

# Improvement of Medical Students' Empathy Levels After an Intensive Experiential Training on Empathy Skills

Efpraxia Avlogiari<sup>1</sup>, Stella Maria Karagiannaki<sup>2</sup>, Eleftherios Panteris<sup>1</sup>, Anastasia Konsta<sup>1</sup>, Ioannis Diakogiannis<sup>1</sup>

<sup>1</sup>1st Psychiatry Clinic, Aristotle University of Thessaloniki Faculty of Health Sciences, School of Medicine; <sup>2</sup>Aristotle University of Thessaloniki Faculty of Health Sciences, School of Medicine

## ABSTRACT

**Background:** EMPATHY IN HEALTHCARE is an intensive 20-hour experiential training program based on mediation techniques and specialized healthcare role-play for clinicians and medical students. It is hypothesized that the training will improve empathy via the intensive experiential techniques implemented.

**Methods:** A total of 50 medical students (25 males/25 females) took the course voluntarily. Empathy was measured using the Jefferson Scale of Empathy-Medical Students Version (JSE-S) (Greek version), before and after the 20-hour training, along with a 6-month follow-up. Gender, age, preferred medical specialty and baseline empathy score were explored as possible moderator variables of the training effect.

**Results:** Empathy increased after training, with a mean JSE-S score improvement of 11.25 points ( $\pm 8.848$ ) ( $P < .001$ ). After 6 months, the mean JSE-S score maintained a difference of 6.514 points ( $\pm 12.912$ ) ( $P < .005$ ). No differences were recorded with regard to gender, age group or medical specialty for the pooled data. Women in the 22-24 year-old age group had a 5-point mean difference ( $P = .05$ ), and higher post-training scores than men. Lower initial scorers were the ones that mostly improved, with a 3-fold mean score difference from the higher scorers regardless of gender ( $P < .001$ ), while also showing a smaller drop in empathy levels 6 months after the training compared to the higher scorers.

**Conclusion:** Intensive experiential training can improve empathy in a clinical setting. EMPATHY IN HEALTHCARE is a successful training program in improving empathy in medical students, as measured by the JSE-S. A score of 110 and below could be used for selecting medical student candidates who will benefit most from empathy training.

## ARTICLE HISTORY

**Received:** May 12, 2021

**Accepted:** July 28, 2021

**KEYWORDS:** Empathy training, cognitive empathy, empathy in healthcare, Jefferson Scale of Empathy-Medical Students Version (JSE-S), experiential training, medical students, psychogeriatric patients

## INTRODUCTION

Empathy is a complex and multidimensional personality attribute<sup>1</sup> which, according to empirical studies, serves as a substantial predictive factor of the clinical competence of medical students<sup>2,3</sup> and the patients' clinical outcomes.<sup>4</sup> It is claimed to be necessary for connecting with the patient, improving the outcome,<sup>4</sup> and to reach a more precise diagnosis.<sup>5</sup> Its benefits do not stop there, as it also seems to help alleviate burnout symptoms in the physicians themselves,<sup>6</sup> and reduce malpractice.<sup>7</sup>

However, empathy training is rarely incorporated in any undergraduate or graduate medical program, which might indicate a devaluation of the concept or a general assumption that empathy is an inherent, unchangeable trait.<sup>8</sup> Thankfully, this assumption has been challenged. A systematic review in 2014<sup>9</sup> examining interventions for cultivating physicians' empathy, found that the notion that

empathy can be enhanced through specialized educational interventions is supported.

Hojat and his colleagues<sup>10</sup> described empathy in patient care as "a predominantly cognitive (rather than an affective or emotional) attribute that involves an understanding (rather than feeling) of pain and suffering of the patient, combined with a capacity to communicate this understanding, and an intention to help." The cognitive aspect of empathy refers to the cognitive processing of mirrored emotions and actions, which involves a deliberate mental effort to intellectually interpret the feelings and the thoughts generated by the mirroring process.<sup>11</sup>

It has been found that cognitive empathy can be improved via experiential activities specifically designed to enhance existing neural pathways and create new ones.<sup>12</sup> According to Schachter and his colleagues,<sup>13</sup> the stimulation of affect

**Corresponding author:** Efpraxia Avlogiari, e-mail: law@avlogiari.gr

**Cite this article as:** Avlogiari E, Maria Karagiannaki S, Panteris E, Konsta A, Diakogiannis I. Improvement of medical students' empathy levels after an intensive experiential training on empathy skills. *Psychiatr Clin Psychopharmacol.* 2021;31(4):392-400.



and emotion-based understanding is essential in order to produce a substantial neuroplastic change in the brain. Role-playing, for example, is a method that has been used as a tool to enhance one's relatedness, thus improving their empathy, and focuses mostly on imitating and mimicking a role and a situation, possibly utilizing the putative mirror neuron system to create shared subjective experiences.<sup>11</sup>

Responding to the need for effective empathy training interventions for medical students, the first author developed an intensive 20-hour training—EMPATHY IN HEALTHCARE—based on the literature regarding the efficacy of role play and experiential exercises in increasing cognitive empathy, as mentioned previously.

