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Philadelphia College of Osteopathic Medicine

Department of Psychology

EFFECT OF MEDICAL EDUCATION ON EMPATHY IN OSTEOPATHIC
MEDICAL STUDENTS

By Adam J. McTighe

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

July 2014

**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE
DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Adam J. McTighe
on the 15th day of May, 2014, in partial fulfillment of the
requirements for the degree of Doctor of Psychology, has been examined and is
acceptable in both scholarship and literary quality.

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Abstract

Empathy is an integral component of the physician-patient relationship and involves a cognitive and emotional ability to connect with others in a meaningful fashion. To date, only two studies exist using osteopathic medical student samples while multiple studies have shown that allopathic student empathy declines significantly during year 3. Similar results were not found in the osteopathic samples; however, the designs used were cross-sectional, while allopathic studies were longitudinal. The current study utilized a mixed-methods approach that included cross-sectional and longitudinal analyses, the first to do so within an osteopathic medical student population. The present study investigated empathy levels of osteopathic medical students during years 1 through 3 ($n = 717$) to determine if empathy declines during education; if self-reported empathy relates to patient perceived empathy, if empathy predicts career choice, and if demographics influence self-reported empathy. The Jefferson Scale of Physician Empathy-Student Version was used to assess self-reported empathy; the Jefferson Scale of Perceived Physician Empathy was used to assess patient perceived empathy; and the Professionalism Assessment Ratings Scale was used to assess patient perceived interpersonal skills of the students. Results of cross-sectional analysis indicate that empathy levels decline significantly during years of education ($M = 111.3$, $M = 112.4$, $M = 108.8$, respectively) and longitudinal analyses of year 3 indicate the same ($M = 111.2$ and $M = 108.7$). Self-reported empathy was not found to correlate with patient perceived empathy nor predict career choice; female students scored higher than males ($M = 112.3$ and $M = 109.3$). Future research is suggested to continue to explore this topic.

Table of Contents**Chapter 1**

Introduction	1
Statement of the Problem	1
Population of Interest	4
Purpose of the Study	4

Chapter 2

Literature Review	6
Overview	6
Healthcare Disparities	7
Physician-Patient Relationship.....	9
Empathy Development	11
Extrinsic Factors.....	12
Intrinsic Factors	13
Patient Centered Medicine	18
Medical Education.....	23
Simulated Clinical Training	25
Literature Review Summary.....	31
Current Study	31

Chapter 3

Methods	36
Participants	37
Recruitment	37

Inclusion Criteria.....	38
Exclusion Criteria.....	38
Measures.....	39
Procedure for Data Collection.....	41
Research Design.....	42
Chapter 4	
Results.....	44
Analysis and Interpretation of Data.....	44
Chapter 5	
Discussion.....	52
Summary of Findings.....	54
Limitations.....	57
Implications of Findings.....	58
Significance of Findings.....	58
Future Research.....	59
Summary and Conclusions.....	61
References.....	63
Appendices	
Appendix A: Student Demographic Questionnaire.....	73
Appendix B: Standardized Patient Demographic Questionnaire.....	75

List of Figures

Figure 1 Mean total empathy of students in years 1 to 3.....	46
Figure 2 Empathy change of students in year 3.....	46
Figure 3 Mean total empathy score of male and female students	49
Figure 4 Osteopathic empathy scores comparisons.....	53
Figure 5 Current findings compared to allopathic samples	53

List of Tables

Table 1	Specialty Preferences by People or Technology Orientation.....	35
Table 2	Scores on the JSPE-S, JSPPPE, and PARS by Class Year for 717 Osteopathic Medical Students During the 2012-2013 Academic Year.....	45
Table 3	Sex and Career Choices of Osteopathic Medical Students	49
Table 4	Student Extracurricular Activities Involvement by Class Year	51

EMPATHY IN OSTEOPATHIC MEDICAL STUDENTS

Chapter 1

Statement of the Problem

American medical education places an emphasis on developing physicians who are as compassionate as they are competent (Halpern, 2007). To that end, the Association of American Medical Colleges (AAMC) requires medical students, in addition to passing all necessary academic standards, to achieve two additional goals: first, to understand the perspective of the patients; and second, to appropriately and adequately express those views in a caring and concerned fashion (AAMC, 2011). Both goals are achieved through the development and nurturing of empathy and the ability to be empathic.

In order to achieve this, the graduate medical curriculum places emphasis on shaping patient-centered physicians (Wilkes, Milgrom, & Hoffman, 2002). Multiple studies have suggested that patient-centered physicians bring with them a plethora of benefits (Beach, Saha, & Cooper, 2006; Bombeke et al., 2011; Centers for Disease Control and Prevention [CDC], 2011). These benefits include patients' treatment adherence (Anolli et al., 2006), satisfaction with their provider (Pederson, 2010), and feeling as if their physician is empathic (Dallo, Borrell, & Williams, 2008). Studies indicate the need for clear communication (Ashton et al., 2003), developed interpersonal skills (Yudkowsky, Downing, & Ommert, 2006), and relating to patients in an empathic manner (Hall et al., 2009).

Empathy and empathic communication are difficult to address through the core medical academic curriculum (Pedersen, 2010). Empathy is a multidimensional concept that plays an integral role in human interaction and relationships (Balint, 1976; Halpern,

2007). Vast amounts of research exist on the different constructs thought to impact empathy and the ability to empathic (Hojat, 2006; Jolliffe & Farrington, 2004). Kassebaum and Szenas (1994) suggest that empathy has a cognitive and emotional component and is largely identified as the concept that helps us gain understanding of others' feelings and situations. This is supported by multiple studies in the current literature (Hojat, 2007; Shapiro, 2008; Tavakol, Dennick, & Tavakol, 2011). The ability to adopt others' perspectives is a useful tool when needing to better understand exactly what an individual is going through; this skill is innate as well as capable of being developed (Rogers, 1959). Being able to gain another's perspective is an essential component that helps humans interact and relate; it is also one of the most crucial aspects in healthcare delivery and the physician-patient relationship (Balint, 1976).

However, multiple studies have found that empathy in medical students significantly decreases during their education (Chen, Lew, Hershman, & Orlander, 2007; Hojat et al., 2002a; Pederson, 2008). Using the Jefferson Scale of Physicians Empathy-Student version, (JSPE-S), Chen, Lew, Hershman, and Orlander (2007) found that students' mean ratings dropped from 118.5 in May at the end of their first year to 106.6 by the end of their fourth year (total ratings range from 0 to 140). These findings are supported Hojat et al. (2004), who found that students' JSPE-S mean scores decreased significantly from 2 two to 3 and did not show any known increases through graduation. Similar results were supported 5 years later in another study by Hojat et al. (2009). It is important to note, however, that these studies represent allopathic students, and there is very limited data on osteopathic medical students (Kimmelman et al., 2012).

The transition in the third year is a critical time for developing physicians because it includes their first clinical hands-on experience and an introduction to the physician-patient relationship (Pederson, 2010). Aside from the obvious concern of level of empathy declining in medical school (e.g., students not caring about their patients), medical students are missing the benefits of developing empathy.

High empathy ratings have been correlated with lower rates of physician stress (Cedfeldt et al., 2010), and burnout (Dyrbye & Shanafelt, 2011), higher career satisfaction (Hojat, Kowitt, Doria, & Gonnella, 2010), and fewer malpractice claims (Buckman, Tulskey, & Rodin, 2011). Low empathy levels correlate with certain specialties (i.e., radiology, surgery) while higher levels correspond to others (i.e., family medicine, general practice, and psychiatry) (Borges et al., 2009). It is important to note that not all medical specialties require these relationship qualities. For instance, radiology and surgery do not emphasize them to the same degree as do family medicine, general medicine, or psychiatry (Hojat, Gonnella, Nasca, Mangione, Vergare, & Magee, 2002b)—and perhaps for good reason, as the former specialties are focused on performing particular tasks while the latter take a more patient-centered approach (Borges, Stratton, Wagner, & Elam, 2009).

Another reason empathy and empathic physicians are important comes from the annual health disparities reports by the Centers for Disease and Prevention's Control (CDC). The CDC found that one of the main reasons why members of minority and underserved populations are often reluctant to see physicians is that they do not feel that their doctors hear them or care about them (CDC, 2011; Moy, Barrett, & Ho, 2011). This is evidenced by the fact that such populations do not access medical care (CDC, 2011),

report diseases (CDC, 2011), or adhere to medical treatment (Anolli, Vescovo, Agliati, Mantovani, & Zurloni, 2006).

This is also a concern due to the Affordable Care Act's 2014 healthcare reform, which marks a significant change in the United States healthcare system (CDC, 2011). The reform aims to change the current lack of general practitioners in America and also change how patients are treated (Carter-Pokras & Baquet, 2002). Another aspect of the reform is the concept of medical homes, which will emphasize primary care physicians as the central point of patient care, however, given the significant declines in empathy during medical school, coupled with the decreased number of students entering primary care/family medicine, there is a serious concern for the future ability to access first-line medical care (Biggs, Bieck; Crosley, & Kozakowski, 2012; Hollingsworth et al., 2012).

In summary, the physician-patient relationship is a delicate yet dynamic aspect of healthcare, arguably the backbone of the entire medical system (CDC, 2011).

Unfortunately, current research suggests that there is trouble in the relationship, mainly due to physicians' lack of empathy (Buckman, Tulskey, & Rodin, 2011); however, the health disparity is a significant contributing factor, as well (CDC, 2011). While recent research has measured empathy development in medical students, the vast majority of the samples were allopathic students (Hojat, 2007). Other than gender and students' age, there is limited data on the relationship between cultural demographic information (e.g., race/ethnicity and religious affiliation) with medical students' self-perception of empathy.

Purpose of the study.

The current literature regarding medical students' empathy development during medical school is primarily on allopathic students. Other than articles from Kimmelman

et al. (2012) and Calabrese, Bianco, Mann, Massello, & Hojat (2013), there is no data using osteopathic student samples: thus, there is a need to examine differences and similarities between allopathic and osteopathic medical student empathy. The purpose of this study, therefore, was to examine (a) how empathy develops through the first and third year for osteopathic medical students, and if empathy declines during the 3rd year of school; (b) if perceived student empathy ratings by standardized patients correlates with student self-reported empathy; (c) if student self-reported empathy predicts choice of specialty; and (d) if any relationship with the cultural demographics of osteopathic medical students exists with self-reported empathy. Data from the osteopathic students provide (a) direct comparison data on similarities to and/or differences in empathy scores from allopathic student samples and (b) information on whether empathy training may be required.

Chapter 2

Literature Review

The literature on physician and medical student empathy is becoming more detailed thanks in large part to a recently developed psychometric tool, the Jefferson Scale of Physician Empathy (JSPE) (Kimmelman et al., 2012; Tavakol, Dennick, Tavakol, 2011). The JSPE was developed by Hojat et al. (2002a) to better assess self-reported empathy within the scope of the physician-patient relationship and medical contexts (Hojat, 2007). As a result of the relatively newly developed JSPE, the literature on medical students' empathy has been growing. Unfortunately, however, is mounting evidence of significant declines in empathy during medical education (Pederson, 2010). An important distinction must be addressed, though, because the samples used were of allopathic students, and research on osteopathic students is very limited (Kimmelman et al., 2012; Calabrese et al., 2013). Additionally and potentially more significant, however, are the impending medical service and treatment changes occurring in America. The changes center on healthcare reform, which is based largely on the healthcare disparities facing the nation (CDC, 2011). These two realities form the foundation for the current discussion, as it moves through the context and content of the physician-patient relationship, and then toward a more detailed analysis of the components and the relevant literature surrounding them.

The CDC has taken a proactive stance against gaps in health care and service since 1946 (CDC, 2011). The result is the CDC's annual *Health Disparities and Inequalities Report*, which provides statistical information on disease prevalence, as well as on differences between populations. These differences are often categorized broadly,

but are generally considered to encompass gender, ethnicity, race, age, sexual orientation, disability, and socioeconomic status (Ashton et al., 2003; CDC, 2011). Many of these groups are protected by the Americans with Disabilities Act (ADA), but research indicates that they are the least likely to receive quality health care (CDC, 2011).

The healthcare disparities are cause for concern because of the demographic shift in the United States and the continuing diversification of ethnic minority populations, so that the total number of ethnic minority members will exceed the Caucasian population in 2050 (Kaufmann & Haklai, 2008). Another concern is the impact of healthcare reform on the physician-patient relationship (Fredricks, Odiet, Miller, & Fredericks, 2006). Physicians are required to maintain larger patient loads due to decreased reimbursements, insurance coverage complications, increases in government insurances (i.e., Medicare, Medicaid), and having to treat new patients who have pre-existing conditions (Dyrbye & Shanafelt, 2011).

The Institute of Medicine, in 2002, published a significant milestone study on the health disparities facing the nation. Results indicated three major barriers to medical treatment of minorities. The first are the patient-level barriers, which included patient preferences (including attitudes and behaviors), uniqueness of patient symptomatology, and treatment refusal. The second are provider-level barriers, which include provider biases (including stereotypes) and unsound professional judgments. The third level, which is an overall barrier to the previous two, is the healthcare-systems barrier. These barriers include insurance complications (including reimbursement), minimal resources for foreign language speaking patients, time constraints, and complications of a fragmented system. These barriers represent different, but equally challenging, sources

of disparities for effective and efficient medical treatment of minorities (Institute of Medicine, 2002). More important, and central to this discussion, are the complications that result in the physician-patient relationship, such as poor communication, difficult relationships, and patients feeling that their physician is not concerned for their well-being (CDC, 2011).

