ORIGINAL ARTICLE

Assessing Empathy Levels and Their Associations Among 3rd-Year Medical Students at Khyber Medical College, Pakistan

Mashal Khan[1], Hooria Asad[1], Naeemullah[2], Muhammad Imran Marwat[3]

[1]Khyber Medical College, Peshawar Pakistan

[2]Department of Community Medicine, Saidu Medical College, Swat

[3]Department of Community Medicine and Public Health, Khyber Medical College, Peshawar, Pakistan

ABSTRACT

Objective

Empathy is a critical factor in doctor-patient relationship. There is well-documented evidence that empathy falls alarmingly during 3rd-year of medical school. Our aim is, therefore, to assess their empathy levels and their associations.

Methodology

A cross-sectional study was conducted from December 2022 to May 2023 using Jefferson Scale of Empathy student-version (JSE-S) at Khyber Medical College, Pakistan to assess 3rd-year students' empathy. A sample size of 152 was calculated. Data was collected using convenience sampling technique. Descriptive statistics were calculated for JSE-S scores with comparisons across variables using an independent sample t-test and one-way analysis of variance (ANOVA) with post hoc test.

Results

After a response rate of 84.9%, 123 forms (65 males, 58 females) were analyzed. Majority (73.2%) had age < 22 years. Overall, mean empathy score recorded was 103.24 ± 15.83 (range = 53-132). Empathy was significantly higher in group younger than 22 years ($p = 0.004$) and females ($p < 0.001$). The difference was non-significant among specialty preference groups ($p = 0.08$) but separately for females, it was significant ($p = 0.02$), with the underlying difference between technology-oriented specialties and undecided group ($p = 0.02$) on post-hoc comparisons.

Conclusion

This article looks into the empathy of 3rd-year medical students. Empathy, as indicated, varied significantly among age and gender groups while specialty preference was found to have little effect. Interestingly, empathy was significantly different for specialty preference only among females. Integration of empathy programs into curriculum is recommended.

Key words: Empathy, Emotions, Medical student, Patient Care, Pakistan.

*For Correspondence

Dr. Muhammad Imran Marwat

Assistant Professor, Department of Community Medicine and Public Health, Khyber Medical College, Peshawar, Pakistan
Email: imranmarwat_30@kmc.edu.pk

INTRODUCTION

Empathy in a clinical setup has four fundamental aspects which has been understood over the years. i.e., *Emotive* (the capacity to imagine the patient's emotional state), *Moral* (internally motivated to empathize), *Cognitive* (the capability to recognize and comprehend patient's emotions), and *Behavioral* (the capacity to communicate this comprehension of their emotions back to them) [1].

Medical school provides a good platform to acquire empathic behavior which later on is critical in the doctor-patient relationship. Although a moderate level of it towards the patient is necessary for doctors, a certain degree of detachment is also important. Over-attachment and over-detachment both can have serious consequences for the doctor as well as the patient [2]. Thus,

doctors need to be emotionally self-aware to maintain a balanced amount of attachment with their patients.

Many scoring systems of empathy are available like the Interpersonal reactivity index, Toronto empathy questionnaire, Balanced emotional empathy test, Kiersma-Chen empathy scale, and Jefferson scale of physician empathy. Considering the suitability and relatedness of these different instruments, the medical student version of Jefferson scale of empathy has been chosen for this study.

In the literature available, empathy has been correlated with many factors like gender [3, 4], year of study [3], academic performance [4], emotional intelligence, gratitude [5], change along the medical course [6,7], and clinical outcomes [8]. But results of these studies are

highly inconsistent. However, an alarming decline is usually seen in empathy during the 3rd-year of medical school, for which it was termed as the devil's year of medical school [9], even though this is the period where it is most essential since they have their first clinical exposure.

Empathy among medical students has been assessed around the globe including many parts of Pakistan. But no study of this kind has been carried out in Khyber Medical College. This study intends to generate data regarding this topic to fill the gap in present information.

