



Evaluation of Empathy and Ethical Perception Among First-Year Medical Students: A Cross-Sectional Study

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Abstract

Objective: In the early stages of medical education, establishing ethical values and an empathetic approach is essential for medical practice. This study aimed to evaluate the relationship between empathy levels and ethical perceptions among first-year medical students at a medical faculty in Türkiye and to determine the significance of this relationship while controlling for demographic variables.

Materials and Methods: This cross-sectional study was conducted using an online questionnaire including sociodemographic questions and two standardized measurement tools: the Toronto Empathy Scale (Cronbach's alpha=0.73) and the Approaches to Ethical Issues in Healthcare Scale (Cronbach's alpha=0.80). Data were analyzed using Jamovi version 2.6.44 with multiple linear regression, analysis of variance (ANOVA), Kruskal-Wallis, Mann-Whitney U, and Pearson correlation analyses. Statistical significance was set at $p<0.05$.

Results: A total of 104 students participated in the study. After data cleaning, 92 participants were included in the final analysis. Among them, 51 (55.4%) were female and 39 (42.4%) were male. A significant positive relationship was found between empathy levels and ethical perception ($r=0.444$, $p<0.001$). This relationship remained significant after controlling for demographic variables such as age, gender, number of siblings, place of birth, and housing status. Gender and family educational background had a significant effect on empathy levels, whereas no significant differences were found between empathy or ethical perception and the number of siblings, place of birth, or housing status ($p>0.05$).

Conclusion: Our findings reveal a substantial, positive association between empathy and the ability to perceive moral issues. We suggest that strengthening empathy education in the early stages of medical training may support the development of ethical values.

Keywords: Empathy, ethics, medical students, regression analysis

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INTRODUCTION

Medical education not only equips students with academic knowledge and practical skills but also emphasizes the importance of human values and virtues in professional life. Among these values, empathy and ethical perception are considered essential for establishing healthy physician-patient relationships and maintaining positive professional interactions.

Empathy can be defined as the ability to understand another person's feelings and communicate that understanding effectively. In the literature, empathy is described as a multidimensional construct consisting of cognitive and emotional components. According to Preston et al. (1), cognitive empathy refers to understanding another individual's situation, whereas emotional empathy involves emotionally responding to another person's experiences. In healthcare settings, empathy is often described as clinical empathy, a predominantly cognitive ability that enables physicians to understand patients' experiences, concerns, and perspectives and communicate this understanding effectively. Research suggests that individuals with higher levels of empathy are more likely to demonstrate altruistic behavior and a stronger motivation to help others (2). This characteristic can support physicians in addressing patients' problems more effectively. However, empathy levels may vary depending on individual, social, and educational factors and may change over time (3). Recent longitudinal and cross-sectional studies highlight that this change often manifests as a measurable decline in empathy scores, particularly as students transition from the pre-clinical phase to the clinical phase of their education (4). Therefore, various educational approaches have been developed to improve empathy skills, including structured empathy training and communication skills programs. For example, Ko et al. (5) reported that fourth-year nursing students showed significant empathic improvements after an eight-month empathy training program, and it was observed that the experimental group maintained and even enhanced these improvements at the four-week follow-up assessment.

Ethics, on the other hand, concerns the behaviors and actions individuals perform within a social context and the mental processes that guide these behaviors (6). Physicians frequently encounter ethical dilemmas related to diagnosis, treatment, and patient rights throughout their professional careers. Ethical perception is therefore considered a crucial competence that enables professionals to recognize ethical problems and make appropriate decisions during their work (7). Previous studies also indicate a strong relationship between empathy and ethical sensitivity, suggesting that empathy plays an important role in morality-based decision-making processes (8).

A study conducted among Chinese nursing students reported a significant and direct relationship between empathy and moral sensitivity. The possibility that moral sensitivity can be developed through empathy contributes to the broader idea that ethical perception of medical problems can be shaped by empathic skills (9).