### Objectives

Until now, there has been no other study investigating the impact of an intensive 3-day experiential empathy skills training program on the levels of empathy of medical students. The aim of the present study is the implementation of the EMPATHY IN HEALTHCARE training among medical students and the pre-/post-evaluation of their empathy levels.

## METHODS

### Participants

In the study, 50 Greek medical students (25 males; 25 females) from different cities of Greece were recruited, and gathered in Thessaloniki to attend the training in person. To ensure the quality of the course, it was imperative that the class size did not exceed a maximum of 30 students. For that purpose, the participants were initially divided into 2 groups of 25 students each, with 50% gender representation,

and each group attended the exact same training with the exact same trainers. The second group was trained 2 weeks after the first. The inclusion criteria required the participants to be in the fourth year or above of medical school, which is when they start their clinical practice. The exclusion criteria included concurrent participation in another study, inability to complete the training, and very low JSE baseline scores. In that context, only 1 female participant with a baseline score of 41 was excluded from the sample, even though she completed both the training and the post-test evaluation with a post-training score of 53. Thus, 47 participants were included in the final sample of the study. Informed consent was obtained from all participants prior to the beginning of the study.

### Design of the Study

This study used a pre-/post-test design. After the pre-test evaluation was completed, the participants attended 20 hours of the EMPATHY IN HEALTHCARE training. The post-test evaluation was conducted right after completion of the training and a follow-up reevaluation took place after 6 months. The gender, age, preferred medical specialty, and baseline empathy score were explored as possible moderator variables of the training effect. Ethics Committee Approval: All procedures were approved by the Committee of Bioethics and Ethics of the School of Medicine of the Aristotle University of Thessaloniki. The approval (Protocol No: 2.358) was issued on February 27, 2019.

### Intervention

The 20-hour intensive training EMPATHY AND HEALTHCARE was designed in accordance with the International Mediation Institute Task Force criteria/standards<sup>14</sup> and it comprised 30% theoretical knowledge and 70% role-playing experiential exercises. The theoretical part included "Introduction to Empathy," "Communication Skills," "Effective Verbal and Non-verbal Communication Techniques with the Patient," "The Patient's Condition and Expectations," "Affective Neuroscience and Emotions," "Announcement of Unpleasant News," and "How to Say I am Sorry." The experiential part included an interactive empathy game and role-play simulations based on 8 real-life scenarios, 4 of which involved geriatric/psychogeriatric cases. The training lasted 3 consecutive days, with 8 hours of training the first 2 days and 4 hours on the third day. The Table 1 has a session breakdown along with a short description.

## PRE-/POST-ASSESSMENTS

### Jefferson Scale of Empathy-Medical Students Version (JSE-S)

For the pre-/post-assessment of empathy levels, the JSE-S<sup>15</sup> was used. The JSE has been recognized as a primary and widely used research tool in medical education.<sup>16</sup> It has been translated into 56 languages and it is currently being

#### MAIN POINTS

- Given the significance of empathy in healthcare, it is of prime importance that medical education incorporates effective training programs to increase the empathy of the student physicians.
- The "EMPATHY IN HEALTHCARE" training is a 20-hour intensive experiential program comprised of 30% theoretical knowledge and 70% role-playing-experiential exercises, based on mediation techniques and specialized role-play.
- The training may improve "Perspective Taking" (i.e., cognitive empathy) in medical students, as measured by the Jefferson Scale of Empathy-Medical Students Version (JSE-S) (Greek version).
- The training is ineffective in improving the other 2 empathy factors, "Compassionate Care" and "Walking in Patients' Shoes."
- Gender differences are evident in the 22-24-year-old group, with women scoring higher than men.
- A score of 110 and below could be used for selecting medical student candidates who will benefit most from empathy training.
- The positive effect of the EMPATHY IN HEALTHCARE training on medical students' empathy levels remains evident 6 months after the intervention.

