship is contingent on how empathic the physician is during each consultation. However, burnout may play a role in the lack of an empathic nature of a physician. Approximately 60% of practicing physicians report having burnout symptoms. Walocha et al. (2013) conducted a study to evaluate the level of empathy and burnout among physicians of multiple specialties in Poland, and to determine if there are any associations with level of empathy and burnout. Results indicated that non-surgical physicians' empathy level was higher than the other two subgroups. The association between empathy and burnout was assessed. A statistically significant, negative correlation was noted between lack of personal accomplishment and level of empathy ($r = -0.23$, $p < 0.05$) [17].

Oncology and Clinical Outcomes

There are limited scientific studies that explore the link between medical empathy and patient outcomes [44]. Patient outcomes are defined as observable, or self-reported consequences; outcomes are categorized by patient participation, immediate satisfaction with the consultation, adherence to treatment, and quality of life [45, 46]. Clinicians' empathy was related to better patients' outcomes as seen in the results from the patient-reported measure; greater psychological well-being, greater satisfaction with care, no anxiety disorders, and the oncologist was the preferred source to receive any information related to care [48,49]. For example, studies showed that nurses and other medical professionals' empathy was directly correlated to the patients' distress [15]. Results also indicated that empathy is not related to how much a patient knows and understands about their condition, nor is it related to coping.

There is a large consensus that clinical empathy is extremely important in a field like oncology at every stage of illness [42]. However, two critical facts were discovered about empathy in medicine. The first fact is that many studies that discuss empathy do not clearly define it. Empathy can be assessed by the patient, a health care professional, or an external coder [43]. It is important to define what is being studied, or addressed with regard to empathy, whether it is understanding of the other, or communication skills. Previous studies suggest that being empathetic in the oncology realm has some negative side effects for the physician which can lead to compassion fatigue [44, 47, 50]. Consequently, at times physicians may need to be less empathic to do their jobs to the best of their ability. For example, oncologists must take the stage of the disease associated with each of their patients into account; the same amount of empathy is not needed at the consultation stage, as is needed for Stage IV breast cancer. Patients are able to visualize facial expressions and know whether their physician has sincere interest in them. Physician attitudes and skills such as genuine interest, respect, reflective listening, and empathy enables them to effectively adhere to their patient's needs and requests which has been associated with a better physician-patient relationship, and improvements in clinical outcomes [41, 51]. The ability to perceive things from the patient's perspective and meet their needs and expectations is a key factor of empathy in medical settings. Future research should employ several methods when assessing empathy such as perspective-taking, coding systems, patient-reporting, etc.

Emergency Physicians

In recent years there has been an increase in the number of patients seen in the emergency department. Compassion is an essential function for emergency care providers; it drives the sense of duty toward patients and leads to satisfaction gained from the alleviation of pain and suffering [18]. Emergency department physicians work in a place of stress and multidisciplinary work, with situations related to a critical risk for patients in many cases [19]. Being exposed to STS in these demanding, and emotional environments can lead to compassion fatigue.

Compassion fatigue could trigger various emotions and behaviors such as sadness, grief, chemical dependency, somatic complaints, detachment, anger and changes in belief systems [18]. Medical professionals in this field are exposed to higher demands in workload and increased social pressure [19]. The physical and emotional impacts of caring in stressful healthcare environments are gaining increased attention [20]. Yugero et al. (2017) conducted a study with all medical professionals and nurses working in an emergency department using the JSPE and the Maslach Burnout Inventory (MBI). Significant differences were observed with empathy. Findings from the study indicated that empathy and burnout correlated with respect to emergency professionals. Those that reported high levels of burnout had the lowest empathy levels [19]. Prospective studies should be carried out to describe the profiles of burnout and empathy, including their association and evolution [19]. Bellolio et al. (2014), conducted a study amongst emergency resident physicians using the Professional Quality of Life (ProQOL) scale to measure compassion fatigue in this population. None of the residents had high burnout levels. A total of 107 (57%) residents had low burnout levels, and 81 (43%) had average levels of burnout [18]. Residents who worked more than 80 hours had higher burnout than those who did not. Additionally, residents who worked overnight had higher burnout levels, and no resident had a high level of STS.

Family Medicine Doctors (FMDs)

Approximately 65% of European family medicine doctors (FMDs) show signs of burnout with many different symptoms [21]. If a physician is experiencing burnout this can have a major impact on their health, as well as the health and wellbeing of their patients. In Slovenia, burnout has only been examined in family medicine trainees who scored high (71%) in at least one burnout dimension [21]. Organizational issues are shown to be a major cause for burnout. High workload is an issue in Slovenia. Having an aging population, the lack of physicians working in primary care, a decrease in interest in family medicine residencies, and shortage of time for the patient suggest the need for more support for FMDs. In a study conducted by El-bar et al. (2013), there was a strong positive correlation between compassion fatigue (CF) and BO. Results showed that 35.2% of family practitioners are at a very high risk for CF, 9.4% are at a high risk for BO, and 21.1% are at risk for having low CS [20]. Being born in another country and no academic affiliation are indicators for high CF. Factors related to high levels of BO were female gender ($p = 0.024$) being born abroad ($p = 0.004$), having low/no academic affiliation ($p = 0.002$), and experiencing personal trauma in the past ($p = 0.004$) [20].

Research in Western settings demonstrated the adverse impact of clinician stress, fatigue, and burnout on the quality of patient care [22]. This could negatively impact clinicians' affective empathy. They could have feelings of alienation, helplessness, and hopelessness, loss of idealism and spirit, physical and emotional drain anxiety, and depressive disorders [22]. Repeated exposure to traumatic situations and injuries has the proclivity to increase the risk of burnout, compassion fatigue, and secondary traumatic stress in health care professionals [23]. Having to provide care to others, while having to care for themselves takes a toll after a while. Eventually they will not have the capacity to give of themselves with significant effects on health care and system cohesion [23]. Future research should focus on the integration of targeted educational programs in mindfulness, communication, and self-awareness for primary care physicians to increase empathy and feelings of personal accomplishments [5].

Dentists

In a study conducted by Hakanen and Koivumaki (2014) Finnish dentists were investigated to determine if work engagement and exhaustion are related to clinical outcomes when controlling for professional and demographic background variables. Since it is suggested that work engagement may have a better relationship with productivity than exhaustion, work engagement and exhaustion may be associated with productivity. Results from the study showed that engagement is contagious and can be transmitted from one employee to another, which will then improve the overall performance of all involved [24]. Workers that are engaged are more productive and healthier which suggests that adaptive strategies such as compensation may act as moderators protecting performance especially in cases of burnout.

Cardiology

Cardiology is a leading field of medicine for technological advancement and research; there are over 25,901 active cardiologists working in the U.S. with 64% being general cardiologists [109]. This area of medicine is attractive to new entrants because of its prestige, and the potential income involved. With all the specialty training and benefits involved with being a cardiologist, stress and burnout may also be associated. Previous research has shown that burnout is detrimental to physicians' health as well as the patient. This could lead to repercussions for the whole healthcare organization; this widespread impact explains why wellness of physicians is extremely important and is a quality indicator in the delivery of healthcare [25].

There is a great deal of emotion involved in cardiology. Previous studies have shown that physicians who manage acutely ill patients and those dealing with the issues surrounding mortality and morbidity are more likely to experience burnout [111]. The five most frequently reported causes of burnout reported by cardiologists in the Medscape Cardiologist Lifestyle Report 2017 were the large amount of time spent at work, increased computerization of practices, lack of autonomy, and meeting certification demands [25]. Recently there has been a limited number of new entrants in the field. This places added stress and pressure on cardiologists already practicing in the field to see more patients in shorter visits, to work long hours, and accept on-call duties [25]. In addition to seeing patients, cardiologists much take on other demanding responsibilities. They must train junior staff, be a leader and manage a team, perform administrative tasks, and participate in research activities [110]. This could lead to a diminished sense of autonomy, and the inability to impact patient care resulting in burnout [25]. Older physicians tend to have difficulty coping with technological advancements in the field. As a result, they may experience feelings of burnout and reduce their working hours. Future studies should explore the inter-relationships between physician age, healthcare modernization, and burnout [25]. Addressing burnout in cardiologists is a time sensitive issue. Physician wellness is fundamental, and should be targeted early to reduce, or prevent burnout.

Social Workers

Wagaman et al. (2015) conducted a study with social workers to explore the relationship between social workers' empathy and level of burnout, STS, and compassion satisfaction. The researchers predicted that higher levels of empathy would show low levels of burnout and STS, and high levels of compassion satisfaction [6]. The results of the study indicated that participants that had been in their field longer had higher levels of compassion satisfaction, and lower levels of burnout. This study showed that there was a significant relationship between empathy and compassion satisfaction. Self-awareness and emotional regulation contributed to compassion fatigue, but affective response was a predictor of compassion satisfaction [6]. In therapeutic practice the combination of the neurotransmitters enkeuphalin (encephalin) and dopamine may drive clinicians to greater competency with their clients [26]. These natural opioids help to create bonds and relationships. For example, when clinical social workers convey empathy during the session these releases endorphins giving the social worker pleasure; both the client and social worker are nurtured and transformed in this interpersonal process [26]. This is taken from the perspective of a helpful professional. From the perspective of both the client and clinical social worker the interpersonal exchange fosters resilience, trust, healing, personal growth, creativity, and learning from the nourishment of therapeutic exchange [26].Future research should focus on incorporating empathy into a dually focused intervention; empathy should be taught, cultivated, and learned in formal educational settings, professional development programs for social workers, and continuing education to improve workplace and organizational outcomes.

Statement of the Problem

There is a paucity of research using the Jefferson Scale of Empathy for Health Professionals (JSE-HP), the Interpersonal Reactivity Index (IRI), and the Professional Quality of Life (ProQOL) together to determine the direct and indirect effects of cognitive and affective empathy, as well as STS and CS on burnout. The primary goal was to determine what contribution (if any) empathy, compassion satisfaction, and compassion fatigue had on a general population of physicians and other clinicians spanning over multiple backgrounds, clinical settings, and specialties.

Relevance / Rationale

Burnout existed primarily in emergency care settings. However, now it negatively impacts the entire healthcare care system, including primary care and specialty services. The rationale for conducting this study was to assess the impact that cognitive and affective empathy had on compassion satisfaction, burnout, and compassion fatigue. Physician and health professionals' burnout continue to rise. A global study of physicians from varying specialties provided more insight into this growing issue.

Research Questions and Hypotheses

A fully recursive path model (see Figure 2) was used to guide the study and develop the research questions and hypotheses included below:

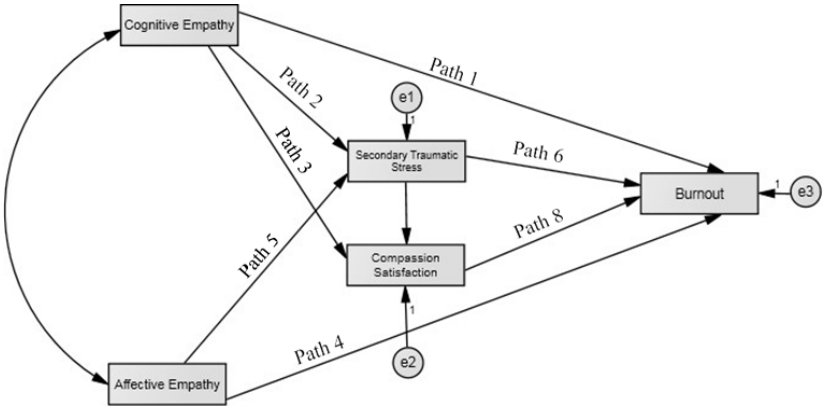

Figure 2. *Recursive Path Model.*

Research Question 1:

Does cognitive empathy have a direct effect on burnout, and is this potential effect mediated by STS and/or CS?

H_1: (Path 1) Cognitive empathy has a direct effect on burnout

H_2: (Path 2) STS mediates the relationship between cognitive empathy and burnout

H_3: (Path 3) CS mediates the relationship between cognitive empathy and burnout

Research Question 2:

Does affective empathy have a direct effect on burnout, and is this potential effect mediated by STS and/or CS?

H_4: (Path 4) Affective empathy has a direct effect on burnout

H_5: (Path 5) STS mediates the relationship between affective empathy and burnout

Research Question 3:

Does STS have a direct effect on burnout, and is this potential effect mediated by CS?

H_6: (Path 6) STS has a direct effect on burnout

H_7: (Path 7) CS mediates the relationship between STS and burnout

Research Question 4:

Does CS have a direct effect on BO?

