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Medical Students' Empathy Level Differences by Medical Year, Gender, and Specialty Interest in Akdeniz University

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ABSTRACT

BACKGROUND: As an important feature in patient-physician communication for both primary and clinical care, empathy is one of the basic competencies that physicians should possess. The primary aim of this study was to evaluate the level of empathy among medical students in all years of medical training using two different instruments: the Jefferson Scale of Physician Empathy (for clinical empathy level) and the Toronto Empathy Questionnaire (for general empathy level).

MATERIALS AND METHODS: This study is a cross-sectional descriptive study conducted in 2017-2018 academic year with students studying at Akdeniz University Faculty of Medicine. Data collection form, Toronto Empathy Questionnaire (TEQ) and Jefferson Scale of Physician Empathy (JSPE) was applied to the students by the researchers. The statistical analysis was carried out by using IBM-SPSS version 23 for Mac OS. T-test, ANOVA test, Spearman and Pearson correlation analysis were used for comparisons.

RESULTS: The mean TEQ score of the students was 52.8/65 and the JSPE-S score was 80.3/100. TEQ scores of students increased up to 4th year and then decreased, but the difference between the years was not statistically significant. The third year students' JSPE-S scores were significantly higher than that of the sixth year students.

CONCLUSION: While the clinical empathy levels of medical students decreased significantly after 3rd year, the general empathy levels decreased less. This result shows us that we should review our medical education curriculum and educational environment, and should initiate initiatives, and devote more time to empathy education in order to prevent the decrease in empathy level and increase empathy during medical education.

KEYWORDS: Empathy, Toronto Empathy Questionnaire, Jefferson Scale of Physician Empathy, Medical Students

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Introduction

An established patient-physician relationship plays an important role in providing quality and efficient health care. An important feature in patient-physician communication, for both primary and clinical care, empathy is one of the basic competencies that physicians should possess.[1,2] Empathy is defined as the ability to understand what another person feels without experiencing the situation firsthand and to interpret events from the other person's point of view.[1]

In the context of medical practice, empathy (clinical empathy) is defined as the ability of a physician to understand a patient's point of view and thoughts and to transmit this back to the patient.[3,4] This skill has 3 elements: (1) a physician's understanding of the patient's condition, perspective, and emotions, (2) the communication of this understanding to the patient and checking its accuracy, and (3) then acting in a beneficial and/or therapeutic manner.[5] Although empathy is important in all medical specialties, it is especially important in family medicine where a continuous relationship with the patient is important. McWhinney, one of the pioneers of family medicine, defines empathy as the capacity to engage in another person's experience. According to McWhinney, empathy is the capacity of the physician to sense what it is like to be sick, and it is very difficult to manage a patient's illness/disease without understanding the illness/disease experience.[6] Specifically, physicians with positive attitudes toward psychosocial issues are more empathic. The patients of these physicians offer relatively more information about psychological and social issues. These patterns of communication are associated with improved patient satisfaction and patient outcomes, and fewer malpractice complaints.[2,6]

Empathy enhances the trust between the physician and patient, diagnostic accuracy, adherence to treatment and healthy lifestyle recommendations, and positively affects patient health.[5,6] There is also evidence that empathy can improve patient satisfaction regardless of outcome.[7] There are many studies that show that an empathic approach to the patient improves physical and psychosocial health outcomes.[8-12] In the study of van Dulmen et al,[9] it was shown that an empathic approach reduces patients' anxiety and distress. Patients discuss their psychosocial problems more easily with an empathic physician. Many patients recommend an

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empathetic physician to others.[2,10] Hojat et al[11] found that physicians' empathic approach positively affected clinical outcomes in patients with diabetes. In a study conducted by Dambha-Miller et al[12] in primary care, higher empathy scores were found to be associated with a lower risk of a cardiovascular event and lower risk of all-cause mortality.

