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The Relationship Between Program Leadership, Resident Physicians' Wellbeing, and Quality of Care

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Walden University
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Abstract

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Fatima Msheik

MBA, Lebanese American University, 2012

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Doctor of Philosophy

Health Services – Healthcare Administration

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Abstract

Research studies have shown that organizational leadership and support affect organizational outcomes in many sectors, including healthcare. However, less is known about how organizational leadership influences the quality of patient care by physicians. This study was guided by the perceived organizational support theory and leader-member exchange theory that provide general understanding of how supportive leadership influences staff wellbeing and productivity. Ninety-five resident physicians residing in Lebanon participated in this cross-sectional study and completed an online survey, which consisted of demographics and five tools, namely, the Leader-Member Exchange 7, Perceived Organization Support 8, Maslach Burnout Inventory 7, Utrecht Work Engagement 9, and Quality of Care 10. This study aimed at examining the association between program director-resident relationship quality and residents' reported quality of care, and the mediating effects of burnout and engagement, as well as the moderating effect of perceived departmental support. The strength and direction of each of these associations was assessed using ordinary least squares regression-based path analysis in Hayes PROCESS macro for SPSS. Results revealed that program director-resident relationship quality had significant indirect effect on residents' suboptimal patient care practices and attitudes towards patients, through at least one of the wellbeing dimensions ($p < .05$). Perceived organizational support did not play a dominant role over program director-resident relationship quality. Our results may be used to promote positive social change by improving residency program leadership practices, and thus supporting residents' wellbeing and achieving important clinical health outcomes for patients.

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Dedication

This work would not have been also possible without the unwavering support of my family. First and foremost, I dedicate this work to my mom, A “thank you,” seems inadequate for the sacrifices you have made that allowed me to fulfill my dream. You have been my soldier behind the scene, and my eternal support system. Thank you for raising my kids and taking care of them in my absence. Without you, this work would not have been possible. I also dedicate this work to my dad, whose self-made journey has been inspirational to mine. You have always exemplified integrity, hard work, and perseverance to us. I hope that I have made you proud. To my brothers and best friends, the rivalry between us has pushed me to succeed. I am so proud of all your accomplishments and excited to see where life takes you next.

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Chapter 1: Introduction to the Study

Sir Winston Churchill was correct in saying: “Healthy citizens are the greatest asset any country can have.” (Winston Churchill Quotes, n.d.). Yet, the field of medicine has become very stressful, and recent studies have shown high U.S. national burnout rate among healthcare citizens. The rate of 43.9 percent among practicing physicians is much higher than individuals in other professions (Shanafelt et al., 2019). Several concerns have been associated with physician burnout including costly turnover, reduced productivity, lower patient satisfaction, and increased medical errors (De Stefano et al., 2018; Hall, Johnson, Watt, Tsipa, & O’Connor, 2016; Han et al., 2019). Thus, physician burnout serves as an early indicator of health system dysfunction, i.e. when physicians are unwell, the performance of the healthcare systems can become suboptimal. For instance, the wellbeing of healthcare providers has garnered recent attention not only due its financial impact, but also due to patient safety concerns, physician suicides, and regulatory case by accreditation governing bodies and in particular the Accreditation Council of Graduate Medical Education and the American Medical Association in the Unites States (Stehman, Testo, Gershaw, & Kellogg, 2019).

Physicians’ wellbeing can improve the organization’s health. It should receive the same priority as patient care and financial viability, because care of the patient requires care of the provider (Wallace, Lemaire, & Ghali, 2009). Hence, physicians’ wellbeing should be treated as a quality indicator, and the triple aim – better care, better outcomes, and lower cost for improving population health – should be expanded to include physicians’ wellbeing (Bodenheimer & Sinsky, 2014). Several factors drive physician

burnout and engagement (ENG): work demands, resources, control and flexibility, work life integration, efficiency, and resources, meaning in work, culture, and values. These drivers should be addressed in every healthcare institution at the organizational, departmental, and individual levels. Perhaps, less attention has been given to the impact of work engagement on quality of care.

Leadership plays a key role in addressing wellbeing drivers at the organizational and departmental level. A recent study by Shanafelt et al. (2015) at Mayo clinic assessed the impact of organizational leadership on physician burnout and satisfaction and showed that organizational leaders who inform, engage, inspire, develop, and recognize their followers contribute towards improving the wellbeing of their subordinates by reducing their cynicism and emotional exhaustion (EE). Thus, organizations that employ good leadership practices towards their physicians benefit by having more productive and efficient healthcare providers, and perhaps patients receive better quality of care.

The results of this study could contribute to positive social change for healthcare organizations because leaders may use the findings of this study to make work environment changes that positively influence resident physicians' wellbeing and enhance quality of patient care. In the remainder of this chapter, I will provide a brief background of the study, discuss the research problem and study purpose, offer the research questions, and describe the theoretical framework which guides the model of the study. I will then provide a concise rationale for the nature of the study; define key terms and variables; and discuss the assumptions, scope, and limitations of the study.

Background

Burnout and work ENG are at opposite ends of the continuum of wellbeing. The former is known for its low emotional energy (e.g. exhaustion), while the latter is known for its high emotional energy (e.g. vigor; Trépanier, Fernet, Austin, Forest, & Vallerand, 2014). Recent studies from around the world indicate that 23.5% to 42.5% of medical residents are burned out, depending on specialty type (Rodrigues et al., 2018). Burnout is a pathological state consisting of three dimensions: EE, depersonalization (DP), and low personal accomplishment (PA; Maslach, Schaufeli, & Leiter, 2001). On the other hand, work ENG refers to a sense of fulfilment, absorption, and energetic investment in one's work (Schaufeli, Salanova, Vicente, & Bakker, 2002). The drivers to both burnout and work ENG are part of the work environment of any organization, which constitutes job demands and job resources. Since residents work in a healthcare system, the effect of their wellbeing is not limited to their own personal experiences but rather residents' affects the whole healthcare system.

Researchers have shown interest in the constructs that improve employee job performance. Scholars have examined the interactive effect of high quality leader-member relationship and perceived organizational support , and found that this results in a dynamic environment that supports employees who are more likely to develop a long-term orientation toward the organization and adapt their behavior to contribute to the organization's success (Sweet,Witt, & Shoss, 2015). In addition, increased interest has been given to the impact of employee burnout on job productivity, in particular among physicians, and especially resident physicians. A recent review of the literature

investigated the impact of residents'' burnout on patient safety, and researchers reported a moderate relationship between burnout and patient safety, as reflected by the self-perceived medical errors and sub-optimal care provided (Dewa, Loong, Bonato, & Trojanowski, 2017). On the other hand, residents with higher mental wellbeing have reported higher cognitive empathy scores when the latter was assessed using the Interpersonal Reactivity Index validated instrument (Shanafelt et al., 2005). In addition to the potential impact of residents on patient safety and quality of care, burnout could have severe long-term financial consequences. A recent study in the United States estimated that $4.6 billion in costs related to physician turnover and reduced clinical hours is attributable to burnout (Han et al., 2019). On the opposite end, researchers agreed that work ENG, a positive affective-cognitive work-related state of mind characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2004), can lead to positive job performance outcomes (Fairlie, 2011; Mijakoski et al., 2015; Owens, Eggers, Keller, & McDonald, 2017; Whittington, Meskelis, Asare, & Beldona, 2017). Hence, ENG is worth striving for both for employees and for the organization. The more that employees feel valued by and dedicated to their organization, the better their job performance.

Healthcare leaders need a greater understanding of factors that affect residents' wellbeing to ensure high quality patient care. Researchers have separately correlated residents' burnout to quality of care, but only two have correlated residents' ENG to quality of care (Loerbroks et al. 2017; Prins et al., 2010). In addition, none have assessed the potential indirect impact of program director leadership and perceived departmental support on residents' quality of care. In this study, I will evaluate the simultaneous effect

of program director-resident relationships and perceived departmental support on residents' burnout and ENG, and on quality of care. The findings of this study may highlight the leadership practices that affect quality of patient care, and thus promote dialogue among different stakeholders on the importance of adopting proven, effective leadership practices to improve residents' wellbeing, patient care, and patient-resident relationships.

Problem Statement

While much has been cited in the literature on the impact of residents' wellbeing on quality of care and sympathy towards patients, less information is available on system evidence-based strategies that would help diminish the reasons behind residents' burnout. Recent literature has focused on developing resiliency programs and comparing pre to post burnout prevalence rates (Brennan et al., 2019; Vu Lam & Black, 2018; Zaver et al., 2018). Although mindfulness strategies have proven to be effective in such studies, it is not enough to teach residents coping skills, and assess the impact of these resiliency programs on residents' burnout; they need an environment and a healthcare system which is worth their efforts. Knowing that the causes of and solutions to burnout are many, a systematic solution should be multipronged (i.e. addressing system, workflow, wellness programs, and program leadership). Only one study has been found that explored the impact of supervisors' leadership on residents' wellbeing, and this study focused on the impact of supervisors' ethical leadership qualities on residents' burnout (Okpozo, Gong, Ennis, & Adenuga, 2017). This current study fills a gap in the literature by being the first to evaluate the influence of program leadership (program director-resident relationship

quality and perceived departmental support) on residents' wellbeing, differentiated by burnout as negative wellbeing and ENG as positive wellbeing, and eventually on residents'' quality of care.

Purpose

The purpose of this study was to examine the association between program-director resident relationship quality and residents' reported quality of care, and the mediating effects of burnout and ENG, as well as the moderating effect of perceived departmental support, among resident physicians from 20 different specialties in Lebanon. Resident physicians may be more prone to burnout because of their job demands and academic goals. These residents play an essential role in patient care. Extensive research has examined the association between residents' burnout and quality of care, but researchers have given little attention to the role of program director leadership style and departmental support. This gap in the literature presented an opportunity to gather empirical data that can be used to inform healthcare executives' action plans to mitigate resident burnout and its concomitant safety concerns.

Research Questions

RQ 1: To what extent does residents' emotional exhaustion (*H*1a), depersonalization (*H*1b) or engagement (*H*1c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization, or engagement → residents' suboptimal patient care management practices).

$H_0$1: Residents' emotional exhaustion ($H_0$1a), depersonalization ($H_0$1b) or engagement ($H_0$1c) does not statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices.

$H_1$1: Residents' emotional exhaustion ($H_1$1a), residents' depersonalization ($H_1$1b) or engagement ($H_1$1c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices.

RQ 2: To what extent does residents' emotional exhaustion (*H*2a), depersonalization (*H*2b) or engagement (*H*2c) statistically mediate the relationship between program director-resident relationship quality and residents' medical errors? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization and/or engagement → residents' medical errors)

$H_0$2: Residents' emotional exhaustion ($H_0$2a), depersonalization ($H_0$2b) or engagement ($H_0$2c) does not statistically mediate the relationship between program director-resident relationship quality and residents' medical errors.

$H_1$2: Residents' emotional exhaustion ($H_1$2a), depersonalization ($H_1$2b) or engagement ($H_1$2c) statistically mediates the relationship between program director-resident relationship quality and residents' medical errors.

RQ 3: To what extent does residents' emotional exhaustion (*H*3a), depersonalization (*H*3b) or engagement (*H*3c) statistically mediate the relationship between program

director-resident relationship quality and residents' suboptimal attitudes towards patients? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization, or engagement → residents' suboptimal attitudes towards patients)

> $H_0$3: Residents' emotional exhaustion ($H_0$3a), depersonalization ($H_0$3b) or engagement ($H_0$3c) does not statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.
>
> $H_1$3: Residents' emotional exhaustion ($H_1$3a), depersonalization ($H_1$3b) or engagement ($H_1$3c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.

RQ 4: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion (*H*4a), depersonalization (*H*4b), or engagement (*H*4c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal patient care management practices).

> $H_0$4: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents'

suboptimal patient care management practices, through residents' emotional exhaustion ($H_0$4a), depersonalization ($H_0$4b), or engagement ($H_0$4c).

$H_1$4: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion ($H_1$4a), depersonalization ($H_1$4b), or engagement ($H_1$4c).

RQ 5: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion (*H*5a), depersonalization (*H*5b), or engagement (*H*5c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' medical errors).

$H_0$5: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion ($H_0$5a), depersonalization ($H_0$5b), or engagement ($H_0$5c).

$H_1$5: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion ($H_1$5a), depersonalization ($H_1$5b), or engagement ($H_1$5c).

RQ 6: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion (*H*6a), depersonalization (*H*6b), or engagement (*H*6c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal attitudes towards patients).

> $H_0$6: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_0$6a), depersonalization ($H_0$6b), or engagement ($H_0$6c).
>
> $H_1$6: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_1$6a), depersonalization ($H_1$6b), or engagement ($H_1$6c).

Conceptual Framework

Leader-member exchange (LMX) relationship theory and perceived organization support (POS) theory served as the framework for this study (Eisenberger, Huntington, Hutchison, & Sowa, 1986; Graen & Uhl-Bien, 1995a). Although both theories interact, and are both based on the norm of reciprocity in relationships, yet they are distinct (Gouldner, 1960). In terms of high quality LMX, the employee would feel obligated not only to perform the job adequately, but also to engage in behaviors that directly benefit

the leader and are beyond the scope of usual job expectations. In terms of POS, reciprocity is somewhat different because the organization is made up of many individuals (Wayne, Shore, & Liden, 1997). Hence, feelings of obligation and commitment towards the organization are based on a history of organizational decisions, which could have been made by their immediate supervisors, or higher supervisors, or individuals in the organization but not part of the supervisory channel (Gouldner, 1960).

Huell et al. (2016) applied a random effects model to the results of 76 studies from different branches and countries in order to examine the relationship between LMX and job-related employee wellbeing. Huell differentiates positive well-being (psychological complacency, occupational self-efficacy, and work ENG) from negative well-being (burnout, psychological strain, and individual health concerns). Findings suggest that high-quality supervisor-follower working relationships have a positive impact on employee health. Additional meta-analysis evidence shows a positive relation between the quality of leader-follower relationship and task performance, which is mediated through motivation, empowerment, and trust (Martin, Guillaume, Thomas, Lee, & Epitropaki, 2016).

Leaders develop different types of exchange relationships with their employees, which in turn influences follower actions and attitudes. The quality of these relationships is predictive of individual, group, and organizational outcomes. Based on the literature, a conceptual framework model was developed to explain the mechanism through which the quality of program director-resident relationships and perceived departmental support influence residents' quality of care. Parallel mediation and moderated parallel mediation

models were adopted in this framework, whereby ENG and burnout (EE and DP) were assessed for mediating the mechanism between program director-resident relationship quality (LMX) and quality of care (suboptimal patient care practices, medical errors and attitudes towards patients), and perceived departmental support (POS) was tested for moderating the mediated relationships as shown in Figure 1. Schaufeli and Salanova (2011) argued that when an employee does not feel burned-out, it does not automatically imply that he or she is engaged in his or her work. Hence, serial mediation was eliminated.

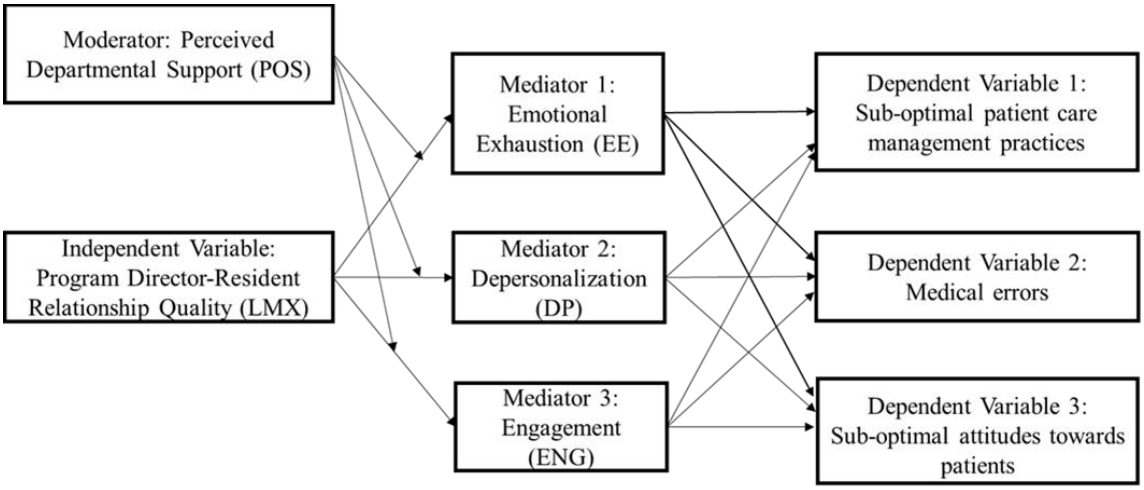

Figure 1. Conceptual framework.

Nature of Study

This study used a quantitative cross-sectional research design to collect and assess numerical data from residents at one point in time. This study included medical residents from an academic medical center in Beirut, Lebanon. Data were collected using the Leader-Member Exchange Tool (LMX-7), Perceived Organization Support Questionnaire

(POS-8), Maslach Burnout Inventory Tool (MBI-2), Utrecht Work ENG Scale (UWES-9), and Quality of Care Questionnaire (QOS-10) – form developed by two previous published papers. The survey was administered through online anonymous Lime Surveys. In this study, I tested for statistically significant moderation and mediation relationships between one independent variable (program director-resident relationship quality), one moderating variable (perceived departmental support), two mediating variables (residents' burnout and ENG), and one dependent variable (residents' quality of care) using least squares regression-based path analysis in PROCESS macro for SPSS to run simple mediation and moderated mediation using models 4 and 7 respectively.

Definitions

Leader-member exchange (LMX): A relationship-based approach to leadership that focuses on the two-way relationship between leaders and followers (Graen & Uhl-Bien, 1995b).

Perceived organizational support (POS): Employees' beliefs concerning the extent to which their organization cares about their well-being and values their contributions (Eisenberger, Huntington, Hutchison, & Sowa, 1986).

Job Burnout: A psychological syndrome arising from continued exposure to chronic work stressors (Maslach, Schaufeli, & Leiter, 2001).

Emotional Exhaustion (EE): Feelings of being exhausted by one's work (Maslach et al., 2001).

Depersonalization (DP): Impersonal response towards recipients of one's service, care, or treatment (Maslach et al., 2001).

Engagement (ENG): Also called ‘commitment’ or ‘motivation’, ENG refers to employees’ sense of investment in their company and willingness to go above and beyond the call of their job duty to help it succeed (Mercer, 2019).

Quality of care (QOC): The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Institute of Medicine, 1999). In this study, quality of care is an inverse measure of medical errors, suboptimal patient care management practices, and low-quality patient care relationships.

Sub-optimal patient care practices: Patient care management processes that are below standards but do not necessarily lead to error (Vidyarthi, Auerbach, Wachter, & Katz, 2007)

Medical errors: Sometimes defined as adverse events affecting patient care (Khoo et al., 2015); however, Vidyarthi et al. (2007) defined it as acts of omission or commission in planning or execution that contribute to unintended results.

Empathy towards patients: One of the most frequently mentioned humanistic patient care components, and a key feature of communication and understanding (Hojat, DeSantis, & Gonnella, 2017).

Resident physician: Also referred to as a ‘resident,’ a resident physician is a medical school graduate, who is participating in a graduate medical education training program in a particular specialty area in an academic hospital (ECFMG, 2019).

Program director: Used in this study to refer to ‘residency program director’- a medical doctor who is responsible for residency program administration and operations,

as well as supervision of residents and for the establishment of an effective learning climate (ACGME, 2012).

Assumptions

I assumed that the resident physicians accurately and truthfully replied to the survey items. I also assumed that the instruments used in this study have the same level of reliability and validity reported in previous studies. In addition, I assumed that I was able to obtain the necessary sample size of participants to provide adequate power to achieve statistical significance among the hypotheses.

Scope and Delimitations

The current research study focused on two leadership theoretical constructs, LMX theory and POS theory, that may impact residents' wellbeing and quality of care. Other theories could apply to this study such as the job demands-resources model; however, I preferred to use the POS and LMX due to their direct relationship with the questionnaire tools that were used in this study; i.e. LMX-7 an POS-8 items tools. In addition, measuring burnout was limited to two dimensions instead of three (EE and DP) while excluding personal accomplishment. Many burnout studies have focused on the presence of high levels of either EE or DP as the foundation of burnout among high-achieving medical professionals for whom low levels of personal accomplishment may be less likely (Rafferty, Lemkau, Purdy, & Rudisill, 1986; Thomas, 2004). The study design was cross-sectional, which means that the scope was delimited to residents' self-reported perceptions at one point in time. The population that was targeted in this study was limited to resident physicians, because residents in all fields of medicine experience high

levels of burnout and less job-related satisfaction due to the stress experienced during training (Hwang, Ippolito, Beebe, Benevenia, & Berberian, 2018). In addition, burnout among resident physicians has been reported higher than in other health professions (Shanafelt et al., 2019). The data collected from this study were generalizable to resident physicians, and this rests on the fact that I calculated sample size using G*Power software using appropriate test family, and I expected to recruit participants above the minimum sample size. Hence, I expected to have adequate sampling procedure. In addition, I used a survey to collect data, and a survey design aims to generalize from a sample to population so that inferences can be made about the characteristics, attitudes, or behaviors of the population (Babbie, 1990).

Limitations

This study has several limitations. The study used scales that require self-reporting, and participants might have skewed the responses based on the sensitivity of the subject. Reliability issues and subject bias may have existed. Also, participants might have had different interpretations of the same question. In addition, the quality of care measure relied solely on recalls, which might have made the results vulnerable to perception biases and memory failures. In addition, measurement of quality of care was based on self-reported answers and not on audit of medical records due to the anonymous nature of the study. However, the extent to which perceived medical errors reflect the actual frequency of medical errors and whether these perceived medical errors affect patient outcomes cannot be determined. Despite this limitation, 53% of self-perceived errors have been found to affect actual patient outcomes in some studies (Milch et al.,

2006). It is also possible that perceived errors that affect patient outcomes could affect residents' stress levels and burnout rate. Also, some potential confounding variables might have not been evaluated, and those could explain some of the associations observed. For example, sleep deprivation and fatigue could affect wellbeing levels. Other confounders such as personality traits (aggressive, pessimistic, and stubborn) might have affected perceived departmental support or perceived relationship with a program director. Personality traits such as arrogance and self-centeredness could also have also influenced residents' perception of errors as well as their vulnerability to distress.

Significance

This study makes an original contribution as the first to examine the interaction effect of program director-resident relationship quality and departmental support on residents' patient care quality outcomes. Investment in this study aimed to highlight factors that might enhance the residents' work environment , and to assess whether this will be also be rewarded through reciprocal residents' behavior and attitudes that results in creating a positive patient safety culture conducive of optimal patient care management, minimal preventable medical errors and high quality patient care relationships. In this manner, positive social change could result from identifying factors that help in reducing residents' burnout, increasing residents' ENG, and improving the quality of healthcare residents deliver.

The triple aim of enhancing patient experience, improving population health, and reducing costs is widely accepted as the compass by which healthcare institutions optimize health system performance (Bodenheimer & Sinsky). However, unwell

physicians contribute to overuse of resources, lower patient satisfaction, sub-optimal patient care practices, and medical errors. Thus, the wellbeing of residents – positive ENG and negative burnout – is of paramount importance in achieving the hospitals' primary tripartite goal of improving population health. This study provides evidence-based recommendations for hospitals to work towards, adding a fourth dimension (improving physicians' wellbeing) to the compass points of better care, better health, and lower costs.

The findings of this study may also encourage healthcare organizations to endorse an organizational strategic plan that prioritizes leadership training to create more productive, rewarding, and safe work environments. In addition, this study highlights the importance of having program directors work collaboratively with residents to understand their concerns in order to create professional practice environments that foster higher quality of patient care. This study could also have important implications on the selection and training of residency program directors by providing academic medical centers with evidence-based recommendations on the most desirable leadership qualities for improving residents' wellbeing and productivity.

Summary

Numerous studies have been conducted on residents' burnout and how it affects quality of care, but few have addressed how leadership plays a role in this mechanism by promoting positive wellbeing in terms of higher ENG and lower burnout. A quantitative study that investigates the effects of leader-member exchange and perceived organizational support on residents' burnout and ENG, and eventually on quality of care,

could lead to remediation of residents' burnout and disengagement, and consequently foster a more robust culture of patient safety. Chapter 2 will include an evaluation of the available literature on the topic and an analysis of the theories used.

Chapter 2: Literature Review

Introduction

The purpose of this study was to examine the association between program-director resident relationship quality and residents' reported quality of care (sub-optimal patient care practices, medical errors, and attitudes towards patients), and the mediating effects of burnout (EE and DP) and ENG, as well as the moderating effect of perceived departmental support, among resident physicians from 20 different specialties in Lebanon. Burnout and work ENG are on the opposite ends of one continuum, whereby burnout is known for its low emotional energy (e.g. exhaustion) and work ENG is known for its high emotional energy (e.g. vigor; Trépanier, Fernet, Austin, Forest, & Vallerand, 2014). The job demands – resources model produces work-related outcomes through two processes (motivation for ENG, and health impairment for burnout). However, little evidence has been found on the psychological mechanisms that guide both processes (Bakker & Demerouti, 2007). Burnout, which is a response to chronic stressors at work, is often defined as EE, DP, and a decrease in the sense of personal achievement (Maslach, Schaufeli, & Leiter, 2001). A recent systematic review of the literature reported high prevalence rates of the overall burnout as well as of the three burnout subcomponents, ranging between 63.2% and 72% (Rothenberger, 2017). These prevalence rates have been almost consistent over the past years, whereby 45% of U.S. physicians have had at least one manifestation of burnout (Shanafelt et al., 2019). Burnout is a significant concern in residency programs, and it is estimated to vary between 17.6% and 82% according to a systematic review done by Prins et al. (2007).

Burnout has several consequences on the individual and organizational levels and has received attention due to its relationship with quality of care, with a growing body of systematic reviews and landmark research on this subject. Burnout in healthcare has been frequently associated with reduced quality of care (Tawfik et al., 2019), whereby EE had the most robust relationship with quality of care, followed by DP and reduced personal accomplishment (Salyers et al., 2017). In addition, performance at work is related to ENG, and workers who are highly engaged have more to offer for their workplace (Harter, Schmidt, & Hayes, 2002; Laschinger & Finegan, 2005). It is essential to study the causes and moderators of this dyadic relationship between residents' wellbeing and quality of care in order to implement corrective and preventive actions. Burnout is one of the final consequences of job stressors and the organizational culture, along with its elements of behavioral control. Both leadership and management support are vital components of the organization's culture (Kheirandish, Farahani, & Nikkhoo, 2016). Hence, it is essential to study the role of both features in the relation between the residents' burnout and work ENG as well as their self-reported quality of patient care.

This literature review consists of nine topics that are critical to an examination of the subject matter. Subject areas for consideration include (a) POS theory, (b) LMX theory, (c) leadership in healthcare, (d) definition of resident, (e) burnout theories, (f) prevalence of burnout, (g) work ENG theories, (h) drivers associated with burnout and work ENG, and (i) factors associated with healthcare productivity. These topics are essential to review in the context of an investigation of the association among leadership,

perceived organization support, residents' burnout and work ENG, and their self-reported quality of patient care.

Literature Search Strategy

For the literature search, the databases that I used were accessed from the Walden University Library and included Academic Search Premier, Business Source Premier, PsycINFO, ERIC, Medline, EMBASE, CINAHL, Emerald Insight, PubMed, and ProQuest Dissertations & Theses. A total of 611 articles were located for this study. I used the following keywords to search for articles: *leadership, organization culture, organization support, burnout, wellbeing, stress, and ENG,* in combination with *productivity, performance, patient care,* and *quality.* Other terms for search included *medical errors, suboptimal care, empathy, commitment, satisfaction, working hours,* and *residents.* The search was then narrowed down to material published between 2010 and 2019. The articles that I used in this research were peer reviewed and came from scholarly journals, scholarly books, dissertations, and internet sources.

