

RESEARCH

Open Access



# Cognitive empathy variations during internship: a study from Iran

Habibeh Ahmadipour<sup>1\*</sup>  and Niloofar Soltanzadeh<sup>2</sup>

## Abstract

**Objective** Despite the critical role of empathy in medical students, various studies have provided conflicting evidence regarding changes in empathy during medical study. The present study was designed to investigate changes in cognitive empathy during the internship.

**Method** A study was conducted at the Afzalipour School of Medicine, Kerman University of Medical Sciences. All medical students at the beginning of their internship were entered the study as a cohort and asked to complete a two-part questionnaire including demographic characteristics and the Persian version of the Jefferson Scale of Empathy-Student Version (JSE-S). The questionnaire was completed again at the end of the internship. Data were analyzed using SPSS software using paired t- test and one-way repeated measures.

**Results** A total of 108 interns participated with a mean age of  $23.85 \pm 1.47$  years, and a female majority (61.1%). The mean score of standing in the patient's shoe increased significantly ( $P < 0.001$ ) during the internship, whereas the mean score of compassionate care decreased ( $P < 0.001$ ). The overall score of empathy decreased during the internship, but the difference was not statistically significant. ( $P = 0.105$ ). No statistically significant difference was found in the mean score of empathy and its subscales based on demographic characteristics in the two phases of the study.

**Conclusion** our results revealed that the level of cognitive empathy in the current study was higher than that in previous studies. The changes were consistent with some studies and contradictory to others. Considering that similar changes were observed in the subgroup analysis, it is necessary to focus more on the factors that cause this feeling to fade during the internship through appropriate assessment and timely intervention.

**Keywords** Empathy, Medical students, Internship, Iran

\*Correspondence:

Habibeh Ahmadipour  
ahmadipour@kmu.ac.ir

<sup>1</sup>Community Medicine Department, School of Medicine, Medical Education Leadership and Management Research Center, Kerman University of Medical Sciences, Kerman, Iran

<sup>2</sup>Community Medicine Department, School of Medicine, Kerman University of Medical Sciences, Kerman, Iran



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

## Introduction

Medical students have a major role and responsibility in patient care during their internship [1]; therefore, it is critical to become familiar with correct, effective, and empathetic patient-physician communication. Evidence revealed that having increased levels of cognitive empathy, vs. affective empathy, in the clinical setting has potential benefits for patients by increasing satisfaction and physicians by decreasing the probability of burnout [2].

Despite the importance and critical role of empathy for medical students as future doctors, various pieces of evidence show that the level of empathy decreases as their educational level progresses [3–7]. However, other similar studies do not reflect this decline [8–12]. This decline is attributed to different factors such as; a long period of study, their experiences in the process of patient care and exposure to the clinical environment [5], struggles in the balance between work and life, and extreme workload [13]. Neumann et al. revealed in a systematic review that the interest in different specialties (“patient-centered” versus “remote patient” specialties) and various kinds of distress, including lack of sleep, burnout, low self-worth, depression, and reduced quality of life, can be the main reasons for decreased self-assessed empathy among medical students [7, 14]. Cultural background, lack of self-esteem, academic pressure, and the students’ point of view toward empathy have been mentioned in a study conducted by Huang L et al [15] as the main reasons for the low level of empathy. Liselotte N.Dyrbye et al. found that the experience of mistreatment in the clinical setting, which is not an uncommon phenomenon [16, 17], and perceiving the clinical environment as less desirable can lead to a lower level of empathy in medical students [18].

In recent years, several studies have been conducted regarding empathy in medical students in our country [12, 19–22]. According to the general medical curriculum in Iran, medical interns go through an 18-month period, and during this period they are present in different clinical environments and practice skills related to patient management. The present study was designed to investigate changes in cognitive empathy during the internship.

## Materials and methods

### Study design and setting

A survey was conducted at the Afzalipour School of Medicine, Kerman University of Medical Sciences between March 2022 and August 2023.

### Participants

All medical students at the beginning of their internship (March 2022) were selected as a cohort and entered the study using a nonprobable convenience sampling

method. The inclusion criteria were being a newcomer intern and consent to participate. In cases where more than 10% of the questions were unanswered or the questionnaire was not completed in one of the two stages of the study, the student was excluded from the study.

