

Tıp Fakültesi 2. Sınıf Öğrencilerinde Duygu İfadesi, Empati Ve Ekip Çalışmasına Yatkinlik Arasındaki İlişki

Relationships Between Emotional Expression, Empathy, And Teamwork Tendency In Second –Year Medical School Students

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Abstract

Aim: Healthcare delivery requires teamwork, and it is essential for team members to possess strong communication skills, empathy, and the ability to express emotions. This study aimed to determine the levels of emotional expression, empathy, and teamwork tendency among second-year medical students studying at a state medical faculty in İstanbul during the 2022–2023 academic year, and to examine the relationships among these variables. Additionally, differences according to gender and students' subjective perceptions of teamwork were evaluated as secondary aims.

Methods: This descriptive cross-sectional study included second-year medical students (N=386). Data from 147 students (87 females, 60 males) who voluntarily completed an information form and three scales via Google Forms—Emotional Expression Questionnaire (EEQ), Basic Empathy Scale (BES) and Teamwork Tendency Scale (TTS)—were analyzed. Normality was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Independent samples t tests or Mann–Whitney U tests were used for two-group comparisons as appropriate. Relationships among scale scores were examined using Spearman's rho, and internal consistency was assessed using Cronbach's alpha coefficients. Statistical significance was set at $p<0.05$. Ethical approval was obtained from the İstanbul Faculty of Medicine Clinical Research Ethics Committee (March 11, 2022; No. 2022-05).

Results: The mean total scores were 71.31±9.83 for the EEQ, 58.76±4.70 for the BES, and 90.35±7.39 for the TTS. Female students had significantly higher EEQ total scores and higher scores on the “closeness” subscale compared with male students ($p<0.05$). Male students scored significantly higher on the TTS total score as well as on the “collaboration” and “high intrinsic motivation” subscales ($p<0.05$). No significant gender differences were found in empathy levels. Overall, 96.6% of students rated teamwork as important in medical practice, and 83% described themselves as prone to teamwork. Correlation analyses revealed weak but significant positive associations between the TTS total score and both the EEQ total score ($\rho=0.277$; $p<0.001$) and the BES total score ($\rho=0.273$; $p<0.001$). While no significant association was found between the EEQ and BES total scores, a weak positive correlation was observed between the EEQ total score and the cognitive empathy subscale of the BES ($\rho=0.285$; $p<0.001$).

Conclusion: The findings of this study provide guidance toward achieving national core educational goals aimed at training physicians with high levels of empathy and strong interprofessional skills. The results support the need to expand and sustain courses and practical activities designed to develop communication, empathy, and teamwork skills—integral components of medical students’ professional competencies—and to systematically integrate these activities into the early phases of medical education.

Özet

Amaç: Sağlık hizmetleri ekip çalışmasını gerektirir ve ekip üyelerinin güçlü iletişim becerilerine sahip, empatik ve duyguyu ifade edici olması büyük önem taşır. Bu çalışma, İstanbul’daki bir devlet tıp fakültesinde 2022–2023 akademik yılında öğrenim gören ikinci sınıf tıp öğrencilerinin duygu ifadesi, empati düzeyleri ve ekip çalışmasına yatkınlıklarını belirlemeyi ve bu değişkenler arasındaki ilişkileri incelemeyi amaçlamıştır. Ayrıca, cinsiyet ve öğrencilerin ekip çalışmasına ilişkin öznel algılarına göre olası farklılıkların değerlendirilmesi de çalışmanın yan amaçları arasındadır.

Yöntem: Tanımlayıcı-kesitsel tasarıma sahip

araştırmanın evrenini ikinci sınıf tıp öğrencileri ($N=386$) oluşturmuştur. Gönüllülük esasına göre Google Forms aracılığıyla uygulanan bilgi formu ile Duygu İfade Ölçeği (DİÖ), Temel Empati Ölçeği (TEÖ) ve Ekip Çalışmasına Yatkınlık Ölçeği (TÇYÖ)’ni eksiksiz dolduran 147 öğrencinin (87 kadın, 60 erkek) verileri analiz edilmiştir. Normallik Kolmogorov–Smirnov ve Shapiro–Wilk testleri ile değerlendirilmiş; iki grup karşılaştırmalarında bağımsız örneklem t testi veya Mann–Whitney U testi kullanılmıştır. Ölçekler arası ilişkiler Spearman rho katsayısı ile incelenmiş ve güvenirlik için Cronbach alfa katsayıları hesaplanmıştır. Anlamlılık düzeyi $p<0,05$ olarak kabul edilmiştir. Etik onay İstanbul Tıp Fakültesi Klinik Araştırmalar Etik Kurulu’ndan alınmıştır (11.03.2022; 2022-05).

