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An Examination of the Moderating Effects of Perceived Quality of Life on the Relationship Between Empathy, Motivation, and Specialty Choice Among Medical Students

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Philadelphia College of Osteopathic Medicine

Department of Psychology

AN EXAMINATION OF THE MODERATING EFFECTS OF PERCEIVED QUALITY
OF LIFE ON THE RELATIONSHIP BETWEEN EMPATHY, MOTIVATION, AND
SPECIALTY CHOICE AMONG MEDICAL STUDENTS

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DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Michael Klein
on the 22 day of October, 2014, in partial fulfillment of the
requirements for the degree of Doctor of Psychology, has been examined and is
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Abstract

The number of medical students opting to specialize in primary care has decreased in recent years. Research suggests that empathy, perceived quality of life, and motivation are significant factors in choosing a specialty. The purpose of this study was to determine whether perceived quality of life moderates the relationship between level of empathy and motivation among medical students, and how that affects their final specialty choice. Participants included 174 third- and fourth-year medical students between the ages of 22 and 36 years at the Philadelphia College of Osteopathic Medicine. Medical students were given an online survey, which included a demographic questionnaire and measures on empathy, motivation, and future perceived quality of life. The hypotheses for this study were as follows: (a) perceived future quality of life moderates the relationship between empathy and motivation and (b) motivation in medical students is a significant predictor of specialty choice. The results indicate that perceived future quality of life does not moderate the relationship between empathy and motivation. Motivation was found to be a significant predictor of specialty choice in that medical students with higher levels of extrinsic motivation were found to be less likely to choose a non-primary-care specialty. Additionally, perceived future quality of life, lifestyle, empathy level, and prestige were not significant predictors of specialty choice. The findings of this study may serve to stimulate research on specialty choice among medical students and address the deficit of students going into primary care.

Keywords: specialty choice, empathy, motivation, perceived quality of life

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Chapter 1

Introduction and Literature Review

Statement of the Problem

Research suggests that the number of medical students opting to specialize in pediatrics and family medicine, which are the lowest paying medical specialties, has decreased in recent years (Bindal, Wall, & Goodyear, 2011; Compton, Frank, Elon, & Carrera, 2008; Hauer et al., 2008). The income disparity between primary-care physicians and other specialists, such as surgeons, can be as significant as \$135,000 per year (Wilder et al., 2010). Considering current economic conditions and the student loan debt crisis, many students are choosing to pursue specialties that produce more financial gain, fewer hours in the workplace, and more vacation time. With research supporting the shift towards choosing a specialty that accommodates perceived quality of life (PQOL; i.e., salary, vacation time, hours in the workplace; Shadbolt & Bunker, 2009), one must understand the diverse components affecting the motivation of a medical student to pursue a given specialty.

The level of empathy in physicians has also been shown to have an impact on specialty choice, patient satisfaction, and quality of care (Cousin, Schmid Mast, Roter, & Hall, 2012; Hojat et al., 2011; Hojat et al., 2002). However, the way PQOL affects the relationship between level of empathy and motivation among medical students has yet to be examined. The current study examined how PQOL influences the relationship between level of empathy and intrinsic/extrinsic motivation among medical students, and how that relationship affects specialty choice.

Motivation in the context of career decisions can be understood through Ryan and Deci's (2000) self-determination theory of motivation. This theory describes motivation on a spectrum from entirely intrinsic (i.e., motivation that stems from within the individual only) to completely extrinsic (i.e., income; Ryan & Deci, 2000). The current trend suggests that incoming medical students are motivated by intrinsic factors, and as their medical education progresses, their motivation becomes influenced more by extrinsic factors (Heiligers, 2012). In addition, research supports that empathy decreases through the course of medical training (Hojat et al., 2004). Given that extrinsic motivation increases and empathy decreases through the course of medical school, and literature suggests that PQOL variables have become increasingly important when determining a specialty, an analysis of how PQOL is influencing medical students' empathy levels, motivation, and final specialty choice is important.

If medical students continue to choose careers based primarily on extrinsic factors, the number of family practitioners and pediatricians may continue to decrease (Morra, Regehr, & Ginsburg, 2009). However, an understanding of the effect of PQOL on the relationship among empathy, motivation, and specialty choice can assist medical-school faculty in effectively guiding students toward choosing a specialty that fulfills them both intrinsically and extrinsically. This may help increase the number of medical students who decide to specialize in family medicine and pediatrics, increase satisfaction with their career choice, increase their level of empathy towards patients, and increase the overall quality of care that they administer.

Purpose of the Study

The purpose of this study was to determine whether PQOL moderates the relationship between level of empathy and motivation among medical students, and how that affects their final specialty choice. The literature has shown that such variables as gender, socioeconomic status, views on the healthcare system, student loan debt, demographics, and personality style influence a medical student's specialty choice (Buddeberg-Fischer, Klaghofer, Stamm, Siegrist, & Buddeberg, 2006), and thus they were considered in conjunction with the current proposed model. Knowing why medical students are choosing certain specialties is important so that the shortage in various areas can be addressed by medical schools, hospitals, and private practices (Gray, Stockley, & Zuckerman, 2012; Jeffe, Whelan, & Andriole, 2010; Wilder et al., 2010). Moreover, medical students must be aware of the influence their PQOL has on their level of empathy and career motivation because higher levels of empathy and intrinsic motivation among physicians have been individually associated with greater patient satisfaction and higher quality of care (Cousin et al., 2012; Hojat et al., 2011; West, Shanafelt, & Kolars, 2011).

Literature Review

Introduction

In recent years, the number of medical students specializing in primary care has decreased (Bindal et al., 2011; Compton et al., 2008; Hauer et al., 2008). Many students enter medical school interested in primary-care specialties because students perceive primary care as the most rewarding owing to the amount of patient contact (Hauer et al., 2008). Medical students begin medical school with idealistic expectations, hopes, and

ambitions as to their future careers. However, once in medical school, various life expectations are brought to the students' attention. A few of these realities include: (a) future salaries, (b) student loan payments, (c) additional bills, (d) perceived prestige of various specialties, (e) work-life balance, (f) workplace environment, and (g) additional quality-of-life variables (Shadbolt & Bunker, 2009).

These quality-of-life expectations have been shown to cause a shift from making a specialty choice based on students' internal desires to primarily fulfilling their future lifestyle needs (Compton et al., 2008). Medical students who choose to specialize in primary care have been shown to display levels of empathy toward their patients higher than those of their subspecialist colleagues (Borges, Stratton, Wagner, & Elam, 2009). While many students enter medical school with idealistic expectations and a high level of empathy, research has shown that empathy levels decrease through the course of medical school for most medical students, regardless of their final specialty choice (Newton, Barber, Clardy, Cleveland & O'Sullivan, 2008). This shift is important because physician empathy has been linked to patient satisfaction, patient adherence, and positive treatment outcomes (Hojat et al., 2011). If this decrease in empathy continues, the quality of medical care that patients receive will suffer.

Since a major reason for the shift in specialty choice has been shown to result from quality-of-life variables, medical students' perceptions of their future lifestyle may be influencing the relationship among their level of empathy, motivation, and specialty choice. Specifically, medical students who place a strong emphasis on obtaining a high quality of life in their future may be willing to sacrifice the amount of time spent with patients for a larger income, more time with their family, and a more pleasant work

environment, which are commonly found in non-primary care specialties. Furthermore, if medical students are predominantly focused on obtaining a high quality of life, they may specialize in a discipline that they are not truly passionate about, which would lower their career satisfaction, and possibly decrease the quality of care that they administer to their patients. If physicians are not interested in their specialty, they may not take the time to build positive relationships with patients, and this could negatively impact treatment adherence, as well as contribute to the overutilization of healthcare services (Zolnierek & DiMatteo, 2009).

The decline in numbers of primary-care physicians has been documented not only in the United States, but also in many other countries (Buddeberg-Fischer et al., 2006). In 2004, only 20% of all physicians in Switzerland were primary-care physicians, and on average, only 15% of recent medical-school graduates in Switzerland choose to specialize in primary care (Buddeberg-Fischer et al., 2006). In Germany, the numbers of primary-care physicians has decreased from 60% in 1991 to 50% in 2004, and in Great Britain, studies have confirmed that only one third of medical students choose to specialize in primary care 10 years after medical school (Buddeberg-Fischer et al., 2006). A notable decline in numbers of primary-care physicians in Norway has been documented as well, with the numbers decreasing from 23% to 15% between 2001 and 2006 (Buddeberg-Fischer et al., 2006). This decline is a worldwide problem, and the reasons for the shift must be addressed so this decline does not continue and patient care does not suffer the consequences.

Primary-care physicians fulfill important roles in medicine because they are frequently responsible for referring patients to other specialists. In addition, brief mental-

health services are provided by primary-care physicians, as is an introduction to where patients can obtain further mental-health treatment, and what that experience will be like. The behavior of primary-care doctors toward their patients heavily influences the treatment plans that patients will agree and adhere to over time (Zolnierek & DiMatteo, 2009). Many patients have positive relationships with and trust their primary-care physician because of his or her strong interpersonal skills and level of empathy (Linzer et al., 1994). Despite the importance of and necessity for primary-care physicians, a precipitous decline in this field has been established on a global level.

Medical students who base decisions primarily on external factors such as salary and prestige, have been shown to display lower levels of empathy than those displayed by individuals who are motivated internally, and to more frequently choose non-primary-care specialties (Hojat et al., 2002). Level of empathy, perceived quality of life, intrinsic and extrinsic motivation, and final specialty choice are linked, but a formal model that examines the relationship among these variables has not been developed. An understanding of how and why these variables interact in the way that they do is necessary so that patients obtain the highest level of medical care and medical education programs can intervene to potentially increase the number of graduates who specialize in primary care.

