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Changes in Medical Students' Empathy Level in Different Academic Years: A Trend Analysis

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ABSTRACT

Empathy is an essential attribute that enables physicians to comprehend the condition and emotions of their patients, facilitating accurate responses. Consequently, empathy has been linked to improved diagnoses and enhanced clinical outcomes. This study aimed to assess the changing patterns of empathy levels among medical students during their academic tenure in medical school. A descriptive study was conducted using convenience sampling, involving 361 medical students in Ahvaz, Iran, between September and December 2021. Empathy levels were assessed using the Persian adaptation of the Jefferson Scale of Empathy (student version) (JSE-S). Statistical analyses were conducted using the t-test and variance analysis (ANOVA). Based on the empathy scale (ranging from 20 to 140), the mean empathy score among medical students was found to be 106.42±14.8, exhibiting variations based on study year, gender, and grade point average (GPA) ($p < 0.01$). Notably, a significant decline in empathy scores was observed in final-year students compared to their counterparts in the first year (113.39 vs. 97.05; $p < 0.001$). Female students and those with higher GPAs demonstrated a higher level of empathy ($p < 0.001$). The results of the present study revealed that medical students in Iran exhibit a moderate level of empathy compared to findings from local studies. Furthermore, the findings suggest a decline in empathy levels as students progress through their years in medical school. Based on these findings, it is strongly recommended to integrate empathy training into the medical curriculum. Such an approach would enhance student learning and contribute to positive patient care outcomes.

Keywords: *Empathy, Trend, Medical students, Medical education, Communication*

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INTRODUCTION

Achieving excellence as a physician encompasses more than just clinical proficiency; it also necessitates the development of specific emotional and professional competencies. Effective communication and empathic abilities are crucial for establishing meaningful connections between physicians and their patients, and they are widely recognised as integral components of professionalism (1).

Empathy is an indispensable skill in medicine and a fundamental aspect of professionalism. It is defined as the cognitive ability to comprehend the emotions of others by envisioning oneself in their circumstances and expressing this understanding, along with a genuine desire to assist (2, 3). Multiple studies have demonstrated a significant correlation between elevated levels of empathy and favourable outcomes in the future careers of medical professionals (4–6). Consequently, medical schools should prioritise teaching empathy skills to their students.

In clinical settings, a crucial aspect of establishing an effective and beneficial relationship lies in the ability to comprehend and the level of empathy shared between the patient and the physician (7). Research has indicated that physicians with higher levels of empathy and competence in obtaining medical history, conducting clinical examinations, delivering post-treatment instructions, and fostering patient cooperation experience enhanced patient satisfaction, fewer functional errors, and improved treatment outcomes (1, 6). Empathy is recognised as an essential skill for physicians and has garnered significant attention from the global medical education system. Consequently, medical educators strongly advocate for including empathy training in the curriculum for medical students (8). Both the World Health Organization (WHO) and the World Federation of Medical Education (WFME) emphasise the importance of communication skills, including empathy, in medical schools. They have recommended that the education of medical students should prioritise developing and promoting these skills (9). Hence, it is imperative for medical educators to prioritise empathy and assess its incorporation into medical student education, thereby reinforcing empathetic behaviour. Medical schools employ various interventions to cultivate empathy among medical students, including early clinical exposure, medical ethics courses, and professional training workshops. In Iran, there has been a recent revision of the undergraduate medical curriculum in which a 7-year programme has been introduced. This curriculum encompasses a series of educational training sessions focused on communication skills and ethics aimed at fostering a solid patient-physician relationship. Additionally, the Ahvaz Jundishapur University of Medical Sciences (AJUMS) in Iran has implemented a training programme that acquaints medical students with professional ethics courses during the pre-clinical years of their medical education (10). The medical education curriculum comprises two distinct components: pre-clinical and clinical. During the pre-clinical phase, medical students are equipped with the necessary materials through various courses. In this period, workshops are conducted for medical students, covering essential topics including professional conduct, empathy, communication, critical thinking, problem-solving, and more. Consequently, a meticulous assessment of the efficacy of these interventions is imperative to foster the growth of empathetic behaviour.

Research reveals contrasting findings regarding changes in empathy during medical school training. Cross-sectional studies employing the Jefferson Scale of Physician Empathy indicate that senior-year medical students either scored higher than junior students or exhibited no significant differences between students commencing their course and those nearing its completion (11, 12). However, further

studies are necessary to enhance our understanding of how empathy evolves throughout medical school training in the future.