Bulgular: Katılımcıların DİÖ toplam puan ortalaması 71,31±9,83; TEÖ toplam puan ortalaması 58,76±4,70 ve TÇYÖ toplam puan ortalaması 90,35±7,39’dur. Kadın öğrencilerin DİÖ toplam puanları ve “yakınlık” alt boyutu erkek öğrencilere göre daha yüksek bulunmuştur ($p<0,05$). Erkek öğrenciler ise TÇYÖ toplam puanı ile “işbirliği” ve “içsel motivasyon” alt boyutlarında daha yüksek puan almıştır ($p<0,05$). Empati düzeylerinde cinsiyete göre anlamlı bir fark saptanmamıştır. Öğrencilerin %96,6’sı ekip çalışmasını tıbbi uygulamada önemli olarak değerlendirirken, %83’ü kendisini ekip çalışmasına yatkın olarak tanımlamıştır. Korelasyon analizinde TÇYÖ toplam puanı ile DİÖ toplam puanı ($\rho=0,277$; $p<0,001$) ve TEÖ toplam puanı ($\rho=0,273$; $p<0,001$) arasında pozitif ancak zayıf düzeyde ilişkiler saptanmıştır. DİÖ ile TEÖ toplam puanları arasında anlamlı bir ilişki bulunmazken, DİÖ toplam puanı ile TEÖ bilişsel empati alt boyutu arasında zayıf pozitif ilişki belirlenmiştir ($\rho=0,285$; $p<0,001$).

Sonuç: Bu çalışmanın bulguları, yüksek empati düzeyine ve güçlü meslekler arası becerilere sahip hekimler yetiştirilmesine yönelik ulusal temel eğitim hedeflerine ulaşılması açısından yol gösterici niteliktedir. Tıp öğrencilerinin mesleki yeterliliklerinin ayrılmaz bir parçası olan iletişim, empati ve ekip çalışması becerilerinin geliştirilmesine yönelik ders ve uygulamaların yaygınlaştırılması, sürekliliğinin sağlanması ve tıp eğitiminin erken evrelerine sistematik biçimde entegre edilmesi gerektiğini desteklemektedir.

INTRODUCTION

According to the patient-centered approach, to provide high-quality medical care in medical education, not only psychomotor skills but also communication, teamwork and emotional management skills need to be acquired (1). These skills contribute to increased patient satisfaction and trust and better diagnosis and treatment compliance (2,3). It has also been suggested that the quality of patient care can thus be increased and that workload problems that cause burnout in healthcare professionals can be reduced (4).

Medical students may encounter both positive (such as pride in professionalism) and negative (such as witnessing a patient's suffering or death) emotional situations in medical environments (5). It is important for individuals to understand their emotions and express these emotions in words to live in harmony with their environment. Expressing emotions is considered a component of emotional intelligence (EI). EI refers to the ability to understand, express, control and regulate emotions (6). In a meta-analysis study, it was reported that people who are aware of their emotions and can express and manage them are more successful in teamwork and exhibit higher team cohesion (7). It has been reported that health professionals need to have a certain level of emotional intelligence and interpersonal skills to specialize in defined competency areas (8, 9). It has been stated that empathy and teamwork form the basis of these interpersonal skills (8).

Empathy is the ability to understand and share the emotions of another person. It is a multidimensional construct that includes both cognitive and affective elements. In the context of healthcare, empathy is defined as "a predominantly cognitive (as opposed to an affective) attribute that involves understanding (rather than feeling) of a patient's concerns, experiences, pain, and suffering combined with a capacity to communicate this understanding and an intention to help" (10; pp:6). Empathy is beneficial not only for patients but also for healthcare professionals. Prior studies have demonstrated a positive association between empathy and mental well-being, and a negative association between empathy and psychological distress among medical practitioners (11,12). Moreover, a prospective longitudinal study conducted with internal medicine residents showed that declining empathy was

significantly associated with a higher likelihood of subsequent self-reported medical errors (13). Empathy is a skill that can be cultivated; however, it is widely acknowledged that medical curricula do not place sufficient emphasis on its development.

It is important for medical students to acquire emotional skills to protect their own health, express and control their emotions, and develop teamwork with their colleagues. In recent years, teamwork has become an important focus in the field of health. The driving force of this new interest in teamwork is the Institute of Medicine (IOM) report on preventable medical errors titled "To Err Is Human: Building a Safer Health System" (14). This report emphasized that most preventable medical errors are the result of dysfunctional or nonexistent teamwork or communication problems.