Self-Determination Theory of Motivation

Ryan and Deci's (2000) self-determination theory (SDT) can be utilized to examine the motivating factors involved in medical students' pursuit of one specialty over another. SDT is based on the notion that individuals innately strive for three psychological needs in order to obtain the highest level of functioning: (a) autonomy, (b)

competence, and (c) relatedness (Guay, Senecal, Gauthier, & Fernet, 2003). Autonomy refers to individuals having choice in their behavior, and not being constrained by external factors, such as money. Competence refers to an individual's perception of his or her capability to complete a given task or job. Relatedness refers to an individual's perception of his or her ability to relate to others in his or her environment. These three factors are thought to explain how one successfully interacts with the environment, which entails the freedom to make independent decisions and lead a satisfying life (Ryan & Deci, 2000). An individual who has the greatest level of autonomy over his or her life is thought to be intrinsically motivated, which has been positively correlated with mental health and happiness (Ryan & Deci, 2000). While individuals strive to be intrinsically motivated, extrinsic motivation becomes powerful and persuasive when fulfilling practical life demands and desires, such as paying bills and spending time with family.

Within the framework of SDT, motivation is conceptualized as lying on a continuum from entirely intrinsic to completely extrinsic. Intrinsic motivation is defined as engaging in behavior when external reinforcement or reward is not possible, and extrinsic motivation may be defined as engaging in behavior when external reinforcement is expected (Ryan & Deci, 2000). The following four subcategories on the spectrum of extrinsic and intrinsic motivation are listed from most extrinsic in nature to most intrinsic in nature: (a) external regulation, which is when individuals behave in a particular manner strictly for the sake of gaining a reward or avoiding a punishment; (b) introjected regulation, which is completing a task because one believes it is the right thing to do and because it will result in praise from others; (c) identification, which is acting in a way that is congruent with one's value system; and (d) integrated regulation, which is when

multiple characteristics and events are combined to form a sense of self (Ryan & Deci, 2000). When individuals reach the stage of integrated regulation, they are considered to be intrinsically motivated. According to Ryan and Deci (2000) individuals typically strive to be driven by intrinsic factors because they reflect internal passions. An example would be a medical student deciding to become an oncologist because he or she had a family member pass away as a result of cancer, and that medical student wants to devote his or her life to curing cancer for the purpose of saving lives. In this example, few external incentives drive the individual; the main motivation is the desire to help others.

Unfortunately, intrinsic motivation alone does not always allow individuals to obtain the practical needs necessary to live a comfortable life. A few of these needs include earning a sufficient income, providing food and shelter for a family, having a suitable balance between work and family time, and other variables related to having a comfortable lifestyle. Extrinsic motivation plays a powerful role in decision making when lifestyle demands are factored into the decision-making process. For example, a medical student may ideally want to become a primary-care physician, but because of the amount of his or her student loans and the lower primary-care salary compared to that of the other specialties, the medical student decides to subspecialize. Ryan and Deci (2000) suggested that humans are continuously striving to avoid allowing their extrinsic motivation to override their intrinsic values. However, in terms of specialty choice among medical students, both intrinsic and extrinsic motivational factors have been implicated as influential in decision-making (Lefevre, Rourpret, Kerneis, & Karila, 2010).

Intrinsic Motivation and Specialty Choice

The literature on intrinsic motivation and its role in specialty choice among medical students has revealed several trends: (a) it is related to choosing primary-care specialties, (b) it is related to higher levels of empathy toward patients, and (c) it is related to higher levels of happiness with career choice and lower levels of mental-health issues, such as depression and anxiety (Baboolal & Hutchinson, 2007; Saigal, Takemura, Nishiue, & Fetters, 2007; Diehl, Kumar, Gateley, Appleby, & O'Keete, 2006; Hojat et al., 2002; Cousin et al., 2012). In addition, physicians who are intrinsically motivated have been shown to have a special interest in creating positive relationships with patients, understand the importance of interpersonal communication, possess a high level of emotional intelligence, and display a greater amount of empathy toward patients (Cousin et al., 2012; Hojat et al., 2002). Level of empathy in physicians has been identified as one of the most important qualities because of its link to patient satisfaction, treatment adherence, treatment outcomes, and overall quality of care (Cousin et al., 2012; Hojat et al., 2002; Price, Mercer, & MacPherson, 2006).

Intrinsic motivation and level of empathy are related because physicians who are intrinsically motivated are likely to treat their patients using a biopsychosocial treatment model, compared to extrinsically motivated physicians, who are more likely to treat their patients using a biomedical model (Borrell-Carrio, Suchman, & Epstein, 2004). This requires physicians to spend more time with patients, resulting in patients' perceptions that their physicians really care about them and their treatment outcome. Patients are likely to feel more comfortable with intrinsically motivated physicians because of the level of empathy that these physicians display. This results in patients listening to their

physicians more closely and being adherent with their treatment (Mercer & Reynolds, 2002).

Patients who have extrinsically motivated physicians may not feel as comfortable communicating with their physicians, which could result in a decrease in treatment adherence and, ultimately, unsuccessful treatment. While many medical students may understand the importance of empathy in patient care, they are likely not as aware of the impact intrinsic motivation has on empathy, which is related to quality of care. Ideally, medical students would choose their specialty through an intrinsic motivational lens, but medical students end up choosing their specialty based on extrinsic factors for numerous reasons. Many of these extrinsic factors fall under the category of PQOL.

Extrinsic Motivation and Specialty Choice

Many medical students choose their specialty based on factors related to extrinsic motivation (Shadbolt & Bunker, 2009). Such factors as income, vacation time, level of prestige, and lifestyle are important quality-of-life variables for medical students that are related to extrinsic motivation (Lefevre et al., 2010; Phillips, Weismantel, Gold, & Schwenk, 2012; Shadbolt & Bunker, 2009).

Research has established a positive correlation between intrinsic motivation and level of empathy, and a negative correlation for students who are driven by extrinsic factors and level of empathy (Hojat et al., 2002; Niemiec, Ryan, & Deci, 2009). Medical students encounter additional stressors when choosing a specialty primarily based on extrinsic factors. Research suggests that students who are extrinsically motivated experience more anxiety, stress, depression, and unhappiness than graduates who are intrinsically motivated (Niemiec et al., 2009). Many studies have supported the positive

correlation between extrinsic motivation and psychological problems, such as anxiety, depression, and career dissatisfaction (Henning, Krageloh, Hawken, Zhoo, & Doherty, 2010; Sheldon et al., 2004; Vansteenkiste, Lens, & Deci, 2006). Research suggests that physicians' dissatisfaction with their career directly influences their ability to provide high-quality patient care, reduces patient satisfaction, and decreases physician empathy levels towards patients (DeVoe et al., 2002).

Intrinsic to Extrinsic Motivation Shift

The literature based on motivation and specialty choice has shown that medical students are not solely influenced by intrinsic or extrinsic motivation, but that a shift occurs from intrinsic to extrinsic motivation as their medical education progresses (Newton et al., 2008). Medical students generally become influenced by extrinsic motivation in their third year of medical school, which is when they begin choosing the specialties they want to pursue (Newton et al., 2008).

Many first- and second-year medical students are motivated by intrinsic values, such as helping people and making a difference in society (Heiligers, 2012). In addition, a large number of first- and second-year medical students tend to be interested in primary-care specialties (Heiligers, 2012). However, these motivations change as medical education progresses to the point where career choices are made and likely influenced by factors such as student loan debt. This shift into career paths dictated by external motivations compromises empathy levels among physicians because they are not practicing in an area of medicine about which they are passionate about (Niemic et al, 2009). While this decision-making strategy among medical students in the latter years of their medical training may not seem to engender negative repercussions in the short term,

research has shown that medical students who choose a specialty based on extrinsic motivation exhibit many negative long-term consequences (e.g., less empathy, lower career satisfaction, and lower patient satisfaction; Halpern, 2007; Hojat et al., 2002).

Clinical Empathy

Clinical empathy is empathy displayed by physicians toward patients in medical settings. Much debate surrounds the appropriate definition of clinical empathy. Some researchers and clinicians believe it is a cognitive process, others feel it is an affective process, and some feel it is a combination of cognitive, affective, and behavioral processes (Halpern, 2003; Spiro, 2009; Larson & Yao, 2005). Researchers and clinicians who believe that clinical empathy is a cognitive process define it as acknowledging the emotional state of another person's experience without having to actually experience it (Halpern, 2003). Of sole importance is the practitioner's intellectual understanding of what patients are going through, and if practitioners become emotionally involved, their clinical judgment may become cloudy resulting in poor treatment outcomes (Halpern, 2003). When physicians use this approach of clinical empathy, they experience no feelings of grief, regret, or any other emotion that could make successful treatment of the patient more difficult. The goal is simply to analyze the inner processes of the patient in an objective manner, which is called detached reasoning (Halpern, 2003). In a seminal paper on detached reasoning, Fox and Lief (1963) pointed out that the way in which medical students learn to dissect body parts to learn anatomy is similar to the way they should learn to listen to patients in an empathetic manner without becoming emotionally involved. This perspective on clinical empathy is thought to be ideal in fast-paced

everyday clinical interactions (Halpern, 2003). However, many researchers and clinicians oppose this view passionately (Spiro, 2009; Larson & Yao, 2005).

