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Effect of Medical Education on Empathy in Osteopathic Medical Students

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Context: Empathy is an integral component of the patient-physician relationship and involves a cognitive ability to connect with others in a meaningful fashion. Multiple longitudinal studies have shown that self-reported allopathic medical student empathy declines significantly during year 3. However, to date, only 4 cross-sectional studies have been published on osteopathic medical students' empathy. Whereas studies of allopathic medical students reported a decline in empathy, similar results were not found in osteopathic studies.

Objective: To investigate (1) self-reported empathy through years 1 to 3 of osteopathic medical students and (2) whether empathy declines during year 3.

Design: Design included cross-sectional and test-retest data collection.

Setting: Private osteopathic medical school in the Northeast region of the United States.

Participants: Osteopathic medical students.

Main Outcome Measure: The Jefferson Scale of Empathy medical student version.

Results: Respondents (N=717) included 383 women (53%) and 334 men (47%). When empathy levels were examined by demographics, the only significant finding was that women reported significantly higher empathy levels than men (112.3 vs 109.3; $P<.001$). Cross-sectional results indicate that mean empathy levels were significantly lower for third-year students at the end of the year (108.7) compared with first- and second-year students at the beginning of the year (111.3 and 112.4, respectively; $P<.05$). Test-retest analyses of year 3 indicated significantly lower empathy levels from the beginning to the end of the academic year (111.2 and 108.7, respectively; $P<.05$).

Conclusion: Osteopathic medical students' empathy declined significantly during year 3, which is consistent with the findings from allopathic samples but differs from findings from osteopathic samples. More research is needed to build the data on osteopathic medical student samples and to achieve a better understanding of changes in empathy in osteopathic and allopathic medical students.

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Medical education in the United States emphasizes developing physicians who are as compassionate as they are competent.¹ Medical education regulatory bodies require both academic standards as well as interpersonal expectations that students are capable and able to provide compassionate care to their patients. Both goals are achieved through the development and nurturing of empathy and the ability to be empathetic.²

Empathy is a multidimensional concept that plays an integral role in human interaction and relationships.^{1,3} It is difficult to address through the core medical academic curriculum^{2,4}; however, studies indicate that medical students and residents must provide clear communication,⁵ develop interpersonal skills,⁶ and demonstrate nonverbal sensitivity.⁷

Research on empathy in different health and medical contexts is burgeoning, and this research typically relies on the Jefferson Scale of Empathy (JSE).⁸ Empathy has been shown to provide broad and meaningful advantages, not only in physicians but in other health care professionals as well (eg, psychologists, nurses, social workers).²⁻⁴ For physicians, high empathy ratings have been correlated with lower rates of stress⁹ and burnout,¹⁰ higher career satisfaction,¹¹ and fewer malpractice claims.¹² Patient benefits include increased treatment adherence¹³ and greater satisfaction with health care professionals.²

Of the different demographic categories, sex is the most researched.⁴ Many studies have found that female medical students and female physicians have higher self-rated empathy than their male counterparts.^{4,11,14} Although the role of age in empathy has received less research, studies on the general population suggest that age and empathy are negatively correlated.¹⁵ Likewise, little research exists on the role of race and ethnicity in empathy; however, one study suggested that Asian American medical students have significantly lower empathy ratings on the JSE medical student version (JSE-S) than their white counterparts.¹⁶ Research sug-

gests that these differences between sex and ethnic groups result from different interpersonal styles stemming from differing social norms and values.^{16,17}

Unfortunately, multiple studies have found that empathy in medical students significantly decreases in year 3 of medical education.^{2,14,17} The vast majority of the research participants, however, were allopathic students.⁴ Three published studies¹⁸⁻²⁰ investigated empathy in osteopathic medical students and 1 study²¹ investigated empathy in osteopathy students. All 4 studies used cross-sectional designs. However, Caruso and Bernstein²⁰ used a different measure than the other 3 studies^{18,19,21} (ie, self-created survey rather than the JSE-S), with the frame of examining an intervention on empathetic self-perception (ie, lecture and discussion) rather than purely cross-sectional self-report data. Therefore, despite their results indicating that empathy levels decline during the third year, caution must be used in generalizing the results because of the differences in purpose and procedures used to obtain such results. Therefore, longitudinal and test-retest studies would be useful in adding to the dearth of research in this area.