The CDC reports that minority populations are significantly less compliant with treatment than majority populations (CDC, 2011). This indicates a likelihood of further complications in patients' health and well-being. Additionally, many individuals in disadvantaged groups do not seek medical treatment, often out of distrust, believing that their confidentiality will not be respected. This is even more prevalent in patients who speak different languages than their physicians, especially older Hispanics and Asians (Kim et al., 2011). Physician empathy, however, is negatively correlated with such problems, suggesting that an empathic physician and a positive physician-patient relationship have the potential to offset systemic problems in the healthcare system (Stepanikova & Cook, 2010).

As indicated above, the physician-patient relationship is a special and sensitive connection between two individuals (Healthways, 2004). A healthy physician-patient relationship is the gateway to efficacious health care (Carter-Pokras & Baquet, 2002). Without it, a patient may ignore and/or altogether avoid his or her physician and the physician's advice. Moreover, the physician will be able to more accurately diagnose and treat the patient if the physician-patient relationship is intact and positive (CDC, 2011). The physician-patient relationship is also important in promoting adherence and patient satisfaction with medical services (DiTomaso & Willard, 2002).

Components of the physician-patient relationship.

Communication, rapport, and empathy are the components of the physician-patient relationship (Ashton et al., 2003; Healthways, 2004). Communication helps deliver the physician's message in a way that it will be heard (Ashton et al., 2003); rapport helps connect the physician to his or her patient (Healthways, 2004); and empathy makes the connection meaningful (Bombeke, Roosbroeck, De Winter, Debaene, Schol, Hal, & Royen 2011). All three are essential to both parties and help create trust, which is crucial in a system where care is difficult to access and may be divide among multiple care providers (CDC, 2011).

Communication.

Multiple studies indicate the importance of clear and concise communication within the physician-patient relationship (Clever et al., 2011, 2006; Evans, Stanley, Mestrovic, & Rose, 1991; Windish et al., 2005). Benefits to the patient include more accurate diagnostics (Evans et al., 1991), increased comfort (Clever et al., 2011), treatment adherence (Anolli et al., 2006), satisfaction with provider (DiTomasso & Willard, 1991), improved outcomes (Yedidia et al., 2003), and the ability to provide sound clinical reasoning (Windish, Price, Clever, Magaziner, & Thomas, 2005).

Effective communication also includes nonverbal communication: being able to communicate effectively without words (nonverbal communication, or body language) is an essential component of the physician-patient relationship that must be addressed. Body language can convey meaning and a sense of acceptance (or rejection) immediately (Bombeke et al., 2011). Unfortunately, some demeanors can be easily misconstrued. A physician's posture, gaze, or any number of gestures can unwittingly convey an attitude

that the patient finds off-putting (Haidet et al., 2006). If a patient senses a negative attitude from his or her physician, communication can shut down and treatment is stifled (Bombeke et al., 2011; Haidet et al., 2006).

Physicians need to avoid body language that can interfere with a healthy and productive physician-patient relationship. One of the most difficult communication scenarios is when physicians need to deliver unfavorable and/or terminal prognoses or so-called bad news. Orlander, Fincke, Hermanns, and Johnson (2002) found that residents giving bad news for the first time were not prepared and did not learn how to effectively deliver such news. Clever and Tulsku (2002) argue that physicians who are able to empathize and seize moments of vulnerability are able to make deeper connections with their patients, thus leading the relationship toward rapport.

Rapport.

Research suggests that being able to develop a good rapport will promote a healthy and positive physician-patient relationship and will yield better treatment outcomes, i.e., shorter recovery time, less chance of recidivism, and more satisfaction of both patient and provider (Clever et al., 2011; Windish et al., 2005). Building rapport may vary, depending on the context and content of the physician-patient relationship; however, it is a necessary component of efficacious treatment (Clever et al., 2011). Once a connection is made, the relationship can develop to a deeper level with the presence of empathy (Anolli et al., 2006).

Empathy.

Empathy, or the ability to perceive another person's experience, has a long-standing presence in many disciplines dating back to ancient Greece, but research

indicates it was first identified as a construct of human emotion and connectedness by a German philosopher and artist, Robert Vischer, who described the concept as *Einfühlung* (Pederson, 2010). This term was then adopted by Freud, who used the term in psychodynamic therapy as an act of projection (Pigman, 1995). Freud's concept was then labeled by Tichener in English in 1909 as *empathy* (Gallese, 2003). After a nearly half century presence in psychotherapy, Carl Rogers pioneered client-centered therapy in 1959 by using empathy as one of the primary factors in meaningful change in suffering individuals (Rogers, 1959).

Rogers (1959) explained empathy as being able to perceive another's personal view of the world "as if they were that person" (p. 5). Being able to perceive another's experience requires both a cognitive and emotional capability (Shapiro, 2008); moreover, research suggests that in order to use empathy effectively, one must have a balance of both (Dyrbye & Shanafelt, 2011; Hojat et al., 2002b; Pederson, 2010).

Below is a review of the current literature, which discusses the internal and external factors of empathy development within the context of the physician-patient relationship and medical education.

Influences on empathy development. Research indicates that different factors both extrinsic and intrinsic to medical education influence empathy in medical students (Bombeke et al., 2011). The external factors include undergraduate major, prior clinical working experience, involvement in extracurricular activities, and career choice (Haidet et al., 2006; Hojat & Gonella, 2004; Kassebaum & Szenas, 1994; Mueller, Segovis, Litin, Hebermann, & Thomas, 2006). The internal factors include demographic characteristics, such as gender (Beutel & Marini, 1995), age (Schieman & Gundy, 2000), race/ethnicity

(Vaughn, Jacquez, & Baker, 2009), and religious affiliation (Curlin, Lantos, Roach, Sellergren, & Chin, 2005).

The external factors in empathy development in medical education typically revolve around curriculum design and academic processes, as previously discussed. Research indicates that didactic learning environments are effective in improving beginners' empathic communication (Hanna & Fins, 2006; Yedidia et al., 2003), but role-play (Shapiro, 2008), simulated clinical encounters (Clever et al., 2011; Hall, Roter, Blanch, & Frankel, 2009), exposure to real patients (Clever et al., 2011), and group discussions (Wilkes, Milgrom, & Hoffman, 2002) are more effective in fostering more advanced empathic communication abilities. Other relevant factors that correlate with empathy, such as undergraduate major, are discussed below.

According to Vaughn, Jacquez, Zhao, and Lang (2011), because medicine is a fusion of art and science, physicians in training obtain a wide range of undergraduate degrees; however, each student must complete a specific core of biomedical classes. Research indicates that no specific major yields more successful medical students in medical school or, for that matter, as practicing physicians (Vaughn et al., 2011). Rasoal, Jingert, Hau, Stiwne and Andersson (2009) found that students in undergraduate programs studying psychology, nursing, and social work had higher empathic skills than students in other study programs. The authors did not control for experience, which is why the results, although not generalizable, offer some insight into the differences in empathy development of students in the humanities and soft sciences (i.e., English, psychology, sociology) versus harder sciences (biology, chemistry, physics) (Rasoal et al., 2009). Pederson (2010) supports the need to bridge the gap between biomedical

sciences with the humanities as a strategy to foster empathy; the author posits that medical students develop a “clinical gaze” (Pederson, 2010) that perpetuates detached and systematic judgments lacking empathic connections.

Prior medical experience is the most influential factor in empathy development during medical school (Yudkowsky, Downing, & Ommert, 2006). This is especially true of students who have had particularly difficult medical treatments and/or lost a loved one due to medical complications; they tend to understand and appreciate how various life circumstances can alter individual functioning and lifestyle (Donnon, Oddone-Paulucci, & Violato, 2009). Such experiences serve as catalysts for students to better appreciate patients’ personal experiences, as well as build a stronger bond more quickly than with someone who has not had these experiences. However, exposure to clinical scenarios typically does not occur until the third year of medical education, which comes after 2 years of didactic academic training. To investigate the effects of exposing students to medical scenarios prior to their own clinical experiences, Wilkes, Milgrom, and Hoffman (2002) investigated, in a qualitative study, the effect of exposing healthy students to inpatient hospitalization. The theme identified was that students felt the medical staff members were unaffectionate and distant. Furthermore, students indicated they expected their experience to affect future interactions with patients, providing evidence that exposure to clinical scenarios before the third year can potentially foster empathy in students.

Extracurricular activities and group involvement offer students a broader and more interactive range of opportunities to gain exposure to and experience in things outside the classroom. Students are able to involve themselves in a diverse range of

activities oriented toward either academic achievement or support and advocacy. Haidet et al. (2006) found that students who were in a support and advocacy group had higher levels of empathy than those who were not. Such findings are critical to offset research that indicates student empathy levels decline during their third year of education (Hojat et al., 2004, 2009), suggesting that offering opportunities for students to participate in extracurricular activities is a good strategy for promoting and developing empathy.

Given the difficulties of the prerequisites students must fulfill before medical school, it is not uncommon for them to be undecided about what type of medicine to practice upon completing school. For that reason, choice of career is placed in the external factor category, since most students' placement is due to examination scores and competencies, rather than inherent interest (Hojat et al., 2004). However, research has indicated that self-reported empathy scores are a predictor of specialty fit for students (Borges et al., 2009; Hojat et al., 2002b). Higher empathy scores have been correlated with interest in people-focused specialties (i.e., family, general, pediatrics, and psychiatry), whereas lower levels of empathy have been correlated with process' and technology-oriented specialties (i.e., surgery, radiology, and research) (Borges et al., 2009; Hojat, Kowitt, Doria, & Gonnella, 2010; Hojat et al., 2002b).

Hojat, Kowitt, Doria and Gonnella (2010) studied the relationship between career choice and satisfaction. The authors surveyed a national sample of more than 5,000 physicians, investigating whether career choice was a predictor of career satisfaction. The results indicated that career satisfaction was directly associated with specialty. This suggests, when considered with results from previous researchers (Borges et al., 2009; Frankel, 1995; Hojat et al., 2002b), that empathy can be used as a moderating factor

when students choose their specialty, which, in turn, will yield more satisfied physicians later in their careers.

The intrinsic factors that moderate empathy development are often multidimensional and difficult to capture; however, cultural demographic categories make measurement easier (Jolliffe & Farrington, 2004). From a biopsychosocial perspective, it is very difficult to assess the real impact these factors have on human emotion and intention, though gathering data on such factors helps quantify potential themes for analysis (Chiao, 2011).

Of the different demographic categories, gender is the most researched (Hojat, 2007). This is arguably due to the differences between women and men, and it makes for an easy independent variable to examine. Many studies have found that female medical students and female physicians have higher scores on measures of self-reported empathy than male physicians (Bylund & Makoul, 2002; Hogan, 1969; Hojat, 2007; Hojat et al., 2002b; Yudkowsky et al., 2006). Research suggests that these differences are due to different interpersonal styles, which are the result of different social norms and values (Beutel & Marini, 1995).

Bylund and Makoul (2002) qualitatively investigated the abilities of male and female physicians to create and seize empathic opportunities; the authors found that while both genders had similar opportunities, women showed more empathy and patience in their responses. Additional research indicates that women choose people-oriented and person-centered specialties (such as family, pediatrics, general, and psychiatry) as compared to men, who choose technology' and procedure-oriented specialties (such as

radiology and surgery) (Hojat et al., 2002b; Tsimtsiou et al., 2007; Yudkowsky et al., 2006).

Age has received less attention in the research than gender; however, studies on the general population suggest that age and empathy are negatively correlated (Schieman & Gundy, 2000). These findings may be counterintuitive; one may postulate that the older one gets, the more able one may be to appreciate the value of another's experience. However, research on medical students indicates that as students progress through school, their empathy decreases (Pedersen, 2010; Shapiro, 2008; Winseman, Malik, Morison, & Balkoski, 2009). This suggests that older students will have lower self-reported ratings of empathy.

There is little research on race and ethnicity as a moderator of empathy development in physicians and medical students (Cassels, Chan, Chung, & Birch, 2010; Chiao, 2011; Rasoal, Eklund, & Hansen, 2011); however, there is substantial research on the disparity of empathic healthcare delivery to minority patients (Ly & Glied, 2010; Vela, Kim, Tang, & Chin, 2010). General research on empathy and empathic abilities suggests that individuals from minority populations are more empathic than the majority population (Rasoal et al., 2011). Beyer (2000) found that African American college students were twice as accurate in their predictions of affective empathy as majority (i.e., Caucasian) students. Rasoal et al. (2011) found that East Asian students reported more personal distress but less empathic concern than their Western counterparts. Similar results were found by Berg, Majdan, Berg, Veloski, and Hojat (2011), who reported that Asian American medical students have significantly lower empathy ratings on the JSPE-

S than their Caucasian counterparts. The authors suggest that future studies are required in order to gather more data on ethnic differences in empathy ratings.

Chiao (2011) argued that racial and ethnic differences in empathy may be directly related to differences in core neural circuitry, which is vital in top-down and bottom-up cognitive processes and emotional regulation; the culture-gene coevolutionary theory was used as support for this argument. Chiao (2011) suggests that cultural neuroscience research is needed to better determine the effects that race and ethnicity have on empathy development from a biopsychosocial perspective. There was no additional literature regarding other races and ethnicities and empathy ratings in medical school, which suggests a need for future research.

Race and ethnicity can add a sense of belongingness and pride, too, perhaps increasing the awareness of need to connect with others, either based on likeliness or past experiences of discrimination (Beyer, 20), thus becoming a catalyst for compassion. Similarly, religiosity and affiliation with community organizations can provide a similar sense of belonging and help develop the ability to understand others' perspectives and attitudes.