Conceptual Framework

There are two types of social exchange relationships that affect staff wellbeing and performance and have received attention in the literature. The first is the exchange relationship between the employee and the supervisor, while the second exchange relationship takes place between the employee and the organization (Eisenberger et al., 1986). Studies have shown that there is interaction between both exchanges, whereby they are positively correlated (Rhoades & Eisenberger, 2002; Yoon & Lim, 1999).

LMX theory and POS theory served as the framework to guide this study. The key variables guided by the research questions of this study are based on a conceptual framework represented by a model, revealing the interaction between leader and organization support, and their impact on staff wellbeing and eventually on quality of care. In the following sections, I discuss empirical support for each of these theories that support each exchange relationship, and its outcomes.

Leader-Member Exchange Theory

A supervisor's role as a leader and their influence on work ENG and burnout can be explained by LMX (Iaeme, 2015; Lee, 2011). Many leadership theories have discussed leadership from the point of view of the leader and the situational context (Northouse, 2016). Another approach is taken by LMX, which theorizes leadership as a process that is focused on the relationship between the leader and each individual follower. Hence, the leader-member relationship is seen as a vertical dyad, whereby staff either become part of the in-group or out-group, and this is dependent on the level of their performance, and how much they report immediately to the leader and have direct contact with him or her at work (Graen & Uhl-Bien, 1995). In addition, being a member of the in-group or out-group is dependent on the extent to which followers try to expand their roles, out the extra effort, and go beyond their formal job descriptions, and thus provoking leaders to do more for them. Leaders provide more feedback, information, trust, and authority to members of the in-group than those of the out-group (Dansereau, Graen, & Haga, 1975). For instance, LMX theory is stemmed in the social exchange

theory, when members perceive that they receive support and rewards, then they develop further obligation to reciprocate and exert more effort at work (Erdogan & Enders, 2007).

Further scholarly research has addressed how LMX theory was linked to employee performance and organizational success. Researchers found that high quality leader-member exchange relationship has affected employee turnover negatively (Yildiz, 2018), and increased their ability to perform tasks beyond their formal job role, which may in turn increase their propensity to take over more challenging demands with positive impacts on work performance (Gupta & Sharma, 2018). In addition, LMX produced higher organizational commitment (Eisenberger et al., 2010), more desirable work assignments (Dulebohn, Bommer, Liden, Brouer, & Ferris, 2012), as higher employee motivation, satisfaction as well as lower stress levels (Malik, Wan, Ahmad, Naseem, & Rehman, 2015).

Perceived Organizational Support Theory

Exploring the factors that affect employees' dedication and commitment to an organization has preoccupied thinkers since the time of Plato. The word *commitment* is used to refer to the "state of being emotionally or intellectually devoted, as to a belief, a course of action, or another person: a profound commitment to the family", which refers to a person's relationship with another group or individual ("Commitment", 2020). Lavinson (1965) initially supported the idea that an individual can have a relationship with an organization. He proposed that "people project upon organizations human qualities and then relate to them as if the organization did in fact have human qualities" (p. 377). Building on that, Eisenberger, Huntington, Hutchison, and Sowa (1986) have

presented the concept of perceived organization support. Employees often form beliefs regarding the extent to which their organizations value their contributions and care about their wellbeing. Such organizational perceptions operate similarly to other social relationships. In this manner, perceived organization support depends on social rewards such as beliefs of proximity, support, understanding, and responsiveness, in addition to other monetary rewards (Blau, 2017; Brinberg & Castell, 1982).

The concept of perceived organizational support is based on the social exchange theory (Blau, 1964). Staff who believe that their organizations recognize their contributions and potential can become more attached towards their organizations (Buchanan, 1975; Verma, 1985). This can be attributed to the social exchange ideology, which promotes the concept of tradeoff that people should help those who have helped them (Gouldner, 1960). In addition, these employees may be more loyal, involved (Cook & Wall, 1980), and willing to invest more energy in the organization's success (Eisenberger et al., 1986). This can be attributed to the expectancy theory, which assumes that employees' motivation towards an outcome depends on the intensity of the expectation that the performance will be followed by a definite desired outcome, and that this outcome will lead to a reward (Vroom, 1964). When an employee expects that his performance will be rewarded, he becomes more attached to the organization and tries to increase his work efforts (Eisenberger et al., 1986).

Eisenberger et al. (1986) developed a set of 36 questions relating to possible evaluative judgements, which employees might make on the degree that their organization cares about their wellbeing and recognizes their involvement, participation

and commitment. Factor analysis of these items resulted in all items loading highly on the main factor, with negligible signal for the presence of other factors. Additional research has been done on perceived organizational support as a construct and has supported the unidimensionality of perceived organizational support scale. Kottke and Sharafinski (1988) have measured employees' beliefs about an organization's support using the 36-item POS scale, and a factor analysis of the 36-item scale yielded one factor.

Organizational support theory also provided a theoretical framework to describe how perceived organization support generates positives consequences on the organization. Eisenberger et al. (1986) tested for the correlation between perceived organization support and increased employee effort. The extent to which an employee increased his or her efforts depended on the strength of the employees' beliefs in reciprocity at work, to trade off work effort for symbolic and material benefits. In addition, perceived organization support positively related with performance. For instance, traffic patrol officers with high perceived organization support made more "Driving under the influence" (DUI) arrests (Armeli, Eisenberger, Fasolo, & Lynch, 1998). Further research has also reported that higher perceived organization support was associated with lower absenteeism (Eisenberger et al., 1986), and a highly consistent positive relationship was reported between perceived support and job performance among steel company managers and line workers, who had made more innovative work proposals for refining the processes (Eisenberger, Fasolo, & Davis-LaMastro, 1990). In addition to improving employees' commitment and performance, perceived organization support is related to reduced negative feelings and stress, and increased willingness to

return back to work sooner after injury (Shaw et al., 2013; Wattoo, Zhao, & Xi, 2018). On the other hand, an employee who becomes dehumanized and made to feel like a tool for the organization's end goals will eventually become unwell and inclined to quit (Caesens, Stinglhamber, Demoulin, & Wilde, 2017). Nonetheless, perceived organization support for the use of employees' strengths has been correlated with higher ENG and satisfaction, as well as lower levels of burnout (Al-Omar et al., 2019; Meyers et al., 2019).

Leadership

Leadership in Healthcare

The Joint Commission advocates for the goal of providing high quality and safe patient care by healthcare organizations (The Joint Commission, 2019). In order for this goal to be achieved, effective leadership should be practiced at every level of healthcare organization. This necessitates having an organizational leadership that promotes a culture of patient safety, plans services and initiatives that meet patient's needs, and ensure availability of human, physical as well as financial resources that promote for high quality of patient care (Agustin & Ernawati, 2013). In general, and similar to other organizations, a healthcare organization has two groups of leaders: the governing body (such as board of trustees), and the C-suite which includes the chief executive officer (CEO) and other senior managers (Schyve, 2009). But most healthcare organizations have a third leadership group which is composed of physicians as leaders, who are responsible for communicating and sustaining the vision because creating the vision of high quality patient care by the C-suite and governing body may be insufficient

(Ghandhi, 2018). These leaders could include department chairpersons, head of divisions, residency program directors, and fellowship program directors. Clinical leadership is available at the different levels of the organization, and when it is activated successfully, it can drive excellence across the entire organization. A healthcare organization is not just a group of separate independent departments, but rather a complex system of people, processes, and other resources working together towards one vision, to achieve success (Compton et al., 2005). Hence, healthcare staff with leadership positions play dual roles; they lead their units through setting strategic plans that align with the organization's vision and mission, and manage their units through ensuring proper implementation of their strategic initiatives that are needed to reach the end goal. Healthcare leaders should not only ensure they have competent healthcare staff that are able to promote a culture of patient safety, but they should also foster a healthy working environment that is designed to prevent human errors (Park & Kim, 2018). Effective clinical leadership has positive implications on patient safety, while leadership failure contributes to adverse events that can range from medical errors to patient management inefficiencies (Agency for Healthcare Research and Quality, 2019). The healthy working environment, which is a vital element of the patient safety culture, could be nurtured through designing work processes and re-designing them once again through applying several process improvement models such as Six-Sigma (Define, Measure, Analyze, Improve and Control - for improving existing process problems with unknown causes), Lean Management (method for eliminating factors that waste time, effort or money, PDCA cycle (Plan-Do-Check-Act), Statistical Process Control Charts (study how processes

change over time), and Failure Mode and Effects Analysis (FMEA, a structured approach that identifies potential errors and failures that may exist within a process) (IHI, 2019). Although designing efficient and effective clinical processes is essential for the delivery of high quality of care (Nicol, Mohanna, & Cowpe, 2014), if healthcare leaders do not take care of healthcare staff who are using these tools and processes to deliver patient care, then preventable human errors could still occur. Improving the clinical environment can start with simple yet strong steps such as promoting leaders who take care of the wellbeing and personal growth of the organization's human resources. The same issues that drive burnout also diminish joy in work for healthcare staff (Musial et al., 2019). The Joint Commission Center for Transforming Healthcare has found that staff wellbeing is an essential element of patient safety culture, and not addressing staff burnout is a contributing factor towards adverse events (Ulrich, Kryscynski, Ulrich, & Brockbank, 2017). Hence, healthcare leaders have new urgent responsibilities to create a healthy work environment whereby healthcare staff gain joy and meaning through their work, and then become more committed, productive, engaged, and collaborative (Musial et al., 2019). Healthcare leaders should ensure that their staff are aware that their wellbeing is a priority. This enables healthcare staff to become more meaningfully engaged in their work, exposed to a lower chance of burnout, and thus able to deliver more effective and safer care (Lucian Leape Institute, 2013).

Attributes and Behaviors of Healthcare Leaders which Impact Staff

A key challenge in all healthcare organizations is to reinforce cultures that ensure delivery of high quality of patient care (West et al., 2015). However, driving cultural

improvement is not easy and does not happen overnight. Leadership exists at every level throughout an organization, and it can be practiced by chief executives or by medical teams in the clinical site such as doctors, nurses, and multidisciplinary teams. Hence, there is executive leadership and clinical leadership in healthcare. Based on several research studies, five key leadership qualities have been identified as essential for sustaining a culture which can ensure that healthcare staff aim for high quality, compassionate care for patients (Dixon-Woods et al., 2014). These leadership qualities are: (1) sharing inspiring visions with staff, (2) clearly defining objectives and communicating them, (3) supporting and engaging staff, (4) encouraging staff professional development and continuous learning, and (5) reinforcing a culture of teamwork (West et al., 2015). Leaders should define and communicate the purpose of the organization clearly, listen to the needs and aspirations of frontline workers, provide directions, incentives, and a supportive environment that encourages continuous improvement and innovation.

There is evidence that leaders who share inspiring visions with their followers and develop strategic initiatives that involve all employees and gain employee buy-in, have an essential influence on improving the interprofessional collaboration among different team members (Bezrukova, Thatcher, Jehn, & Spell, 2012). For instance, whenever healthcare leaders develop visions into actions and implement them, then they could become more powerful (Avolio & Gardner, 2005).

In addition to sharing an inspiring vision, the leader should share clear direction and inform staff on priorities while challenging them to provide the utmost quality of care

(West, 2013). Hence, cultures should be focused on providing a high quality of care by ensuring that objectives are clearly communicated with healthcare staff at different levels. Further research shows that managing staff effectively, through supporting and enabling them, is a crucial determinant of healthcare (West, 2013). For instance, higher levels of patient satisfaction have been reported for staff who are well-led and have high levels of satisfaction with their immediate supervisors (West, Dawson, Admasachew, & Topakas, 2011). Endorsing a positive and supportive work environment by leaders favors staff ENG; hence, staff feel that they have the emotional capacity to care for others. For example, lower patient mortality rates have been documented for healthcare staff who are more engaged, feel positive, and have a supportive climate at work (West, Dawson, Admasachew, & Topakas, 2011).

Staff ENG can be achieved by giving staff an opportunity to make decisions that have an influence on the workflow. Leaders who treat their staff with respect and fairness, and are considerate towards their staff potential in making positive change, are more prone to create a culture that nurtures job satisfaction among staff (Phillips, Douthitt, & Hyland, 2001). To further support the importance of staff ENG in healthcare, additional studies linking staff management practices with patient outcomes have shown meaningful correlation and prediction between both variables (West et al., 2002, 2006). For example, significant associations have been found between staff well-being and other productivity measures such as their intent to leave, tendency to take more sick leave, in addition to patient care quality measures such as satisfaction and infection rates (West et

al., 2002). In addition, more meaningful relationships have been found between staff and patients, when staff experience low burnout (West et al., 2002).

Further research has shown that leaders who re-iterate high standards of learning, innovation, and quality improvement among healthcare staff members reinforce the culture of patient safety. Healthcare leaders should always encourage a culture of ethic and self-directed learning and should continuously work on creating a "learning organization" (IHI, 2013). Leaders should also recognize with courage the need for continuous change and abandon blame as a tool. Leaders should trust the goodwill and good intentions of their staff and assist them in achieving what they already want to achieve. They should be continuously available to provide staff at different levels with essential tools to learn, master, and apply modern tools of quality control, assurance, improvement, and planning (IHI, 2013).

There is additional evidence that the fifth necessary healthcare leadership behavior is encouraging teamwork among staff members, in order to deliver high quality of patient care. When healthcare staff members work as an efficient and coherent team, then medical errors and comorbidities become less frequent. Further research provides evidence on the meaningful correlation between staff teamwork and level of patient care outcomes (Wilson, Palmer, Levett-Jones, Gilligan, & Outram, 2016). Findings reveal that staff who value the skills and responsibilities of all team members and value each other's contributions to the team can lead to more effective communication and collaboration in medication safety (Wilson et al., 2016).

Social learning theory hypothesizes that 'opinion leadership' plays a crucial role in encouraging followers to find the evidence supporting best practices at work, and to promote behavior change (Rogers, 1976). These leaders are known as "likable", "credible," and "trustworthy." The effectiveness of this informal leadership style has been studied in healthcare, and findings suggested that opinion leaders alone or in combination with other leadership styles could effectively encourage evidence-based healthcare, through being influential in promoting positive change (Flodgren et al., 2011; Ryan, Marlow, & Fisher, 2002). This leadership style is not a function of a leader's position, but it is a technical competence that is gained through experience, social intelligence, approachability, and adherence to the socially accepted system's conventions. These leaders are the center of the interpersonal communication networks and are known for their unique and influential characteristics (Rogers, 1976).

Like opinion leadership, charismatic leadership is also described as reinforcing change and communicating both a vision and high-performance expectations. Charismatic leaders reinforce change in follower's behavior by making their values and identities noticeable (Boerner & Dütschke, 2008). This type of leadership has been tested in several settings, including healthcare ones, and it has proven that it is helpful in times of crisis and change. It is also a predictor of work ENG in the healthcare sector with a significant path (Shooraj, 2016).

Resident Physicians

A resident physician is a medical school graduate, who is participating in a graduate medical education training program in a particular specialty area in an academic

hospital. A medical school graduate joins a residency training program, after completing at least seven years of medical school training, to become licensed and certified specialist in his/her chosen residency training specialty (ECFMG, 2019). Residents, as commonly called, spend between three to seven years of post-graduate training, depending on their chosen medical specialty (ECFMG, 2019). The term 'resident' was first used to reflect that these resident physicians used to literally live in the hospitals and work round the clock to provide patient care. Currently, resident physicians no longer live in the hospital, but they still provide continuous patient care through having work shifts and on-call duties (24 hours shift) (ECFMG, 2019). A resident physician can work up to 80 hours per week, depending on their specialty and workload. During their training, resident physicians have dual roles in the healthcare systems, whereby they act as learners and medical care providers. As medical care providers, residents are responsible for patient care, whereby they are part of patient care examination, diagnosis, treatment, and management plans (ECFMG, 2019). Residents take medical histories for patients, assess patients during physical exam, order diagnostic therapeutic tests, request consultations, and perform procedures appropriate to their level of training under appropriate level of supervision. As they mature, residents assume gradual independence in patient care management and decision making (ECFMG, 2019).

Burnout

Freudenberger's Theory of Burnout

Freudenberger, an American psychologist in the early 1970s, is credited for first using the term "Burnout" to refer to the devastating effects of chronic drug abuse and

described the state of exhaustion in the helping professions as "burnout syndrome" (Freudenberger, 1986). Several characteristics accompany burnout, and these could be physical and behavioral such as anger, frustration, mistrust, and fear regarding the potential influence of their colleagues on their own career path, which might in turn cause excessive rigidity and inflexibility in practice and the prevalence of depression symptoms (Bridgeman, Bridgeman, & Barone, 2018). Freudenberger has defined burnout as an accumulation of stress that been translated into long lasting EE as well as physical fatigue, in the presence of detachment from work and lowered job commitment (Freudenberger, 1986). Rather than just a scholar of burnout, Freudenberger fell victim to burnout twice. This fact has increased his credibility in addressing "burnout", in addition to being a psychoanalytically trained practitioner who was primarily interested in preventing and combatting burnout, rather than in understanding and investigating its underpinnings (Schaufeli, Maslach, & Marek, 2018). Freudenberger's theory of burnout has shown that burnout is not an abnormal response by a few individuals, but rather an experience (Schaufeli et al., 2018). The many social and cultural changes that our society has passed through has facilitated the prevalence of "burnout" among human beings. In addition, the symptoms of burnout tend to be job-related and situation-specific, which could lead to increased fatigue and depression.

Freudenberger's theory of burnout states that "achievers" are more prone to burnout because they are more dedicated and committed to give and go beyond the call of duty to shine and make their organization shine too (Freudenberger, 1986). These people put the best of their skills and talents towards their organizations, in addition to long

hours, with a bare minimum of financial compensation. There are three potential dangers of burnout; (1) commitment as a sign of personal need to be accepted and liked, (2) need to give in a way that is excessive and unrealistic but also depleting to oneself, (3) boredom, monotony of work and having less challenging tasks (Freudenberger, 1986).

Freudenberger (1986) mentioned several measures that can be taken by organizations to reduce the occurrence of burnout among its staff. Freudenberger suggested not sending the same staff member into a given frustrating task repeatedly, but rather try assigning them to new tasks and different from the usual. Limiting the working hours and monitoring any excessive work helps to ensure work-life balance and prevent burnout (Schaufeli, Maslach, & Marek, 2018).

In addition to having preventive measures, Freudenberger suggested several strategies that could help someone who has burned out. Of utmost importance is having a support group around this burned-out person, and encouraging him to leave for a while (Schaufeli et al., 2018). The support group should make sure to view this leaving process positively and not make the burned-out feel that he is leaving because of failure.

Maslach's Theory of Burnout and Burnout Inventory Tool

Burnout was initially a very slippery concept, and there was no standard definition of it, although there were several opinions on what it was and what could be done about it. Although Freudenberger (1986) has initially used the term "burnout", Maslach (1982a) helped to define what is now widely accepted as the three dimensions of burnout. Freudenberger (1986) mentioned that highly dedicated, and committed people are more prone to burnout, however, according to Maslach (1982a) burnout is a chronic

condition that could be due to culmination of professional responsibilities and work environment (Bridgeman et al., 2018). Several exploratory research studies were done that led to the development of a multidimensional theory of burnout, which is "Maslach's Theory of Burnout" (Maslach et al., 2001). Maslach (1982) has defined burnout as a syndrome consisting of EE, DP, and reduced personal accomplishment. As EE becomes more severe, DP and cynicism occur, with the individual having a negative attitude towards job and workplace, and feeling detached from his or her work (Bridgeman et al., 2018). Hence, Maslach et al. (2001) have described burnout as "…an erosion of ENG with the job. What started as important, meaningful, and challenging work becomes unpleasant, unfulfilling, and meaningless. Energy turns into exhaustion, involvement turns into cynicism, and efficacy turns into ineffectiveness. Accordingly, ENG is characterized by energy, involvement, and efficacy—the direct opposites of the three burnout dimensions" (p. 416).

Maslach's three-dimensional model of burnout focuses on the stress experience that is formed based on the person's conception of both self and others (Lee & Ashforth, 1990; Maslach et al., 2001). As the emotional resources of employees become depleted, they feel they are no more psychologically fit and able to put more effort and give of themselves to others. Among the three burnout sub-components, EE is the most prevalent and analyzed aspect; however, this fact does not make it a sufficient and absolute indicator of burnout (Maslach & Jackson, 1981). Cynicism is another aspect of burnout, whereby people develop negative attitudes towards their surroundings, whether employees, patients, or customers. Cynical employees can also develop a more

dehumanized perception of others, which can further lead them to view their clients as deserving of their troubles. The third aspect of burnout is the tendency to evaluate one's work negatively and feel unhappy and unsatisfied with accomplishments at work (Henson, 2016; Maslach & Jackson, 1981). This statement refers to the sense of personal accomplishment that measures feelings of achievement and competence in one's field of work. Initial research on burnout has shown that burnout leads to deterioration in the quality of care or service provided by the staff (Maslach & Jackson, 1981).

Burnout was associated with several self-reported indices of personal distress, including family problems, drug addiction, physical exhaustion, and insomnia (Maslach & Jackson, 1981). Hence, this necessitated the need to construct a burnout inventory tool to measure the three hypothesized aspects of burnout syndrome. Previous exploratory research, interviews, and questionnaire data collected served as a valuable source of ideas on feelings and attitudes that characterize burned-out employees. Currently, the Maslach Burnout Inventory tool is recognized as the leading measure of burnout and has been validated by over 35 years of experience, in addition to being used in 88% of burnout research publications (Boudreau, Boudreau, & Mauthe-Kaddoura, 2015).

Cherniss' Theory of Burnout

Burnout is the last stage of a failing coping process with stress (Cherniss, 1980). Professional burnout also refers to the professional's inability to develop a sense of competence and self-efficacy and is related to boredom, self-doubt, insecurity, dissatisfaction, disappointment, and dissatisfaction (Cherniss, 1980). Some professionals argue that they feel a sense of existential significance if their work makes a difference,

which ultimately makes them less stressed and less prone to burnout (Danzig, 1981). Hence, factors that prevent professionals from using their skills to achieve their ultimate goals do serve as stressors that give professionals a feeling that what they do is insignificant. This argument refers to self-efficacy as a significant contributor against burnout (Cherniss, 1980). Successfully and independently achieving goals leads to self-efficacy; hence, failure to achieve these goals leads to psychological failure, decreases self-efficacy, and eventually burnout (Cherniss, 1980). Also, Cherniss goes on to argue that self-efficacy is not a personal trait but rather a professional work role that refers to one's ability to perform his tasks, one that spreads over three domains; task, interpersonal, and organization. In addition, Cherniss (1980) considers that professionals who have doubts about their competence are more prone to burnout, especially in their early career stages.

In addition, based on Cherniss' research (1980) with new employees, burnout is different from three other phenomena. Burnout is different from temporary fatigue, although the latter could be one of the early symptoms of burnout. In addition, burnout is different from socialization, but rather the employees' attitudes and emotions change in response to the social influences occurring in his workplace (Cherniss, 1980). Moreover, employees who leave their jobs are not all burned out. Burnout may push an employee to leave work; however, a burned-out employee might decide to remain at job (Cherniss, 1980).

Prevalence of Burnout among Physicians

Burnout among Practicing Physicians

Physician's burnout serves as an early indicator of health system dysfunction, hence, health decision-makers need to be provided with more evidence on the potential strong impact of burnout on healthcare, so that they change their course of actions and implement burnout preventive strategies. Shanafelt et al. (2019) campaign to proactively measure, track and manage professional burnout and wellbeing in individuals to avoid crises. Hence, monitoring burnout could allow healthcare administrators to manage professional burnout in a way to avert crises and cost-effectively address its early signs before disrupting patient care.

The wellbeing of healthcare providers has garnered a national interest due to its influence on patient safety and quality of care. Healthcare professionals have reported burnout syndrome across different stages of their career, and because burnout increased across all medical specialties between 2011 and 2014 while remaining stable in the general population, is further evidence that this is a workplace issue (Olson, 2017). Recent studies have shown a U.S. national burnout rate of 43.9 percent among practicing physicians, which is much higher than individuals in other professions, even after adjusting for working hours and other factors (Shanafelt et al., 2012, 2019; Shanafelt, Hasan, et al., 2015). Similarly, further research in Europe has shown similar results, whereby a study that was done by the General Practice Research Network Burnout Study Group, which included 1,400 family physicians in 12 European countries, reported high prevalence of burn out among its physicians on the different domains, whereby 43

percent of the respondents suffered from EE, 35 percent reported high depersonalization, and 32 percent reported low for personal accomplishment (Soler et al., 2008). Furthermore, 12 percent of these physicians suffered from burnout in the three domains (Soler et al., 2008). Another Danish study that included 216 physicians reported higher rates of burnout among physicians from other professions (13.2% vs. 9.1% new burnout cases in seven years) (Pedersen, Andersen, Olesen, & Vedsted, 2013). A cross-sectional study was done in Germany, and burnout reported high among German general practitioners on two domains; 34.1% scored high for EE, and 29% scored high for depersonalization, whereby higher rates of burnout was found among female physicians (Dreher, Theune, Kersting, Geiser, & Weltermann, 2019). Similarly, another study was done in the United Kingdom, and it included 501 surgeons, whereby burnout has prevailed among 32% of them on at least one domain (Sharma, Sharp, Walker, & Monson, 2008). Further research was done in some Arab countries (Yemen, Saudi Arabia. & Lebanon), and comparable results were found (Al-Dubai & Rampal, 2010; Romani & Ashkar, 2014; Selaihem, 2013).

In addition to research that aimed to assess the prevalence of burnout among different specialties and in different populations, more research was done to assess the impact of physician burnout on quality of care, as well as its financial costs on the healthcare institutions. Burned out physicians have negative consequences not only on their own care and safety (Colin P. West, Tan, & Shanafelt, 2012) but also on the quality of patient care (Shanafelt et al., 2010; Colin P. West et al., 2006) as well as on the

productivity and healthcare system costs (Dyrbye & Shanafelt, 2011; Shanafelt, Mungo, et al., 2016).

Burnout among Medical Students

It is noteworthy to mention that burnout among physicians might start early during their medical school. A recent systematic review of the literature has reported an average of 44.2 percent of burnout among medical students (Frajerman, Morvan, Krebs, Gorwood, & Chaumette, 2019). The current prevalence of burnout among medical students was estimated to be 40.8 percent for EE, 35.1 percent for depersonalization, and 27.4 percent for personal accomplishment (Frajerman et al., 2019).

Burnout among Residents

Residents are essential citizens of the healthcare systems they belong to, and evidence shows that residents are unwell. The seeds of burnout among physicians start early during their medical school and continue to grow during their residency years. The prevalence of burnout among medical residents has been reported as high as that of program directors and chairpersons (de Oliveira et al., 2013). Based on a systematic review of the literature, the overall prevalence of burnout was 35.1 percent for all specialties (Rodrigues et al., 2018). Specialties were distributed into three groups based on the different levels of the prevalence of burnout: general surgery, anesthesiology, obstetrics and gynecology, and orthopedics (42.5 percent); internal medicine, plastic surgery and pediatrics (29.4 percent); and finally a group including otolaryngology and neurology, with a low burnout prevalence of 23.5 percent (Rodrigues et al., 2018). The current breakdown of burnout among residents across its three dimensions was estimated

to be 43.6 percent for depersonalization, 38.9 percent for EE, and 34.3 percent for low personal accomplishment (Rodrigues et al., 2018). The corollary is that residents' burnout might affect not only the individual resident, but also the delivery of quality healthcare services as well as healthcare system productivity (Wallace et al., 2009).