The purpose of the present study was to (1) examine self-reported empathy of osteopathic medical students in years 1 through 3 and (2) examine whether self-reported empathy declines during year 3.

Methods

This study examined de-identified archived data previously obtained from family medicine classes. Osteopathic medical students in years 1, 2, and 3 completed surveys. Self-reported empathy was obtained using the JSE-S. The study used a cross-sectional and test-retest quantitative design.

Participants

The participants in this study were first-, second-, and third-year osteopathic medical students enrolled at a private osteopathic medical school in the

Northeast region of the United States during the 2012-2013 academic year. Students in each class were recruited at the beginning of the year after their first encounter with a standardized patient. Third-year students were recruited again at the end of the year during their radiology rotation. No exclusion criteria were used, and the only inclusion criteria for the current study were year in medical school (ie, 1 through 3) and enrollment at the given osteopathic medical school.

Instruments

We administered the JSE-S, which is a validated, 20-item self-report measure, with an estimated administration time of approximately 10 minutes. A 7-point Likert-type scale (1, “strongly disagree,” to 7, “strongly agree”) is provided for each item. It assesses empathy ratings based on 3 different constructs: perspective taking, compassionate care, and the “ability to stand in patient’s shoes.”⁸ Total possible scores ranged from 20 (low empathy) to 140 (high empathy). The JSE-S has been shown to provide a valid and reliable measurement of student empathy.⁸ The JSE has been translated into dozens of languages and is the most widely used self-report empathy measurement in the context of patient care and medical service and education.⁴

Procedures

The institutional review board of the school approved the study, which occurred during the 2012-2013 academic year. This study examined coded archived data; thus, informed consent from participants was not needed.

Each student in cohort years 1 through 3 completed the study materials at the conclusion of his or her first standardized patient encounter of the academic year. The standardized patient laboratory coordinators distributed materials. Each cohort had a different color paper survey to identify the cohort—students in year 1 were given blue paper, students in year 2 were given pink paper, and students in year 3 were given purple

paper. In addition to the time students received to complete their encounter paperwork, an additional 10 minutes was provided to the students to complete the JSE-S, which the laboratory coordinator collected. Students in year 3 completed the JSE-S a second time during their radiology rotation, which occurred at the end of the year.

Survey materials for each class were collected and placed into an envelope that was delivered through inter-office mail to the standardized patient office. Only the date and the last 4 digits of each student’s social security number were used as an anonymous code to assess changes in year 3. Responses were manually entered into an Excel data sheet (Microsoft Corporation).

Statistical Analysis

Analyses were twofold. First, aggregate analysis using analysis of variance was conducted to compare 1 dependent variable (ie, self-reported empathy) across years 1, 2, and 3. A separate test-retest analysis using a *t* test examined self-reported empathy at the beginning and end of the year for students in year 3 only. A *t* test was also used to compare empathy scores between men and women. The α level of significance was set at .05 for all statistical tests. All statistical analyses were conducted using SPSS version 22 (IBM) for Windows (Microsoft Corporation).

Results

Participants

A total of 717 osteopathic medical students, representing 92% of the student population in years 1 through 3 during the study period, returned the survey. Of those, 5 students (<1%) did not complete the JSE-S. Incomplete surveys were included in the final analyses. The final sample for surveys completed at the beginning of the school year included 269 (38%) first-year students, 250 (35%) second-year students, and 198 (28%) third-year students (383 women [53%]; 334 men [47%]) (Table 1). The Cronbach α reliability coefficient for the total sample was .82.

Self-Rated Empathy and Demographics

Women scored significantly higher on the JSE-S than did men ($F_{781}=0.49$; $P<.001$). However, no significant differences existed for self-reported empathy by age ($F_2=80.02$; $P=.98$) or race/ethnicity ($F_{2,716}=0.45$; $P=.64$).

Comparison by Class Year

Significant differences were found by school year in self-reported empathy ($F_{2,709}=22.56$; $P<.001$). Mean (SD) empathy scores are reported in Table 2.

Test-retest analysis of students in year 3 indicated that mean (SD) empathy scores declined from the beginning of the year (111.2 [9.6]) to the end of the year (108.7 [10.2]) ($P<.05$). However, whereas 198 third-year students responded to the survey at the beginning of the year, only 92 students responded at the end of the year.