Teamwork involves behaviors, cognitions, and attitudes beyond knowledge and skills. It is the ability to collaborate, communicate, anticipate needs, and build trust for coordinated action (15). Each team member is expected to anticipate others' needs, adapt to changes, and share a common understanding of procedures (16). Many medical schools today have added teamwork skills to their learning objectives as one of the basic skills that students must acquire before graduation (17-19). However, medical students' perceptions of teamwork are mixed. Physicians, who act as the "most powerful" and often "the patient's owner" in classical treatment institutions, are seen as independent decision-makers who work alone and are trained to assume full responsibility (19). This may also affect their predisposition to teamwork. Previous studies have shown that factors such as gender, medical specialty, and experience affect team member perceptions (19-21). For example, one study reported that women are better team workers than men are, whereas men score higher on leadership (20). Emotional intelligence, empathy, and effective communication are also important in successful teamwork (8-10, 19-21).

The aim of this study was to determine the emotional expression, empathy and teamwork predispositions of 2nd-year medical students at the beginning of their education and to examine the relationships among them. It also aimed to examine the differences according to gender and personal perceptions of teamwork (such as feeling predisposed and giving importance). The study

sought answers to the following questions among 2nd-year medical students:

- 1- What are the scores for emotional expression, empathy and teamwork tendency?
- 2- Do emotional expression, empathy and teamwork tendency scores differ according to gender and personal perceptions of teamwork (such as feeling prone and caring)?
- 3- Is there a relationship between teamwork tendency and emotional expression and empathy levels?

METHODS

Study Population

The population of this descriptive cross-sectional study consisted of second-year students studying at a state medical faculty in İstanbul from the 2022-2023 academic year (N: 386). Only second-year students were included based on methodological considerations, as interpersonal competencies—such as emotional expression, empathy, and teamwork—are still in an early stage of development at this point in medical training and have not yet been shaped by clinical experience. This allowed for a more homogeneous sample for assessing baseline levels of these skills while minimizing potential confounders related to clinical stressors or patient-care responsibilities. The information form and three scales adapted to Turkish were given to the entire population and were asked to fill out on a voluntary basis. The responses of 147 participants (87 females; 60 males) who completed all forms in full were analyzed.

Procedure

This study was conducted prior to the Teamwork Practice course, which is part of the spring semester curriculum for second-year students at the İstanbul Faculty of Medicine. The study employed a convenience sampling method and participation was voluntary. The scales to be used in the study were prepared in the format of an online measurement tool and uploaded to the Google Forms platform, and this link was sent to the student representatives of Term 2. The student representatives shared the link by announcing it to the students via the WhatsApp term group. Before participating in the study, a consent form was uploaded to the Google Forms platform. This form explained who was conducting the study, its purpose, that participation

was voluntary, that their information would be kept confidential, that no personal data would be collected, and that they could withdraw at any time. Volunteer participants were asked to read and approve the form before proceeding to the survey questions. The students were allowed to complete the scales only after providing their approval. To prevent the form from being completed more than once by the same student, they were asked to write their school numbers on the survey form so that duplicate responses would not be evaluated. Ethical approval was given by the İstanbul Faculty of Medicine Clinical Research Ethics Committee (Date:11/03/ 2022; No: 05).

Instruments

In this study, Turkish versions of three validated scales were used, in addition to the information form created by the researchers.

Information Form

In addition to demographic questions such as age and gender, the information form included two questions asking students to evaluate their own thoughts on teamwork on a 5-point Likert scale. These questions were as follows:

1- How important do you think teamwork is in medical practice? (1=very unimportant, 5=very important)

2- How would you describe yourself in terms of your tendency to teamwork? (1 = very little; 5 = very much)

Emotional Expression Questionnaire (EEQ)

The Emotional Expression Questionnaire (EEQ) was developed by King and Emmons in 1990 (22) and was adapted to Turkish by Kuzucu (2011). The scale determines at what level “positive,” “negative” and “closeness” feelings are expressed in interpersonal relationships and individually, verbally, or nonverbally. It is a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree), and some items are reverse scored. The total score is obtained by adding the score from each item on the scale. A high score indicates high expression of emotion (23).