H_8: (Path 8) CS has a direct effect on BO

Methods

This study used a quantitative, correlational, cross-sectional survey design to assess whether there were any direct effects between cognitive and affective empathy, as well as secondary traumatic stress (STS) and burnout, and if these direct effects were mediated by compassion satisfaction (CS) or STS. The criterion and mediating variables were measured using the ProQOL-5. Cognitive and affective empathy were measured using the Jefferson Scale of Empathy for Health Professionals (JSE-HP), and the Interpersonal Reactivity Index (IRI), respectively. Sociodemographic characteristics were evaluated using a demographic survey consisting of 16 questions.

Snowball sampling was used to recruit participants. Participants included physicians and medical professionals from multiple centers, geographic regions, and clinical settings. A description of the study, and link to the surveys were sent individually to physicians and medical professionals on LinkedIn whose profiles matched the inclusion criteria. Eligible physicians and other medical professionals accessed the link from their LinkedIn inbox and participated in the study by completing a demographic survey, the JSE-HP, IRI, and the ProQOL-5 on SurveyMonkey. The enhanced security option of secure socket layers encryption was used to ensure anonymity. Additionally, Internet Protocol (IP) addresses were concealed so that they were not linked to any of the survey respondents.

The demographic survey took approximately one minute to complete. The other surveys took 4 ½ minutes to complete. Total time to complete all the surveys was approximately 15 minutes or less. The survey link was available for two weeks. All data were compiled and downloaded from Survey Monkey into an excel spreadsheet and then exported and analyzed using SPSS v.24 and SPSS Amos v.25.

Subject and Eligibility Criteria

A sample of approximately 200 physicians and other medical professionals were asked to participate.

Inclusion Criteria

All physicians and medical professionals who provided direct patient care on a regular basis regardless of age, geographic region, or other demographic characteristics.

Exclusion Criteria

All physicians and medical professionals who did not provide direct patient care on a regular basis, and students. The JSE -HPS was created specifically for medical students; whereas the JSE-HP was created for medical professionals already established in their career/specialty of choice.

Characteristics

Physicians and health professionals included, but were not limited to: (1) primary care physicians; (2) specialists; (3) nurses; (4) physician assistants; (5) social workers; (6) licensed mental health and psychiatric clinicians, etc.

Data Analyses

Descriptive statistics were calculated for all demographic variables (i.e. means, percent, and standard deviations). Structural Equation Modeling (SEM) using covariances was used to assess the relationships between the predictor, criterion, mediating, and moderating variables. Additionally, SPSS Amos was used to conduct confirmatory factor analysis (CFA) on all the scales used in the study. Principal Components Analysis (PCA) was not performed on the scales so as to not lose any data since this would reduce dimensionality [82]. SPSS Amos was also used to determine any mediating effects between the predictor and criterion variables. The chi-square difference test was calculated to analyze competing CFA models and compared the results using:

$$\chi^2_{diff} = \chi^2_s + \chi^2_1 \text{ and } df_{diff} = df_s - df_1$$

In the equation above, s is the smaller model with fewer parameters and more degrees of freedom, and 1 represents the larger model with more parameters and fewer degrees of freedom. Using a χ^2 table, if the χ^2_{diff} value is significant, the larger model with freely estimated parameters fits the data better than the smaller model where the parameters were fixed.

Structural Equation Modeling (SEM)

SEM was the appropriate choice of available analytic techniques to test the theoretical models that were proposed a priori. Structural equation modeling using maximum likelihood estimation procedure is a technique that provides extensive information where all model parameters are estimated concurrently. A change in one parameter during the iteration process may result in a change in other parameters in the model [30]. The goal of SEM is to explain the patterns of covariance observed among the study variables [31]. The model explains if two or more variables are related. Path diagrams illustrate the models; a simple path with a single-headed arrow represents a direct relationship between two variables, and a compound path represents the product of multiple paths [30]. The Statistical Package for Social Sciences Analysis of Moment Structures (SPSS AMOS) was the software chosen for the analyses.

Confirmatory Factor Analysis (CFA)

CFA is a special case of SEM, also known as the covariance structure [32]. Fit measures used are the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA). The value of the RMSEA should be .05 or less, and the CFI should be ≥ .90 [33].

Path Analysis

Mediation. Mediation involves several steps (see Figure 3). When a relationship between two variables is established, a third variable can provide a clearer interpretation of the relationship between the two variables; a clearer interpretation may be obtained by elucidating the causal process among the three variables, a mediation hypothesis [34].

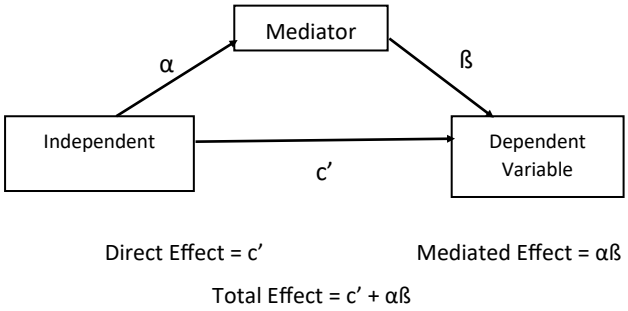

Figure 3. *Mediation.*

Moderation. Moderation implies that introducing a moderating variable changes the direction or magnitude of the relationship between two variables. This is also known as an interaction effect (see Figure 4). A moderator is a variable that specifies conditions where a predictor is related to an outcome. Essentially, a moderator explains when a dependent variable and independent variable are related [35]. A moderation effect could result in: (1) increasing the moderator would increase the effect of the predictor on the outcome; (2) increasing the moderator would decrease the effect of the predictor on the outcome; or (3) increasing the moderator would reverse the effect of the predictor on the outcome.

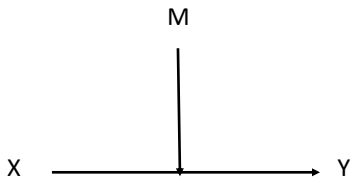

Figure 4. *Moderation.*

Results

The purpose of this study was to determine if there were any direct and indirect effects that cognitive and affective empathy had on BO, and whether the effects, if any, were mediated by STS and CS. Cognitive empathy was measured using the JSE-HP; affective empathy was measured by the IRI; and the criterion variables were measured using the ProQOL-5. Principal components factor analysis and confirmatory factor analysis were conducted on each of the scales to produce a final model for each scale/subscale. Path analyses and structural equation modeling with covariances were the primary statistical analyses utilized. Moderation using an interaction effect was used to determine if there were any differences between genders. Additionally, effect sizes are provided along with statistically significant results.

Screening and Scoring

After two weeks responses were collected from 235 participants. The data was exported from SurveyMonkey into Excel and then exported to IBM SPSS v. 24 for subsequent data management procedures and statistical analyses. SPSS AMOS v. 25 was used for structural equation modeling to determine mediating effects of variables. Screening indicated that 70 participants were missing an excessive number of responses and were removed from the dataset. This resulted in 165 respondents that were included in the analyses. The sample size was much larger than the 55 estimated by the power analysis for a power of .80.

The data were screened for missing responses for each survey. On the JSE-HP a respondent must answer at least 16 (80%) of the 20 questions. If less than 16 questions are answered the missing values should be replaced with the mean score calculated from the items, the respondent completed. Respondents should be removed from the data set if less than 16 questions are answered because this is considered incomplete. There were no missing items on the JSE-HP for any of the respondents. To score the scale items 1, 3, 6, 7, 8, 11, 12, 14, and 18 were reverse scored while the other items were scored on their Likert weights (Strongly disagree = 1…Strongly agree = 7). Three participants were missing two responses from the IRI. Those missing responses were replaced with the mean of the total number of items they responded to. To score the scale items 3, 4, 7, 12, 13, 14, 15, and 19 were reversed scored while the other items were scored on their Likert weights (Does not describe me well = A…Describes me very well = E). A total of four respondents were missing three responses from the ProQOL. The missing responses were replaced with the mean of the total number of items they responded to. Each subscale was scored separately. The compassion satisfaction and secondary traumatic stress subscales were scored on their Likert weights (Never = 1…Very Often = 5) while the burnout subscale items 1, 4, 15, 17, and 29 were reversed scored.

Statistical Assumptions

In order to run regression models the dependent variable should be measured on a continuous scale; there should be one or more independent variables; there should be an independence of observations using the Durbin-Watson statistic; there should be a linear relationship between the dependent variables and each of the independent variables; the data must show homoscedasticity; the data must not show multicollinearity; there should be no significant outliers; and finally the residuals should be normally distributed. All assumptions were met using SPSS.

The reliability for the JSE-HP was obtained using Cronbach's alpha reliability procedure in SPSS. This is an indicator of the internal consistency of the responses to the items that make up an instrument. A reliability of .80 or higher is generally considered acceptable. The JSE-HP's reliability was (Cronbach's alpha = .80). Although this is lower than in previous studies, it was considered adequate. The reliability for the IRI subscales were obtained using Cronbach's alpha reliability procedure. The IRI's reliability was (FS, α = .75; PT, α = .76; EC, α = .69, and PD, α = .74). The Cronbach alpha obtained was higher on the FS and subscales, but slightly lower on the PT and PD subscales than in previous studies. The reliability for the ProQOL subscales were (CS, α = .87, STS, α = .77, and BO, α = .82). The individual subscale coefficients are much higher than previous studies [36,37] but the overall consistency of the scale (α = .63) supports the idea to remove certain items from the scale.

Confirmatory Factor Analyses

JSE-HP. CFA Factor Analysis with maximum likelihood extraction was used on the JSE-HP scale. The χ^2 statistic for the model fit was significant. The RMSEA was .077 and CFI .720. Items relating to "Rendering Better Care" loaded on the common factor with standardized regression weights of .682, .970, .759, .632, .875, .777, and .595. The five-factor model fits the data substantially better than the single factor model with RMSEA = .042 and CFI = .921. To improve the fit further the modification indices made suggestions about loosening certain model parameters to improve the overall model fit. Amos suggested adding a path from "Attentiveness" and "Rendering Better Care". The "Attentiveness" variable was only weakly accounted for by the others variable hinting that the survey item was not tapping the same value dimensions as the other four "Emotionless Care" indicators. An alternative possibility is that J8_Attentiveness is also tied to the "Rendering Better Care" dimension. After adding the path, the model remained significant, but the CFI improved from .921 to .931. An additional path from "History Taking" to "Understanding Patients" for a better model fit. The CFI increased to .943. The results from the regression weights suggested adding a path from "Imagine being in a Pt's Shoes" to "Rendering Better Care" which indicates that they may be measuring the same thing; "Better Care" accounted for only 20% of the variance for "Rendering Better Care" and was removed. As result, the modification indices suggested moving some of the items on different factors, and the model was no longer significant χ^2 = (142, N = 165) = 165.94, p = 0.83); RMSEA = 0.32 and CFI = .956. The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 337.01 – 165.94 = 171.07; df 170 – 142 = 28. Using the χ^2 table p was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

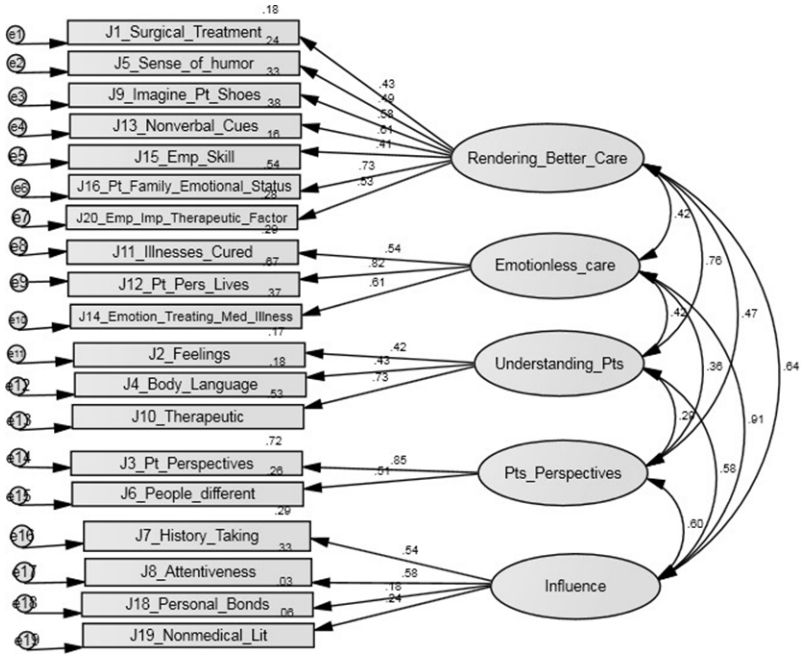

Figure 5. *Final JSE-HP Model.*

IRI Fantasy Scale. The χ^2 statistic for the fantasy subscale was significant. The RMSEA was .110 and the CFI was .882 which suggested that the fit of the model was questionable. The items relating to "Putting Yourself in Others' Shoes" loaded on the common factor with standardized regression weights of .526, .724, .769, and .639; while the standard regression weights for "Getting Emotionally involved in a Book or Play" items were .391, .358, and .375. Additionally, FS explains about 15%, 13%, and 14% of the variance on the second factor. The two-factor model fit the data substantially better than the single factor model with CFI = .907. It may still be possible to improve the fit further. The results from the regression weights to add a path from "Novel" and "Emotionally" seemed to be the most plausible. The "Novel" variable was only weakly accounted for by the others variable hinting that the survey item was not tapping the same value dimensions as the two "Other" value indicators. An alternative possibility is that "Novel" is also tied to the "Emotionally" dimension. After adding the path, the model remained significant $\chi^2 = (12, N = 165) = 21.24$, $p = .047$), but CFI improved from .907 to .961. The regression weights results suggested an additional path from "Daydream Fantasize" to "Others" for a better model fit. Adding the path indicated a good model fit $\chi^2 = (11, N = 165) = 7.63$, $p = .746$); CFI = 1.000 and RMSEA = .000. This indicated that "Daydream Fantasize" was also tied to the "Others" dimension.