Discussion

To our knowledge, the present study is the first test-retest investigation of osteopathic medical student self-reported empathy during year 3 of medical school. Results suggest that osteopathic medical students' empathy scores reflected the third-year decrease that has been found in allopathic medical students in both cross-sectional and longitudinal analyses. The decline in empathetic attitude found in this study is similar to that of allopathic student samples^{4,14,22} (Figure 1), but it contrasts with findings from osteopathic samples that used the JSE-S^{18,19} (Figure 2). Ellen²¹ had results similar to the current findings, but the sample was of osteopathy students in Great Britain, and thus the results lack generalizability.

The present study had a relatively high Cronbach α (.82). Typically, Cronbach α values greater than .70 are acceptable as a reliable measure of the underlying construct, which in this case is empathy.²³ In comparison, 2 of the 4 studies using osteopathic samples reported α values of .83¹⁸ and .84,¹⁹ whereas the other 2 studies^{20,21} did not. A sample of UK medical students⁸ yielded an α value of .76, and the initial study by Hojat et al⁴ obtained a value of .89.

Table 1.
Empathy in Osteopathic Medical Students:
Demographics of Respondents (N=717)

Race/Ethnicity ^b	No. (%) ^a		
	Year 1 (n=269)	Year 2 (n=250)	Year 3 ^c (n=198)
African American	14 (5)	10 (4)	16 (8)
Asian	39 (15)	29 (12)	19 (10)
Hispanic/Latino	6 (2)	7 (3)	3 (3)
Caucasian/white	197 (73)	192 (77)	145 (73)
Other	15 (6)	17 (7)	15 (8)

^a Percentages do not total 100 because of rounding.

^b Race/ethnicity terms reflect those used in the survey. "Other" here may include Native American, Native Hawaiian/Pacific Islander, Arab American/Middle Eastern, mixed, and other.

^c Third-year osteopathic medical students were asked to take the survey twice: once at the beginning of the school year and once at the end of the school year. In this table, only data from the beginning of the year are shown.

Table 2.
Empathy in Osteopathic Medical Students:
Respondents' JSE-S Scores by Sex
and Class Year

Outcome Measure	JSE-S Score, ^a	
	n	Mean (SD)
Sex		
Women	383	112.3 (9.5)
Men	334	109.3 (10.4)
Class Year		
1	269	111.3 (9.6)
2	250	112.4 (9.7)
3 ^b		
Beginning	198	111.2 (9.6)
End	92	108.7 (10.2)

^a The Jefferson Scale of Empathy medical student version (JSE-S) is a 20-item survey with Likert-type responses ranging from 1 (strongly disagree) to 7 (strongly agree) for a possible total score of 20 to 140. Higher scores indicate greater empathy.

^b Third-year osteopathic medical students were asked to take the survey twice: once at the beginning of the school year and once at the end of the school year. First- and second-year students were only asked to take the survey once at the beginning of the school year.

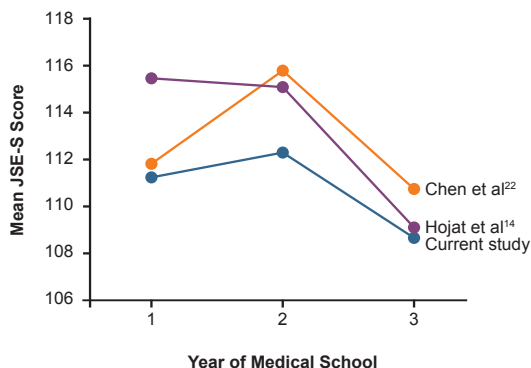


Figure 1. Mean scores on the Jefferson Scale of Empathy medical student version (JSE-S) from the current study of osteopathic medical students (N=717) compared with studies of allopathic medical students: Hojat et al¹⁴ (N=193) and Chen et al²² (N=436). All unadjusted mean JSE-S scores were used with written permission from the authors.