An empathic approach also provides benefits for physicians. The increase in satisfaction and treatment compliance of the patients increases the professional and job satisfaction of the physician and reduces the feeling of burnout.[12,13]

Evaluating the empathy level of tomorrow's physicians is important in emphasizing this issue in medical education. Therefore, in recent years, an increasing number of studies have been conducted on the evaluation of the empathy level in medical students and the factors affecting empathy level.[14]

In studies conducted in different countries, it has been found that empathy decreases during medical education.[15-27] However, there are also studies[28-36] showing that empathy has not changed, and there are also studies[37-43] showing that empathy increases as the students progressed. In most studies, the empathy level of medical students was generally measured by the Jefferson Empathy Scale Student Version (JSPE-S). In some studies, the JSPE-S was used along with different scales.[23,25,29,32,33] In one study, the JSPE-S and Toronto Empathy Questionnaire (TEQ) were used together.[23] In 2 studies, only the TEQ was used.[31,35]

The primary aim of this study was to evaluate the level of empathy of medical students in all years of medical training at the Akdeniz University, Faculty of Medicine, using 2 different instruments: the JSPE-S (for clinical empathy level in medical students) and the TEQ (for general empathy level in medical students), and whether the empathy level changed during the education process. There are 2 main hypotheses of this study:

Hypothesis 1: There is a correlation between the general empathy level and clinical empathy level of the students.

Hypothesis 2: During the education process, there will be a change in the empathy levels of medical students.

The study was approved by the Akdeniz University Faculty of Medicine Clinical Research Ethics Committee with the decision dated October 19, 2018, and numbered 70904504/482.

Materials and Methods

This cross-sectional descriptive study was conducted in the 2017-2018 academic year. Medical education in Turkey takes 6 years, including 3 years of preclinical training and 3 years of clinical training. The sixth year (final year) is called the "candidate doctoral period or internship." In Akdeniz University, Faculty of Medicine, in the first 3 years of preclinical medical education, problem-based learning activities are carried out alongside theoretical classroom lectures. During this period, students take theoretical courses on the patient-physician relationship and patient-centered consultation where the importance of an empathic approach to patients is emphasized. In the fourth year, the students start their clinical education, and they continue their education with rotations in different clinical specialties in their fourth and fifth year. During these 2 years, students are not given primary responsibility for the patients. Students are given primary responsibility for the patients during the internship period.

The population of the study consisted of all students in the 6-year program of the Akdeniz University Faculty of Medicine. There were 2057 students in Akdeniz University Faculty of Medicine during the study period. An equal number of students were recruited for each year (total 300 students). We explained the purpose of the study to the students and also informed them that participation was voluntary and anonymous. The first 50 students who gave written consent to participate were included in the study. After obtaining consent, a questionnaire consisting of a sociodemographic data form, the TEQ, and Jefferson Scale of Physician Empathy Student Version (JSPE-S) was given to the students.

Scales Used in the Study

1. Sociodemographic Information Form is a 14-question form that asks for data such as age, gender, education year, long-term disease history in himself/herself and first-degree relatives, postgraduate specialty preferences, and whether he or she chooses the medical faculty voluntarily.
2. TEQ was developed by Spreng et al[44] to professionally quantify and consistently assess empathy. The TEQ is a 16-item 5-point Likert-type self-report questionnaire that assesses the behavioral, emotional, cognitive, and physiological aspects of empathy in individuals in a broad spectrum. An adaptation into Turkish and a validity and reliability study was conducted by Totan et al.[45] The Turkish version of the questionnaire consists of 13 items, 5 formulated positively and 8 negatively, and the respondents were asked to state how often they felt, thought, or behaved according to the statements according to a 5-point Likert scale from 1 (*not suitable at all*) to 4 (*fully suitable*). The total possible score ranged from 13 to 65, with a higher score indicating a higher level of empathy. The Cronbach-alpha for the entire scale TEQ for Turkish version was 0.79.
3. Student Version of the Jefferson Scale of Physician Empathy (JSPE-S) was devised by Hojat et al[4] in 2001, which was specifically created for the context of patient care and medical education. JSPE-S is a 20-item scale used to measure empathy in medical students. The scores obtained for each question will be added, resulting in a final score pertaining to the individual's empathy. The scale has been validated in many different languages in medical schools located in more than 30 countries.[46] The JSPE-S was adapted to the Turkish population by Gonullu Erden and Gokmen.[22] The Cronbach's-alpha for the entire scale was 0.83 for

Table 1. Sociodemographic data and some characteristics of medical students.