The R^2 coefficient for "Daydream Fantasize" was only .01, and "Emotionally" only accounted for 15% of the variance. Changing "Novel" to load on to "Emotionally", and "Novel" to load on to "Others" indicated a better model fit $\chi^2 = (13, N = 165) = 12.89$, $p = .456$); CFI = 1.000 and RMSEA = .000). The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 41.82 – 12.89 = 28.93; df 14 – 13 = 1. Using the χ^2 table p was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

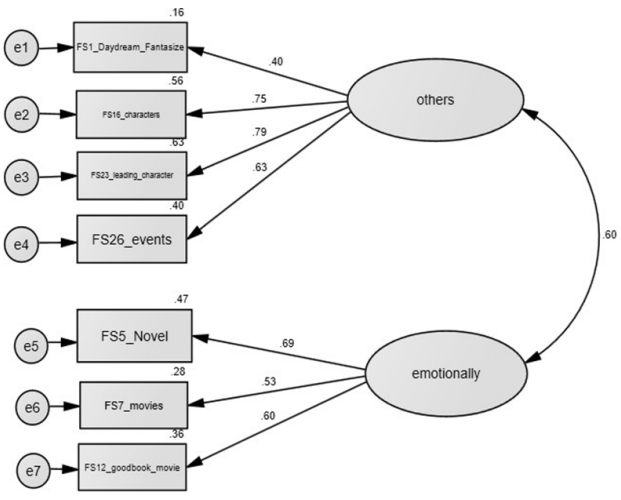

Figure 6. *Final Fantasy Subscale Model Fit*.

Table 1. Fantasy Subscale Factor Loadings for Final Model Fit	
Fantasy Subscale	
Component 1: **"Putting Yourself in Others Shoes"**	FS1: I daydream and fantasize, with some regularity, about things that might happen to me.
	FS16: After seeing a play or movie, I have felt as though I were on of the characters
	FS23: When I watch a good movie, I can very easily put myself in the place of a leading character
	FS26: When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me
Component 2: **"Getting Emotionally Involved in a Book or Play"**	FS5: I really get involved with the feelings of the characters in a novel
	FS7: I am usually objective when I watch a movie or play, and I don't often get completely caught up in it
	FS12: Becoming extremely involved in a good book or movie is somewhat rare for me.

IRI: Perspective Taking Subscale. The χ^2 statistic for the perspective taking subscale was significant. The RMSEA was .114 and the CFI was .874 suggesting that the fit of the model was questionable. The items relating to "Remaining Neutral in Tense Situations" loaded on the common factor with standardized regression weights of .576, .585, .600, and .756; while the standard regression weights for "Seeing Things from Other's Perspectives" were .381, .488, and .528. Additionally, PT explained about 24%, 28%, and 14% of the variance on the second factor. The two-factor model did not fit the data substantially better than the single factor model with CFI = .872. The modification indices made suggestions about loosening certain model parameters in order to improve the overall model fit. The regressions weight results, meanwhile, suggested adding single-headed arrows between "Criticizing", and "Upset" for a better model fit. Adding the path indicated a better model fit $\chi^2 = (12, N = 165) = 21.91, p = .039$); CFI = .958 and RMSEA = .071. This indicated that "Upset" and "Criticizing" was measuring the same thing as "Upset" accounts for 24% of Neutral's variance. Removing "Upset" from the scale was plausible because the model was a good fit $\chi^2 = (8, N = 165) = 8.86, p = .354$); CFI = .995 and RMSEA = .026. The two-factor structure was acceptable with three items loading onto each factor.

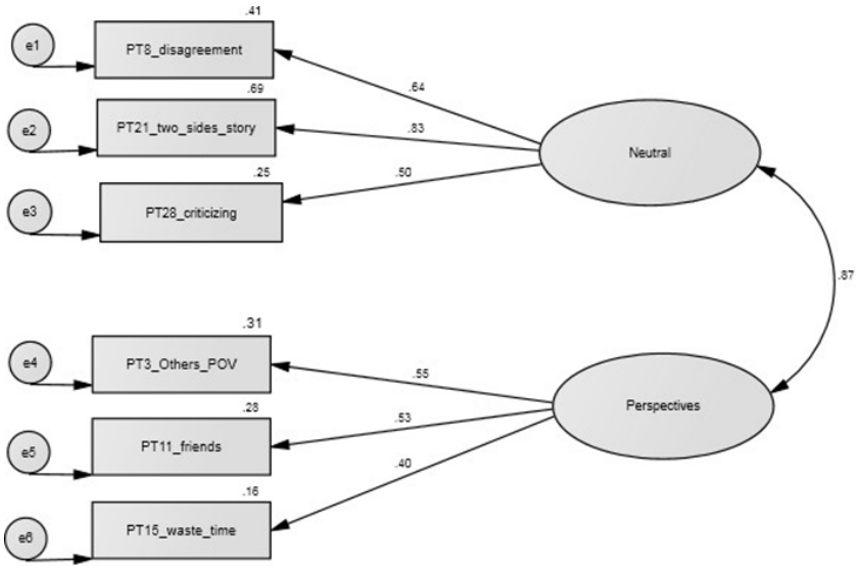

Figure 7. *Final Perspective Taking Model Fit.*

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 44.01 – 8.86 = 35.15; df 14 – 13 = 6. The p value was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

Table 2. Perspective Taking Subscale Factor Loadings for Final Model Fit.

Perspective Taking Subscale	
Component 1: **"Remaining Neutral in Tense Situations"**	PT3: I sometimes find it difficult to see things from the "other guy's" point of view
	PT11: I sometimes try to understand my friends better by imagining how things look from their perspective
	PT15: If I'm sure I'm right about something, I don't waste much time listening to other's people's arguments
Component 2: **"Seeing Things from Other's Perspectives"**	PT8: I try to look at everybody's side of a disagreement before I make a decision
	PT21: I believe that there are two sides to every question and try to look at them both
	PT28: Before criticizing somebody, I try to imagine how I would feel if I were in their place.

IRI: Empathic Concern Subscale. The χ^2 statistic for the empathic concern subscale was significant. The RMSEA was .113 and the CFI was .826 suggesting that the fit of the model was questionable. The items relating to "Caring for those Less Fortunate" loaded on the common factor with standardized regression weights of .783, and .561; while the standard regression weights for "Touched by Compelling and Emotional Circumstances" were .415, .421, and .432; and the standard regression weights for "Not Caring for those Less Fortunate" were .305, and .512. Additionally, EC explained about 9% and 18% of the variance on the third factor. The three-factor model fit the data marginally better than the single factor model with CFI = .927. It was still possible to improve the fit further. The modification indices made suggestions about loosening certain model parameters to improve the overall model fit. The regression weight results, meanwhile, suggested adding single-headed arrows between "Protective" and "Not Caring" for a better model fit which seemed the most plausible. The "Protective" variable was only weakly accounted for by the "Others" variable hinting that the survey item was not tapping the same value dimensions as the other two "Touched" value indicators. An alternative possibility is that "Protective" was also tied to the "Not Caring" dimension. After adding the path, the model was a good fit χ^2 = (10, N = 165) = 12.48, p = .254); CFI = .985 and RMSEA = .039. The three-factor model was acceptable. However, moving the "Protective" variable to factor three "Not Caring" resulted in a good model fit χ^2 = (11, N = 165) = 13.22, p = .279); CFI = .987 and RMSEA = .035.

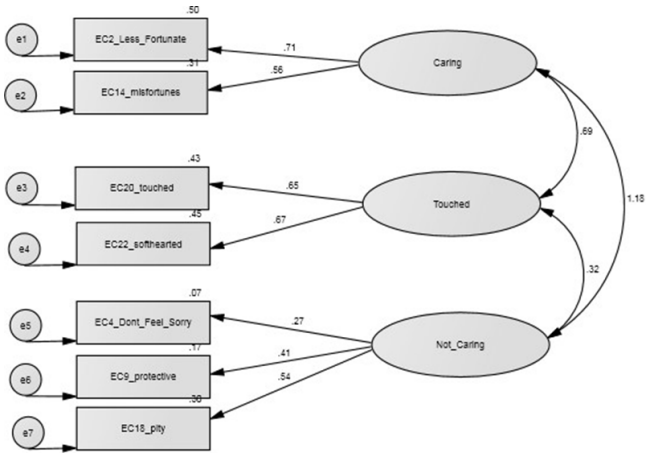

Figure 8. *Final Empathic Concern Model Fit.*

Between the one-factor model and the final model the chi-square difference test was 43.53 – 13.22 = 30.31; df 14 – 11 = 3. Using the χ^2 table p was not significant indicating that both values fit the model well, statistically, so the parameters in question can be fixed to 0 and the smaller model can be accepted just as well.

Table 3. Empathic Concern Subscale Factor Loadings for Final Model Fit

Empathic Concern Subscale	
Component 1: **"Caring for those Less Fortunate"**	EC2: I often have tender, concerned feelings for people less fortunate than me
	EC14: Other people's misfortunes do not usually disturb me a great deal.
Component 2: **"Touched by Compelling and Emotional Circumstances"**	EC20: I am often quite touched by the things that I see happen
	EC22: I would describe myself as a pretty soft-hearted person
Component 3: **"Not Caring for those Less Fortunate"**	EC4: Sometimes I don't feel very sorry for other people when they are having problems
	EC9: When I see someone being taken advantage of, I feel kind of protective towards them
	EC18: When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

IRI: Personal Distress Subscale. The χ^2 statistic for the personal distress subscale was significant. The RMSEA was .133 and the CFI was .845 suggesting that the fit of the model was questionable. The items relating to "Reacting to Emergency Situations" loaded on the common factor with standardized regression weights of .675, .609, .686, .570, and .699; while the standard regression weights for "Dealing with Stressful Situations" were .212, and .407. Additionally, PD explained about 5% and 17% of the variance on the second factor. The two-factor model did not fit the data substantially better than the single factor model with CFI = .872. It was still possible to improve the fit further. The modification indices made suggestions about loosening certain model parameters to improve the overall fit. The regressions weight results suggested adding single-headed arrows between: "Tense Scares" and "Helpless" for a better model fit. Adding the path indicated a better model fit χ^2 = (12, N = 165) = 18.45, p = .103); CFI = .975 and RMSEA = .057. This indicated that "Tense Scares" and "Helpless" may be measuring the same thing because "Helpless" accounted for 23% of "Emergency's" variance. Removing "Helpless" from the scale was plausible because the model was a good fit χ^2 = (8, N = 165) = 8.82, p = .357); CFI = .995 and RMSEA = .025. The two-factor structure was acceptable.