Similar to race and ethnicity, there is little research on religious affiliation and its effects as a moderating factor in empathy development (Curlin, Lantos, Roach, Sellergren, & Chin, 2005), again demonstrating a need for future research. However, in a broad context, religious affiliation can generate a sense of belongingness and appreciation for a group identity. This, in turn, would arguably help lead to greater feelings, concern, and/or compassion for others.

Empathy evolved into a central feature in medicine in 1954, just before Rogers's development of client-centered therapy. This development took the form of patient-centered medicine and was pioneered by Michael Balint, a family physician, who understood the utility of and necessity for empathy in medicine and patient care (Balint, 1976). Balint's work changed the dynamics of the physician-patient relationship by acknowledging the importance of the patients' experiences and feelings. Unfortunately, as research suggests, physicians do not always appreciate or account for this (Dyrbye & Shanafelt, 2011; Halpern, 2007; Pederson, 2008).

In summary, there are various correlates that better define the multidimensionality of empathy in current literature (Hojat, 2007). While the literature regarding the decline of empathy in medical school is burgeoning, there is still limited data on (a) effects of school orientation (i.e., allopathic versus osteopathic), (b) effects of race/ethnicity, (c) effects of religious affiliation, (d) familial influences (i.e., intact nuclear families, children of divorced parents, children of non traditional families), and (e) effects of social media on empathy development in medical students in the digital age (Hojat, 2007; Pederson, 2010). These areas may prove to be significant correlates of empathy and empathy development in medical school.

Patient centered medicine.

Balint (1976) suggests that physicians should approach patients as individuals. This means that not only are the patient's problems or chief complaints addressed, but the individual's unique needs, wants, and/or concerns are also considered. Thus, the physician must set aside personal biases and engage the patient as a whole person, regardless of differences, within the boundaries of his or her professional abilities (Beach,

Saha, & Cooper, 2006). However, research (e.g., Cene et al., 2009) suggests that this does not always occur, and physicians are affected by the ethnic, racial, and socioeconomic status of their patients and thus sometimes unable to provide patient-centered treatment.

Patient-centeredness. One key factor affecting empathy development, empathic physicians, and the physician-patient relationship is whether the medical school curriculum is patient-centered (Haidet et al., 2006). The authors investigated patient-centered characteristics of medical education at nine U.S. allopathic medical schools in response to increasing pressure from medical education organizations to initiate, develop, and advance patient-centered care. Using a cross-sectional Internet-based survey, more than 800 third- and fourth-year allopathic medical students responded to the Communication, Curriculum, and Culture (C³) Instrument (Haidet et al., 2005). The C³ is a valid and reliable 29-item instrument that measures patient-centered medical education. Its three constructs are role modeling, student experience, and patient-centered student support. The authors found significantly different results for each construct, and the results indicated statistically significant differences between each school. This indicates differences in medical curricula across different schools in the United States, implying that emerging physicians are receiving uneven education regarding patient-centeredness and, more importantly, may be lacking the training to develop empathy for the patients (Haidet et al., 2006).

Tsimtsiou et al. (2007) also investigated patient-centeredness from allopathic medical students' perspective. In a longitudinal survey of the same cohort over 2 years, results from 483 questionnaires indicated that students' attitudes were significantly more

doctor-centered (i.e., the doctor's views and concerns are more important than those of the patient) at graduation, as compared to being patient-centered in the first year. The study used the Patient-Practitioner Orientation Scale (PPOS) (Yudkowsky, Yeager, & Putname, 2000), which is an 18-item scale that differentiates between doctor and patient orientation. These authors found that female students were significantly more patient-centered before residency, but their mean scores decreased after residency. Tsimitsiou et al. (2007) concluded by suggesting education reform, with more focus on meaningful communication and developing empathic physicians.

The argument suggested by Tsimitsiou et al. (2007) is echoed and supported by other studies that point directly to a lack and/or depletion of empathy in graduating physicians (Pedersen, 2010; Shapiro, 2008). These findings suggest that more emphasis must be placed on the interpersonal skill sets of medical students, in addition to the more traditional academic focus schools favor. Furthermore, there is a need to examine the orientation of osteopathic schools and compare the results to allopathic ones.

With much research surrounding patient-centered medicine and the orientation of physician, school, and student, it is also important to consider the patient in the process.

Patient perception. Dallo, Borrell, and Williams (2008) investigated patient perceptions of their relationships with their doctors. Using a cross-sectional quantitative telephone survey, the researchers surveyed more than 6,000 respondents (5,156 U.S. born and 1,518 foreign-born) and found two statistically significant factors: the physician not listening and the patient not understanding. Not surprising too, are the negative consequences suffered by patients who feel the physician is not listening or lacks empathy and a genuine concern for his or her well-being.

The need to consider patients' perceptions was also addressed by Norfolk, Birdi, and Walsh (2007), whose aim was to emphasize the role of interpersonal skills, including communication and empathy, within patient-centered medicine. Norfolk, Birdi, and Walsh (2007) argue that a shared understanding of the patient's presenting problem must be achieved in order the most efficacious treatment to be delivered. Together, then, both the patient and physician can work toward mutually set goals and obtain the results they are both seeking, which, not surprisingly, helps to reinforce the physician-patient relationship, as well. Findings from Bylund and Makoul (2002) also provide support for physicians to be patient centered, as they found that empathic communication helps patients connect better with their physicians reduces communication barriers that may otherwise interfere with treatment.

Results from studies (i.e., Dallo, Borrell, & Williams, 2008; Haidet et al., 2006; Norfolk, Birdi, & Walsh, 2007; Tsimtsiou et al., 2007) investigating patient-centeredness efficacy and patients' perceptions suggest that physicians who are able to focus on their patients' needs are more likely to yield better treatment outcomes (e.g., shorter recovery time, less recidivism). However, even if physicians attend to their patients' needs from the outset, patient anxiety and resistance can still interfere (Donnon et al., 2009).

Many patients experience lengthy waiting processes, screening procedures, and paperwork prior to seeing the physician, and once the physician enters the room for a brief time, the patient is eager to share the problem and/or receive results (Donnon et al., 2009). In doing so, patients may feel uncomfortable discussing information they should in fact share. This is often referred to as "white coat hypertension," because nervous individuals who do not normally have hypertension can register abnormally high blood

pressure readings under the stress of visiting a doctor's office (Cene et al., 2009). Not only can this lead to the occasional misdiagnosis, but when patients become so anxious that they are unable to trust or communicate with their doctors, they can leave out important information that would aid in diagnosis and treatment.

Additionally, and central to his argument, according to Rees, patients who have hypertension may feel as if their physician lacks empathy and any genuine ability to connect. Such an unpleasant experience may negatively reinforce the behavior of not going to the physician. This leads to avoidance of proper treatment and reinforces patients' anxiety and depressive episodes. In this way, a patient seeking treatment for physical health symptoms can also encounter mental health issues that actually have the potential to compound his or her physical problems (Rees, 1993), again, providing evidence for why empathy is so important.

In summary, patient-centered medicine is a dynamic yet integral component of efficacious medical treatment, as well as a central component in the physician-patient relationship (Ashton et al., 2003; Healthways, 2004). Unfortunately, however, research findings indicate that medical schools do not provide students patient-centered education and students have significant empathy declines during their education (Chen et al., 2007; Pedersen, 2010). The education that physicians receive in medical school is a key component that shapes their individual approaches to the physician-patient relationship. This directly affects meaningful connections and interactions with future patients and perceptions of their role (Shapiro, 2008). Medical education and the regulatory processes that govern it will be examined in more detail in the next section.

Medical education.

Medical education is a rigorous and lengthy process. Four years in duration in the United States, these studies require dedication, commitment, and aptitude (Bombeke et al., 2011; Hamdy et al., 2006). The American Medical Association (AMA) is the governing body of medical education and policy legislation and sets the profession's guiding principles (Putnam, 2006). It is composed of over 600,000 allopathic medical doctors (MDs) and doctors of osteopathic medicine (DOs); the aim is to advance the science and practice of medicine for the betterment of patients and public health policy overall (American Association of Medical Colleges [AAMC], 2011).

According to Hamdy et al. (2006), during medical training, personal views must be filtered and molded into the regimented, accepted norms that govern the profession. Physicians in training must refine their personal views, values, and beliefs to, at the very least, accept the basic standards of care and ethical practice within the culture of the medical community (Hamdy et al., 2006). This idea is illustrated best through the acculturation model by Knapp and VandeCreek (2006). The authors suggest that individuals adapt to different situations and circumstances through an ongoing process, which continues through their entire life. This idea is dynamic because it implies students and professionals strive throughout their careers to become fully acculturated to medical professional roles.

Osteopathic education. The American Osteopathic Association (AOA) is the governing body for osteopathic medicine and abides by the same guidelines as the allopathic schools (AOA, 2011). The main difference, however, is that osteopathic education emphasizes a holistic approach to patient care that addresses the mind-body-

spirit connection while integrating a focus on the musculoskeletal system through body manipulative adjustment. One of the oldest osteopathic schools in the United States is the Philadelphia College of Osteopathic Medicine (PCOM), which was founded in 1899 (www.pcom.edu).

Osteopathic education includes four key elements that practicing physicians need to follow, all of which recognize the importance and significance of the mind-body connection. These include: (a) the human body is a unit composed of the mind, body, and spirit; (b) bodily functions can be self-regulating and self-healing; (c) the structure and function are reciprocally interdependent; and (d) the musculoskeletal system is a significant body system that requires attention due to its contributing to and maintaining of manifestation and disease (PCOM, 2008). These tenets are the foundation for osteopathic manipulative treatment (OMT), which is an important feature that differentiates osteopathic education practices from allopathic.

Biggs, Bieck, Crosley, and Kozakowski (2012) examined the number of graduates entering family medicine residencies in 2011 to 2012 from allopathic and osteopathic programs. The authors found that osteopathic graduates had significantly higher percentages of students entering family medicine than 22% versus 8%, respectively. The authors noted that this had been a general trend over the past 3 years, with osteopathic residents decreasing approximately 2% year over year. Regardless, osteopathic students have historically chosen family/general practice medicine at higher rates than their allopathic counterparts. This is largely due to the medical training orientation that osteopathic schools endorse, which emphasizes the need for a biopsychosocial approach that utilizes musculoskeletal manipulation and empathy through interpersonal skill-set

development (Kimmelman et al., 2012). As a result, the osteopathic medical education orientation lends itself toward more general practitioner development than allopathic training, which does not incorporate the holistic hands-on approach that osteopathic medicine does.

In the first study to compare osteopathic and allopathic medical student empathy, Kimmelman et al. (2012) found that empathy levels of osteopathic students did not decrease as significantly by year of schooling as did those of their allopathic counterparts. However, the authors found of lower first- and second-year empathy levels than in allopathic students. The authors did not find statistically significant differences in osteopathic students across 4 years with respect to gender, age, ethnicity, or choice of specialty. The authors suggest this may be the result of the aforementioned osteopathic medical school orientation and the emphasis placed on holistic, person-centered, and musculoskeletal manipulation, thus requiring a more direct connection with patients. In a second, and only other osteopathic study, Calabrese et al., (2013) found similar results; however, both studies utilized cross-sectional analysis. Therefore, it could not be determined if the declines found in allopathic longitudinal studies would be obtained in osteopathic students assessed over time. Both authors suggested that future research is needed using osteopathic samples to continue adding to osteopathic empathy levels as well as compare allopathic and osteopathic empathy.

Before students treat real patients, one of the common educational tools is exposing them to simulated clinical encounters with simulated patients (SP). The SP process involves an actor who is debriefed and trained to exhibit particular symptoms of a

disease while the student engages in a role-play scenario, attempting to properly diagnose him or her (Yudkowsky et al., 2006).

Medical schools have different grading systems for their core curricula; however, all students and graduates are compared and assessed using set, standardized measures. At the conclusion of the second academic year, students take either the United States Medical Licensing Examination (USMLE Step 1), for MDs, or the Comprehensive Osteopathic Medical Licensing of the United States (COMPLEX-USA), for DOs (AMA, 2011). Both tests are used to assess scientific knowledge as well as the capacity to use this knowledge in clinical practice. This includes both crystallized and fluid knowledge, but also ethical reasoning and presence or lack of empathy (Putnam, 2006). This is a critical opportunity for the student to display his or her competence with a patient (Yudkowsky et al., 2006). It is also the beginning of the much-emphasized physician-patient relationship as the foundation of patient-centered medicine.

Students achieve success during these encounters from in first two years of academic medical education. Both allopathic and osteopathic schools emphasize SP encounters. In an exploratory study, Yudkowsky et al. (2006) investigated whether prior experience and comfort correlated with patient-centered communication and empathy. Using a sample consisting of internal medicine and family medicine residents, the authors used SPs to assess the residents' patient-centered communication. The participants completed demographic questionnaires prior to the SP evaluation. The results suggested generalizable estimates of communication and interpersonal skill sets; women and residents with previous SP experience received higher scores. Residents with no SP experience were five times more likely to be rejected by patients, as measured by

qualitative responses provided by the SPs. This suggests that SP encounters help develop student empathy and are an efficacious tool in promoting meaningful connections between students and patients.

While research suggests that simulated clinical experience is a viable and useful teaching methodology, one truth still differentiates it from a true clinical experience: evaluation. Hanna and Fins (2006) argue that simulated sessions reverse the power differential inherent to the physician-patient relationship, where the power is inverted and placed on the simulated patient. The authors argue that SP encounters only produce simulated doctors who are unable to genuinely connect with real patients once they begin practicing. Hanna and Fins (2006) suggest that experience with real patients along with an integrated humanistic learning (i.e., literature, art, and the humanities) approach will develop students' interpersonal and professional skill sets.