		NUMBER OF STUDENTS (N)	PERCENT (%)
Medical school year	1st year	50	16.7
	2nd year	50	16.7
	3rd year	50	16.7
	4th year	50	16.7
	5th year	50	16.7
	6th year	50	16.7
Gender	Female	176	58.7
	Male	124	41.3
The history of long-term illness in himself/herself	Yes	28	9.3
	No	272	90.7
A history of long-term illness in first-degree relatives	Yes	158	52.7
	No	142	47.3
A history of a negative life event in the last year	Yes	93	31.0
	No	207	69.0
Did he choose medical school voluntarily?	Yes	270	90.0
	No	30	10.0
Choice of medical specialty	Clinical medicine[a]	154	51.3
	Surgical medicine[b]	106	35.3
	Basic medicine[c]	24	8.1
	Emergency medicine	16	5.3

[a]Clinical medicine: for example, family medicine, pediatrics, internal medicine, and dermatology.
[b]Surgical medicine: for example, example, general surgery, pediatric surgery, orthopedics, and anaesthesiology.
[c]Basic medicine: for example, histology, pharmacology, and pathology.

Turkish version. The original questionnaire was a 7-point Likert-type scale, but the Turkish version is used as a 5-point Likert-type scale. Questions are scored between 1 and 5 according to the scoring criteria: "strongly disagree" = 1, "disagree" = 2, "no idea" = 3, "agree" = 4, "strongly agree" = 5. The first 10 items are evaluated positively and the last 10 items are reverse scored. The total score interval is 20 to 100, and higher scores show a higher empathy level.

Statistical Analyses

The statistical analysis was carried out using the IBM-SPSS, version 23, for Mac OS (IBM Corp, Released 2015). A P value $< .05$ was used to assess the significance for all statistical analyses. To define the sample, variables were expressed as the mean ± standard deviation, median (minimum-maximum), and categorical variables such as number and percentage. Differences between groups were analyzed using the student t-test, Mann–Whitney U test, analysis of variance (ANOVA) or Kruskall Wallis for independent samples. Correlation analyses were performed using Pearson's and Spearman's correlation, and regression analyses were performed when necessary.

Results

Three-hundred students were included in the study. There were 176 females (58,7%) and 124 males (41,3%). The mean age of the students was 21.52 years with a standard deviation of 2.17. The rate of participants with long-term disease was 9.3% and the rate of participants with a history of long-term disease in their first-degree relatives was 52.7%. The rate of participants who experienced negative life events in the past year was 31%. Ninety percent of the students reported that they chose the medical school voluntarily. More than half of the participants reported their willingness to pursue a career in clinical medicine in the future. The sociodemographic data of the medical students are shown in Table 1.

The mean TEQ score of the students was 52.8 ± 6.1, and the JSPE-S score was 80.3 ± 9.2. Table 2 shows the TEQ and JSPE-S scores of the medical students according to their year

Table 2. TEQ and JSPE-S scores of the medical students according to years.

	TEQ (MIN 13, MAX 65)			JSPE-S (MIN 20, MAX 100)		
	M ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE	*M* ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE[a]
1st year	52.9 ± 5.5	53 (33-64)	>.05	80.9 ± 8.4	80 (60-100)	<.05
2nd year	52.9 ± 6.1	52 (40-65)		81.5 ± 9.8	82 (56-97)	
3rd year	53.8 ± 6.6	54 (28-65)		**83.1 ± 8.0**	82 (65-99)	
4th year	54.0 ± 6.4	55.5 (36-65)		81.2 ± 9.3	81.5 (61-98)	
5th year	52.7 ± 6.3	53.5 (34-63)		78.3 ± 9.1	78 (57-95)	
6th year	50.7 ± 5.3	51 (31-64)		**77 ± 9.3**	78 (54-100)	
Total score	52.8 ± 6.1	53 (28-65)		80.3 ± 9.2	80 (54-100)	

Abbreviations: TEQ, Toronto Empathy Questionnaire; JSPE-S, Student Version of the Jefferson Scale of Physician Empathy; *M*, sample mean; *SD*, standard deviation.
[a]ANOVA.

Table 3. TEQ and JSPE-S score distributions according to some characteristics of the students.

