RESEARCH ARTICLE

Measuring empathy in medical students: A cross-sectional study

Muhammad Zafar Iqbal,[1] Areej Riyadh AlBuraikan,[2] Afnan Abdullah AlQarni,[3] Hanan Abdulaziz AlQahtani,[4] Alyaa Mohammad AlOhail,[5] Malak Mohammed AlMusaileem[6]

Abstract

Objective: To measure the empathy levels of undergraduate medical students, and to explore whether the empathy level has any significant association with gender, academic year and academic achievement.

Methods: The cross-sectional study was conducted at the College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia, from January to March 2020, and comprised medical students. Data was collected using the pre-validated student version of the Jefferson Scale of Empathy. Data was analysed using SPSS 23.

Results: Of the 391 students, 251(64.19%) were females, and 140(35.8%) were males. The overall mean empathy score was 105.18±12.51. Second year medical students showed the highest empathy score 108.59±13.33. There was minor but significant decline in empathy as the students progressed through their academic studies ($p<0.05$). Empathy scores were significantly higher in female students ($p<0.05$), and students with higher grade point average scores ($p<0.05$).

Conclusion: The gradual reduction in empathy is alarming and demands due attention.

Keywords: Empathy, Jefferson scale of empathy, JSE-S, Medical students. (JPMA 72: 1101; 2022)

DOI: https://doi.org/10.47391/JPMA.3226

Introduction

A good doctor-patient relationship is instrumental in raising the quality of healthcare services overall. Although this relationship is a multifactorial construct, it depends largely upon the empathetic attitude of healthcare providers toward their patients.[1] Empathy is a person-specific trait comprising both cognitive and emotional or affective domains. The cognitive domain concerns the ability of a person to understand another's inner feelings, experiences and emotions from the perspective of an outsider with no experience of their condition. The emotional domain describes the ability to commune with and appreciate another's feelings and experiences.[2] Clinical empathy has been defined as 'the ability of healthcare providers to understand the patient's situation, perspective and feelings, communicate that understanding and check its accuracy, and act on that understanding with the patient in a helpful (therapeutic) way'.[3]

Empathy is a vital facet of the doctor-patient interaction that has been closely linked to improved patient satisfaction, treatment compliance and healthcare outcomes.[4] When doctors observe their patients closely and show concern non-verbally, patients tend to trust them more, sharing a more comprehensive history of their illness that typically results in better clinical decision-making.[3] Empathy has also been associated with fewer cases of physician burnout and medicolegal litigation.[5] Considering the significance and value of empathy in healthcare, it is reasonable to surmise that medical students will not necessarily succeed as practitioners unless they are able to display adequate empathy for patients during training.[6] Therefore, the development of empathetic skills is critical for the optimal professional development of medical students as they progress through their undergraduate training.

With the growing significance of empathetic behaviour in clinical practice, the majority of medical schools do focus on teaching empathetic behaviours to medical students.[7] Despite these efforts, it is not known whether the students are able to translate empathy into their clinical practice, as recent studies report mixed and inconsistent findings concerning empathy levels among medical students.[8-12] For instance, some studies have reported a gradual decline in empathy levels among the students as their studies progress.[10,13,14] Nevertheless, concrete evidence confirming a decline in empathy among students over time is lacking.[12] Similarly, there is insufficient evidence to determine an association between empathy level and academic achievement among medical students. Some studies have reported a

[1]Department of Medical Education, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, [2,4]Department of Surgery, [3]Department of Internal Medicine, [5]Department of Pediatrics, [6]Department of Orthopedic Surgery, King Fahad Teaching Hospital of Imam Abdulrahman Bin Faisal University, Khobar, Saudi Arabia.

Correspondence: Muhammad Zafar Iqbal. Email: drzafariqbal@live.com

positive correlation between academic achievement and empathy levels, while others indicate a lack of significant correlation.[15] With respect to gender, it is commonly assumed that female students are more empathic than male students when dealing with patients during clinical rotations.[16,17] These mixed findings suggest there is scope for additional research, especially in the context of the Kingdom of Saudi Arabia (KSA) where the level of empathy among medical students has not yet been studied.

The current study was planned to measure the empathy levels of undergraduate medical students, and to explore whether the empathy level has any significant association with gender, academic year and academic achievement.