**Table 1.** Session Breakdown and Content Overview

Duration (minutes)	Session	Content overview
Day 1		
105	General introduction	Introduction to the Seminar Flow—Getting to Know the Trainees
	Introduction to empathy	Lecture on the basics of empathy
15	Break	
120	Verbal and non-verbal communication	Lecture: Verbal Communication Exercise: Verbal Communication
	Lectures and exercises	Lecture: Non-verbal Communication Exercises: Handshake Exercise & Intimacy Zone
30	Break	
105	Introduction to role-playing	Lecture: Role-Playing Techniques
	Syringe exercise	Exercise: Doctor’s Empathy Game (looking at a syringe from different perspectives)
15	Break	
105	Announcement of bad news	Lecture: How to Announce Bad News Exercise: Role Playing
75mins		Personalized debriefing
	Emotions in Neuroscience	Lecture on Affective Neuroscience and Emotions Presentation of home exercise
Day 2		
120	Microethics	Lecture on Microethics
	Role play & debriefing	Two long role-play sessions with diverse scenarios on Geriatrics/Psychogeriatrics
15	Break	
105	Role play & debriefing	Two long role-play sessions with diverse scenarios on Geriatrics/Psychogeriatrics
30	Break	
120	Role play & debriefing	Two long role-play sessions with diverse scenarios on Cancer patients/ Palliative care
15	Break	
90	Role play & debriefing	One long role-play session
15	Break	
75	Retrospection and homework	Discussion with Q&A and 2 case studies for homework
Day 3		
120	Case studies	Divided into 2 groups, the students discuss each case study for 15 minutes and then present the way they would handle them
15	Break	
75	Interactive Story telling	Discussing real-life stories regarding personal experiences of medical errors or medical malpractice from the life of both the trainers and the students, with a focus on the emotions of the patient and the patient’s relatives as well as the impact on their lives
15	Break	
45	Closing	Discussion about the training program

used in more than 80 countries.<sup>10</sup> The JSE-S version is a 20-item questionnaire, which was specifically designed for the assessment of medical students’ empathy levels.<sup>10</sup> The items are scored in a 7-point Likert scale (1=strongly disagree, 7=strongly agree), and 10 of the items are positively worded and directly scored, while the other 10 are negatively worded and scored reversely. Three sub-dimensions have been specified for the scale; “Perspective Taking” (10 items), “Compassionate Care” (7 items), and “Walking in Patient’s Shoes” (3 items).<sup>10</sup> “Perspective Taking” refers to the students’ perception of patients’ perspectives,

“Compassionate Care” refers to the students’ understanding of patients’ emotional states during inpatient care, and “Walking in Patients’ Shoes” refers to the students’ ability to understand patients’ experiences.<sup>10</sup> For the purposes of the present study, the JSE S-version was translated in Greek, as this particular version had not been previously translated in the Greek language. The S-version questions that differed from the already translated and validated HPS-version (the JSE version for health professional students)<sup>17</sup> were translated using both forward and backward translation from 2 different native English speakers.

### Statistical Analysis

In addition to descriptive statistics and the Student's *t*-test for the pre-/post-JSE-S group comparison, more conservative non-parametric tests were used for all other analyses because they are robust to violations of the assumptions of parametric tests. Group differences on demographics and baseline measures were tested using Wilcoxon-Mann-Whitney tests for continuous measures. Pre/post change scores were computed for all outcome measures, and the Kruskal-Wallis *H*-test was used for more than 2 parameters. Statistical analysis was performed with Statistical Package for the Social Sciences (SPSS) version 23.0 (IBM SPSS Corp.; Armonk, NY, USA). All tests were two-tailed, with a 5% level of significance when appropriate, and effect size estimates were calculated to examine the practical significance of statistically significant findings using the online resource Psychometrica.<sup>18</sup> Cohen's *d* was used as an estimate of the effect size, with values <0.25 considered negligible, near 0.50 as moderate, and >0.75 as large.<sup>19,20</sup> Eta squared ( $\eta^2$ ), Glass'  $\Delta$ , and Hedges *g* effect size were calculated where appropriate instead of Cohen's *d*.<sup>18</sup>

### RESULTS

There were 48 participants; 25 males and 23 females gathered on a first-come-first-served basis for inclusion to the training program. The training was done in 2 groups of 22 and 26 participants (2 participants did not show up in the first group). One participant was removed post-training, due to very low pre-/post-testing scores. The data collected from 47 participants before and after the training for the 2 groups were pooled. The majority (77.1 %) of the participants were between 22 and 24 years old,

with 85.4% being in their fourth and fifth year of medical school (41.7 % and 43.8% respectively). Unfortunately, their medical specialties were not proportional, nor were all represented. Figure 1 represents the medical specialties along with their percentages.

Regarding the empathy evaluation, Cronbach's alpha for the JSE-S pre-testing was 0.868, while the post-testing alpha was 0.852.

The training was indeed successful in raising student empathy, with a pre-training mean score of 106.55 ( $\pm 11.188$ ) and a post-test score of 117.85 ( $\pm 7.451$ ) ( $P < .001$ ) (Table 1). No differences were recorded regarding gender, age group, or medical specialty for the pooled data.