Researchers and clinicians who believe clinical empathy is emotion based feel that empathy is not a thought or a skill and cannot be taught (Spiro, 2009). They define clinical empathy as the ability to identify with someone who is suffering, and that in order to identify with someone in an accurate manner, emotion must play a significant role. It is thought that the curriculum in medical school significantly contributes to the documented decline in empathy (Spiro, 2009). Medical students learn through lectures and presentations, and frequently empathy is taught in this manner as well. Students learn to become detached scientists, and when school demands increase significantly by the third year, medical students begin to transform into robotic scientists, as opposed to caretakers of their patients (Spiro, 2009). Another reason for this transformation is thought to be the advances in technology and reliance on computers, numbers, tests, and other objective means of analyses (Spiro, 2009). Medical students become so focused on the results of these tests that they fail to actually listen to the concerns of their patients. While medical students have much to learn as it is, advocates of this definition of clinical empathy believe that technology and new-age medical tests can never replace listening, understanding, and connecting with patients on a deeper, more personal level (Hojat et al., 2002).

A third and more comprehensive definition of clinical empathy is a psychological process that involves affective, cognitive, and behavioral processes and outcomes in reaction to observed experiences of another (Larson & Yao, 2005). Advocates of this definition place equal importance on understanding the thoughts and feelings of others

and developing an emotional connection with them. These researchers and clinicians acknowledge that being empathetic towards patients is not an easy process that can be learned through a lecture and a short presentation. Clinical empathy is an evolving trait that is fostered by conscious effort and the belief in the positive role it has on patient treatment outcomes. While medical students are expected to memorize and understand a wealth of information, they should be taught that clinical empathy takes an equal amount of effort and is as important as anything else learned in medical school. Different specialties require various levels of expertise depending on the amount of interpersonal communication practitioners have with patients. Nevertheless, an adequate level of clinical empathy is essential among all medical students and practicing physicians.

One of the most important components of empathy is level of awareness, and for medical students, this directly relates to: (a) recognizing and interpreting patients' emotions in the moment, (b) having the capacity to reflect on negative emotions, (c) decoding emotional communication from patients, (d) comprehending nonverbal communication from patients, and (e) effectively dealing with negative feedback from patients (Halpern, 2007). Many individuals understand the definition of empathy, yet many medical students and physicians lack empathy while knowing the positive outcomes of using it. One explanation is that empathy is not a simple skill that can be taught; rather, it is an attribute acquired through a process over time. Medical students are taught to learn much information in a short amount of time, but empathy is not something that can be learned in a crash course. It requires one to understand crucial information not only about the patient, but also about the self.

Research suggests a variety of methods to enhance empathy in medical students. A major area of research on increasing empathy in medical students focuses on comprehensive empathy training in the third year of medical school, the time when empathy has been shown to decrease significantly (Rosenthal et al., 2011). Advocates of this position stress not only teaching empathy to medical students at this time, but also, highlighting the importance of taking time out of the day to sit and reflect on patient interactions. These reflections are made on a confidential group level consisting of other medical students, supervisors, and a mental-health professional who runs the group (Rosenthal et al., 2011). This creates an environment in which medical students can discuss the communication styles between themselves and patients, ask for advice from colleagues and mentors, and most importantly, discuss the emotional feelings behind their communication, as well as their perceived patients' emotional state.

The majority of research on the efficacy of these groups has been qualitative and has involved interviewing veteran practicing physicians on their opinions on building empathy among medical students (Shapiro, 2002). Twelve primary-care physicians were questioned about their use of empathy in clinical practice and their thoughts on teaching empathy to medical students, and the results were not consistent in all areas. Some physicians believed that empathy was a behavioral skill that could be taught, others felt it was an attitude, and some felt it was a combination of both (Shapiro, 2002). However, all of the physicians agreed that medical students needed to learn to use a person-centered interviewing approach when interacting with patients, which entails focusing on enhancing the patients' quality of life in all areas and promoting their overall health, as opposed to solely treating the presenting physical illness. In addition, while the majority

of physicians felt that encouragement among mentors and supervisors to use empathy when interacting with patients was insufficient, all of the physicians in this study identified the importance of role modeling and mentoring for medical students (Shapiro, 2002).

While many studies make recommendations on how to build empathy in medical students, and a few even propose short-term programs in medical school, only a few research studies have evaluated the durability of change in empathy levels among medical students after the programs have been implemented. In addition, many of the studies in this area include small sample sizes, weak control groups, and a non-agreed-upon definition of clinical empathy, which has decreased the reliability and validity of many of these studies (Stepien & Baernstein, 2006). While many weaknesses appear in the studies that have been done, forward movement in this area is important because of the link between empathy and quality of care (Mercer & Reynolds, 2002).

Currently, the literature provides different definitions and viewpoints on teaching and maintaining high levels of empathy in medical students and practicing physicians (Mercer & Reynolds, 2002). However, all of the research suggests that clinical empathy is multifaceted and extremely complex. The majority of research agrees that clinical empathy involves: (a) an understanding of the patient's situation, perspective, and feelings, (b) the ability to communicate that understanding to the patient, and (c) the ability to act on that understanding with the patient in a therapeutic manner (Mercer & Reynolds, 2002). In addition, research suggests that empathy levels can potentially be increased through in-depth courses as well as through motivated mentors, supervisors, and colleagues (Mercer & Reynolds, 2002).

Empathy and Specialty Choice

For the purpose of this paper, clinical empathy is defined as the ability to comprehend another individual's experience and discuss this experience with the person in such a way that he or she feels understood (Hojat et al., 2002). Few research studies have attempted to examine the link between level of empathy and specialty choice (Hojat et al., 2002). Research suggests that students interested in pursuing careers in psychiatry, pediatrics, family medicine, and internal medicine have higher levels of empathy than medical students interested in specialties, such as surgery, radiology, and pathology (Hojat et al., 2002). Furthermore, medical students with higher levels of empathy have been shown to have greater social skills, lower levels of aggression and hostility, closer family relationships and a vast interest in people-oriented specialties compared to individuals who are interested in procedure and technology-focused specialties, such as surgery and radiology (Hojat et al., 2005). Researchers have also conducted longitudinal studies attempting to predict medical students' specialty choices based on personality traits and work values evaluated in the first year of medical school (Taber, Hartung, & Borges, 2011). The results suggest that medical students who scored significantly high on warmth and sensitivity exhibited higher levels of empathy and tended to choose more primary-care residencies than other medical students (Taber et al., 2011). Conversely, medical students who scored significantly high on dominance and tension tended to choose non-primary care residencies more frequently than did other medical students (Taber et al., 2011). In regard to work values, medical students who placed a significant emphasis on obtaining a more grandiose lifestyle more frequently chose non-primary-care specialties compared to students who placed a larger emphasis on helping others

(Taber et al., 2011). Though not explicitly labeled as such in the Taber et al. (2011) piece, work values fall under the umbrella of PQOL, as addressed in the current paper, which has implications for specialty choice. One study, however, reported no differences in empathy levels between students interested in primary-care specialties and students interested in non-primary-care specialties (Borges et al., 2009). The authors did not identify a significant explanation for their results. This study simply collected data using a survey method and reported it, but did not attempt to explain it through any type of formal statistical model or theory.

A meta-analysis by Neumann et al. (2011) analyzed 18 studies on empathy in medical students and residents. Overall, the meta-analysis revealed a decline in levels of empathy among medical students and residents throughout their training, but numerous explanations contributing to the decline in empathy were identified. The results suggest the following explanations for the possible decline: (a) mistreatment from mentors and supervisors; (b) lack of social support, which has been shown to increase the likelihood of experiencing depression; (c) excessive workload, which can result in burnout and decreased quality of life; (d) short interaction time between patient-physician, which does not allow time to build rapport, and (e) poor role models. In addition, the ways in which the media portrays physicians is thought to contribute to patients feeling that their physicians are not empathetic. Medical students and residents believe that physicians are held to idealistic expectations in regard to the empathy levels displayed by physicians in television shows and movies. Feeling the need to meet this expectation has been shown to contribute to burnout, depression, and anxiety and an overall lower quality of life for medical students and residents (Neumann et al., 2011; Niemiec et al., 2009). These

negative experiences in their training could be the culprit in declining empathy levels among medical students, and these experiences likely are shifting the students' motivation toward specializing in areas that are more focused on enhancing their future quality of life. These areas are typically non-primary-care specialties.

Medical students' self-evaluation of empathy and their observed level of empathy by medical-school faculty when taking clinical exams have been compared and analyzed (Chen, Pahilan, & Orlander, 2009). The results suggest that as medical school progresses, students' self-evaluation of their empathy decreases, while their observed level of empathy from standardized patients increases. One should note that while observed empathy levels increased overall in this study, the level of observed empathy slightly decreased between the second and third year of medical school. This suggests that while students' self-rated level of empathy was lower than patients' ratings of them, patient ratings of students' level of empathy still decreased slightly in their third year compared to ratings from their second year. The decline in empathy may signify that through training, medical students begin to feel physician/patient interaction is not as important as other factors in treatment. If this is true, they may be becoming more motivated to specialize in areas such as surgery and radiology that place a greater emphasis on objective procedures and technology-based medical tests.

Research suggests that medical students' empathy levels decrease through their medical training in both allopathic and osteopathic programs, but significantly more for students in allopathic medical programs (Hojat et al., 2002; Kimmelman et al., 2012; Newton et al., 2008; Neumann et al., 2011). While allopathic and osteopathic physicians frequently end up obtaining similar positions in the field of medicine, research suggests

that patient satisfaction is higher among osteopathic physicians (Carey, Motyka, Garrett, & Keller, 2003). This is thought to be the case because osteopathic physicians are more heavily trained than allopathic physicians to discuss psychological and social issues, as well as medical issues, during their exams. Carey et al. (2003) analyzed patient satisfaction with allopathic and osteopathic physicians by having patients rate physicians on a variety of variables, such as social interaction, knowledge, body language, explanation of medical information, and empathy. A vast majority of the patients gave higher ratings to the osteopathic physicians. Specifically, patients reported that the osteopathic physicians more frequently used the patient's first name; discussed etiologic factors of their illness in depth; and discussed the social, familial, and emotional impact of the illness. While further research comparing allopathic and osteopathic physicians is lacking, the Carey et al. study suggests that the communication styles between allopathic and osteopathic physicians are clearly different. Based on the items that the physicians were rated on in Carey et al., one may reasonably assume that the osteopathic physicians were more empathetic than their allopathic colleagues.