METHODOLOGY

A cross-sectional study was carried out among 3rd-year students of Khyber Medical College from December 2022 to May 2023. The study was approved by the Institutional Research and Ethical Review Board (IREB) of Khyber Medical College, Peshawar Pakistan under reference no. 888/DME/KMC. All participants gave written informed consent prior to the study. Strobe guidelines were followed here.

Participants and sampling technique: Sample size was computed with the help of online calculator of Raosoft Inc. (http://www.raosoft.com/samplesize.html). Keeping the margin of error and confidence interval at 5% and 95% respectively, and a population size of 250 with a response distribution of 50% which is a conservative assumption, the recommended sample size was obtained to be 152. In Pakistan, MBBS is a 5-year study plan having the first two years devised as pre-clinical years, which are followed by three clinical years with limited patient contact. Students start their clinical rotations in 3rd-year of MBBS. Therefore, we included only 3rd-year students, both males and females, in this study. Non-probability convenience sampling technique was employed for data collection.

Questionnaire: A self-administered questionnaire was distributed among 3rd-year medical students as developed by Thomas Jefferson University after permission was taken from the Center for Research in Medical Education and Health Care Thomas Jefferson University Sidney Kimmel Medical College. Students were asked to specify their age, gender, and future specialty preference. Specialty preferences were categorized into people-oriented, technology-oriented, and undecided as given in table 1 [10,11]. Students then had to fill the 20-items Jefferson Scale of Empathy Medical Student version (JSE-S).

Measurement of empathy: JSE-S was employed to assess the empathy of medical students in our study. It is a validated tool to calculate the empathy of medical students [12] and is used across the globe. It has been translated into many languages [10,13,14] including Urdu [15] which is the national language of Pakistan. The original version of the scale in English language was utilized because all participants understood the English. Besides JSE-S, Jefferson scale of empathy has 2 other versions namely, Health Professionals version (HP-version) for practicing physicians, and Health Profession Students' version (HPS-version) for paramedical students and other health profession students except those of medicine. S-version contains 20 items each of which is scored on

a 7-point Likert scale. Of them, 10 items are positively scored with 1 being strongly disagree and 7 being strongly agree. The other 10 items are scored in opposite order with 1 being strongly agree and 7 being strongly disagree. All the items' scores are summed up to obtain a total empathy score which has the range of 120 i.e., 20 score as possible minimum and 140 score as possible maximum. As the mean score increases so does the empathy. The items are further categorized into three domains i.e., *perspective taking* (10 directly scored items), *compassionate care* (8 reverse scored items), and *standing in the patient's shoes* (2 reverse scored items). If a returned questionnaire is missing answers for more than 4 items it is excluded. While missing answers for 4 or fewer items are considered and their values calculated from the average of the filled items scores.

Data analysis: Data were analyzed using the software S.P.S.S version 24.0 for Windows (SPSS Inc, Chicago, IL, USA). Quantitative results were displayed as mean ± standard deviation while qualitative as frequencies and percentages. Descriptive statistics were calculated for the JSE-S score. Cronbach's alpha was additionally determined to observe the internal consistency of the 20 items. The value greater than 0.9 was interpreted as excellent, greater than 0.8 as good, and greater than 0.7 as acceptable [16]. Comparison of JSE-S scores between groups of age and gender was done using independent sample t-test while among specialty preference groups was drawn using one-way analysis of variance (ANOVA) with post hoc test using the Turkey HSD test. A *p* value of < 0.05 was taken as statistically significant. T-tests and ANOVA were also done for sub-scales of JSE-S i.e., *perspective taking*, *compassionate care*, and *standing in patient shoes* for age, gender, and specialty preference. Cohn's *d* and eta squared (η^2) were calculated as effect sizes to inspect the practicability of those findings which were statistically significant. For a *d* of 0.2 effect size was considered as small, for 0.5 as medium, and for 0.8 as large effect size. However, eta squared (η^2) value was taken as small effect size if $\eta^2 = 0.01$, medium effect size if $\eta^2 = 0.06$, and large effect size if $\eta^2 = 0.14$ [17].