Stratified by age groups, the 22-24-year-old age group had indeed a statistically significant difference in the empathy score for the JSE-S between the 2 genders, with women having higher post-training scores than men, with a 5-point mean difference ( $P = .05$ ) (Table 2).

The mean JSE-S score improvement was 11.25 points ( $\pm 8.848$ ), with the minimum being a 2- point decrease from a score of 120 to 118, and the maximum being a 42-point increase from a score of 88 to 130. The most notable improvements were made by participants that scored from 86 to 110 in the pre-JSE-S test. Participants' pre-test scores  $\leq 110$  had a mean difference of 15.69 ( $\pm 9.094$ ), and the scores  $\geq 110$  had a mean difference of 5.76 ( $\pm 4.04$ ) ( $P < .001$ ) (Figure 2) (Table 2).

Analyzing the 3 different factors the JSE-S is built upon- "Perspective taking," "Compassionate Care," and "Walking in patient shoes"<sup>10</sup>-statistically significant differences were found for the "Compassionate Care" factor associated with the year of study. The fifth-year students had the lowest score of 40.09 ( $\pm 5.898$ ), compared to fourth, with 44.50

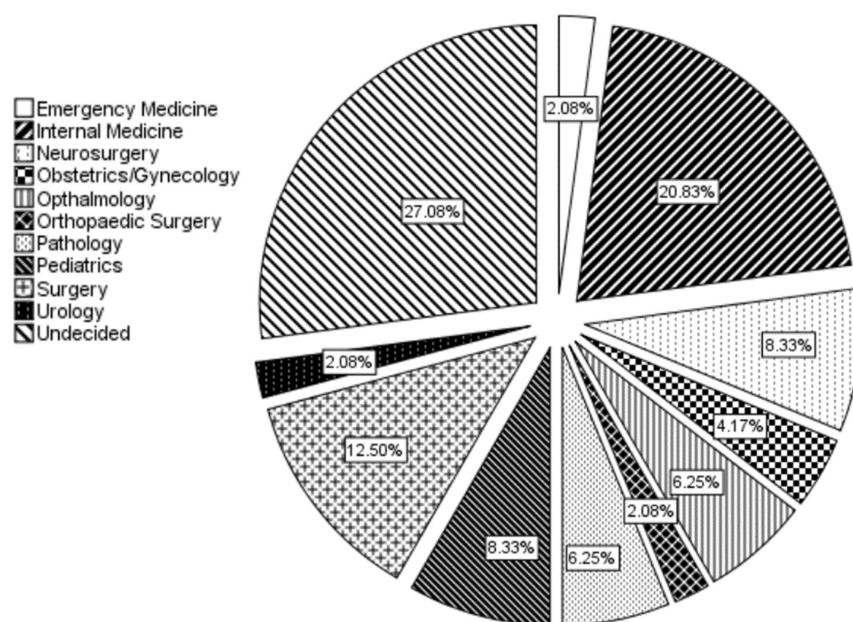


Figure 1. Percentages of medical specialties of the participants.

**Table 2.** Statistical Analysis of All Reported Parameters

JSE-S	N	Mean	SD	95% CI Mean		Cohen's <i>d</i>	Effect size	<i>P</i>
				Lower	Upper			
Pre-score Total	47	106.55	11.118	103.27	109.84	1.189	Glass' Δ	.000 <sup>α</sup>
Post-score Total	47	117.85	7.451	115.66	120.04		1.577	
Pre-score 22-24 years							.104 <sup>#</sup>	
♂	18	103.28	11.007	97.80	108.75			
Pre-score 22-24 years								
♀	18	109.00	8.825	104.61	113.39			
Post-score 22-24 years						0.692 <sup>*</sup>	η <sup>2</sup>	.05 <sup>#</sup>
♂	18	114.72	7.858	110.81	118.63			
Post-score 22-24 years							0.107	
♀	18	119.78	7.369	116.11	123.44			
Pre-score ≤110 Pre/Post Difference	26	15.692	9.094	12.01	19.36	1.344	Hedges <i>g</i>	.000 <sup>α</sup>
Pre-score ≥110 Pre/Post Difference	21	5.761	4.043	3.75	7.76		1.344	
Pre-score fourth year Compassionate Care	20	44.50	5.20	42.06	46.93	0.720 <sup>*</sup>	η <sup>2</sup>	.029 <sup>γ</sup>
Pre-score fifth year Compassionate Care	21	40.09	5.890	37.41	42.78		0.115	
Pre-score sixth year Compassionate Care	6	45.50	4.590	40.67	50.32			
Pre-score Perspective taking	47	56.09	6.430	54.20	57.97	1.230	Glass' Δ	.000 <sup>α</sup>
Post-score Perspective taking	47	62.98	4.623	61.62	64.34		1.49	
Post-score Perspective taking						0.608 <sup>*</sup>	η <sup>2</sup>	.045 <sup>#</sup>
♂	25	61.84	4.670	59.91	63.77			
Post-score Perspective taking							0.085	
♀	22	64.27	4.310	62.36	66.18			