Research suggests that osteopathic medical students have lower levels of self-reported empathy in the first and second year of medical school than the levels reported by their allopathic counterparts, but do not experience as much of an overall decline in empathy compared to allopathic medical students, whose empathy has been shown to sharply decline as their medical training progresses (Kimmelman et al., 2012). However, the literature on empathy levels among osteopathic medical students is sparse compared to the wealth of research on empathy amid allopathic medical students. Further research

is necessary in order to accurately compare empathy levels between osteopathic and allopathic medical students.

Regardless of whether or not osteopathic physicians are more empathetic than allopathic physicians, the development of clinical empathy among all medical students must be examined because of its influence on patient satisfaction, quality of patient care, and diagnostic outcomes (Bonvicini et al., 2009; Cousin et al., 2012; Hojat et al., 2011). The decrease in empathy while progressing through medical school needs to be addressed so that future patient satisfaction and treatment outcomes are not jeopardized. An important method by which empathy in medical students can be measured is analysis of their vicarious empathy. Vicarious empathy is defined as portraying an emotional response that matches the perceived emotional response of others in various situations (Newton et al., 2008). The goal of vicarious empathy is to determine how accurately individuals can display the emotional experience of another, which indicates their level of understanding of another's emotional state. The study by Newton et al. (2008) revealed that students seeking to pursue specialties with greater patient contact maintain their level of vicarious empathy over time more than students who decide to specialize in areas that involve less patient contact (Newton et al., 2008). However, this study failed to examine if empathy influenced specialty choice, or vice versa. The ways in which these two variables interact has not been firmly established in the literature.

Many medical students enter medical school with a high level of empathy, passion, and drive and with the goal to help others in need. However, through their clinical experiences and feedback from mentors, practical obligations upon graduation (i.e., student loans, salary, hours in the workplace) become a reality (Neumann et al.,

2011). This may explain both the lowered levels of empathy as students progress through medical school, as well as the shift from intrinsic motivation toward extrinsic motivation in regard to final specialty choice. Owing to the importance of maintaining a high level of clinical empathy when practicing medicine, quality-of-life values must be examined among medical students, as well as how these factors affect their level of empathy and intrinsic and extrinsic motivation, which ultimately has been shown to affect medical students' specialty choice (Phillips, Weismantel, Gold, & Schwenk, 2012; Shadbolt & Bunker, 2009).

PQOL and Specialty Choice

There are many different definitions of PQOL; however, for the purpose of this paper, it is defined as medical students' values in regard to what they envision their lives to look like upon graduation in regard to salary, work-life balance, vacation time, perceived level of prestige, and flexibility of work schedule. In the literature on career choice among medical students, research suggests that lifestyle, salary, perception of prestige, gender, and student loan debt are all important facets of the selection of specialty choice (Phillips et al., 2012; Shadbolt & Bunker, 2009).

Lifestyle. Lifestyle can be defined as the number of hours physicians work per week, vacation time, on-call time, work environment, schedule flexibility, and work-family balance (Linzer et al., 1994). Research has shown that medical students are interested in specialties that offer long annual vacations, shorter residency programs, and consistent work schedules (Thornton & Esposto, 2003). Kiolbassa et al. (2011) analyzed the factors that are most important to medical students in selecting a medical specialty. The results suggest that medical students pursue non-primary-care specialties because of

personal ambition, work-life balance, working conditions, increased time with family, and other lifestyle luxuries that primary-care specialties do not offer.

Other studies have examined barriers that prevent medical students from pursuing primary-care specialties and the factors that would have changed their decision. The results of a study by DeZee et al. (2011) suggest that salary is not the only determinant that prevents students from pursuing primary care; lifestyle factors, such as work hours, work environment, vacation time, and amount of time on-call also play a crucial role. Research supports that perceived lifestyle after graduation contributes to 55% of students changing their specialty choice during their academic career (DeZee et al, 2011). Medical students are not pursuing primary care because of the lifestyle they believe they will obtain from other specialties. Students might be more inclined to choose primary care if the work hours, vacation time, on-call time, family-work time, and other lifestyle factors were more desirable (DeZee et al., 2011; Kiolbassa et al., 2011 Linzer et al, 1994; Thornton & Esposto, 2003).

Salary and Student Loans. One of the most prominent factors that contributes to medical students choosing either primary care or non-primary-care specialties is salary. Over the course of a career, a subspecialist may earn as much as 3.5 million dollars more than a primary-care physician (Wilder et al., 2010). Thornton and Esposto (2003) analyzed the importance of income in regard to specialty choice in medical students. The results suggest that medical students have a greater interest in specialties that offer higher salaries. With many students graduating from medical school with an overwhelming amount of student loans, research has examined the role debt has on medical students' perceptions of various specialties and their salaries (Morra et al., 2009). Morra et al.

(2009) analyzed medical student's perceptions towards various specialties and their salaries, and the results suggested that medical students perceive family medicine and pediatrics to be the lowest paying specialties and hold these negative views early in their training. DeZee et al. (2011) found that medical students' interest in primary-care specialties has continuously decreased since 1998 as a result of salary. Seventeen percent of students reported that they would pursue general medicine if the salary were 18% higher and that they did have an interest in the field. While perceptions of family medicine and pediatrics were negative overall, students graduating with greater debt held stronger negative opinions of primary care (Morra et al., 2009).

Studies have shown that medical students' interests in pursuing primary care as a specialty choice have decreased and that one of the main reasons for this shift is the amount of student loans they have accrued (Morra et al., 2009). Colquitt, Zeh, Killin, and Coltice (1996) analyzed the influence of student loan debt on a medical student's career choice and discovered that students who decide to specialize in primary care may eventually leave the field and pursue a different specialty with an increased income so that they can pay off their student loans. This trend could be problematic because if future medical professionals are driven by extrinsic motivational factors, the deficit in various specialties, such as family medicine and pediatrics, will continue. While income and student loan debt have been shown to be important factors that contribute to medical specialty choice, other variables that relate to quality of life have been discussed in the literature as well.

Socioeconomic Status. Limited research has examined the relationship between medical students' socioeconomic status and specialty choice. However, Cooter et al.

(2004) examined the relationship between socioeconomic status and specialty choice and found that individuals from lower income families choose primary-care specialties more often than non-primary-care specialties. In addition, medical students from higher income families specialize in surgery more often than students from lower income families. The results from this study also suggest that individuals from lower income families tend to have a higher delayed graduation rate than students from higher income families. Finally, the results showed that students from lower income families had a significantly greater amount of student loan debt than students from higher income families. While this data was collected from only one medical school, it showed that there is a connection among medical students' socioeconomic backgrounds, academic performance, and specialty choice (Cooter et al., 2004). A possible explanation for this relationship is that medical students from higher income families may care more about prestigious specialties, such as surgery, as opposed to students from lower income families, who may be less influenced by the concept of prestige.

Prestige. Level of prestige has been shown to be an important factor for medical students when choosing a final specialty (Azizzadeh et al., 2003). Medical students driven by extrinsic factors have been linked to ranking prestige high on their scale of importance in choosing a specialty. Azizzadeh et al. (2003) and colleagues surveyed fourth-year medical students interested in surgery on the factors most important to them when choosing a medical specialty. The results showed that level of prestige was the most important, followed by salary. Medical students learn about the prestige associated with various specialties before they enter medical school and while they receive training (Compton et al., 2008). Prior to the student entering school, family and friends are often

influential in the decision-making process regarding specialty choice (Compton et al., 2008). As students continue training, mentors and faculty tend to discuss level of prestige among various specialties (Saigal et al., 2007). Perceptions are negative towards general internal medicine and psychiatry, which are typically perceived as the least prestigious medical specialties (Holmes, Tumiel-Berhalter, Zayas, & Walkins, 2008). Studies have shown that the perception of lack of prestige among internal medicine, family medicine, and pediatrics has a great impact on medical students' final specialty choice (Morra et al., 2009). Research suggests that men are more concerned about prestige than women, but that more women are choosing to enter prestigious careers because of the comfortable and controllable lifestyle they offer in regard to work-life balance, work hours, and on-call time, which are all perceived quality-of-life variables (Lambert & Holmboe, 2005).

Gender. Traditionally, women have been overrepresented in primary care specialties (Lambert & Holmboe, 2005). However, as a result of changes in the healthcare system, research suggests that these specialties are not as appealing to women as they once were (Lambert & Holmboe, 2005; Shadbolt & Bunker, 2009). In the literature regarding specialty choice, frequently the terms *controllable* and *uncontrollable* are used when describing the lifestyle a particular specialty provides. A controllable lifestyle can be defined as having a stable work schedule, on-call schedule, vacation time, and work-life balance. Overall, these attributes relate to a stable and predictable lifestyle. Specialties that are thought to provide a controllable lifestyle are radiology, dermatology, anesthesiology, and other non-primary-care areas of medicine (Lambert & Holmboe, 2005).