Work Engagement

Emergence of Engagement in Business and in Academia

This transition is due to a "psychologization" which is psychological adaptation and involvement of the employees to keep their workplaces nourished and alive. The psychological capabilities that are needed in order to obtain this switch are: adaptation, perspective taking, assertiveness, communication skills, personal initiative, self-control, and resilience. In his book "Human resource champions" Ulrich (1997) wrote: "Employee contribution becomes a critical business issue because in trying to produce more output with less employee input, companies have no choice but to try to engage not only the body, but also the mind and the soul of every employee" (p. 125) highlighting two issues revealing the importance of the organizations' employees who are willing to contribute to their work world psychologically and therefore being engaged.

Engagement as a Unique Construct

ENG is a unique construct, and it is essential to show its distinctiveness from other job-related attitudes, job behaviors and behavioral intentions, as well as health and wellbeing and personality.

Job related attitudes. Job satisfaction, involvement and organizational commitment are attitudes that have intertwined with the concept of ENG. However,

evidence showed that despite the positive correlation between ENG and the former three concepts Newman, Joseph, & Hulin (2010), it is still an outstanding notion and much more associated with job performance (Christian, Garza, & Slaughter, 2011; Rich, Lepine, & Crawford, 2010).

Job behavior and behavioral intentions. Halbesleben (2010) described the inverse relation between ENG and turnover intention, which was previously shown by Schaufeli and Bakker (2004) and (Salanova & Schaufeli, 2008). In other words, job ENG is highly affected by job resources, therefore, the more resourceful the job, the more committed is the employee and lower the intention to quit a job (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008).

Health and Wellbeing. Two contradictory findings have been reported regarding the relationship between ENG and burnout. One finding supported a negative relationship relating the two together and disproving the discrimination between them (Cole, Walter, Bedeian, & O'Boyle, 2012; Halbesleben, 2010); however the other finding, despite the proven inverse relationship between ENG and burnout dimension, researchers considered them as completely different concepts (Hakanen & Schaufeli, 2012).

Personality: The argument falls under the question: Is ENG related to personality? To assess for this, different personality traits were studied in relation to ENG. Neuroticism and extraversion were two models that were found, respectively, to be negatively and positively associated with ENG (Langelaan, Bakker, van Doornen, & Schaufeli, 2006) but with low (-0.33 to 0.5) correlation coefficients. Inversely, Kim, Shin, and Swanger (2009) showed that conscientiousness was the only attribute related to

ENG, and to a lesser extent to distressing and/or cheerfulness emotions; the latter is thus supporting Macey's and Schneider's (2008) viewpoint.

Approaches Associated with Work Engagement

Four approaches constitute the framework for work ENG.

The needs-satisfying approach. This approach was described by Kahn (1990). It is comprised of three aspects: meaningfulness, psychological safety, and availability. The first aspect relates to recognition at work, the second aspect revolves around the bonds between colleagues and their relationships with each other, and with the environment. The third aspect addresses the personal resources that are more dependent upon employee energy and willingness to be engaged at work. May, Gilson, and Harter (2004) were able to positively correlate each notion with ENG.

The Job Demands-Resources (JD-R) Model. This model is composed of two processes. The motivational process: The JD-R model is associated with two types of resources, job resources (which is affected by the job nature and work environment) and personal resources (which is directly related to the employees' adaptation with his environment and self-motivation) (Bakker & Demerouti, 2008; Schaufeli, Taris, & Van Rhenen, 2008). The structure of this model is based on a motivational process whereby the job and personal resources energize each other and thus strengthen ENG. ENG could therefore boost positivity in the workplace. However, burnout could counteract the effects of ENG through the "health impairment process" (p. 296) which is exclusively the output of heavy job demands that require both the physical and psychological effort by the employee (Demerouti, Nachreiner, Bakker, & Schaufeli, 2001; Schaufeli & Bakker,

2004). Thus, this process can lead to negative effects instead. Hence, the job-demands resources model can be either motivational or discouraging depending upon the resources and demands nature. Rich et al. (2010) confirmed this through a meta-analysis to prove that impediments are negatively associated with ENG however challenge demands were positively related to ENG.

The Affective Shift Model. A vital process underlies the affective shift model. Bledow, Schmitt, Frese, and Kühnel (2011) explained dynamism of work ENG. Work ENG is described as a transition from a negative affect (i.e. negative mood due to negative events or situations happening) to positive affect (positive mood active spirit) in the workplace.

Social Exchange Theory. Under this theory, resources offered by the organization play main role in motivating the employees and engaging them. Saks (2006) and Kahn (1990) supported the social exchange theory by explaining that ENG is related to the reimbursement from the employees towards their organizations which resides in the positive responsiveness of employees. However, disengagement might occur due to the failing of an organization to supply their employees' particular resources (Schaufeli, 2006).

Drivers Associated with Burnout and Work Engagement

Work Demands and Resources

Burnout and work ENG are on the opposite ends of one continuum whereby burnout is known for its low emotional energy (e.g. exhaustion) while ENG is known for its high emotional energy (e.g. vigor) (Trépanier, Fernet, Austin, Forest, & Vallerand,

2014). It is known that burnout is not just a state of one-moment feelings, but rather a psychological response to chronic job stressors over a period (Maslach, Schaufeli, & Leiter, 2001). On the other hand, work ENG is "a persistent positive fulfilling, work-related state of mind that comprises energy, involvement and absorption" (Schaufeli & Bakker, 2004, p. 295). The drivers to both burnout and work ENG are part of the work environment of any organization, which constitutes job demands and job resources. Job demands are those aspects of the job that require consistent and chronic psychosocial and/or physical efforts, and therefore associated with psychological, social, physical and wellbeing costs (Demerouti, Nachreiner, Bakker, & Schaufeli, 2001). These demands could be work overload, as well as cognitive (pressure to receive/explore and understand information), emotional (i.e. interpersonal conflicts) or physical (holding heavy items or moving between floors to complete a task) (Trépanier et al., 2014). Due to the fact that highly demanding jobs are associated with stress and might cause burnout, research is currently focusing on positive outcomes such as personal growth, positive development, and work ENG that are simulated by high job resources (Richter & Hacker, 1998). Motivation is a key component of job resources, and it can be extrinsic or intrinsic. In addition, organizational support, supervisory approachability, and feedback, as well as job control are vital metrics of job resources (Trépanier et al., 2014). Through intrinsic motivation, employees will have their basic needs satisfied (such as autonomy and competence) and will have less intent towards leaving work (Deci & Ryan, 1985; Hackman, 1980). In addition, extrinsic motivation gives a push to the employee to finish their task successfully, by providing them with the necessary information and innovative

resources to reach the target (Meijman & Mulder, 1998). Hence, both types of motivation aid in task accomplishment and contribute to personal as well as professional development of the employee (Hobfoll, 2002; Schaufeli & Bakker, 2004). Nonetheless, Bakker and Demerouti (2007) argue that job resources could help in buffering the effect of heavy job demands, such as job control, social support, supervisory support, and feedback (Bakker, Demerouti, & Euwema, 2005). Hence, motivation and work ENG are positively correlated, whereby work ENG mediates the relationship between motivation and intent to leave, as well as between motivation and health impairment (Deci & Ryan, 1985; Hackman, 1980). However, an energetic process that starts with high job demands can cause stress and may lead to burnout among employees. Therefore, job demands are primarily related to the exhaustion component of burnout, whereas the lack of job resources is primarily related to disengagement (Demerouti et al., 2001). For instance, the work demands resources model suggest two pathways to improve employees' wellbeing. In addition to efforts that aim to address burnout by reducing job demands, organizations can work on increasing job resources which may increase employees' wellbeing (ENG) and decrease their un-wellbeing (burnout). Van Den Broeck, Vansteenkiste, De Witte, and Lens (2008) found that job demands negatively affected job satisfaction, which in turn increased EE among employees. Low job satisfaction was linked with the occurrence of burnout in several studies (Chopra, Sotile, & Sotile, 2004; Ramirez, Graham, Richards, Cull, & Gregory, 1996; Salpigktidis et al., 2016; Visser, Smets, Oort, & De Haes, 2003). In Shanafelt et al.'s study (2002), DP was significantly associated with sub-optimal patient care. Based on this, one may conclude that feelings of burnout can negatively

affect the patient-physician relationships, and which can further lead to reduced job satisfaction. A cross-sectional study on "burnout, depression and job satisfaction" done across six obstetric units found that burnout is strongly correlated with depression, and inversely correlated with job satisfaction (Govardhan, Pinelli, & Schnatz, 2012). Hence, decreasing stressors may prove to be helpful in the enhancement of job satisfaction. In another study done in the UK among gastroenterologists, surgeons, radiologists, and oncologists in the UK, burnout was found to be associated with low job satisfaction in three domains: relationships with patients, relatives, and staff; professional status/esteem; and intellectual stimulation (Ramirez et al., 1996). Job stress, job satisfaction, and burnout were also strongly correlated in a large Dutch study across 2400 residents, which showed that both job stress and job satisfaction appeared to be significant predictors of EE, whereby when job stress is high, and satisfaction is low, so is the EE (Visser et al., 2003). Job satisfaction and stress were less critical in predicting DP and personal accomplishment (Visser et al., 2003). The same results have been confirmed in another Chinese study whereby there was a strong correlation between low job satisfaction and high EE, and moderate correlations exist between low job satisfaction and the other two dimensions of burnout (Li et al., 2018). Another large study was done by surveying 277 Australian mental health personnel and researchers found that both elements of burnout (disengagement and exhaustion), and turnover intention were negatively correlated with job satisfaction (Scanlan & Still, 2019). According to the Minnesota Job Satisfaction Survey, job satisfaction could be intrinsic or extrinsic or both (Weiss, Dawis, & England, 1967). A Turkish study examined the levels of burnout and job satisfaction among

emergency health professionals, and researchers found that EE is a significant indicator of overall satisfaction (Tarcan, Tarcan, & Top, 2017). EE and DP have been found to be significant predictors of intrinsic job satisfaction, while EE and personal accomplishment are essential indicators of extrinsic job satisfaction (Tarcan et al., 2017). These results are like those presented in a Brazilian study, which was done in a teaching hospital, and showed that the lower EE, the higher the job satisfaction (de Oliveira, Silva, Galvão, & Lopes, 2018).

When job demands are high, this requires persistent physical and/or psychosocial effort to produce the expected outcomes, which is related directly to physiological and /or psychosocial costs and stress (Gregory, Menser, & Gregory, 2018). This stress could cause detachment which could later mediate the relation between heavy job demands and chronic fatigue. On the other hand, high job resources could motivate employees to master their profession and become more harmoniously passionate. Employees may then acknowledge their job as meaningful and important with no sense of obligation. A quasi-experimental design study introduced workload re-design interventions that aimed to decrease burnout levels among physicians (Gregory et al., 2018). Instead of having one physician and a certified medical assistant to manage appointments, rooming of patients, ordering tests and diagnosing, obtaining vital signs, conducting the examination, and documenting visits on EHR, the organization recruited one additional physician and two additional CMAs. Following this increase in work resources, and workflow re-design, there was a 10% reduction in the proportion of respondents who previously high EE, in

addition to 5% reduction in the proportion of respondents who previously reported high DP (Gregory et al., 2018).

However, when job demands are high and beyond the normal capacity of a full time employee, passionate employees may feel pressure to invest themselves more at work and meet job demands, and hence become obliged to put extra effort that would cost them psychosocial and/or physical impairment. These people become obsessively passionate about their work because it provides them with a great ego boost, and they become extremely attached to their work and unable to disconnect (Trépanier et al., 2014). Hence, this leads to several negative outcomes including but not limited to rigid persistence at work, negative affect, EE, and conflict with other life spheres (Trépanier et al., 2014).

Control and Flexibility

Flexibility at work and control over one's job have been cited as two important factors that support the psychosocial as well as physical wellbeing of employees (Ulmer, Wolman, & Johns, 2009). Although burnout has been mostly associated with high work demands and job associated stressors, the impact of work scheduling cannot be ignored, especially among physicians, and among residents. Among resident physicians, the persistent stress and pressure can affect the quality of their work (patient care, educational duties, and requirements) as well as their mental wellbeing. Work schedule flexibility could help alleviate these stressors. The work adjustment theory assumes that flexible work conditions are associated with high work ENG, and high job performance and actual productivity (Bal & De Lange, 2015). Both the employee and the work

environment need to meet each other at halfway, to satisfy each other's requirements for the interaction to be sustained. This work adjustment process will be reflected through mutual satisfaction of both parties; i.e. employee and work environment. In addition, the AMO theory (ability, motivation, opportunity) assumes that flexible management is correlated with higher work ENG through providing the employee with the ability, motivation, as well as opportunity to work more, and hence becoming more productive without obligations (Kellner, Cafferkey, & Townsend, 2019). This kind of flexible management (workplace flexibility and schedule flexibility) provides the employee with sense of autonomy and control over one's work, and studies show that work flexibility decreases absenteeism and turnover, and provides higher levels of satisfaction, productivity and ENG, through the mediating effect of higher perceived organizational support (Ma, 2018). Accordingly, these employees don't leave their jobs behind when they are off the clock; however, they carry their projects with them 24/7 until they meet the deadlines and expected outcomes (Forbes, 2013). Hence, work flexibility is highly contagious, with positive consequences for individuals as well as organizations. Work flexibility has a direct positive impact on one's performance, as well as indirect effect on the functioning of other life spheres (Greenhaus & Powell, 2006). Such opportunities for flexibility has provided employees with feelings of control, as well as self-efficacy which in turn influences their inspiration and input at work, and was associated with higher motivation, ability and opportunity to be more productive and higher performers (Pedersen & Jeppesen, 2012).

In order to catch up with the rapid changes at work as well as diversity of workforce, organizations need to be more proactive towards building and sustaining work ENG. Interventions do not need to be expensive to succeed; simple strategies could work such as those that make people feel they are respected, involved, heard, well led, and valued by those they work with (Lockwood, 2007). Hence, organizations are currently faced with challenges to improve employee ENG in order to retain committed and productive employees. Organizations that focus on what employees want and are perceived as supportive, are those who fill the ENG gap successfully, close the loop of differences in expectations between the employee and the organization, and push employees to become more engaged and consequently motivated to perform higher (de Menezes & Kelliher, 2011). Flexible work arrangements (FWA) are those options that advocate for flexibility in terms of "where" work is done, and "when" work is done (Hill, Hawkins, Ferris, & Weitzman, 2001). Such flexible work arrangements can be traced back to the pre-industrialization era in the United States whereby most workers were either farmers or self-employed who determine their own work schedules (Ronen, 1981). For instance, employees who can use flexible work arrangements can better utilize their resources to meet expected goals and gain more control over their work. Hence, again FWA can counteract potential stress that might arise due to imbalance between professional obligations as well as personal obligations, therefore employees become more energetic and willing to invest at work (Bal & De Lange, 2015).

Work Life Integration

There is contrasting evidence on the impact of number of working hours on residents' wellbeing. The Accreditation Council of Graduate Medical Education (ACGME) has initially restricted the maximum number of working hours to 80 hours per week in 2003, after which 16-consectutive hours restriction was put in place based on the recommendations of the 2009 Institute of Medicine report on resident duty hours (Ulmer et al., 2009). In addition to the several healthcare system factors that affect physician's burnout, the number of working hours has significantly correlated with burnout (Barrack, Miller, Sotile, Sotile, & Rubash, 2006). EE and DP correlated significantly with the number of hours worked by week by surgeons ($p < .0001$) and nights on call per week (Balch et al., 2010). A threshold effect was also observed at ≥2 nights on-call/week, with a burnout rate at 29.7% for ≤one call night per week compared with 44.6% to 45.8% for ≥two night calls per week ($p < .0001$) (Balch et al., 2010). Researchers have reported an independent relationship between burnout and number of working hours, whereby there was a 3% increased odds of burnout for each additional hour per week, and 3-9% increased odds of burnout for each additional night or weekend on-call (American Medical Association, 2019). Another study by Elmariah, Thomas, Boggan, Zaas, and Bae (2017) supported these results whereby it was reported that working hours might not be the main reason behind burnout. However, the night float rotations, which were created in response to the Accreditation Council of Graduate Medical Education (ACGME) duty hour rules, have created a new source for burnout. Among inpatient rotations, residents rotating on night float rotations were burned out than on other

inpatient rotations. In addition, of all specific rotations, residents on the night float rotation were the most burned-out (3.84, $p<0.001$ relative to other inpatient rotations) (Elmariah et al., 2017). The higher number of medical errors were also reported for residents who work 60 hours or more per week, and those were twice likely to attribute the error to burnout (20.1% vs. 8.9%) (Balch et al., 2010).

It has been well-documented that extended-duration shifts cause higher rates of burnout among residents (Mchill, Czeisler, & Shea, 2018). For example, interns, who work five or more extended-duration shifts per month reported more failures to focus during lectures and clinical rounds (Barger et al., 2006). These interns also reported three times the number of fatigue-related preventable medical errors or adverse events, leading to fatality (Barger et al., 2006). Sleep loss by residents causes fatigue, which in turn serves as an additional risk to the physician and patient safety. Objective data has shown that alertness was significantly lower on mornings after on-call nights compared to regular shifts ($p< .001$) (Basner et al., 2017). It is noteworthy to mention that both insufficient sleep and high work demands are well-known causes of physiological and subjective stress, and are potential precursors to burnout (Söderström, Jeding, Ekstedt, Perski, & Åkerstedt, 2012). Moreover, the number of night shifts had been an indicator of resident burnout, and burnout was reported higher for residents who experienced night shifts a day before completing the survey (Söderström et al., 2012).

There were concerns that if the reduction of working hours is not coupled with hiring of more resident physicians, then theoretically residents will be asked to complete more work during a shorter period of time, and work compression will occur; thus

stressors and burnout will be maintained (McHill, Czeisler, & Shea, 2018). This concern was shown to be valid according to a previous study by Ripp et al. (2015), which showed that residents' burnout decreased from 81% to 68% after implementation of the 2011 ACGME duty hour rules, and this reduction was considered insignificant. Hence, even though the limitation of working hours has caused a modest decrease in the prevalence of burnout, some scholars define this decrease as appreciable relative to the workload, while others state that the trend did not reach significance. A mild decrease in burnout could be explained by the multifactorial nature of job stress among resident physicians, which includes lack of control over scheduling, work intensity, as well as the cumulative effect of long duty hours (Gopal, Glasheen, Miyoshi, & Prochazka, 2005), in addition to the impact of the hidden curriculum on residents such as participating in life-death decisions, and caring for critical patients (Billings, Lazarus, Wenrich, Curtis, & Engelberg, 2011). Hence, the impact of the restrictions of the duty hour rules on residents' wellbeing is still unclear because number of working hours was not significantly correlated with higher levels of burnout across different populations. For example, although Dutch residents work less than U.S. residents by number of hours, their burnout levels are still considerable and need to be addressed as well (Prins et al., 2010). Residents undergo a personal and professional transformation during their residency training (Gopal et al., 2005), and some argue that the challenges that residents go through are part of the training and professional development journey. However, the high rate of burnout can cause serious hazards at the level of the residents' personal wellbeing, which can be

reflected on the quality of patient care. Hence, the balance between resident wellbeing, substantial education, and patient safety is yet to be established (Ripp et al., 2015).

Efficiency and Resources

Job resources are known to influence employees' wellbeing (Bakker & Demerouti, 2007). In addition, inefficiency in the work environment (including clerical tasks) is a global driver to burnout and dissatisfaction. One of the main resources that monitor physicians' efficiency in the healthcare is the use of the Electronic Health Records (EHRs) (Kroth et al., 2019). The introduction of EHR has occurred in parallel to the high prevalence of stress and burnout among physicians. The demanding and time consuming repetitive and routine process of communicating with EHR for every single patient, has imposed additional clinical stressors such as electronic prescribing, electronic order, electronic degradable data to be entered, etc. (Kroth et al., 2019). Although the introduction of electronic health records (EHRs) has several benefits on the healthcare system, in terms of improved ability to remotely access patient information and improve quality of care, it is has been a time consuming system that encounters degradation of clinical information (Friedberg et al., 2014). It has increased the clerical burden on physicians, and interfered with the patient-physician relationship, and hence distracted physicians from the meaningful aspects of their work. Zulman, Shah, and Verghese (2016) stated that "There is building resentment against the shackles of the present EHR; every additional click inflicts a nick on physicians' morale" (p. 923). Physicians have already shown high rates of dissatisfaction with using this tool, whereby only around 30% believed that the time used on EHR for entering and reviewing patient-related data

was reasonable, and around 25% of the physicians considered the time spent on clerical tasks while using EHRs as reasonable (Shanafelt et al., 2016). On the other hand, EHRs have revolutionized patient care, and have enabled patients to access their records, obtain their tests, and communicate with their physicians with a finger click. Although this has increased patient satisfaction, it has increased the physicians work demands and time demands, as well as exposed physicians to liability, in addition to the lost productivity since most of the patient-physician computerized interactions are not reimbursable (Iezzoni, 1999; Linzer et al., 2009). An audit has tracked the use of EHR by physicians, and it showed that completing clinical documentation accounts for 33% of time spent using the EHR, while 18% of their time was used for communicating with the patient and managing their inbox (Kroth et al., 2019). In addition to the time consumption associated with using EHR, users have reported that a long learning curve is required to be able to navigate the system easily and troubleshoot, and this was perceived as an extra EHR workload (Khairat et al., 2018). In addition, most EHRs focus on processes rather than on patient outcomes, which adds to the physician's workload. A time motion study was done on 142 physicians in Wisconsin, and it found out that physicians spent 44.2% of their EHR time on clerical and administrative tasks, which added stress on the physicians (Arndt et al., 2017). Another study quantified the allocation of physician's resources during office hours, and it reported that for every hour of direct face-to-face interaction, two additional hours are spent using EHR (Sinsky et al., 2016). Researchers concluded that increased workload from EHR tasks are major contributors to career dissatisfaction among physicians (Shanafelt et al., 2012; Shanafelt, Dyrbye, et al., 2016)

Meaning at Work

Work ENG has been initially defined based on the psychological state of employees, which drive their attitudes, behaviors, and level of attachment towards work (Kahn, 1990). Kahn argued that employees are engaged when their "preferred self" is manifested in the workplace. In addition, research has shown that a meaningful work environment is one of the most significant factors that affect work ENG, whereby it accounted for 16% of the total variance in ENG scores (Fairlie, 2011). Employees spend more than one third of their lives at work, and the bulk of their identity is formed experientially at work (Ciulla, 2000). For instance, most individuals seek to find a career that fulfills them in ways other than just money (Frankl & Lasch, 1992). The importance of meaningful work is not just limited to the individual, but it is also reflected on the organization, and research has shown that psychological meaningfulness has mediated the positive relationship between work resources and work ENG (Olivier & Rothmann, 2007). Meaningfulness was also related to positive job-related outcomes such as higher organizational commitment, better organizational performance, in addition to easier coping with change (Baumeister & Vohs, 2002). Meaningfulness at work entails "life meaning, purpose and coherence" (Ryff, 2000, p. 132). Meaningfulness at work has common dimensions that are not only represented by how much an employee finds their work meaningful, but also by the extent to which one's work is integrated into a broader context and has a greater purpose (Martela & Pessi, 2018). These dimensions address autonomy, achievement, personal growth, professional development, competence, self-realization, and fulfillment. All these items seem to encourage the process of

transformation for individuals who want to transform themselves as well as the world around them. These are employees who want to be involved in bigger tasks, and have a passion and desire to experience their work as well as their lives as meaningful (Adhiya-Shah, 2016; Cameron, Kim S; Dutton, Jane E; Quinn, 2003). Hence, these employees advocate for additional work demands, which is known as job crafting, that have potential to produce greater good (Diddams, Whittington, Rodgers, & Ciulla, 2003). Meaningful work is associated with positive organizational commitment, through four pathways; (1) positive impact on wellbeing of employees, (2) important personal value, (3) contagious effect on other job characteristics, and (4) building supportive relationships among people (Lips-Wiersma, Haar, & Wright, 2018). Transformational leadership style has proven its effectiveness in creating meaning at work, while job design creates meaning in work, and the person's integrated faith brings meaning to work (Arnold, Turner, Barling, Kelloway, & McKee, 2007). Leaders play a crucial role in creating a positive work environment that motivates and inspires people to innovate, through consistently articulating a vison that provides employees with clear and systematic strategic objectives; hence, this provides employees with clear understanding on how their job contributes to the organization's purpose (Arnold et al., 2007). In addition, transformational leadership focuses on the employees' strengths and capabilities, and pushes employees to achieve extraordinary results through revealing their potential and creating a positive climate that endorses gratitude and compassion (Cameron, 2012). Specific job characteristics have an important role in motivating employees. Complexity of task, its identity (completing a full task rather than part of it),

as well as its significance, in addition to the presence of feedback, and the amount of control that an employee can exercise in performing his job (Oldham, Hackman, & Pearce, 1976). The correlation between each of the meaningfulness dimensions and others of work ENG has been positively and significantly correlated, whereby ENG has mediated the positive relationship between meaningfulness and employee outcomes such as job satisfaction, affective commitment, and organizational citizenship behaviors (OCBs) (Cameron, Dutton, & Quinn, 2003). A longitudinal study was conducted to examine physician wellbeing by cultivating efficiency, autonomy and meaning at work. These interventions were associated with lower levels of burnout and higher rates of satisfaction at the organization level over a 4-years interval (Dunn, Arnetz, Christensen, & Homer, 2007). In addition, further research has proved that mindfulness strategies that encourage self-awareness and reflection motivates physicians to identify what they value and connect with what is most meaningful for them (Shanafelt, 2009). These physicians developed lower levels of burnout and mood disturbance, and higher levels of empathy (Krasner et al., 2009). In addition, further research has supported the proposition that meaningful work and resilience are positively correlated through the mediation effect of work ENG and job crafting. Hence, meaningfulness at work enables employees to develop resilience and control burnout through effectively negotiating, adapting and managing substantial sources of stress (Hobfoll, Johnson, Ennis, & Jackson, 2003). As for resident, the time spent on administrative tasks rather than patient care can result in detachment and reduced sense of meaning at work, which adds stress and pressure, and may ultimately result in burnout (Ironside et al., 2019).

Organizational Support and Leadership

WHO (2019) has explicitly stated that burnout is a result of workplace stressors that have not been successfully managed. Hence, the reminiscent power of this syndrome lies in its ability to capture people's experiences in the workplace. What is more evocative is the ability of "burnout" to impact productivity negatively in a way that being a significant concern in the healthcare field that deals with patients (Dewa, Loong, Bonato, Thanh, & Jacobs, 2014). In addition to the negatively patient-reported outcomes (Hall, Johnson, Watt, Tsipa, & O'Connor, 2016b), burnout has been positively associated with intent to leave, early retirement, sick leaves, intent to decrease clinic hours (Dewa, Jacobs, Thanh, & Loong, 2014b; Dewa, Loong, et al., 2014; Soler et al., 2008; Zhang & Feng, 2011). In the U.S. alone, job stress costs the economy over $300 billion annually as a result of accidents, absenteeism, employee turnover, diminished productivity, direct medical, legal, and insurance costs, as reported by the American Institute of Stress (2019). Hence, any organization should deal with burnout actively, and implement interventions as well as prevention strategies to decrease the occurrence or impact of its contributors. Most research has presented burnout as a simple guise: it is a result of heavy work demands, long duty hours, and work compression. Job is often defined in terms of specific tasks and not the broader organizational context (Maslach et al., 2001). In fact, further research has identified several organizational risk factors as possible contributors to burnout, such as role ambiguity and unclear objectives, a lack of social support, and perceptions of unfairness at work (Lee & Ashforth, 1996; Maslach & Leiter, 2008). Hence, in theory, leaders should be shielding their followers from these stressors, and

they should counter this kind of burnout by giving employees clear and realistic goals, the support and resources they need to meet those goals, and appreciation for a job well done.