	TEQ			JSPE-S		
	MEAN ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE	*M* ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE
Gender*						
Female	54.1 ± 5.3	55 (33-65)	**<.05**	81 ± 8.4	80 (54-99)	>.05
Male	51 ± 6.7	51 (28-65)		79.3 ± 10.1	79 (56-100)	
The history of long-term illness in himself/herself[a]						
Yes	53.2 ± 6.5	53 (39-65)	>.05	79.5 ± 10.3	78.5 (60-97)	>.05
No	52.8 ± 6.1	53 (28-65)		80.4 ± 9.1	80 (54-100)	
Did he choose medical school voluntarily?[a]						
Yes	53.2 ± 5.8	53 (31-65)	**<.05**	80.6 ± 8.9	80 (54-100)	>.05
No	49.5 ± 7.4	49.5 (28-65)		77.9 ± 11.1	78 (57-100)	
A history of long-term illness in first-degree relatives[a]						
Yes	52.4 ± 6	52 (34-65)	>.05	80.4 ± 10	80 (54-100)	>.05
No	53.3 ± 6.2	53.5 (28-65)		80.2 ± 8.2	80 (58-100)	
A history of a negative event in the last year[a]						
Yes	53.1 ± 5.9	53 (40-65)	>.05	81.6 ± 9.8	81 (56-100)	>.05
No	52.7 ± 6.2	53 (28-65)		79.7 ± 8.8	80 (54-100)	

Abbreviations: TEQ, Toronto Empathy Questionnaire; JSPE-S, Student Version of the Jefferson Scale of Physician Empathy; *M*, sample mean; *SD*, standard deviation.
[a]*T* test.

in medical school. The TEQ scores of students increased until their fourth year, and then decreased. The highest score is in the fourth year. However, the difference between the years was not statistically significant ($P > .05$).

The JSPE-S scores of the students increased in the first 3 years and then decreased. Third-year medical students had the highest empathy scores; whereas the sixth-year medical students had the lowest empathy scores. In the paired comparison of the students' JSPE-S scores, the 2 groups with a statistically significant difference were the third-year and sixth-year students. The third-year students' JSPE-S scores were significantly higher than the sixth-year students' JSPE-S scores ($P < .05$).

Table 4. The distribution of TEQ and JSPE-S scores according according to the preference of students for future medical speciality as a career.

MEDICAL SPECIALTY	TEQ			JSPE-S		
	M ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE[a]	*M* ± *SD*	MEDIAN (MIN-MAX)	*P* VALUE
Clinical medicine	53.6 ± 5.5	54 (36-65)	>.05	80.7 ± 8.8	80 (54-99)	>.05
Surgical medicine	52.5 ± 6.4	53 (31-65)		80.2 ± 9.6	80 (56-100)	
Basic medicine	50.8 ± 7.4	51 (28-65)		80.4 ± 9.3	78.5 (65-96)	
Emergency medicine	50.6 ± 7.1	49.5 (33-61)		77 ± 9.3	78 (57-89)	

Abbreviations: TEQ, Toronto Empathy Questionnaire; JSPE-S, Student Version of the Jefferson Scale of Physician Empathy; *SD*, standard deviation.
[a]ANOVA.

According to these results, the general empathy level of the students was highest in the fourth year, and there was a slight nonstatistically significant decrease in the following years. Clinical empathy level was the highest in third year, and there was a statistically significant decrease by sixth year. This shows us that while the general empathy level of students remained relatively constant, with only slight change in their clinical empathy level during the education process.

The TEQ and JSPE-S score distributions according to the characteristics of the students are shown in Table 3.

In the study, for TEQ, the mean empathy score of women was 54.1 ± 5.3, while the empathy score of men was 51 ± 6.7; the difference was statistically significant. For JSPE-S, women's empathy score was 81 ± 8.4 while the men's empathy score was 79.3 ± 10.1, and the difference was not statistically significant.

In this study, the mean empathy scores for the 4 main specialty groups which students reported they intend to apply to after graduation were compared. Students intending to follow the clinical specialty had higher empathy scores, compared with those intending to follow a different specialty. However, the score difference between specialties was not statistically significant ($P > .05$). Table 4 shows the distribution of the TEQ and JSPE-S scores according to the students' future medical specialty preference.

Discussion

The presence of empathy in the patient-physician relationship is associated with many positive results for both the physician and the patient. The importance of providing an empathic perspective to students in the core education programs of medical faculties is emphasized.[47] Likewise, the core education program of Akdeniz University Faculty of Medicine aims to provide students with an empathic perspective.

Understanding and assessing the level of empathy of medical students during medical education is an important issue addressed during medical training. This study provided a cross-sectional empathy profile of medical students during medical training in the faculty of Medicine in Akdeniz University. In this study, the empathy level of the students was evaluated with 2 different instruments: the JSPE-S for clinical empathy level, and the TEQ for general empathy level.