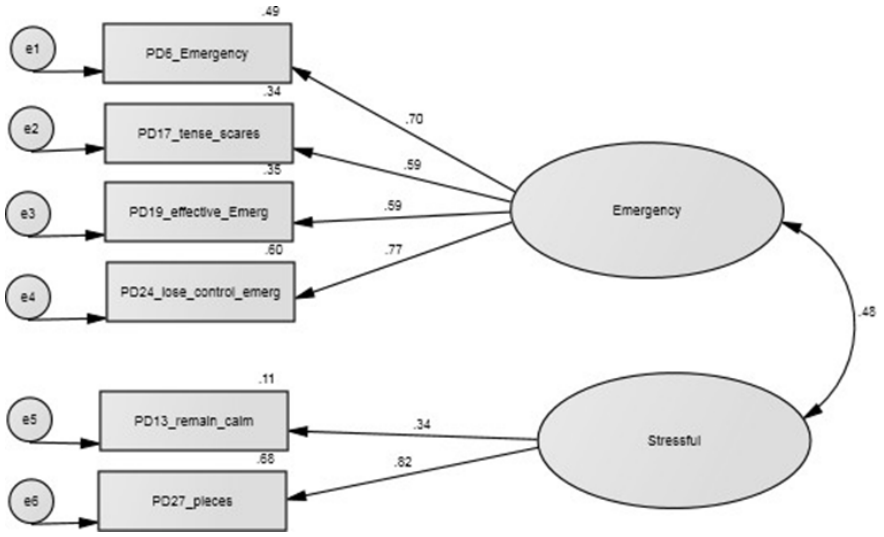

Figure 9. *Final Personal Distress Model Fit.*

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 54.58 – 8.83 = 45.75; df 14 – 8 = 6. Using the χ^2 table p was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters were fixed.

Table 4. Empathic Concern Subscale Factor Loadings for Final Model Fit

Empathic Concern Subscale	
Component 1: **"Caring for those Less Fortunate"**	EC2: I often have tender, concerned feelings for people less fortunate than me
	EC14: Other people's misfortunes do not usually disturb me a great deal.
Component 2: **"Touched by Compelling and Emotional Circumstances"**	EC20: I am often quite touched by the things that I see happen
	EC22: I would describe myself as a pretty soft-hearted person
Component 3: **"Not Caring for those Less Fortunate"**	EC4: Sometimes I don't feel very sorry for other people when they are having problems
	EC9: When I see someone being taken advantage of, I feel kind of protective towards them
	EC18: When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

ProQOL: STS Subscale. The χ^2 statistic for the STS subscale was significant. The RMSEA .123 and the CFI was .774 suggesting that the fit of the model was questionable. The items relating to "Trauma" loaded on the common factor with standardized regression weights of .677, .790, and .764; while the standard regression weights for "Frightening Thoughts and Experiences" were .530, .482, .462, and .364; and "The Impact of Traumatic Stress" were .230, .306, and .334. Additionally, STS explained about 10%, 18%, and 24% of the variance on the third factor. The three-factor model did not fit the data substantially better than the single factor model with CFI = .839. It was still possible to improve the fit further. The modification indices made suggestions about loosening certain model parameters to improve the overall model fit. The regressions weight results suggested adding single-headed arrows between: "Q11 – On Edge" and "Impact of STS" and "Trauma". Adding both paths resulted in a slightly better fit χ^2 = (30, N = 165) = 54.15, p = <.01); CFI = .937 and RMSEA = .070. The model remained significant. This indicated that approximately four other pairs were measuring the same thing. Questions 2, 5, 7 were removed and the new two-factor model indicated a good fit χ^2 = (13, N = 165) = 20.87, p = <.01); CFI = .975 and RMSEA = 0.61. Further analyses results in a one-factor model with five questions from the STS factor removed. The final model was a good fit χ^2 = (5, N = 165) = 6.33, p = <.01); CFI = .994 and RMSEA = .040.

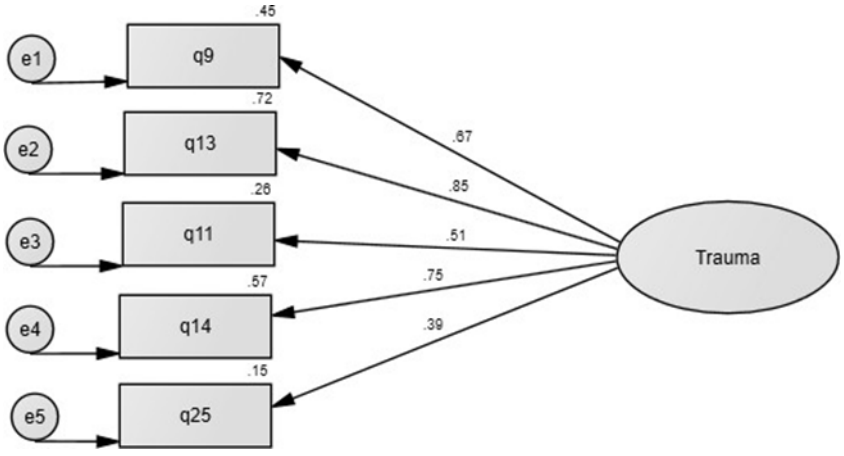

Figure 10. *Final STS Model Fit.*

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 121.58 – 6.33 = 115.25; df 35 – 5 = 30. Using the χ^2 table p was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

Table 5. STS Subscale Factor Loadings for Final Model Fit.	
Secondary Traumatic Stress Subscale	
Component 1: **"Trauma"**	Q9: I think I might have been affected by the traumatic stress of those I [help]
	Q11: Because of my [helping], I have felt "on edge" about various things
	Q13: I feel depressed because of the traumatic experiences of people I [help]
	Q14: I feel as though I am experiencing the trauma of someone I have [helped]
	Q25: As a result of my [helping], I have intrusive, frightening thoughts

ProQOL: BO Subscale. The χ^2 statistic for the BO subscale was significant. The RMSEA was .105 and the CFI was .864 suggesting that the fit of the model was questionable. The items relating to "Work Stress" loaded on the common factor with standardized regression weights of .733, .802, .735 and .718; while the standard regression weights for "Being Content with Life" were .507, and .563; "Connectedness to Others" were .430, and .334; and "Stability in Life" were .399 and .327. Additionally, BO explained about 11%, and 16% of the variance on the third factor. The four-factor model did fit the data substantially better than the single factor model with CFI = .986. It was still possible to improve the fit further. The modification indices made suggestions about loosening certain model parameters to improve the overall model fit. The regressions weight box, meanwhile, suggested adding a single-headed arrow between: B10 "Trapped" and "Connectedness", but the four-factor model without the added path was acceptable $\chi^2 = (29, N = 165) = 35.47$, p = .190) and CFI .986 was satisfactory.

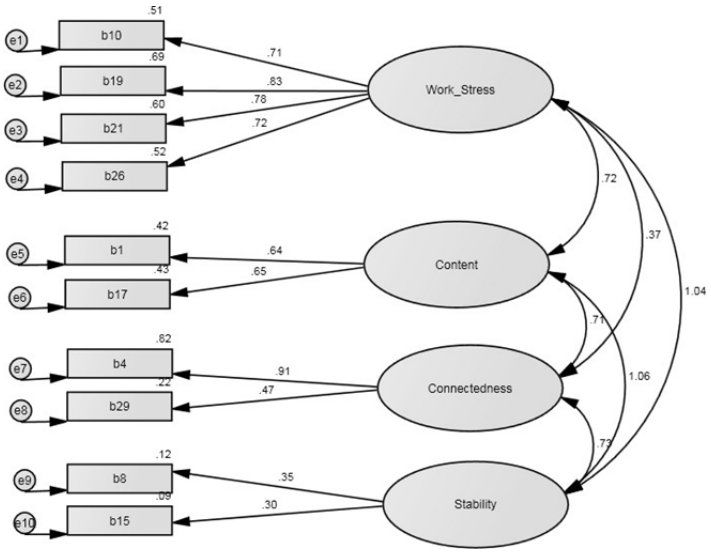

Figure 11. *Final Burnout Model Fit.*

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 98.05 – 35.47 = 62.58; df: 35 – 29 = 6. The p value was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

Table 6. Burnout Subscale Factor Loadings for Final Model Fit.	
Burnout Subscale	
Component 1: **"Work Stress"**	B10: I feel trapped by my job as a [helper]
	B19: I feel worn out because of my work a [helper]
	B21: I feel overwhelmed because my case [work] load seems endless
	B26: I feel "bogged down" by the system
Component 2: **"Being Content with Life"**	B1: I am happy
	B17: I am the person I always wanted to be
Component 3: **"Connectedness to Others"**	B4: I feel connected to others
	B29: I am a very caring person
Component 4: **"Stability in Life"**	B8: I am not productive at work because I am losing sleep over traumatic experiences of a person I [help]
	B15: I have beliefs that sustain me

ProQOL: CS Subscale. The χ^2 statistic for the CS subscale was not significant. The RMSEA was .048 and the CFI was .982. All of the items with the exception of C18 "My work makes me feel satisfied" loaded onto the common factor "Satisfaction with Helping Others in my Occupation". It loaded onto its own factor and accounted for no variance on the "Satisfaction with Helping Others in my Occupation" factor. Therefore, C18 was removed from the model. Since C6 only accounted for 28% of the variance on "Satisfaction with Helping Others in my Occupation" it was also removed from the model. This resulted in a one-factor model with a good model fit $\chi^2 = (20, N = 165) = 26.32$, $p = .155$) and CFI = .991.

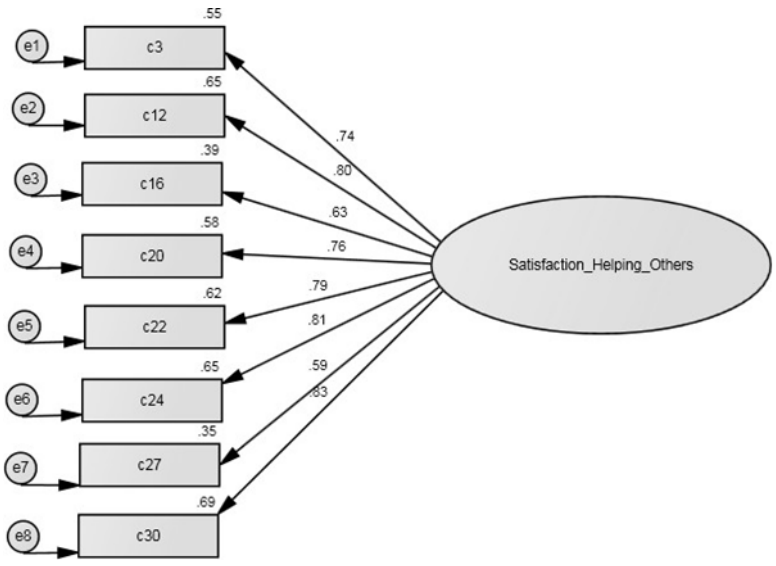

Figure 12. *Final Model for CS.*

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 48.34 – 26.32 = 22.02; df 35 – 20 = 15. The p value was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

Table 7. STS Subscale Factor Loadings for Final Model Fit.	
Compassion Satisfaction Subscale	
Component 1: **"Satisfaction"**	C3: I get satisfaction from being able to [help] people
	C12: I like my work as a [helper]
	C16: I am pleased with how I am able to keep up with [helping] techniques and protocols
	C20: I have happy thoughts and feelings about those I [help] and how I could help them
	C22: I believe I can make a difference through my work
	C24: I am proud of what I can do to [help]
	C27: I have thoughts that I am a "success" as a [helper]
	C30: I am happy that I chose to do this work

The chi-square difference test was calculated for the CFI changes in the freely estimated model and the constrained model. Calculations were: 48.34 – 26.32 = 22.02; df 35 – 20 = 15. The p value was significant indicating that the larger model with more freely estimated parameters fits the data better than the smaller model where the parameters are fixed.