To elaborate on this point, Clever et al. (2011) randomly assigned first-year medical students to either a control group of SPs or a test group of volunteer outpatients (VOs). Students were assigned to small groups of five students, each having one faculty preceptor, and interviewed one patient for 15 minutes. The interview focused on biopsychosocial intake information; however, VOs used real information and did not work from scripts, as the SPs did. Students and faculty rated the sessions independently. Interpersonal skills were rated by students and faculty. Results indicated that 98% of participants rated VOs' sessions significantly higher than SPs' sessions on every dimension (communication training, comfort, friendliness, rapport building, and amount of learning). This study suggests that VOs sharing their real stories offer a unique

learning opportunity and may provide a more substantial and significant base for genuine empathy growth and development in students.

In summary, Clever et al. (2011) argue that use of SPs promotes and enhances interpersonal skill sets of developing physicians; however, just as important and prevalent are the studies that examine the efficacy of additional training interventions. Below is a review of such methods that focus on research targeting enhancement of the different components of the physician-patient relationship as previously discussed.

Empirical evidence supports the efficacy of communication training and its positive effects on patient care (Clever et al., 2011; Evans et al., 1991). Clever et al. (2011) found that communication training increases patient satisfaction and comfort with provider, while Evans et al. (1991) found communication training improved student diagnostic ability. This has been studied at all levels of medical education (first year through residency); however, emphasis is placed on both second- and third-year education, which represents a significant transition from a didactic system to a clinical in vivo environment.

One of the reasons communication enhancement is so prominent is because it represents one of the key components to the physician-patient relationship. Arguably just as important, if bridging from the communication abilities, are the responsibilities physicians have in terms of making professional decisions that often involve direct and/or life-altering changes for more critically patients (Vela et al., 2010).

Windish et al. (2005) examined the connection between communication ability and clinical reasoning. Using a randomized trial of second-year students, a 6-week intervention course was examined to assess efficacy of small-group exercises, role play,

reflection, and feedback. Results indicated that SPs rated students who enrolled in the communication curriculum more favorably in establishing rapport. Moreover, 95% of students indicated this intervention was beneficial, as well as rating self-reflection and observation as useful learning strategies in their professional future when seeing patients. Nearly 70% of participants rated role play as the most important learning process; this was echoed by facilitators, who suggested that structured breaks in class that allow for discussion help develop a meaningful connection between communication and clinical judgment.

Yedidia et al. (2003) also examined the efficacy of communication training in fostering empathy in students with a random sample of third-year students. The authors evaluated recently implemented curriculum changes in three U.S. medical schools that focused on communication training and performance. Using objective structured clinical examinations (OCSEs), they found that the changes had four similar characteristics. The first emphasized knowledge, skills, and attitudes of being student-centered. The second focused on competencies following a structured format in the medical intake. The third was an integration of clinical material. The fourth related the participation of core faculty to foster student development. Results indicated students exposed to the intervention improved significantly on empathy.

Student attitudes about communication training. Research has investigated student attitudes toward empathic communication training. Using a survey intended to examine relationships and differences between importance, confidence, and knowledge among first- and fourth-year students at a U.S. medical school, Wright et al. (2006) found that only perception of importance strongly correlated with confidence and knowledge (p

= 0.45 and 0.27, respectively). Moreover, results indicated that fourth-year students did not differ from first-year students on attitudes about communication (i.e., students did not change their attitudes regarding communication training through their education). The authors found that positive attitudes toward communication training were significantly correlated with perceived importance, thus suggesting that student attitude, whether favorable or not, is the central question concerning efficacious communication training and not the training itself.

These findings contrasted with those of Bombeke et al. (2011), who examined the efficacy of preclinical communication skills training (CST) and its effect on students' patient-centered attitudes and self-reported empathy ratings. The authors prospectively compared two cohorts before and after residency. Results indicated a significant effect with a decrease in communication for those students who had the CST training compared to those who did not, suggesting that communication training had an iatrogenic effect on patient-centeredness and empathy ratings. Moreover, demographic results indicated that women were more patient-centered at baseline and outcome and also had higher empathy levels than did men (consistent with the previous literature). Bombeke et al. (2011) noted, however, that their study's results may not be generalizable due to the prospective nature of the study design.

Being able to communicate effectively is an essential component of the physician-patient relationship and a skill that can be developed through interpersonal emphasis during medical education. The literature on communication training reveals that women and more experienced students have more developed communication abilities. Regardless, given the importance of interpersonal abilities and the significance of person-

centered medicine, ongoing research on these topics is needed. More important, however, is that the majority of research in the current literature was conducted on allopathic students, thus raising questions of whether similar findings would be present in osteopathic samples.

Literature review summary.

In summary, the literature regarding empathy in the context of health disparities, the physician-patient relationship, medical school, and medical students is vast (Jolliffe & Farrington, 2004). Empathy, or the ability to perceive the needs and concerns of others, is a vital component to not only any relationship (Rogers, 1975), but also of a relationship where there is a need for trust, openness, honesty, and professional service (Balint, 1976).

The research regarding medical student development indicates that empathy declines significantly during school (Tsimtsiou et al., 2007); however, the sample populations consisted of allopathic students, which omits a significant population of osteopathic students (AAMC, 2011). Research has provided evidence that different strategies can be efficacious in increasing empathy in medical students, which include patient-centered education (Haidet et al., 2006), using volunteer patients instead of simulated ones (Hanna & Fins, 2006), and communication training (Clever et al., 2011).

The current literature has yet to address the effects of cultural demographic variables (i.e., race/ethnicity, religious affiliation, and location where born, raised, and educated) on empathy for both osteopathic and allopathic medical students. There is also an ongoing need to study (a) medical school orientation, (b) students' attitudes toward their roles as physicians, (c) medical students' self-reported empathy, and (d) whether

medical students' interpersonal skills develop throughout their education, as perceived by standardized patients (i.e., communication, rapport, empathy).

Questions and Hypotheses

Research question 1. Is there any pattern in osteopathic medical (DO) students' development of empathy during the first to third year of medical school, and does empathy decline during the third year?

Hypothesis 1. Empathy will remain constant from years 1 to 3, and then decline during year 3 among DO students.

Research conducted by Hojat et al. (2002a), which studied allopathic students, found that empathy levels decline significantly in year 3, then remain constant through year 4. These findings were supported by research examining empathy development trends of allopathic students (Chen et al., 2007; Dyrbye & Shanafelt, 2011; Pederson, 2010; Shapiro, 2008).

Research question 2. Do standardized patient (SP) perceptions of DO students' empathy correlate with self-reported empathy during years 1 through 3?

Hypothesis 2. SPs' perception of DO students' empathy will negatively correlate with students' own perception in years 1 and 2, but will positively correlate with students' in year 3.

Patient perceived empathy was found to be a predictor of DO student self-reported empathy. Numerous studies support this claim (Chen et al., 2007; Dyrbye & Shanafelt, 2011; Pederson, 2010; Shapiro, 2008), thus providing the basis for this hypothesis.

Research question 3. Is there a relationship among DO students' self-reported empathy scores and their gender, age, race/ethnicity, and or religion?

Hypothesis 3. Females will obtain higher empathy scores than males.

This hypothesis is based on findings from studies suggesting females have higher levels of empathy (Bylund & Makoul, 2002; Hogan, 1969; Hojat, 2007; Hojat et al., 2002b; Hojat et al., 2010; Wright et al., 2006; Yudkowsky et al., 2006).

Hypothesis 4. Younger students will report higher levels of empathy.

This hypothesis is based on general findings of Schieman and Gundy (2000), who found that younger students reported higher levels of empathy; however, the authors used a general sample not medical students. Samples of medical students have found differing results. Hojat et al. (2002) found that older students reported lower levels of empathy, while Kimmelman et al. (2012) found no statistically significant differences in empathy when comparing any demographic information. It should be noted that samples used by Hojat et al. were of allopathic students, while Kimmelman et al. studied osteopathic students. However, more research has been conducted with allopathic samples. Therefore, the hypothesis is largely based on those findings.

Hypothesis 5. Minority students will report higher levels of empathy.

This hypothesis is based on the limited research on race and ethnicity as a moderator of empathy medical students (Cassels et al., 2010; Chiao, 2011). Research on random samples has suggested that individuals from minority populations are more empathic than the majority population (Rasol, Eklund, & Hansen, 2011; Beyer, 2000). Research suggests this is the result of minority populations understanding what it is like to feel discriminated or unheard.

Religion will be an exploratory variable since no literature exists on the topic (Curlin et al., 2005).

Research question 4. Does DO student self-rated empathy predict choice of specialty?

Hypothesis 6. Students who score higher on empathy would be interested in practicing people-oriented specialties (i.e., family or general medicine, pediatrics, and psychiatry) than students with lower empathy scores, who will wish to practice procedure- and technology-oriented specialties (i.e., surgery and radiology).

Research findings from Hojat et al. (2002b, 2006), Haidet et al. (2006), Mueller et al. (2006), and Tavakol, Dennick, and Tavakol (2007) found evidence that practitioners in people-oriented specialties have higher empathy scores than those in procedure and technology-oriented specialties; however, the samples used in these studies were of allopathic students and physicians. Table 1 indicates the differences in choice of specialty. The only two osteopathic samples (Calabrese et al., 2013; Kimmelman et al., 2012) found no statistically significant differences with empathy and choice of specialty. Therefore, this hypothesis is speculative in nature due to limited research on osteopathic students as a sample population.

Table 1.

Specialty Preferences by People or Technology Orientation

People-Oriented	Technology-Oriented
Dermatology	Anesthesiology
Emergency Medicine	Neurosurgery
Family medicine	Otolaryngology
Internal medicine	Orthopedic surgery
Obstetrics/gynecology	Pathology
Ophthalmology	Plastic Surgery
Pediatrics	Radiology
Physical medicine/rehabilitation	Surgery
Preventative medicine	Urology
Psychiatry	
Public health	

Chapter 3

Method

This study examined de-identified archived data previously obtained from Family Medicine classes. Doctor of osteopathic medicine (DO) students completed surveys in years 1 through 3 of medical school, as did standardized patients (SPs) during the first clinical encounter of each year. The data obtained yielded information on students' self-reported empathy and was used to determine whether empathy developed throughout education and if it declined during the third year or is a predictor of specialty choice. In a second aim of the study, the data from students' simulated clinical encounters was analyzed to assess if SPs' perceptions of students' empathy correlates with students' view of their own empathy. Demographic information (i.e., age, gender, race/ethnicity, and religious affiliation) was used to investigate the differences in and/or relationships with students' self-perceived empathy. As an exploratory query, correlations with students' self-reported empathy and involvement with extracurricular activities were also examined.

Demographic information was obtained through a questionnaire (see Appendix A); self-reported empathy was gathered using the Jefferson Scale of Physician Empathy Student (JSPE-S) version. SPs' perceptions of student empathy were obtained from the Professionalism Assessment Ratings Scale (PARS) and the Jefferson Scale of Perceived Physician Empathy (JSPPPE).

Design.

The study was a mixed-methods cross-sectional quantitative design. Analyses were twofold; first, aggregate analysis was conducted comparing three dependent

variables (i.e., self-reported empathy, patient-perceived empathy, and patient-perceived interpersonal skills) across year 1, year 2, and year 3 of medical school. A separate longitudinal analysis examined self-rated empathy in the beginning of the year and the end of the year for students in year 3 only.

Participants.

The participants in this study were first- through third-year DO students and the SPs whom the students encountered at the Philadelphia College of Osteopathic Medicine (PCOM). The sample size was derived from the DO cohort years 1, 2, and 3. Each class size is approximately 260 students. Students completed the study packet after their first standardized patient encounter of each year. Additionally, each SP the student encountered also completed one packet. Therefore, each student from years 1 through 3 had one survey with the accompanying SP [(3 x 260) + (3 x 260)]. Only students in year 3 completed the JSPE-S twice, once in the beginning of the year and again at the end of the year, to examine whether self-reported empathy changed during year 3.

Statistical analysis.

The project utilized multivariate analysis of variance (MANOVA) followed by univariate analysis of variance (ANOVA) to compare the scores of the three scales by year in medical school, gender, age, and specialty interest. Pearson product-moment correlations were used to examine relationships among variables. *T* tests were used to compare results among demographic variables. The minimum level of significance was set at .05 for all statistical tests. All statistical analyses were conducted using SPSS version 22 for Windows.

The independent variables were the student's year in the program (i.e., 1, 2, or 3), demographic information (i.e., age, gender, race/ethnicity, and religious affiliation), and specialty choice. The dependent variables were empathy ratings, as assessed by the JSPE-S, the PARS, and JSPPPE (self-reported and perceived, respectively). For this study to detect a medium effect size at a power of 80% with an alpha level of 0.05, 156 participants (39 from each cohort) were needed (Kazdin, 1993).

In most study designs, there exists the possibility of data to be lost or missing as a result of participant omission. Participants may have different reasons for omitting responses to particular questions. Whether the answer may be too personal or the question was simply missed, missing data diminish the generalizability of results because representativeness of the sample is reduced (Kazdin, 1993). Different strategies are available to adjust for missing data. Imputation allows for repeated analysis to compensate for lacking data; however, caution is suggested due to the likelihood that the statistical power may be reduced. Data may also be deleted in an effort to allow for analysis of the completed surveys or questionnaires. Interpolation can occur where new data points are constructed to fall within a distinct series of valid responses (Kazdin, 1993). Such conditions took place while coding the JSPE-S, based on coding instructions from Hojat et al. (2002).