In today's rapidly changing healthcare environment, physicians increasingly interact with patients from diverse cultural, religious, and social backgrounds, which requires them to address complex ethical challenges (10). Furthermore, advancing healthcare technologies introduce new ethical dilemmas. These include doctors being held accountable for outcomes despite being unable to comprehend the "black box" nature of artificial intelligence, as well as the emergence of the "problem of many hands," where accountability becomes blurred due to the involvement of numerous actors in the technology's development. Additionally, nurses are left to navigate expanding medical decision-making roles in tele-monitoring processes without adequate support (11). This highlights the need for new frameworks that emphasize a collective understanding of responsibility. Such frameworks must center on the moral virtues of both practicing healthcare professionals and the medical students who are entangled in today's circumstances as they train to become the future doctors. Empathy may play a critical role in helping medical students evaluate ethical dilemmas and make appropriate decisions on current conflicts. However, most existing studies examine empathy and ethical perception separately, and research investigating their relationship, particularly among first-year medical students, remains limited. Therefore, this study aimed to evaluate the relationship between empathy levels and ethical perception among first-year medical students at a medical faculty in Türkiye. Additionally, the study examined whether demographic factors such as gender, age, living conditions, and parental education levels were associated with empathy levels and whether the relationship between empathy and ethical perception persists after adjusting these variables.

MATERIALS AND METHODS

This cross-sectional study was conducted among 247 first-year medical students at a medical faculty in Türkiye. Participation was voluntary, and 104 students who completed the online survey administered via Google Forms were enrolled. The first section of the survey included sociodemographic questions such as age, gender, parental education level, place of residence, number of siblings, housing status, and place of birth.

Parental education levels were categorized into three groups based on the classification system used by the

Turkish Statistical Institute (TÜİK). “Low education” included individuals who were illiterate, literate without formal schooling, or primary school graduates. “Moderate education” included individuals with middle school and high school education. “High education” included individuals with tertiary education (associate degree, bachelor’s degree, or postgraduate education).

During data cleaning, 12 participants were excluded due to incomplete questionnaires or inconsistent responses. These responses were considered likely to affect the reliability and validity of the results.

In the second section, students’ empathy and ethical perception levels were assessed using the Toronto Empathy Scale (TES) and the Approaches to Ethical Issues in Healthcare Scale.

The Toronto Empathy Scale was developed by Spreng et al. (12), and its Turkish validity and reliability were established by Totan et al. (13). The scale consists of 13 items measuring cognitive and emotional empathy. It uses a 5-point Likert-type rating (1, not at all; 5, completely) with a maximum score of 65; higher scores indicate higher empathy levels. The Cronbach’s alpha value for the Turkish version was 0.73.

The Approaches to Ethical Issues in Healthcare Scale was developed by Kurt et al. (14) to evaluate ethical perception among medical students. It consists of 13 items rated on a 5-point Likert scale (1, least important/unimportant; 5, most important) with a maximum score of 65. The scale includes three subdimensions: perception of fundamental principles of medical ethics, values and standards in medical ethics, and rules and written ethical codes. The Cronbach’s alpha value was 0.805.

Potential sources of bias were considered in the study design. Since participation was voluntary, selection bias may have occurred. In addition, as the data were collected through self-reported questionnaires, response bias is possible. To reduce bias, validated standardized scales were used and the survey was conducted anonymously.

The study was approved by the Marmara University Faculty of Medicine Ethics Committee on March 21, 2025, with decision no. 09.2025.25-0256.

Statistical Analysis

Data were analyzed using jamovi software version 2.6.44 (The jamovi project, Sydney, Australia). Descriptive statistics were presented as frequency (n) and percentage (%). Outliers were removed using the interquartile range (IQR) boxplot method. Normality of continuous variables was assessed using the Shapiro-Wilk test. For comparisons between two groups, the Independent Samples *t* test was

used for normally distributed data and the Mann-Whitney *U* test for asymmetrically distributed data. For comparisons of three or more groups, Welch analysis of variance (ANOVA) and Kruskal-Wallis tests were applied, followed by post hoc analysis where necessary. The relationship between empathy (dependent variable) and ethical perception (main independent variable) was analyzed using Pearson correlation. Multiple regression analysis was performed to evaluate the combined effects of demographic factors. A correlation coefficient of $r > 0.4$ and a significance level of $p < 0.05$ were accepted.

Initially, univariate analyses were conducted to identify variables associated with the outcome. Variables considered relevant were then included in the multiple regression model.