Structural Equation Modeling (SEM)

SEM using SPSS Amos indicated that the model was a good fit; X^2 = .165, p = .685; TLI = 1.032; CFI = 1.000; and RMSEA = .000. Additionally, Pearson product moment correlation was used to test each null hypothesis (H_0) with the .05 level of probability used as the benchmark to interpret statistical significance. Figure 3 shows the interactions between each variable:

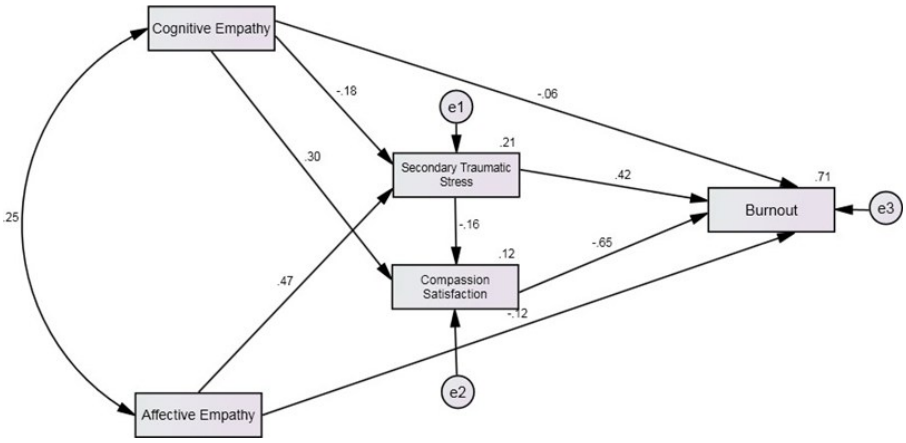

Figure 13. *Fully Recursive Model with Interactions.*

Research Questions and Hypotheses

RQ1: Does cognitive empathy have a direct effect on burnout, and is this potential effect mediated by STS and/or CS?

H_1: (Path 1) Cognitive empathy has a direct effect on burnout

H_2: (Path 2) STS mediates the relationship between cognitive empathy and burnout

H_3: (Path 3) CS mediates the relationship between cognitive empathy and burnout

Results based on 500 bootstrapped samples indicated that while the total effect of cognitive empathy and burnout was significant (TE = -.350, SE = .080, p = .171), the direct effect was not (DE = -.063, SE = .048, p = .238). STS did mediate the relationship between cognitive empathy and BO (IE = .105, SE = .051, p = .050), but not CS. The CI between the lower and upper bounds for CS included zero. Cognitive empathy had an indirect effect on BO (IE = -.287, SE = .065, p = .003). While CS did not mediate the relationship between cognitive empathy and BO, cognitive empathy's entire effect was indirect (IE lower 95% CI = -.401, upper 95% CI = -.143). The f^2 for STS was .003 (small effect) and .324 for burnout (large effect). Hypotheses 1 and 3 were accepted because the direct effect between cognitive empathy and burnout and the indirect effect of CS on the relationship between cognitive empathy and burnout were not significantly different from 0, respectively. Hypothesis 2 was rejected because the indirect effect of STS on the relationship between cognitive empathy and burnout was significantly different from 0.

RQ2: Does affective empathy have a direct effect on burnout, and is this potential effect mediated by STS?

H_4: (Path 4) Affective empathy has a direct effect on burnout

H_5: (Path 5) STS mediates the relationship between affective empathy and burnout

Results based on 500 bootstrapped samples indicated that the total effects of affective empathy and burnout was significant (TE = .133, SE = .062, p = .015), as well as the direct effect (DE = -.116, SE = .054, p = .020); lower 95% CI = -.226, upper 95% CI = -.010. STS did mediate the relationship between affective empathy and BO. Affective empathy also had an indirect effect on BO (IE = .249, SE = .047, p = .005). Affective empathy had a direct, and indirect effect on BO (IE lower 95% CI = .168, upper 95% CI = .349). The f^2 for STS was .183 (large effect) and .282 for BO (large effect). Hypotheses 4 and 5 were rejected because the indirect effect between affective empathy and burnout, and the indirect effect of STS on the relationship between affective empathy and burnout were significantly different from 0, respectively.

RQ3: Does affective empathy have a direct effect on burnout, or is the effect mediated by STS?

H_6: (Path 6) STS has a direct effect on burnout

H_7: (Path 7) CS mediates the relationship between STS and burnout

Results based on 500 bootstrapped samples indicated that the total effects of STS and burnout were significant (TE = .491, SE = .065, p = .005), as well as the direct effect (DE = .369, SE = .045, p = .004). CS mediated the relationship between STS and BO. The CI between the lower and upper bounds did not include zero. STS had an indirect effect on BO (IE = .122, SE = .056, p = .032). STS had a direct, and indirect effect on BO (IE lower 95% CI = .011, upper 95% CI = .237). The f^2 for CS was .03 (small effect) and .692 for BO (large effect). Hypotheses 6 and 7 were rejected because the direct effect between STS and burnout, and the indirect effect of CS on the relationship between STS and burnout were significantly different from 0, respectively.

RQ4: Does CS have a direct effect on BO?

H_8: (Path 8) CS has a direct effect on BO

Results based on 500 bootstrapped samples indicated that the direct effect of CS and burnout was significant (DE = -.792, SE = .051, p = .003). The CI between the lower and upper bounds did not include zero; (DE lower 95% CI = -.893, upper 95% CI = -.695). The f^2 for BO was .560 (large effect). Hypothesis 8 was rejected because the direct effect between CS and burnout was significantly different from 0.

Connecting the Path Analysis Model with the SEM

SEM was conducted on each observed variable in the path model to determine which latent variables contributed to the predictor and criterion variables. The model indicated that: (1) "Emotionless Care" contributed most to cognitive empathy; (2) "Reacting to Emergency Situations", "Not Caring for Those Less Fortunate", and "Putting Yourself in Other's Shoes" contributed most to affective empathy; (3) "Trauma" contributed most to secondary traumatic stress; (4) "Work Stress" contributed most to burnout; and (5) "Satisfaction with Helping Others in my Occupation" contributed most to compassion satisfaction. The CFI was .915. Correlations between the predictors and burnout are presented in Table 13, which are consistent with the overall results.

Table 8. Correlations between Predictors of Burnout.

	1	2	3	4	5
Cognitive Empathy	-				
Affective Empathy	.255**	-			
Secondary Traumatic Stress	-.059	.427***	-		
Compassion Satisfaction	.305***	.032	-.179***	-	
Burnout	-.315***	.027	.491***	-.748***	-

Note: *Significant at p < .05 level; **Significant at p < .01 level; ***Significant at p < .0001 level

Moderation. To assess moderation a dummy variable was created for gender, as well as an interaction variable between gender and cognitive empathy to determine whether gender had any moderating affects between cognitive empathy and the criterion variables. Variables used in the analysis were saved as z-scores. In the model summary BO was assessed. The R^2 change is reported as .060, or a 6% increase in the variation explained by the addition of the interaction term. The increase is also statistically significant (p = .001). We can conclude that gender does moderate the relationship between cognitive empathy and BO. BO was higher in females than in males. Gender was not a moderating variable between cognitive empathy and STS (F (1, 163) = 1.472, p = .233). Gender was a moderating variable between cognitive empathy and CS. The R^2 change is reported as .063, or a 6.3% increase in the variation explained by the addition of the interaction term. The increase is also statistically significant (p < .0001). CS was higher in males than in females.

The same dummy variable for gender, and a new interaction variable between gender and affective empathy was created and used to determine whether gender had any moderating affects between affective empathy and the criterion variables. In the model summary BO was assessed. The R^2 change is reported as .160, or a 16% increase in the variation explained by the addition of the interaction term. The increase is also statistically significant (p < .0001). We can conclude that gender does moderate the relationship between affective empathy and BO. As affective empathy increases in females BO starts to decrease; whereas in males as affective empathy increases, BO starts to increase.

In the model summary STS was assessed. The R^2 change is reported as .030, or a 3% increase in the variation explained by the addition of the interaction term. The increase is also statistically significant (p = .049). We can conclude that gender does moderate the relationship between affective empathy and STS. In both males and females, the higher the affective empathy score the more STS the caregivers will experience. However, STS is higher in males who had higher affective empathy scores.

In the model summary CS was assessed. The R^2 change is reported as .160, or a 16% increase in the variation explained by the addition of the interaction term. The increase is also statistically significant (p < .0001). We can conclude that gender does moderate the relationship between affective empathy and CS. Affective empathy increases CS in both males and females, but significantly more in males.

Table 9. Gender Scale Scores for Each Measure (N = 59, Males; N = 106, Females).

	Gender	Mean	Std. Deviation
Cognitive Empathy	Male	105.88	16.55
	Female	106.50	16.37
Affective Empathy	Male	59.32	11.47
	Female	63.91	9.89
Burnout	Male	22.69	6.03
	Female	26.06	6.52
STS	Male	22.69	5.65
	Female	23.96	5.43
CS	Male	40.98	5.39
	Female	37.69	6.28

Appendix A

Table A1. Descriptive Statistics for Demographic Variables.

N = 165		
	N	%
Gender		
Male	59	36%
Female	106	64%
Age		
21-30	36	15%
31-40	73	44%
41-50	39	24%
51-60	20	12%
61-70	7	4%
> 70	1	1%
Race		
Caucasian	62	38%
African American or Black	41	25%
Indian	11	7%
Hispanic or Latino	26	16%
Asian	14	9%
Other	11	7%
Are you On Call		
Yes	94	57%
No	70	42%
Primary Specialty		
Family Medicine/Gen Practice	53	32%
Cardiology	26	16%
Pediatrics	12	7%
Nursing	15	9%
Nurse Practitioner	10	6%
Surgeon	7	4%
Emergency Medicine	12	7%
OBGYN	7	4%
Oncology	5	3%
Not listed	18	12%

Table A2. Empathy, Compassion Satisfaction, and Compassion Fatigue Scores (N = 165)

	Mean	**Std. Deviation**	**Minimum**	**Maximum**	**Cronbach's α**
Cognitive Empathy	106.28	16.39	65	140	.797
Affective Empathy	62.27	10.68	31	90	.737
Burnout	24.85	6.53	10	41	.821
STS	23.51	5.52	12	41	.767
CS	38.87	6.17	22	50	.857

Discussion

Various statistical analyses were employed using SPSS Amos to assess the direct and indirect effects of the variables presented in path analysis model on a sample of medical professionals (N = 165). Results indicated that cognitive empathy did not have a direct effect on burnout, but the entire effect was indirect. Affective empathy and secondary traumatic stress both had direct and indirect effects on burnout. Secondary traumatic stress partially mediated the relationship between affective empathy and burnout, and compassion satisfaction partially mediated the relationship between secondary traumatic stress and burnout. Gender was found to have moderating effects on the predictor and criterion variables. When cognitive empathy was assessed with gender moderating CS, multiple correlations showed a statistically significant shared variance of 6% by the addition of the interaction term. Cognitive empathy was higher in males than females. When affective empathy was assessed with gender moderating BO the results showed that as affective empathy increased in females, BO started to decrease; but in males as affective empathy increased, BO also increased. Affective empathy was assessed with gender moderating CS. There was a statistically significant shared variance of 16% which indicated that affective empathy increased CS in both males and females, but more in males. Gender moderated the relationship between affective empathy and STS. The higher the affective empathy score the higher the STS score. However, males who had high affective empathy scores had a much higher STS score than females. Future research should explore the relationship these variables have with the different domains of empathy, as well as compassion satisfaction, burnout, and secondary traumatic stress across multiple centers, specialties, and geographic regions.

Strengths and Limitations

This study sought to eliminate biases discovered in previous research such as not conducting research at one institution, or across one field, or specialty. The sample consisted of medical professionals from multiple backgrounds and specialties. Although the sample size was larger than what the power analysis suggested there were limitations in this study. The medical professionals may not have been honest when they self-reported their responses. Self-reported feelings of empathy, BO, CS, and STS may be subject to problems of social-desirability bias. Participants are liable to provide socially accepted responses or responses that are evident of the impressions they want to create [40]. In addition, they may have experienced recall bias. Recall bias occurs when there are differences in the way individuals remember or report exposures or outcomes [84]. The survey consisted of a total of 94 questions including the demographic portion. Participants were asked to recall certain situations in the last 30 days and being able to recall particular situations may have actually been non-existent, and/or reported inaccurately. The self-reported scales may have also resulted in an estimation of cognitive and affective empathy, as well as BO, CS, and STS rather than the actual recall or the behaviors [40]. The sample size may not have captured accurate results due to too little variability because women were overrepresented in the study. There were almost half as many men as there were women in the study. Males in the medical professions field should be studied through further research. Future research should explore a sample size that is representative of the whole population to include an equal number of respondents across multiple specialties.