The maximum score in the Turkish version of TEQ was 65. In this study, the average TEQ score was 52.8 ± 6.1/65. We found 3 studies conducted using the TEQ in the literature. In the study conducted by Youssef et al[23] in the Caribbean, the mean TEQ score of the students was 47.06 ± 11.65/64; in the study conducted by Haque et al[31] in Malaysia, the average TEQ score of the students was 45.83 ± 6.03/64, and in the study conducted by Stefanovic et al[35] in Serbia, the average TEQ score of the students was found to be 45.23 ± 7.02/64. These scores are lower than the scores of our students. This may be due to differences in the curricula of medical schools and cultural differences between countries.

In this study, there were fluctuations in TEQ scores as the education process progressed, but there was no statistically significant difference. While similar results have been reported in studies of Haque et al[31] and Stefanovic et al,[35] Youssef et al[23] reported that TEQ empathy scores decreased significantly as the education process progressed.

In this study, the clinical empathy level of the students was evaluated with a 5-point Likert-type JSPE-S. The average score of all students was 80.3 ± 9.2/100. A 7-point Likert-type JSPE-S (maximum score is 140) was used in studies conducted in other countries. To compare the results of the study, the score in the study was converted to the score to be obtained from the 7-point Likert-type scale and calculated as approximately 112/140 by simple proportion calculation.

The highest mean JSPE-S score (121/140) was found by Guilera et al[29] in a study conducted with medical students in Spain. The lowest JSPE-S score was 82.94/140 which was found by Rafati et al[20] in Iran. Some studies evaluating the empathy level of medical students and their results are given in Table 5.

According to the JSPE scores, empathy levels are evaluated in 3 groups. Scores between 47 and 105 are considered as a low empathy level, 106 to 120 as a moderate empathy level, and 121 to 140 as a high empathy level.[29] When the results of the studies were examined, it was seen that the average empathy scores of medical students did not reach a high empathy level in countries except Spain.

In this study, the average empathy score of students (112/140) was at the moderate empathy level. This score was

Table 5. Some studies and results with medical students on empathy.

AUTHORS (YEAR)	COUNTRY	N	INSTRUMENT	DESIGN	LEVEL	MEAN EMPATHY SCORE/MAX SCORE	GENDER DIFFERENCES	CONCLUSION
The present study	Turkey	300	TEQ and JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th, 6th year	TEQ: 52.8/65; JSPE-S: 80.3 ± 9.2/100	TEQ: female > males; JSPE-S: Female students scores were slightly higher than males; but no statistically significant differences	TEQ scores of students increased up to fourth year and then decreased. However, the difference between the years was not statistically significant. The third-year students' JSPE-S scores were significantly higher than the sixth-year students' JSPE-S scores ($P < .05$)
Chen et al[15]	USA	658	JSPE-S	Cross-sectional	Incoming, 1st, 2nd, 3rd, 4th year	114.82/140	Female > males	Empathy scores of students in the preclinical years were higher than in the clinical years
Chen et al[16]	USA	1162	JSPE-S	Longitudinal cohort	Preclinic ve clinic	Not reported	Female > males	Empathy scores of students in preclinical years were higher than in clinical years
Hojat et al[17]	USA	456	JSPE-S	Longitudinal	Five moments: 1st, 2nd, 3rd, 4th, 5th year.	Pre:114/140 Post:111/140	Female > males	A significant decline in empathy occurs during the third year of medical school
Li et al[18]	China	442	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th, 6th, 7th year	104.2/140	Female > males	Empathy scores of students in the preclinical years were higher than in the clinical years
Shashikumar et al[19]	İndia	488	JSPE-S	Cross-sectional	1st, 3rd, 5th, 7th, 9th semestre	102.91/140	Female > males	The progressive decline in empathy levels with years
Rafati et al[20]	Iran	373	JSPE-S	Cross-sectional	Preclinic > clinic	82.94/140	Female > males	The overall rate of empathy of the students in the basic sciences period was more than that of the clinical study period
Igde and Sahin[21]	Turkey	511	JSPE-S	Cross-sectional	1st, 2nd, 3rd year	109.44/140	Female > males	Empathy scores reduce with educational level
Gonullu Erden and Gokmen[22]	Turkey	1257	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	Not reported.	Female > males	Medical student's empathy declines as the year of study gets higher
Youssef et al[23]	Caribbean	669	JSPE-S and TEQ	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	TEQ: 47.06/65 JSPE-S: 106.00/140	Female > males	There was a significant correlation between the JSPE-S and TEQ, both scales indicating a decline in medical student empathy scores over time
Ren et al[24]	Singapore	881	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	112.18/140	Female > males	Empathy declined significantly between preclinical and clinical years