Multicollinearity was assessed using variance inflation factor (VIF), and all VIF values were below 2, indicating no significant multicollinearity among the independent variables.

RESULTS

The mean age of participants was 19 ± 0.88 years (range, 17–21+ years) (Table 1). Among the students, 55.4% ($n=51$) were female and 42.4% ($n=39$) were male, and 2 (2.2%) did not specify sex. More than half (55.4%, $n=51$) had siblings. Most mothers (77%, $n=70$) and fathers (87.0%, $n=80$) had a high level of education (high school or higher). Additionally, 78.3% ($n=72$) of participants were born and raised in metropolitan cities. During medical education, students lived in family homes (31.5%, $n=29$), dormitories (54.3%, $n=50$), rented apartments alone (9.8%, $n=9$), or with roommates (4.3%, $n=4$).

Participants’ mean empathy score was 52.8 ± 6.10 , indicating a high level of empathy, while the mean ethical perception score was 51.1 ± 6.57 . Since both variables followed a normal distribution, Pearson’s correlation analysis was performed and revealed a significant positive relationship between empathy and ethical perception ($r=0.444$, $p<0.001$), confirming the main hypothesis of the study.

The mean empathy scores among participants were 55.2 ± 5.47 for female students and 49.8 ± 5.73 for male students. The differences in mean empathy scores between sexes were found to be statistically significant ($p<0.001$), indicating that female participants demonstrated higher empathy scores than male participants (Table 2).

Analysis of the relationship between participants’ mothers’ and fathers’ educational levels and their empathy scores showed that fathers’ educational levels followed a

Table 1. Sociodemographic characteristics of the participants.

Variable	Category	n (%)
Age, years	17	3 (3.3)
	18	22 (23.9)
	19	44 (47.8)
	20	18 (19.6)
	21+	5 (5.4)
Gender	Male	39 (42.4)
	Female	51 (55.4)
	Unspecified	2 (2.2)
Mothers' education level	Illiterate	2 (2.2)
	Literate	2 (2.2)
	Primary education	18 (19.6)
	High school	20 (21.7)
Fathers' education level	Bachelors' degree or above	50 (54.3)
	Illiterate	0 (0)
	Literate	2 (2.2)
	Primary education	10 (10.9)
Accommodation status	High school	20 (21.7)
	Bachelors' degree or above	60 (65.2)
	Dormitory	50 (54.3)
	Family home	29 (31.5)
Number of siblings	Shared apartment	4 (4.3)
	Living alone	9 (9.8)
	0	5 (5.4)
	1	51 (55.4)
Place of birth	2	26 (28.3)
	3	5 (5.4)
	4+	5 (5.4)
Place of birth	Metropolitan	72 (78.3)
	Nonmetropolitan	16 (17.4)
	Other	4 (4.3)

normal distribution, whereas mothers' educational levels did not.

Empathy scores differed significantly according to parental education level. The distribution of participants across education groups was as follows: for mothers, low

Table 2. Comparison of empathy scores by sex.

Gender	n	Mean ± SD	t	df	p-value
Female	51	55.2 ± 5.47	4.49	88	<0.001
Male	39	49.8 ± 5.73			

Note: Independent samples t test was used. Normality was assessed using the Shapiro-Wilk test and was satisfied for both groups ($p > 0.05$).

($n=22$), moderate ($n=20$), and high ($n=50$); for fathers, low ($n=12$), moderate ($n=20$), and high ($n=60$). A significant difference was found based on the mothers' education (Kruskal-Wallis, $\epsilon^2=0.109$, $p=0.007$), indicating a moderate effect size. Similarly, empathy scores varied by father's education (Welch ANOVA, $F=42.0$, $p<0.001$); post hoc comparisons indicated significant differences between the high-low and middle-low groups ($p<0.001$), while no difference was observed between the high and middle groups ($p=0.231$) (Table 3).

In the multiple linear regression analysis, empathy score was the only significant predictor of ethical perception ($B=0.474$, standard error (SE)=0.117, $\beta=0.440$, $t=4.053$, $p<0.001$). Other variables, including age, parental education level, number of siblings, gender, accommodation status, and place of birth, were not significantly associated with ethical perception $p>0.05$ for all variables). The model explained 27.6% of the variance ($R^2=0.276$) (Table 4).