<sup>α</sup>Wilcoxon Signed-Rank test; <sup>#</sup>Mann-Whitney *U*-test; <sup>α</sup>Student's *t*-test; <sup>γ</sup>Kruskal-Wallis test; <sup>\*</sup>Transformed from eta squared. All calculated from the online resource, Psychometrica.<sup>18</sup>

(±5.206), and the sixth-year students 45.50 (±4.593) (*P* < .05) (Table 2).

Interestingly, for the comparison of pre/post factors, the segment that essentially affects the JSE-S score is “Perspective taking” with a pre-test mean score of 56.09 (±6.430) and a post-test score of 62.98 (±4.623) (*P* < .001), while the other 2 remained unchanged after the training (Table 2). The difference is evident even between the 2 genders, with an almost 4-point mean score difference for the women, albeit with a mild effect size (Table 2).

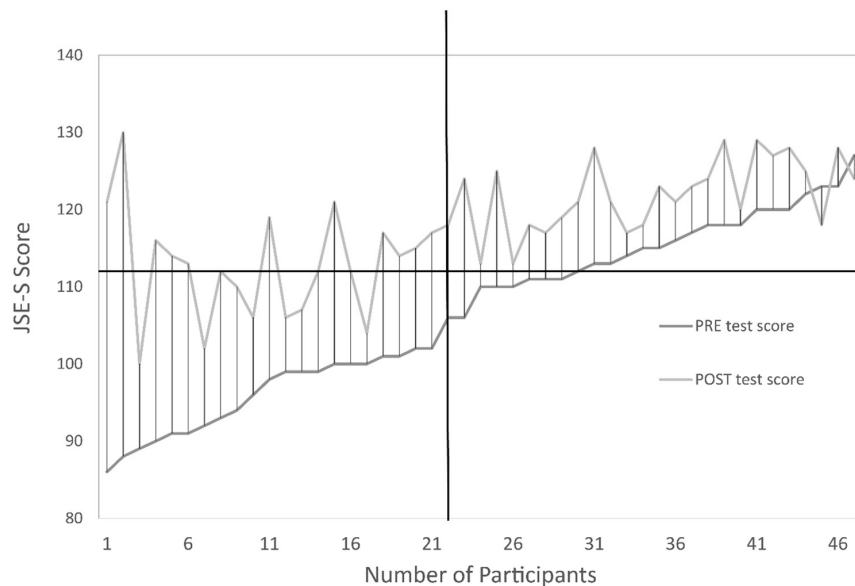
### 6-Month Follow-up

Of the students who participated, 72.91% (35 out of 48) responded to the call for a follow-up reevaluation. Overall, there was an average difference of 5.4 points, from 118.06 (±7.420), which was the average final JSE-S score for the 35 students, to 112.66 (±8.951) (*P* < .001) (Figure 4.11).

Of the 35 students, the average 6-month score was still high enough to maintain a difference of 6.514 (±12.912) points (*P* < .005).

Male students with an initial score of ≤110 (N=12) had a drop of 3.333 (±8.403) points in the 6-month reevaluation from the final score, but without statistical significance (*P* < .197). They also maintained a difference of 14.5 (±15.739) points from their initial score (*P* < .009). Similarly, for female students with an initial score of ≤110 (N=8), there was a drop of 3.375 (±6.823) points in the 6-month follow-up from the final score, again without statistical significance (*P* < .205). They also maintained a difference of 12 (±4.106) points from their initial score (*P* < .001).

In students with a score ≥110, the results were different. Male students with an initial score of ≥110 (N=10) had a drop of 8.800 (±5.865) points from the final score, in the 6-month reevaluation (*P* < .001). In fact, their average



**Figure 2.** Pre-/post-JSE-S scores for all participants. Cross-section indicates the cut-off point that can be used to identify better-suited candidates for empathy training.

initial score was 5.200 ( $\pm 6.521$ ) points higher than the 6-month score ( $P < .016$ ), meaning that students scored lower in the 6-month follow-up than they initially did. The same was the case for female students with an initial score of  $\geq 110$  ( $N=7$ ); there was a drop of 6.714 ( $\pm 6.969$ ) points in the 6-month reevaluation from the final score ( $P < .044$ ). However, unlike men, their average initial score was 2.143 ( $\pm 5.460$ ) lower than the 6-month score but without statistical significance ( $P < .339$ ).