Considering the imperative role of medical students as future physicians, it becomes crucial for them to acquire the essential competencies required to fulfil their professional responsibilities. Therefore, early intervention becomes pivotal in understanding the empathy levels of physicians and the patterns of its evolution. While there is a strong emphasis from educators on promoting empathy in medical students, research findings have been inconsistent. Certain studies indicate a decline in empathy throughout medical school (13, 14), whereas others report no substantial change (4) or even an increase as medical training progresses during the course of medical education (15). Limited data is currently available regarding the trend of empathy among Iranian medical students, and the generalisability of findings from studies conducted elsewhere remains uncertain. This uncertainty arises primarily due to potential cultural differences and significant variations in the medical education system. Consequently, the objective of the present study was to examine the levels of empathy and its potential changes throughout medical school among Iranian medical students.

METHOD

Participants

A descriptive study was conducted at the medical school of AJUMS, Iran, spanning from October to December 2021. The target population of the study encompassed all students enrolled in the 7-year programme at AJUMS. The total number of students in AJUMS School of Medicine during the study period was 2,900. The sample size for this study was determined to be 341, utilising the Krejcie and Morgan table (16). A total of 370 students were selected as the study sample to account for potential incomplete questionnaires and an anticipated attrition rate of 5%. The sample size for this study ultimately consisted of 370 students selected through convenience sampling.

The inclusion criteria for this study were enrolment in a medical programme and willingness to participate in research. Conversely, unwillingness to participate in the study and incomplete responses to the questionnaire served as the exclusion criteria.

Instrument

The instrument utilised in this study consisted of a two-section questionnaire. The initial section focused on capturing the demographic characteristics of the students, including age, gender, academic year, and grade point average (GPA). The second section comprised the Persian version of the Jefferson Scale of Empathy (student version) (JSE-S) questionnaire (16). The JSE, developed by Hojat, is a widely employed tool for assessing empathy levels among medical students. Its validity and reliability have been confirmed in a study conducted by Hojat et al. (7). Rahimi-Madiseh and Hashempor adapted the JSE for the Iranian population (17, 18). The Iranian version of the scale demonstrated a Cronbach's alpha of 0.87 for the entire instrument. It comprises 20 items divided into three subscales: "Perspective Taking" (consisting of 10 items with a score range of 10–70), "Compassionate Care" (comprising eight items with a score range of 8–56), and "Walking in the Patient's Shoes" (comprising two items with a score range of 2–14). This questionnaire includes ten negatively worded items that are reverse scored. Each item is rated on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The total score ranges from 20 to 140, with higher scores indicating a higher level of empathy and vice versa.

Students' GPAs were collected through self-report. As part of the questionnaire, students were requested to indicate their academic average and personal characteristics. Subsequently, the students were classified into two groups based on their GPA, distinguishing between high and low academic performance. Specifically, students with GPAs below the mean were categorised as the low group, while those with GPAs above the mean were classified as the high group.

Before distributing the questionnaires, the participants were provided with a clear explanation of the study's objectives and instructions on completing the questionnaires. The importance of maintaining the confidentiality of information was emphasised. Written informed consent was obtained from all participating students prior to their involvement in the research. The respondents completed the questionnaires anonymously, and strict confidentiality measures were implemented to ensure the privacy of their responses.

Statistical Analysis

Statistical analysis was performed using SPSS 18.0 (SPSS Inc., Chicago, IL, US). Descriptive statistics were used to express sample characteristics, including mean and standard deviation for continuous variables and number and percentage for categorical variables. Group comparisons were assessed using the student t-test for independent samples and variance analysis (ANOVA). Statistical significance was set at a p value of less than 0.05.

RESULTS

Out of the 370 questionnaires distributed, a total of 361 were completed and returned, resulting in a response rate of 97.5%. Among the respondents, 161 (44.6%) were male, and 200 (55.4%) were female. The mean age of the participants was 23.67±2.8 years. The average GPA of the students was 16.47±1.37. Among the participants, 173 (49.9%) had a low GPA, 174 (50.1%) had a high GPA, and 114 did not specify their GPA. The mean empathy score

Table 1: Empathy scores distribution according to demographic characteristics of the students

Variable	n (%)	Mean±SD	*p*-value
Gender			
Male	161 (44.6)	103.02±15.4	0.001
Female	200 (55.4)	109.15±13.7	
GPA			
Lower	173 (49.9)	102.90±14.8	0.001
Higher	174 (50.1)	109.17±14.1	
Academic year			
1st	56 (15.5)	113.39±13.1	0.001
2nd	57 (15.8)	111.94±12.7	
3rd	48 (13.3)	110.62±12.1	
4th	54 (15.0)	109.59±15.8	
5th	47 (13.0)	101.25±15.4	
6th	48 (13.3)	98.95±13.6	
7th	51 (14.1)	97.05±11.3	

among the medical students was 106.42 ±14.8. Table 1 provides the distribution of sociodemographic factors and the mean empathy scores. Comparisons revealed significant differences in empathy levels among students based on sex, GPA, and academic year. Female students and those with higher GPAs reported higher levels of empathy (p = 0.001).