DISCUSSION

The findings of this study show that first-year medical students at a medical faculty in Türkiye have relatively high levels of empathy and ethical perception. A statistically significant positive relationship was identified between these two variables, supporting the main hypothesis of the study. When demographic factors were examined, sex and parental education levels were found to have a significant effect on empathy, confirming the related subhypotheses, while other demographic variables did not produce a significant difference. The positive relationship between empathy and ethical perception remained significant even after adjustment for these significant factors.

Participants demonstrated relatively high empathy scores according to the Toronto Empathy Scale. Previous research has similarly reported that students in health-related disciplines tend to exhibit higher empathy levels than students in other fields. For instance, Wilson et al. (15) found that nursing and pharmacy students

Table 3. Comparison of empathy scores by parental education level.

Variable	Test	Statistic	p-value	Effect size	Significant pairwise comparisons
Mothers' education level	Kruskal-Wallis	$\chi^2 = 9.93$	0.007	$\epsilon^2 = 0.109$	Moderate > Low ($p=0.017$)
Fathers' education level	Welch ANOVA	$F=42.0$	<0.001	$\omega^2 = 0.471$	High > Low ($p<0.001$); Moderate > Low ($p<0.001$)

Note: The Kruskal-Wallis test showed a small-to-moderate effect size, whereas Welch ANOVA indicated a large group difference in empathy scores according to father's education level.

Table 4. Analysis of factors associated with ethical perception scores by multiple linear regression.

Predictor	B	SE	β	t	p-value
Age	-0.793	0.817	-0.1074	-0.971	0.334
Mothers' education level	-1.521	1.194	-0.2287	-1.274	0.206
Fathers' education level	1.560	1.256	0.1846	1.241	0.218
Number of siblings	0.285	0.981	0.0389	0.291	0.772
Sex					
Male vs Female	0.370	1.450	0.0563	0.255	0.799
Unspecified vs Female	5.004	4.435	0.7619	1.128	0.263
Accommodation status					
Dormitory vs Family home	-0.623	1.531	-0.0948	-0.407	0.685
Living alone vs Family home	1.599	2.430	0.2435	0.658	0.512
Shared apartment vs Family home	-2.813	3.396	-0.4283	-0.828	0.410
Place of birth					
Nonmetropolitan vs Metropolitan	1.489	1.850	0.2267	0.805	0.423
Other vs Metropolitan	2.824	3.367	0.4300	0.839	0.404
Empathy score	0.474	0.117	0.439	4.053	<0.001

Model summary: $R=0.525$, $R^2=0.276$. The model was statistically significant ($F=2.51$, $p=0.008$).

showed higher empathy scores than law students. Given that the participants in the present study were medical students, the relatively high empathy levels observed are consistent with existing literature.

Another important finding of the study was the positive and significant effect of empathy on ethical perception. Although the regression model explained 27.6% of the variance in ethical perception, the adjusted R^2 value (16.6%) suggests that some variables may have limited explanatory power relative to the sample size. This difference may indicate potential overfitting, particularly given the relatively small sample size ($N=92$) and the inclusion of multiple predictors. Future studies with larger samples may benefit from more parsimonious models

including fewer predictors to improve stability and generalizability. Despite these limitations, the findings are consistent with previous literature. Yuguero et al. (16) also reported a meaningful relationship between empathy and ethical perception. Although Can et al. (17) reported that ethical perception was not associated with empathy skills among nurses, our findings suggest that empathy positively contributes to ethical perception. Additionally, a study conducted among first-year ergotherapy students, which shares a similar limitation to ours, identified a significant and positive relationship between empathy and ethical values (18). This supports the view that empathy may play a fundamental role in the development of ethical perception and may facilitate ethical decision-making processes.

The result from the study also suggested that female participants had significantly higher empathy scores than males. Similar findings were reported in studies conducted among medical students by Akgün et al. (19) and Yuguero et al. (16). This difference has often been discussed in the literature from both biological and sociocultural perspectives, with the implication that women may be more prone to displaying emotional responsiveness and fostering closer emotional bonds with patients.