Subjects and Methods

The cross-sectional study was conducted from January to March 2020 at the College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, KSA. The College of Medicine teaches an integrated, patient-centred curriculum that focusses on teaching communication skills, professionalism and empathy during training. The curriculum spans six years, distributed into one preparatory, two pre-clinical and three clinical years. In the pre-clinical years, there are numerous regular sessions dedicated to developing students' empathy. The empathy-focussed teaching sessions encourage medical students to discuss clinical scenarios, explore relevant educational resources, and routinely reflect on the impact of the sessions on their behaviours. During their clinical years, the students observe how doctors communicate with patients having diverse characteristics and needs. They also have frequent direct supervised patient encounters in which empathetic doctor-patient communication is considered one of the key competencies of clinical training that they are aiming to achieve.

The current study was conducted after approval from the institutional ethics review board. A purposive, non-probability sampling technique was used in this study. The target population of this study was all enrolled medical students who were invited to participate voluntarily. Students from other health professional domains, such as dentistry, nursing, pharmacy and allied health sciences, were excluded. Also excluded were students of the preparatory first year as they do not receive medical training or opportunities for exposure to patients. The sample size was calculated using Open Epistatistical Calculator, which is a reliable and valid tool.[18] While calculating the sample size, we kept the margin of error at 5%, and confidence interval (CI) at 95%, which gave a sample size of 269 students.

To date, various strategies have been used to measure empathy levels, ranging from subjective self-rating to objective approaches, like functional magnetic resonance imaging (fMRI).[8] In the domain of self-rated empathy measurement, a number of scales exist. For the present study, the Jefferson Scale of Empathy's student version (JSE-S) was selected, as it is a content-specific and context-relevant instrument.[19,20] It was used after taking permission from the Thomas Jefferson University.

The JSE-S is an evidence-based reliable scale that has previously been used frequently to measure empathy among medical students.[20] It includes 20 items, of which 10 are negatively-worded (1, 3, 6, 7, 8, 11, 12, 14, 18 and 19). Since its creation, the scale has been translated into 56 languages, used in 74 countries and in multiple health professional domains, including dentistry, nursing and allied health sciences, among others.[20,21]

After taking informed consent from the subjects, data was collected electronically via Question Pro (Survey Analytics LLC, Beaverton, Oregon, USA). The online survey included two parts: demographic data and the JSE-S scale. The demographic data collected details regarding gender, career choice preferences, current academic year of training, and grade point average (GPA). The second section required the students to rate all 20 items of the JSE-S using a seven-point Likert scale; from 1 = strongly disagree to 7 = strongly agree. The overall score ranged 20-140, and higher score indicated greater level of empathy. The students' responses were collated over 3 months during the academic year 2019-20.

Data was analysed using SPSS 23. Prior to the data analysis, the scores were reversed for the 10 negatively worded JSE-S items. Independent t-test was used to compare the overall empathy scores with gender and pre-clinical / clinical year of training. Analysis of variance (ANOVA) was used to explore the possible correlation among empathy level, academic year and GPA. $P<0.05$ was considered statistically significant. For categorical variables, frequencies and percentages were calculated, whereas for continuous variables, mean and standard deviations (SD) were calculated.

Results

Of the 893 students in the cohort, 391(43.8%) completed the survey. Of them, 251(64.19%) were females, 318(81.33%) were studying medicine by choice, 108(27.62) were in the fourth year of the academic programme, 232(59.34%) were in clinal years, and 204(31.46%) had GPA 4-4.49. The overall mean empathy

Table-1: Association between empathy scores and different variables.

Variables	Participants N (%)	Empathy Score Mean ± SD	p-value
Gender			
Male	140 (35.81)	102.39 ± 12.87	0.001*
Female	251 (64.19)	106.7 ± 12.37	
Decision to join medicine			
Own	318 (81.33)	105.51 ± 12.63	0.211
Others'	73 (18.67)	103.47 ± 11-56	
Academic Year			
Second	76 (19.44)	108.59 ± 13.33	0.011*
Third	83 (21.23)	105.23 ± 10.43	
Fourth	108 (27.62)	104.74 ± 12.42	
Fifth	61 (15.60)	103.10 ± 13.53	
Sixth	63 (16.11)	101.29 ± 12.95	
Training Category			
Pre-clinical	159 (40.66)	106.91 ± 11.88	0.003*
Clinical	232 (59.34)	103.04 ± 12.96	
Grade Point Average (GPA)			
4.50-5.00	64 (16.37)	108.28 ± 12.07	0.003*
4.00-4.49	204 (52.17)	103.68 ± 12.42	
3.99 and below	123 (31.46)	103.58 ± 12.18	

SD: Standard deviation; N: Frequency; %: Percentage.
* Represents statistically significant p-value (<0.05).