(Continued)

Table 5. (Continued)

AUTHORS (YEAR)	COUNTRY	N	INSTRUMENT	DESIGN	LEVEL	MEAN EMPATHY SCORE/MAX SCORE	GENDER DIFFERENCES	CONCLUSION
Park et al[25]	Korea	2692	JSPE-S PSS, SPSS	Cross-sectional	1st, 2nd, 3rd, 4th year	105.47/140	Female > males	Empathy scores showed a declining trend as the students progressed
Nair et al[26]	India	437	JSPE-S	Cross-sectional	1st, 2nd, 3rd year and internship	100.5/140	Female > males	Empathy scores showed a declining trend as the students progressed
Huang et al[27]	China	1690	JSPE-S	Cross-sectional	Basic science (1st, 2nd. years), clinical (3rd, 4th years) intership (5th year)	102.73/140	Females > males	The mean empathy scores declined from basic science course to the internship year of medical school
Tavakol et al[28]	UK	853	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	110/140	Females > males	There was no significant difference between the mean empathy scores across year groups
Guilera et al[29]	İspanya	99	JSPE-S, IRI, EQ, SQ	Follow-up study and feedback	Mix	121/140	There were no statistically significant gender differences in the SPE scores	Most of the medical students had a good level of empathy and empathy was unchanged throughout the follow-up
Alcorta-Garza et al[30]	Mexico	1022	JSPE-S	Cross-sectional	1st, 3rd, 5th year	110/140	Female > males	Not reported any difference between classes
Haque et al[31]	Malaysia	224	TEQ	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	45.79/65	Female > males	There no statistically significant differences the TEQ score between the years
Moreto et al[32]	Brazil	296	JSPE-S IRI EQ	Cross-sectional	Basic Group (1st, 2nd), Clinical Group (3rd, 4th) Clerkship Group (5th and 6th	114/140	Women > males in both scales. Only in IRI-Brazilian version cognitive dimension was there no difference between genders	There is no statistically significant differences in JSPE-S score between the different years
Quince et al[33]	UK, New Zealand, and Ireland		JSPE-S, IRI	Cross-sectional	First/second year and Final year	113.03/140	Female > males	There no statistically significant differences the JSPE-S score between first year and final year
Hegazi et al[34]	Australia	404	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	109.07/140	Females > males	There were no significant differences in the total empathy scores in relation to the year of medical training
Stefanovic et al[35]	Serbia	363	TEQ	Cross-sectional	First and final year	45.23/65	Females > males	First-year students and final-year students did not differ in their level of empathy

(Continued)

Table 5. (Continued)

AUTHORS (YEAR)	COUNTRY	N	INSTRUMENT	DESIGN	LEVEL	MEAN EMPATHY SCORE/MAX SCORE	GENDER DIFFERENCES	CONCLUSION
Baykan and Naçar[36]	Turkey	151	JSPE-S	Longitudinal	1,3,6	102.44/140	No statistically significant differences by sex	There was no significant decline of empathy scores
Wen et al[37]	China	902	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th year	109.60/140	Females > males	There were statistically significant increase in empathy scores among medical students in in the process of medical education
Magalhaes et al[38]	Portugal	476	JSPE-S	Cross-sectional	First year and final year	112.03/140	Females > males	The empathy scores of students in the final year were higher than first-year students
Duarte et al[39]	Portugal	208	JSPE-S	Cross-sectional	1st, 3rd, 6th year	114.40/140	Females > males	Empathy increases over the course, but with no statistically significant differences
Kataoka et al[40]	Japan	400	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th, 6th year	104.3/140	Females > males	The mean empathy scores increased from the first year to the last year of medical school
Hong et al[41]	Korea	133	JSPE-S	Cross-sectional	1st, 2nd, 3rd year	110.09/140	No statistically significant differences by sex	The mean empathy scores increased from the first year to the third year of medical school
Chatterjee et al[42]	India	418	JSPE-S	Cross-sectional	1st, 3rd, 5th, 7th semestres	96.01/140	Females > males	The empathy scores tended to decline initially and then rebound over time
Mostafa et al[43]	Bangladesh	426	JSPE-S	Cross-sectional	1st, 2nd, 3rd, 4th, 5th year	110.41/140	Females > males	Level of empathy declines in preclinical year followed by a rise of empathy scores in clinical year