### Ethical consideration

This study was approved by the vice chancellor of research at the Kerman University of Medical Sciences with code number 400,000,701 and ethical approval code: IR.KMU.AH.REC.1400.248. Participation in this study was voluntary and anonymous, with no incentives. Since, data collection was done by an electronic questionnaire, in the introduction of the questionnaire, the confidentiality of the data and its use only for research purposes were assured. Moreover, it was explained that the completion and submission of the electronic questionnaire by participants would be considered as their informed consent for the collection and use of data for specific research purposes. Considering that the questionnaire needed to be completed in two stages, the students were asked to enter their date and month of birth as a code so that comparison would be possible.

### Data collection

A two-part self-administered questionnaire was used to collect data. The first part included the demographic characteristics of the participants (gender, marital status, residence, parents’ educational level and job, and the degree of student interest in the field of medicine). The second part was the Persian version of the Jefferson Scale of Empathy-Student Version (JSE-S) which was developed by Hojat et al and its psychometric properties were previously confirmed [23–25]. In this instrument, empathy was defined as “understanding of the patient’s experiences, concerns, and perspectives, and ability to communicate this understanding.” [24].

This scale consists of 20 items on the empathy of medical students with the patient and has 3 subscales: taking a perspective (10 items), compassionate care (8 items), and standing in the patient’s shoe (2 items). Each item is scored on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), and 10 items are scored in reverse. The scores of the items in each subscale are added; therefore, the overall score can be in the range of 20–140. A higher score indicates more empathy with the patient [26]. All students were asked to complete the questionnaire at the beginning (the time of the pre-internship exam) and end of their internship (the time of graduation), which took approximately 10 min. The instrument was designed electronically on the Porsline platform, and the link was shared with students through social media. The questionnaire is completed in approximately 10 min.

**Table 1** Characteristics of medical interns

Variable	Category	N (%)
Gender	Male	42(38.9)
	Female	66(61.1)
Marital status	Single	77(71.3)
	Married	31(28.7)
Residence	Dorm	29(26.9)
	With parents	33(30.6)
	Own	46(42.6)
Father's educational level	Diploma	17(15.7)
	Academic	91(84.3)
Mother's educational level	Diploma	30(27.8)
	Academic	78(72.2)
Father job	Governmental	45(41.7)
	Private sector	52(48.1)
	Retired	11(10.2)
Mother job	Governmental	40(37.0)
	Private sector	42(38.9)
	Retired	1(0.9)
	Housekeeper	25(23.1)
Interest in medicine	Little	3(2.8)
	Moderate	23(21.3)
	Great	82(75.9)

**Table 2** Comparison of the mean score of empathy and its subscales at the beginning and end of the internship

Mean (SD)	Num- bers of items	The beginning	The end	P
Standing in the patient's shoe	2	9.28 (3.04)	11.24 (1.56)	<0.001
Compassionate care	8	47.32 (2.99)	43.72 (3.04)	<0.001
Taking a perspective	10	59.79 (2.95)	60.07 (4.01)	0.584
Overall score of empathy	20	116.40 (5.37)	115.03 (6.75)	0.105

The significance level was set as <0.05

### Data analysis

Data were analyzed using SPSS software (version 26.0; IBM Corporation) using paired t- test and one-way repeated measures. The significance level was set as <0.05.

### Results

**Demographic characteristics:** In total, 126 and 116 interns participated at the beginning and end of their internship, respectively. After the exclusion of those who did not participate in one of the steps, 108 interns were included in the statistical analysis with a mean age of  $23.85 \pm 1.47$  years, and a female majority (61.1%). Table 1 shows the details of the participants' characteristics.