Poor leaders may drive burnout and decrease job satisfaction. However, good leaders should be nurturing a healthy workplace, which is the antidote to burnout. Maslach et al. (2001) have identified six key components of burnout which are: workload, control, reward, community, fairness, and values. Hence, ignoring these six ingredients by the leaders is a recipe for burnout. However, leaders who are mindful of these components have an opportunity to foster a work environment that serves "Joy" at work. Good leadership, whether in the form of an inspiring manager, receiving regular feedback, or simply knowing that a leader will support the employee, can help prevent burnout as reported by a recent study done at Mayo Clinic by Shanafelt et al. (2015). Scholars have assessed the ethical leadership qualities among leaders using the “Ethical Leadership Questionnaire”, and have found that this leadership type is negatively related to burnout when the latter was measured using Maslach inventory tool (Okpozo et al., 2017), and positively related to work ENG when they used the shortened Utrecht work ENG scale (Demirtas, Hannah, Gok, Arslan, & Capar, 2017). These leaders articulate behaviors such as role clarity and fair distribution of workload, which are both are negatively related with staff burnout (Vullinghs, De Hoogh, Den Hartog, & Boon, 2018). In addition, another study has measured leadership among supervisors using the “transformational leadership style questionnaire”. This style is very well known for encouraging open communication with followers, and has proved that it serves as a

resource that decreases stress, and eventually prevalence of burnout among employees (Hildenbrand, Sacramento, & Binnewies, 2018). Scholars have also assessed the correlation between leader-member exchange relationship quality and burnout. Leader–member exchange was measured using a tool consisting of a single factor of seven items tool known as LMX-7, and results found out a negative correlation between leader–member exchange and burnout (Lee & Ji, 2018). Different literature sources demonstrate that supervisors are influential in retaining talent, contributing to staff satisfaction, as well as improving their wellbeing (i.e. decreasing burnout and improving work ENG) (Mendes & Stander, 2011).

In addition to the role of the individual department leaders in improving the healthcare worker's wellbeing, the organization should support this mission though quadrupling its healthcare system's aims, and adding a fourth aim which focuses on improving the staff wellbeing (Bodenheimer & Sinsky, 2014). This suggestion has been made in action since the disengaged and burned out employees affect the achievement of the triple aim (i.e. enhancing patient experience, improving population health, and reducing costs) negatively. For resident physicians, the main concern of the healthcare system would be endorsing a supportive and health work environment as well as learning environment, that are committed to the intentional ENG of residents (Wieneke et al., 2019). Studies have shown that perceived organizational support (POS) significantly decreases burnout levels among employees. Wattoo, Zhao, and Xi (2018) have measured organizational support by using the perceived organization support questionnaire developed by Eisenberger (1986), and have supported the hypothesis that POS improves

worker's wellbeing, through encouraging them and acknowledging their efforts, rather than just providing them with financial support. Such efforts improve employees' citizenship behaviors, as well as their performance on the job through increasing work ENG (Podsakoff, Ahearne, & MacKenzie, 1997). Additional studies have studied the direct relationship between POS and burnout domains, and found significant negative correlation between both cynicism and POS (Kanbur & Canbek, 2018). This is explained by the assumption that employees who perceive higher organizational support should perceive greater incentives (March & Simon, 1958), which can increase instances of positive mood at work and decrease stress levels, and which can then cause positive associations with the organization itself, and improve commitment as well as work ENG (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002). Such improved work ENG and organizational commitment can decrease intent to leave among workers (Adan Gök, Akgündüz, & Alkan, 2017). Nonetheless, supervisor leadership styles and organizational support interact together to affect staff performance and wellbeing.. However, although the theory of burnout is based on the relationship between the individual and his or her workplace, interventions have focused on improving the resilience of an individual to withstand this imbalance rather than identifying and ameliorating the cause. If the organization communicates and promotes the organization vision to employees, seeks their feedback, gets their acknowledgement of the vision and strategic plan, then it's easier to gain their buy-in and commitment towards the organizational goals. This positive interaction could encourage subordinates to behave in

a focused way towards achieving the organization mission, while increasing their work ENG and satisfaction (Tsai, 2011).

Factors Associated with Healthcare Staff Productivity

Leadership and Quality of Care

Quality of care is a vital metric of healthcare staff productivity. The Institute of Medicine defines the quality of care as the degree to which achieving the expected health outcomes depends on the professional knowledge and skills of health services personnel (Institute of Medicine, 1990). Following the famous Donabedian approach by the National Academy of Medicine, quality measures are structure, process, and structure (Berwick & Fox, 2016). Measures on patient outcomes could fall short in any of these domains and could result in higher hospital mortality levels, higher adverse events, higher cognitive medical errors, higher technical, medical errors, or inadequate patient care management practice (Lang, Hodge, Olson, Romano, & Kravitz, 2004).

Many studies have identified that leadership styles affect the quality of care, whereby significant positive associations have been found between effective leadership and high levels of patient satisfaction, as well as reduction of adverse events (Wong, Cummings, & Ducharme, 2013). For example, Wong et al. (2013) suggested positive relationships between positive relational leadership styles and higher patient satisfaction and lower patient mortality, medication errors, restraint use, and hospital-acquired infections. A significant positive relationship has also been found between task-oriented leadership and quality of care (Havig, Skogstad, Kjekshus, & Romøren, 2011). In addition, leadership styles were studied among nurses at the University of Alberta, and

the variance in their leadership styles explained 5.1% of 72.2% of total variance in mortality across hospitals, whereby lower mortality rates were significantly related to a highly resonant leadership style (Cummings, Midodzi, Wong, & Estabrooks, 2010). Further research supports that empowering leadership is related to higher patient outcomes via staff stability and reduced burnout (Page, 2004). Higher quality of patient care has also been reported for consensus leadership style (Castle & Decker, 2011), in addition to formal leadership style, which was associated with moderate patient safety events (Cummings et al., 2010).

Motivating healthcare staff is key to meeting the changing demands of healthcare services. Team leaders should always encourage staff to engage in a deliberate inquiry, and provide an environment of innovation and support, in order to incentivize these staff to use their potential to meet the demanding and rapidly changing environment. However, when team members are demotivated, then their performance at work deteriorates. Since these members are working in the healthcare sector, and quality of patient care is an essential part of their productivity; the quality of healthcare that is provided will be less effective and less efficient (Kasenga et al., 2014). Poor leadership can also cause employees to become stressed, and evidence supports that stressed staff produces inferior care (Gerrity, 2001) that has been reported in terms of cognitive errors related to medical decision making (Firth-Cozens & Greenhalgh, 1997).

Burnout and Patient Outcomes

Quality of patient care is a vital metric of healthcare productivity, and it reflects the degree to which expected health outcomes are attained in line with gold standards of

medical knowledge, skills, and abilities (Institute of Medicine, 2001). For instance, medical errors and patient safety are an essential concern for patients and physicians. Several studies had reported that hospitalized patients are profoundly affected by medical errors (Robbennolt, 2009), and the 1999 report by the Institute of Medicine noted that between 48,000 and 98,000 Americans die each year due to preventable adverse events (Institute of Medicine, 1999). On the other hand, several studies have reported a negative relationship between physician's burnout and quality of patient care (Hall, Johnson, Watt, Tsipa, & O'Connor, 2016b; Klein, Grosse Frie, Blum, & Knesebeck, 2010; West et al., 2006).

Personal distress and decreased empathy have been linked to increased odds of future self-perceived errors among internal medicine residents at Mayo Clinic Rochester (West et al., 2006; West, Tan, Habermann, Sloan, & Shanafelt, 2009). The same research was replicated around the world, and results in Germany have confirmed that burnout is associated with suboptimal psychosocial care, diagnosis/therapy, quality assurance, diagnostic errors, and therapeutic errors (Klein et al., 2010). In addition, reporting perceived medical errors was highly associated with lower mental quality of life, whereby a seven-point increase in EE was associated with a doubled risk of depression and increased reporting of a significant medical error within the last three months (Shanafelt et al., 2010). While ensuring safe patient care is a top priority of hospitals, burned out physicians working in intensive care units (ICUs) in Switzerland have subjectively rated lower safety, and this has been confirmed objectively through higher mortality ratios (Welp, Meier, & Manser, 2015). Moreover, additional research on this

subject was done across East Asia, Europe, the Middle East and North America, and a systematic review of the literature showed that 27 out of the 46 identified studies reported a significant correlation between wellbeing and patient safety, with another six studies, found a correlation with some but not all scales used (Hall et al., 2016). These studies signify that both physician's wellbeing and burnout may be important targets for patient safety interventions.

Increasing physician burnout leads to reduced time spent with patients, which could lead to the missed diagnosis of comorbid conditions, such as depression, that would increase recovery times for hospitalized patients post-discharge (West, Dyrbye, & Shanafelt, 2018). In addition, physicians may be more likely to make medical errors due to suboptimal care practices, which increases the risk to the safety of patients (Shanafelt, Bradley, Wipf, & Back, 2002). Research on this subject has also shown that burnout had a significant positive relationship with reduced patient satisfaction, and this is alarming given the importance of patient satisfaction as a benchmarking quality outcome indicator among hospitals (Salyers et al., 2017). Additional cross-sectional studies have also reported significant correlations between physician burnout and both job satisfaction (Sharma et al., 2008)) and patient satisfaction with hospital care (Halbesleben & Rathert, 2008; Shanafelt, Balch, et al., 2009; Shanafelt, West, et al., 2009), and between physician job satisfaction and patient-reported adherence to medical advice (Dewa, Loong, Bonato, & Trojanowski, 2017; DiMatteo et al., 1993). These associations suggest a prospective effect of burnout on patient satisfaction and physician-patient relationships, with consequent effects on healthcare outcomes.

Burnout also had a medium-sized relationship with lower perceived (provider-reported) quality of care (Salyers et al., 2017). A 3-year longitudinal study was done in New York in 101 ambulatory clinics, including 426 physicians, showed a significant relationship between burnout and self-reported likelihood of error, as well as sub-optimal patient care (Williams, Manwell, Konrad, & Linzer, 2007). Current levels of physician's burnout are placing the health of doctors as well as their patients at stake, and research is being done worldwide to address this subject. A multicenter study was done in Ireland and demonstrated that a considerable proportion of residents are burned out, more than their counterparts in the USA, and this was associated with higher levels of self-reported errors (O'Connor et al., 2017). In order to further confirm the real effects of the residents' burnout on medical errors, an observational study was done, whereby a two-step surveillance methodology was conducted to measure and categorize medical errors (Brunsberg et al., 2019). The researchers found that the mean number of harmful medical errors for residents had a statistically significant correlation with positive levels of burnout among residents (Brunsberg et al., 2019).

While measuring the physicians' professional fulfillment and burnout, and exploring its relation to self-reported errors, a significant correlation was found between the professional fulfillment index burnout scales and perceived quality of care (Trockel et al., 2018). Burned out physicians have reported the higher occurrence of errors related to ordering wrong lab tests, ordering wrong medication, making a medical error that resulted in patient harm, and making a significant medical error that could have resulted in patient harm (Trockel et al., 2018). To provide further evidence on the effects of

burnout of patient safety, a large national study was done in the U.S., and it included 6,586 physicians. Perceived significant errors were independently more likely to be reported by physicians with burnout, and the odds of error increased by 5% for each one-point increase in EE, and by 10% for each one-point increase of depersonalization, and by 5% for each one-point decrease in personal accomplishment (Tawfik et al., 2018), consistent with prior studies (Shanafelt et al., 2010; West et al., 2006, 2009). From a psychological perspective, it was reported that those physicians who identify themselves as mentally healthy report higher wellness, lower burnout, and better quality of patient care (Eckleberry-Hunt, Kirkpatrick, Taku, & Hunt, 2017). All this evidence on the correlation between burnout and lowered clinical care necessitates implementing a multifaceted approach towards combatting physician burnout, promoting wellbeing, and improving the patient safety infrastructure.

Burnout and Performance Levels

Burnout can occur across all professional workers in all fields; however, it has mostly prevailed among physicians. Physicians are at increased risk of burnout (odds ratio, 1.39) than other working U.S. adults (Shanafelt et al., 2019) About one third to one-half of physicians of various specialties experience at least one dimension of burnout (Dewa, Loong, et al., 2014). There has been an increasing interest in the well-being of physicians due to its evidence-based impact on the quality of healthcare. In addition to the effects of physicians' burnout on the healthcare system quality, burnout affects different types of healthcare system productivity, in terms of operational and financial costs. However, this economic burden has been less clear than the impact of burnout on

the physician's quality of care and quality of life. Estimating the economic cost of burnout is an essential first step towards informing healthcare administrators on the importance of endorsing an organizational strategy that prioritizes the physician's wellbeing.

In a longitudinal study done at the Mayo Clinic between 2008 and 2013, administrative/payroll records were used to track the actual professional work effort of physicians who participated in this study (Shanafelt, Mungo, et al., 2016). The actual professional work effort was measured in full-time equivalent (FTE) units, and other standardized tools were used to measure burnout and satisfaction. Results have shown that each 1-point increase in EE and each 1-point decrease in satisfaction was associated with a 28% and 67% greater likelihood, respectively, of reduction in professional effort and work hours. Hence, burnout and declining physician satisfaction were strongly associated with an actual decrease in professional work (Shanafelt, Mungo, et al., 2016). When extrapolated to the national level in the United States, this loss is roughly equivalent to the loss of the graduating class of 7 medical schools. It is noteworthy to mention that this loss is due to the number of working hours, and it does not include other potential impacts such as early retirement or change of careers (Shanafelt, Mungo, et al., 2016). A systematic review of the literature has reported significant negative relationships between the three dimensions of burnout and the productivity measures used (Dewa, Loong, et al., 2014). These productivity measures include sick leave, intent to change jobs, intent to continue to practice medicine, and the ability to work (Dewa, Loong, et al., 2014). Further studies support the relationship between burnout symptoms

and physicians leaving their clinical practices, whereby 12.5% of middle career physicians were more likely to plan to leave the practice due to their highest levels of burnout and lowest satisfaction among different career levels (Dyrbye et al., 2013).

Soler et al. (2008) found a negative relationship between sick leaves and burnout, whereby those who had at least one sick leave day during the year had significantly higher odds of reporting EE, depersonalization, or low personal accomplishment. In addition, Soler et al. (2008) and Zhang and Feng (2011) has also found a significant relationship between burnout and intention to change job, whereby between 42 percent and 66 percent of physicians who experienced at least one dimension of burnout considered changing jobs. Besides, 44 percent of the physicians who reported burnout indicated that they intended to discontinue their current medical practice within four years (Hoff, Whitcomb & Nelson, 2002). The link between burnout and intent to leave medicine suggests that there are burnout costs on the healthcare system, and it is highly valuable to quantify these costs in order to inform healthcare administrators on the importance of implementing initiatives towards reducing physician's burnout.

By using data from the Canadian national physician sample survey (2007-2008), it was estimated that the health service loss due to early retirement was $185.2 million and $27.9 million for reduced clinical hours (Dewa, Jacobs, Thanh, & Loong, 2014). As the healthcare expenditures are expanding, this information highlights the importance of promoting activities that address burnout among physicians. In addition, the U.S. national cost-consequence analysis has investigated the economic burden associated with physician burnout, and it examined two direct cost components: the cost associated with

physician replacement as well as cost related to lost income from unfilled positions (Han et al., 2019). By auditing both cost components, it was estimated that physicians' burnout costs the healthcare industry between $2.6 billion and $6.3 billion each year, with a baseline of about $4.6 billion due to physician turnover, reduced number of clinical hours, and other burnout related factors (Han et al., 2019). In addition, at an organizational level, each employed physician contributes from $4,100 to a maximum of $10,200 towards the burnout-attributable costs, with 95% of physicians ranging between $6,100 to $8,700 per physician (Han et al., 2019). The same study reported that losses due to turnover costs were higher than the costs of reduced productivity (Han et al., 2019). Hence, these findings, along with other reported evidence, suggest a significant economic value for healthcare administrators and policymakers to invest time and funds to reduce stress on their physicians. These facts should encourage healthcare institutions to monitor and measure physician's wellness as a quadruple aim, in addition to three aims of improving population health, increasing patient satisfaction, and reducing per-capita healthcare spending.

Further research has shown that patients tend to recommend their physicians to others if they judged them as "empathetic" (Vedsted & Heje, 2008). Another cross-sectional study done in Spain found that burned out physicians received fewer visits (18.1 vs. 18.9), whereas more empathetic physicians received more visits per patient (19.4 vs. 17.2) (Yuguero, Melnick, Marsal, Esquerda & Soler-Gonzalez, 2018). Hence, the number of annual visits per patient that healthcare professionals receive is closely associated with the physician’s empathy and burnout.

On the other hand, small studies have shown that there is a higher possibility of referrals and greater resource utilization among physicians who experience burnout and more onerous work demands (Bachman & Freeborn, 1999; Kushnir et al., 2014). In addition, physician burnout may affect healthcare expenditures indirectly via medical errors and preventable complications and morbidity (Shanafelt et al., 2010; West et al., 2006, 2009). For example, surgical complications are associated with a 96.6% increase in hospital charges (Kalish et al., 1995). According to a large study that was done in New York, and included 30,121 randomly selected records, adverse events occurred in 3.7 percent of the hospitalizations, and 27.6 percent of them were due to negligence (Brennan et al., 1991). Another Canadian study has shown that preventable adverse events occurred in 16.9% and death in 20%. The study also reported that additional 1521 hospital days were associated with adverse events for 1527 patients, which was reflected as higher preventable healthcare costs (Baker et al., 2004).

Burnout and Empathy

Self-reported medical errors are just one clinical indicator of physician's burnout. Burnout has proven to have an impact on other clinical indicators, including "Empathy." Medicine is no more limited to the biomedical paradigm of diseases, as postulated by the German physician Robert Koch and the French scholar Louis Pasteur (DeKriuf, 1926). This microbe hunting model of diseases serves as a limited scope of medicine (DeKriuf, 1926), and is no more consistent with the triangular biopsychosocial paradigm of illness (Engel, 1977), which addresses the patient as a human being that needs to be cured as a system, in relation to the biological, social, and psychological elements (Hojat et al.,

2017). Hence, there needs to be a holistic care system approach, which applies the science of medicine in the context of human relationships, which offers optimal patient care that is entirely personal, rather than just treatment of diseases which could be entirely impersonal (Peabody, 1984). While considering the physician-patient relationship, empathy is a crucial element in the holistic care system. The constitution of the World Health Organization (1948) has defined health as "a state of complete of physical, mental, and social wellbeing, and not merely an absence of disease or infirmity" (p. 1). Empathy is defined as a predominantly cognitive attitude that involves an understanding of patient's concerns and experiences and having the physician communicating effectively backward, to help and provide optimal patient care (Hojat et al., 2017). This necessitates highlighting the impact of physician's burnout on their empathy towards patients, because this will help to have a more insightful understanding of this association and could lead to effective interventions and improved patient care. Burnout appears to be as toxic for the clinician as for the patient. Several researchers have studied the relationship between physician's burnout and empathy towards patients. Exhausted physicians are less able to stand in the patient's shoes and listen empathetically to their concerns (Shanafelt et al., 2005). They tend to withdraw from their relationships with patients (Truchot, Roncari, & Bantégnie, 2011). Shanafelt et al. (2005) has measured physician's wellbeing using the validated Medical Outcomes Study 8-Item Short Form (SF-8) and has measured empathy using the validated Perspective Taking (PT) and Empathetic Concerns (EC) sub-scales of the Interpersonal Reactivity Index. The study results revealed that high mental wellbeing is associated with enhanced resident

empathy (Shanafelt et al., 2005). Demonstrating empathy by physicians in the workplace requires them to be able to interact with patients, understand their concerns, try to reassure the patient, and act in a helpful way. This process should be logically affected by the physician's mental health, and research has shown that increased feelings of EE and DP lead to reduced empathy for patients, and lower patient satisfaction accordingly (Walocha, Tomaszewski, Wilczek-Ruzyczka, & Walocha, 2013; West et al., 2018). A multicenter comparative study in Portugal found an inverse relationship between physician burnout and empathy, which was measured using the Jefferson scale of Empathy (Ferreira, Afonso, & Ramos, 2019). Cross-sectional research from around the world has also suggested that empathy of emergency medicine professionals is associated with burnout (Wolfshohl et al., 2019; Yuguero et al., 2017), and the same results were prevalent among 446 residents of different specialties in a recent study in Singapore (Lee, Loh, Sng, Tung, & Yeo, 2018). Another study has tracked the level of resident empathy during their long shifts, and it found that residents reported levels of stress and burnout increased throughout the shift, as well as self-reported empathy levels (Passalacqua & Segrin, 2012). Passalacqua and Segrin (2012) suggested that residents who perceive higher levels of stress are at higher risk of burnout and deterioration of empathy towards their patients. In addition, a large cross-sectional study done in China across 211 hospitals showed that anesthesiologists with a high level of DP engaged in shorter conversations with patients and provided less information about the procedures or pain; these anesthesiologists tended to have less empathy towards patients (Li et al., 2018).

ENG and Work Performance/Productivity

Performance at work is related to ENG and workers who are highly engaged have more to offer for their workplace (Harter et al., 2002; Laschinger & Finegan, 2005). The organizational outcomes of ENG are addressed using three approaches. The first is related to the employees' and teams' attitudes and behaviors that are components of ENG. It was clearly shown that these items are outcomes in an ENG mediated model with job resources being the main input (Shantz, Alfes, Truss, & Soane, 2013). The more engaged an employee is, the better performance and higher positive outcomes detected at both the individual and organization levels (Bakker & Bal, 2010; Xanthopoulou, Baker, Heuven, Demerouti, & Schaufeli, 2008). Fewer mistakes were observed by engaged medical students compared to their less engaged fellows (Prins, Van Der Heijden, & Hoekstra-Weebers, 2010). The second approach associates the employee ENG with the business success; higher levels of ENG are correlated with better organizational performance, higher customer satisfaction and profitability, lower turnover, and improved safety (Harter, Schmidt, Killham, & Agrawal, 2009; Harter, Schmidt, & Hayes, 2002). Nevertheless, evidence-based research is needed to confirm the claims of this approach.

In their meta-analysis, Harter et al. (2002) showed that there is a positive correlation between ENG and productivity. Higher ENG due to higher organization support results in the optimal quality for delivering patient care (Laschinger & Leiter, 2006). Employee performance is highly related to ENG core measures/indicators (Wildermuth & Pauken, 2008). This is due to the satisfied core characteristics of work

ENG that were described by (Green, Finkel, Fitzsimons, & Gino, 2017), and which include positive emotions, feeling of energy, and positive job-oriented behaviors.

Workers who can manage to use their energy at work efficiently and focus on delivering their best, are employees who are willing to receive more information, be more productive, and go beyond the call of duty (Bakker, 2011). Work ENG depends on two resources, the job resources and the employees' own resources (Bakker, 2011). Once fulfilled, satisfaction, efficiency at work, better results, enthusiasm and joy, well-being, determination, hard work, and job crafting may result and subsequently lead to better ENG and effectiveness as well as higher productivity (Bakker, 2011).

Productivity was measured using the "Earned Value Management System" (EVMS) by Davidson (2010). Davidson (2010) assessed if the dissemination of employee ENG programs was effective; he used the EVMS scoring system to measure productivity and explore any relation between employee ENG and productivity in skilled workers and engineers. In his study, the information that was collected using the EVMS in order to determine the productivity measures: schedule performance index (SPI) and the cost performance index (CPI). The employee ENG programs that were deployed did not have an effect on the productivity that was assessed using the schedule performance index and the cost performance index scores (except for the schedule performance index in the skilled workers, but also could not be totally attributed to the ENG programs performed).

Considering that employees are the building blocks of any organization (Reijseger, Peeters, Taris, & Schaufeli, 2017), if work ENG indicators are met and employees are motivated, better performance is achieved (Bakker & Demerouti, 2007). It

is essential to determine the importance of employees ENG positive effects on performance under the "happy-productive worker hypothesis" (Fisher, 2003), instead of only considering burnout alone as an indicator of the negative work life environment (Halbesleben & Buckley, 2004). The job features play an important role in determining the motivational drive and psychological attributes of an employee (Hackman & Oldham, 1976; Schaufeli & Bakker, 2004). To address this, the Job Demands-Resources model of work ENG that was described by Bakker and Demerouti (2007) should be used. Performance indicators have been proven to be correlated with ENG, i.e. organizational commitment (Hakanen, Bakker, & Schaufeli, 2006; Hakanen, Schaufeli, & Ahola, 2008), absenteeism (Schaufeli, Bakker, & Van Rhenen, 2009), self-reported medical errors (Prins et al., 2009), customer satisfaction (Marisa Salanova, Agut, & Peiró, 2005), innovativeness (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008), and organizational revenue (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). Roe (1999) classified performance into two categories (aspects): Process (behavior) performance and outcome (products/output) performance. Process performance consists of the extra-role behavior (Smith, Organ, & Near, 1983), in-role behavior (Goodman & Svyantek, 1999), and counter-productive behavior (Fox & Spector, 1999). Outcome performance includes all that precedes performance at the individual, team and institutional level i.e. productivity and absenteeism.

Job satisfaction and performance. Employee performance at work is associated with individual job satisfaction, which is mostly related to the satisfaction with the supervisor or the manager (Judge, Thoresen, Bono, & Patton, 2001). As described in

Harter et al. (2002) meta-analysis, productivity measures can be summarized as: (1) Revenue figures, (2) Revenue-per-person figures, (3) Revenue per patient, and (4) Managerial evaluation (which is based on the available measures at the business-unit). It was revealed that both the overall satisfaction and employee ENG are correlated with productivity with a 0.2 and 0.25 correlation coefficient respectively. Monthly revenues, from business units with high ENG scores, were approximately from $80,000 to $120,000 (and might be up to $300,000) higher. In contrary, other researchers (Fisher, 2003; Wright & Cropanzano, 2000) found a weak or even no relationship between satisfaction and performance/productivity. This might be due to that fact that satisfaction does not relate to consciousness at work as much as burnout and ENG do (Büssing & Bussing, 1992).

Work stress effects and productivity. It was demonstrated that productivity and work stressors as well as psychological well-being are highly correlated (Donald et al., 2005; Jacobs, Tytherleigh, Webb, & Cooper, 2007); Productivity can be hindered by high stress levels encountered by workers (Gmelch & Miskin, 1993), and thus decreasing or alleviating the pressures causing job stress helps in increasing productivity. Stress was measured using the ASSET- An Organizational Stress Screening Tool (Cartwright & Cooper, 2002). Burnout and ENG were assessed in Danish resident doctors to determine their well-being (they also collected sociological and demographic data) through a self-report questionnaire (Prins et al., 2010). They found a relationship between burnout and patient optimal care (the higher the burnout levels, the lower care quality). Burnout was

measured using the Maslach Burnout Inventory (Dutch version), while ENG was measured using the Utrecht Work ENG Scale.

Sedentary behavior and productivity. Productivity is associated with sedentary behavior (Holden et al., 2011; Puig-Ribera et al., 2015), and together with ENG are considered as predictors of the job-related employees health (Schaufeli et al., 2008). High work-related sedentary behavior was associated with the lowest level of efficiency among workers (age between 20 and 39 years in the Japanese population) with an Odds Ratio (OR)=1.38, p=0.02 compared to low work related sedentary behavior (Ishii, Shibata, & Oka, 2018). The measurement tool used to assess productivity was the Health and Work Questionnaire (Shikiar, Halpern, Rentz, & Khan, 2004).