## DISCUSSION

Our study demonstrated that the EMPATHY IN HEALTHCARE training program attains its goal of increasing students' empathy as measured by the JSE-S, in 20 hours. The post-training mean JSE-S score was indeed higher than the pre-training mean JSE-S score in a statistically significant manner for the pooled data, while maintaining a high internal consistency both before and after the training. After 6 months, the mean JSE-S score was lower but did not reach the pre-training mean JSE-S score, indicating that the positive effect of the training was still evident, albeit weakened. It should be noted that the effects of maturation and time may have also affected the empathy levels measured at the 6-month follow-up, in unknown ways. The initial results did not show any differences with regard to gender, age group, or medical specialty for the pooled data, in contrast to what has been reported.<sup>21</sup>

The stratified dataset showed more statistically significant findings. For the 22-24-year-old age group, the most represented in the dataset, there was indeed a statistically significant difference in the empathy score for the JSE-S between the 2 genders, with women having higher post-training scoring than men, with a 5-point mean difference

( $P = .05$ ), in accordance with the literature.<sup>10</sup> The lower initial scorers with a score  $\leq 110$  in the JSE-S scale were the ones that mostly improved, with a 3-fold mean score difference from the higher scorers, regardless of gender. Moreover, those with an initial score  $\leq 110$  in the JSE-S scale had a smaller decline at the 6-month follow-up than the higher initial scorers, while also maintaining a substantial increase from the pre-training scores. One plausible explanation could be that the high scorers were more likely to adopt a more complacent attitude and were less motivated to practice the learned skills after the training, and did not make their best effort to focus on the follow-up evaluation, compared to the lower scorers.<sup>22</sup> Nonetheless, these findings suggest that a lower initial scorer is more likely to benefit from an empathy training and maintain these benefits in the long-term, which is an interesting fact that can be used to identify better-suited candidates for such training.

Regarding the year of study, the fourth-year and sixth-year students scored higher than the fifth-year students in the initial testing for the "Compassionate care" factor of the JSE-S.<sup>10</sup> Other empathy studies for medical students report a slight gradual decline in the empathy for medical students,<sup>16,23</sup> starting from their third year,<sup>24</sup> which is not evident in the present study but agrees with several other studies and meta-analyses.<sup>25-27</sup>

Interestingly, comparing the pre/post scores for the 3 factors for the pooled data, "Perspective Taking" is the only factor that is indeed different, with the other factors unchanged after the training (Table 2), essentially being the one factor affecting the JSE-S score. "Perspective Taking" taps on the cognitive aspect of empathy<sup>28</sup> and reflects the doctor's ability to understand their patients while remaining objective, in order to make informed (not

emotionally charged) decisions that best suit the patient needs.<sup>29</sup> Thus, one can say that this course may train the participants in recognizing the patient’s perspective, hence improving their cognitive empathy, as it is intended to do. Nonetheless, the training was proven ineffective in improving the other 2 factors of clinical empathy, “Compassionate Care” (i.e., the students’ understanding of patients’ emotional states) and “Walking in Patient’s Shoes” (i.e., the students’ ability to understand patients’ experiences). Hence, further research is required to update the training program, by designing and incorporating methods that aim to enhance these 2 other aspects of clinical empathy in medical students.

### Limitations

The study has several limitations, the first one being its small scale and short duration. Due to the nature of the course and the voluntary priority recruitment, the specialties and age groups were not representative of the ideal experimental set up and could not provide more useful insights. In addition, there was no control group included in the study, which did not allow the investigators to rule out possible variables that could have interfered with the observed changes on medical students’ empathy. Another shortcoming could be the fact that some probable confounding factors were not investigated, such as depression levels, stress levels, and other psychological factors that could possibly contribute to the individual differences in participants’ empathy scores. Such a psychometric evaluation, however, could have had a negative impact on the students’ overall attendance of the 3-day program, and therefore it was decided to not include such measurements. Selection bias could also be an issue

for the present study, as it may be argued that medical students participating in a course to improve empathy may already be more empathic than others who did not chose to participate. Furthermore, the use of the JSE-S versions of the Jefferson Scale, which has not been previously validated in Greek, is another limitation that could not have been avoided. The EMPATHY IN HEALTHCARE training program should be adapted to reflect the results found, with additional gender-related exercises to alleviate the gender score difference if possible, and by identifying the higher-empathy participants and engaging them in more challenging custom scenarios to further improve their empathy. Finally, new methods that will specifically target the “Compassionate Care” and “Walking in Patients’ Shoes” factors, should be incorporated in the training to enhance its overall effectiveness on medical students’ empathy.