Table-2: Gender-wise comparison of empathy scores in each academic year.

Academic Year	Gender	N (%)	Empathy score Mean ± SD	p-value
2nd	Male	24 (31.58)	106.46 ± 12.51	0.180
	Female	52 (68.42)	110.78 ± 13.79	
3rd	Male	36 (43.37)	103.53 ± 9.21	0.153
	Female	47 (56.63)	106.77 ± 11.34	
4th	Male	49 (45.37)	102.59 ± 13.46	0.207
	Female	59 (54.63)	105.70 ± 11.51	
5th	Male	21 (34.43)	100.11 ± 13.34	0.045*
	Female	40 (65.57)	107.38 ± 12.72	
6th	Male	10 (15.87)	99.24 ± 15.85	0.517
	Female	53 (84.13)	102.86 ± 12.49	

SD: Standard deviation; N: Frequency; %: Percentage.
* Represents statistically significant p-value (<0.05).

score was 105.18±12.51, second-year medical students showed the highest empathy score 108.59±13.33, while pre-clinical students displayed significantly higher empathy scores than those in the clinical years (p=0.003). A slight but significant (p=0.011) fall in empathy scores was observed as the seniority of the students increased (Table-1).

Female students had overall significantly higher empathy scores 106.7±12.37 than males 102.39±12.87 across all academic years (p=0.001). In terms of individual academic years, female students scored higher than their male counterparts in each batch, but the difference was only

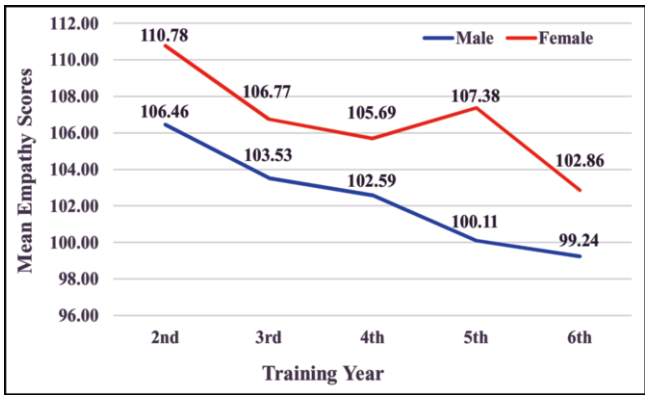

Figure: Year-wise mean empathy scores of both genders.

significant among 5th year students (Table-2). Students with a higher GPA significantly scored higher in terms of empathy level than students with a lower GPA (p=0.003) (Figure).

Discussion

The findings showed overall empathy level of 105.18, which is within the previously reported bracket for empathy scores (104-110).[13,16,22] Students in their pre-clinical years showed higher empathy levels, which could be due to the relative novelty of patient exposure combined with the patient-centred training curricula focussed on developing students' effective communication and empathetic abilities. A slight reduction in empathy as the duration of education increased was also observed, reflecting the findings of previous studies.[5,22] This could potentially be attributed to the increased stress and/or sleep deprivation associated with the additional academic responsibilities and longer working hours experienced with each progressive year.[2,3,5] A further explanation for decreased empathy levels among medical students could be exposure to inappropriate role modelling.[23] Clinical trainers and academics, by default, act as role models for medical students, and efficient and effective role modelling could serve as a valid strategy to instil empathy. However, little is known about what students observe and perceive as empathetic practice in their clinical trainers during their training, highlighting the vital importance of qualitative research to explore students' perspectives in depth.[24]

Although the drop in empathy among medical students was minor, it is still a point of concern. Since a decline in empathy was observed in the current as well as previous studies, it is essential to ensure that contemporary clinical education and training focusses on enhancing empathy among students who will be future healthcare providers. Although the exact method for imparting empathy in medical students is debatable, the level of empathy could

be improved through effective teaching, as some educational strategies are known to positively influence students' empathy levels.[7] These interventions include workshops on doctor-patient communication skills, simulation-based training, and extended student-patient interactions during clinical rotations.[25-27] Moreover, dedicated teaching sessions covering ethics, humanity, and professionalism were also reported as a useful strategy to enhance students' empathy levels.[28,29] Similarly, problem-based learning (PBL), early patient exposure, interprofessional education and experiential training have also been demonstrated to enhance empathy among medical students.[30]