Basic Empathy Scale (BES)

The basic empathy scale (BES) was developed by Jolliffe and Farrington in 2006 (24) to measure both cognitive and affective empathy levels and was adapted to Turkish by Topçu et al. (2010). The scale consists of two subscales titled “cognitive empathy”

and “emotional empathy”. It is a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree), and some items are reverse scored. The total score is obtained by adding the score from each item on the scale. A higher score on the scale indicates a higher level of basic empathy (25).

Teamwork Tendency Scale (TTS)

The Teamwork Tendency Scale (TTS) was developed by Tuncer (2008) to measure the characteristics required for effective teamwork (26). Douglas McGregor’s model of characteristics required for effective teamwork was taken into account in the development of the scale. The scale consists of 7 sub-dimensions. These sub-dimensions can be listed as follows: a) trust, b) problem diagnosis and analysis, c) responsibility, d) collaboration and teamwork, e) training and guidance, f) high intrinsic motivation and g) leadership. It is a 5-point Likert type (1 = not at all suitable, 5 = completely suitable), and some items are reverse scored. Higher scores on the scale indicate higher levels of teamwork tendency.

Statistical Analysis

Statistical analyses were performed via SPSS, version 29.0.0.0. Descriptive statistics for continuous variables were arithmetic means, standard deviations, medians, minimum and maximum values, and frequencies and percentages for categorical variables. First, the Kolmogorov-Smirnov and Shapiro-Wilk tests were used to

examine whether all continuous variables, including those in subgroups, were normally distributed. Independent two-group comparisons of normally distributed variables were performed via t tests, and the Mann-Whitney U test was used for nonnormally distributed variables. Since the scores did not have a normal distribution, the relationships between scale scores were investigated via the Spearman rho coefficient. The Spearman rho coefficient can take values between -1 and +1, and the relationship becomes weaker as it approaches 0, whereas the strength of the relationship increases as it approaches 1 (-1 or +1) (27). Validity and reliability analyses were performed for the scales and their sub-dimensions, and Cronbach’s alpha coefficients were calculated. A value between 0.80–1.00 is considered high reliability, 0.60–0.80 is considered reliable, 0.40–0.60 is considered low reliability, and 0.00–0.40 is considered unreliable. In all analyses, the significance level was set at $p < 0.05$.

RESULTS

Descriptive Analysis

A total of 59.2% (n=87) of the participants were female, and 40.8% (n=60) were male. The mean age was also 20.39 ± 0.64 years (20.39 ± 0.62 years for females and 20.38 ± 0.67 years for males).

Descriptive statistics for the total scores and subscales of the applied scales are given in Table 1.

Table 1. Descriptive statistics of students (n=147) regarding total scale and subscale scores of EEQ, BES and TTS

	Mean	SD	Median	Min- Max
EEQ				
Total score	71.31	9.83	72.00	47- 98
Positive emotional expression	24.40	4.51	24.00	12- 35
Negative emotional expression	18.37	3.69	18.00	10- 28
Closeness emotional expression	28.54	5.51	29.00	16- 41
BES				
Total score	58.76	4.70	59.00	42- 74
Cognitive empathy	29.28	2.27	29.00	22- 36
Emotional empathy	29.48	3.82	29.00	18- 41
TTS				
Total score	90.35	7.39	89.00	70- 115
Trust	11.24	1.98	11.00	7- 17
Problem diagnosis and analysis	13.54	2.31	13.00	8- 19
Responsibility	13.16	1.85	13.00	8- 19
Collaboration and teamwork	13.64	2.09	13.00	9- 20
Training and guidance	14.69	1.89	15.00	10- 20
High intrinsic motivation	11.81	2.15	12.00	6- 19
Leadership	12.29	2.02	12.00	7- 17

EEQ: Emotional Expression Questionnaire; BES: Basic Empathy Scale; TTS: Teamwork Tendency Scale

The participants' EEQ mean total score was 71.31±9.83, the BES mean total score was 58.76±4.70, and the TTS mean total score was 90.35±7.39.