An uncontrollable lifestyle often refers to unpredictable hours in the workplace, bringing work home, and other unstable working conditions. Such specialties as family medicine and pediatrics have become characterized as uncontrollable, causing a shift for women to become more interested in radiology and dermatology because their work-life balance is especially important to them (Lambert & Holmboe, 2005; Shadbolt & Bunker). While a shift has occurred for women in regard to specialty choice, men have always sought out specialties that offer controllable lifestyles (Lambert & Holmboe, 2005). Research has shown that family planning is especially important to women when choosing a specialty, but both men and women prefer careers that offer controllable lifestyles (Sanfey et al., 2006). Historically, surgical specialties have been popular among men. However, recently, as a result of the uncontrollable lifestyle of a surgeon, the choice of surgery as a specialty among medical students has declined (Marschall & Karimuddin, 2003). Research suggests that major negative changes in the work environment for primary-care physicians are largely the result of systematic changes in the healthcare system (Zuger, 2004). A few of these changes include a decrease in patient visit time, strict regulations on prescriptions and referrals, and other barriers that make physicians' treatment of patients in the most effective manner more difficult (Zuger, 2004).

Perceptions of the Healthcare System. Medical students' perceptions of the healthcare system have also been shown to influence their specialty choice (Bodenheimer, Berenson, & Rudolf, 2007; Zuger, 2004). Owing to changes in the healthcare model to managed care, primary-care specialties have been associated with short, rushed office visits; unstable work schedules; excessive paperwork; limitations on referrals for specialists; limitations on prescriptions; and an expectation to treat a large

number of patients (Bodenheimer et al., 2007; Zuger, 2004). These restrictions and expectations have resulted in significant career dissatisfaction among physicians (Zuger, 2004), and have discouraged medical students from pursuing primary-care specialties. Effects of physician dissatisfaction have been increased patient noncompliance rates, documented poorer clinical management, and suffering treatment outcomes (Zuger, 2004). Insurance companies typically will pay more for procedures compared to office visits. Primary-care physicians devote most of their time conducting office visits and are expected to work longer hours and see more patients than most specialists (Bodenheimer et al., 2007). The limitations that insurance companies place on primary-care physicians (prescriptions, referrals, and medical tests) make it difficult to fulfill their job requirements in the most effective manner. Many physicians are continuously forced to use alternative treatment methods that insurances will pay for and accept (Zuger, 2004).

Medical students are aware early in their training of the hardships that primary-care physicians face in regard to the healthcare system (Schwartz, Durning, Linzer, & Hauer, 2011), and these hardships have been shown to discourage them from pursuing primary-care specialties. The combination of student loan debt, lack of income, and healthcare restrictions is likely to motivate medical students to specialize in non-primary-care areas of medicine. Furthermore, the characteristics of the working conditions for primary-care specialists are likely to result in decreased empathy levels and decreased quality of life, which ultimately influence patient satisfaction and treatment outcomes (Zuger, 2004). An examination of how future PQOL affects empathy and intrinsic/extrinsic motivation in regard to medical students' specialty choice is important

because research suggests that these variables are critical in the decision-making process (Hojat et al., 2002; Phillips et al., 2012).

Conclusion of Major Specialty Choice Determinants. There is concern that the decline of medical students choosing to pursue internal medicine is going to continue and that this problem is underestimated (Hauer et al., 2008). Research has shown that many students enter medical school with the intention of pursuing primary care (Kiolbassa et al., 2011), but end up subspecializing because of lack of salary, school loan debt, lifestyle factors, perception of prestige, and perception of the healthcare system (Phillips et al., 2012). Students prefer to pursue a specialty that is structured and consistent. They desire stable weekly schedules, vacation time, on-call time, work-life balance, and salaries. Students perceive having a stable and comfortable lifestyle as an important determinant when planning their careers, and they are willing to earn less money in order to obtain this goal (Dorsey, Jarjoura, & Rutecki, 2005). Medical students at 11 medical schools were given a survey on their opinions and interest in primary care, and the majority reported that student loan debt, salary, taking work home, and lack of prestige were all important factors that contributed to their lack of interest in specializing in primary care (Hauer et al., 2008). Numerous variables discourage and encourage students to pursue primary care or other specialties that offer prestige and higher salaries (e.g., surgery).

Many of the published measures on PQOL inquire only about individual's current PQOL, or their PQOL in the recent past, but conclusions are made about the future. The focus of this dissertation was to measure future PQOL in medical students after graduating from medical school. Understanding medical students' future PQOL is

important because the ways students imagine their lives in the future are likely motivating them to make various decisions regarding their specialty choice.

Empathy and PQOL

PQOL and empathy are significantly related to specialty choice individually, but one also must understand the influence of future PQOL on empathy. Research suggests that as personal and professional stressors, such as work hours, personal relationship issues, and financial obligations, increase, medical students' level of empathy decreases (Thomas et al., 2007). Given the connection between actual quality-of-life factors and empathy, a relationship also is likely between medical students' future-oriented PQOL and empathy level.

A study by Bellini and Shea (2005) examining internal-medicine residents' level of empathy and mood throughout their training revealed a significant decrease in empathy (measured by the Jefferson Scale of Empathy) and an increase in mood disturbances (measured by the Profile of Mood States). Internal medicine residents work long hours, lack sufficient sleep, and lack a personal life because of work requirements (Gopal, Glasheen, Miyoshi & Prochazka, 2005; Shanafelt, Bradley, Wipf, & Back, 2002). Not surprisingly these working conditions contributed to mood issues, such as depression and anxiety. These quality-of-life experiences probably influenced these residents' PQOL about their future in internal medicine, which motivated them to pursue another specialty. This study is an example of how empathy, PQOL, motivation, and specialty choice may influence one another. More importantly, this study suggests that future PQOL may moderate the relationship among empathy, motivation, and specialty choice.

Research has identified motivation as a significant factor in specialty choice (Buddeberg-Fischer et al., 2006), but no studies have attempted to analyze how future PQOL and level of empathy influence motivation towards choosing a final specialty choice. Only 30% of medical students originally interested in primary care and pediatrics continue to pursue those specialties after graduation (Compton et al., 2008). Since a documented shift in specialty choice has been shown to begin in the third year of medical school, when analyzing specialty choice, one must examine students in their third year through graduation. The literature suggests that students in their first and second years of medical school are more intrinsically motivated, interested in primary care, and display higher levels of empathy, while students in the middle and toward the end of their training are more extrinsically motivated, display lower levels of empathy, and are more interested in non-primary-care specialties (Heiligers, 2012). Examining medical students in years 3 and 4 would allow the researcher to examine not only the influence of future PQOL in specialty choice, but also potentially capture the shift in empathy and motivation that has been documented in the literature.

Current Study

PQOL, level of empathy, and motivation have been shown to significantly influence medical students' specialty choice individually (Buddeberg-Fischer et al., 2006; Hojat et al., 2002), but the impact that future PQOL has on the relationship between empathy and motivation, and how that relationship influences specialty choice has not been examined. The aim of this paper was to explore if and how future PQOL moderates the relationship between level of empathy and motivation (intrinsic/extrinsic) among medical students and how that relationship influences their final specialty choice.

Possible implications for medical schools and mentors are discussed, as is the role of mental-health professionals in helping medical students build and maintain a high level of empathy throughout their medical education and career.

Chapter 2

Hypotheses

The following study examined if future perceived quality of life (PQOL) moderates the relationship between level of empathy and motivation among medical students, and how that affects their final specialty choice. Research suggests that medical students' empathy decreases through the course of medical school (Bellini & Shea, 2005; Hojat et al., 2004). This shift is thought to occur because of quality-of-life values, such as income and work-family balance, resulting in a change from internal motivation to a focus on extrinsic motivational factors (Heiligers, 2012). A result of this shift has been a decrease in medical students specializing in primary care (Hauer et al., 2008).

In the current study, specialty choice was divided into two categories, primary care and non-primary care. Primary-care specialties include family practice, general pediatrics, general internal medicine, and obstetrics and gynecology. Non-primary-care specialties include all other specialties not identified in the primary-care category. The following hypotheses were tested in the current study:

1. While empathy has been shown to be a significant predictor of motivation in medical students, future PQOL moderates the relationship between empathy and motivation. Specifically, medical students with lower levels of empathy exhibit higher levels of extrinsic motivation when future PQOL entails higher levels of self-esteem and belonging. Furthermore, medical students with higher levels of empathy exhibit higher levels of intrinsic motivation when future PQOL entails higher levels of self-actualization.

2. Motivation in medical students is a significant predictor of specialty choice. Specifically, medical students who exhibit higher levels of extrinsic motivation choose non-primary-care specialties, and medical students who exhibit higher levels of intrinsic motivation more frequently choose primary-care specialties. In addition, lifestyle, prestige, empathy, and PQOL are significant predictors of specialty choice.

Chapter 3

Methodology

Participants

The participants in this study were current third- and fourth-year medical students at the Philadelphia College of Osteopathic Medicine ($N = 174$; 103 women and 71 men) ranging from 22 to greater than 36 years of age (8% of the participants were between the ages of 22 and 24 years; 80% were between the ages of 25 and 30 years; 9% were between the ages of 31 and 36 years; 3% were greater than the age of 36). Of the participants, 74 were currently in their third year of medical school and 100 were in their fourth year. Among the students who participated in the study, 144 were White, three were Hispanic or Latino, 11 were Black or African American, and 16 were Asian/Pacific Islander. The majority of the participants identified as coming from middle- to moderately high-income families ($n = 137$) compared to those who came from high- and low-income families ($n = 37$). In addition, 128 of the participants attended the Philadelphia campus of the Philadelphia College of Osteopathic Medicine, and 46 attended the campus located in Georgia. Among the participants, 105 reported that they intend to pursue a primary-care specialty, and 59 reported that they intend to pursue a non-primary-care specialty. The students were not compensated for participating in the study, and participation was voluntary. The only criteria that the students had to meet to be eligible for this study were to be currently enrolled as a third- or fourth-year medical student at the Philadelphia College of Osteopathic Medicine and to be in good academic standing.