Table 2 compares the mean score of cognitive empathy and its subscales at the beginning and end of the

internship. According to this table, the mean score of the standing in the patient's shoe subscale increased significantly ( $P < 0.001$ ) during the internship, whereas the mean score of the compassionate care subscale decreased significantly ( $P < 0.001$ ). The mean score of the taking a perspective subscale increased and the overall score of empathy decreased but none of these differences were statistically significant. ( $P > 0.05$ )

One-way repeated measure revealed that the mean score of cognitive empathy and its subscales at the beginning and end of the internship had no statistically significant difference based on demographic characteristics ( $P > 0.05$ ), except for the taking a perspective subscale, which was significantly higher in interns whose father had university education ( $P = 0.027$ ).

Changes in the mean score of empathy during the internship were not significant based on the demographic characteristics, except for the mother's education level, so in the interns whose mothers have a university education, the score at the end of the internship was significantly reduced ( $P = 0.037$ ). The score of the standing in the patient's shoe subscale was significantly increased during the internship based on all demographic characteristics, except for the interns whose mother is a housewife ( $P = 0.073$ ), with retired father ( $P = 0.092$ ) and those who had a low and moderate interest in the field of medicine ( $P = 0.088$ ). The score of the compassionate care subscale was significantly reduced during the internship based on all demographic characteristics, except for the interns who had a retired father ( $P = 0.057$ ). Changes in the score of taking a perspective subscale were not significant during the internship based on demographic characteristics. ( $P > 0.05$ )

### Discussion

The current study revealed that, although not statistically significant, the overall score of cognitive empathy decreased during the internship. This finding agrees with most evidence indicating a decline in the level of empathy during medical studies [3–7]. This decline is due to several factors identified in research studies. Some of the prominent reasons include the prioritization of biomedical knowledge in the hidden curriculum of medical education, [4, 27] the demanding academic workload, including exams and time constraints, [2, 27] personal stress and environmental factors within the clinical setting, a lack of formal training on empathy in healthcare settings, and excessive use of technology [4, 27]. It should also be considered that other evidence has shown that empathy is preserved or even enhanced during general medicine [8–12]. The contradiction in the evidence is attributed to various factors such as variations in study designs and methodologies (sample size, instruments, and setting), cultural and societal context (being more

supportive of empathy and patient-centered care), educational approaches, and curriculum (incorporating empathy-building activities, communication skills training, and other interventions) [9, 11, 28].

Regardless of the changes in empathy that may be influenced by various factors, it is better to keep in mind that cognitive empathy is a skill that should be taught to students during general medicine courses [29]. Several educational interventions have shown positive impacts on the empathy and compassion of medical students. One of these interventions is considering practical empathy training courses during the general medical course, in which standard patient, role-playing, and similar methods can be used [30–32]. Currently, the empty place of these trainings in our general medical curriculum is completely felt, and there is a serious need for these trainings to be prioritized in the reforms made in the program.

The current study revealed, both in the overall and subgroup analyses (based on demographic data), that there are almost the same results regarding the variation of cognitive empathy and its dimensions during internship. The findings indicate that there was no statistically significant difference between the various subgroups at the beginning and end of the internship. Although various studies have shown a correlation between demographic factors and medical students' empathy, [33–35] the present study showed that changes in empathy and its dimensions during the internship period are not related to students' demographic factors. Therefore, to strengthen cognitive empathy in medical students, effective and timely interventions should be used in the educational system, considering related factors (maybe other than demographic factors). There is conflicting evidence regarding the relationship between demographic factors and empathy. For example, Anderson et al. found through a systematic review that some studies reported that females have higher empathy scores while others revealed no differences between genders about cognitive empathy [19, 33]. In justifying these contradictions, Howick et al. concluded through another systematic review that poor reporting of demographic characteristics, in the studies about empathy, makes any speculation about the effect of this factor impossible to determine with precision [2].

Our results revealed that “standing in the patient's shoes” and “compassionate care” increased and decreased, respectively, and “taking a perspective had no change. Frequent exposure to difficult and demanding situations can lead to emotional detachment as a coping mechanism among healthcare providers. These conditions also cause emotional exhaustion and burnout which prevents proper communication with the patient. More focus on clinical tasks rather than an emphasis on interpersonal skills and patient perspectives as well as

systemic pressures (efficiency, productivity metrics, and time constraints) should be considered.

