Empathy score among medical students in Mashhad, Iran: study of the Jefferson Scale of Physician Empathy

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Abstract

Background: Empathy is one of the essential components of physician-patient relationship that has a significant effect on treatment outcomes.

Objective: The aim of this study was to assess the empathy score among medical students in Mashhad, Iran.

Methods: In this cross-sectional study in 2015, 624 medical students at Mashhad University of Medical Science (Iran) completed the Jefferson Scale of Physician Empathy (JSPE). Data were analyzed by SPSS ver. 16, using independent-samples t-test, Chi-square, MANOVA, Spearman correlation, and Confirmatory factor analysis.

Results: Of the 38.4% males and 65% females who participated in this study, the mean score of JSPE in the sample was 103.67 ($\pm$15.34) which was higher in women than in men. Also, the mean scores for each of the three factors of the scale were calculated. The total empathy score, compassionate care, and taking perspectives among different age groups were significant (p=0.000). Furthermore, students having high interest in their field were more empathic (p=0.008). Empathy of interns in relation to three areas of basic sciences (the first year, the second year and the first half of the third year), physiopathology (the second half of the third year, and the fourth year), and clinical trainings (the fifth year, and the first half of the sixth year), experienced significant reduction (p$\leq$0.001).

Conclusions: This study showed that empathy was higher in women in their first medical year and who were of younger age. The overall rate of empathy in the basic sciences period was more than that in the clinical period. Therefore, the initial exposure to clinical education, especially patient education and empathy, has a very prominent effect on the ability of medical students.

Keywords: Empathy, Medical students, Jefferson scale of Physician Empathy

1. Introduction

Empathy is a very important factor, and is one of the first communication factors in the relationship between physician and patient (1-10). It is also considered as a proprietary factor in the medical profession (11). It can be

defined as a cognitive attitude to understanding the suffering and pain of a patient and the ability to understand and help him (12-15). Empathy is a broad concept that has many meanings, due to different theories and attitudes (16-18). A number of studies have suggested that empathy in a physician-patient relationship improves patient satisfaction (16, 19), increases indulgency (20), increases the doctor's ability to diagnose and treat (20), reduces the risk of medical malpractice (21) and improves clinical outcomes (9, 13). Jefferson created a tool to measure the level of empathy among health professionals (HP version) and students (S-version) (22), which is currently translated into 38 languages including Persian (2). According to the previous studies, the construct validity, criterion-related validity, predictive validity, internal consistency, and test-retest reliability of the JSE have been approved (17). This tool has been expanded by Hojat et al. (17). This scale is also validated in Iran (2). Jefferson's empathy assessment tool includes three factors, which include perspective taking, compassionate care, and ability understand things from the perspective of the patient (14). These three factors have been used in various studies. However, no studies yet exist on the examination of the JSPE scale among medical students. This study has been conducted to evaluate empathy among medical students. The study aimed to measure psychometric characteristics of the JSPE scale among medical students in Mashhad, Iran, from March to September 2015.

2. Material and Methods
2.1. Research design and participants
This cross-sectional study was conducted from March to September 2015. To determine the sample size, preliminary data were obtained. The quantitative dependent variables were determined according to the study of Hojat et al. (1). Inclusion criterion was being a medical student, and the following were set as the exclusion criteria:
1) Aged older than 30 years
2) Having a history of drug or alcohol abuse or personality disorder.
3) Having a history of psychiatric problems.
4) Having no written informed consent.

2.2. Instrument
JSPE-Health Professional Version is a tool for evaluating physician and patient communication (9). It is a self-reporting tool and contains 20 questions (from strongly disagree to strongly agree). The Persian version has previously been used by general practitioners and assistants (2).