Subjects were students in the first through third years of the doctor of osteopathic (DO) medicine program at PCOM. The SPs the students encountered were also subjects.

Students not seeking a DO degree at PCOM and fourth year DO students. The student investigator, with permission from the Dean of the school and the chair of the

department of Family Medicine, obtained the de-identified archived data after approval from the IRB.

Measures.

The JSPE-S (Hojat et al., 2002a) is a 20-item self-report measure, with each answer on a 7-point Likert scale (*1, strongly disagree to 7, strongly agree*, with an estimated administration time of approximately 10 to 15 minutes. The JSPE-S assesses empathy ratings based on three different constructs; perspective taking, compassionate care, and the ability to stand in the patient's shoes (Tavako et al., 2011). There are three versions of the JSPE: physician, medical student, and health graduate student. The medical student version was used in this study. The JSPE-S has been shown to be a valid and reliable measurement of student empathy (Tavakol et al., 2011). The JSPE has been translated into 42 languages and is the most widely used empathy measurement in the context of patient care and medical service (Hojat, 2007).

Hojat et al. (2002a) found that the factor structure of the JSPE is consistent with conceptual and theoretical constructs of the multidimensionality of empathy provided in the current literature (Hojat et al., 2002b). The internal consistency of the JSPE-S was assessed using Cronbach's coefficient alpha. The reliability coefficient was 0.81, indicating that it is internally consistent. The test-retest reliability coefficient was 0.65, thus indicating stable responses over time. The same findings were reported 9 years later (Tavakol et al., 2011). It is important to note, however, that the sample used to norm the data was of allopathic students, not osteopathic students. Thus, results may differ with different samples.

The PARS is a tool that assesses students' relationship qualities and clinical examination competencies (Errichetti, Myers-Hill, & Boulet, 2000). SPs provide responses using a 9-item Likert scale. There are four relationship quality variables: rapport, empathy, confidence, and body language. There are four examination competency variables: clear communication, active listening, timely feedback, and conducting a thorough physical exam. The constructs, per the PARS, are operationalized on the form. A low score is from 1 through 3, mid-score is from 4 through 6, and superior is 7 through 9.

The PARS is intended for academic evaluation use only and is provided to the SPs after the student completes his or her clinical encounter. As such, the tool has received limited research on its validity and reliability; however, Errichetti, Myers-Hill, and Boulet (2000) conducted a reliability and validity assessment of the communication portion of the PARS tool. Using a variance components analysis, the authors found that generalizability of the ratings were moderate ($p^2 = 0.54$), indicating that results may not be applied to larger samples. The authors note that a significant part of the variance was due to the differences in SPs. The authors averaged the overall component ratings to yield a communication score, which they found to be positively correlated with the physical examination ($r = 0.49$) and history taking ($r = 0.36, p < 0.05$). The authors suggest that moderately reproducible communication scores can be gathered from the PARS; however, limitations include SP training and length of assessment time.

The JSPPPE (Kane et al., 2007) is a brief scale that includes five different items that describe and assess physician empathic engagement (Berg et al., 2011). Each of the five items is answered by patients on a 7-point Likert scale (1, *strongly disagree* to 7,

strongly agree) and can be completed within 5 minutes. The reliability coefficient (Cronbach's alpha) for the JSPPPE is 0.58, and though low, it is considered acceptable based on the brevity of the items.

Kane et al. (2007) found significant correlations between the JSPPPE and the American Board of Internal Medicine patient ratings scales and other valid interpersonal appraisals of physicians' performance during treatment. The range was from 0.54 to 0.70, which indicated statistically significant correlations ($p < 0.001$), with a median of 0.678. Criterion-related validity was 0.75 ($p < 0.001$). As a result, the authors concluded that the JSPPPE, though brief, had good psychometric validity and reliability in measuring the perceptions of patients' outcomes. Psychometric evidence exists in support of the JSPPPE, as provided by Glaser et al. (2007) with family medicine residents and by Kane et al. (2007) with internal medicine residents.

Correlations between scores on the JSPPPE and the JSPE self-report measure were found to be 0.48 ($p < 0.05$) by Glaser et al. (2007), though nonsignificant correlations of 0.24 ($p < 0.05$) were found by Kane et al. (2007); however, the sample used was of physicians and patients, not students and SPs. Berg et al. (2011) found correlations between the JSPPPE and JSPE-S to be 0.19 ($p < 0.05$). Kane et al. (2007) concluded that the lack of significant correlations between the JSPPPE and JSPE required further exploration, a point the current study addressed due to the need for greater utilization of assessment of patients' perceptions of their physicians' treatment.

Procedure.

The study assessed four areas: DO student self-reported empathy, as measured by the JSPE-S; perceived empathy ratings from SPs as measured by the PARS and JSPPPE;

DO student self-perceived empathy and correlations with specialty choice; and demographic information obtained by a demographic questionnaire. The data collected was entered into SPSS 22 for statistical analysis.

Each student in cohort years 1 through 3 completed the study materials, consisting of the JSPE-S and demographic questionnaire, at the conclusion of his or her first standardized patient encounter of the year. The Standardized Patient laboratory coordinators distributed study materials to each student after the first clinical encounter. Each cohort had a different color paper to identify the cohort. Students in year 1, or M1, were given blue paper; students in year 2, or M2, were given pink paper; and students in year 3, or M3, were given purple paper. The study materials were the same for each cohort and the SPs were not aware of the student's cohort. In addition to the time students received to complete their encounter paperwork, an additional 10 minutes was provided to allow the students to complete the study materials, which the lab coordinator collected.

Every four weeks, approximately 24 third-year DO students come to the PCOM campus for their radiology rotation, which is at the exact opposite of their SP clinical lab encounter during their year. Only the JSPE-S was distributed to the students. Students completed the survey during their break and passed their completed materials to the end of the aisle, where they were collected and placed into an envelope that was delivered through interoffice mail to the STEPPS office. There was no identifying information on any of the study materials other than the date and the last four digits of each student's Social Security number, which was only used for students in year 3 to compare empathy scores from the beginning and end of the year.

PARS information and JSPPPE responses were obtained after the SP encounters with the students. SPs had an additional 10 minutes to complete their study materials. Lab coordinators collected and put the completed SP materials with the corresponding student materials. All data in the set was coded and then entered into SPSS.

Chapter 5

Results

A total of 717 doctor of osteopathic medicine students, representing 92% of the current student population at PCOM in years 1 through 3, completed the student materials. Of those, 5 students (< 1%) did not complete the JSPE-S, 64 standardized patients (SPs) did not complete the PARS, and 69 SPs did not complete the JSPPPE. The final sample included 269 first year students (35%), 250 second-year students (32%), and 198 third-year students (33%).

Multivariate analysis of variance (MANOVA) results indicated that an overall test of significance (Wilks's lambda and related multivariate *F* ratio) showed all results were significant. Univariate analysis of variance (ANOVA) results indicated significant differences in groups in self-reported empathy (JSPE-S), patient-perceived student empathy (JSPPPE), and patient-perceived student interpersonal skill sets (PARS), indicating significant differences between students.

Comparison by class year.

A MANOVA was conducted using year of program (three levels) as the independent variable, with the dependent variables being self-reported empathy (JSPE-S), patient perception of student empathy (JSPPPE), and patient perceived of student interpersonal skills (PARS). Means and standard deviations and summary results of the MANOVA are reported in Table 2.

Table 2.

Results by Class Year

Year	<i>n</i>	JSPE-S	(<i>SD</i>)	JSPPE	(<i>SD</i>)	PARS	(<i>SD</i>)
1	269	111.3	(9.6)	22.8	(5.4)	48.8	(6.7)
2	250	112.4	(9.7)	25.7	(5.5)	51.2	(6.9)
3	198	108.8	(10.9)	25.4	(4.8)	52.2	(5.5)

Boxes' test of equality of covariance matrices approached significance, but was not significant (Boxes' $M = 20.845$, $F(1.73, 203420.39) = 1.73$), $p = .06$). This indicates that the observed covariance of the dependent variables is equal across groups to the overall multivariate test for the differences among groups and was significant for all multivariate statistical analysis (Wilks's $\lambda = 0.910$, (Multivariate $F(6, 1414) = 11.3$, $p = .00$).

A post hoc Tukey test on self-reported empathy revealed no differences in year 1 and year 2. However, there was a significant difference between both year 1 ($M = 111.3$; $SD = 9.6$) and year 2 ($M = 112.4$; $SD = 112$) when compared with year 3 ($M = 108.8$; $SD = 10.9$), indicating students in year 3 had significantly lower self-rated empathy. This finding confirms hypothesis 1 as a result; results are displayed in Figure 1 as well as the longitudinal analysis in Figure 2.

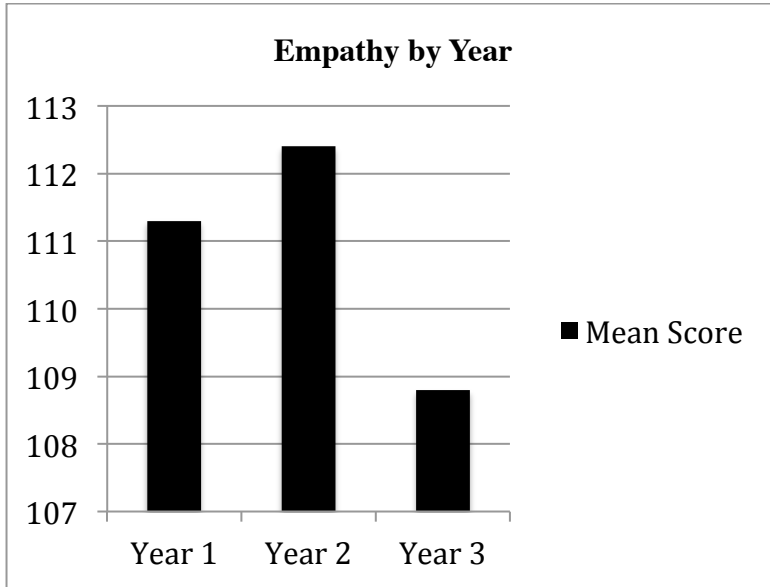


Figure 1. Mean total empathy of students in years 1 to 3.

A longitudinal analysis of students in year 3 using a paired *T* test indicates that empathy ratings declined from the beginning of the year ($M = 111.2; SD = 9.6$) to the end of the year ($M = 108.7; SD = 10.2$). However, only 92 students were represented in this analysis.

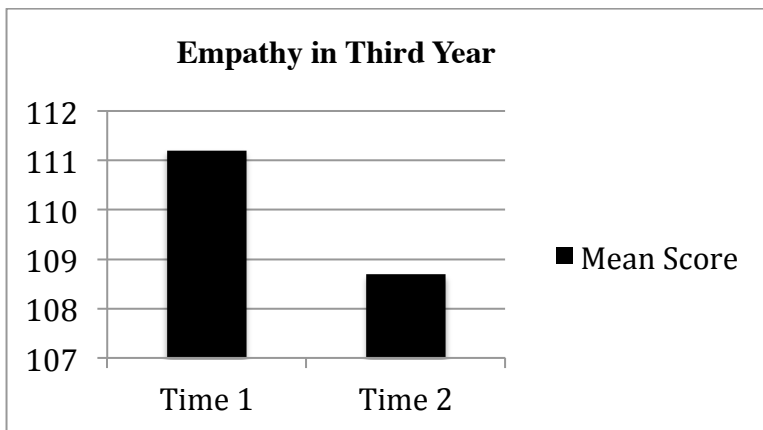


Figure 2. Empathy change among students in Year 3.

These findings provide more evidence for hypothesis 1 and also support findings that empathy declines during the third year of medical school in allopathic students; however, these findings contrast the limited data on osteopathic samples, who did not show a decline during 3 three (Calabrese et al., 2013; Kimmelman et al., 2012).

The Levene's test of equality of error variance revealed a significant difference among the patient perceptions of student empathy ($F(2,709) = 1.84, p = .816$). While the analysis of student self-reported empathy resulted in no significant difference on error variances across groups ($F(2,709) = 1.84$), examination of the patient-perceived interpersonal skill sets of the students revealed significance ($F(2, 709) = 8.42, p = .002$). The Levene's test of equality of error examining the null hypothesis indicates that the error variance is equal across groups. This assumption was violated for the perceived empathy analysis.

Post hoc univariate analysis revealed significant differences among the groups in each of the dependent variables: self-reported empathy ($F(2, 709) = 7.45, p = .001$); patient-perceived empathy ($F_{2,709} = 22.56, p = .000$); and patient perceived interpersonal skills ($F(2, 709) = 16.97, p = .00$). Post hoc analyses were conducted to determine if differences exist on the dependent variable across years. The Grams Howell test revealed a significant difference between year 1 and year 2, as well as with year 1 and year 3 on patient-perceived empathy; more specifically, students in year 1 ($M = 22.82; SD = 5.4$) had significantly lower scores than those in year 2 ($M = 25.7; SD = 5.5$). Similarly, students in year 1 scored significantly lower than students in year 3 ($M = 25.4; SD = 4.8$). This indicates that students in year 1 were perceived to have significantly lower empathy than students in both years 2 and year 3.

In the patient-perceived interpersonal skills of students, significant differences exist between students in year 1 ($M = 48.8$; $SD = 6.7$) and students in year 2 ($M = 51.2$; $SD=7$) as well as year 3 ($M = 52$; $SD = 5.5$). This indicates that first-year students scored lower in terms of their interpersonal skills than students in both years 2 and 3.