Comparison to Existing Literature

Empathy and Gender

Neuroscience indicates characteristics like gender may predict whether empathy is processed as an affective or cognitive based on left-brained or right-brained orientation; cognitive empathy presents more prevalently in males and affective empathy is observed mostly in females [26]. The study of empathy as it relates to gender has been widely explored. In a study conducted by Bratek et al (2015), affective empathy was significantly higher in females than in males. The overall score for the female respondents was 59.83, and for males 51.16. In this present study the females also scored higher than males on the IRI (59.32), than males (63.90). Overall, Bratek et al.'s (2015) study showed that empathy measured by the IRI increases in women and decreases in men over the course of medical school. The results of another study conducted by Calabrese et al (2013) which included 197 women, and 176 men indicated that women scored significantly higher than men on the JSE. However, in this empathy study women did not score significantly higher than males in this study. The mean scores were 106.5 and 105.8 respectively. Tariq et al. (2017) conducted a multicenter, cross- sectional study including 1453 Pakistani medical students. The aim of the study was to assess whether female medical students outscored male students. Results showed that empathy scores were the same which is contrary to most studies indicating that women's empathy scores are higher. The results of this empathy study coincided with what most other research suggests with women outscoring men on both the IRI and JSE-HP.

Empathy, Compassion Fatigue, and Compassion Satisfaction

Empathy is a core element of a therapeutic relationship between a caregiver and their patient; but it is sometimes confused with compassion fatigue and sympathy [87]. Burnout is also important to delivering or not delivering quality healthcare. It is a related but distinct concept. Wilkinson et al (2017) conducted a systematic literature review. Results showed a moderate negative correlation between depersonalization and empathy for non-surgical and primary care doctors; and a moderate negative correlation for emotional exhaustion and empathy was only observed among the primary care doctors. In addition, a moderate correlation was observed between cognitive empathy and depersonalization. Many studies reported that those who scored higher in empathy had low burnout scores (72.1%) [88]. In this present empathy study the moderate negative correlation between BO is observed with cognitive empathy, but cognitive empathy did not correlate with STS. Affective empathy did not correlate with BO but did positively correlate with STS. This study distinguished between cognitive and affective empathy and did not group empathy into one construct. In a study conducted by Wagaman et al. (2015), the ProQOL was used to assess BO, STS, and CS in a sample of 185 social workers. The authors used multiple regression to analyze the three dependent variables: STS, BO, and CS. Overall, participants that had been in their field longer had higher levels of CS, and lower levels of BO. The outcomes of this study showed that there was a significant relationship between empathy and CS. In the current empathy study, there was a positive correlation between cognitive empathy and CS—the higher the cognitive empathy score, the higher the CS score.

The Importance of Cultivating Empathy Early

The curriculum in the other countries (i.e. the Middle East) differs from Western countries in that clinical rotation begins from the second year, and in Korea and Japan, there is no humanities content in the curriculum [89]. Clinical exposure takes place at different times in different countries. For example, the third year is different in a four-year US curriculum than in a five to six-year UK curriculum; the experience may also be different for "mature entry" students than for traditional school leaver entrants [90]. In another study, data were collected by Shariat and Habibi (2013) from 17 Iranian medical schools and although the results showed a decline in empathy it occurred at different times [91,92]. Therefore, it is imperative to collect data at different time points to get a true reflection of whether empathy declines. It is also equally important to understand and assess the maturation process of medical students and trainees by implementing more sophisticated, integrated models that employ culturally sensitive topics of emotional intelligence and moral reasoning with clearer understandings for empathy for the safe practice of patient care [93, 94].

Costa et al. (2013) longitudinal latent growth modeling study conducted on Portuguese students showed that empathy did not decline over time—or at least not significantly. The slight decline was observed at the end of the preclinical phase. This contradicts previous studies that indicate empathy declines over time. The decline in students' empathy over the course of medical school is referred to as the phenomenon of "hardening of the heart" [85]. Studies show that JSE scores decreased after the first year of medical school [95]. In another study, Van Winkle et al. (2017) utilized six measures to assess attitudes toward relationship-centered care. These measures were administered to students at the beginning and end of their clerkships. One of the scales used was the JSE to measure the patient/relationship-centered attitudes of their students. Results showed that the decline in patient-centered attitudes was attributed to a "gap between 'ideal' training, and 'real' world" and to "problematic validity of measures" used in the study. Students who received the intervention scored higher on each of the six scales than students who did not receive training. The results of a paired t-test showed that comparisons were statistically significant ($p < 0.004$); the effect size was ($r = 0.91$), ($r > 0.50$). However, as soon as the intervention ended during the sixth year of clinical clerkship, the positive effects of patient-centered training ceased. Interventions should be implemented throughout the duration of medical school to increase or maintain empathy.

It is important to expose medical students to vulnerable and underserved populations early in their medical career. Offering a combination of workshops, lectures about physician-patient interactions, and volunteering at Student-Run Free Clinics (SRFCs) may prevent empathy decline in up-and-coming physicians [97]. Implications of previous research studies suggest integrating empathy training in each year of residency [98,99]. Future randomized controlled trials (RCTs) should not only address improvements in patient ratings after training, but also assess medical outcomes, greater patient compliance, reduced healthcare utilization, improved career satisfaction, reduced burnout, and fewer malpractice claims [100,101]. Building skills to better serve the underserved is important in order to create a world of tolerance and mutual understanding [102].

The use of motivational interviewing, or MI spirit increases caregiver empathy. The results of the study conducted by Pollak et al. (2011) indicated that a higher level of physician empathy, and an increased use of MI spirit during patient encounters led to high patient satisfaction and perceived autonomy support. When physicians used reflective statements, patients perceived the highest level of autonomy support; one of the main purposes of reflective statements is to share the "conversational floor" and allow patients to direct the conversation more. Overall, physician use of MI techniques improves outcomes and patient perceptions; increasing physician empathy and the use of reflective statements could improve clinical encounters and patient compliance [9, 103].

Empathy Barriers

There are barriers to empathy that could cause medical professionals' empathy to dissipate. Howick and Rees (2017) discussed three empathy barriers which are: (1) time pressure which is a concrete barrier to listening to patients; (2) tyrannical guidelines; and (3) an ever-increasing burden of paperwork. Physicians see this system as lacking empathy for them because there is no interest in the practitioners' perspectives, health, or welfare [10]. Empathy is an interaction between individuals that is relational and is influenced reciprocally by the behavior and responses of the other person [108]. However, there are situations where a physician's lack of empathy exuded is based on alexithymia. Alexithymia affects empathic responses; it is present in approximately 10% of the population [64, 66]. Those with alexithymia are preoccupied by internally oriented thinking, have lower affective empathy, and show fewer altruistic behaviors [65]. Burnout instruments may not allow us to confidently identify work-induced symptoms, but other studies have identified that personal life events were strongly related to burnout [104]. Studies have shown that physicians find more satisfaction with their jobs than with their personal lives [105, 106]. Findings from a longitudinal study showed that at both one year and five years after graduation job satisfaction remained high. However, burnout is the inevitable consequence of the way that medical education is organized, and the maladaptive behaviors that are reinforced in healthcare organizations by way of the curriculum [107]. Burnout interventions have been seen to reduce errors when practicing medicine and improve patient care. There is sufficient evidence for the effectiveness of stress management interventions that occur over an extended period of time. When medical professionals participate in empathy training and/or interventions, findings from several studies indicated that healthcare professionals responded more favorably to sadness vs. anger, and sadness vs. fear [108].

Conclusions and Future Recommendations

Empathy may protect health providers from burnout; being empathic supposes awareness of negative emotions, and requires the physician to practice self-reflection, and to accept negative feedback. These skills are resources against stress and burnout. With 49% of physicians reporting that they "often or always experience feelings of burnout," preventing physician burnout is important. When individuals think that they have to "feel everyone" this may lead to emotional exhaustion. This is one of the main components of burnout. Preventing burnout requires a multilevel approach that includes structural and individual interventions. Many interventions have been developed and executed to reduce burnout. However, there is a lack of research assessing this condition in multiple specialties, especially oncology. Oncologists' success and long-term sustainability will depend on how extensively and systematically an organization can integrate the following principles: (1) physician wellness as a shared responsibility of healthcare systems and individuals by reducing administrative tasks, increasing non-physician support staff, new compensation models and practice models, teamwork, and productivity; (2) creating a new culture by teaching new values to oncologists such as the importance of self-awareness, life-work balance, acceptance of clinical uncertainty, and that it is acceptable to seek mental health if needed; (3) valuing and fostering individual and organizational resilience by having a balanced focus on eliminating the risks of burnout; (4) engaging organizations and physicians by optimizing the adaptation of generic strategies to the needs of specific specialties; and (5) developing new tools to capture the multidimensional nature of physician wellness.

The ultimate goal of medical practice is improving the quality of patient care; the physician's opportunity to stop and think and write about how their behaviors are viewed by patients are not offered to them. This could be beneficial for a physicians' wellbeing and could improve patient outcomes. It is vital, and necessary to engage members and stakeholders in the healthcare environment to implement multidisciplinary activities and initiatives that are intended to provide self-care strategies for medical professionals, as well as techniques to increase compassion satisfaction, and reduce compassion fatigue in the workplace.

As knowledge base increases, and trainees rely more heavily on technology, unique challenges are facing the newest rank of physicians; more and more trends are emerging that discuss depression and burnout. While there are many empathy interventions and trainings on how to sustain empathy during and after the clinical training years, empathy is still a concern. Physicians experience this decline in empathy not as physicians, but as people; addressing the deeper level of conflict between clinical medicine and human needs will provide a more robust, and informed foundation for more skills training. The pressures that physicians experience in the clinical setting may lead to them ignoring their humanity; the first step in supporting a physician's growth is to help them remember that they are human, not to tell them to act more human. Some pressures in the clinical setting are unavoidable. When unrealistic expectations are placed on a physician this could lead to strained team dynamics, and a decline in empathy. Future research should include a large sample size of medical professionals that not only examines the short-term effects of empathic communication, but also why, and how empathy and burnout changes over time. In addition, studies should include how alexithymia might play a role in these effects.

Conflicts of Interest

To the author's knowledge there is no conflict of interest, financial, or other conflicts involved.

Funding

None.

References

1. Dehning, S., Gasperi, S., Krause, D., Meyer, S., Reiß, E., Burger, M., Jacobs, F., Buchheim, A., Muller, N., & Siebeck, M. (2013). Emotional and cognitive empathy in first-year medical students. *International Scholarly Research Notices Psychiatry*, 1-6. https://doi.org/10.1155/2013/801530
2. Hojat, M., Vergare, M., Isenberg, G., Cohen, M., & Spandorfer, J. (2015). Underlying construct of empathy, optimism, and burnout in medical students. *International Journal of Medical Education, 6*: 12-16. https://doi.org/10.5116/ijme.54c3.60cd
3. Decety, J. (2011). Dissecting the neural mechanisms mediating empathy. *Emotion Review, 3*(1), 92-108. https://doi.org/10.1177/1754073910374662
4. Gerdes, K.E., Lietz, C.A., & Segal, E.A. (2011). Measuring empathy in the 21st century: Development of an empathy index rooted in social cognitive neuroscience and social justice. *Social Work Research, 35*(2), 83-93. https://doi.org/10.1093/swr/35.2.83
5. Burks, D.J., & Kobus, A.M. (2012). The legacy of altruism in health care: The promotion of empathy, prosociality and humanism. *Medical Education, 46*(3), 317-325. https://doi.org/10.1111/j.1365-2923.2011.04159.x
6. Wagaman, M.A., Geiger, J.M., Shockley, C., & Segal, E.A. (2015). The role of empathy in burnout, compassion satisfaction, and secondary traumatic stress among social workers. *Social Work*, *60*(3), 201-209. https://doi.org/10.1093/sw/swv014
7. Elliott, R., Bohart, A.C., Watson, J. C., & Greenberg, L.S. (2011). Empathy. *Psychotherapy. 48*(1), 43-49. https://doi.org/10.1037/a0022187
8. Gibbons, S.B. (2011). Understanding empathy as a complex construct: A review of the literature. *Clinical Social Work Journal, 39(3),* 243-252. https://doi.org/10.1007/s10615-010-0305-2
9. Pollak, K.I., Alexander, S.C., Tulsky, J.A., Lyna, P., Coffman, C.J., Dolor, R.J., Gulbrandsen, P., & Ostbye, T. (2011). *Journal of the American Board of Family Medicine, 24*(6), 665-672. https://doi.org/10.3122/jabfm.2011.06.110025
10. Howick, J. & Rees, S. (2017). Overthrowing barriers to empathy in healthcare: Empathy in the age of the internet. *Journal of the Royal Society of Medicine, 110*(9), 352-357. https://doi.org/10.1177/0141076817714443
11. Mercer, S.W., Fitzpatrick, B., Guthrie, B. (2016). The CARE Plus study – a whole-system intervention to improve quality of life of primary care patients with multimorbidity in areas of high socioeconomic deprivation: exploratory cluster randomised controlled trial and cost-utility analysis. *BMC Med, 14*(1), 88. https://doi.org/10.1186/s12916-016-0634-2

12. Jacobson, J.M., Rothschild, A., Mirza, F., & Shapiro, M. (2013). Risk for burnout and compassion fatigue and potential for compassion satisfaction among clergy: Implications for social work and religious organizations. *Journal of Social Service Research, 394*(4), 455-468. https://doi.org/10.1080/01488376.2012.744627

13. Hasan, S., Al-Sharqawi, N., Dashti, F., AbdulAziz, M., Abdullah, A., Shukkur, M., Bouhaimed, M., & Thalib, L. (2013). Level of empathy among medical students in Kuwait University, Kuwait. *Med Princ Pract., 22*(4), 385-389. https://doi.org/10.1159/000348300

14. Pooler, D.K., Wolfer, T.A., & Freeman, M.L. (2014). Finding joy in social work: Interpersonal sources. *Social Work, 59* (3), 213-221. https://doi.org/10.1093/sw/swu020

15. Wilkinson, H., Whittington, R., Perry, L., & Eames, C. (2017). Examining the relationship between burnout and empathy in healthcare professionals: A systematic review. *Burnout Research, 6*, 18-29. https://doi.org/10.1016/j.burn.2017.06.003

16. Villacieros, M., Olmos, R., & Bermejo, J.C. (2017). The empathic process and misconceptions that lead to burnout in healthcare professionals. *The Spanish Journal of Psychology*, *20*, E68. https://doi.org/10.1017/sjp.2017.66

17. Walocha, E., Tomaszewski, K.A., Wilczek-Ruzyczka, E., & Walocha, J. (2013). Empathy and burnout among physicians of different specialties. *Folia Medica Cracoviensia, 53*(2), 35-42.