A comparison of the total scale and subscale scores of the participants according to gender is given in Table 2. Compared with male students, female students had higher total BES scores ($t=2.461$,

Table 2. Comparison of total scale and subscale scores of EEQ, BES and TTS according to gender (Female n= 87; Male n= 60)

		Mean	SD	Min- Max	Test Statistics	p value
EEQ						
Total score	F	72.94	9.89	48- 98	t:2.461	0.015*
	M	68.95	9.33	47- 90		
Positive emotional expression	F	24.90	4.52	12- 35	z:1.215	0.224
	M	23.68	4.44	13- 34		
Negative emotional expression	F	18.66	3.59	10- 28	t:1.114	0.267
	M	17.97	3.82	10- 28		
Closeness emotional expression	F	29.39	5.40	16-41	z:2.351	0.019*
	M	27.30	5.46	16- 39		
BES						
Total score	F	58.63	4.67	42- 69	z:0.051	0.959
	M	58.93	4.78	48- 74		
Cognitive empathy	F	29.21	2.28	22- 35	z:0.406	0.685
	M	29.38	2.27	24- 36		
Emotional empathy	F	29.43	3.80	18- 36	z:0.049	0.961
	M	29.55	3.88	20- 41		
TTS						
Total score	F	89.07	6.79	70- 111	z:2.605	0.009**
	M	92.22	7.87	75- 115		
Trust	F	11.07	1.93	7- 16	z:1.467	0.143
	M	11.48	2.03	7- 17		
Problem diagnosis and analysis	F	13.30	2.35	8- 19	z:1.459	0.144
	M	13.88	2.23	10- 18		
Responsibility	F	13.21	1.86	9- 19	z:0.142	0.887
	M	13.08	1.84	8- 17		
Collaboration and teamwork	F	13.38	2.08	9- 20	z:2.003	0.045*
	M	14.02	2.08	10- 19		
Training and guidance	F	14.44	1.68	11- 20	z:1.940	0.052
	M	15.05	2.11	10- 20		
High intrinsic motivation	F	11.48	2.15	6- 17	z:2.155	0.031*
	M	12.28	2.09	8- 19		
Leadership	F	12.20	1.83	7- 17	z:0.755	0.450
	M	12.42	2.29	8- 17		

z: Mann-Whitney U test value, t: independent samples t test value, * $p<0.05$, ** $p<0.01$

EEQ: Emotional Expression Questionnaire; BES: Basic Empathy Scale; TTS: Teamwork Tendency Scale

$p<0.05$) and closeness subscale scores ($z=2.351$, $p<0.05$). On the other hand, male students had higher total scores on the TTS ($z=2.605$, $p<0.01$) and cooperation sub-dimension scores ($z=2.003$, $p<0.05$) and higher intrinsic motivation sub-dimension scores ($z=2.155$, $p<0.05$) than female students did. However, there was no difference between genders in the BES total score or subscale

(cognitive and emotional empathy) scores.

When the participants responded to the question "How important do you think teamwork is in medical practice?" The information form was evaluated, and 0.7% ($n=1$) gave 1 point, 2.7% ($n= 4$) gave 3 points, 37.4% ($n= 55$) gave 4 points, and 59.2% ($n= 87$) gave 5 points. That is, 96.6% of the participants stated that teamwork is important. Additionally,

participants responded at similar rates to the question “How would you describe yourself in terms of your tendency to teamwork?” in this form. A total of 1.4% (n=2) gave 2 points, 15.6% (n=23) gave 3 points, 55.1% (n=81) gave 4 points, and 27.9%

(n=41) gave 5 full points. As a result, 83% of the participants also described themselves as tending to teamwork. The comparison of scale scores according to the definitions of proneness to being a team member is given in Table 3.

Table 3. Comparison of total scale and subscale scores of EEQ, BES and TTS according to the tendency to be a team member

	Degree of tendency	N	Mean	SD	Min- Max	Test Statistics	p value
EEQ Total score	1-3 points	25	64.24	8.98	48- 85	t:4.163	<0.001***
	4-5 points	122	72.76	9.39	47- 98		
Positive emotional expression	1-3 points	25	22.88	4.28	12- 29	t:1.867	0.064
	4-5 points	122	24.71	4.51	13- 35		
Negative emotional expression	1-3 points	25	17.36	4.25	11- 25	z:1.108	0.268
	4-5 points	122	18.58	3.54	10- 28		
Closeness emotional expression	1-3 points	25	24.00	5.12	16- 38	z: 4.462	<0.001***
	4-5 points	122	29.47	5.12	16- 41		
BES Total score	1-3 points	25	59.00	6.06	42- 74	t:0.285	0.776
	4-5 points	122	58.70	4.40	47- 69		
Cognitive empathy	1-3 points	25	28.80	2.52	24- 36	z: 1.405	0.160
	4-5 points	122	29.38	2.21	22- 35		
Emotional empathy	1-3 points	25	30.20	4.77	18- 41	z: 1.045	0.296
	4-5 points	122	29.33	3.60	20- 37		
TTS Total score	1-3 points	25	91.28	8.09	78- 112	z: 0.684	0.494
	4-5 points	122	90.16	7.26	70- 115		
Trust	1-3 points	25	11.40	2.63	8- 17	z: 0.047	0.962
	4-5 points	122	11.20	1.83	7- 16		
Problem diagnosis and analysis	1-3 points	25	12.40	2.33	10- 18	z: 2.858	<0.004**
	4-5 points	122	13.77	2.24	8- 19		
Responsibility	1-3 points	25	12.96	2.15	8- 17	z: 0.564	0.573
	4-5 points	122	13.20	1.78	9- 19		
Collaboration and teamwork	1-3 points	25	14.00	1.47	11- 17	z: 1.411	0.158
	4-5 points	122	13.57	2.20	9- 20		
Training and guidance	1-3 points	25	14.28	2.13	11- 20	z: 1.395	0.163
	4-5 points	122	14.77	1.83	10- 20		
High intrinsic motivation	1-3 points	25	12.24	1.85	8- 16	z: 1.445	0.149
	4-5 points	122	11.72	2.21	6- 19		
Leadership	1-3 points	25	14.00	1.73	11- 17	z: 4.550	<0.001***
	4-5 points	122	11.93	1.90	7- 17		