In the univariate analysis, first-year students had higher empathy scores (113.39±13.1) than last-year students (97.05±11.3). The difference in mean scores between different years of study was statistically significant (p = 0.001). Notably, a declining trend was observed in the empathy scores among medical students as they progressed through their years of study in medical school. Figure 1 displays the mean empathy scores of students categorised by academic year and gender.

The most notable and statistically significant difference was observed between male and female students. The mean empathy score for male students was 103.02±15.41, while for female students, it was 109.15±13.77 (p = 0.000). Furthermore, female students exhibited higher total scores in the perspective-taking, compassionate care, and standing in the patient's shoe subscales than male medical students, as shown in Table 2.

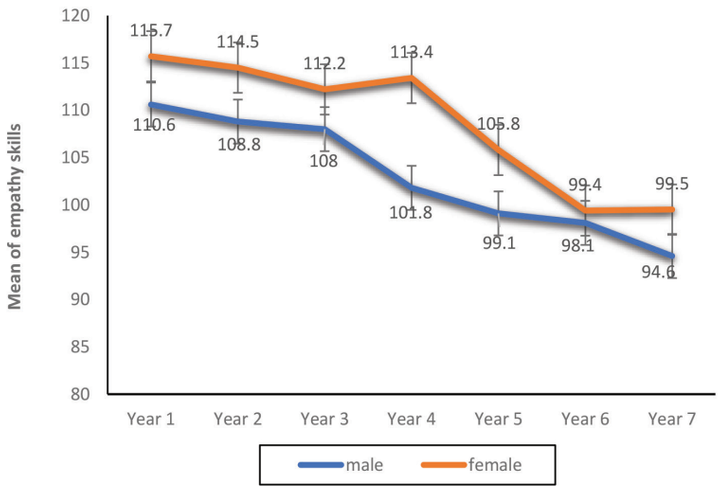

Figure 1: Trend of empathy scores of medical students according to years and gender.

Table 2: Comparison of empathy scores and its subscales according to gender

Item	Total SD±Mean	Male SD±Mean	Female SD±Mean	*t*	*p*
Perspective taking	6.98±57.68	7.04±56.80	6.87±58.39	2.164	0.031
Compassionate care	8.41±39.60	9.35±37.62	7.20±41.20	3.994	0.001
Standing in the patient's shoes	2.54±9.13	2.70±8.60	2.32±9.56	3.562	0.001
Empathy	14.82±106.42	15.41±103.02	13.77±109.15	3.985	0.001

DISCUSSION

The study aimed to assess empathy levels and their changes among medical students throughout their academic years in medical school. Our findings revealed that the mean empathy score among medical students was 106.42±14.8, consistent with the results reported in two local studies conducted among Iranian medical students by Arani et al. and Hamidia et al. They reported mean empathy scores of 106.85±16.80 and 106.1±29.8, respectively (19, 20). The empathy level of medical students in our study was comparable to that of Asian countries such as Japan (21), Korea (22), China (23), Malaysia (24), and Kuwait (25), which predominantly reported moderate levels of empathy. However, the empathy level observed in our study was relatively lower when compared to studies conducted on medical students in Western countries, such as the US (7, 26) and Europe (4, 8). Hojat et al. suggested that the lower empathy scores among Asian medical students compared to their Western counterparts could be attributed to cultural and social differences (16). Nevertheless, it is crucial to conduct further investigations to explore and consider other factors related to this issue.