Regarding the relationship between GPA and mean empathy score, significantly lower empathy scores were measured in students who received a lower GPA. This finding is in contradiction of previous studies, which did not find any relationship between academic performance and empathy scores.[15,31] In the current study, female students significantly scored higher than male students on the scale, which is consistent with literature.[17,32] Hojat et al. observed in their longitudinal study that despite a reduction in empathy over time, female students consistently showed higher scores than their male peers.[33] This finding could be due to the different brain activity patterns in emotion-related areas in females compared to the males, which suggest that females are better at recognising and expressing emotions, while males have greater control over the expression of their emotions.[34,35] Moreover, the impact of social influences, such as the typical expectations for a specific gender regarding interpersonal conduct cannot be overlooked.[10,36]

The current study has its limitations, some of which are methodological, while others which are directly related to the scope of the study. One limitation is that a relatively low response rate was attained, which was most likely because participation was voluntary and there was also an element of selection bias. The non-participating students might express a different viewpoint from those who responded. Moreover, self-reported studies are subject to various biases that could influence results. For example, the participants might have overestimated or underestimated their empathy. In addition, some participants might have given what they perceived to be socially desirable response, leading to an overreporting (non-differential misclassification bias) of empathy levels. Another limitation could be the language barrier, as we used the English version of JSE-S as a validated Arabic version was not available. This may have caused students with poor English skills to misinterpret the questions. Moreover, the study was confined to a single centre. Overall, the results might not be generalisable to other educational settings.

Despite the limitations, the current study has contributed to the existing knowledge about the level of empathy in medical students, revealing significantly higher empathy in females and academic achievers, and a decline in empathy levels over progressive academic years. Curriculum planners and academic decision-makers should consider incorporating additional empathy-oriented teaching and learning strategies.

Conclusion

Empathy is of special importance in the context of medicine as it is an essential element when professionally and effectively serving suffering individuals. The gradual reduction in empathy noted is alarming and demands due attention of all concerned.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Vogel D, Meyer M, Harendza S. Verbal and non-verbal communication skills including empathy during history taking of undergraduate medical students. BMC Med Educ. 2018; 18:1–8.
2. Wahjudi JW, Findyartini A, Kaligis F. The relationship between empathy and stress: a cross-sectional study among undergraduate medical students. Korean J Med Educ. 2019; 31:215-26.
3. Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, et al. Empathy decline and its reasons: A systematic review of studies with medical students and residents. Acad Med. 2011; 86:996–1009.
4. Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: A systematic review. Br J Gen Pract. 2013; 63:76–84.
5. Mirani SH, Shaikh NA, Tahir A. Assessment of clinical empathy among medical students using the Jefferson scale of empathy-student version. Cureus. 2019; 11:e4160.
6. Naguib GH, Sindi AM, Attar MH, Alshouibi EN, Hamed MT. A cross-sectional study of empathy among dental students at King Abdulaziz University. J Dent Educ. 2020; 84:22–6.
7. Ayub A, Khan RA. Measuring empathy of medical students studying different curricula; a causal comparative study. J Pak Med Assoc. 2017; 67:1238–41.
8. Håkansson Eklund J, Holmström IK, Ollén Lindqvist A, Sundler AJ, Hochwälder J, Hammar ML. Empathy levels among nursing students: A comparative cross-sectional study. Nurs Open. 2019; 6:983–9.
9. Haider SI, Riaz Q, Gill RC. Empathy in clinical practice: a qualitative study of early medical practitioners and educators. J Pak Med Assoc. 2020; 70:116–22.
10. Shaheen A, Mahmood MA, Zia-Ul-Miraj M, Ahmad M. Empathy levels among undergraduate medical students in Pakistan, a cross sectional study using Jefferson scale of physician empathy. J Pak Med Assoc. 2020; 70:1149-53.