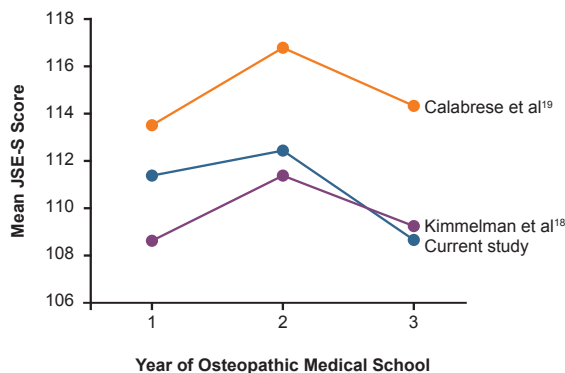


Figure 2. Mean scores on the Jefferson Scale of Empathy medical student version (JSE-S) from the current study of osteopathic medical students (N=717) compared with 2 studies of osteopathic medical students: Kimmelman et al¹⁸ (N=320) and Calabrese et al¹⁹ (N=304). All unadjusted mean JSE-S scores were used with written permission from the authors.

Demographic analyses indicated that female osteopathic medical students scored comparable to previous research on both allopathic and osteopathic students⁴; however, male osteopathic students reported higher levels of empathy than in previous studies.^{18,19} No statistically significant differences were found with regard to race/ethnicity, which is a contrast from 2 studies^{16,24} that found Asian American students to be less empathetic than African Americans or whites.

As a result of the inconsistencies in osteopathic samples and in the comparisons between osteopathic and allopathic students, more research is suggested to further explore this topic.

Future investigation would be helpful in better determining an empathy baseline for osteopathic medical students while preserving osteopathic distinctiveness as inherent in the core principles of practice. Osteopathic distinctiveness involves a comprehensive approach to patient care beginning during medical education and increasing through lifelong learning in practice. The distinction involves a hands-on approach that requires students and physicians to understand patient perspectives and develop skills and abilities to express feedback in a sensitive manner. Future research may also examine the different characteristics responsible for empathy development or for its decline during osteopathic medical school. Such findings may be of particular interest given osteopathic medicine's predominant education path and focus on family medicine and general practice. Research has shown, regardless of the type of medical school attended, that both specialties are strongly correlated with high self-reported levels of empathy, from students and physicians alike.⁸

Implications

The data from the present study may provide evidence that interpersonal skills training could be needed to compensate for empathy deficits, based on the decline found in year 3 (and low scores in years 1 and 2 when compared with allopathic student research). However, it is important to note that while the decline in empathy found in year 3 was statistically significant, the difference may

likely not result in clinical significance. For example, a medical student's behavior during an examination or appointment with a patient may not produce a noticeable difference, either by the patient or student, during the encounter.

Limitations

An important limitation is that we used nonexperimental data, and no manipulation took place. Thus, cause-and-effect inferences cannot be made, which affects internal validity.²³ The sample in the study consisted of only osteopathic medical students from a single private medical school, resulting in a lack of generalizability. Another limitation is the use of self-report measures (ie, responders masking true responses or providing a confirmation bias).²³ Less than 50% of the third-year sample took the posttest, therefore limiting the results and generalizability. It is also possible that the students who completed the retest had a possible interest or other confounding reason to complete the survey compared with those who did not; therefore, caution is again suggested in generalizing the results. In addition, the cross-sectional and test-retest design is not as strong as longitudinal analyses in detecting changes over time.

Conclusion

The findings from the present study provide data on the empathetic attitudes of osteopathic medical students. The data provide information on a limited osteopathic sample, as compared with the larger allopathic samples. The current findings may suggest that osteopathic medical students have lower self-rated levels of empathy in years 1 and 2 than allopathic medical students; however, the findings were similar to what little research exists currently with osteopathic samples in those years of education. The study also found that empathetic attitudes decline significantly during year 3, which is consistent with allopathic samples but differs from the limited studies in 3 of the 4 osteopathic samples. Caruso and Bernstein,²⁰ who found a decrease in osteopathic medical students' empathy levels, used a

different outcome measure and a different design than the current study. Moreover, the decline does not imply or suggest that any behavior intervention is necessary. Future research is suggested to explore patient perceptions of encounters to better understand whether the self-reported declines in student empathy are experienced—and to what degree they are experienced—by patients. More research is suggested to build the data on osteopathic medical student samples and to achieve a better understanding of why possible differences exist between osteopathic and allopathic medical students.

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Author Contributions

All authors provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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