Correlations between self-rated empathy and patient-perceived empathy.

Using a Pearson product-moment correlation to examine the linear degree of correlation with the dependent variable between each year showed no significant correlation. However, using a correlation across the groups ($r = 0.66$; $p = 00$) indicated that for the sample ($N = 717$), the higher the interpersonal skills, as measures by the PARS, the higher the patient-perceived empathy, as measured by the JSPPPE. Hypothesis 2 is not supported as a result of the non significant correlations between self-reported empathy and patient-perceived empathy.

Self-rated empathy and demographics.

A t test was conducted comparing the significant differences between men and women on self-reported empathy, as shown in Table 3. The Levene's test for equality of variance results showed significant differences between sexes ($F (2.29), p = .09$). The F test revealed a significant difference between men and women ($F (781) = .4291, p = .000$), indicating that females scored significantly higher than males on self-rated empathy, as displayed in Figure 2. As a result, hypothesis 3 is confirmed and also supportive of findings on both osteopathic and allopathic medical students.

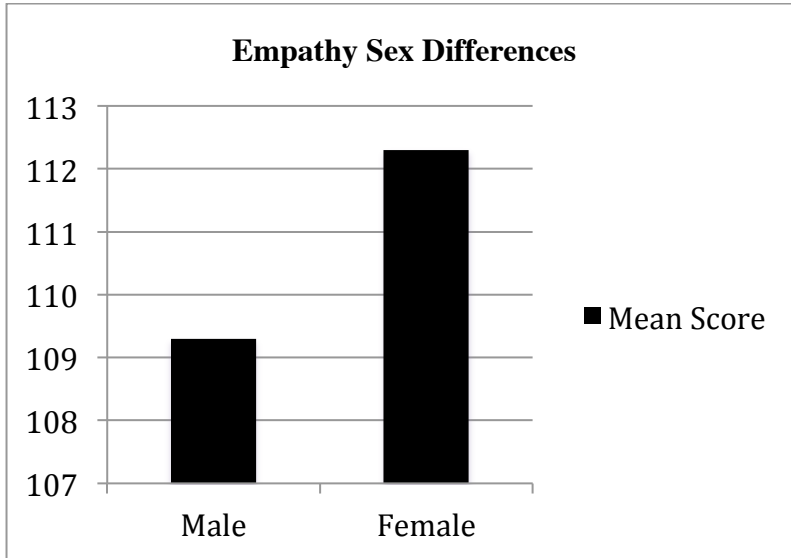


Figure 3. Mean total empathy score of male and female students.

Table 3.

Sex and Career Choices of Osteopathic Medical Students

Sex	<i>n</i>	JSPE-S Score	<u>(SD)</u>
Male	334	109.3	(10.4)
Female	383	112.3	(9.5)
Specialty			
Orientation			
People	397	110.9	(10.1)
Technology	80	109.5	(10.6)

A univariate analysis on age was conducted to determine if the age of students had an impact on self-perceived empathy. The F test was not significant ($F(2, 80.02), p = .98$). Hypothesis 4 was not supported as a result. An ANOVA was conducted to examine differences between self-reported empathy and race/ethnicity. No differences were observed ($F(2, 716) = .45, p = .64$). Hypothesis 5 is not supported as a result.

Comparisons by specialty interest.

An ANOVA was conducted to compare students who reported interest in either people-oriented or technology-oriented specialties. Comparisons of these groups on the JSPE-S and summary results of statistical analyses are reported in Table 3. No significant differences were observed ($F(1, 475) = 1.13, p = .29$) indicating hypothesis 6 is not supported.

Extracurricular analysis.

Table 4 presents results of an ANOVA for extracurricular activities. Activities types included: academic clubs, volunteer/community clubs and organizations, and sport-related activities. Results indicated that students in year 1 had statistically significant different empathy scores when not involved in an activity ($M = 113.5; SD = 9.9$) from students involved in an activity ($M = 110.5; SD = 8.4$). However, results were reversed in year 2, as evidenced by higher empathy scores among students involved in an activity ($M = 113; SD = 8.9$) than in students not involved ($M = 107.9; SD = 14.3$). No differences were found among students in year 3.

Table 4.

Student Extracurricular Activities Involvement by Class Year

		<i>n</i>	JSPE-S	(SD)
1	Involved	194	110.5	(9.9)
	Not Involved	77	113.3	(8.3)
2	Involved	228	113.0	(8.9)
	Not Involved	27	107.9	(14.3)
3	Involved	114	109.3	(10.1)
	Not Involved	142	108.2	(11.1)

Chapter 6

Discussion

The present study examined self-reported and stimulated-patient-perceived empathic attitudes and abilities of osteopathic medical students. Results suggest that osteopathic medical students' empathy scores were reflective of the third-year decrease that has been found in allopathic medical students' in both cross-sectional and longitudinal analyses. However, no direct comparisons were made from the findings of this study to allopathic research, so the following interpretation, though based on current research, is speculative. The decline in empathic attitude found in this study is similar to results obtained by Hojat et al. (2002a,b) and Chen et al. (2007), but contrasts with findings by both Kimmelman et al. (2012) and Calabrese et al. (2013) in osteopathic samples (see Figure 4 for osteopathic comparisons and Figure 5 for allopathic comparisons). However, Ellen (2011) had results similar to the current findings, though the sample was of DO students in Britain. As a result of the inconsistencies in osteopathic samples as well as comparisons between osteopathic and allopathic medical students, more research is required to further explore this topic.

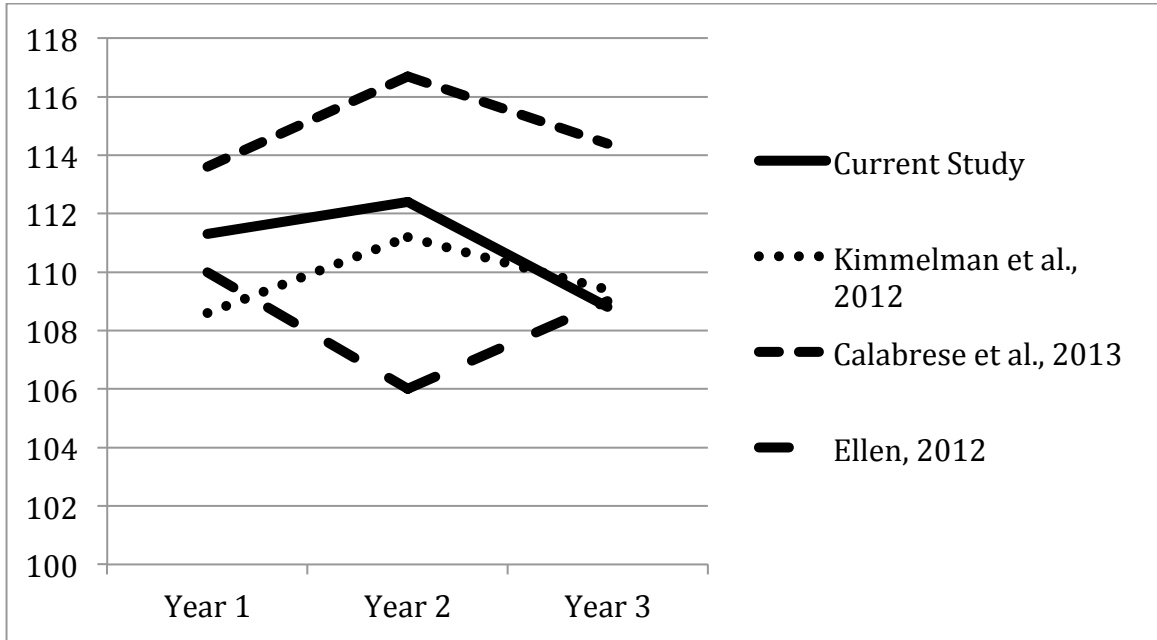


Figure 4. Osteopathic empathy scores comparisons.

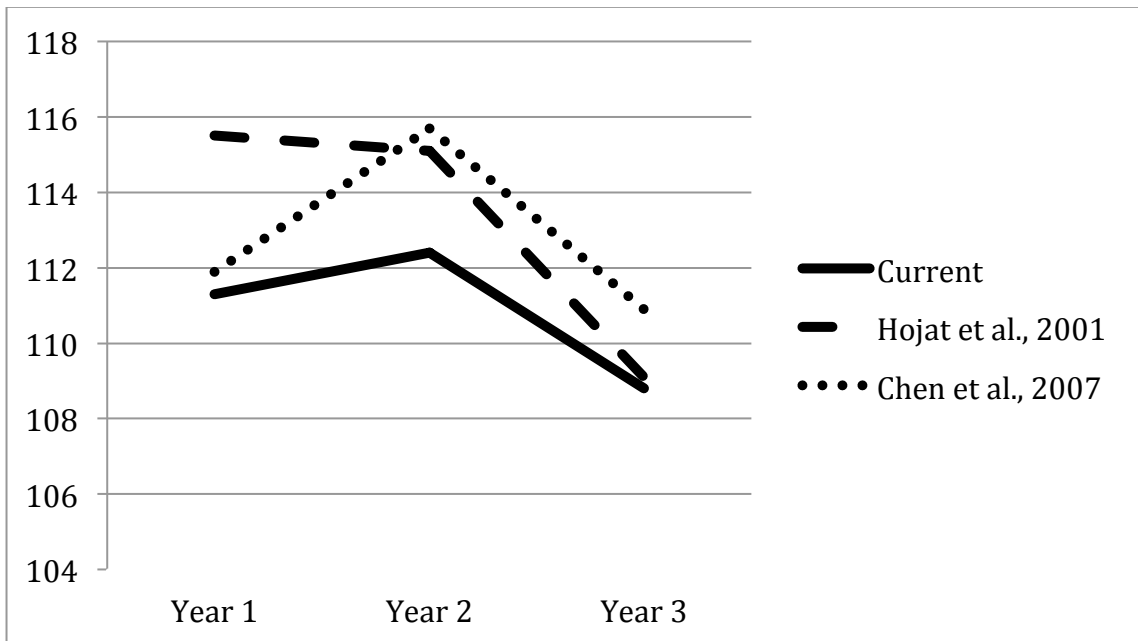


Figure 5. Current findings compared to allopathic samples.

Although the overall medical curricula are similar, and both osteopathic and allopathic medical students undergo rigorous training, osteopathic students also partake in a holistic hands-on approach, suggesting their training is more person-centered. This is the emphasis of DO training and practices that involve osteopathic manipulative treatment (OMT). As a result, the findings from this study may be counterintuitive, thus providing a further rationale for more research in this area.

Results from the correlational analysis from self-reported empathy with perceived empathy did not yield significant results. However, when considering that patient-perceived empathy (JSPPPE) and self-reported empathy (JSPE-S) are both validated measures, and the results of this study did not identify correlations as expected. Students may view themselves as being more empathic in the beginning of medical education, but then become more self-critical or detached as they progress through school. As a result, their empathic attitude may decline, despite the requirements for simulated encounters emphasizing an outwardly empathic engagement to SPs during the brief scheduled clinical encounters. Results may validate that students' core competencies increase as they progress through education; however, an alternative interpretation may suggest students may "learn to play the game," as suggested by Hojat et al. (2007).

Such an argument is supported by the current findings that students in year 1 were perceived to have lower empathy and interpersonal skill sets when compared to students in both years 2 and 3 despite higher self-reported empathic attitudes in year 1. Provided both the student and SP are aware of the expectations of the simulated encounter (i.e., it is not a real patient, grading is involved, it is short-term), it would stand to reason that students become increasingly better at the role plays as they progress through school.

Empathic engagement realized through a developed physician-patient relationship may require more time than is available during a simulated encounter. Both the student and SP are aware of nature of the encounter, thus creating a false sense of rapport. This may provide a confirmation bias, whereby positive affirming behavior of both the student and SP are influenced during the assessment.

Demographic analyses indicated female student empathy levels comparable to previous research on both allopathic and osteopathic students; however, male osteopathic students reported higher levels of empathy than in previous studies. No statistically significant differences were found with regard to race and ethnicity, which is a contrast from the few studies that found Asian American students to be less empathic than African American or Caucasian students. Future studies could examine cross-cultural aspects of SP encounters and whether student and SP race and/or ethnicity are a factor in developing empathic engagement.

Career choice had no bearing on empathy levels, indicating students from this study did not endorse different empathic attitudes depending on interest in practice people-oriented or technology-oriented specialties, as previous studies have found. This finding is similar to the limited osteopathic student samples studied by Kimmelman et al. (2012) and Calabrese et al. (2013); however, it contrasts with results that have found allopathic students choosing people-oriented specialties tend to have higher empathy ratings than those choosing technology-oriented specialties.

Despite the results indicating statistically non significant differences between people-oriented specialties and technology-oriented, further analysis indicates that students in years 1 and 2 who intend to practice family medicine and pediatrics had

statistically significantly higher empathy scores than their respective year mean. This is evidenced in year 1 among those interested in Pediatric ($M = 115.2$) and year 2 family medicine and pediatrics ($M = 116.4$ and 116.2 , respectively) as compared to the aggregate empathy scores per year ($M = 111.2$ and 112.4 , respectively). Of the year 3 specialties, only those interested in obstetrics and gynecology demonstrated a significantly higher empathy rating than their cohort ($M = 114.4$ versus 108.8 , respectively). However, this represented only 6% of the cohort and therefore did provide significant weight to the cohort mean.