Work environment and productivity. The work environment design is key in determining the organizational performance and future outcomes (Haynes, Saurin, Ratcliffe, & Puybaraud, 2008; Kotler & Rath, 1988; Mitchell-Ketzes, 2003). Productivity is significantly influenced by the work environment design and any changes that the employees believe are important can increase their work performance and behavior (Gould, Dao, & Kovacsics, 2009). The environment design includes the office environmental factors that influence productivity, that are listed by Kegel (2017) to be temperature, air quality, lighting, and noise, with the lightning having the highest importance according to Hameed and Amjad (2016), but temperature and sound according to Mak and Lui (2012). Others such as Allen and Allen (2007), Chaboki et al. (2013), Hua, Loftness, Kraut, and Powell, (2010), and Chaboki et al. (2013) highlighted

the importance of work environment layout and its effect on the workers and institutional productivity.

Office productivity was measured using a tool provided by Haynes (2008) which is based on the following: Worker comfort, Spatial configurations, Interaction, and Distraction. Organizational cultural change impacts employees' productivity, that is described as the organizational "revenue, employment, stock price, and net income growth" at the level of the intrinsic transformation (Pueschel, 2017). At this stage, the leader at the organization, should be aware of the factors that might improve office productivity, and be ready to help the employees overcome the challenges during this transition through proper communication and leadership values (Zacher & Jimmieson, 2013). Productivity is the product of both the organizational work force and the customer feedback, which was described in the equation of productivity: productivity = ((output x quality factor)/input). Organizations who succeeded in adapting to culture change had an increase in their revenue growth, employment rates, stock price elevation, and net income increase (Kotter & Heskett, 1992). In this study, changes in the organizational culture did not affect the institutional productivity and therefore the two cannot be associated (Pueschel, 2017).

Summary

In summary, the importance of perceived program director support and perceived department support, as well as the effects of these two kinds of social exchanges on burnout has been studied among different populations, but not among resident physicians. There have been few studies conducted on the interactive effect of both exchanges on

work ENG; none of them has addressed resident physicians. In addition, the unique connection between leader-member exchange and perceived department support, when considered together with the specific outcomes on quality of care, is yet to be understood. Limited research has addressed the impact of leadership on quality of care with inconclusive findings. In chapter 3, I will explain the research methodology, data collection, and data analysis plan for this study.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine the association between program-director resident relationship quality and residents' reported quality of care (sub-optimal patient care practices, medical errors, and suboptimal attitudes towards patients), and the mediating effects of burnout (EE and DP) and ENG, as well as the moderating effect of perceived departmental support, among resident physicians from 20 different specialties in Lebanon.

Chapter 3 presents a descriptive analysis of the setting, research design, and rationale, methodology, and data analysis of the study. The discussion of the methodology includes description of the population, sampling strategy, procedures for participation, data collection, instrumentation, and data analysis strategies. In addition, I address validity threats and ethical considerations of the study.

Research Design and Rationale

Quantitative research is a means for testing objective theories by examining the relationship among variables. This quantitative study used a non-experimental design because I did not wish to examine a cause-effect relationship between the independent and dependent variable nor to compare different groups. The study, however, provided descriptions of associations between the independent and dependent variables.

A quantitative cross-sectional survey design was used to collect the data. The survey provides numeric description of trends, attitudes, or opinions of a population by studying a sample of that population (Creswell, 2009). Variables in this study were

measured at one time point, using validated instruments, so that numbered data can be analyzed using statistical procedures; hence, the study was identified as quantitative cross-sectional research. This research model consisted of one independent variable (program director-resident relationship quality), one moderator variable (perceived departmental support), three mediators (residents' EE, residents' DP, and residents' ENG), and three dependent variables (residents' sub-optimal patient care management practices, residents' medical errors, residents' suboptimal attitudes towards patients).

A survey aims to generalize from a sample to population so that inferences can be made about a characteristic, attitude, or behavior of a population (Babbie, 1990). For instance, the purpose of using a survey in this study was to generalize from a sample of resident physicians to a larger population of resident physicians so that inferences can be made about the factors that are associated with residents' burnout, ENG, and quality of care. There was no longitudinal component of this investigation, neither prospective nor retrospective follow-up. A cross-sectional survey design was the preferred type of data collection in this study because it primarily serves the purpose of the study collecting descriptive measures, assessing relationships, and making inferences to larger populations. In a cross-sectional survey design, a sample taken is perceived to be representative of the population (Singleton & Straits, 1999). In addition, the administration of a cross-sectional survey is cost-efficient, and data collection has a rapid turnaround time. Data collection consisted of an online survey via LimeSurvey. I sent an email invitation to participate in the study to all potential participants.

Methodology

In the following section, I present the population, participant selection and sampling strategy, instrumentation, data collection, and data analysis strategies.

Population

To investigate relationships between program leadership (i.e. program director-resident working relationship quality and perceived departmental support), residents' burnout and work ENG, and quality of care, I selected resident physicians from an academic medical center in Beirut, Lebanon, with 20 residency training programs and 332 resident physicians. The academic medical center represents the largest academic medical center in Lebanon. Selecting resident physicians from this medical center provided an opportunity to recruit from a larger population for data collection in this study.

Participant Selection and Sampling Strategy

The sample size was determined by computer calculation on G*Power using statistical power, statistical significance *(p)*, and effect size (Erdfelder, Faul, Buchner, & Lang, 2009). The statistical power was set at 0.8, which is an 80% probability of correctly rejecting the null hypothesis when it is false or by implication an 80% probability of correctly detecting a relationship between independent and dependent variables (Cohen, 1988). The level of probability or statistical significance *(p)* was set at 0.05, which is a 5% probability of incorrectly rejecting the null hypothesis when it is true or by implication a 5% probability of incorrectly detecting a relationship between independent and dependent variables when none exists. The practical significance of

effect size was set at 0.15 (medium effect size) based on two effect sizes reported in two studies. Havig, Skogstad, Kjekshus, and Romøren (2011) have reported the correlation coefficient (R^2=0.25) occurring between relationship-oriented leadership style and quality of care among nurses. Another study by McFadden, Stock, and Gowen (2015) reported the R^2 between transformational leadership and patient safety climate as 0.13. Based upon using a G*Power (version 3.1.9.4), linear multiple regression: Fixed model, R^2 deviation from zero, with power set at 0.80 and probability set at 0.05, using 2 predictors for research questions 1, 2, and 3, and 3 predictors for research questions 4, 5 and 6, and effect size 0.15, a sample size of 68 was detected for RQs 1, 2 and 3, and 77 for RQs 3, 4 and 5 was detected. Hence, the minimum collection response of this study should be 77.

Procedure for Recruitment, Participation, and Data Collection

After securing Institutional Review Board (IRB) approval, I sent 332 resident physicians an email with a link to LimeSurvey where the invited participant would sign the informed consent electronically and take the survey. The email contained an invitation to the study with a synopsis of the research and purpose of the study. The informed consent was also presented, indicating that participation was voluntary, and participants were free to withdraw at any time.

After securing IRB approval, I was supposed to announce the study to resident physicians during educational sessions at their departments. The needed logistics for the organization of each departmental session was to be done in coordination with each residency program coordinator. However, the IRB office did not approve the announcement process to avoid any perception of undue influence or coercion. Hence, I

initiated sending invitation emails to resident physicians to participate in this study without any announcement. Invitations were generated through Lime Surveys. These emails provided participants with a synopsis on the research topic and purpose, and invited them to participate in my research study, through clicking on a Lime Survey link. After clicking on the link, participants were asked to read the consent and decide whether they wanted to be involved in the study. The informed consent reiterated that participation was voluntary and anonymous. Participants could drop out of the study at any time, even after approving the informed consent. The timetable for data collection was proposed as 1 month, with one initial invitation email and three automatic weekly reminders by Lime Surveys. For statistical significance, the intent was to receive at least 77 completed surveys.

Instrumentation and Operationalization

Demographics – Descriptive Variables

Residents were asked to provide information on five demographic items: (a) gender, a dichotomous categorical variable, (b) age, a continuous variable, (c) level of postgraduate training, a five-level ordinal variable, and (d) specialty type, a 20-level nominal variable, and (e)(e)number of working hours, a 5-level ordinal variable. Residents reported their working hours using an ordinal scale; >80 hours, 71-80 hours, 61-70 hours, 51-60 hours, 41-50 hours, ≤ 40 Data on these variables were collected for descriptive statistical purposes. hours.

Leader-Member Exchange (LMX-7) – Independent Variable

I measured the quality of the working relationship between the program director

and resident using the leader-member exchange seven-items tool (LMX-7), that has demonstrated reliability and validity. I chose the LMX-7 instrument because of its direct relationship to the leader-member exchange theory, as well as to its ability to assess leadership as a process that is centered on the interaction between the leader and follower, i.e. program director and resident in my study.

The LMX-7 is designed to measure three dimensions of leader-member exchange relationship: respect, trust, and obligation. It assesses the degree to which leaders and followers have mutual respect for each other's capabilities, feel a sense of reciprocal trust, and have a strong sense of obligation to one another (Dansereau et al., 1975). While LMX theory focuses on role making, role taking, and routinization of tasks between the leader and follower, the varying styles of leadership can be inferred from the LMX-7 instrument. Leaders who score low on the LMX-7 instrument tend to be transactional leaders, while those who score high on the LMX-7 instrument tend to be transformational in their leadership style.

Instructions and scoring. The seven-item LMX questionnaire uses a continuous five-point Likert scaling with varying responses to each question ranging from 1 (left) to 5 (right). Responses on the left, such as *rarely, not a bit, not at all, none, extremely ineffective,* and *strongly disagree*, indicate a low-quality dyadic relationship, while responses on the right, such as *very often, a great deal, fully very high, strongly agree,* and *extremely ineffective,* indicate a high-quality dyadic relationship. The total score on the LMX-7 ranges from 7 to 35, and the higher score reflects higher quality of leader-member relationship.

Psychometric properties. I have used LMX-7 items tool in this study due its high internal reliability and validity. Internal reliability for LMX-7 has been tested using Cronbach's alpha, which has ranged between 0.85 to 0.93 in several studies (Els, Viljoen, Beer, & Brand-Labuschagne, 2016; Graen, Novak, & Sommerkamp, 1982). In addition, concurrent validity for the 7-items instrument was established by showing strong and consistent correlation between the high quality leader-member exchange relationship and higher organizational citizenship behaviors, higher empowerment, less employee turnover, more positive performance, greater organizational commitment, better job attitudes, and more desirable job assignments (Graen & Uhl-Bien, 1995; Harris, Wheeler, & Kacmar, 2009; Ilies, Nahrgang, & Morgeson, 2007; Liden, Wayne, & Stilwell, 1993).

Perceived Organizational Support (POS-8) – Moderator Variable

Perceived organizational support is defined as employees' overall perception of the extent to which the organization supports, values, and cares for its employees (Eisenberger et al., 1986). Rhoades and Eisenberger (2002) performed a meta-analysis covering 70 empirical studies, and results showed that POS highly correlated with better job performance (Afzali et al., 2015), higher organizational commitment (Rhoades, Eisenberger, & Armeli, 2001), as well as higher perceived supervisor support (Nye & Witt, 1993).

The operational definition of perceived organizational support in this study is the level of perceived departmental support, and it was measured using the POS-8 item questionnaire. The Perceived Organizational Support 8-item Questionnaire (POS-8) is a shortened version of the original 36-item POS, which was developed by Eisenberger et

al. (1986). The 36-item original scale is unidimensional and highly reliable, hence using a shortened tool does not seem to jeopardize validity of results (Rhoades & Eisenberger, 2002).

Instructions and scoring. The 8-item POS questionnaire uses a continuous seven-point Likert scaling as follows: 0 = never, 1 = few times per year, 2 = once a month, 3 = a few times per month, 4 = once a week, 5 = a few times per week, 6 = every day. Scores on questions 2, 3, 5 and 7 are inverse. Participant responses were averaged to create an overall perceived organizational support score ranging from 0 to 6. Higher scores indicate that respondents perceived their organization to be more supportive.

The questions ask residents on the extent to which they agree or disagree with statements regarding different aspects of organizational support. Participants were told that these items might represent possible opinions they may have about their department and were asked to indicate their level or agreement or disagreement with the items using the seven-item Likert scale. Simple items include: “The department fails to appreciate any extra effort from me” and “The department values my contribution to its well-being”.

Psychometric properties. I used the short version of the Survey of Perceived Organizational Support developed by Eisenberger et al. (1997) to assess the extent to which residents perceived that their department valued their contributions and cared about their wellbeing. This version of the POS questionnaire contains eight items that have been developed based on the highest loading items in the original POS questionnaire (Eisenberger et al., 1986), and which seemed applicable to wide variety of organizations (Eisenberger et al., 1997). A reliability and items analysis of the original

36-item scale indicated high acceptable internal consistency with Cronbach's alpha value of 0.97 and item-total correlations ranging from 0.42 to 0.83 (Eisenberger et al., 1986). Hence, every one of the 36-item questionnaire showed a strong loading on the main factor, with minimal evidence or the existence of other factors (Eisenberger et al., 1986). The high internal reliability and unidimensional nature of the questionnaire was supported in additional scholarly work (Shore & Wayne, 1993; Wayne et al., 1997). In addition, principal factor analysis of the eight-item POS tool similarly indicated high internal reliability and unidimensional nature, with Cronbach's alpha value of 0.90 (Eisenberger et al., 1997). In addition, Hellman, Fuqua, and Worley (2006) reported an acceptable internal reliability for studies using the POS eight-item questionnaire, with Cronbach's alpha of 0.90.

Maslach Burnout Inventory Tool (MBO – 2 items) – 2 Mediator Variables

The Maslach burnout inventory tool has been widely used to measure burnout among health care workers, and it has proven to be the gold standard tool to assess burnout experience (Dyrbye et al., 2018; Maslach & Jackson, 1981; Schaufeli, Leiter, & Maslach, 2009). The instrument was developed following exploratory research with interview and questionnaire data, testing in a variety of health and service occupations, and factor and confirmatory data analysis (Maslach & Jackson, 1981). Although other tools such as the Oldenburg Burnout Survey (Reis, Xanthopoulou, & Tsaousis, 2015; Sinval, Queirós, Pasian, & Marôco, 2019) and the Copenhagen Burnout Inventory (Sestili et al., 2018) have been used in the literature, yet the Maslach Burnout Inventory has dominated the literature (Cox, Tisserand, & Taris, 2005).

To look simply at the stress component to assess burnout experience is not enough, because it ignores the two other components, which are self-evaluation and relation to others. Here comes the role of the 22-items original MBI scale, which was developed by Maslach & Jackson (1981). Responders rate the frequency of which they experience burnout on three categories: EE, which assesses feelings of being exhausted by one's work, DP that measures unfeeling or impersonal response towards recipients of one's service, care or treatment, and personal accomplishment, which assesses feelings of competence and personal achievement in one's work. Based on this MBI tool, burnout is characterized by high EE and DP with low personal accomplishment.

Residents' EE and DP will be measured in this study using the Maslach single-items tool, which is a shortened version of the original 22-item Maslach Burnout Inventory (MBI) tool. The MBI single-items tools was designed to measure EE and DP using one item for each sub-scale, and a seven-items Likert scale ranging from zero (never) to six (everyday) (West, Dyrbye, Sloan, & Shanafelt, 2009). Burnout was defined as a high score in either EE or DP.

Instructions and scoring. The single-items MBI tool uses a continuous 7-point Likert scaling as follows: 0 = never, 1 = few times per year, 2 = once a month, 3 = a few times per month, 4 = once a week, 5 = a few times per week, 6 = every day. Participant responses were averaged on each subscale to create an overall score on EE and DP ranging from 0 to 6. Mean overall scores for those answering "Never" or "few times per year" to one of the single item measures are consistent with low EE and/or DP. Mean overall scores for those answering "once a month" or "a few times per month" are

consistent with average EE and/or DP, while mean overall scores for those answering "once a week", "a few times per week" and "everyday" are consistent with high EE and/or DP. (West et al., 2009). This variable will be considered an ordinal one, as there is no composite score for each sub-scale.

The questions ask residents on the extent to which they agree or with the statements that ask about: "I feel burned out from my work" and "I have become more callous toward people since I took this job".

Psychometric properties. The original 22-items MBI tool is known for its high internal consistency and reliability. Internal consistency was estimated by Cronbach's alpha, and reliability coefficients for the sub-scales were 0.90 for EE, 0.79 for DP, and 0.71 for personal accomplishment. Data on test-retest reliability of the MBI were reported for two samples and test-retest reliability coefficients were the following: 0.82 for EE, 0.60 for DP, and 0.80 or personal accomplishment.

Although the original 22-items MBI tool is the gold-standard burnout inventory tool, yet the instrument's length limits its use for assessing burnout in lager surveys. For instance, burnout assessments have revealed the presence of high EE and DP among highly achieving physicians. Hence, West et al. (2009) has assessed the performance of two questions relative to the full MBI for measuring burnout on two sub-scales: EE was measured by the question "I feel burned out from my work" and DP was measured by the question "I have become more callous toward people since I took this job".

When all items used to measure EE or DP in the full MBI were evaluated, response to these two items showed the highest correlation with overall EE or DP score

across four samples (Spearman's correlation ranged from 0.76 to 0.83 for EE item, and 0.61 to 0.72 for the DP item) (West et al., 2009). In a separate study, the 2 items correlated with their parent subscales of the full MBI (Spearman's r = 0.89 and 0.81, p <.0001) (Waddimba et al., 2016).

Furthermore, concurrent validity for the 2-items instrument was established by showing strong and consistent correlation between the single items measures and adverse outcomes among medical students and residents, such as suicide, intent to leave medical school, and suboptimal academic and clinical performance (West, Dyrbye, Satele, Sloan, & Shanafelt, 2012; West et al., 2009).

Utrecht Work ENG Scale (UWES-9) – Mediator Variable

Employees are referred to as engaged when they show sense of energy and affective connectivity towards their work demands and activities (Eldor & Vigoda-Gadot, 2017). Burnout and work ENG were previously supposed to be opposite ends of one continuum, and they were both measured using the Maslach burnout inventory tool (MBI) (Maslach & Leiter, 1997). Thus, the opposite scoring of burnout on the MBI tool implied work ENG. However, the fact that both concepts are measured using the same tool has negative consequences, because it is not reasonable to assume for granted that burnout and ENG have consistent negative relationship. Although burnout reflects negative psychological state, while ENG reflects positive psychological state; however, when an employee is not burned-out, that should not directly mean that he or she is engaged, and vice versa (Schaufeli & Bakker, 2001). Hence, both burnout and ENG should be referred to as two distinct concepts and should be treated independently and

measured using two separate tools. Residents' work ENG is measured in this study using the Utrecht Work ENG (UWES) 9-items scale, which is a shortened version of the original 24-items scale.

Instructions and scoring. The 9-items UWES questionnaire uses a continuous 7-point Likert scaling as follows: 0 = never, 1 = few times per year, 2 = once a month, 3 = a few times per month, 4 = once a week, 5 = a few times per week, 6 = every day. Although the 9-items UWES scale consists of three sub-scales, however, further confirmatory analysis was done for this scale, and no clear three-factor structure was reported (Sonnentag, 2003). Hence, it was decided to use a total score rather than three-factor structure score. In addition, the three subscales of the short version of the UWES are highly interrelated, with median correlation > 0.90 in 27 studies across 10 national samples, and the internal consistency was very high in all national samples (Schaufeli, Bakker, & Salanova, 2006). Hence, practically speaking, considering scores on three sub-scales would not be of high added value, and researchers might consider using one total scale (Schaufeli et al., 2006). Hence, residents' responses in this study were averaged to create an overall score ranging from 0 to 6, and higher scores indicate that respondents were more engaged at work.

The questions ask residents on the extent to which they agree or disagree with the statements that ask about their different feelings at work. Participants will be asked to indicate their level or agreement or disagreement with the items using the 7-items Likert scale. Simple items include: "At my work, I feel bursting with energy" and "My job inspires me".

Psychometric properties. I will be using the short version of the Utrecht Work ENG Scale, which was originally developed to measure work ENG (Schaufeli, Salanova, Vicente, & Bakker, 2002). The original Utrecht scale consisted of 24 items of which the vigor-items and the dedication-items consisted for a large part of positively rephrased MBI-items. Psychometric evaluation was done by Schaufeli et al. (2002), and 7 items were removed, as they did not demonstrate value or positive contribution to the overall UWES, and this resulted in 17-items scale. Further exploratory analysis was done using a database of 27 studies across 10 countries. This has reduced the 17-items scale to 9-items scale, made up of three sub-scales with three items each: vigor (VI), dedication (DE) and absorption (AB) (Schaufeli et al., 2006).

The shortened version of the scale correlated highly with its original longer counterparts, sharing more than 80% of their variances (Schaufeli et al., 2006). Also, Cronbach's alpha of the total 9-items scale was good in almost all 10 countries, satisfying a solid value of 0.80, whereas values of Cronbach's alpha on the three item scales exceeded the value of 0.7 (Schaufeli et al., 2006).

Quality of Patient Care (QOC – 10 items) – 3 Dependent Variables

Residents' self-reported quality of care was measured using 10-items QOC questionnaire that is based on three predictors, and which is adapted from two research studies. This survey collects data on self-reported sub-optimal patient care practices (5 items), medical errors (3 items), and empathy towards patients (2 items). Each of these quality dimensions is a dependent variable. The eight questions on suboptimal patient care practices and medical errors have been used with permission from the author

Vidyarthi et al. (2007), while the two questions on empathy have been used with permission from the author Trockel et al. (2018).

Sub-optimal patient care practices are defined as those patient care management processes that are below standards but not necessarily lead to an error or adverse event (Vidyarthi et al., 2007). Although medical error has been defined by some scholars as an adverse event affecting patient care (Khoo et al., 2015), however, Vidyarthi et al. (2007) has defined it as the act of omission or commission in planning or execution that contributes or could contribute to unintended results. This act might be a near miss faulty process that does not necessarily have an adverse outcome. Empathy is one of the most frequently mentioned humanistic patient care components, and it is a key feature of communication of understanding (Hojat et al., 2017).

Instructions and scoring. The 10-items questionnaire on self-reported quality of care uses a continuous 5-point Likert scaling as follows: 1 = never, 2 = rarely, 3 = sometimes, 4 = fairly often, 5 = very often. Participant responses will be averaged on each subscale but not summarized to give a composite score on the full scale. The measures on each subscale are inverse, and higher scores on each quality predictor means lower quality of care; i.e. a higher score on each subscale reflects a greater likelihood of suboptimal practices and medical errors and showing less empathy towards patients.

The questions ask residents on the frequency of engaging in common suboptimal patient care practices, frequency of medical errors, and frequency of engaging in sub-optimal attitudes with the patient during the last 3 months. Simple items include: “work while impaired by fatigue”, “feel less empathetic with your patients”.

Psychometric properties. Internal consistency for the suboptimal practices and medical errors sub-scales was estimated by Cronbach's alpha, and reliability coefficients for the two subscales were 0.75 and 0.60 consecutively (Vidyarthi et al., 2007). In addition, Vidyarthi et al. (2007) did factor analysis for the items on each subscale, and the items of each subscale loaded into the same factor, reflecting unidimensionality. Hence, scores for items of each subscale were combined to form a summary score on each of the two subscales.

The two items on attitudes towards patients subscale were extracted from the 6-items "interpersonal disengagement" subscale, which was specifically developed by Trockel et al. (2018) to measure empathy and connectedness with patients and colleagues. I chose the two items: "Feel less empathetic with your patients" and "Feel less interested to talking with my patients" that assess empathy towards patients because I am looking at quality of patient care. Internal consistency for these two questions will be measured in the data analysis part.

Summary of Instrumentation Tools

The instruments for this quantitative cross-sectional study are the Perceived Organizational Support 8-items tool, Leader-Member Exchange 7-items tool, Maslach Burnout Inventory 2-items tool, Utrecht Work ENG Scale 9-items tool, and Self-Reported Quality of Care 10-items tool. After obtaining permission for copyrighted questionnaires, they will be incorporated into one survey with a series of demographic questions. The use of LMX tool as well as the UWES too does not need permission. Permission has been secured for the POS tool as well as the quality of care tool

(Appendix A and B). As for the MBI tool, permission is still under process (Appendix C). Table 1 shows how the variables for this study will be operationalized, and identifies the study variable name and type, research tool used and associated types of responses. The email invitation to the questionnaire includes an invitation script (Appendix E), a link to access an informed consent (Appendix F) and the 41-items full questionnaire.

Table 1

Instrumentation and Operationalization of Variables

Scale	Variable name	Variable type	Types of responses	Descriptive statistics
Demographics item-1	Age	Descriptive: Continuous	Age number	Mean ± SD
Demographics item-1	Gender	Descriptive: Dichotomous	Dichotomous Male, Female	Frequency and percentages
Demographics item-1	Post-graduate level of training	Descriptive: Ordinal	1, 2, 3, 4, 5, 6, 7	Frequency and percentages
Demographics item-1	Specialty	Descriptive: Nominal	Anesthesiology, surgery, internal medicine…	Frequency and percentages
Demographics item-1	Working hours	Descriptive: Ordinal	>80 hrs., 71-80 hrs., 61-70 hrs. ..	Frequency and percentages
Leader-Member Exchange Questionnaire *(LMX-7)* **(Graen & Uhl-Bien, 1995)**	Program director-resident relationship quality	Independent: Continuous	Five-point Likert Scale	One ccore: Mean composite (total) score is calculated. Scoring interpretation: Scores in the upper ranges indicate stronger, higher-quality leader-member exchanges, and vice-versa
Perceived Organization Support Tool *(POS-8)* **(Eisenberger, Cummings, Armely, & Lynch, 1997)**	Perceived departmental support	Moderator: Continuous	Seven-point Likert Scale	One score: Mean composite (total) score is calculated. Scoring interpretation: Higher mean scores indicate that respondents perceived their organization to

				be more supportive
Maslach Burnout Inventory tool *(MBI-2)* **EE-1** **DP-1** **(West, Dyrbye, Satele, Sloan, & Shanafelt, 2012)** **(Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1996)**	Residents' burnout defined by two variables: 1. Residents' EE 2. Residents' depersonalization	Mediator: Ordinal	Seven-point Likert Scale	Frequency and percentages for each item. Scoring interpretation: EE and DP: Low: 0-1; Average: 2-3 High: 4-6
Utrecht Work ENG Scale *(UWES-9)* **Vigor-3** **Dedication-3** **Absorption-3** **(Schaufeli & Bakker, 2004)**	Residents' work ENG	Mediator: Continuous	Seven-point Likert Scale	One score: Mean score on the full scale. Scoring interpretation: Higher mean scores indicate that respondents are more engaged
Resident-reported Quality of Care *(QOC-10)* **Sub-optimal patient care-5** **Medical errors-3** **(Vidyarthi, Auerbach, Wachter, & Katz, 2007)** **Sub-optimal attitudes towards patients-2** **(Trockel et al., 2018).**	Residents' -reported quality of patient care defined by three variables: 1.Sub-optinal patient care practices 2.Medical errors 3. Attitudes towards patients	Dependent: Continuous	Five-point Likert Scale	Three sub-scale scores: Mean sub-scale score. Scoring interpretation: Measures are inverse. Higher scores on each subscale means lower quality of care

Data Analysis Plan

Respondents completed an online questionnaires and data were automatically available through the Lime Survey. Responses were assessed for completeness per observation. Instruments for the data collection included the LMX-7, POS-8, MBI-2, UWES-9, and QOC-10. Demographic questions were part of the survey and included age, gender, postgraduate level of training, and specialty, in addition to the number of working hours which I controlled for its effect on EE and DP. The data will be exported from Lime Survey to Microsoft Excel and then to SPSS for analysis.