Research Design

The goal of this study was to examine how PQOL, level of empathy, and intrinsic and extrinsic motivation influence specialty choice. Third- and fourth-year medical students were asked to fill out measures on empathy, future PQOL, and extrinsic/intrinsic motivation. Given that the medical students filled out one demographic questionnaire and three scales, a within-groups prospective correlational design was used for this study.

Measures

Four instruments were administered in this study. First, medical students filled out a questionnaire (see Appendix A) developed by the researcher. This questionnaire consisted of such items as age, gender, socioeconomic status, ethnicity, race, and specialty choice.

Jefferson Scale of Empathy (S Version)

The second measure used in this study was the Jefferson Scale of Empathy (JSE; Hojat et al., 2001). This self-report measure requires healthcare providers to answer 20 questions on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) regarding empathy in patient care scenarios. Scores range from 20 to 140, with a higher score indicating a higher level of empathy. Research supports that this measure has construct validity (Hojat et al., 2001). A factor analysis revealed four factors with eigenvalues greater than 1; (a) physician's view of the patient's perspective (eigenvalue = 7.56); (b) understanding patient's experiences, feelings, and clues (eigenvalue = 1.30); (c) ignoring emotions in patient care (eigenvalue = 1.14), and (d) thinking like the patient (eigenvalue = 1.01; Hojat et al., 2001). The JSE has also been shown to have criterion-related validity when correlated with other measures ($r = .41$ with the Empathetic Concern scale of the

Interpersonal Reactivity Index (IRI), $r = .45$ with self-reported personal attribute of Empathy, $r = .48$ with self-reported measure of Compassion, $r = .11$ with self-reported attribute of Self-Protection, $r = -.05$ with self-reported attribute of Clinical Neutrality; Hojat et al., 2001). In addition, the JSE has been shown to have internal consistency reliability (Cronbach $\alpha = .89$; Hojat et al., 2001). There are different versions of the JSE, and one specifically developed for medical students, the JSE-S, was used in this study.

Future Perceived Quality of Life Inventory for Medical Students Scale

The third measure in this study was the Future Perceived Quality of Life Inventory for Medical Students (see Appendix B), which is a self-report measure that was developed by the researcher. This 16-item scale consists of a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*) for questions that assess medical students' future PQOL after graduation. This scale was developed based on an extensive literature review of the major motivating factors that contribute to the final specialty choice among medical students. The factors are as follows: (a) income and student loan debt, (b) prestige of specialty, (c) work-personal life balance, (d) work environment, (e) socioeconomic status of medical student, (f) level of empathy, and (g) perception of the healthcare system. The scores on the scale range from 16 to 80, with lower scores indicating higher levels of self-actualization and higher scores indicating higher levels of self-esteem and belonging as based on Maslow's hierarchy of needs (Maslow, 1943). Self-actualization refers to such attributes as morality, creativity, spontaneity, authenticity, meaningfulness, and other factors related to intrinsic motivation. Self-esteem and belonging refer to such attributes as achievement, mastery, recognition,

respect, friends, family, love, and other factors related to extrinsic motivation. Questions 3, 4, 7, 8, 9, 14, and 15 were reverse scored.

Aspiration Index

The fourth measure in this study was Kasser and Ryan's Aspiration Index (1996). This scale is a self-report measure that evaluates intrinsic and extrinsic aspirations across seven domains: (a) self-acceptance, (b) affiliation, (c) community feeling, (d) financial success, (e) image, (f) popularity, and (g) physical health. There are different versions of this scale, but for the purpose of this study, Kasser and Ryan's 1996 version was used to assess medical students' intrinsic and extrinsic motivation. This 42-item scale consists of two 5-point Likert scales for each question (1 = *not at all*, 5 = *very important for assessing the importance of a statement to the participant*, 1 = *very low*, 5 = *very high for assessing the chance that the participant believes that the statement will happen to him or her*) that assess the seven domains mentioned above in regard to extrinsic/intrinsic motivation. Research supports the validity of the Aspiration Index. A factor analysis revealed two main factors in regard to the importance of aspirations: intrinsic (self-acceptance = .77, affiliation = .76, community feeling = .76, physical fitness = .60, social recognition = .18, appealing appearance = .10, financial success = .02) and extrinsic (self-acceptance = .20, affiliation = .19, community feeling = -.21, physical fitness = .18, social recognition = .75, appealing appearance = .76, financial success = .87; Kasser & Ryan, 1996). For the current study, the physical fitness domain was not used, and only the importance of intrinsic and extrinsic aspirations was measured. Scores range from 38 to 190 with higher scores indicating higher levels of extrinsic motivation and lower levels indicating higher levels of intrinsic motivation. The questions under the intrinsic

motivation domains (self-acceptance, affiliation, community feeling) were reverse scored. Final scores were calculated by averaging the scores from all of the questions relating to intrinsic aspirations (self-acceptance, affiliation, community feeling domains) as well as the mean scores for all of the questions relating to extrinsic aspirations (financial success, attractive appearance, social recognition domains). Finally, the intrinsic score was subtracted from the extrinsic score to determine an overall composite score, which is similar to the procedure followed in Kasser and Ryan (1993).

Procedure

The names and e-mail addresses of all third- and fourth-year medical students at the Philadelphia College of Osteopathic Medicine were obtained from the office of student affairs. A document was then created that consisted of a general questionnaire, the JSE-S, the Future Perceived Quality of Life Inventory, and the Aspiration Index. The measures were uploaded to SurveyMonkey as one continuous document, but the order of the JSE-S, the Future Perceived Quality of Life Inventory, and the Aspiration Index were counterbalanced to account for order effects. Current third- and fourth-year medical students were contacted through e-mail with a link to SurveyMonkey. The e-mail sent to the medical students included an introduction to the researcher, a description of the project being done, and the purpose of the project. Participants were told to click on the link to SurveyMonkey, where directions for proceeding would follow. When the link to SurveyMonkey was opened, there was an introduction page in which participants were thanked for considering participation in the study, and another description and purpose of the study. In addition, participants were told that they were going to answer a variety of questions about themselves and their career choice and that the study would take 15 to 20

minutes to complete. The participants were asked to answer all of the questions honestly to the best of their ability. When the participants were ready, they clicked a “Begin Survey” button and completed all of the measures. In the e-mail and on the introduction page, participation was clearly described as voluntary, and participants were assured that anonymity would be maintained and that they could exit the study at any time if they changed their mind. After collecting all of the data through SurveyMonkey, the researcher analyzed the data in SPSS. The researcher administered all aspects of the study.

Chapter 4

Results

Hypothesis One

In order to examine if future perceived quality of life (PQOL) moderates the relationship between empathy and motivation in medical students, a moderation analysis was conducted by testing multiple regressions in SPSS. Before doing this analysis, tests were conducted to see if the data met the assumptions of collinearity and independent errors. Both collinearity and independent errors assumptions were met as evidenced by VIF values (empathy = 1.07; PQOL = 1.12; moderator = 1.05), and a Durbin Watson value of 1.90, respectively. Next, the histogram of standardized residuals indicated that the data contained approximately normally distributed errors, as did the normal P-P plot of standardized residuals, which showed points that were not completely on the line, but very close. Fourth, the scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity. Finally, the data met the assumption of nonzero variances.

After centering empathy and PQOL, and computing the empathy-by-PQOL interaction term (moderator), the two predictors and the interaction were entered into a simultaneous regression model to predict motivation (see Table 1 for correlations and descriptive statistics). Participants with greater than 5% of missing data on any of the independent or dependent variables were omitted from the analysis through the pairwise deletion method (Scholmer, Bauman, & Card, 2010). Furthermore, missing data that did not meet the cutoff was identified as missing completely at random through an inspection of the frequency distribution across each item. A mean imputation method was utilized to

input remaining missing data points for analysis (Scholmer et al., 2010) As a result of the exclusion of participants through the pairwise deletion method, the total sample size decreased and varies across the analyses.

Table 1

Correlations and Descriptive Statistics for Motivation, Empathy, PQOL, and Moderator Variables for All Participants

Variable	<i>N</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	148	92.31(12.28)				
Empathy	148	116.11 (10.5)	-.18			
PQOL	148	39.84 (5.79)	.51	-.24		
Moderator	148	.23 (.99)	.19	.04	.20	

Note. *N* = 148 because of missing data.

* $p < .05$.

The results indicate that PQOL does not moderate the relationship between empathy and motivation in medical students ($b = 1.24$, $SE = .90$, $\beta = .100$, $p > .05$). Empathy alone was not shown to be a statistically significant predictor of motivation ($b = -0.89$, $SE = .086$, $\beta = -.076$, $p > .05$). However, PQOL alone was found to be a statistically significant predictor of motivation in medical students ($b = 1.00$, $SE = .16$, $\beta = .47$, $p < .001$). Empathy, PQOL, and the moderator had a statistically significant impact on motivation, with the effect size accounting for approximately 28% of the variance of the model, $R^2 = .28$, $F(3, 144) = 18.25$, $p < .001$.

Additional analyses were conducted to examine more specific differences between medical students and to see if those differences significantly influence the impact of PQOL on the relationship between empathy and motivation. Specifically,

medical students at the two PCOM campuses, Philadelphia and Georgia, were compared (see Table 2 for descriptive statistics for the campus comparison). Next, male and female medical students were compared (see Table 3 for descriptive statistics for the gender comparison). Finally, third- and fourth-year medical students were compared (see Table 4 for descriptive statistics for the school year comparison).