### CONCLUSION

The EMPATHY IN HEALTHCARE training is a 20-hour intensive experiential program that comprises of 30% theoretical knowledge and 70% role-playing-experiential exercises. It may improve empathy in medical students, as measured by the JSE-S (Greek version), with the positive effect being maintained after 6 months, albeit weakened. Gender differences are indeed evident in the 22-24-year-old group, with women scoring higher than men. Moreover, lower initial scorers were the ones that mostly improved, with a 3-fold mean score difference from the higher scorers regardless of gender, while also maintaining a higher increase 6 months later. A score of 110 and below could be used for selecting medical student candidates who will benefit the most from empathy training.

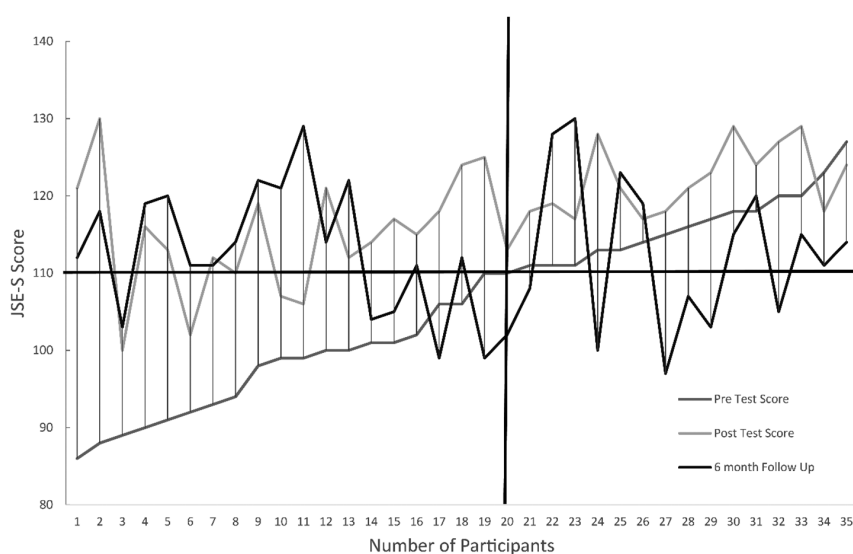


Figure 3. Pre-/post-JSE-S and follow-up scores for participants who responded. Cross-section indicates the cut-off point that can be used to identify better-suited candidates for empathy training.

**Ethics Committee Approval:** Ethics committee approval was received from the Committee of Bioethics and Ethics of the School of Medicine of the Aristotle University of Thessaloniki. The approval (Protocol No: 2.358) was issued on February 27, 2019.

**Informed Consent:** Informed consent was obtained from all participants who participated in this study.

**Peer Review:** Externally peer-reviewed.

**Author Contributions:** Concept - E.A.; Design - E.A., E.P., S.M.K., A.K., I.D.; Supervision - A.K., I.D.; Resource - E.A.; Materials - E.A.; Data Collection and/or Processing - E.A., S.M.K., E.P.; Analysis and/or Interpretation - E.A., E.P., S.M.K., A.K.; Literature Search - E.A., S.M.K.; Writing - E.A., S.M.K., E.P.; Critical Reviews - A.K., I.D.

**Conflict of Interest:** The first author is the president of Alternative Dispute Resolution Hellenic Center which plans to offer the training as a paid service. All other authors have no declarations of interest to report.