RESULTS

A total of 152 survey forms were distributed among the students. One hundred twenty-nine forms were returned (84.9% response rate). After the invalid form's exclusion, 123 were finally analyzed. The demographics of participants are presented in Table 1.

Descriptive statistics of JSE-S, including score intervals with frequencies, central tendency and dispersion (mean, SD, range, and percentiles), and distribution (skewness and kurtosis) are displayed in Table 2. A Cronbach's α coefficient of 0.82 for the 20-items scale was suggestive of good internal consistency of the scale for our sample. Overall, the mean empathy score recorded was 103.24 ± 15.83. Among the items, the highest mean recorded was of item no. 20, i.e., 6.16 ± 1.37, which is regarding their belief about the importance of empathy in medical treatment. On the other hand, the lowest mean was of item no. 18, i.e., 2.85 ± 1.73, which is about how much a physician should allow himself to be influenced by his personal bond with the patient or their family

members.

Variables	n (%)
Age	
< 22 years	90 (73.2)
≥ 22 years	33 (26.8)
Gender	
Male	65 (52.8)
Female	58 (47.2)
Future Specialty Preference	
[a] People-oriented specialties	57 (46.3)
[b] Technology-oriented specialties	48 (39.0)
Undecided	18 (14.6)
[a] People-oriented specialties: Internal medicine and medicine sub-specialties including; cardiology, hematology/oncology, general internal medicine, gastroenterology, endocrinology, nephrology, rheumatology, & obstetrics/gynecology, emergency medicine, neurology, general pediatrics, psychiatry, sports medicine, dermatology. [b] Technology-oriented specialties: Surgery & surgical sub-specialties including; cardiothoracic, general surgery, transplant surgery, vascular surgery, & orthopedic surgery, ophthalmology, ENT, plastic surgery, neurosurgery. [10,11]	

Table 1: Demographics of the survey participants

Score interval	Frequency (%)	Cumulative frequency (%)
≤ 60	2 (1.6)	2 (1.6)
61-70	2 (1.6)	4 (3.3)
71-80	7 (5.7)	11 (8.9)
81-90	17 (13.8)	28 (22.8)
91-100	20 (16.3)	48 (39.0)
101-110	26 (21.1)	74 (60.2)
111-120	32 (26.0)	106 (86.2)
121-130	16 (13.0)	122 (99.2)
131-140	1 (0.8)	123 (100.0)
Statistics	**value**	
Mean ± SD	103.24 ± 15.83	
Possible range	120 (20-140)	
Actual range	79 (53-132)	
Skewness	-0.631	
SE skewness	0.218	
Kurtosis	0.306	
SE kurtosis	0.433	
25th percentile	93	
50th percentile	104	
75th percentile	115	
Cronbach's α	0.82	
N	123	

Table 2: Score distribution, descriptive statistics, central tendency and dispersions for JSE-S

Across the age groups, participants younger than 22 years had a significantly higher mean empathy than equal to or older than 22 years (p = 0.004, two-tailed). Their mean difference was 9.18 (95% CI: 3.00 to 15.37) and had an effect size of medium estimate (d = 0.56) (Table 3).

Table 3: Comparison of empathy across age and gender				
	Age		**Gender**	
	< 22 years	**≥ 22 years**	**Male**	**Female**
n	90	33	65	58
Mean ± SD	105.7±14.2	96.52±18.13	96.7±16.8	110.6±10.6
df	121		109.49	
t	2.94		-5.53	
p-value (2-tailed)	0.004		< 0.001	
Cohen's d	0.56		0.99	

The gender difference on JSE-S mean scores showed females had a significantly higher empathy than males (p < 0.001, two-tailed) and had an effect size of large estimate (d = 0.99) with a mean difference of -13.91 (95% CI: -18.89 to -8.93) (table 4).