As an exploratory analysis, extracurricular activities provided interesting results. As shown in Table 4, students in year 1 who were not involved in any extracurricular activities reported statistically significant higher levels of empathy than those who were not involved in such activities. In contrast, students in year 2 who were not involved in activities ($n = 27$), reported the lowest levels of empathy of any subgroup in this analysis, while those in year 2 engaged in extracurricular activities ($n = 228$) demonstrated the highest empathic attitude in this study ($M = 113.2$; $SD = 8.9$). This may provide support for the need for students in year 2 to take part in extracurricular activities. Results indicated significantly more positive empathic attitudes than students in different program years, regardless of extracurricular activity involvement. Students in year 3 had no differences perhaps as a result of the differences inherent between years 2 and 3 (i.e., the transition into rotations and out of didactic learning environments) and arguably less free time.

Limitations of the current study

The design and procedure of this investigation had limitations that may have lessened the validity and reliability of the anticipated results. The study had both external and internal threats to validity that could not be otherwise controlled for.

External threats.

A major limitation of the study design is that the researcher had no control over the SPs during the clinical encounters, thus suggesting a potential for high variability in each session. Examples include: time constraints, the SP's experience, and the student's experience. Another weakness is using nonexperimental data, thus, no manipulation took place (Kazdin, 2003). This indicates that cause-and-effect inferences cannot be made. These limitations directly impact the external validity. Additionally, the sample in the study consisted of only DO students from one private medical school, which indicates that the results may lack generalizability to other osteopathic students in the United States as well as to allopathic students. Another issue is the use of self-report measures and the possibility of them being influenced by a number of different factors. Responders may not truly identify how they feel regarding a particular question and/or may supply an answer that may be in line with what they would expect to be correct (Kazdin, 2003).

Internal threats.

There are threats to the internal validity of this investigation, as well. The first is a lack of research supporting the validity and reliability of the PARS. However, limited research does exist on the reliability and validity of the communication subscale. Therefore, conducting an exploratory correlation analysis on the communication and empathy scales may provide some information on the validity of the PARS. Another

threat to internal validity is that the PARS tool is used as a repeated measure and is subject to maturity and history threats (Kazdin, 2003). A maturity threat may occur due to students being exposed to more and more medical experiences (both academic and in vivo) through their education, as well as being able to better identify the scoring rubric based on previous SP experiences. However, given the research that suggests empathy declines through medical school (Pederson, 2010), this may not occur. Lastly, the cross-sectional design is not as strong in detecting changes over periods of time, as compared to longitudinal analyses, and therefore is a limitation of this study.

Implications.

The data from this study provides evidence that interpersonal skills training may be required to compensate for empathy deficits within the sample. This is based on the findings that empathy ratings decline during medical education (and were low in years 1 and 2 compared to allopathic student research), consistent with the findings from Kimmelman et al. (2012). This study is the first to utilize a longitudinal investigation of osteopathic medical students' change in empathy in the third year, a unique feature not found in either Kimmelman et al. (2012) or Calabrese et al. (2013), whose designs only included cross-sectional analyses.

Additionally, this study may provide support for recording SP and student demographics so that future studies can investigate cross-cultural aspects of the physician-patient relationship introduced in medical training, to determine whether more culturally diverse SPs should be incorporated into the simulated encounters.

Relevance of the study to the theory and practice of psychology.

This investigation helps to provide evidence for behavioral health and support the integration of psychology and psychologists in the field of medicine, as a result of the limited time physicians have with patients. Research suggests empathy declines during the third year of medical school. The integrated behavioral health model will allow psychologists the opportunity to consult and clarify any concerns patients may have, as well as to provide efficacious interventions to reinforce physician orders and increase treatment compliance. Moreover, this will provide support for the need for psychology students to collaborate with medical students to consult and conceptualize treatment in a person-centered orientation. Graduate school provides a safe and effective learning environment that will help prepare both groups of developing professionals to effectively interface with one another and provide empathic care. Such outcomes could yield meaningful and lasting treatment compliance and illness improvement.

Future research.

The findings from this investigation provide data on empathic attitudes of osteopathic medical students. The data provide much-needed support on a limited osteopathic student sample, as compared to the larger allopathic student samples found in previous research. The data may add evidence for differences or similarities between empathy scores of medical students in allopathic and osteopathic schools. Future research may also provide evidence of empathy disparities among different student demographics. Additionally, if significant empathy declines continue to be found, future research may investigate empathy trainings for osteopathic and/or allopathic students.

Programs to enhance empathy would provide a useful strategy to promote and enhance medical students' abilities to provide a more patient-centered approach, such as caring and compassionate medical treatment, to their patients, which may also allow them some of the advantages that empathy has been shown to provide from the literature (i.e., less stress, lower burnout, higher career satisfaction, more compliant patients, less malpractice suits) (Hojat, 2007). Future studies could evaluate the efficacy of small-group processes in developing empathic communication among students.

Future studies may also want to consider analysis of the reliability and validity of the PARS tool. This would provide needed evidence supporting the measure as an efficacious tool in measuring osteopathic student interpersonal skill sets. Lastly, given the advancing technology in healthcare and the demands for fast paced patient encounters, a future study may examine students who use handheld devices as compared to those who do not during SP encounters. This type of SP interface may expose students to the realities of current healthcare and show that the need for immediate computer entry during patient encounters and may lead to less interaction time with their patients (Hojat, 2007).

A more tangible application may include the following: Provided the current findings that students choosing family medicine or pediatrics and those involved in extra curricular activities have significantly higher levels of empathy, a class project could involve a community volunteer project (for credit of some sort). Time permitting (and barring any similar course concept or content), students could divide into smaller groups and either choose or be assigned to community-oriented projects. Smaller groups will foster a more personal environment capable of revealing and challenging personal

judgments of students; however, group processing activities (e.g., brief discussion focused on a few relevant issues) and/or journaling could reveal any issues and therapeutically work through them. Moreover, and assuming ease and practicality of coordination between programs and students a smaller subset of psychology students could join each medical rotation group. This would accomplish two aims: engage the entire cohort of medical students in activities shown to have higher empathic attitude orientation and develop an academic model that fuses medicine and psychology, thus remaining current with the already evolving healthcare industry.

Summary.

Empathy and the ability to be empathic within the physician-patient relationship is an integral component of efficacious healthcare delivery. Empathic awareness is an ability to effectively utilize cognitive and emotional skill sets, both inherent as well as capable of development. There exists burgeoning research on empathy in different health and medical contexts as a result of wide use and adaptation of the Jefferson Scale of Physician Empathy (JSPE). The JSPE has allowed researchers to examine what had previously been comprised of difficult constructs to capture within the physician-patient relationship and the healthcare domain at large. Research has shown broad and meaningful advantages of empathic ability, not only in physicians but other healthcare providers as well (i.e., psychologists, nurses, social workers). However, within the domain comprised of physicians and medical students, research had predominantly focused on the allopathic orientation, and little research exists on osteopathic physicians and medical students. Nonetheless, concern has arisen due to findings that medical students' empathic attitudes decline significantly during year 3 of school. This is cause

for concern, due to the transition from didactic learning environments to beginning their rotations with patients.

The current findings suggest that osteopathic medical students have lower self-rated levels of empathy in years 1 and 2 than allopathic students; however, the findings were similar to what little research exists currently with osteopathic samples in those years of education. The current study also found that empathic attitudes decline significantly during the third year of medical education, which is congruent with research on allopathic samples but differs from previous studies in osteopathic medical students. More research is needed to not only build the data on osteopathic student samples, but to also achieve a better understanding of why differences exist between osteopathic and allopathic samples, and, perhaps more importantly, what can be done to maintain empathic attitudes during the critical transition from the classroom to the exam room.

References

- American Association of Medical Colleges (2011). State physician workforce data book.
Retrieved from www.aaamc.org/workforce
- American Osteopathic Association. Core competency compliance program; Guidelines of seven core competencies in osteopathic philosophies. Retrieved from www.osteopathic.org/pdf/acc_cccpart3.pdf.
- Anolli, L. L., Vescovo, A. A., Agliati, A. A., Mantovani, F. F., & Zurloni, V. V. (2006). Simulation-based training of communication and emotional competence for the improvement of physician-patient relationship. San Diego, CA: Interactive Media Institute (IMI).
- Ashton, C. M., Haidet, P., Paterniti, D. A., Collins, T. C., Gordon, H. S., O'Malley, K. ... Street, R. R. (2003). Racial and ethnic disparities in the use of health services: Bias, preferences, or poor communication?. *Journal of General Internal Medicine, 18*(2), 146-152.
- Balint, M. (1976). *The doctor, his patient and the illness* (3rded). New York, NY: International Universities Press, Inc.
- Beach, M. C., Saha, S., & Cooper, L. A. (2006). The role and relationship of cultural competence and patient-centeredness in health care quality. *Commonwealth Fund; October Pamphlet*.1-22.
- Beutel, A. Marini, A. (1995). Gender and values. *American Sociological Review, 60*(3), 436-448.
- Berg, K., Majdan, J. F., Berg, D., Veloski, J., & Hojat, M. (2011). A comparison of medical students' self-reported empathy with simulated patients' assessments of

the students' empathy. *Medical Teacher*, 33(5), 388-391.

doi:10.3109/0142159X.2010.530319

Bombeke, K., Roosbroeck, S. F., De Winter, B., Debaene, L., Schol, S., Hal, G. V., & Royen, P. V. (2011). Medical students trained in communication skills show a decline in patient-centered attitudes: An observational study comparing two cohorts during clinical clerkships. *Patient Education and Counseling*,

doi:10.1016/j.pec.2011.03.007

Borges, N. J., Stratton, T. D., Wagner, P. J., & Elam, C. L. (2009). Emotional intelligence and medical specialty choice: Findings from three empirical studies. *Medical Education*, 43(6), 565-572. doi:10.1111/j.1365-2923.2009.03371.x

Buckman, R., Tulskey, J. A., & Rodin, G. (2011). Empathic responses in clinical practice: Intuition or tuition? *Canadian Medical Association Journal*, 183(5), 569-571.

Bylund, C. L., & Makoul, G. (2002). Empathic communication and gender in the physician-patient encounter. *Patient Education and Counseling*, 48(3), 207-216.

Calabrese, C. H., Bianco, J. A., Mann, D., Massello, D., & Hojat, M. (2013). Correlates of change in empathy and attitudes toward interprofessional collaboration in osteopathic medical students. *Journal of the American Osteopathic Association*, 113, 898-907.

Cassels, T. G., Chan, S., Chung, W., & Birch, S. J. (2010). The role of culture in affective empathy: Cultural and bicultural differences. *Journal of Cognition and Culture*, 10(3-4), 309-326.

Carter-Pokras, O., & Baquet, C. (2002). What is "health disparity"? *Public Health Reports*, September-October (117), 426-433.

Cedfeldt, A., Bower, E., English, C., Grady-Weliky, T., Girard, D., & Choi, D. (2010).

Personal time off and residents' career satisfaction, attitudes and emotions.

Medical Education, 44(10), 977-984. doi:10.1111/j.1365-2923.2010.03773.x

Cene, C. W., Roter, D., Carson, K. A., Miller, E., & Cooper, L. A. (2009). The effect of patient race and blood pressure control on patient-physician communication.

Journal of General Internal Medicine, 24(9), 1057-1064. doi:10.1007/s11606-009-1051-4.

Centers for Disease Control and Prevention (2011). *MMWR*, January, 60(Suppl), 1-116.

Chen, D., Lew, R., Hershman, W., & Orlander, J. (2007). A cross-sectional measurement of medical student empathy. *Journal of General Internal Medicine*, 22 (10), 1434-1438.

Chiao, J. Y. (2011). Towards a cultural neuroscience of empathy and prosociality.

Emotion Review, 3(1), 111-112. doi:10.1177/1754073910384159

Clever, S., Dudas, R., Solomon, B., Yeh, H., Levine, D., Bertram, A., & . . . Cofrancesco, J. (2011). Medical student and faculty perceptions of volunteer outpatients versus simulated patients in communication skills training. *Academic Medicine*, 86(11), 1437-1442.

Clever, S. L., Ford, D. E., Rubenstein, L. V., Rost, K. M., Meredith, L. S., Sherbourne, C. D., . . . Cooper, L. A. (2006). Primary care patients' involvement in decision-making is associated with improvement in depression. *Medical Care*, 44(5), 398-405. doi:10.1097/01.mlr.0000208117.15531.da

- Clever, S., & Tulskey, J. (2002). Dreaded conversations: Moving beyond discomfort in patient-physician communication. *Journal of General Internal Medicine, 17*(11), 884-885.
- Curlin, F. A., Lantos, J. D., Roach, C. J., Sellergren, S. A., & Chin, M. H. (2005). Religious characteristics of U.S. physicians. *Journal of General Internal Medicine, 20*(7), 629-634. doi:10.1111/j.1525-1497.2005.0119.x
- Dallo, F. J., Borrell, L. N., & Williams, S. L. (2008). Nativity status and patient perceptions of the patient-physician encounter: Results from the Commonwealth Fund 2001 Survey on Disparities in Quality of Health Care. *Medical Care, 46*(2), 185-191. doi:10.1097/MLR.0b013e318158af29
- DiTomasso, R., & Willard, M. (1991). The development of a patient satisfaction questionnaire in the ambulatory setting. *Family Medicine, 23*(2), 127-131.
- Donnon, T., Oddone-Paolucci, E., & Violato, C. (2009). A predictive validity study of medical judgment vignettes to assess students' noncognitive attributes: A 3-year prospective longitudinal study. *Medical Teacher, 31*(4), 148-155.
- Dyrbye, L., & Shanafelt, T. (2011). Physician burnout: A potential threat to successful health care reform. *Journal of The American Medical Association, 305*(19), 2009-2010.
- Evans, B., Stanley, R. O., Mestrovic, R., & Rose, L. (1991). Effects of communication skills training on students' diagnostic efficiency. *Medical Education, 25*, 517-526. doi: 10.1111/j.1365-2923.1991.tb00105.x
- Fredericks, M., Odiet, J. A., Miller, S. I., & Fredericks, J. (2006). Toward a conceptual reexamination of the patient-physician relationship in the healthcare institution for

the new millennium. *Journal of the National Medical Association*, 98(3), 378-385.