Despite the aforementioned, effective training and curriculum design, a stronger initial orientation towards patient-centered care, training environment, and culture (hidden curriculum) can lead to an enhancement in empathy scores during medical study. Moreover, the study design (cross-sectional vs. longitudinal) can be effective in revealing the decrease or increase of empathy, [36–38].

Considering that in the present study, the mean score of empathy and its dimensions were at a suitable level [12], it is necessary to focus more on the factors that cause this feeling to fade during the internship through appropriate assessment and timely intervention. Regarding the difference in the level of empathy in the present study compared with other studies, [12, 19, 39, 40] factors related to the educational environment, cultural background, and methodology can play a role.

One of the strengths of the current study is that it has been conducted to show cognitive empathy changes at the start and end of the 18 months of internships. Also, considering the importance of the internship period, this study is one of the limited studies that show the changes in empathy during this period. However, the present study was conducted in a limited population, and the possibility of generalizing its results is limited, due to the nature of this study, it is not possible to judge the temporal relationship.

## Conclusion

Our results revealed that the level of cognitive empathy in the current study was higher than that in previous studies. The changes in empathy during the internship were consistent with some studies and contradictory to others. Considering that similar changes were observed in the subgroup analysis, it is necessary to focus more on the factors that cause this feeling to fade during the internship through appropriate assessment and timely intervention, considering other related factors maybe other than demographic factors.

## Acknowledgements

Authors are grateful to all medical students without their cooperation this study would not be possible.

## Author contributions

H.A: Conceptualization, Methodology, Supervision, Writing review and editing. N.S: Data collection, Writing—original draft, Writing review and editing.

## Funding

None.

## Data availability

All data of the current paper are included in this published version.

## Declarations

### Ethics approval and consent to participate

This paper is the result of a project that was scientifically approved by Kerman University of Medical Sciences with code number 400000701 and ethical approval code: IR.KMU.AH.REC.1400.248.

### Consent for publication

N/A.

### Competing interests

The authors declare no competing interests.