The IBM's Statistical Package for the Social Sciences (SPSS) version 24.0 (IBM, Inc., Chicago, IL) was used for cleaning, management, and SPSS PROCESS macro for data analysis. I did not expect to have missing data because all fields of the survey are mandatory. However, if outlier values of age were reported, they were eliminated. Descriptive analysis and inferential statistics will be conducted. The following research questions will be tested in this study.

RQ 1: To what extent does residents' emotional exhaustion (*H*1a), depersonalization (*H*1b) or engagement (*H*1c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization, or engagement → residents' suboptimal patient care management practices).

> $H_0$1: Residents' emotional exhaustion ($H_0$1a), depersonalization ($H_0$1b) or engagement ($H_0$1c) does not statistically mediate the relationship between

program director-resident relationship quality and residents' suboptimal patient care management practices.

$H_1$1: Residents' emotional exhaustion ($H_1$1a), residents' depersonalization ($H_1$1b) or engagement ($H_1$1c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices.

RQ 2: To what extent does residents' emotional exhaustion (*H*2a), depersonalization (*H*2b) or engagement (*H*2c) statistically mediate the relationship between program director-resident relationship quality and residents' medical errors? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization and/or engagement → residents' medical errors)

$H_0$2: Residents' emotional exhaustion ($H_0$2a), depersonalization ($H_0$2b) or engagement ($H_0$2c) does not statistically mediate the relationship between program director-resident relationship quality and residents' medical errors.

$H_1$2: Residents' emotional exhaustion ($H_1$2a), depersonalization ($H_1$2b) or engagement ($H_1$2c) statistically mediates the relationship between program director-resident relationship quality and residents' medical errors.

RQ 3: To what extent does residents' emotional exhaustion (*H*3a), depersonalization (*H*3b) or engagement (*H*3c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients?

(i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization, or engagement → residents' suboptimal attitudes towards patients)

> $H_0$3: Residents' emotional exhaustion ($H_0$3a), depersonalization ($H_0$3b) or engagement ($H_0$3c) does not statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.
>
> $H_1$3: Residents' emotional exhaustion ($H_1$3a), depersonalization ($H_1$3b) or engagement ($H_1$3c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.

RQ 4: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion (*H*4a), depersonalization (*H*4b), or engagement (*H*4c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal patient care management practices).

> $H_0$4: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion ($H_0$4a), depersonalization ($H_0$4b), or engagement ($H_0$4c).

$H_1$4: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion ($H_1$4a), depersonalization ($H_1$4b), or engagement ($H_1$4c).

RQ 5: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion (*H*5a), depersonalization (*H*5b), or engagement (*H*5c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' medical errors).

$H_0$5: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion ($H_0$5a), depersonalization ($H_0$5b), or engagement ($H_0$5c).

$H_1$5: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion ($H_1$5a), depersonalization ($H_1$5b), or engagement ($H_1$5c).

RQ 6: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion

(*H*6a), depersonalization (*H*6b), or engagement (*H*6c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal attitudes towards patients).

> $H_0$6: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_0$6a), depersonalization ($H_0$6b), or engagement ($H_0$6c).
>
> $H_1$6: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_1$6a), depersonalization ($H_1$6b), or engagement ($H_1$6c).

Descriptive Statistics

For this quantitative research study, data were summarized as frequency and percentages for categorical variables, and mean, standard deviation, maximum and minimum will be presented for continuous ones. This included one table summarizing the baseline characteristics of the residents completing the questionnaire, i.e. frequency and percentages were reported for genders, postgraduate level of training, working hours, and specialty, and median was reported for age. In another table, the frequency and percentages were reported for burnout dimensions (EE and DP). As for other variables with Likert scale data and mean/composite scores (the level of program director-resident relationship quality, level of perceived departmental support, level of ENG and the three

sub-scales of quality of care), these were analyzed at the interval measurement scale. In this study, composite scores (sum or mean) from five or more type Likert-type items were calculated; therefore, the composite scores for Likert scales were analyzed at the interval measurement scale, as continuous (Harpe, 2015). Descriptive statistics plan for each variable subscale is included in Table 1 in Chapter 3.

Inferential Statistics

To analyze all six theorized hypotheses in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). This results in simple mediation and moderated mediation (conditional indirect effect analysis) using model 4 and model 7 of the PROCESS macro respectively.

Research Questions 1 (Mediation Analysis): To analyze RQ 1 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). To assess for the presence of mediation, model 4 will be used. I used model number 4 to assess *H*1a, H_1b and H_1c simultaneously. This model consisted of one independent variable (IV: program director-resident relationship quality), three mediators (M: residents' EE, DP, and ENG), and one dependent variable (DV: residents' sub-optimal patient care management practices). The indirect effect (IE) for *H*1a, *H*1b and *H*1c would be significant if $p < 0.05$ for the IE. To further confirm the interpretation, mediation is significant if the 95% bias corrected and accelerated CIs lower limit (LL), upper limit (UL) for the indirect effect (IE) did not include 0. Then, the null hypothesis would be rejected

Research Question 2 (Mediation Analysis): To analyze RQ 2 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). To assess for the

presence of mediation, model 4 will be used. I used model number 4 to assess *H*2a, *H*2b and *H*2c. This model consisted of one independent variable (IV: program director-resident relationship quality), three mediators (M: residents' EE, DP, and ENG), and one dependent variable (DV: residents' medical errors). The indirect effect for *H*2a, *H*2b and *H*2c would be significant if $p < 0.05$ for the IE. To further confirm the interpretation, mediation is significant if the 95% bias corrected and accelerated CIs lower limit (LL), upper limit (UL) for the indirect effect (IE) did not include 0. Then, the null hypothesis would be rejected.

Research Question 3 (Mediation Analysis): To analyze RQ 3 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). To assess for the presence of mediation, model 4 will be used. I used model number 4 to assess *H*3a, *H*3b and *H*3c. This model consisted of one independent variable (IV: program director-resident relationship quality), three mediators (M: residents' EE, DP, and ENG), and one dependent variable (DV: residents' suboptimal attitudes towards patients. The indirect effect for H_3a, H_3b and H_3c would be significant if $p < 0.05$ for the IE. To further confirm the interpretation, mediation is significant if the 95% bias corrected and accelerated CIs lower limit (LL), upper limit (UL) for the indirect effect (IE) did not include 0. Then, the null hypothesis would be rejected

Research Question 4 (Moderated Mediation Analysis): To analyze RQ 4 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). The proposed model is under model 7 of the PROCESS documentation where the moderation effects takes place at the A-path (independent to mediator). I used model 7 to assess *H*4a,

*H*4b and *H*4c. This model consisted of one independent variable (program director-resident relationship quality), one moderator variable (perceived departmental support), three mediators (residents' EE, DP and ENG), and one dependent variable (residents' sub-optimal patient care management practices).

For this moderated mediation relationship in H4a, H4b and H4c to be significant, there should be significant interaction between the moderating variable and the independent variable ($p < 0.05$), and significant relationship between the mediating variable and dependent variable ($p < 0.05$). This portion of the output provided an omnibus test of the conditional indirect effect (Preacher, Rucker, & Hayes, 2007) – reflected in the Index of moderated mediation (Hayes, 2015, 2018a, 2018b) – of program director-resident relationship quality (X) on quality of care (Y). The 'Index of Moderated Mediation' (IMM) is the slope of the line relating the indirect effect to the perceived departmental support (moderator). Thus, by looking at the full model, if the lower and upper limit of the 95% confidence interval of the IMM does not cross zero, then I can reject the null hypothesis.

Research Question 5 (Moderated Mediation Analysis): To analyze RQ 5 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). The proposed model is under model 7 of the PROCESS documentation where the moderation effects takes place at the A-path (independent to mediator). I will use model 7 to assess *H*5a, *H*5b, and *H*5c. This model consisted of one independent variable (program director-resident relationship quality), one moderator variable (perceived departmental support),

three mediators (residents' EE, DP, and ENG), and one dependent variable (residents' medical errors)..

For this moderated mediation relationship in H_5a, H_5b, and H_5c to be significant, there should be significant interaction between the moderating variable and the independent variable ($p < 0.05$), and significant relationship between the mediating variable and dependent variable ($p < 0.05$). This portion of the output provides an omnibus test of the conditional indirect effect (Preacher, Rucker, & Hayes, 2007) – reflected in the Index of moderated mediation (Hayes, 2015, 2018a, 2018b) – of program director-resident relationship quality (X) on quality of care (Y). The 'Index of Moderated Mediation' (IMM) is the slope of the line relating the indirect effect to the perceived departmental support (moderator). Thus, by looking at the full model, if the lower and upper limit of the 95% confidence interval of the IMM does not cross zero, then I can reject the null hypothesis.

Research Question 6 (Moderated Mediation Analysis): To analyze RQ 6 in SPSS, this study made use of the PROCESS macro developed by Hayes (2013). The proposed model is under model 7 of the PROCESS documentation where the moderation effects takes place at the A-path (independent to mediator). I used model 7 to assess *H*6a, *H*6b, *H*6c. This model consisted of one independent variable (program director-resident relationship quality), one moderator variable (perceived departmental support), three mediators (residents' EE, DP and ENG), and one dependent variable (residents' suboptimal attitudes towards patients).

For this moderated mediation relationship in H6a, H6b and H6c to be significant, there should be significant interaction between the moderating variable and the independent variable ($p < 0.05$), and significant relationship between the mediating variable and dependent variable ($p < 0.05$). This portion of the output provides an omnibus test of the conditional indirect effect (Preacher, Rucker, & Hayes, 2007) – reflected in the Index of moderated mediation (Hayes, 2015, 2018a, 2018b) – of program director-resident relationship quality (X) on quality of care (Y). The 'Index of Moderated Mediation' (IMM) is the slope of the line relating the indirect effect to the perceived departmental support (moderator). Thus, by looking at the full model, if the lower and upper limit of the 95% confidence interval of the IMM does not cross zero, then I can reject the null hypothesis.

Threats to Validity

The objective of this study was to understand the relationship between program director-resident working relationship quality and quality of care, while assessing the role of perceived departmental support, burnout and ENG in this mechanism. Thus, the study results are valid if the measurement of the construct is valid and if its conclusions can be generalized to resident physicians beyond the respondent tool. These two types of validity are known as construct validity and external validity.

Construct validity can be threatened if constructs are incorrectly measured. However, all five constructs except for "self-reported quality of care instrument" have been tested in multiple studies. As for the self-reported quality of care instrument, two of its three sub-scales have been tested for reliability and validity in one previous study as

explained above in the instrumentation part, and they fulfilled reliability and validity criteria. As for the third quality sub-scale on attitude towards patients, it was extracted from a longer scale on interpersonal disengagement. To address any construct validity threat, it was tested for reliability and unidimensionality during the preliminary data analysis. Hence, I was using reliable measurement procedures.

However, one threat to construct validity could be response bias, which represents tendencies for participants to respond inaccurately or falsely to questions. Residents might consider answering as they think they should, rather than how they honestly self-assess their levels of burnout, ENG, quality of care, program director leadership style and perceived department support. To address this threat, the use of standard instruments and an anonymous web-based survey was the best defense.

` As for the adequacy of my statistical tests, I ran my analysis using SPSS PROCESS macro based on Hayes (2015, 2018a, 2018b) recommendations for robust simple mediation and moderated mediation. All of my variables were continuous, except for the two burnout variables (EE and DP) which were ordinal. However, this does not violate test assumptions, and thus I expected that I will be using adequate statistical tests.

Another type of response bias could have been the effect of nonresponses on survey estimates. This means that if non-respondents had responded, their responses would have changed the results. To tackle this threat, I have addressed this issue through conducting wave analysis, using the assumption that those who have responded during the last week are all non-respondents (Fowler, 2012). If the results change, then a potential existed for response bias (Creswell, 2009).

External validity refers to whether results from a study can be generalized to a larger population that is wider than the sample from which the results come. External validity in this study is the extent to which its results can support claims that program director-resident relationship quality and perceived departmental support are indirectly related to residents' self-reported quality of care, through burnout and work ENG. The question of whether results of this study are generalizable nationally, rests on the fact that I have calculated sample size using G*Power software using appropriate test family, and I was expecting to recruit participants above the minimum sample size. Hence, I expected to have adequate sampling procedure. In addition, I collected data from a large academic medical center, which is one of the largest medical centers in the Middle East, and which recruits resident physicians from all regions of Lebanon as well as from different countries in the Middle East. In addition, results of this study could be generalized internationally due to the fact that residency programs in this medical center are accredited by the Accreditation Council of Graduate Medical Education - International, which is a US certifying body for postgraduate training programs in the United States and internationally. Hence, the surveyed residency training programs provide clinical learning and working environments that meet international standards.

Ethical Considerations

Prior to conducting this study, approval was sought from the Walden University (IRB# 05-06-20-0539831) and American University of Beirut (IRB# SB-2020-0104) Institutional Review Boards. This process provided an assurance that all participants would be treated in an ethical manner. Assurance of participant anonymity was ensured

through completion of an informed consent and by using Lime Survey anonymous software engine. A consent form was presented indicating that participation was voluntary, and participants are free to withdraw from the study at any time. Participants also received information on the purpose of the study along with the consent form. Data collection was done through Lime Survey, a highly secure and encrypted program providing a null risk for identifying participants. In addition, participants were not asked to give their name or any other identifiers. The ethical framework of this study included: (a) certificate of course completion of Collaborative Institutional Training Initiative (CITI) certificate, and (b) informed consent form, which provided a full disclosure of the study. Confidentiality was obtained by (a) issuance of anonymity, and (b) providing appropriate instructions to ensure confidentiality. For this study, I maintained confidential data information in a data repository and will destroy the data within five years of completing the study, per Walden University guidelines. Dissemination of results will occur through a series of mediums such as thesis and manuscript publication, conference proceedings, and professional development workshops.

Summary

Research design and methodology presented in Chapter 3 answered research questions examining the nature of the relationship between program director-resident relationship quality and quality of care. This mechanism was assessed by looking at residents' wellbeing as a mediator of this relationship, and perceived departmental support as a moderator. This research study presents its findings in Chapter 4 using a

quantitative approach. Data were analyzed using both descriptive and inferential statistics.

Chapter 4: Results

Introduction

The purpose of this study was to examine the association between program-director resident relationship quality and residents' reported quality of care (sub-optimal patient care practices, medical errors, and attitudes towards patients), and the mediating effects of burnout (EE and DP) and ENG, as well as the moderating effect of perceived departmental support. This study was guided by six research questions that targeted Lebanese resident physicians from 20 different specialties in August 2020. Research question #1, research question #2, and research question #3 focused on the extent to which residents' wellbeing dimensions (EE, DP, and ENG) mediate the relationship between program leadership and quality of care dimensions (suboptimal patient care practices, medical errors, and suboptimal attitudes towards patients). Research question #4, research question #5, and research question #6 focused on the extent to which departmental support moderates the mediational effects of residents' wellbeing dimensions (EE, DP, and ENG) on the relationship between program leadership and quality of care dimensions (suboptimal patient care practices, medical errors, and suboptimal attitudes towards patients).

In this chapter, I present the data collection process and statistical analyses used for the interpretation of the data, and results of data analyses. The results of this study included baseline descriptive and demographic characteristics of the sample, basic univariate analyses, evaluation of the statistical assumptions, and statistical analysis organized by research question with associated hypotheses.

Data Collection

The group of resident physicians who completed the survey was diverse. Participants were from 20 different specialties and were deemed representative of their population. I recruited participants through an invitation email, which included a brief synopsis of the research purpose and significance, along with a link to an anonymous survey. A total of 332 residents received the online survey, and 129 participants attempted to access the link. Ninety-five residents completed the survey; 34 other surveys were incomplete and missing more than 50% of the data. Surveys with incomplete or missing data were deleted. Study participants also completed a short demographic survey that provided information on their age, gender, specialty, postgraduate year level, and number of working hours per week.

The study plan presented in Chapter 3 proposed an announcement of the study to potential participants before sending the survey invitation to participate emails. However, the IRB asked that I not send out the announcement to avoid imposing any kind of coercive influence on participants. In addition, I proposed to collect data over 4 weeks to gather a minimum of 77 responses. I initiated data collection on September 3, 2020 and collected 95 complete responses within 11 days. Hence, data collection concluded on September 14, 2020, and data were collected over 12 days instead of 4 weeks. There were no additional deviations from the study plan presented in Chapter 3 relative to the data set. The collected data were then retrieved from Lime Survey portal and were exported into Statistical Package for the Social Science (SPSS 25) for data analysis.

The age of participants ranged from 24-33 years of age, with a mean of 27.17 and SDEV of 1.71 (Table 2). In the sample of 95 residents, most participants (57 or 60%) were women. For their postgraduate year level of training, 19 (20%) reported being in their first year of training, 21 (22) in their second year of training, 28 (29.5%) in their third year of training, 21 (22.1%) in their fourth year of training, 5 (5.3%) in their fifth year of training, and 1 (1.1%) in their sixth year of training. For the number of working hours, 16 (16.8%) reported working for > 80 hours, 36 (37.9%) for 71-80 hours, 18 (18.9%) for 61-70 hours, 18 (18.9%) for 51-60 hours, 6 (6.3%) for 41-50 hours, and 1 (1.1%) for ≤ 40 hours (Table 3).

Table 2

Descriptive Statistics for Continuous Demographic Variables (N = 95)

			Range	
Demographic attribute	M	SD	Minimum	Maximum
Age	27.17	1.71	24	33

Table 3

Descriptive Statistics for Categorical Demographic Variables (N = 95)

Demographic attribute	*n*	%
Gender		
Male	38	40
Female	57	60
Postgraduate year level		
1	19	20
2	21	22
3	28	29.5
4	21	22.1
5	5	5.3
6	1	1.1

7	0	0
Working hours		
>80 hrs	16	16.8
71-80 hrs	36	37.9
61-70 hrs	18	18.9
51-60 hrs	18	18.9
41-50 hrs	6	6.3
≤ 40 hrs	1	1.1
Specialty		
Anatomic pathology or clinical pathology	2	2.1
Anesthesiology	28	29.5
Dermatology or ophthalmology	1	1.1
Diagnostic radiology or radiation oncology	2	2.1
Emergency medicine	5	5.3
Family medicine	7	7.4
Internal medicine	10	10.5
Neurology	8	8.4
Obstetrics & gynecology	6	6.3
Otorhinolaryngology & head & neck surgery	2	2.1
Pediatrics	8	8.4
Psychiatry	7	7.4
Surgery - general surgery	6	6.3
Surgery - neurosurgery or plastic surgery	2	2.1
Surgery - Orthopedic surgery	0	0
Surgery - urology	1	1.1

Results

Descriptive Statistics and Frequencies

I employed the LMX-7 instrument to measure the strength and quality of LMX relationships between the leader (program director) and the follower (resident physician). Table 4 contains the LMX mean score of 23.41, which represents a moderate quality LMX relationship according to Graen and Uhl Bein (1995).

Table 4

LMX-7 Total Mean Score among Resident Physicians

Items	M	SD
Do you know where you stand with your program director [and] do you usually know how satisfied your program director is with what you do?	3.17	1.20
How well does your program director understand your job problems and needs?	3.49	1.10
How well does your program director recognize your potential?	3.32	1.03
Regardless of how much formal authority your program director has built into his or her position, what are the chances that your leader (follower) would use his or her power to help you solve problems in your work?	3.42	1.04
Again, regardless of the amount of formal authority your program director has, what are the chances that he or she would "bail you out" at his or her expense?	2.88	1.07
I have enough confidence in my program director that I would defend and justify his or her decision if he or she were not present to do so.	3.53	.99
How would you characterize your working relationship with your program director?	3.60	.87
Total	23.41	6.02

Note. Minimum = 1, maximum = 5, n = 95

I employed the POS-8 instrument to assess the quality of organizational (departmental) support perceived by the employees (resident physicians) in terms of how highly the department thinks of their contributions and promotes their welfare. Table 5 contains the POS mean score of 3.67 in resident physicians and SD of 1.36, referring to low levels of POS (Shanock et al., 2019).

Table 5

POS-8 Total Mean Score among Resident Physicians

POS Items	M	SD
The department values my contribution to its wellbeing	3.54	1.68
The department values my contribution to its well-being	3.11	1.82
The department would ignore any complaint from me	4.05	1.59
The department really cares about my well-being	3.56	1.80
Even if I did the best job possible, the department would fail to notice	3.77	1.76
The department cares about my general satisfaction at work	3.40	1.67
The department shows very little concern for me	3.98	1.55
The department takes pride in my accomplishments at work	3.93	1.60
Total	3.67	1.36

Note. Minimum = 0, maximum = 6, n = 95

I employed the MBI-2 items tool to explore the extent to which residents experience EE and DP. Table 6 provides the category frequency and percentages for each burnout dimension. Forty-five (47.4%) resident physicians experienced high EE and 34 (35.8%) experienced high DP. Fifty-four residents (56.8%) experienced high EE or high DP, and were positive for burnout.

Table 6

Prevalence of Burnout among Resident Physicians Using MBI-2 Items tools

	n (%)		
MBI Items	Low	Average	High
EE			
I feel burned out from my work	18 (18.9)	32 (33.7)	45 (47.4)
DP			
I have become more callous toward people since I took this job	34 (35.8)	27 (28.4)	34 (35.8)
	n (%)		
Burnout			
High EE or DP		54 (56.8)	

Note. Minimum = 0, maximum = 6, n = 95

I employed the UWES-9 item tool to measure residents' ENG in their workplace, in terms of the extent to which they show an energetic and affective connectivity towards their work demands and activities. Table 7 provides the UWES subscale mean scores and full scale mean score. The total mean ENG score is 4.23 with SD of 1.15, which represents moderate ENG among surveyed resident physicians.

Table 7

UWES-9 Total Mean Score among Resident Physicians

UWES Items	M	SD
Vigor		
At my work, I feel bursting with energy	3.64	1.58
At my job, I feel strong and vigorous	3.97	1.49
When I get up in the morning, I feel like going to work	3.45	1.85
Total	3.69	1.40
Dedication		
I am enthusiastic about my job	4.29	1.56
My job inspires me	4.44	1.58
I am proud of the work that I do	4.91	1.38
Total	4.55	1.37
Absorption		
I feel happy when I am working intensely	4.37	1.56
I am immersed in my work	4.67	1.26
I get carried away when I'm working	4.32	1.57
Total	4.45	1.18
ENG	M	SD
Overall ENG score	4.23	1.15

Note. Minimum = 0, maximum = 6, n = 95

I assessed the residents' quality of care using a self-reported three sub-scales instrument. Residents have self-reported the frequency of engaging in common sub-optimal patient care practices, frequency of making avoidable medical errors, which were not due to lack of medical knowledge, and frequency of engaging in sub-optimal attitudes with the patients. Table 8 provides the mean score of each quality of care (QOC) category. Scores are inverse and higher mean score on each subscale reflects lower quality of care. Residents' suboptimal patient practices show a mean of 2.44 and SD of .57, while residents' medical errors show a mean of 1.60 and SD of .46, and a mean of score of 2.51 and SD of .97 for reported for sub-optimal attitudes towards patients.

Table 8

QOC-10 Mean Sub-scale Scores among Resident Physicians

QOC Items	M	SD
Frequency of suboptimal patient care practices		
Work while impaired by fatigue	3.42	.94
Forget to transmit important information during sign-out	1.93	.57
Report information that you were unsure of	1.96	.94
Write information in a patient's chart that you were unsure of	1.41	.61
Make up information to report to your superior	1.32	.66
Total	2.44	.57
Frequency of medical errors		
Cognitive (wrong test, wrong diagnosis, wrong treatment)	1.75	.68
Technical (procedural error e.g. pneumothorax)	1.37	.52
Administrative errors (patient record error…)	1.69	.70
Total	1.60	.46
Frequency of suboptimal attitudes with patients		
Feel less empathetic with your patients	2.46	1.04
Feel less interested in talking with your patients	2.57	1.02
Total	2.51	.97

Note. Minimum = 1, maximum = 5, n = 95

Inferential Statistics

The research questions developed for the study were tested using SPSS PROCESS macro developed by Hayes (2013). This results in simple mediation and moderated mediation (conditional indirect effect analysis) using model 4 and model 7 of the PROCESS macro respectively. However, before a data can be appropriate for multiple regression analysis through PROCESS macro, a set of assumptions aligned to this statistical test were tested. In this analysis, I had three different quality of care dimensions, and each one of them was a dependent outcome variable. Hence, the assumptions of multiple regression analysis were first tested before conducting data analysis.

Testing of Assumptions

I developed my research questions based on parallel mediation and moderated mediation analyses. Both analyses can be broken down into simple and multiple regressions, which each need to fulfil the six assumptions: (1) independence of observations, (1) linear relationship between dependent and independent variables (c) homoscedasticity of residuals (d) no multicollinearity (5) no significant outliers and (6) normal distribution of outliers. Since I am using existing instruments to assess each of my variables, then there is no need to check for the presence of outliers; hence, the first four assumptions will be tested only.

Each indirect effect should satisfy each assumption, which means that its constituting effects (Predictor variable on mediator [IVP on M] and mediator on dependent variable [M on DV]) need also to satisfy the assumptions. To examine these

criteria for parallel mediation, twelve regressions were conducted (i.e., IVP [program director leadership] predicting each mediator [EE, DP, and ENG]; each mediator predicting each DV [suboptimal patient care practices, medical errors, suboptimal attitudes towards patients]; IVP and all three mediators predicting each DV; and IVP predicting each DV).

To examine these assumptions for moderated mediation, nine additional regressions were conducted (i.e., IVP [program director leadership] and the moderator variable (IVM) [departmental support] predicting each mediator [EE, DP, and ENG]; IVP, IVM and all three mediators predicting each DV; and IVP and IVM predicting each DV. We noted no assumption violations. There was independence of residuals, as assessed by a Durbin-Watson statistic. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1.

Data Analysis for Research Questions

As I have determined that my data respects simple and multiple regression assumptions, I conducted parallel mediation and moderated mediation analyses. In this section, I present findings by research questions.

RQ 1: To what extent does residents' emotional exhaustion (*H*1a), depersonalization (*H*1b) or engagement (*H*1c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient

care management practices? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization, or engagement → residents' suboptimal patient care management practices).

$H_0$1: Residents' emotional exhaustion ($H_0$1a), depersonalization ($H_0$1b) or engagement ($H_0$1c) does not statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices.

$H_1$1: Residents' emotional exhaustion ($H_1$1a), residents' depersonalization ($H_1$1b) or engagement ($H_1$1c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices.

To investigate RQ 1, a parallel mediation analysis was performed using Model 4 in PROCESS macro for SPSS. The dependent variable (DV1) was suboptimal patient care practices. The predictor variable (IVP) was program director-resident relationship quality. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). The total effect of IVP on DV1 [Effect = -.03, 95% C.I. (-.04, -.01), p = .01] was significant. The IVP had a statistically significant negative effect on M1 and M2 (p < .001 and p = .0028 respectively), and significant positive effect on M3 (p < .001).

The direct effects of IVP, M2 and M3 on DV1 were not found to be statistically significant (p > .05), while the direct effect of M1 on DV1 [Effect = .08, 95% C.I. (.00, .16), p = .04] was statistically significant. The indirect effects of IVP on DV1 through M2 [Effect = -.04, 95% C.I. (-.12, .02), p > 0.5] and M3 [Effect = .02, 95% C.I. (-.07, .10), p >

0.5] were not significant. The respective partially standardized indirect effects were ab_{ps} = -.01, .0. The respective completely standardized indirect effects for DP and ENG were ab_{cs} = -.04, .02. The indirect effect of IVP on DV1 through [Effect = -.01, 95% C.I. (-.02, -.00), $p < .05$] was significant, whereby the C.I. UL suggests a non-zero values; however the effect size was small (ab_{ps} = -.01, ab_{cs} = -.08) as per Cohen's (1988). Hence, the null hypotheses $H_0$1b and $H_0$1c were both accepted, while the null hypothesis $H_0$1a was rejected. The results indicate that EE mediates the relationship between program director-resident relationship quality and suboptimal patient care practices, while ENG and DP were not supported as mediators in this relationship. Path analysis effects for each of the parallel mediation analysis are presented in Figure 2.