2.3. Data collection
The Iranian student version of the JPSE-S was distributed to a number of medical students of Mashhad University of Medical Sciences (IRAN) in September 2015. Similar studies were used to determine the sample size (3). A total of 700 volunteers completed the JSPE-S. Participants of this study were residents from 5 large governmental hospitals in Mashhad (Iran) and they were given 20 minutes to complete the questionnaire themselves. To cover almost all residents, three different fields of residency were selected. To investigate the underlying components of the Jefferson Scale of Physician Empathy, data were subjected to principal component analysis by using Varimax rotation method. The researchers selected students from different years with convenient sampling. A total of 665 completed questionnaires were received; however, only 624 of these questionnaires were analyzed in the study. Forty-one questionnaires were omitted due to incorrect scoring.

2.4. Ethics of research
The protocol was approved by the Ethical Committee of Mashhad University of Medical Sciences (Ref. no.: 911016). The study was performed in accordance with the Declaration of Helsinki and subsequent revisions. Participants voluntarily completed the questionnaire and written informed consents were obtained from students before entering the study.

2.5. Statistical analysis
The data were analyzed using descriptive statistics; including tests for assessing the normality of the data, independent-samples t-test, Chi-square, MANOVA, Spearman correlation, and Confirmatory factor analysis. MANOVA was used to assess the effect of gender on scores of JSPE and its three factors. The data were analyzed by SPSS-16 (SPSS Inc., Chicago, Illinois, USA). P-values of less than 0.05 were significance level.

3. Results
In this study, 640 questionnaires were completed, which were mostly by women. Of these, 33% were in the field of basic sciences, 13.2% were physiopathology (second half of the third year, and fourth year), 31.4% were clinical

trainings and 22.1% were interns (Table 1). Mean score of JSPE in the sample was 103.67 (±15.34). The mean scores for each of the three factors of the scale were also calculated. The mean scores for perspective taking were 51.25 (±10.53) and compassionate care 43.52 (±7.02), while ability to understand views from the perspective of the patient had a mean score of 8.87 (±2.79). Subsequent tests of between-subjects effects showed that the female group scored significantly higher on compassionate care with p=0.003 (95% CI: -2.23 to -0.22), but the differences were not significant on ability to understand views from the perspective of the patient and perspective taking. The study found an inverse significant relationship between the students' age and mean empathy score, perspective taking, and compassionate care. Table 2 shows the correlation between empathy and factors with independent variables. Post hoc tests to determine differences between groups were carried out and the results are shown in Table 3.

Table 1. Demographics of the participants in the study

Variable		n (%)
Sex	Male	248 (40)
	Female	376 (60)
Age (year)	<22	321 (51.4)
	22-24	167(26.7)
	≥25	136 (21.7)
Level of education	Basic sciences	206 (33.0)
	Physiopathology	84 (13.2)
	Clinical trainings	196 (31.4)
	Interns	138 (22.1)

Table 2. Correlation between the empathy and factors with independent variable

Variable	Mean Empathy Score	Perspective taking	Compassionate care	ability to understand views from the perspective of the patient
Sex	0.178	0.922	0.003	0.661
Age	0.006	0.000	0.005	0.309
Interest in the field	0.087	0.008	0.820	0.648
Level of education	0.015	0.000	0.006	0.928

Table 3. Correlation between the empathy factors with age groups

Variable	(I) age	(J) age	Sig.	95% CI Lower Bound	Upper Bound
Compassionate care	<22	22-24	0.881	-1.1149	1.9649
		25-27	0.030	.1772	4.5353
	22-24	<22	0.881	-1.9649	1.1149
		25-27	0.131	-.3819	4.2444
	25-27	<22	0.030	-4.5353	-.1772
		22-24	0.131	-4.2444	.3819
Perspecting taking	<22	22-24	0.000	2.3477	6.9460
		25-27	0.000	7.7621	14.2540
	22-24	<22	0.000	-6.9460	-2.3477
		25-27	0.000	2.6828	10.0396
	25-27	<22	0.000	-14.2540	-7.7621
		22-24	0.000	-10.0396	-2.6828
Total Empathy	<22	22-24	0.004	1.1889	7.9829
		25-27	0.000	9.1989	18.0086
	22-24	<22	0.004	-7.9829	-1.1889
		25-27	0.000	4.1180	13.9178
	25-27	<22	0.000	-18.0086	-9.1989
		22-24	0.000	-13.9178	-4.1180

* The mean difference is significant at the .05 level.