18. Bellolio, M.F., Cabrera, D., Sadosty, A.T., Hess, E.P., Campbell, R.L., Lohse, C.M., & Sunga, K.L. (2014). Compassion fatigue is similar in emergency medicine residents compared to other medical and surgical specialties. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 15*(6), 629-635. https://doi.org/10.5811/westjem.2014.5.21624

19. Yugero, O., Forne, C., Esquerda, M., Pifarre, J., Abadias, M.J., & Vinas, J. (2017). Empathy and burnout of emergency professionals of a health region: A cross-sectional study. *Medicine, 96*(37): e8030. https://doi.org/10.1097/MD.0000000000008030

20. El-bar, N., Levy, A., Wald, H.S., & Biderman, A. (2013). Compassion fatigue, burnout, and compassion satisfaction among family physicians in the Negev area – a cross sectional study. *Israel Journal of Health Policy Research, 2*(1), 31. https://doi.org/10.1186/2045-4015-2-31

21. Pensek, L. & Selic, P. (2018). Empathy and burnout in Slovenian family medicine doctors: The first presentation of Jefferson Scale of Empathy results. *Zdr Varst, 57*(3), 155-165. https://doi.org/10.2478/sjph-2018-0020

22. Bhutani, J., Bhutani, S., Balhara, Y.P.S., & Kalra, S. (2012). Compassion fatigue and burnout amongst clinicians: A medical exploratory study. *Indian Journal of Psychological Medicine, 34*(4), 332-337. https://doi.org/10.4103/0253-7176.108206

23. Haik, J., Brown, S., Liran, A., Sokolov, A., Zilinsky, I., & Kornhaber, R. (2017). Burnout and compassion fatigue: Prevalence and associations among Israeli burn clinicians. *Neuropsychiatric Disease and Treatment, 13*, 1533-1540. https://doi.org/10.2147/NDT.S133181

24. Hakanen, J.J. & Koivumaki, J. (2014). Engaged or exhausted—How does it affect dentists' clinical productivity? *Burnout Research, 1*(1), 12-18. https://doi.org/10.1016/j.burn.2014.02.002

25. Panagioti, M., Geraghty, K., & Johnson, J. (2018). How to prevent burnout in cardiologists? A review of the current evidence, gaps, and future directions. *Trends in Cardiovascular Medicine, 28*(1), 1-7. https://doi.org/10.1016/j.tcm.2017.06.018

26. VanCleave, D.S. (2016). Contributions of neuroscience to a new empathy epistemology: Implications for developmental training. *Advances in Social Work, 17*(2), 369-389. https://doi.org/10.18060/21087

27. Creswell, J.W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th Ed.) Los Angeles, CA: Sage.

28. Ingham-Broomfield, R. (2014). A nurses' guide to quantitative research. *Australian Journal of Advanced Nursing, 32* (2), 32-38. https://doi.org/10.37464/2015.322.1573

29. Kaplan, R.M., Chambers, D.A., & Glasgow, R.E. (2014). Big data and large sample size: A cautionary note on the potential for bias. *Clinical and Translational Science, 7*(4), 342-346. https://doi.org/10.1111/cts.12178

30. Bentler, P.M. & Chou, C.P. (1987). Practical issues in structural modeling. *Sociological Methods & Research, 16*(1), 78-117. http://dx.doi.org/10.1177/0049124187016001004

31. Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-Fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin, 103*, 391-410. http://dx.doi.org/10.1037/0033-2909.103.3.391

32. Kenny, D.A. (2016). Multiple latent variable models: Confirmatory factor analysis. Retrieved from http://davidakenny.net/cm/mfactor.htm

33. Kenny, D.A. (2015). Measuring model fit. Retrieved from http://davidakenny.net/cm/fit.htm

34. Kenny, D.A. (2018a). Mediation. Retrieved from http://davidakenny.net/cm/mediate.htm

35. Kenny, D.A. (2018b). Moderation. Retrieved from http://davidakenny.net/cm/moderation.htm

36. Hemsworth, D., Baregheh, A., Aoun, S., & Kazanjian, A. (2018). A critical enquiry into the psychometric properties of the professional quality of life scale (ProQOL-5) instrument. *Applied Nursing Research, 39*, 81-88. https://doi.org/10.1016/j.apnr.2017.09.006

37. Thirioux, B., Birault, F., & Jaafari, N. (2016). Empathy is a protective factor of burnout in physicians: New neuro-phenomenological hypotheses regarding empathy and sympathy in care relationship. *Hypothesis and Theory, 7* (763), 1-11. https://doi.org/10.3389/fpsyg.2016.00763

38. Hoffman, J.P. (2016). *Regression Models for Categorical, Count, and Related Variables: An Applied Approach*. University of California Press.

39. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

40. Simundic, A.M. (2013). Bias in research. *Biochemia Medica, 23*(1), 12-15. https://doi.org/10.11613/bm.2013.003

41. Ruiz-Moral, R., Perula de Torres, L., Monge, D., Garcia Leonardo, C., & Caballero, F. (2017). Teaching medical students to express empathy by exploring patient emotions and experiences in standardized medical encounters. *Patient Education and Counseling, 100*(9), 1694-1700. https://doi.org/10.1016/j.pec.2017.04.018

42. Lelorain, S., Bredart, A., Dolbeault, S., & Sultan, S. (2012). A systematic review of the associations between empathy measures and patient outcomes in cancer care. *Psychooncology, 21*(12), 1255-1264. https://doi.org/10.1002/pon.2115

43. Nembhard, I.M., David, G., Ezzeddine, I., Betts, D., & Radin, J. (2023). A systematic review of research on empathy in health care. *Health Serv Res., 58*(2), 250-263. https://doi.org/10.1111/1475-6773.14016

44. Guidi, C., & Traversa, C. (2021). Empathy in patient care: from 'Clinical Empathy' to 'Empathic Concern'. *Med Health Care Philos., 24*(4), 573-585. https://doi.org/10.1007/s11019-021-10033-4

45. Légaré, F., Adekpedjou, R., Stacey, D., Turcotte, S., Kryworuchko, J., Graham, I.D., Lyddiatt, A., Politi, M.C., Thomson, R., Elwyn, G., & Donner-Banzhoff, N. (2018). Interventions for increasing the use of shared decision making by healthcare professionals. *Cochrane Database Syst Rev., 7*(7):CD006732. https://doi.org/10.1002/14651858.CD006732.pub4

46. Wang, Y., Liu, C., & Wang, P. (2023). Patient satisfaction impact indicators from a psychosocial perspective. *Front Public Health, 11*. https://doi.org/10.3389/fpubh.2023.1103819

47. Laor-Maayany, R., Goldzweig, G., Hasson-Ohayon, I., Bar-Sela, G., Engler-Gross, A., Braun, M. (2020). Compassion fatigue among oncologists: the role of grief, sense of failure, and exposure to suffering and death. *Support Care Cancer, 28*(4), 2025-2031. https://doi.org/10.1007/s00520-019-05009-3

48. Derksen, F., Bensing, J., & Lagro-Janssen, A. (2013). Effectiveness of empathy in general practice: a systematic review. *Br J Gen Pract., 63*(606), e76-84. https://doi.org/10.3399/bjgp13X660814

49. Torres-Vigil, I., Cohen, M.Z., Million, R.M., & Bruera, E. (2021). The role of empathic nursing telephone interventions with advanced cancer patients: A qualitative study. *European Journal of Oncology Nursing, 50*. https://doi.org/10.1016/j.ejon.2020.101863

50. Licciardone, J.C., Tran, Y., Ngo, K., Toledo, D., Peddireddy, N., & Aryal, S. (2024). Physician Empathy and Chronic Pain Outcomes. *JAMA Netw Open,* 7(4), e246026. https://doi.org/10.1001/jamanetworkopen.2024.6026

51. Fuehrer, S., Weil, A., Osterberg, L.G., Zulman, D.M., Meunier, M.R., & Schwartz, R. (2024). Building authentic connection in the patient-physician relationship. *J Prim Care Community Health, 15*:21501319231225996. https://doi.org/10.1177/21501319231225996

52. Hurtig, R.R., Alper, R.M., Berkowitz, B. (2018). The cost of not addressing the communication barriers faced by hospitalized patients. *Perspect ASHA Spec Interest Groups, 3*(12):99-112. https://doi.org/10.1044/persp3.SIG12.99.

53. Wondra, J.D. & Ellsworth, P.C. (2015). An appraisal theory of empathy and other vicarious emotional experiences. *Psychological Review, 122*(3), 411-28. https://doi.org/10.1037/a0039252

54. Steinberg, D. (2010). Altruism in medicine: Its definition, nature, and dilemmas. *Camb Q Healthc Ethics, 19*(2), 249-257. https://doi.org/10.1017/S0963180109990521

55. Messineo, L., Seta, L., & Allegra, M. (2021). The relationship between empathy and altruistic motivations in nursing studies: a multi-method study. *BMC Nurs., 20*(1), 124. https://doi.org/10.1186/s12912-021-00620-4

56. Filkowski, M.M., Cochran, R.N., & Haas, B.W. (2016). Altruistic behavior: Mapping responses in the brain. *Neurosci Neuroecon, 5*, 65-75. https://doi.org/10.2147/NAN.S87718

57. Yu, C.C., Tan, L., LE, M.K., Tang, B., Liaw, S.Y., Tierney, T., Ho, Y.Y., Lim, B.E.E., Lim, D., Ng, R., Chia, S.C., Low, J.A. (2022). The development of empathy in the healthcare setting: A qualitative approach. *BMC Med Educ., 22*(1), 245. https://doi.org/10.1186/s12909-022-03312-y

58. Zenasni, F., Boujut, E., Woerner, A., & Sultan, S. (2012). Burnout and empathy in primary care: Three hypotheses. *Br J Gen Pract., 62*(600), 346-347. https://doi.org/10.3399/bjgp12X652193

59. Samra, R. (2018). Empathy and burnout in medicine-acknowledging risks and opportunities. *J Gen Intern Med., 33*(7), 991-993. https://doi.org/10.1007/s11606-018-4443-5

60. Lown, B.A. (2016). A social neuroscience-informed model for teaching and practicing compassion in health care. *Medical Education, 50*(3), 332-342. https://doi.org/10.1111/medu.12926

61. Fredrickson, B.L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *Am Psychol., 56*(3), 218-26. https://doi.org/10.1037//0003-066x.56.3.218

62. Zhenjing, G., Chupradit, S., Ku, K.Y., Nassani, A.A., & Haffar, M. (2022). Impact of employees' workplace environment on employees' performance: A multi-mediation model. *Front Public Health, 10*:890400. https://doi.org/10.3389/fpubh.2022.890400

63. Mazzetti, G., & Schaufeli, W.B. (2022). The impact of engaging leadership on employee engagement and team effectiveness: A longitudinal, multi-level study on the mediating role of personal- and team resources. *PLoS One, 17*(6): e0269433. https://doi.org/10.1371/journal.pone.0269433