Table 2

Correlations and Descriptive Statistics for Motivation, Empathy, PQOL, and Moderator Variables for Medical Students at the Philadelphia and Georgia Campuses

Philadelphia Campus						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	107	91.96 (11.91)				
Empathy	107	116.28 (11.10)	-.28			
PQOL	107	40.03 (6.02)	.49	-.29		
Moderator	107	-.30 (1.10)	.22	.08	.23	
Georgia Campus						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	41	93.22 (13.28)				
Empathy	41	115.68 (8.86)	.09			
PQOL	41	39.34 (5.17)	.60	-.04		
Moderator	41	-.03 (.58)	.10	-.15	.13	

Note. *N* equals 148 because of occasional missing data.

* *p* < .05.

The results indicate that for medical students at both the Philadelphia and Georgia campuses, PQOL did not have a statistically significant impact on the relationship between empathy and motivation (Philadelphia, $b = 1.50$, $SE = .94$, $\beta = .14$, $p > .05$;

Georgia, $b = .83$, $SE = 3.10$, $\beta = .04$, $p > .05$). Additionally, empathy alone was not shown to be a statistically significant predictor of motivation for students at both campuses, but it did approach significance for students at the Philadelphia campus (Philadelphia, $b = -.18$, $SE = .10$, $\beta = -.17$, $p = .06$; Georgia, $b = .17$, $SE = .20$, $\beta = .11$, $p > .05$). PQOL alone was found to be a statistically significant predictor of motivation in medical students at both the Philadelphia and Georgia campuses (Philadelphia, $b = .81$, $SE = .18$, $\beta = .41$, $p < .001$; Georgia, $b = 1.54$, $SE = .34$, $\beta = .60$, $p < .001$). Empathy, PQOL, and the moderator had a statistically significant effect on motivation for students at both campuses, with the effect size accounting for approximately 28% of the variance of the model for students at the Philadelphia campus, $R^2 = .28$, $F(3, 103) = 13.18$, $p < .001$, and 37% for students at the Georgia campus, $R^2 = .37$, $F(3, 37) = 7.26$, $p < .05$.

Table 3

Correlations and Descriptive Statistics for Motivation, Empathy, PQOL, and Moderator Variables for Male and Female Participants

Male Participants						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	60	92.37 (12.67)				
Empathy	60	113.77(12.02)	-.22			
PQOL	60	40.03 (5.74)	.46	-.29		
Moderator	60	-.31 (1.07)	.05	.24	-.24	
Female Participants						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	88	92.27 (12.07)				
Empathy	88	117.72 (9.05)	-.16			
PQOL	88	39.70 (5.85)	.55	-.20		
Moderator	88	-.17 (.93)	.31	-.19	.55	

Note. *N* equals 148 because of occasional missing data.

* $p < .05$.

The results indicate that for both male and female medical students, PQOL does not have a statistically significant impact on the relationship between empathy and motivation (males, $b = 2.31$, $SE = 1.43$, $\beta = .20$, $p > .05$; females, $b = .08$, $SE = 1.42$, $\beta = .01$, $p > .05$). Empathy alone was not shown to be a statistically significant predictor of motivation for both male and female medical students (males, $b = -.14$, $SE = .13$, $\beta = -.14$, $p > .05$; females, $b = -.06$, $SE = .12$, $\beta = -.05$, $p > .05$). PQOL alone was shown to be a statistically significant predictor of motivation for both male and female medical students (males, $b = 1.03$, $SE = .27$, $\beta = .46$, $p < .001$, females, $b = 1.11$, $SE = .23$,

$\beta = .54, p < .001$). Empathy, PQOL, and the moderator had a statistically significant impact on motivation for both male and female medical students, with the effect size accounting for approximately 25% of the variance of the model for male students, $R^2 = .25, F(3, 56) = 6.28, p < .05$, and 31% for female students, respectively, $R^2 = .31, F(3, 84) = 12.35, p < .001$).

Table 4

Correlations and Descriptive Statistics for Motivation, Empathy, PQOL, and Moderator Variables for Third- and Fourth-Year Medical Students

Third-Year Students						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	66	92.48 (13.36)				
Empathy	66	116.21 (10.69)	-.18			
PQOL	66	39.83 (6.47)	.69	-.22		
Moderator	66	-.24 (1.08)	.31	.06	.44	
Fourth-Year Students						
Variable	<i>n</i>	<i>M (SD)</i>	Motivation	Empathy	PQOL	Moderator
Motivation	82	92.05 (11.20)				
Empathy	82	115.91 (10.67)	-.20			
PQOL	82	39.99 (5.34)	.32	-.26		
Moderator	82	-.23 (.95)	.06	.03	-.07	

Note. *N* equals 148 because of occasional missing data.

* $p < .05$.

The results indicate that for both third- and fourth-year students, PQOL did not have a statistically significant impact on the relationship between empathy and motivation (third-year students, $b = .26, SE = 1.30, \beta = .02, p > .05$; fourth-year students,

$b = 1.03$, $SE = 1.30$, $\beta = .09$, $p > .05$). Empathy alone was not shown to be a statistically significant predictor of motivation for both third- and fourth-year students (third-year students, $b = -.05$, $SE = .12$, $\beta = -.04$, $p > .05$; fourth-year students, $b = -.14$, $SE = .12$, $\beta = -.13$, $p > .05$). PQOL was shown to be a statistically significant predictor of motivation for both third- and fourth-year medical students (third-year students, $b = 1.38$, $SE = .22$, $\beta = .67$, $p < .001$; fourth-year students, $b = .62$, $SE = .24$, $\beta = .30$, $p < .05$). Empathy, PQOL, and the moderator had a statistically significant impact on motivation for both third- and fourth-year students, with the effect size for third year students accounting for approximately 47% of the variance of the model, $R^2 = .47$, $F(3, 62) = 18.32$, $p < .05$, and for fourth-year students accounting for approximately 13%, $R^2 = .13$, $F(3, 78) = 3.54$, $p < .05$.

Hypothesis Two

In order to examine if motivation in medical students is a significant predictor of specialty choice, a logistic regression was computed in SPSS. Before doing this regression, tests were conducted to see if the data met the assumptions of linearity, independence of errors, and multicollinearity, and all of the criteria were met.

In the analysis for this study, the predictor variables were motivation as well as lifestyle, prestige, empathy, and PQOL. The outcome variable was specialty choice, categorized as primary care and non-primary care (see Table 5 for variable descriptions, Table 6 for descriptive statistics, and Table 7 for the results of the logistic regression).

Table 5

Variable Descriptions

Variable	Variable description
Specialty choice	0 = Primary-care specialty choice; 1 = Non-primary care specialty choice
PQOL	
Motivation	
Empathy	
Lifestyle	
Prestige	

The dependent variable in this model is specialty choice. Specialty choice was coded as 0 if the participants chose a primary-care specialty and 1 if they chose a non-primary-care specialty. Since the dependent variable is discrete, a logistic regression model was used to estimate the factors that influence specialty choice. The logistic regression results are presented in Table 7, where one model is presented. The model includes a block of five independent variables: motivation, prestige, lifestyle, empathy, and PQOL.

Table 6

Descriptive Statistics

Variable	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
PQOL	152	22.00	56.00	39.94	5.85
Motivation	156	67.00	128.00	92.54	12.57
Empathy	153	86.00	136.00	115.62	10.83
Lifestyle	152	1.22	3.78	2.29	.42
Prestige	152	1.00	4.50	2.72	.59
Valid <i>N</i>	138				

Table 7

Logistic Regression Results

Model 1						
	β	<i>S.E.</i>	<i>Wald</i>	<i>df</i>	<i>p</i>	<i>Nagelkerke's R²</i>
Constant	2.70	3.00	.81	1	.37	
Motivation	-.04	.02	3.83*	1	.05*	
Prestige	.46	.63	.54	1	.46	
Lifestyle	.21	1.10	.04	1	.85	
Empathy	-.03	.02	1.74	1	.19	
PQOL	.03	.11	.07	1	.79	
Model chi-square (df)						7.60(5)
Block chi-square (df)						7.60(5)
% correct predictions						66.7
					.07	

Note: The Wald statistics are distributed chi-square with 1 degree of freedom.

*Indicates that the coefficient is statistically significant at the $P = .05$ level.

The results of the logistic regression indicate that medical students are influenced by motivation when choosing a specialty, but not in the way that was hypothesized. The results suggest that medical students who are more extrinsically motivated are slightly less likely to choose a non-primary-care specialty. The coefficient on the motivation predictor has a *Wald* statistic equal to 3.83, which is the only significant coefficient in the model. The overall model is not statistically significant according to the model's chi-square statistic, indicating that the five selected predictors do not predict specialty choice to a significantly larger degree than the intercept-only model. The model predicts specialty choice 66.7% of the time correctly (in contrast to 64.5% using the intercept alone).

This model also included four additional theoretically important independent variables: prestige, lifestyle, empathy, and PQOL. However, none of these coefficients

attained statistical significance. Since these independent variables are not significantly different from zero, interpretation of their magnitude has little meaning in logistic regression, and thus any related subsequent discussion is limited.

Chapter 5

Discussion

The results of this study suggest that PQOL does not significantly influence the relationship between empathy and motivation in medical students. While PQOL was not shown to moderate the relationship between empathy and motivation among medical students, it was found to be a significant predictor of motivation by itself, which indicates that it is an important variable to consider when examining medical students and their career choices. Medical students might benefit from counseling throughout medical school to discuss their current lifestyle obstacles, future quality-of-life goals, and how those variables are impacting the development of their career choices. Mental-health professionals could help medical students objectively examine their thoughts and feelings about the future, and help problem solve perceived barriers that students may face. For example, if a student is reluctant to go into primary care solely because of student loan debt, a psychologist or counselor could help the student find possible primary-care residency programs that help pay back student loans. Additionally, if students do not want to go into primary care because of the lack of prestige, a mental-health professional could explore what prestige means to them, why it is important, and what is really going to make them happy in their life. Utilizing psychologists and counselors in the career decision-making process may help medical students think more clearly about what they want and need in their future, and ultimately lead them to choosing a specialty that they are passionate about.