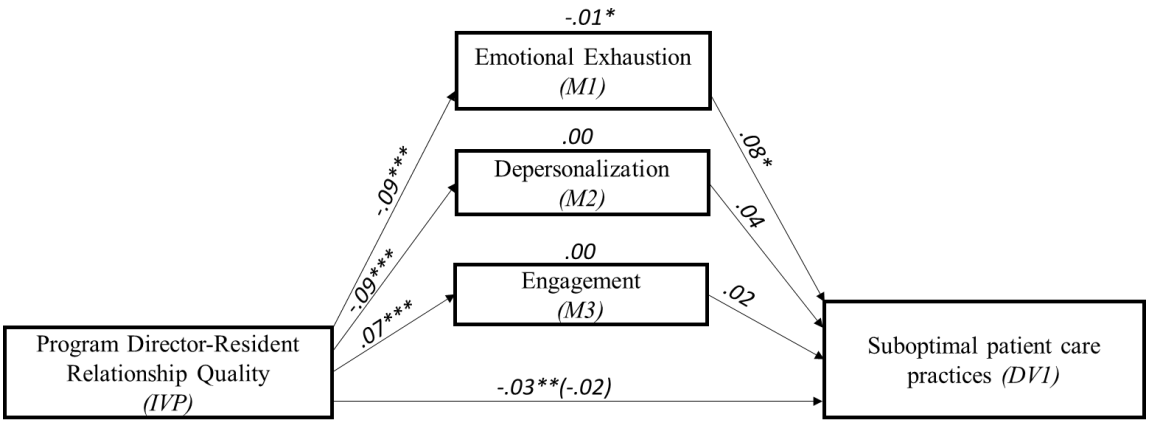

Figure 2. The mediating effects of wellbeing dimensions in the relationship between program director-resident relationship quality and suboptimal patient care practices. Note: The effects on the direct path from IVP to M1, M2 and M3 depict the effect of DV1 on M. The effects on the direct path from M1, M2, and M3 to DV1 depict the direct effect of each M variable on DV1. The effects above each M variable depict the indirect effect of IV on DV1 through each M variable. The effects on the direct path from IVP to DV depict the total effect for IVP on DV1 as well as the (direct effect); total effect c-path (c' path). *$p < .05$, **$p < .01$, ***$p < .001$

RQ 2: To what extent does residents' emotional exhaustion (*H*2a), depersonalization (*H*2b) or engagement (*H*2c) statistically mediate the relationship between program director-resident relationship quality and residents' medical errors? (i.e. program director-resident relationship quality → residents' emotional exhaustion, depersonalization and/or engagement → residents' medical errors)

$H_0$2: Residents' emotional exhaustion ($H_0$2a), depersonalization ($H_0$2b) or engagement ($H_0$2c) does not statistically mediate the relationship between program director-resident relationship quality and residents' medical errors.

$H_1$2: Residents' emotional exhaustion ($H_1$2a), depersonalization ($H_1$2b) or engagement ($H_1$2c) statistically mediates the relationship between program director-resident relationship quality and residents' medical errors.

To investigate RQ 2, a parallel mediation analysis was performed using Model 4 in PROCESS macro for SPSS. The second outcome variable (DV2) was medical errors. The predictor variable (IVP) was program director-resident relationship quality. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). As mentioned previously, the direct effects of IVP on all mediator variables were significant ($p < .05$). The total effect of IVP on DV2 was not significant ($p > .05$). In addition, the IVP, as well as M1, M2 and M3 had no significant direct effect on DV2 ($p > .05$). The indirect effect of IVP on DV2 through each of the three mediators was not significant; M1 [Effect = .00, 95% C.I. (-.01, .00), $p > .05$], M2 [Effect = .00, 95% C.I. (-.01, .00), $p > .05$], and M3 [Effect = .00, 95% C.I. (-.01, .00), $p > .05$]. The respective partially standardized indirect

effects were ab_{ps} = -.01, -.01, .00. The respective completely standardized indirect effects for EE, DP and ENG were ab_{cs} = -.04, -.03, -.01. Hence, the null hypotheses $H_0$2a, $H_0$2b and $H_0$2c were accepted. The results indicate that EE, DP and ENG do not mediate the relationship between program director-resident relationship quality and medical errors. Path analysis effects for each of the parallel mediation analysis are presented in Figure 3.

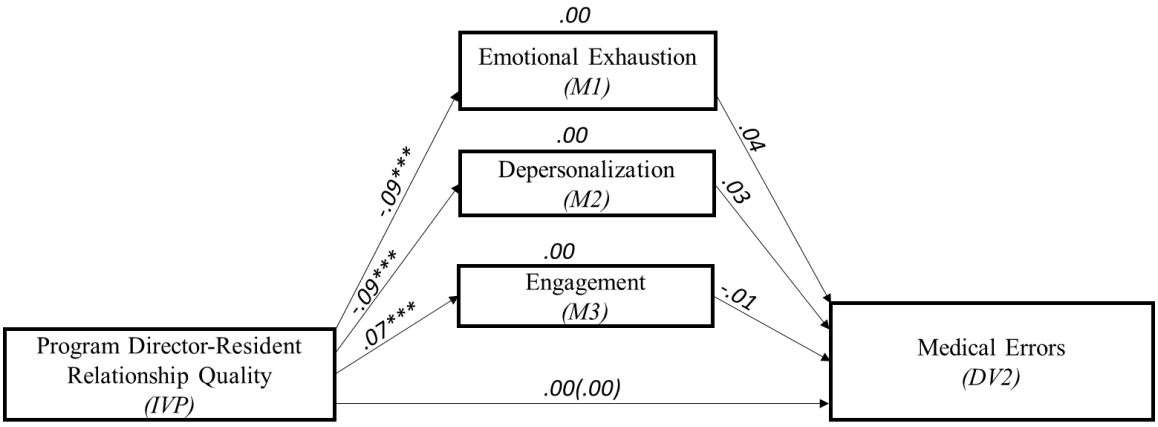

Figure 3. The mediating effects of wellbeing dimensions in the relationship between program director-resident relationship quality and medical errors.
Note: The effects on the direct path from IVP to M1, M2 and M3 represent the effect of DV on M. The effects on the direct path from M1, M2, and M3 to DV2 represent that direct effect of each M variable on DV2. The effects above each M variable depict the indirect effect of IVP on DV2 through each M variable. The effects on the direct path from IVP to DV depict the total effect for IVP on DV2 as well as the (direct effect); total effect c-path (c' path). *$p < .05$, **$p < .01$, ***$p < .001$

RQ 3: To what extent does residents' emotional exhaustion (*H*3a), depersonalization (*H*3b) or engagement (*H*3c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients? (i.e. program director-resident relationship quality → residents'

emotional exhaustion, depersonalization, or engagement → residents' suboptimal attitudes towards patients)

$H_0$3: Residents' emotional exhaustion ($H_0$3a), depersonalization ($H_0$3b) or engagement ($H_0$3c) does not statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.

$H_1$3: Residents' emotional exhaustion ($H_1$3a), depersonalization ($H_1$3b) or engagement ($H_1$3c) statistically mediates the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients.

To investigate RQ 3, a parallel mediation analysis was performed using PROCESS macro for SPSS. The third dependent variable (DV3) was suboptimal attitudes towards patients. The predictor variable (IVP) was program director-resident relationship quality. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). As mentioned previously, the direct effect of IVP on each mediator variable was significant ($p < 0.05$).

The total effect of IVP on DV3 [Effect = -.04, 95% C.I. (-.08, -.01), p = .009] was significant. The direct effect of M1 on DV3 was not found to be statistically significant (p > .05), while the direct effect of M2 on DV3 [Effect = .21, 95% C.I. (.11, .31), p = .00] was significantly positive, and that of M3 on DV3 [Effect = -.25, 95% C.I. (-.40, -.09), p = .002] was also significantly negative. Similarly, the indirect effects of IVP on DV3 through M2 [Effect = -.02, 95% C.I. (-.04, -.00)] and M3 [Effect = -.02, 95% C.I. (-.04, -.00), p < .05] were statistically significant, whereby the C.I. UL suggests a non-zero

value. The respective partially standardized effect sizes were ab_{ps} = -.02, -.02. The respective completely standardized indirect effects for DP and ENG were ab_{cs} = -.12, -.11, and approaching a moderate effect size as per Cohen's (1988). The indirect effect through M1 was not statistically significant, [Effect = -.01, 95% C.I. (-.04, .00), p >.05], and the partially standardized indirect effects was ab_{ps} = -.03, while the completely standardized indirect effects was ab_{cs} = -.03. The results indicate that DP and ENG mediate the relationship between program director-resident relationship quality and suboptimal attitudes towards patients, while EE was not supported as a mediator in this relationship. The null hypothesis $H_0$3a was accepted, while the null hypotheses $H_0$3b and $H_0$3c were rejected. Path analysis effects for the parallel mediation analysis are presented in Figure 4.

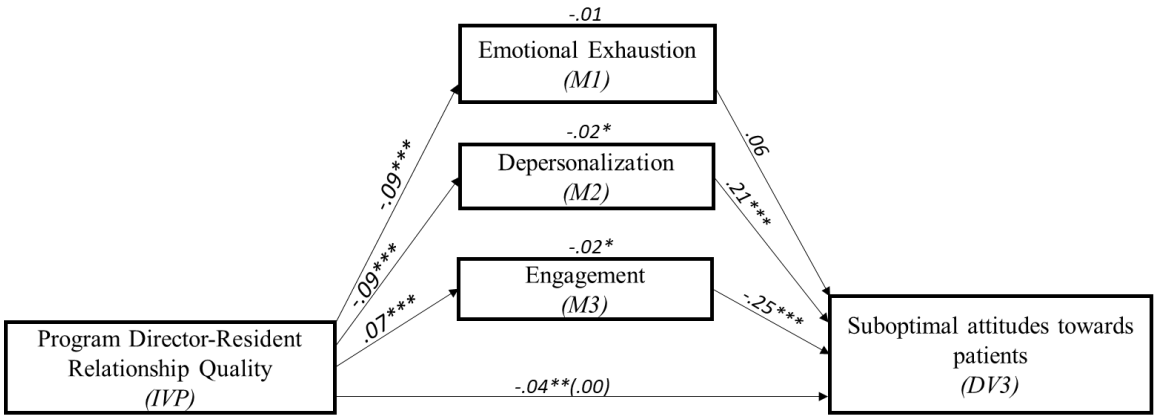

Figure 4. The mediating effects of wellbeing dimensions in the relationship between program director-resident relationship quality and suboptimal attitudes towards patients. Note: The effects on the direct path from IVP to M1, M2 and M3 represent the effect of DV3 on M. The effects on the direct path from M1, M2, and M3 to DV3 represent that direct effect of each M variable on DV3. The effects above each M variable depict the indirect effect of IVP on DV3 through each M variable. The effects on the direct path from IVP to DV depict the total effect for IVP on DV2 as well as the (direct effect); total effect c-path (c' path). *p < .05, **p < .01, ***p < .001

RQ 4: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion (*H*4a), depersonalization (*H*4b), or engagement (*H*4c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal patient care management practices).

$H_0$4: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion ($H_0$4a), depersonalization ($H_0$4b), or engagement ($H_0$4c).

$H_1$4: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion ($H_1$4a), depersonalization ($H_1$4b), or engagement ($H_1$4c).

To investigate RQ 4, a moderated mediation analysis was performed using Model 7 in PROCESS. The dependent variable (DV1) was suboptimal attitudes towards patients. The predictor variable (IVP) was program director-resident relationship quality. The moderator variable (IVM) was departmental support. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). The interaction effect between [IVP] and [IVM] on M1 [Effect = .02, 95% C.I. (-.01, .05), p = .23], M2 [Effect = .00, 95% C.I.

(-.04, .04), p = .95], and M3 [Effect = .02, 95% C.I. (.00, .04), p = .06] was not found to be statistically significant. Thus, regardless of where the IVM [departmental support] lies, the relationship between IVP [program director-resident relationship quality] and each M variable [EE, DP, ENG] remains the same. The conditional indirect effect (IE) of IVP on DV1 through each of M1, M2 and M3 was not also statistically significant at any level of IVM (p > .05), and it marginally changed while moving from low (-1SD) to average (mean) to high (+1SD) levels of perceived departmental support, which confirmed that no moderated mediation occurred. The index of moderated mediation, [IMM = .00, 95% C.I. (-.00, .00), p > .05] further confirmed that the difference was not significantly different from zero. Therefore, the null hypotheses $H_0$4a, $H_0$4b, and $H_0$4c were accepted, and I conclude that perceived departmental support did not moderate the relationship between program director-resident relationship quality and suboptimal patient care practices, through any of the mediators. Path analysis and conditional IEs for this moderated mediation model are presented in Figure 5.

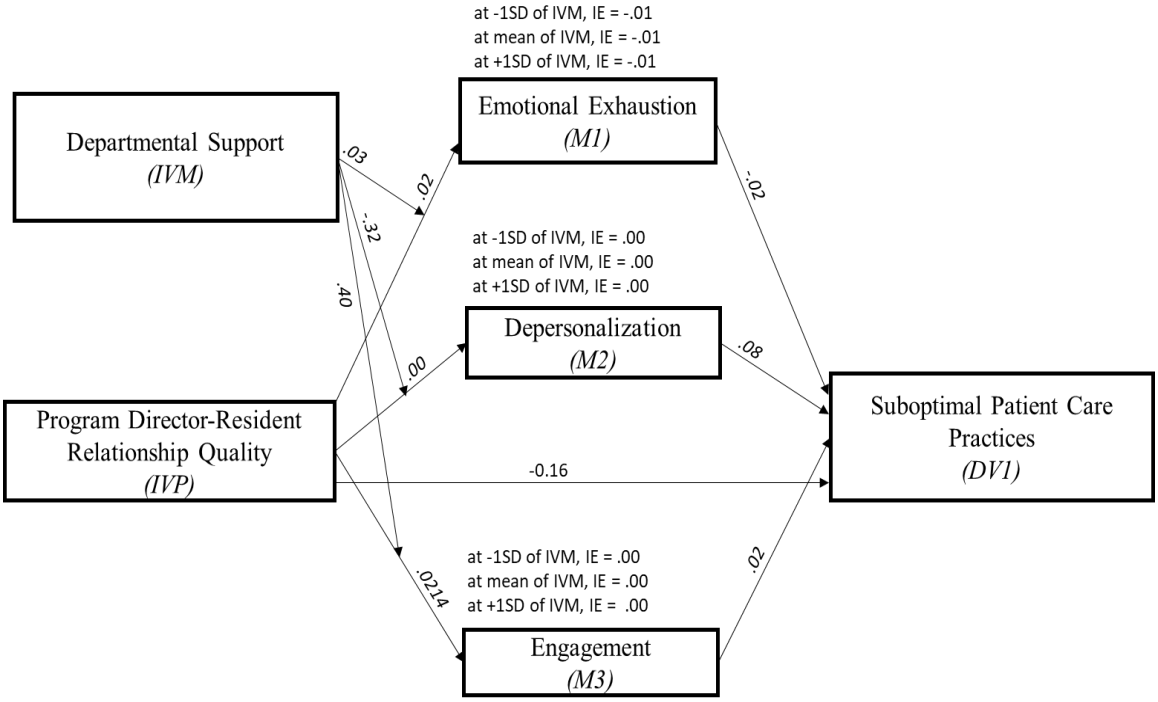

Figure 5. The conditional indirect effects of departmental support on the relationship between program director-resident relationship quality and suboptimal patient care practices, through wellbeing dimensions.
Note: The effects on the direct path from IVM to the paths depict the direct effect of IVM on each path. The effects on the direct path from IVP to M1, M2 and M3 depict the interaction effect of IVP and IVM; i.e. IVP*IVM. The effects on the direct path from M1, M2, and M3 to DV1 represent that direct effect of each M variable on DV1. *$p < .05$, **$p < .01$, ***$p < .0001$.

RQ 5: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion (*H*5a), depersonalization (*H*5b), or engagement (*H*5c)? (i.e. program director-resident relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' medical errors).

$H_0$5: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents'

medical errors, through residents' emotional exhaustion ($H_0$5a), depersonalization ($H_0$5b), or engagement ($H_0$5c).

$H_1$5: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion ($H_1$5a), depersonalization ($H_1$5b), or engagement ($H_1$5c).

To investigate RQ 5, a moderated mediation analysis was performed using Model 7 in PROCESS. The outcome variable (DV2) was medical errors. The predictor variable (IV) was program director-resident relationship quality. The moderator variable (IVM) was departmental support. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). The interaction effect between [IVP] and [IVM] on M1 [Effect = .02, 95% C.I. (-.013, .052), p = .23], M2 [Effect = .00, 95% C.I. (-.04, .04), p = .95], and M3 [Effect = .02, 95% C.I. (.00, .04), p = .06] was not found to be statistically significant. Thus, regardless of where the IVM [departmental support] lies, the relationship between IVP [program director-resident relationship quality] and each M variable [EE, DP, ENG] remains the same. The conditional indirect effect (IE) of IVP on DV2 through each of M1, M2 and M3 was not also statistically significant at any level of IVM (p > .05), and it marginally changed while moving from low (-1SD) to average (mean) to high (+1SD) levels of perceived departmental support, which confirmed that no moderated mediation occurred. The index of moderated mediation, [IMM = .00, 95% C.I. (-.00, .00), p > .05] further confirmed that the difference was not significantly different from zero. Therefore, the null hypotheses $H_0$5a, $H_0$5b, and $H_0$5c were accepted, and I conclude that perceived

departmental support did not moderate the relationship between program director-resident relationship quality and medical errors, through any of the mediators. Path analysis and conditional IEs for this moderated mediation model are presented in Figure 6.

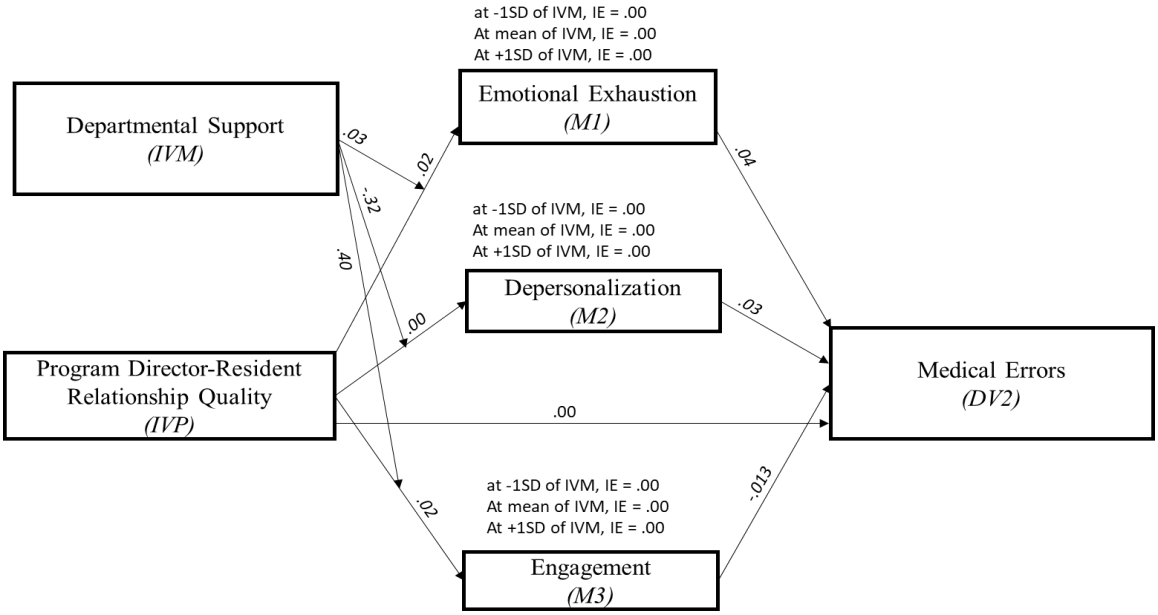

Figure 6. The conditional indirect effects of departmental support on the relationship between program director-resident relationship quality and medical errors, through wellbeing dimensions.
Note: The effects on the direct path from IVM to the paths depict the direct effect of IVM on each path. The effects on the direct path from IVP to M1, M2 and M3 depict the interaction effect of IVP and IVM; i.e. IVP*IVM. The effects on the direct path from M1, M2, and M3 to DV2 represent that direct effect of each M variable on DV2. *$p < .05$, **$p < .01$, ***$p < .0001$.

RQ 6: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion (*H*6a), depersonalization (*H*6b), or engagement (*H*6c)? (i.e. program director-resident

relationship quality*perceived departmental support → residents' emotional exhaustion, depersonalization or engagement → residents' suboptimal attitudes towards patients).

$H_0$6: Perceived departmental support does not statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_0$6a), depersonalization ($H_0$6b), or engagement ($H_0$6c).

$H_1$6: Perceived departmental support statistically moderates the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion ($H_1$6a), depersonalization ($H_1$6b), or engagement ($H_1$6c).

To investigate RQ 6, a moderated mediation analysis was performed using Model 7 in PROCESS. The outcome variable (DV3) was suboptimal attitudes towards patients. The predictor variable (IVP) was program director-resident relationship quality. The moderator variable (IVM) was departmental support. The three mediator (M) variables were EE (M1), DP (M2), and ENG (M3). The interaction effect between [IVP] and [IVM] on M1 [Effect=.02, 95% C.I. (-.013, .052), p = .23], M2 [Effect=.00, 95% C.I. (-.04, .04), p = .95], and M3 [Effect=.02, 95% C.I. (.00, .04), p = .06] was not found to be statistically significant. Thus, regardless of where the IVM [departmental support] lies, the relationship between IVP [program director-resident relationship quality] and each M variable [EE, DP, ENG] remains the same. The conditional indirect effect (IE) of IVP on DV3 through each of M1, M2 and M3 was not also statistically significant at any level of

IVM ($p > .05$), and it marginally changed while moving from low (-1SD) to average (mean) to high (+1SD) levels of perceived departmental support, which confirmed that no moderated mediation occurred. The index of moderated mediation, [IMM = -.00, 95% C.I. (-.01, .00), $p > .05$] further confirmed that the difference was not significantly different from zero. Therefore, the null hypotheses $H_0$6a¸ $H_0$6b, and $H_0$6c were accepted, and I conclude that perceived departmental support did not moderate the relationship between program director-resident relationship quality and suboptimal attitudes towards patients, through any of the mediators. Path analysis and conditional IEs for this moderated mediation model are presented in Figure 7.

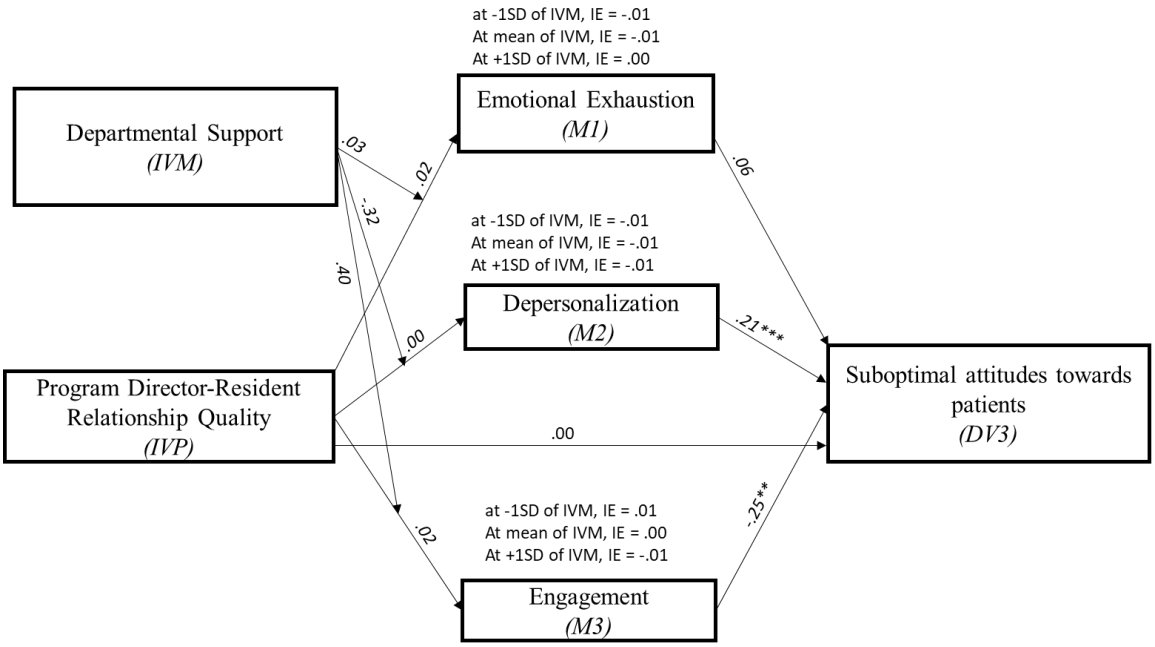

Figure 7. The conditional indirect effects of departmental support on the relationship between program director-resident relationship quality and suboptimal attitudes towards patients, through wellbeing dimensions.
Note: The effects on the direct path from IVM to the paths depict the direct effect of IVM on each path. The effects on the direct path from IVP to M1, M2 and M3 depict the interaction effect of IVP and IVM; i.e. IVP*IVM. The effects on the direct path from M1, M2, and M3 to DV3 represent that direct effect of each M variable on DV3. *$p < .05$, **$p < .01$, ***$p < 0.0001$

Table 9 presents a summary of key findings in relation to research questions.

Table 9

Summary of Key Findings in Relation to the Research Questions

Research Questions	Findings
RQ 1: To what extent does residents' emotional exhaustion (H1a), depersonalization (H1b) or engagement (H1c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal patient care management practices?	Emotional exhaustion statistically mediated the relationship between program director-resident relationship quality (LMX) and residents' sub-optimal patient care management practices, while depersonalization and engagement did not.
RQ 2: To what extent does residents' emotional exhaustion (H2a), depersonalization (H2b) or engagement (H2c) statistically mediate the relationship between program director-resident relationship quality and residents' medical errors?	None of the wellbeing dimensions (emotional exhaustion, depersonalization, and engagement) mediated the relationship between program director-resident relationship quality (LMX) and residents' medical errors.
RQ 3: To what extent does residents' emotional exhaustion (H3a), depersonalization (H3b) or engagement (H3c) statistically mediate the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients?	Depersonalization and engagement statistically mediated the relationship between program director-resident relationship quality (LMX) and residents' sub-optimal attitudes towards patients, while emotional exhaustion did not.
RQ 4: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal patient care management practices, through residents' emotional exhaustion (H4a), depersonalization (H4b), or engagement (H4c)?	Perceived departmental support (POS) did not influence the indirect relationship between program director-resident relationship quality (LMX) and residents' sub-optimal patient care management practices, through any of the mediators.

RQ 5: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' medical errors, through residents' emotional exhaustion (H5a), depersonalization (H5b), or engagement (H5c)?	Perceived departmental support (POS) did not influence the indirect relationship between program director-resident relationship quality (LMX) and residents' medical errors, through any of the mediators.
RQ 6: To what extent does perceived departmental support statistically moderate the mediated relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients, through residents' emotional exhaustion (H6a), depersonalization (H6b), or engagement (H6c)?	Perceived departmental support (POS) did not influence the indirect relationship between program director-resident relationship quality (LMX) and residents' sub-optimal attitudes towards patients, through any of the mediators.