64. Aaron, R.V., Benson, T.L., & Park, S. (2015). Investigating the role of alexithymia on the empathic deficits found in schizotypy and autism spectrum traits. *Pers Individ Dif., 77*, 215-220. https://doi.org/10.1016/j.paid.2014.12.032

65. Saito, N., Yokoyama, T., & Ohira, H. (2016). Self-other distinction enhanced empathic responses in individuals with alexithymia. *Scientific Reports, 6*:35059. https://doi.org/10.1038/srep35059

66. Hogeveen, J., & Grafman, J. (2021). Alexithymia. *Handb Clin Neurol., 183*, 47-62. https://doi.org/10.1016/B978-0-12-822290-4.00004-9

67. Delgado, N., Bonache, H., Betancort, M., Morera, Y., & Harris, L.T. (2021). Understanding the links between inferring mental states, empathy, and burnout in medical contexts. *Healthcare (Basel), 9*(2), 158. https://doi.org/10.3390/healthcare9020158

68. Delgado, N., Delgado, J., Betancort, M., Bonache, H., & Harris, L.T. (2023). What is the link between different components of empathy and burnout in healthcare professionals? A systematic review and meta-analysis. *Psychol Res Behav Manag., 16*, 447-463. https://doi.org/10.2147/PRBM.S384247

69. Garnett, A., Hui, L., Oleynikov, C., & Boamah, S. (2023). Compassion fatigue in healthcare providers: a scoping review. *BMC Health Serv Res., 23*, 1336. https://doi.org/10.1186/s12913-023-10356-3

70. Santos, M.A., Grosseman, S., Morelli, T.C., Giuliano, I.C.B., Erdmann, T.R. (2016). Empathy differences by gender and specialty preference in medical students: A study in Brazil. *International Journal of Medical Education, 7*, 149-153. https://doi.org/10.5116/ijime.572f.115f

71. Trivers, R. L. (1972). Parental investment and sexual selection. In 'Sexual Selection and the Descent of Man'. (Ed. B. Campbell.) pp. 136–179. *Aldinc: Chicago*, *13*(2).

72. Bjorklund, D.F., & Kipp, K. (1996). Parental investment theory and gender differences in the evolution of inhibition mechanisms. *Psychol Bull., 120*(2):163-88. https://doi.org/10.1037/0033-2909.120.2.163

73. Bjorklund, D. F., & Shackelford, T. K. (1999). Differences in Parental Investment Contribute to Important Differences Between Men and Women. Current Directions in Psychological Science, 8(3), 86-89. https://doi.org/10.1111/1467-8721.00020

74. Christov-Moore, L., Simpson, E. A., Coude, G., Grigaityte, K., Iacoboni, M., & Ferrari, P. F. (2014). Empathy: Gender effects in brain and behavior. *Neuroscience & Biobehavioral Reviews, 46*(4), 604-627. https://doi.org/10.1016/j.neubiorev.2014.09.001

75. Kovalchuk, Y., Budini, E., Cook, R.M., Walsh, A. (2022). Investigating the relationship between facial mimicry and empathy. *Behav Sci (Basel), 12*(8), 250. https://doi.org/10.3390/bs12080250

76. Phelps, E. A. (2006). Emotion, Learning, and the Brain: From Classical Conditioning to Cultural Bias. In P. B. Baltes, P. A. Reuter-Lorenz, & F. Rösler (Eds.), *Lifespan development and the brain: The perspective of biocultural co-constructivism* (pp. 200–216). Cambridge University Press. https://doi.org/10.1017/CBO9780511499722.011

77. Alfasi, Y., & Besser, A. (2024). The association between adult attachment patterns, attachment to group and mental health in Israel following the October 7th attack: The role of emotion regulation strategies. *Int J Environ Res Public Health, 21*(11):1443. https://doi.org/10.3390/ijerph21111443

78. Kalter, M., Bollen, K., Euwema, M., & Verbeke, A.L. (2021). A Matter of Feelings: Mediators' Perceptions of Emotion in Hierarchical Workplace Conflicts. *Front Psychol., 12*:629768. https://doi.org/10.3389/fpsyg.2021.629768

79. Scheff, T. (2014). Role-taking, Emotion and the Two Selves. *The Canadian Journal of Sociology / Cahiers Canadiens de Sociologie*, *39*(3), 315–330. http://www.jstor.org/stable/canajsocicahican.39.3.315

80. Davis, J.L. & Love, T.P. (2017). Self-in-self, mind-in-mind, heart-in-heart: The future of role-taking, perspective taking, and empathy. *Advances in Group Processes, 34*, 151-174. https://doi.org/10.1108/S0882-614520170000034007

81. Toussaint, L., & Webb, J.R. (2005). Gender differences in the relationship between empathy and forgiveness. *J Soc Psychol., 145*(6), 673-85. https://doi.org/10.3200/SOCP.145.6.673-686

82. Jolliffe, I.T., & Cadima, J. (2016). Principal component analysis: a review and recent developments. *Philos Trans A Math Phys Eng Sci., 374*(2065):20150202. https://doi.org/10.1098/rsta.2015.0202

83. Hui Zou, T.H., & Tibshirani, R. (2006). Sparse principal component analysis. *Journal of Computational and Graphical Statistics, 15*(2), 265-286. https://doi.org/10.1198/106186006X113430

84. Sedgwick, P. (2012). What is recall bias? *BMJ, 344*: e3519. https://doi.org/10.1136/bmj.e3519

85. Bratek, A., Bulska, W., Bonk, M., Seweryn, M., & Krysta, K. (2015). Empathy among physicians, medical students and candidates. *Psychiatria Danubina, 27*(1), 48-52.

86. Tariq, N., Rasheed, T., & Tavakol, M. (2017). A quantitative study of empathy in Pakistani medical students: A Multi-centered approach. *Journal of Primary Care & Community Health, 8*(4), 294-299. https://doi.org/10.1177/2150131917716233

87. Wilkinson, H., Whittington, R., Perry, L., & Eames, C. (2017). Examining the relationship between burnout and empathy in healthcare professionals: A systematic review. *Burnout Research, 6*, 18-29. https://doi.org/10.1016/j.burn.2017.06.003
88. Bogiatzaki, V., Frengidou, E., Savakis, E., Trigoni, M., Galanis, P., & Anagnostopoulos, F. (2019). Empathy and burnout of healthcare professionals in public hospitals of Greece. *International Journal of Caring Science, 12*(2), 611.
89. Roff, S. (2015). Reconsidering the "decline" of medical student empathy as reported in studies using the Jefferson Scale of Physician Empathy-Student version (JSPE-S). *Medical Teacher, 37*, 783-786. https://doi.org/10.3109/0142159X.2015.1009022
90. Rosenfield, P.J., & Jones, L. (2004). Striking a balance: Training medical students to provide empathetic care. *Medical Education, 38*, 927-933. https://doi.org/10.1111/j.1365-2929.2004.01931.x
91. Shariat, S.V., & Habibi, M. (2013). Empathy in Iranian medical students: Measurement model of the Jefferson scale of empathy. *Medical Teacher, 35*(1), e913-e918. https://doi.org/10.3109/0142159X.2012.714881
92. Benabbas, R. (2016). Empathy in Iranian medical students: A comparison by age, gender, academic performance and specialty preferences. *Medical Journal of the Islamic Republic of Iran, 30*:439.
93. Birks, Y.F., & Watt, I.S. (2007). Emotional intelligence and patient-centered care. *J R Soc Med., 100*(8), 368-74. https://doi.org/10.1177/014107680710000813
94. McNulty, J.P., & Politis, Y. (2023). Empathy, emotional intelligence and interprofessional skills in healthcare education. *Journal of Medical Imaging and Radiation Sciences, 54*(2), 238-246. https://doi.org/10.1016/j.jmir.2023.02.014
95. Keshtkar, L., Ward, A., Winter, R., Leung, C., & Howick, J. (2024). Does empathy decline in the clinical phase of medical education? A study of students at Leicester medical school. *PEC Innov., 5*:100316. https://doi.org/10.1016/j.pecinn.2024.100316
96. Van Winkle, L.J., Schwartz, B.D., & Michels, N. (2017). A model to promote public health by adding evidence-based, empathy-enhancing programs to all undergraduate health-care curricula. *Front Public Health, 5*:339. https://doi.org/10.3389/fpubh.2017.00339
97. Modi, A., Fascelli, M., Daitch, Z., & Hojat, M. (2017). Evaluating the relationship between participation in student-run free clinics and changes in empathy in medical students. *J Prim Care Community Health, 8*(3):122-126. https://doi.org/10.1177/2150131916685199
98. Aziz, A.B., & Ali, S.K. (2020). Relationship between level of empathy during residency training and perception of professionalism climate. *BMC Med Educ., 20*(1), 320. https://doi.org/10.1186/s12909-020-02231-0
99. Noordman, J., Post, B., van Dartel, A.A.M., Slits, J.M.A. (2019). Training residents in patient-centered communication and empathy: Evaluation from patients, observers and residents. *BMC Med Educ, 19*, 128. https://doi.org/10.1186/s12909-019-1555-5
100. Riess, H. (2017). The science of empathy. *Journal of Patient Experience, 4*(2), 74-77. https://doi.org/10.1177/2374373517699267
101. Riess, H., Kelley, J.M., Bailey, R.W., Dunn, E.J., & Phillips, M. (2011). Empathy training for resident physicians: A randomized controlled trial of a neuroscience- informed curriculum. *Journal of General Internal Medicine, 26*(1), 1280-86. https://doi.org/10.1007/s11606-012-2063-z
102. Bertrand, P., Guegan, J., Robieux, L., McCall, C.A., & Zenansi, F. (2018). Learning empathy through virtual reality: Multiple strategies for training empathy-related abilities using body ownership illusions in embodied virtual reality. *Frontiers in Robotics and AI, 5*:26. https://doi.org/10.3389/frobt.2018.00026
103. Bischof, G., Bischof, A., & Rumpf, H.J. (2021). Motivational interviewing: An evidence-based approach for use in medical practice. *Dtsch Arztebl Int., 118*(7):109-115. https://doi.org/10.3238/arztebl.m2021.0014
104. Bianchi, R., Mayor, E., Schonfeld, I.S., Laurent, E. (2018). Burnout and depressive symptoms are not primarily linked to perceived organizational problems. *Psychol Health Med., 23*(9):1094-1105. https://doi.org/10.1080/13548506.2018.1476725
105. Horowitz, C.R., Suchman, A.L., Branch, W.T. Jr., & Frankel, R.M. (2003). What do doctors find meaningful about their work? *Ann Intern Med., 138*(9):772-775. https://doi.org/10.7326/0003-4819-138-9-200305060-00028

106. McMurray, J.E., Williams, E., Schwartz, M.D., Douglas, J., Van Kirk, J., Konrad, R.T., Gerrity, M., Bigby, J.A., & Linzer, M. (1997). Physician job satisfaction: Developing a model using qualitative data. *J Gen Intern Med., 12*(11), 711–714. https://doi.org/10.1046/j.1525-1497.1997.07145.x
107. Montgomery, A. (2014). The inevitability of physician burnout: Implications for interventions. *Burnout Research, 1 (1)*, 50-56. https://doi.org/10.1016/j.burn.2014.04.002
108. Elayyan, M., Rankin, J., & Chaarani, M.W. (2018). Factors affecting empathetic patient care behavior among medical doctors and nurses: An Integrative literature review. *East Mediterr Health J., 24*(3), 311-316. https://doi.org/10.26719/2018.24.3.311
109. Alexandrou, M., Simsek, B., Rempakos, A., Kostantinis, S., Karacsonyi, J., Rangan, B.V., Mastrodemos, O.C., Allana, S.S., Rao, S.V., Linzer, M., Egred, M., Milkas, A., Sandoval, Y., Burke, M.N., Brilakis, E.S. (2024). Burnout in cardiology: A narrative review. *J Invasive Cardiol.,36*(5). https://doi.org/10.25270/jic/23.00292
110. Dasgupta, S., Dave, I., McCracken, C.E., Mohl, L., Sachdeva, R., Border, W. (2019). Burnout and work-life balance among pediatric cardiologists: A single center experience. *Congenit Heart Dis., 14*(3), 350-355. https://doi.org/10.1111/chd.12723.
111. Martin, M. (2018). Physician well-being: Physician burnout. *FP Essent.,471*, 11-15.