z: Mann-Whitney U test value, t: independent samples t test value, **p<0.01, ***p<0.001

EEQ: Emotional Expression Questionnaire; BES: Basic Empathy Scale; TTS: Teamwork Tendency Scale

Correlation Analysis

Significant Spearman correlations between EEQ, BES, and TTS scores are shown in Table 4. A positive but weak correlation was found between the scales. A positive correlation was found

between the total TTE score and the total EEQ score (r= 0.277, p<0.001) and between the total BES score (r= 0.273, p<0.001). No correlation was found between the EEQ total score and the BES total score. However, a positive but weak

Table 4. Correlation analysis results of the total scale and subscale scores of the EEQ, BES and TTS

		rho coefficient	p value
EEQ			
Total score	Cognitive empathy	0.285	<0.001
	Training and guidance	0.277	<0.001
Positive emotional expression	TTS total score	0.277	<0.001
	Responsibility	0.167	0.044
	Training and guidance	0.344	<0.001
Negative emotional expression	Cognitive empathy	0.167	0.044
	Training and guidance	0.185	0.025
Closeness emotional expression	Cognitive empathy	0.317	<0.001
	Collaboration and teamwork	-0.204	0.013
BES			
Total score	TTS total score	0.273	<0.001
	Trust	0.198	0.016
	Responsibility	0.246	0.003
	Leadership	0.196	0.017
Cognitive empathy	TTS total score	0.241	0.003
	Problem diagnosis and analysis	0.219	0.008
Emotional empathy	TTS total score	0.199	0.016
	Trust	0.220	0.007
	Responsibility	0.228	0.006
	Leadership	0.231	0.005

EEQ: Emotional Expression Questionnaire; BES: Basic Empathy Scale; TTS: Teamwork Tendency Scale

correlation was found between the EEQ total score and the BES Cognitive Empathy subscale score ($r=0.285$, $p<0.001$). While the BES Cognitive Empathy subscale showed the highest correlation with the EEQ closeness expression subscale ($r=0.317$, $p<0.001$), the BES Emotional Empathy subscale showed the highest correlation with the TTS leadership subscale ($r=0.231$, $p<0.01$).

Although there was a weak correlation between the total score of the research scales and their subscales, the highest correlation was found between the EEQ positive emotional expression subscale and the TTS education and guidance subscale ($r=0.344$, $p<0.001$). The lowest correlation was found between the EEQ positive emotional expression subscale and the TTS responsibility subscale ($r=0.167$, $p=0.04$).

DISCUSSION

This study aimed to assess the levels of emotional expression, empathy, and teamwork tendencies among second-year medical students and explore the relationships between these factors. To our knowledge, this is the first study conducted on these variables among medical students in Turkey. Therefore, this study makes a significant contribution to literature and practical application. The study showed that students had relatively high levels of emotional expression (mean = 71.31), empathy (mean = 58.76), and teamwork tendency (mean = 90.35) (Table 1). Some studies report that these skills tend to decline over time (28, 29). This pattern may be explained by the fact that the participants were still at an early stage of their medical education. Therefore, conducting a follow-

up assessment could provide important additional insights.