Consistent with the existing literature, our study findings demonstrate a significant decline in empathy scores among medical students as they progress through their years of medical school (5, 14, 27–29). This observation aligns with numerous previous studies that have reported a decline in empathy scores during the course of medical education. For instance, a cross-sectional study conducted by Arani et al. (19) among Iranian medical students yielded similar results. The study found a notable decrease in mean empathy scores, from 110.19 in the first year to 103.52 in the final year of medical school. Hojat et al. (11) similarly reported a declining trend in empathy scores among American medical students, decreasing from 115.04 in the first year to 113.04 in the final year. A review study further supported this observation, revealing an inverse relationship between academic years and empathy scores among medical students (14). Germán Málaga discussed this phenomenon as the "heart hardening" or "dehumanisation" of medical students, referring to the decline in empathy levels throughout their medical education (30). Málaga suggested that this decline could be attributed to various factors, including distress encompassing burnout, depression, sleep deprivation, and reduced quality of life. Distress appears to be the primary reason behind the observed decreased empathy during academic years. In the final years of study, it is likely that increased emphasis on acquiring technical skills among higher education students and decreased focus on patient communication contribute to a decline in empathy. Additionally, the stress and anxiety experienced in clinical environments and the responsibility of caring for patients during the later years of medical education may also contribute to the decrease in empathy levels. However, contrary to the findings of our study, some studies have reported increased empathy scores among medical students throughout their academic years (15, 31, 32). A cross-sectional study of Portuguese medical students found that final-year students had higher empathy scores than first-year students (28). Our findings are inconsistent with a study on Japanese medical students, which showed an upward trend in empathy scores throughout their academic years (15). A systematic review of 30 studies conducted in 20 different countries (including 24 cross-sectional and six longitudinal studies) examining changes in empathy scores among medical students over time reported a decline in empathy in 14 studies. The remaining 16 studies observed improvement or no change in empathy (4). These discrepancies in findings may be attributed to cultural differences and variations in the emphasis placed on teaching empathy and communication skills within the medical school curriculum.

Further research is necessary to explore this issue and identify the factors that contribute to changes in empathy levels.

According to our findings, female students consistently scored significantly higher on empathy levels than male students throughout their university years. This difference remained consistent, with women consistently obtaining higher empathy scores than men. A similar study by Hojat et al. (33) also demonstrated that although the average empathy scores of both men and women changed over the years, women consistently had higher scores than men. While many studies have consistently shown higher average empathy scores among female medical students compared to male students (1, 15, 28), some studies have reported no difference between male and female students in this regard (4, 17, 22). Gender differences in students' empathy levels may be attributed to various factors. It has been suggested that women tend to be more receptive to emotional signals than men. Additionally, women often have a greater interest in family life and social relationships, which may contribute to their ability to better understand patients and establish empathetic connections. However, further studies are required to explore the relationship between gender, gender roles, and empathy in greater detail.

Consistent with previous research demonstrating a significant association between academic performance and levels of empathy in medical students (16, 34), our study revealed a notable correlation between GPA and empathy levels. Specifically, students with higher academic achievements exhibited higher empathy scores. This finding contrasts with the results of some prior studies (3, 35), which failed to identify a significant link between empathy and students' academic performance. One possible explanation for this relationship is that students who excel academically display greater interest in the medical field, demonstrate increased dedication to studying and mastering the curriculum, and strive to acquire the necessary skills and competencies, including communication skills like empathy, to prepare themselves for their future professional endeavours.

The findings of the current study reveal a concerning decline in empathy skills among medical students throughout their years in university. This trend raises the alarm as it has implications for the future training of physicians with inadequate clinical capabilities. One possible explanation for this decline is the absence of interpersonal and communication skills training in the medical curriculum of Iranian medical universities. The results of this study provide valuable insights for policymakers, enabling them to better comprehend empathy levels and their associations among medical students in Iran. Hopefully these findings serve as a wake-up call for educational policymakers in Iranian medical universities to prioritise interpersonal skills, including communication and empathy. Medical schools have a pivotal role in assessing and monitoring the empathic skills of medical students, and they should undertake educational interventions to preserve and enhance these skills. Implementing appropriate training programmes to improve empathy in medical students is crucial.

This study had certain limitations that should be acknowledged. Firstly, the data were obtained solely from a single medical school, which may restrict the generalisability of the findings to a wider population. Additionally, this study relied on a self-report questionnaire, which may not consistently provide an accurate reflection of actual behaviours.

CONCLUSION

A significant decrease was observed in empathy scores as medical students progressed through their years of study. The findings indicate a decline in empathy scores among students at AJUMS during their training, which aligns with similar trends observed in medical universities worldwide. Additionally, this study revealed

that female students displayed higher levels of empathy than their male counterparts. Furthermore, a positive association between higher academic performance and empathy scores among students was observed. To enhance empathy skills, it may be beneficial to incorporate activities within the medical curriculum, such as personal and professional development courses. These study findings will inform efforts to reshape the AJUMS curriculum and optimise the various dimensions of empathy among medical students.

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ETHICAL APPROVAL

The study was approved by the Research Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (ethical code: IR.AJUMS.REC.1398.870).

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