Received: 18 February 2024 / Accepted: 23 July 2024

Published online: 29 July 2024

## References

- Masoomi B, Dastgiri M. Medical students' satisfaction about quality of education in Medial Emergency Ward in Isfahan University of Medical Sciences. *J Isfahan Med School*. 2011;28(121):1617–27. (Persian).
- Howick J, Dudko M, Feng SN, Ahmed AA, Alluri N, Nockels K, et al. Why might medical student empathy change throughout medical school? A systematic review and thematic synthesis of qualitative studies. *BMC Med Educ*. 2023;23(1):1–13. <https://doi.org/10.1186/s12909-023-04165-9>.
- Baig KS, Hayat MK, Khan MAA, Humayun U, Ahmad Z, Khan MA. Empathy levels in medical students: a single Center Study. *Cureus*. 2023;15(5). <https://doi.org/10.7759/cureus.38487>.
- Triffaux J-M, Tisseron S, Nasello J. Decline of empathy among medical students: dehumanization or useful coping process? *L'encephale*. 2019;45:3–8. <https://doi.org/10.1016/j.encep.2018.05.003>.
- Shah S, Muneeb M, Rajput AH. Empathy levels among medical students: a psycho-social analysis. *Annals Psychophysiol*. 2015;2(A):2–5.
- Barbosa P, Huchital MJ, Weiss JJ. Empathy in Podiatric Medical Education: challenges and opportunities for Comprehensive Care. *J Am Podiatr Med Assoc*. 2020;110(5). <https://doi.org/10.7547/18-187>.
- Adatia S, Tellier PP, Remtulla R. Survey of Medical Student Empathy at a Canadian Medical School: a cross-sectional quantitative survey. *PRIMER*. 2022;6:6. <https://doi.org/10.22454/PRIMER.2022.535629>.
- Tariq N, Tayyab A, Jaffery T. Differences in empathy levels of medical students based on gender, year of medical school and career choice. *J Coll Physicians Surg Pak*. 2018;28(4):310–3. <https://doi.org/10.29271/jcpsp.2018.04.310>.
- Samarasekera DD, Lee SS, Yeo SP, Ponnampereuma G. Development of student empathy during medical education: changes and the influence of context and training. *Korean J Med Educ*. 2022;34(1):17–26. <https://doi.org/10.3946/kjme.2022.216>.
- Herber-Valdez CR, Blow JA, Salazar TT, Horn KV, Herrera DG, Lacy NL, et al. The integrated curriculum and student empathy: a longitudinal multi-cohort analysis. *Adv Health Sci Educ Theory Pract*. 2023. <https://doi.org/10.1007/s10459-023-10292-1>.
- Blanco JM, Caballero F, Álvarez S, Plans M, Monge D. Searching for the erosion of empathy in medical undergraduate students: a longitudinal study. *BMJ Open*. 2020;10(12):e041810. <https://doi.org/10.1136/bmjopen-2020-041810>.
- Rahimi-Madiseh M, Tavakol M, Dennick R, Nasiri J. Empathy in Iranian medical students: A preliminary psychometric analysis and differences by gender and year of medical school. *Medical Teacher*. 2010; 32(11): e471–e8. PMID: 21039088 <https://doi.org/10.3109/0142159X.2010.509419>.
- Hill MR, Goicochea S, Merlo LJ. In their own words: stressors facing medical students in the millennial generation. *Med Educ Online*. 2018;23(1):1530558. <https://doi.org/10.1080/10872981.2018.1530558>.
- 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(8):996–1009. <https://doi.org/10.1097/ACM.0b013e318221e615>.
- Huang L, Thai J, Zhong Y, Peng H, Koran J, Zhao XD. The Positive Association between Empathy and Self-Esteem in Chinese Medical students: a multi-institutional study. *Front Psychol*. 2019;10:1921. <https://doi.org/10.3389/fpsyg.2019.01921>.
- Tauben A, Yousif E, Harriette Gillian Christine Van S. Systematic review of academic bullying in medical settings: dynamics and consequences. *BMJ Open*. 2021;11(7):e043256. <https://doi.org/10.1136/bmjopen-2020-043256>.
- Ahmadipour H, Vafadar R. Why mistreatment of medical students is not reported in clinical settings: perspectives of trainees. *Indian J Med Ethics*. 2016; 1(4):215–8. PMID: 27473016 <https://doi.org/10.20529/IJME.2016.062>.
- Dyrbye LN, Satele D, West CP. Association of characteristics of the Learning Environment and US Medical Student Burnout, Empathy, and Career Regret. *JAMA Netw Open*. 2021;4(8):e2119110. <https://doi.org/10.1001/jamanetworkopen.2021.19110>.
- Nasiri M, Amini M, Mani A, Delavari S, Kiani M, Sagheb MM, et al. Assessing empathy in final-year medical students using the Persian version of the Jefferson Scale of Physician Empathy. *J Educ Health Promot*. 2021;10:310. [https://doi.org/10.4103/jehp.jehp\\_1539\\_20](https://doi.org/10.4103/jehp.jehp_1539_20).
- Soheili F, Taheri A, Hosseinian S, Nooripour R. Comparison of the relationship between patient-patient Empathy and Birth Order in Medical students in Iran and England: cross-cultural study. *Iran J Med Ethics History Med*. 2019;12:151–60. (Persian).