Gender Differences

When we compared the total and subscale scores of the scale in our study, some differences were determined according to gender (Table 2). In line with our expectations, the emotional expression level (especially the closeness subscale) of female students was greater than that of male students. Although inconsistent results have been obtained in studies on this subject, a recent study revealed that emotional intelligence was greater in female medical students than in male medical students and that the emotional expression level was greater in female university students than in male medical students (8, 30). Women and men differ in emotional expression due to both biological differences and different socialization processes. One reason for the higher level of emotional expression in women may be their greater emotional sensitivity. On the other hand, the culture we live in influences how individuals experience their emotions and which emotions they are encouraged to express or conceal. The finding that women express their emotions more than men do can be explained in the context of the masculinity and femininity roles defined through gender roles. As seen in expressions such as “a man does not cry”, which are common in Turkish society, the need for men to be tougher and stronger and not to express emotions other than anger may be imposed by culture.

In our study, no difference was found between genders in terms of empathy levels. However, although the difference was not significant, male students were found to have higher empathy scores. This result is not consistent with the literature reporting that women have higher empathy scores. In the literature, studies have reported that female medical students who are in their early years of education prefer person-centered specialties (e.g., psychiatry) and have higher empathy levels (18-20, 31). In one study, it was emphasized that personality traits are an important variable in empathy compared with gender (32). On the other hand, it has been reported that doctors' shift away from humanistic approaches, as well as their tendency to suppress emotional expression in order to protect themselves and focus on individual work, also contribute to a decline in empathy skills (10,

33).

Men scored better than women did on the teamwork tendency scale. Men also had significantly better collaboration and intrinsic motivation scores. This result contradicts the literature. A recent study reported that female medical students scored higher in the team worker role (19), and another study reported that female medical students had higher levels of competence in the “completer-finisher” role (20).

Personal Perceptions of Teamwork

Participants were grouped based on their responses to the question about “the importance of teamwork in medical practice” in the information form; however, since 96.6% considered it important, no analysis could be conducted. They were also classified by teamwork tendency (low: 1–3 points, high: 4–5 points). The high tendency group had higher scores in emotional expression, closeness, and problem diagnosis, while leadership scores were higher in the low tendency group. However, due to the imbalance (83% in the high tendency group), these results are not conclusive.

Associations Between Emotional Expression and Empathy

In our study, a positive but weak correlation was found between emotional expression and cognitive empathy. Another study reported that students with high emotional intelligence (EI) have higher empathy levels because they can perceive and express emotions more clearly and develop close relationships with others (31). Another study revealed a strong and positive relationship between empathy skills and EI in first-year medical students (34). In fact, mixed results have been reported in the literature on this subject, but one reason for these contradictory results may be differences in test methods and measurements. In the assessment of empathy and emotional expression, a more accurate approach would be to consider self-report scales and peer (and patient) assessments together rather than a cross-sectional and single assessment.

Associations Between Emotional Expression and Teamwork Tendencies

Teamwork, defined as one of the core competency domains in medical education, is evaluated within

the concept of interprofessionalism. Medical students are usually educated with an individualistic approach, but in practice, they perform their functions as part of a team. This can create confusion between education and reality. A study comparing medical and nursing students reported that medical students presented less emotional expression and a lower tendency for teamwork than did nursing students (20). Teamwork requires the perfect integration of multiple types of knowledge, skills and emotional competence (15). Our study revealed that there was a relationship between emotional expression and teamwork tendencies, especially with the education and guidance dimensions, with a positive but weak relationship. In addition, positive emotional expression was positively related to responsibility, and closeness expression was negatively related to collaboration. Open communication and emotional expression are important for team development as well as for psychological safety within the team. Research on the effects of emotions on teamwork is increasing. One study reported that team members' emotional awareness of themselves and others positively increased team task performance (7). Another experimental study revealed that talking about emotions experienced during teamwork was beneficial. It was also reported that positive emotional expression positively affects team success (35).

Associations Between Empathy and Teamwork Tendencies

In our study, a weak but statistically significant association was identified between empathy scores and teamwork tendency. According to the literature, empathy scores in medical students are significantly related to teamwork and interprofessional collaboration tendencies (36, 37). Another study conducted with medical students reported that teamwork and lifelong learning have a positive effect on the development of empathy and that this interaction is reciprocal (38). The relatively weaker association observed in our study may be attributed to several factors. First, the fact that the participants were in the preclinical phase of their education is an important consideration. Among second-year students who have not yet been exposed to clinical environments, a more limited relationship between empathy and teamwork-related constructs is