Abbreviations: TEQ, Toronto Empathy Scale; JSPE-S, Student Version of the Jefferson Scale of Physician Empathy; IRI, Davis's Interpersonal Reactivity Index; PSS, Perceived Stress Scale; MPSS, Multidimensional Scale of Perceived Social Support.

lower than the scores of Guilera et al[29] in Spain, Chen et al[15] and Hojat et al[17] in the USA, Moreto et al[32] in Brazil, Quince et al[33] in UK, and Duarte et al[39] in Portugal. It was close to the scores obtained from the studies of Ren et al[24] in Singapore, Tavakol et al[28] in UK, and Magalhaes et al[38] in Portugal. In this study, the mean score was higher than the mean scores of 3 studies in India,[19,26,42] 2 studies in Korea,[25,41] one study in Iran,[20] one study in Australia,[34] one study in Japan,[40] one study in the Caribbean,[23] and one study in Bangladesh.[43]

These results show that our students' empathy score is closer to the students' empathy score in Western countries rather than Eastern countries. This may be because medical students and their families have adopted the Western way of life rather than the Eastern way of life. In Turkey, most medical students are the children of families that have adopted the Western-type lifestyle. In addition, an increasing access to information and social media affects the students' lifestyle and thinking toward the Western type.

In Turkey, studies in different medical schools were carried out using a JSPE-S. The mean JSPE-S scores were 109.44/140[22] and 102.44/140.[36] These scores are lower than our study. The difference is thought to stem from the different curriculum in different medical schools in Turkey.

When the studies conducted in different countries were reviewed; it was found that the empathy level of medical students decreased as the education process progressed in 13 studies.[15-27] This decrease was shown in both cross-sectional studies[15,18-27] and longitudinal studies.[16,17]

In 2 cross-sectional studies[24,25] conducted in different medical schools in Turkey, students' empathy scores decreased as they progressed. In a longitudinal study conducted by Baykan and Naçar,[36] contrary to our study, it was found that the level of clinical empathy of the students did not change they progressed.

Hojat, one of the developers of the JSPE scales and the conductor of many studies about empathy, after reviewing other studies, considered the third year as the critical year where empathy scores started to decrease.[17] The reasons for this decrease are unrealistic expectations, loss of idealism, negative role models, lack of support, inappropriate learning environments, excessive amount of material to be learned, excessive workload, time pressure, patient factors, stress, anxiety, and a hidden curriculum. Technological changes within the health care system could probably influence the patient-physician relationship negatively and could undermine empathy.[14,17,33,48,49]

The active participation of students in patient care, and taking responsibility of patients increase their workload. Some studies show that increased workload reduces the level of empathy. In a study conducted by Neuman et al,[14] it was shown that empathy level decreased when students actively participated in patient care. In the medical school where the study was conducted, the sixth-year students were actively involved in patient care and took responsibility of patients. This may be one of the reasons for the decrease in the level of empathy in the sixth year. In addition, sixth-year students prepare for an exam for postgraduate specialization training. This situation creates stress and anxiety in students. Another reason for the decrease in empathy is thought to be the stress and anxiety brought by this specialty exam.

In studies conducted in the UK;[28] in Spain;[29] in Mexico;[30] in Malaysia;[31] in Brazil;[32] in England, New Zealand and Ireland;[33] in Australia,[34] and in Serbia,[35] it was found that the change in the scores of clinical empathy were not statistically significant as the year progressed.[38,39] In Japan,[40] Korea,[41] India,[42] and Bangladesh[49] the empathy score increased as the year progressed. Differences in empathy scores could be explained by intercultural variability among different countries.

In line with general population studies, female students recorded higher mean scores for empathy, compared with male students.[15-28,33-35,37-40,42,49] In this study, the general empathy score measured by the TEQ was found to be higher in women than men. In the context of clinical empathy, female students' JSPE-S scores were slightly higher than males, but there were no statistically significant differences.