**Financial Disclosure:** The authors declared that this study has received no financial support.

## REFERENCES

- Moudatsou M, Stavropoulou A, Philalithis A, Koukouli S, eds. The role of empathy in health and social care professionals. *Healthcare (Basel)*. Multidisciplinary Digital Publishing Institute. 2020;8(1). [CrossRef]
- Hojat M, Erdmann JB, Gonnella JS. Personality assessments and outcomes in medical education and the practice of medicine: AMEE Guide No. 79. *Med Teach*. 2013;35(7):e1267-e1301. [CrossRef]
- Hojat M, Gonnella JS, Nasca TJ, et al. Physician empathy: Definition, components, measurement, and relationship to gender and specialty. *Am J Psychiatry*. 2002;159(9):1563-1569. [CrossRef]
- Hojat M, Louis DZ, Markham FW, et al. Physicians' empathy and clinical outcomes for diabetic patients. *Acad Med*. 2011;86(3):359-364. [CrossRef]
- Halpern J. From idealized clinical empathy to empathic communication in medical care. *Med Health Care Philos*. 2014;17(2):301-311. [CrossRef]
- Thirioux B, Birault F, Jaafari N. Empathy is a protective factor of burnout in physicians: New neuro-phenomenological hypotheses regarding empathy and sympathy in care relationship. *Front Psychol*. 2016;7:763. [CrossRef]
- Hannan J, Sanchez G, Musser ED, et al. Role of empathy in the perception of medical errors in patient encounters: A preliminary study. *BMC Res Notes*. 2019;12(1):327. [CrossRef]
- Riess H, Kelley JM, Bailey RW, Dunn EJ, Phillips M. Empathy training for resident physicians: A randomized controlled trial of a neuroscience-informed curriculum. *J Gen Intern Med*. 2012;27(10):1280-1286. [CrossRef]
- Kelm Z, Womer J, Walter JK, Feudtner C. Interventions to cultivate physician empathy: A systematic review. *BMC Med Educ*. 2014;14(1):219. [CrossRef]
- Hojat M, DeSantis J, Shannon SC, et al. The Jefferson Scale of Empathy: A nationwide study of measurement properties, underlying components, latent variable structure, and national norms in medical students. *Adv Health Sci Educ Theory Pract*. 2018;23(5):899-920. [CrossRef]
- Bekkali S, Youssef GJ, Donaldson PH, et al. Is the putative mirror neuron system associated with empathy? A systematic review and meta-analysis. *Neuropsychol Rev*. 2021;31(1):14-57. [CrossRef]
- Gerdes KE, Lietz CA, Segal EA. Measuring empathy in the 21st century: Development of an empathy index rooted in social cognitive neuroscience and social justice. *Soc Work Res*. 2011;35(2):83-93. [CrossRef]
- Schachter HM, Girardi A, Ly M, et al. Effects of school-based interventions on mental health stigmatization: A systematic review. *Child Adolesc Psychiatry Ment Health*. 2008;2(1):18. [CrossRef]
- IMI. Train Program Requirements. *IMI*. 2016 [cited 2019]. Available at: <https://www.immediation.org/training/training-program-requirements/>.
- Hojat M, Gonnella JS. Eleven years of data on the Jefferson Scale of Empathy-Medical Student Version (JSE-S): Proxy norm data and tentative cutoff scores. *Med Princ Pract*. 2015;24(4):344-350. [CrossRef]
- Chatterjee A, Ravikumar R, Singh S, Chauhan PS, Goel M. Clinical empathy in medical students in India measured using the Jefferson Scale of Empathy-Student Version. *J Educ Eval Health Prof*. 2017;14:33. [CrossRef]
- Chrisofaki H. Translation and weighting of the Jefferson Scale of Empathy questionnaire in Greek nurses (in Greek) [Master's Thesis]. Athens: Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών; 2018.
- Lenhard W, Lenhard A. Calculation of effect sizes. *Dettelbach (Germany)*. [CrossRef]. Dettelbach (Germany): Psychometrica; 2016 [cited 2019]. Available at: [https://www.psychometrica.de/effect\\_size.html](https://www.psychometrica.de/effect_size.html). [https://www.psychometrica.de/effect\\_size.html](https://www.psychometrica.de/effect_size.html)
- Hojat M, Xu G. A visitor's guide to effect sizes-statistical significance versus practical (clinical) importance of research findings. *Adv Health Sci Educ Theory Pract*. 2004;9(3):241-249. [CrossRef]
- Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. Routledge; 2013.
- Chen D, Lew R, Hershman W, Orlander J. A cross-sectional measurement of medical student empathy. *J Gen Intern Med*. 2007;22(10):1434-1438. [CrossRef]
- Wood SL, Lynch Jr JG. Prior knowledge and complacency in new product learning. *J Con Res*. 2002;29(3):416-426. [CrossRef]
- Mirani SH, Shaikh NA, Tahir A. Assessment of clinical empathy among medical students using the Jefferson Scale of empathy-student version. *Cureus*. 2019;11(2):e4160. [CrossRef]
- Hojat M, Vergare MJ, Maxwell K, et al. The devil is in the third year: A longitudinal study of erosion of empathy in medical school. *Acad Med*. 2009;84(9):1182-1191. [CrossRef]
- Jeffrey DI. Changes in students' empathy During their training. *Exploring Empathy with Medical Students*. Berlin: Springer; 2019:185-215.
- Quince TA, Kinnersley P, Hales J, et al. Empathy among undergraduate medical students: A multi-centre



- cross-sectional comparison of students beginning and approaching the end of their course. *BMC Med Educ.* 2016;16(1):92. [\[CrossRef\]](#)
27. Roff S. Reconsidering the “decline” of medical student empathy as reported in studies using the Jefferson Scale of Physician Empathy-Student Version (JSPE-S). *Med Teach.* 2015;37(8):783-786. [\[CrossRef\]](#)
28. Decety J, Jackson PL. The functional architecture of human empathy. *Behav Cogn Neurosci Rev.* 2004;3(2):71-100. [\[CrossRef\]](#)
29. Quill TE, Brody H. Physician recommendations and patient autonomy: Finding a balance between physician power and patient choice. *Ann Intern Med.* 1996;125(9):763-769. [\[CrossRef\]](#)