11. Hojat M, Shannon SC, Desantis J, Speicher MR, Bragan L, Calabrese LH. Does empathy decline in the clinical phase of medical education? A nationwide, multi-institutional, cross-sectional study of Students at DO-Granting Medical Schools. Acad Med. 2020; 95:911-8.
12. Roff S. Reconsidering the "decline" of medical student empathy as reported in studies using the Jefferson Scale of Physician Empathy-Student version (JSPE-S). Med Teach. 2015; 37:783-6.
13. Shashikumar R, Chaudhary R, Ryali VSSR, Bhat PS, Srivastava K, Prakash J, et al. Cross sectional assessment of empathy among undergraduates from a medical college. Med J Armed Forces India. 2014; 70:179–85.
14. Chen DCR, Kirshenbaum DS, Yan J, Kirshenbaum E, Aseltine RH. Characterizing changes in student empathy throughout medical school. Med Teach. 2012; 34:305–11.
15. Hojat M, Gonnella JS, Mangione S, Nasca TJ, Veloski JJ, Erdmann JB, et al. Empathy in medical students as related to academic performance, clinical competence and gender. Med Educ. 2002; 36:522–7.
16. Mostafa A, Hoque R, Mostafa M, Rana MM, Mostafa F. Empathy in undergraduate medical students of Bangladesh: Psychometric analysis and differences by gender, academic year, and specialty preferences. ISRN Psychiatry. 2014; 2014:375439.
17. Chatterjee A, Ravikumar R, Singh S, Chauhan PS, Goel M. Clinical empathy in medical students in India measured using the Jefferson Scale of Empathy–Student Version. J Educ Eval Health Prof. 2017;14:33.
18. Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, version 2.3.1. [Online] [Cited 2020 January 4]. Available from: URL: http://www.OpenEpi.com.
19. Hojat M, Mangione S, Nasca TJ, Cohen MJM, Gonnella JS, Erdmann JB, et al. The Jefferson scale of physician empathy: Development and preliminary psychometric data. Educ Psychol Meas. 2001; 61:349-65.
20. Hojat M, DeSantis J, Shannon SC, Mortensen LH, Speicher MR, Bragan L, et al. The Jefferson scale of empathy: A nationwide study of measurement properties, underlying components, latent variable structure, and national norms in medical students. Adv Heal Sci Educ. 2018; 23:899-920.
21. Dohrenwend AM. Defining empathy to better teach, measure, and understand its impact. Acad Med. 2018; 93:1754-6.
22. Li D, Xu H, Kang M, Ma S. Empathy in Chinese eight-year medical program students: Differences by school year, educational stage, and future career preference. BMC Med Educ. 2018; 18:1–9.
23. Burgess A, Goulston K, Oates K. Role modelling of clinical tutors: A focus group study among medical students. BMC Med Educ. 2015; 15:13–5.
24. Quince T, Thiemann P, Benson J, Hyde S. Undergraduate medical students' empathy: Current perspectives. Adv Med Educ Pract. 2016; 7:443-55.
25. Losasso AA, Lamberton CE, Sammon M, Berg KT, Caruso JW, Cass J, et al. Enhancing student empathetic engagement, history-taking, and communication skills during electronic medical record use in patient care. Acad Med. 2017; 92:1022–7.
26. Lee J, Kim H, Kim KH, Jung D, Jowsey T, Webster C. Effective virtual patient simulators for medical communication training: A systematic review. Med Educ. 2020; 54:786-95.
27. Laughey W, Sangvik Grandal N, Stockbridge C, Finn GM. Twelve tips for teaching empathy using simulated patients. Med Teach. 2019; 41:883–7.
28. Bas-Sarmiento P, Fernández-Gutiérrez M, Díaz-Rodríguez M, Carnicer-Fuentes C, Castro-Yuste C, García-Cabanillas MJ, et al. Teaching empathy to nursing students: A randomised controlled trial. Nurse Educ Today. 2019; 80:40–51.
29. Batt-Rawden SA, Chisolm MS, Anton B, Flickinger TE. Teaching empathy to medical students: An updated, systematic review. Acad Med. 2013; 88:1171–7.
30. Ratka A. Empathy and the development of affective skills. Am J Pharm Educ. 2018; 82:1140-3.
31. Hasan S, Al-Sharqawi N, Dashti F, Abdulaziz M, Abdullah A, Shukkur M, et al. Level of empathy among medical students in Kuwait University, Kuwait. Med Princ Pract. 2013; 22:385–9.
32. Fields SK, Mahan P, Tillman P, Harris J, Maxwell K, Hojat M. Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: Health provider - Student version. J Interprof Care. 2011; 25:287–93.
33. Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year: A longitudinal study of erosion of empathy in medical school. Acad Med. 2009; 84: 1182–91.
34. Derntl B, Finkelmeyer A, Eickhoff S, Kellermann T, Falkenberg DI, Schneider F, et al. Multidimensional assessment of empathic abilities: neural correlates and gender differences. Psychoneuroendocrinology. 2010; 35:67–82.
35. Kret ME, De Gelder B. A review on sex differences in processing emotional signals. Neuropsychologia. 2012; 50:1211–21.
36. Magalhães E, Salgueira AP, Costa P, Costa MJ. Empathy in senior year and first year medical students: A cross-sectional study. BMC Med Educ. 2011; 11:1–7.