In more studies, JSPE-S scores were not significantly associated with the students' intended specialty. In this study, the specialties were evaluated in 4 main categories: clinical medicine (internal medicine, family medicine, pediatrics, etc), surgical medicine (eg, anesthesiology, surgery, gynecology, and obstetrics), basic medicine (eg, anatomy, pharmacology, and histology), and emergency medicine specialty. In both the TEQ and JSPE-S scales, although there was no statistically significant difference between specialties, clinical medicine was associated with higher empathy scores. This was followed by surgical medicine, basic medicine, and emergency medicine.

In studies conducted Ren et al in Singapore,[24] Moreto et al[32] in Brazil, clinical medicine specialty and surgical medicine specialty were compared. The JSPE-S scores of those who preferred clinical medicine specialty were found to be significantly higher.

In studies conducted in the USA,[15,17] UK,[28] Spain,[29] Serbia,[35] and Japan,[40] students who preferred *people-oriented* specialties (eg, internal medicine, family medicine, and pediatrics) had higher empathy scores than students preferring technology-oriented specialties (eg, anesthesiology, radiology, and surgery). Significant differences in empathy levels were not found between the students who preferred people-oriented specialties compared with those who favor the technology-oriented specialties in studies conducted in Portugal.[38,39]

The results of this study and other studies support the idea that the level of empathy is effective in the selection of clinical medicine specialties where the patient-physician relationship is very important.[2,3]

It is accepted that there is a close relationship between the development of empathy and life events.[1] For this reason, it was investigated whether there was a relationship between empathy levels and "long-term illness," "first-degree relative's

illness," and "negative life events in the last year." Contrary to popular belief, there was no significant relationship between these variables and empathy scores ($P < .05$). The TEQ and JSPE-S empathy scores were higher among students who voluntarily had chosen the medical education. The difference was statistically significant at the level of general empathy ($P < .05$), but not at the level of clinical empathy ($P > .05$).

The fact that clinical empathy, which is an important element of patient—physician communication, increases patient satisfaction, reduces anxiety, and improves clinical outcomes, shows the importance of increasing empathy levels in medical students. In many studies, the low level of empathy of medical students and its decrease as their medical education progresses are of concern. Due to this concern, studies have been conducted on how to increase empathy levels in medical students. Studies have shown that effective educational interventions, targeted training programs, or medical interviews can increase empathy.[49,50]

In a review conducted by Batt-Rawden et al,[49] they found that educational interventions such as patient narrative and creative arts, writing, drama, communication skills training, problem-based learning, interprofessional skills training, patient interviews, experiential learning, and empathy-focused training can be effective in maintaining and enhancing empathy. In a study conducted by Fernndez-Olano et al,[50] they found that a 25-h theoretical/practical workshop on communication and empathy improves the level of empathy. In a study conducted by Akdeniz et al, in which sixth-grade students' perception of the educational environment in primary-care centers where empathic physicians practiced was evaluated, students stated that they learned a lot about empathy.[51]

Conclusion

Empathy is important in the physician-patient relationship and has clear benefits for the patient and the physician. As shown observed in many previous studies, this study also show that the empathy profile of students changed during the 6-year medical education. While the clinical empathy levels of medical students decreased significantly after their third year, their general empathy levels decreased less. This result shows us that we should review our medical curriculum and educational environment, spearhead initiatives, and devote more time to empathy education to prevent the decrease in empathy levels and increase empathy during medical education. The results of future research on the factors that affect the level of empathy and the attempts to increase the level of empathy in students during the education process will be useful when reconstructing the medical curriculum.

Limitations

Our study is limited by the fact that we presented cross-sectional data. Cross-sectional studies are limited to a single time point and changes over time cannot be measured. Another limitation is that our sample is drawn from one medical school. Therefore, our findings may be somewhat limited in generalizability. Finally, the instruments used were self-reporting scales. Therefore, it may be impossible to identify the extent to which findings accurately predict the students' experiences and expectations of their empathy due to social desirability and inaccurate recall.

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Author Contributions

All authors contributed equally to this work.

Ethics Approval and Consent to Participate

The study was approved by the Akdeniz University Faculty of Medicine Clinical Research Ethics Committee with the decision dated October 19, 2018 and numbered 70904504/482. All researchers have signed the declaration of Helsinki. Written consent was obtained from all participants.

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Availability of Data and Materials

The data that support the findings of this study are available from Dr Melahat Akdeniz

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