As given in Table 4, the analysis of variance (ANOVA) showed no significant difference in JSE-S mean scores among the three specialty preference groups (p = 0.08). However, when ANOVA was done separately for genders, the scores varied significantly among the specialty preference groups for females (p = 0.02, η^2 = 0.12) while for males it was non-significant (p = 0.38). Further, when post-hoc comparisons were done, the underlying significant difference for females was between technology-oriented specialties and undecided groups (p = 0.02) with a mean difference of 13.28 (95% CI: 1.92 to 24.65). The difference between people-oriented specialties and undecided was, however, marginally significant (p = 0.07) with a mean difference of 10.27 (95% CI: 0.59 to 21.13).

The mean and Standard deviation of the 3 domains of JSE-S and their comparisons across age, gender, and specialty preference are given in Table 5. Among the age and gender groups, younger than 22 years and females had significantly higher *perspective taking* (age: p = 0.01; gender: p < 0.001) and *compassionate care* (age: p = 0.004; gender: p < 0.001). For specialty preference groups, no significant difference was seen for these 2 domains (p = 0.053, p = 0.28, respectively). Differences in mean values of *standing in the patient's shoes* were non-significant across age (p = 0.67), gender (p = 0.48), and specialty preference (p = 0.88).

DISCUSSION

This study assessed the empathy level of 3rd-year medical students with the help of JSE-S version. Although we did not include other years to see the transition in empathy during medical school. Instead, we only focused on 3rd-year students as studies have shown them the lowest empathic [7]. Observed Cronbach's α of 0.82 supports the reliability of the scale for our

	Total			Males			Females		
	Group 1	**Group 2**	**Group 3**	**Group 1**	**Group 2**	**Group 3**	**Group 1**	**Group 2**	**Group 3**
n	57	48	18	25	28	12	32	20	6
Mean ± SD	105.37 ± 15.32	99.27 ± 16.09	107.06 ± 15.29	98.72 ± 17.86	93.36 ± 16.97	100.17 ± 14.09	110.56 ± 10.66	107.55 ± 10.38	120.83 ± 4.07
Between groups df	2			2			2		
Within groups df	120			62			55		
F-value	2.62			0.98			3.96		
***p*-value**	0.08			0.38			0.02		
Group 1 = People-oriented specialties									
Group 2 = Technology-oriented specialties									
Group 3 = Undecided									

Table 4: Summary results of one-way ANOVA of empathy scores across specialty-preference groups

	Perspective taking Mean ± SD	Compassionate care Mean ± SD	Standing in the patient's shoes Mean ± SD
Total	54.38 ± 10.12	40.46 ± 7.24	8.40 ± 2.80
Age			
< 22 years	55.78 ± 9.17	41.59 ± 6.70	8.33 ± 2.68
≥ 22 years	50.58 ± 11.64	37.36 ± 7.84	8.58 ± 3.15
p-value	0.01	0.004	0.67
Cohen's d	0.50	0.58	0.08
Gender			
Male	50.69 ± 11.17	37.75 ± 7.47	8.23 ± 3.07
Female	58.52 ± 6.79	43.48 ± 5.64	8.59 ± 2.48
p-value	< 0.001	< 0.001	0.48
Cohen's d	0.85	0.86	0.13
Specialty preference			
People-oriented specialties	55.79 ± 8.91	41.09 ± 7.69	8.49 ± 3.01
Technology-oriented specialties	51.69 ± 11.76	39.19 ± 6.39	8.40 ± 2.56
Undecided	57.11 ± 7.44	41.83 ± 7.76	8.11 ± 2.87
p-value	0.053	0.28	0.88
Eta squared	0.05	0.02	0.002

Table 5: Domains of JSE-S and their comparisons across age, gender, and specialty preference

sample. The 20-item questionnaire has good internal consistency as reported in previous studies 0.88 [10], 0.83 [18], 0.80 [19].