- Cyrus A, Salehi B, Naziri M, Sedeh BS, Vosoulie R. Empathic communication and essential instruction for medical students. *J Biology Today's World*. 2017;6(6):97–101. <https://doi.org/10.15412/J.B.TW.01060601>.
- Benabbas R. Empathy in Iranian medical students: a comparison by age, gender, academic performance and specialty preferences. *Med J Islamic Repub Iran*. 2016; 30(1). PMID: 28210604 PMID: PMC5307608.
- Hizomi Arani R, Naji Z, Moradi A, Shariat SV, Mirzamohamadi S, Salamati P. Comparison of empathy with patients between first-year and last-year medical students of Tehran University of Medical Sciences. *BMC Med Educ*. 2021;21(1):460. <https://doi.org/10.1186/s12909-021-02897-0>.
- Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: definition, components, measurement, and relationship to gender and specialty. *Am J Psychiatry*. 2002;159(9):1563–9. <https://doi.org/10.1176/appi.ajp.159.9.1563>.
- Shariat SV, Habibi M. Empathy in Iranian medical students: measurement model of the Jefferson scale of empathy. *Med Teach*. 2013;35(1):e913–8. <https://doi.org/10.3109/0142159X.2012.714881>.
- Shakurnia A, Maniati M, Khajeali N, Barani M. Effect of a short training course on Empathy level in medical students: a quasi-experimental study. *Strides Dev Med Educ*. 2021;18(1):1–6. <https://doi.org/10.22062/sdme.2021.196387.1070>.
- Chhabra N, Chhabra S, Archer E. Medical students' perspectives on the factors affecting Empathy Development during their undergraduate training. *Med Sci Educ*. 2022;32(1):79–89. <https://doi.org/10.1007/s40670-021-01487-5>.
- Ye X, Guo H, Xu Z, Xiao H. Empathy variation of undergraduate medical students after early clinical contact: a cross-sectional study in China. *BMJ Open*. 2020;10:e035690. <https://doi.org/10.1136/bmjopen-2019-035690>.
- Hardee JT. An overview of Empathy. *Perm J* 2003 Fall; 7(4):51–4. PMID: PMC5571783.
- Perrella A. Fool me once: The illusion of empathy in interactions with standardized patients. *Med Teach*. 2016; 38(12):1285–7. PMID: 27573287 <https://doi.org/10.1080/0142159X.2016.1210115>.
- McNally G, Haque E, Sharp S, Thampy H. Teaching empathy to medical students. *Clin Teach*. 2023;20(1):e13557. <https://doi.org/10.1111/tct.13557>.
- Boshra M, Lee A, Kim I, Malek-Adamian E, Yau M, LaDonna KA. When patients teach students empathy: a systematic review of interventions for promoting medical student empathy. *Can Med Educ J*. 2022;13(6):46–56. <https://doi.org/10.36834/cmej.73058>.
- Wang Q, Wang L, Shi M, Li X, Liu R, Liu J, et al. Empathy, burnout, life satisfaction, correlations and associated socio-demographic factors among Chinese undergraduate medical students: an exploratory cross-sectional study. *BMC Med Educ*. 2019;19:341. <https://doi.org/10.1186/s12909-019-1788-3>.
- Wen DL, Ma XD, Li HH, Liu ZF, Xian BS, Liu Y. Empathy in Chinese medical students: psychometric characteristics and differences by gender and year of medical education. *BMC Med Educ*. 2013;13:130–5. <https://doi.org/10.1186/1472-6920-13-130>.
- Rezayat AA, Shahini NS, Asl HT, Jarahi L, Behdani F, Shojaei SRH, et al. Empathy score among medical students in Mashhad, Iran: study of the Jefferson scale of physician empathy. *Electron Physician*. 2018;10(7):7101–6. <https://doi.org/10.19082/7101>.
- Andersen FA, Johansen AS, Søndergaard J, Andersen CM, Assing Hvidt E. Revisiting the trajectory of medical students' empathy, and impact of gender, specialty preferences and nationality: a systematic review. *BMC Med Educ*. 2020;20:1–8. <https://doi.org/10.1186/s12909-020-1964-5>.

37. -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. <https://doi.org/10.1186/1472-6920-11-52>.
38. -Teng VC, Nguyen C, Hall KT, Rydel T, Sattler A, Schillinger E, Weinlander E, Lin S. Rethinking empathy decline: results from an OSCE. *Clin Teach.* 2017;14(6):441–5. <https://doi.org/10.1111/tct.12608>.
39. -Daryazadeh S, Adibi P, Yamani N, Mollabashi R. Impact of narrative medicine program on improving reflective capacity and empathy of medical students in Iran. *J Educ Eval Health Prof.* 2020;17:3. <https://doi.org/10.3352/jeehp.2020.17.3>.
40. -Karimi FZ, Abdollahi M. Factors affecting Empathy with patient among Healthcare Provider students: a structural equation modeling study. *Indian J Crit Care Med.* 2019;23(9):396–9. <https://doi.org/10.5005/jp-journals-10071-23232>.

### **Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.