Maternal/paternal education proved to be a determining factor in empathy development. Participants whose mothers had intermediate educational levels tended to demonstrate higher empathy scores compared with those whose mothers had low educational levels. Likewise, Ekinci and Aybek (20) observed lower empathy tendencies among individuals whose mothers were illiterate. In addition, participants whose fathers had intermediate or high educational levels seemed to show higher empathy scores than those whose fathers had low educational levels, although no significant difference was observed between the intermediate and high groups. These findings imply that empathy might be shaped by the family environment and could increase with higher parental education levels.

In contrast, the number of siblings did not appear to exhibit a statistically significant relationship with empathy levels. Karabulut et al. (21) reported that medical students with a higher number of siblings tended to demonstrate higher empathy levels. Although a weak correlation was observed in the present study, it did not attain statistical significance, which might be attributed to the relatively small sample size and the homogeneity of the study population.

Ethical decision-making requires ethical perception, empathy, and objective evaluation skills, which develop through knowledge and experience (10). Therefore, understanding how empathy and ethical perception change during medical education is important. Some studies report that empathy increases during professional education, particularly among nursing students (22), whereas others have suggested a decline among medical students (23,24). Gönüllü et al. (25) also noted that certain empathy dimensions may vary across academic years. Similarly, Yuguero et al. (16) found no significant change in empathy levels among medical students but observed increases in moral reasoning and ethical perception between the first and third years.

Current literature suggests that the erosion or stagnation of such sensitivity is closely linked to the "hidden curriculum" of medical schools. In these settings, stressful organizational cultures and the prioritization of biomedical knowledge over humanistic values may lead to student adaptations such as cynicism and emotional distancing

(26). Given this challenging environment, students often perceive standard empathy training as overly "mechanical" and tend to view it as a mere mandatory "check-the-box" task that conflicts with their natural empathetic abilities (27). To mitigate this, it might be beneficial to acknowledge the "emotional capital" students initially bring, fostering a collaborative and "emotionally reflexive" practice rather than imposing standardized, repetitive patterns (27). Ultimately, for these communication skills to be genuinely adopted rather than sidelined, they likely need to be integrated as structural components of medical evaluation systems (27).

Although previous research indicates that empathy and ethical perception may change during education, studies examining how these variables are affecting each other over time remain limited. Larger and more diverse studies, particularly longitudinal and multicenter designs, are needed to determine whether the relationship observed in this study persists in later academic years.

This study had several limitations. The limited time available to distribute the survey restricted participation, and the final dataset represented less than half of the target population. In addition, 12 participants were excluded due to incomplete or inconsistent responses, which may have affected the representativeness of the sample. Voluntary participation may also have introduced volunteer bias that could influence empathy scores. The similarity of participant characteristics limited sample diversity, and the study included only first-year students from a medical faculty in Türkiye, which restricts the generalizability of the findings. Furthermore, due to the cross-sectional design of the study, causal inference is precluded; and results are interpreted as associations. Consequently, the results may primarily reflect the characteristics of first-year medical students in similar institutions. Larger multicenter studies are needed to validate these findings in broader medical student populations.

CONCLUSION

Our findings showed a significant positive correlation between empathy and ethical perception that remains significant after controlling for demographic variables. Gender and parental education were associated with empathy levels, whereas age, number of siblings, place of birth, and housing conditions were not significantly associated with empathy levels. Future studies with larger samples are needed to examine how educational level affects empathy and ethical perception in medical students. These results emphasize the importance of educational initiatives that strengthen empathy and ethical perception in medical training to support the development of compassionate and responsible physicians.

Ethical Approval: This study was approved by the Marmara University Faculty of Medicine Ethics Committee on March 21, 2025, with decision no. 09.2025.25-0256.

Informed Consent: Informed consent was obtained from all participants through an online voluntary participation form.

Peer-review: Externally peer-reviewed

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AI Use Statement: During the preparation of this work, the authors used OpenAI ChatGPT for guidance on certain analytical procedures and clarification of methodological questions. All statistical analyses and data interpretations were performed manually by the authors. DeepL was used for limited word and sentence translation, and Google Gemini was used for minor assistance in organizing and editing parts of the manuscript structure. All outputs generated by these tools were carefully reviewed and revised by the authors. The authors take full responsibility for the final content of the publication.

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