In previous studies across Pakistan, 3rd-year empathy as recorded with JSE-S is found to be 87.71 ± 13.94 (Lahore) [7], 101.49 ± 12.90 (Sukkur) [3], 86.15 ± 16.7 (Karachi) [20]. These values are comparatively lower than our obtained empathy (103.24 ± 15.83). However, when compared with the empathy of foreign medical students i.e., 109.1 ± 11.8 (United States) [9], 109.75 ± 11.39 (Bangladesh) [10], 104.5 ± 13.9 (Malaysia) [21], our participants had a lower empathy than them. These differences could possibly be attributed to variation in sample selection, educational systems, curriculum demands, working environment, cultural factors and spiritual beliefs.

The age difference in the empathy score has been found multiple times to be insignificant as shown by Aye SZ et al. [21] and others [22, 23]. Narang R et al. has obtained similar results even in dental students [24]. In contrast to these studies, our findings showed that empathy was significantly decreasing for the older age group compared to younger group. Although, we did not find any study that look into the details of the age vs. empathy association, one reason for the decline with age can be a result of going into a higher class [6] but since the participants were only from 3rd-year the confounding effect of the changing class has been avoided.

In the literature available, the majority studies have found females to have more empathic nature than males [3,7,9]. There are only a few studies which show otherwise such as by Hussain AA [20] and other [23]. Our results also agreed with the majority of studies since females scored greater than males. The reason females have

higher empathizing ability is explained by both biological factors such as their genetic architecture and social factors such as expected gender roles which make them more cognizable of emotions [25]. Moreover, females consider interpersonal relations more important than males [26].

Although some studies have found no significant effect of specialty preference over empathy [10,21], those students who express interest in specialties requiring continuous encounter with patients, classified as people-oriented specialties usually are inclined to have higher empathy towards their patients as compared to technology-oriented and other specialties [9,18]. In contrast to these studies, our results showed highest empathy among those students who had not yet decided their preference for any future specialty i.e., undecided specialty > people-oriented specialties > technology-oriented specialties. This provides very important data that could be utilized by medical educationists and trainers to have a targeted approach during empathy learning as part of the medical curriculum. However, it is also important to note that this difference was still insignificant in our findings.

While comparing 3 domains of JSE-S across gender groups, females had significantly higher *perspective taking* ($p < 0.001$) and *compassionate care* ($p < 0.001$) than males but the difference was non-significant for *Standing in the patient's shoes* ($p = 0.48$). The study of Hussain AA, found higher *perspective taking* for females but males dominated the *compassionate care* and *Standing in the patient's shoes* as compared to our study [20]. In addition, we did not see significant variation in the 3 domains across the specialty preference groups ($p = 0.053$, $p = 0.28$, and $p = 0.88$, respectively). In contrast, Hussain AA found the undecided group to have higher scores in all the 3 domains of JSE-S than the other specialty preference groups.

Our study had some limitations. First, it should be noted that it included only 3rd-year students studying in the same college. Generalization of the findings can be achieved by expanding this study to other years and colleges in Pakistan. Second, we used convenience sampling technique that could make our findings biased.

CONCLUSION

We found that overall empathy of 3rd-year students in our study is comparatively greater than other parts of the country. There are variations in empathy across age and gender groups. Specialty preference was found to have little effect on empathy. However, the association of empathy with specialty preference among females is interesting. Integration of empathy into the learning objectives of medical education is necessary because of its clear importance for the doctor and patient [8]. Targeted programs focusing on interpersonal skills, analyzing audio-, video-tape encounters with patients, studying literature and arts, and importance of role models should be taught to them [9]. Also, the variation in empathy among age groups should be looked into because of literature gap.

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