The JSPE mean score was also compared in the following four groups of students: 1) students on their basic sciences studies (the first 2.5 years of medical program), 2) students on their physiopathology studies (from year 2.5 of their medical program till the end of year 4), 3) students on their clinical trainings (from year 5 to year 6.5 of their

medical program), and 4) interns (on their last 1.5 years of medical program). The difference in various education levels showed that the total score on the intern empathy towards three areas of basic sciences were significantly reduced (p=0.000). When divided into two groups of basic science and clinical level, the results showed that the total score of empathy and the domain, perspective taking, and compassionate care were significantly different between the two groups (Table 4). Construct validity of the empathy scale showed that three meaningful factors emerged.

Table 4. Comparison of the total score of empathy and domains in basic science and clinical level

Variable	Basic science	Clinical level	p-value
Total empathy score	107.32±13.5	97.91±16.2	≤0.001
Perspective taking	54.55±7.76	46.08±12.11	≤0.001
Compassionate care	43.95±6.8	42.83±7.2	0.006
ability to understand views from the perspective of the patient	8.83±2.7	8.9±2.8	0.808

4. Discussion

This study examined the empathy score in medical students. The mean empathy score of this study (mean=103.67) was similar to the scores of Japanese (mean=104.3), Kuwaiti (mean=104.6) and Iranian (mean=105.1), and was lower than the scores of Chinese (mean=109.60) and Iranian medical students (mean=110.41) (25, 26). It may be due to differences in culture, ethnicity, race, religious beliefs and training systems. The average score of empathy in women was higher than in men. This is similar to other studies (26-30). Also, in dental students, it was shown that females scored significantly higher on the JSPE than males (30-32). Women showed more emotional perception in physician and patient relationships. (25). Also, several studies have suggested that female physicians (2) and female medical students (1, 22) gain a higher score of empathy and show a more positive attitude toward empathy with patients. The present study also showed similar results in which the empathy score was significantly higher in women. On the other hand, a few studies have shown no gender difference in empathy and few studies have suggested that there is no gender difference. In the present study, there was a significant difference only in the compassionate care factor; while in the study of van Ryn et al., in both domains, perspective taking and compassionate care were differences (33). Only in the study of Prabhu et al. was the mean empathy score of male students greater than female students (34). In this study, among different ages, empathy decreased with increasing age, and this was similar with the study of Khademalhosseini et al. (30). But in the study of Deliang Wen, there were no significant differences in the age groups. Statistical difference existed in empathy scores in different levels of education. This indicated that level of empathy declined in clinical level, followed by an increase in empathy scores in basic science, which is similar to those of Chinese (26), Japanese (22) Korean (35) Portuguese (36) and Kuwaiti (24) medical students, but different from American (37, 38) medical students. In this study, it was found that empathy score among medical students decreased when their educational years increased. The point of concern is that medical students should be educated in a way that they learn both scientific concepts of medicine and communicate with patients, and also learn how to empathize with them. Medical students must learn how to treat patients, not just to treat their diseases (30, 39). A cohort study conducted on internal residency students indicated that the amount of empathy with patients was much higher in the first year as compared to the last year of specialty (40). Regarding the study limitations, this study was cross-sectional in nature; so, a prospective study was needed to follow students. Also, larger study populations covering different medical colleges were needed to validate the results of this study.

5. Conclusions

This study shows significant differences in total empathy score. The overall rate of empathy in the basic sciences period was more than that of the clinical period. Therefore, early exposure to clinical training helps to enhance the empathy of medical students.

Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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