Summary

I gathered surveys from 95 residents to assess the mediating role of residents' wellbeing (EE, DP, and ENG) in the relationship between program director-resident relationship quality (LMX) and quality of care (QOC), in addition to the moderating role of perceive departmental support (POS). Descriptive analysis of each instrument data indicated that residents in the sample perceived a moderate level program director-resident relationship quality. Additionally, residents' satisfaction with departmental support fell in the lower ranges of POS score. In relation to burnout data, data revealed that high EE is prevalent in 47.4% of the residents, while 35.8% reported high DP. As for ENG, data revealed residents in the sample perceived themselves as being moderately engaged in their work. As for the quality of care data, residents reported low to average frequency of performing sub-optimally on quality of care dimensions. Statistical analysis of the research questions showed that program director-resident relationship quality

significantly predicted residents' EE, DP and ENG. It also had statistically significant indirect effect on suboptimal patient care practices through EE, as well as on suboptimal attitudes towards patients through DP and ENG respectively. However, there was no evidence that perceived departmental support influenced any of these indirect effects. In Chapter 5, interpretation of findings within the context of previous research is presented. Additionally, Chapter 5 presents limitations of the study, recommendations for future research and suggests implications for social change relevant to program director leadership, perceived departmental support, residents' wellbeing and their quality of care.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Much has been cited in the literature on the impact of residents' burnout on QOC, while only two publications highlighted the role of residents' ENG as another predictor of residents' quality of care. In addition, no previous work examined how program director leadership or departmental support assists in reducing residents' burnout levels, increasing their ENG in the workplace, and improving their QOC. In my study, I aimed to build on previous findings related to LMX and POS in other fields and examine the association between program-director resident relationship and residents' reported QOC, and the mediating effects of burnout and ENG, as well as the moderating effect of perceived departmental support in this relationship, among resident physicians from 20 different specialties in Lebanon.

Among the study respondents, the mean score for the quality of program director-resident relationship (LMX) was in the moderate range as measured by the LMX tool (Graen and Uhl Bein, 1995). However, the perceived departmental support (POS) mean score was 3.67, referring to low levels of POS when compared to benchmark scores in the health sector (Shanock et al., 2019). As for the wellbeing dimensions, the findings of this study indicated the 47.7% of the residents met the criteria of high EE, compared to lower proportions in the literature (38.9%), while 35.8% of them experienced high DP, compared to higher proportions in the literature (43.6%), as measured by the single items MBI tool (Rodrigues et al., 2018). Nonetheless, 54.8% of our study respondents were found to meet the criteria of burnout, and that was significantly higher than the findings

(35.1%) reported in a systematic review by Rodrigues et al. (2018). However, the mean score for ENG was in the moderate range in our sample, similar to scores reported by the two other studies, which assessed residents' ENG (Loerbroks et al. 2017; Prins et al., 2010).

The QOC dimensions were measured using two tools, one of which was developed and validated by Vidyarthi et al. (2015), to assess the frequency of suboptimal patient care management practices and medical errors among internal medicine resident physicians at the University of California, San Francisco. Respondents in this present study reported a higher frequency of suboptimal patient care practices (2.44 compared to 2.16), but a substantial lower frequency of medical errors (1.60 compared to 2.39). As for the frequency of suboptimal attitudes with patients, which was assessed using two questions previously developed by Trockel et al. (2018) within a longer questionnaire to assess physicians' professional fulfillment, the average score was 2.51, which is higher than the average frequency reported for medical errors and suboptimal patient care management practices.

In response to the research questions, the present study found that program director-resident relationship quality (LMX) was negatively associated with suboptimal patient care management practices and suboptimal attitudes towards patients. EE mediated the relationship between program director-resident relationship quality and residents' suboptimal patient care practices, while DP and ENG (ENG) mediated the relationship between program director-resident relationship quality and residents' suboptimal attitudes towards patients. Perceived departmental support (POS) did not

prove to have a dominant role over LMX in my conceptual framework, and thus did not moderate the mediated relationship between LMX and QOC through any of the wellbeing dimensions.

Interpretation of Findings

Wellbeing and Quality of Care

Residents' burnout is associated with negative patient outcomes, and this is further confirmed through two systematic reviews in the field (Dewa et al., 2017; Hall et al., 2018), which suggested a relationship between burnout and patient safety outcomes (resident self-perceived medical errors and sub-optimal care). However, less evidence is prevalent on the relationship between residents' burnout and their communication with patients. With regard to the potential link between residents' work ENG and QOC, prior research has been limited to two studies to my knowledge (Loerbroks et al. 2017; Prins et al., 2010). The authors reported that ENG was associated with better quality of patient care indicators (lesser medical errors and higher quality of interactions with patients).

Overall, my findings on burnout and ENG are in keeping with these observations, which documented associations with various indicators of QOC, except for one. EE was significantly associated with suboptimal patient care practices while holding DP and ENG variables constant. In addition, DP and ENG were both significantly associated with suboptimal attitudes towards patients, while holding EE variable constant. Hence, one can hypothesize that DP and ENG may have more immediate effect on interactions with patients, while EE that depletes the individual's energy, may impair quality of patient care management practices. However, none of the wellbeing dimensions was

significantly associated with medical errors, although the literature reported that emotionally exhausted and depersonalized residents become less attentive to patients, and more prone to make medical errors (Hall et al., 2018). The non-confirming results could be due to the sensitive nature of the questions in this particular QOC dimension, as well as fears of confidentiality, thus reluctance to report accurate frequency of medical errors.

Program Director-Resident relationship Quality (LMX) and Quality of Care

Relationship oriented leadership was associated with positive patient outcomes among the nursing healthcare workers (Wong et al., 2013). However, the association of relationship-oriented leadership in residency programs with positive outcomes of QOC was previously not known. The results of the present study demonstrated that high quality of program director-resident relationship was significantly negatively associated with higher frequency of suboptimal patient care practices and suboptimal attitudes towards patients. However, significant association was not found with the frequency of medical errors made by residents. This could be attributed to the fact that the study respondents did not report significant high frequency of making medical errors as compared to other residents in another study. This could either reflect true low frequency of medical errors, or under-reporting due to the sensitivity of the questions on medical errors, especially that a previous study suggested that relationship-oriented leadership exerted a significant negative effect on the incidence of medication errors (Vogus and Sutcliffe, 2007).

The findings from this study confirm previous findings of a systematic review on nursing leadership and patient outcomes, which provided evidence that relationship-oriented leadership styles are significantly associated with better QOC indicators such as

higher patient satisfaction, lower incidents of patient morbidity and mortality, and fewer medication errors (Wong et al., 2013). In addition, high quality of leader-member relationship also proved to play a significant role in non-healthcare fields, and it was significantly associated with various indices of performance (positive with task and citizenship performance and negative with counterproductive performance; Martin et al., 2016). Based on the study findings, one may suggest that the quality of program director leadership style plays an integral role in enhancing quality of care measures among resident physicians, and the impact on QOC dimensions differs according to the quality of relationship between the resident and program director (leader). Based on the present study results, it would be valid to further extend the research investigation and examine the mechanisms that explain the link between program director-resident relationship quality (LMX) and the various QOC dimensions.

Program Director-Resident Relationship Quality (LMX) and Wellbeing

There is abundance of research on the relationship between good leadership practices and psychological wellbeing of employees in different fields. An employees' relationship with his or her leader represents one of the closest relationships at work. To date, studies support a positive association between leader-member relationship quality and the employee job attitudes, behaviors, and career outcomes (Malik, Wan, Ahmad, Naseem, & ur Rehman, 2015; Thomas & Kankau, 2009). Previous research found that employees with low quality relationships with leaders exhibit low morale, perceive limited leadership support, high levels of stress, and low levels of satisfaction (Lebron et al., 2018; Martin et al. 2015). However, there is a scarcity of research on the impact of

leadership on resident physicians' wellbeing, and among graduate medical education programs. The association between program director-resident relationship quality and residents' wellbeing was not studied earlier.

In the present study, program director-resident relationship quality (LMX) was significantly negatively associated with residents' burnout (EE and DP). This follows the line of Tepper (2000), who stated that low quality of leader-member relationships are one of the most common sources of stress in organizations. Thus, a high-quality exchange between resident and program director can act as 'antidote' to work strain and might help to create an environment that is supportive of employee needs and values. This may have implications for followers' stress and well-being. Residents who are in high-quality LMX with their program director are likely to receive more emotional and social support from their program directors, which might help them to cope with their stressful work environment.

Findings in the current study also showed significant positive association between program director-resident relationship quality (LMX) and residents' work ENG. This echoes previous findings in other fields, where employees who experienced high-quality relationships with their leaders felt safe and empowered, which further enhanced their work ENG (Aggarwal, Chand, Jhamb, & Mittal, 2020). In addition, employees in high-quality relationships with their leaders were found to be more enthusiastic and confident about their abilities to execute and succeed, and such beliefs were important predictors of work ENG (Halbesleben, 2010). Hence, I assume that residents in high-quality LMX with their program director might be more likely to spend more time with program

director, receive more emotional support, and feel psychologically safe. This could result in positive attitudes towards work and might enhance levels of work ENG. In addition, when residents are in high-quality LMX with their program director, residents might feel motivated to work harder as a means of reciprocation.

A meta-analysis on LMX and wellbeing, which included ninety-three correlations between LMX and different outcome variables, further confirmed our results on the association of LMX with wellbeing (Huell et al., 2016). This systematic review found that LMX correlated highly with greater psychological wellbeing followed by work ENG, suggesting that LMX can be regarded as a resource for employees. More specifically, LMX was significantly negatively associated with psychological strain, and especially with burnout (Huell et al., 2016).

Wellbeing Dimensions as Mediators

There is empirical research on the association between residents' burnout and quality of care, while none tried to understand how program leadership could help in reducing the negative effects in this relationship (Dewa et al., 2017). The present study found significant indirect relationship between LMX and suboptimal patient care practices through EE. High LMX significantly reduced residents' EE and suppressed its positive effect on suboptimal patient care practices. In addition, significant indirect relationship was found between LMX and suboptimal attitudes towards patients through DP and ENG (ENG). LMX significantly reduced residents' DP and suppressed its positive effect on suboptimal attitudes towards patients. In addition, LMX significantly

improved residents' ENG and amplified its negative effect on suboptimal attitudes towards patients.

For instance, there wasn't anything previously known on the role that program leadership could play in enhancing residents' quality of care, and eventually nothing was known about potential mediators in this relationship, if it existed. The findings in this study suggested that high quality of program director-resident relationship quality (LMX) is an important predictor of residents' wellbeing (reduced burnout and increased ENG), and eventually reduced frequency of suboptimal performance (defined by suboptimal patient care practices and attitudes towards patients). Hence, residents in high-quality LMX with their program director might be in a more positive mental and emotional state to cope with job demands, less likely to experience high levels of chronic stress, and more likely to be engaged and committed towards their work. This significantly affects the execution of residents' tasks; thus, they become less likely to perform poorly in their patient care practices. Based on the present study results, it would be valid to further extend again the research investigation and examine whether the improvement in quality of care through the indirect effect of program director-resident relationship quality will be affected by other factors in the organization.

Perceived Departmental Support (POS) as Moderator

Only recently, scholars have begun to devote increased attention to investigate the interrelationships between POS and LMX, and the effect of their interaction on job outcomes such as job satisfaction, organizational commitment, organizational citizenship behavior, and innovative work behaviors (Agarwal, 2014; Eisenberger et al., 2014;

López-Ibort, González-De la Cuesta, Antoñanzas-Lombarte, & Gascón-Catalán, 2020). Yet, the interactive effect of program director-resident relationship quality (LMX) and perceived departmental support (POS) on residents' job outcomes (wellbeing and quality of care) has not been studied earlier.

The findings in the study showed that perceived departmental support (POS) failed to play a significant role in regulating the process where program director-resident relationship quality (LMX) influences quality of care (QOC) indirectly through any of the wellbeing dimensions. In other words, POS whether high or low, will not affect the way LMX works on QOC through any of the wellbeing dimensions. This finding is intriguing, as I expected that lower POS would deteriorate residents' wellbeing enhanced by high quality LMX.

The current findings of this study mean that even though the department fails to care enough for the residents, those with high-quality relationship with their program director are very likely to experience reduced burnout and higher levels of ENG, and less likely to perform poorly in their patient care practices. Conversely, a poor relationship with the program director will hardly enhance residents' ENG and reduce their burnout, even if the departments offers all types of benefits. The reason is that residency programs are conveyed and eventually implemented by program directors, with whom the residents must deal face to face for all residency matters. Hence, program directors play an important and irreplaceable role in promoting residents' wellbeing and reducing the occurrence of suboptimal quality of care. Therefore, regardless of departmental support,

it is the immediate leadership that residents always face, as the program director is the representative of the department.

Findings in the Context of Conceptual Framework

The leader-member exchange and perceived organizational support theories guided the conceptual framework of the current study, to assess the extent to which program leadership affects residents' wellbeing and their job outcomes. This study adapted the LMX theory by examining the effect of high-quality program director resident relationship on residents' burnout and ENG, and eventually on the quality of their patient care services. Based on the current findings, there were statistically significant associations between program leadership and residents' wellbeing, and statistically significant indirect effect on quality of care through at least one of the wellbeing dimensions. The LMX theory states that high-quality relationship with supervisor is a resource for individuals to aid job stress resistance, and that support from leaders contributes to psychological safety (Graen & Sommerkamp, 1982). In addition, high LMX is positively related to feelings of energy, which, in turn, is related to greater work ENG among employees (Walumbwa, Cropanzano, & Goldman, 2011). The role that LMX plays on job stress and ENG makes employees capable of dealing with job demands and work strain, as well as more motivated, and thus more likely to perform well (Huang, Wang, & Xle, 2014; Walumbwa et al., 2011). Subsequently, my findings were in line with LMX theory.

Studies have also shown that POS is more predictive of psychological outcomes, while LMX is more predictive of behavioral outcomes. Since intent precedes behavior,

the framework of this study also suggested that POS is a necessary condition for residents in high-quality LMX to be engaged and experience lower levels of EE and DP, and eventually to perform well. My findings showed very little empirical evidence for the dominant role of perceived departmental support (POS) over the quality of relationship between the program director and resident (LMX). The current findings mean that even though the department fails to care enough for the residents, those with high-quality relationship with their program director are very likely to experience reduced burnout and higher levels of ENG, and less likely to perform poorly in their patient care practices. Conversely, poor relationship with program director will hardly enhance residents' ENG and reduce their burnout, even if the departments offers all kinds of benefits. However, it would be remised to point out that little to no research studies have been conducted on how high POS is a condition for the influence of high LMX on wellbeing and job outcomes. Plethora of literature examined LMX and POS as simultaneous independent variables; however, I am not aware of any studies which have studied whether POS is a necessary condition for LMX in residency programs. Hence, this study prompts future studies on the conditional roles of POS and LMX in residency programs.

Limitations of the Study

First, the study was conducted during the Corona Virus Disease-19 (COVID) pandemic, and fears of becoming a vector for COVID infection and endangering colleagues and family members could have inflated residents' chronic stress and feelings of burnout. Second, data was collected during unseen economic hardship and financial threats in Lebanon, and this could have also inflated residents' stress at work and might

have had potential adverse effects on performance levels and workforce ENG. Third, although I proposed a process model in which LMX reduce burnout and enhanced ENG, which then results in improved quality of care, the relationships found in this study are correlated and provide no evidence of the direction of the relationships. Fourth, the self-reported measures of all constructs raise the general issue of common method variance, and this may affect the strength of the association among the variables. Fifth, the measurement of quality of care was based on self-reported answers and not on audit of medical records due to the anonymous nature of the study. However, the extent to which perceived medical errors really reflect the frequency of medical errors and whether these perceived medical errors affect patient outcomes could not be determined. Sixth, 30% of the respondents were from one specialty, while 70% were from 19 other different specialties, and this could have skewed the results. Seventh, the hypotheses were derived based on theories mainly developed in the Western context, and thus I cannot rule out the cross-cultural variation of the model. Further limitations are: (a) The responses may have been influenced by the principle of social desirability; (b) although anonymity was guaranteed, the residents could have feared identification; (c) there are other variables (learning environment, organizational culture, personality traits, sleep deprivation and fatigue, etc.) that could influence the model, and it would be interesting to include them in future works.

Recommendations

Considering the limitations of the study, it is recommended to replicate the same study with larger sample size, in order to come up with stronger conclusions about the

association between the study variables, and to further confirm whether program director-resident relationship quality (LMX) has dominant role over perceived departmental support (POS) in residency programs. It is also unlikely that leadership affects the studied wellbeing dimensions directly, but through a set of mediators. Hence, it is recommended to further understand the mechanism through which program director-resident relationship quality could have affected residents' burnout and ENG and explore any mediators in this process. In addition, I also recommend replicating this study using a phenomenological research design. With this research design, data-gathering techniques requires face-to-face interactions between the researcher and participants. Thus, utilizing face-to-face interviews may enable future studies to gain a deeper understanding about the important role of program director leadership and departmental support by residents, and to confirm the extent to which residents perceive that this affects their wellbeing and quality of care.

Implications

The results of this study could contribute to positive social change on numerous levels by increasing insight as to how program director-resident relationship quality (LMX) is associated with burnout (EE and DP) as well as ENG, and with lower levels of suboptimal patient care practices. With these findings, program directors may focus more on improving their support relationship with residents, and creating more favorable work environments, which can exert stronger positive influence on residents' psychological wellbeing and performance. In addition, given the importance of program director leadership in the context of residents' burnout and ENG, as well as performance, it would

be appropriate to evaluate the quality of program director leadership style as one of the residency program performance indicators. Findings of this study also present empirical evidence on the association between residents' ENG and burnout with quality of care. Thus, the wellbeing of residents – positive ENG and negative burnout – is of paramount importance in achieving the hospitals primary goal of the triple aim, which is improving population health. This could provide evidence-based recommendations for hospitals to work towards adding a fourth dimension, improving physician's wellbeing, to their triple aim of better care, better health, and lower costs.

Conclusion

The purpose of this study was to examine the association between program-director-resident relationship quality (LMX) and residents' reported quality of care (sub-optimal patient care practices, medical errors, and attitudes towards patients), and the mediating effects of burnout (emotional exhaustion (EE) and depersonalization(DP)) and engagement (ENG), as well as the moderating effect of perceived departmental support (POS). The results demonstrated that residents who are in high-quality LMX with their program directors are likely to receive more emotional and social support from their program directors, which might help them to cope with their stressful work environment. This could result in positive attitudes towards work and might further enhance levels of work ENG. Hence, residents in high-quality relationship with their program director might be in a more positive mental and emotional state to cope with job demands, less likely to experience high levels of chronic stress, and more likely to be engaged and committed towards their work. This significantly affects the execution of their tasks; thus,

they become less likely to perform poorly in their patient care practices. My findings also showed very little empirical evidence for the dominant role of perceived departmental support (POS) over the quality of relationship between the program director and resident (LMX). Although unexpected, my non-finding of the hypothesized pathways is intriguing, and could indicate that program directors play an important and irreplaceable role in promoting residents' wellbeing and their optimal performance on the job. The obtained data may assist healthcare executives in recognizing suitable program leadership practices that improve residents' wellbeing, which in turns creates a positive patient safety culture. This ultimately may enhance patient care management and promote a high-quality relationship with patients.

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Appendix A: Permission for the Perceived Organizational Support Questionnaire

Dear Fatima,
I am happy to give you permission to use the POS scale for your research.

Cordially,
Bob

Robert Eisenberger
Professor of Psychology
College of Liberal Arts & Soc. Sciences
Professor of Management
C. T. Bauer College of Business
University of Houston
[redacted]

Appendix B: Permission for the Quality of Care Questionnaire

From: Arpana R. Vidyarthi [redacted]
Sent: Thursday 28 November 2019 12:24 AM
To: Fatima MSHEIK EL-KHOURY <[redacted]
Subject: Re: Permission to use survey questions

Of course. Best luck.

Arpana

Appendix C: Permission for the Maslach Burnout Tool

Fatima Msheik

Remote online use of the Mind Garden instrument stated below is approved for the person on the title page of this document.

Your name:
Fatima Msheik
Email address:
fatima.msheik@waldenu.edu
Company/institution:
Walden University
Mind Garden Sales Order or Invoice number for your license purchase:
DHBROVVVR
The name of the Mind Garden instrument you will be using:
MBI shortened 2 items instrument
Please specify the name of and web address for the remote online survey website you will be using and describe how you will be putting this instrument online:
Survey name: Program Leadership, Residents' Wellbeing and Quality of Care Survey portal: Lime Survey Description: I will be using the MBI single-items tool, which was shortened and validated by West, Dyrbye, Sloan, & Shanafelt, 2009. The two questions on emotional exhaustion and depersonalization will be part of a 41-items survey that includes questions on demographics, LMX-7, POS-8, UWES, Quality of Care, and Burnout. This questionnaire will be filled by resident physicians in a tertiaty medical center in Lebanon.

added 13 September 2018

Fatima Msheik

Conditions of Use

Question	Answer
I will administer this Mind Garden instrument for research purposes only.	I agree to this condition.
I will **not** send Mind Garden instruments in the text of an email or as a PDF file to survey participants.	I agree to this condition.
I will put the instrument copyright statement (from the footer of my license document; includes the copyright date, copyright holder, and publisher details) on every page containing questions/items from this instrument.	I agree to this condition.
I will send screenshots of my online survey to info@mindgarden.com so that Mind Garden can verify that the copyright statement appears.	I agree to this condition.
I will compensate Mind Garden, Inc. for each license use; one license is used when a participant first accesses the online survey.	I agree to this condition.
I will track my license use.	I agree to this condition.
Once the number of administrations reaches the number purchased, I will purchase additional licenses or the survey will be closed to use.	I agree to this condition.
I will remove this online survey at the conclusion of my data collection and I will personally confirm that it cannot be accessed.	I agree to this condition.

I agree to abide by each of the conditions stated above

Your name (as electronic signature): Fatima Msheik
Date: 07/14/2020

Appendix D: 41-Item Questionnaire on the Relationship between Program Leadership, Residents' Wellbeing, and Quality of Care

Demographics

1. **Age: _____**

2. **Gender:**

Female	**Male**

3. **Post Graduate Year Level:**

1	**2**	**3**	**4**	**5**	**6**	**7**

4. **Specialty:**

Anatomic Pathology /Clinical Pathology	Anesthesiology	Dermatology or Ophthalmology	Diagnostic Radiology or Radiation Oncology	Emergency Medicine
Family Medicine	Internal Medicine	Neurology	Obstetrics & Gynecology	Pediatrics
Psychiatry	Surgery - General Surgery	Surgery- Neurosurgery or Plastic & Reconstructive Surgery	Surgery - Orthopedic Surgery	Surgery- Otorhinolaryngology & Head & Neck Surgery
Surgery – Urology				

5. Average number of working hours per week:

>80 hrs	71-80 hrs	61-70 hrs	51-60 hrs	41-50 hrs	≤40 hrs

Leader Member Exchange (LMX-7) Questionnaire

Instructions: This questionnaire contains items that ask you to describe your relationship with your **Program Director**. For each of the items, indicate the degree to which you think the item is true for you by circling one of the responses that appear below the item.

6. Do you know where you stand with your **program director** [and] do you usually know how satisfied your **program director** is with what you do?

1	2	3	4	5
Rarely	Occasionally	Sometimes	Fairly often	Very often

7. How well does your **program director** understand your job problems and needs?

1	2	3	4	5
Not a bit	A little	A fair amount	Quite a bit	A great deal

8. How well does your **program director** recognize your potential?

1	2	3	4	5
Not at all	A little	Moderately	Mostly	Fully

9. Regardless of how much formal authority your **program director** has built into his or her position, what are the chances that your program director would use his or her power to help you solve problems in your work?

1	2	3	4	5
None	Small	Moderate	High	Very high

10. Again, regardless of the amount of formal authority your **program director** has, what are the chances that he or she would "bail you out" at his or her expense?

1	2	3	4	5
None	Small	Moderate	High	Very high

11. I have enough confidence in my program director that I would defend and justify his or her decision if he or she were not present to do so.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

12. How would you characterize your working relationship with your **program director?**

1	2	3	4	5
Extremely ineffective	Worse than average	Average	Better than Average	Extremely effective

Perceived Organizational Support Eight-item Survey

Listed below are statements that represent possible opinions that YOU may have about working at **your department**. Please indicate the degree of your agreement or disagreement with each statement by filling in the circle on your answer sheet that best represents your point of view about **your department**. Please choose from the following answers:

0	1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree

13. The department values my contribution to its well-being.
14. The department fails to appreciate any extra effort from me.
15. The department would ignore any complaint from me.
16. The department really cares about my well-being.
17. Even if I did the best job possible, the department would fail to notice.
18. The department cares about my general satisfaction at work.
19. The department shows very little concern for me.
20. The department takes pride in my accomplishments at work.

Maslach single items burnout survey

0	1	2	3	4	5	6
never	*few times per year*	*once a month*	*a few times per month*	*once a week*	*a few times per week*	*everyday*

Emotional exhaustion:

21. I feel burned out from my work

Depersonalization

22. I have become more callous toward people since I took this job

Utrecht Work Engagement Scale in Residency Training

0	1	2	3	4	5	6
never	*few times per year*	*once a month*	*a few times per month*	*once a week*	*a few times per week*	*everyday*

Vigor

23. At my work, I feel bursting with energy
24. At my job, I feel strong and vigorous
25. When I get up in the morning, I feel like going to work

Dedication

26. I am enthusiastic about my job
27. My job inspires me
28. I am proud of the work that I do

Absorption

29. I feel happy when I am working intensely
30. I am immersed in my work
31. I get carried away when I'm working

Self-Reported Quality of Patient Care

1	2	3	4	5
Never	*Rarely*	*Sometimes*	*Fairly often*	*Very often*

Frequency of engaging in common suboptimal patient care practices

During your last 3 months, how often did you...?

32. Work while impaired by fatigue
33. Forget to transmit important information during sign-out
34. Report information that you were unsure of
35. Write information in a patient's chart that you were unsure of
36. Make up information to report to your superior

Frequency of medical errors

Medical error is the act of omission or commission in planning or execution that contributes or could contribute to unintended results. It might not necessarily have adverse outcome, but it could be a faulty process. During your last 3 months, how often did you make the following avoidable medical errors, which were not due to lack of medical knowledge?

37. Cognitive (wrong test, wrong diagnosis, wrong treatment)
38. Technical (procedural error e.g. pneumothorax)

39. Administrative errors (patient record error, patient identification error, follow up errors, communication failure during transitions of care)

Frequency of engaging in sub-optimal attitudes with the patient

During your last 3 months, how often did you...?

40. Feel less empathetic with your patients
41. Feel less interested to talking with your patients

Appendix E: Invitation Script

[redacted] Social & Behavioral Sciences
INVITATION SCRIPT

Invitation to Participate in a Research Study
This notice is for an [redacted] IRB Approved Research Study
for *PI: Dr. Salah Zein El Dine [redacted]
and *Co-PI: Mrs. Fatima Msheik El Khoury
[redacted]
*It is not an Official Message from [redacted] *

We are inviting you to participate in a research study about assessing the extent to which program leadership affects residents' wellbeing and quality of care.

You will be asked to complete a questionnaire to give your opinion on your program director leadership style, perceived departmental support, and to self-report data on your burnout, engagement and quality of care.

You are invited because we are targeting resident physicians. The estimated time to complete this survey is approximately 15 minutes.

The research is conducted online and is hosted on [redacted]

Please read the consent form and consider whether you want to be involved in the study.

If you have any questions about this study, you may contact the investigator/research team (Dr. Salah Zein El Dine, [redacted] and Mrs. Fatima Msheik El Khoury, [redacted] for further information regarding the study.