plausible. Limited exposure to structured teamwork training, interprofessional learning experiences, or clinical team dynamics may also contribute to this finding. Another factor concerns the use of self-report instruments to assess both variables. As self-report measures do not fully capture observable behavioral manifestations, they may attenuate the strength of correlations (39). Individual differences should also be taken into account. Personality traits, communication self-efficacy, social anxiety, and interpersonal sensitivity are known to influence both empathy and teamwork-related behaviors (40, 41). As these variables were not measured in the present study, it is possible that the empathy–teamwork relationship was weakened by unmeasured individual-level factors. In addition, cultural factors should also be considered. The hybrid cultural structure of Turkish society, which incorporates both collectivistic and individualistic elements, may influence how empathy is translated into teamwork-related behaviors. In such cultural contexts, team interactions are often shaped by norms such as hierarchical role expectations, respect for authority, and harmony-oriented communication. As a result, even individuals with high levels of empathy may behave more cautiously within a team and may be less inclined to take initiative or openly contribute. These cultural dynamics may limit the extent to which empathy aligns with teamwork tendencies and may have contributed to the relatively weak association observed in this study.

CONCLUSION

This study investigated the relationships between emotional expression, empathy, and teamwork orientation among second-year medical students, as well as the effects of gender and personal perceptions of teamwork on these variables. The findings indicate that both empathy and emotional expression are positively correlated with teamwork. Women exhibited higher levels of emotional expression, whereas men showed a stronger tendency toward teamwork. No significant gender differences were observed in terms of empathy. These results highlight the critical need for ongoing, targeted educational programs to develop communication, empathy, and teamwork skills as integral components of medical students' professional development. Within this scope, it is recommended that training activities aimed at

enhancing students' expressive abilities—such as emotional awareness workshops, role-play exercises, and communication training based on clinical scenarios—be integrated into the curriculum. To further support the development of empathy, narrative medicine practices, engagement with patient stories, reflective writing activities, video-based awareness exercises, and peer-feedback-guided communication sessions may serve as effective educational tools. Early-stage structured brief clinical simulations may also help students translate empathy into practice. To develop teamwork skills, it is recommended to expand the use of collaborative learning methods such as small-group learning, team-based learning (TBL), problem-based learning (PBL), and interdisciplinary mini-projects.

In conclusion, systematic and continuous support for these competencies from the early stages of medical training is essential for preparing future physicians for effective interprofessional collaboration and for strengthening standards of professionalism. Fostering an educational culture that values teamwork not only promotes student development but also contributes to improved patient outcomes, reduced medical error rates, and enhanced overall healthcare quality at the system level.

Limitation

This study has several limitations. One of the main limitations is its cross-sectional design and the use of a self-report measure to assess empathy. Another limitation is that the data were collected from a participant group consisting solely of second-year students from a single university, which restricts the generalizability of the findings. The selection of second-year students, however, provided a more homogeneous sample, as these competencies have not yet been substantially shaped by clinical training. Nevertheless, this limits the applicability of the findings to other academic years. Future studies are recommended to include student groups from all academic years or to follow students longitudinally throughout medical education. Another limitation is the relatively low participation rate, with 147 students out of a total population of 386 taking part. This limited response rate primarily stems from the voluntary nature of participation. Although this approach is ethically appropriate, it may affect the generalizability of the findings. While the demographic characteristics of

the participants largely reflect those of the general population, the sample size may not capture the full diversity of the target group. On the other hand, as a descriptive cross-sectional study, the primary aim of this research is to provide an initial overview of the investigated phenomenon and to serve as a foundation for more comprehensive future studies. Future research should aim to increase participation rates through enhanced strategies to improve representativeness and strengthen the applicability of the results. Additionally, future studies could examine the relationships of variables with other demographic factors beyond gender.

Although the study has limitations, the findings provide valuable insights in guiding the design of future research and educational practices and supporting the early development of core professional competencies. These findings emphasize the necessity of integrating educational interventions aimed at developing core competencies in interpersonal skills and professionalism from the early phases of medical education. Ensuring the continuity and systematic integration of such educational practices may contribute significantly to the cultivation of competent, empathetic, and collaborative future physician. These core competencies are essential for improving both the standards of professionalism and the quality of patient care.

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Authors' contributions

NA was the primary investigator. NE contributed to the planning and distribution of questionnaires and contributed to the interpretation of the results. SOY contributed to the data analysis, interpretation of the results and writing of the paper. All the authors read and approved the final manuscript.

Ethical Approval

Ethics committee approval was received for this study from the ethics committee of İstanbul Faculty of Medicine (Date: March 11, 2022; Number: 2022-05).

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Conflict of interest

The authors declare that they have no competing interest.

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