The results of this study also indicate that motivation is a significant predictor of specialty choice, but in the opposite direction that was hypothesized. Medical students

who exhibited higher levels of extrinsic motivation were found to be slightly less likely to choose a non-primary-care specialty. A possible interpretation of this finding is that such factors as salary, prestige, lifestyle, empathy, and motivation are relative as to their meaning for each individual. For example, while family medicine physicians may make significantly less money than do orthopedic surgeons, some medical students specializing in family medicine may have grown up in a low-income family, and that family medicine salary may seem extremely high to them. Though the literature on specialty choice links extrinsic motivation with prestigious specialties, what is considered prestigious also may be different for various individuals. For example, even though pediatricians make less money than radiologists, some pediatricians may feel that nothing is more prestigious than treating sick children. An additional possible interpretation for this finding is that the change in the healthcare system in recent years has shifted medical students' motivation toward pursuing a given specialty. Those who went into a non-primary care specialty 10 to 15 years ago were almost guaranteed to make a great deal of money and work for themselves. As a result of new healthcare laws and a shift in the way the system operates, specialists are now being forced to team up with one another in order to pay for their expensive malpractice insurance and other liabilities (Hentoff, 2013; Singer, 2013). Large practices of surgeons, radiologists, dermatologists, and other non-primary-care specialists are now more common. While this helps cover the cost of malpractice insurance and other necessities, it reduces the overall income of these physicians and forces them to work for a larger medical system (Hall & Lord, 2014). Medical students may be aware of these changes and, as a result, may view non-primary-care specialties as less desirable than they were once viewed.

Another important implication for this study is that it raises awareness of the relationships among empathy, PQOL, motivation, and specialty choice. Since PQOL was found to be a significant predictor of motivation, further examination of PQOL among medical students is imperative. The identification and addressing of specific important PQOL factors, desires, concerns, and needs among medical students could motivate more students to go into primary care and help reverse the trend that is causing the shortage crisis.

Limitations

The limitations to this study are numerous. First, the sample was a group of third- and fourth-year medical students from one osteopathic medical school in the northeastern part of the United States. While the relationships are not fully understood because of lack of research, some research suggests that empathy levels influence allopathic and osteopathic medical students differently (Kimmelman et al., 2012). Owing to the findings of this limited research, the characteristics of the medical students at the Philadelphia College of Osteopathic Medicine used in the study may not have been representative of many other medical students in the United States regarding race, ethnicity, socioeconomic status, gender, and other pertinent variables. This decreases the external validity of the results since the sample may not be representative and was a sample of convenience.

Next, the researcher collected data using only self-report measures, which are known to have both reliability and validity issues (Fan et al., 2006; Hawkshead & Krousel-Wood, 2007). Participants may not have answered the questions in an accurate manner for a variety of reasons, such as not wanting to disclose certain information or not

understanding a question. Also, the mission statement of the Philadelphia College of Osteopathic Medicine is to train primary-care physicians, so the number of medical students who chose primary care in this study may be significantly higher than those who did not. This ratio may not be representative of other medical schools that do not place an emphasis on training primary-care physicians.

Furthermore, this model did not analyze numerous factors that have been shown to contribute to choosing a specialty. A few examples are medical students' personal skill sets and aptitudes; personality characteristics, such as confidence and assertiveness levels; and preference to work in isolation or as part of a treatment team (Bindal et al., 2011; Hojat & Zuckerman, 2008). Research suggests that individuals who are highly confident and assertive and have elite technical skill sets tend to be more interested in non-primary-care specialties such as surgery (Bindal et al., 2011). Additionally, these individuals have been found to have a preference for working alone as opposed to alongside a treatment team (Hojat & Zuckerman, 2008). Research also indicates that individuals who have higher interpersonal skill sets and enjoy working as part of a team tend to be more interested in primary-care specialties (Bindal et al., 2011; Hojat & Zuckerman, 2008).

A final limitation to this study is that the future PQOL measure used in this study was not psychometrically validated. It was designed by the researcher based on an extensive literature review. Using psychometrically sound measures in research is crucial and should be considered when conducting research in this area in the future.

Future Research

Future research should include testing the model in this study on larger sample sizes and on medical students from allopathic, as well as osteopathic, institutions. Furthermore, future research should include testing this model utilizing qualitative data as opposed to using solely self-report scales and questionnaires. While the PQOL measure that was created was based on the research that has been done in this area, identifying what is important to an individual and the factors that motivate them by asking and allowing them to respond in their own words could yield important contributions to the PQOL construct. Key factors that are being missed by using only self-report scales and questionnaires could potentially be identified by collecting qualitative data.

Other areas of future research should further examine the reason behind the deficit in primary-care physicians and the potential solutions to this worldwide problem. Research areas of interest may include developing incentive programs to increase the quality of life among primary-care practitioners. Primary-care physicians are notorious for working the most hours of any physicians while getting paid the least. If there was a way to make their schedule more desirable, increase their salary, or offer other incentives for medical students going into primary care, such as helping with student loan debt, the number of medical students that decide to specialize in primary care could increase.

Future research should also examine specific quality-of-life variables (e.g., work environment, work schedule, salary, work-family balance, on-call schedule) and their importance in preventing physician burnout, as well as analyze personality characteristics/coping mechanisms among successful and happy primary-care physicians. This would not only allow medical students to see if their personality characteristics and

values positively correlate with those of others in the field, but also allow students to focus more on the life factors that are important to them to determine whether primary care would be a good fit.

Finally, future research should explore the way in which medical schools and mentors present primary-care medicine to their students. During the third and fourth years of medical school, students rotate through a multitude of specialties, and research has shown that medical students' experiences with practicing physicians in those rotations highly influence students' perceptions of that specialty (Heiligers, 2012). Therefore, examining the experiences medical students are having in their primary-care rotations is important.

Conclusion

Research has revealed a worldwide shortage of primary-care physicians and fewer medical students choosing to specialize in primary care each year (Bindal et al., 2011; Hauer et al., 2008). Studies also suggest that empathy, PQOL, and motivation are significant factors in choosing a specialty (Hojat et al., 2011; Heiligers, 2012; Shadbolt & Bunker, 2009). This study aimed to examine if PQOL moderates the relationship between empathy and motivation and if type of motivation (intrinsic/extrinsic) is a significant predictor of specialty choice among third- and fourth-year medical students at the Philadelphia College of Osteopathic Medicine. The results indicate that PQOL does not moderate the relationship between empathy and motivation. However, PQOL was found to be a significant predictor of motivation, highlighting the importance of studying PQOL in future studies regarding medical students and their career choices. Additionally, motivation was found to be a significant predictor of specialty choice in that medical

students who were more extrinsically motivated were marginally less likely to choose a non-primary specialty, which is the opposite of what was hypothesized. While the hypotheses in this study were not confirmed, research must continue to examine factors contributing to the primary-care shortage and ways to rectify the problem.

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Appendix A**Demographic Questionnaire**

1. Ethnicity origin (or Race):

- A. White
- B. Hispanic or Latino
- C. Black or African American
- D. Native American or American Indian
- E. Asian/Pacific Islander
- F. Other

2. How would you describe your SES of the household in which you grew up?

- A. High
- B. Moderately high
- C. Middle income
- D. Moderately low
- E. Economically deprived

3. Are any of the following helping you pay for your education?

- A. The Military
- B. Immediate and/or Extended Family
- C. Friends
- D. A and B
- E. A and C
- F. B and C
- G. All of the above
- H. None of the above

4. Which PCOM campus do you attend?

- A. Philadelphia
- B. Georgia

5. Age:

- A. < 22
- B. 22-24
- C. 25-27
- D. 28-30
- E. 31-33
- F. 34-36

G. > 36

6. Gender:

- A. Male
- B. Female

7. Which specialty do you plan to pursue?

- A. Anesthesiology
- B. Family Med./General Practice
- C. Neurosurgery
- D. Otolaryngology
- E. Pediatrics
- F. Preventive Medicine
- G. Radiology
- H. Dermatology
- I. Internal Med.
- J. Obstetrics/Gynecology
- K. Orthopedic Surgery
- L. Physical Med./Rehabilitation
- M. Psychiatry
- N. Surgery
- O. Undecided
- P. Emergency Medicine
- Q. Neurology
- R. Ophthalmology
- S. Pathology
- T. Plastic Surgery
- U. Public Health
- V. Urology
- W. Other (please specify)

8. Year of medical school:

- A. 3rd Year
- B. 4th Year

Appendix B

Future Perceived Quality of Life Inventory for Medical Students

The following questions ask how you perceive your quality of life will be after graduating from medical school. In addition, some of the questions will ask about your future wishes and desires in regard to your quality of life after graduation. Please choose the answer that is the most accurate for you.

1. Having a prestigious position means a lot to me.

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

2. The more income I make, the happier I will be.

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

3. Being able to spend time with my family is more important than my future salary.

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

4. Having a flexible work schedule is more important than earning a higher salary.

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

5. I am going to settle in an affluent town.

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

6. I am going to work in a well-known medical facility.

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

7. I am going to have a good balance between my personal and professional life.

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

8. I will work in a pleasant work environment.

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

9. I am going to have plenty of time to spend with friends and family.

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

10. I am going to always search for the most prestigious positions regardless of their geographic location.

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

11. I will work in a private practice that serves a higher SES patient population.

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

12. Driving an expensive car and having a large house are important to me.

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

13. My student loans/other financial obligations will prevent me from living the lifestyle that I would like.

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

14. I am going to spend as much time with patients as needed in order to treat them in the most effective manner.

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

15. It does not matter where I work as long as I am helping others.

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

16. I will take at least one vacation per year.

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