Gallese, V. (2003). The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, 36(4), 171-180.

doi:10.1159/000072786

Haidet P., Kelly P. A. Chou C., et al. (2005). Characterizing the patient-centeredness of hidden curricula in medical schools: development and validation of a new measure. *Academic Medicine*, 80, 44-50.

Haidet, P., Kelly, P., Bentley, S., Blatt, B., Chou, C. L., Fortin VI, A. H., . . . Inui, T. S. (2006). patient-centered learning environments at nine medical schools. *Journal Of General Internal Medicine*, 21(5), 405-409.

Hall, J. A., Roter, D. L., Blanch, D. C., & Frankel, R. M. (2009). Nonverbal sensitivity in medical students: Implications for clinical interactions. *Journal of General Internal Medicine*, 24(11), 1217-1222.

Halpern, J. (2007). Empathy and patient–physician conflicts. *Journal of General Internal Medicine*, 22(5), 696-700.

Hamdy, H., Prasad, K., Anderson, M., Scherpbier, A., Williams, R., Zwierstra, R., & Cuddihy, H. (2006). BEME systematic review: Predictive values of measurements obtained in medical schools and future performance in medical practice. *Medical Teacher*, 28(2), 103-116. doi:10.1080/01421590600622723

Hanna, M., & Fins, J. J. (2006). Viewpoint: Power and communication: Why simulation training ought to be complemented by experiential and humanist Learning. *Academic Medicine*, 81(3), 265-270.

Healthways, Inc. (2004). Defining the patient-physician relationship for the 21st century.

Third Annual Disease Management Outcomes Summit October 30- November 2

2003; Pamphlet; 1-31.

Hojat, M. (2007). *Empathy in patient care: Antecedents, development, measurement, and outcomes*. New York, NY: Springer Science + Business Media.

Hojat, M., Gonnella, J. S., Nasca, T. J., Mangione, S., Veloksi, J., & Magee, M. (2002a).

The jefferson scale of physician empathy: Further psychometric data and differences by gender and specialty at item Level. *Academic Medicine*, 77(10), S58-S60.

Hojat, M., Gonnella, J. S., Nasca, T. J., Mangione, S., Vergare, M., & Magee, M.

(2002b). Physician empathy: Definition, components, measurement, and relationship to gender and specialty. *American Journal of Psychiatry*, 159(9), 1563-1569.

Hojat, M., Kowitt, B., Doria, C., & Gonnella, J. (2010). Career satisfaction and professional accomplishments. *Medical Education*, 44(10), 969-976.

Hojat, M., Mangione, S., Nasca, T. J., Rattner, S., Erdmann, J. B., Gonnella, J. S., & Magee, M. (2004). An empirical study of decline in empathy in medical school.

Medical Education, 38(9), 934-941. doi:10.1111/j.1365-2929.2004.01911.x

Hojat, M., Veloski, J., Nasca, T. J., Erdmann, J. B., & Gonnella, J. S. (2006). Assessing

physicians' orientation toward lifelong learning. *Journal Of General Internal Medicine*, 21(9), 931-936. doi:10.1007/BF02743140

Hojat, M., Vergare, M. J., Maxwell, K., Brainard, G., Herrine, S. K., Isenberg, G. A., . . .

Gonnella, J. S. (2009). The devil is in the third year: A longitudinal study of

- erosion of empathy in medical school. *Academic Medicine*, 84(9), 1182-1191.
doi:10.1097/ACM.0b013e3181b17e55
- Hogan, R. (1969). Development of an empathy scale. *Journal of Consulting and Clinical Psychology*, 33(3), 307-316. doi:10.1037/h0027580
- Hollingsworth, J. M., Saint, S., Sakshaug, J. W., Hayward, R. A., Zhang, L., & Miller, D. C. (2012). Physician practices and readiness for medical home reforms: Policy, pitfalls, and possibilities. *Health Services Research*, 47(1pt2), n/a.
doi:10.1111/j.1475-6773.2011.01332.x
- Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior*, 9, 441-476.
- Kassebaum, D. G., & Szenas, P. L. (1994). Factors influencing the specialty choices of 1993 medical school graduates. *Academic Medicine*, 69(2), 164-170.
- Kaufmann, E., & Haklai, O. (2008). Dominant ethnicity: From minority to majority. *Nations and Nationalism*, 14(4), 743-767. doi:10.1111/j.1469-8129.2008.00362.x
- Kazdin, A. E. (2003). *Methodological issues and strategies in clinical research* (3rd ed.). Washington, DC: American Psychological Association.
- Kim, G., Worley, C. B., Allen, R. S., Vinson, L., Crowther, M. R., Parmelee, P., & Chiriboga, D. A. (2011). Vulnerability of older Latino and Asian immigrants with limited english proficiency. *Journal of the American Geriatrics Society*, 59(7), 1246-1252. doi:10.1111/j.1532-5415.2011.03483.x
- Kimmelman, M., Giacobbe, J., Faden, J., Kumar, G., Pinckney, C., & Steer, R.. (2012). Empathy in osteopathic medical students: A cross-sectional analysis. *Journal of American Osteopathic Association*, 112(6), 347-355.

- Knapp, S., & VandeCreek, L. (2006). *Practical ethics for psychologists: a positive approach*. Washington, DC: American Psychological Association.
- Krupat, E, Yeager, C. M., & Putnam S. (2009). Patient role orientations, doctor-patient fit, and visit satisfaction. *Psychology Health, 15*, 707-19.
- Mueller, P. S., Segovis, C. M., Litin, S. C., Habermann, T. M., & Thomas A. P. (2006). Current status of medical grand rounds in departments of medicine at U.S, medical schools. *Mayo Clinic Proceedings, 81*(3), 313-321.
- Norfolk, T., Birdi, K., & Walsh, D. (2007). The role of empathy in establishing rapport in the consultation: A new model. *Medical Education, 41*(7), 690-697.
- Orlander, J. D., Fincke, B., Hermanns, D., & Johnson, G. A. (2002). Medical residents' first clearly remembered experiences of giving bad news. *Journal of General Internal Medicine, 17*(11), 825-840. doi:10.1046/j.1525-1497.2002.10915.x
- Pedersen, R. (2010). Empathy development in medical education: A critical review. *Medical Teacher, 32*(7), 593-600.
- Philadelphia College of Osteopathic Medicine. (2008). 2008-2009 catalogue. Retrieved from www.pcom.edu
- Pigman, G. W. (1995). Freud and the history of empathy. *International Journal of Psychoanalysis, 76*(2), 237-256.
- Putnam, C. E. (2006). Reform and innovation: A repeating pattern during a half century of medical education in the USA. *Medical Education, 40*(3), 227-234. doi:10.1111/j.1365-2929.2006.02402.x
- Rogers, C. R. (1975). Empathic: An unappreciated way of being. *Counseling Psychologist, 5*(2), 2-10. doi:10.1177/001100007500500202

- Rasoal, C., Jungert, T., Hau, S., Stiwne, E., & Andersson, G. (2009). Ethnocultural empathy among students in health care education. *Evaluation and the Health Professions, 32*(3), 300-313.
- Rees, A. (1993). Communication in the physician-patient relationship. *Bulletin Medical Library Association, 81*(1).1-10.
- Schieman, S., & Van Gundy, K. (2000). The personal and social links between age and self-reported empathy. *Social Psychology Quarterly, 63*(2), 152-174.
doi:10.2307/2695889
- Shapiro, J. (2008). Walking a mile in their patients' shoes: Empathy and othering in medical students' education. *Philosophy, Ethics, and Humanities in Medicine, 3*.
- Stepanikova, I., & Cook, K. S. (2008). Effects of poverty and lack of insurance on perceptions of racial and ethnic bias in health care. *Health Services Research, 43*(3), 915-930. doi:10.1111/j.1475-6773.2007.00816.x
- Tavakol, S., Dennick, R., & Tavakol, M. (2011). Psychometric properties and confirmatory factor analysis of the Jefferson Scale of Physician Empathy. *BMC Medical Education, 21*(2), 1154.
- Tsimtsiou, Z., Kerasidou, O., Efstathiou, N., Papaharitou, S., Hatzimouratidis, K., & Hatzichristou, D. (2007). Medical students' attitudes toward patient-centered care: A longitudinal survey. *Medical Education, 41*(2), 146-153. doi:10.1111/j.1365-2929.2006.02668.x
- Vaughn, L., Jacquez, F., Zhao, J., & Lang, M. (2011). Partnering with students to explore the health needs of an ethnically diverse, low-resource school: An innovative large group assessment approach. *Family and Community Health, 34*(1), 72-84.

- Vela, M. B., Kim, K. E., Tang, H., & Chin, M. H. (2010). Improving underrepresented minority medical student recruitment with health disparities curriculum. *Journal of General Internal Medicine*, *25*(Suppl 2), S82-S85.
- Wilkes, M., Milgrom, E., & Hoffman, J. (2002). Towards more empathic medical students: A medical student hospitalization n experience. *Medical Education*, *36*(6), 528-533.
- Windish, D. M., Price, E. G., Clever, S. L., Magaziner, J. L., & Thomas, P. A. (2005). Teaching medical students the important connection between communication and clinical Reasoning. *Journal Of General Internal Medicine*, *20*(12), 1108-1113. doi:10.1111/j.1525-1497.2005.0244.x
- Winseman, J., Malik, A., Morison, J., & Balkoski, V. (2009). Students' views on factors affecting empathy in medical education. *Academic Psychiatry*, *33*(6), 484-491.
- Wright, K. B., Bylund, C., Ware, J., Parker, P., Query, J. r., & Baile, W. (2006). Medical student attitudes toward communication skills training and knowledge of appropriate provider-patient communication: A comparison of first-year and fourth-year medical students. *Medical Education Online*, *11*, 1-10.
- Yedidia, M., Gillespie, C., Kachur, E., Schwartz, M., Ockene, J., Chepaitis, A., . . . Lipkin, M. R. (2003). Effect of communications training on medical student performance. *Journal of The American Medical Association*, *290*(9), 1157-1165.
- Yudkowsky, R., Downing, S., & Ommert, D. (2006). Prior experiences associated with residents' scores on a communication and interpersonal skill OSCE. *Patient Education and Counseling*, *62*, 368-373. doi:10.1016/j.pec.2006.03.004

Appendix A

Instructions:

It is anonymous and designed to obtain cultural demographic information. Please indicate your response by placing an “X” or **circling** where appropriate. Please answer all the questions. All responses are confidential.

Date: ____/____/____

PRINT LAST FOUR digits of social: _____

Are you currently enrolled in the Doctor of Osteopathic Medicine degree program?

___ YES

___ NO

OMS year: 1 2 3

J-Group:

1 2 3 4 5 6 7 8 9 10 11 12

What is your gender?

___ Male

___ Female

How old are you today?

What is your identified race/ethnicity?

___ African-American

___ Asian

___ Native American

___ Native Hawaiian / Pacific Islander

___ Hispanic / Latino/a

___ Arab American / Middle eastern

___ Caucasian / White

___ Mixed

___ other group(s) please be specific

What is your religion?

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Buddhism | <input type="checkbox"/> Hinduism |
| <input type="checkbox"/> Christianity | <input type="checkbox"/> Agnostic |
| <input type="checkbox"/> Catholicism | <input type="checkbox"/> Atheist |
| <input type="checkbox"/> Islamic | <input type="checkbox"/> None |
| <input type="checkbox"/> Judaism | <input type="checkbox"/> other <i>specify</i> |
-

Which specialty do you want to pursue?

- | | |
|------------------------------------|---|
| <input type="checkbox"/> Family | <input type="checkbox"/> Psychiatry |
| <input type="checkbox"/> General | <input type="checkbox"/> Neurology |
| <input type="checkbox"/> Internal | <input type="checkbox"/> Ob/Gyn |
| <input type="checkbox"/> Pediatric | <input type="checkbox"/> Dermatologist |
| <input type="checkbox"/> Radiology | <input type="checkbox"/> Cardiologist |
| <input type="checkbox"/> Surgery | <input type="checkbox"/> Emergency |
| <input type="checkbox"/> Oncology | <input type="checkbox"/> OTHER <i>Specify</i> |
-

Not Decided

Are you currently involved in an extracurricular activity?

- Yes No

If yes, please specify:

How many hours a week do you spend involved in the activity (circle one)

- <1 1-2 3-4 4-6 7-8 9-10 10+

Appendix B

Instructions:

It is anonymous and designed to obtain cultural demographic information. Please answer all the questions. All responses are confidential.

Date: ____/____/____

What is your gender?

____ Male ____ Female

How old are you today?

What is your identified race/ethnicity?

____ African-American

____ Asian

____ Native American

____ Hispanic / Latino/a

____ Caucasian / White

____ Native Hawaiian / Pacific Islander

____ Arab American / Middle eastern

____ Mixed

____ other group(s) please be specific _____