

Level of Empathy for Patients among Students of Zanjan University of Medical Sciences in 2016

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Abstract

Background: Empathy is an important factor in the relationship between the therapist and the patient and leaves positive impacts on the health outcomes.

Objectives: To investigate the level of empathy for patients among students of Zanjan University of Medical Sciences.

Methods: The present cross-sectional study was carried out in Zanjan University of Medical Sciences. A sample of 420 students was selected based on stratified sampling method. Jefferson Scale of Empathy was used to measure the level of empathy. Scores in the range of 20-60, 61-100, and 101-140 were regarded as the low, moderate, and high level of empathy, respectively. Data analysis was performed using independent t-test and one-way ANOVA in SPSS-16.

Results: The total score of empathy of students was 103.5 ± 16 . The lowest and highest scores in empathy were obtained in dimensions of “standing in the patient’s shoes” and “compassionate care”, respectively. The mean score of empathy for male students (102.15 ± 5.23) was lower than that of females (103.16 ± 2.39). Scores of empathy subscales, except “perspective taking”, were higher in female students than male ones. In addition, there was a significant difference between male and female students in terms of the mean score of “perspective taking”, “compassionate care”, and “standing in the patient’s shoes”.

Conclusion: The study findings indicated that the level of empathy for patients among the studied students is moderate and higher. However, given the positive impacts of empathy on treatment outcomes, it is recommended that students’ level of empathy be further improved through appropriate interventions.

Key words: *Empathy, Students of Medical Sciences, Zanjan, Iran*

Introduction

The term “empathy” has been derived from the Greek word “Empathia” which means to understand and respect the personal feelings of others [1]. Empathy is a key factor in the relationship between the patient and the therapist [2] and plays an important role in interpersonal

communication. It is also frequently mentioned as a key element of communication in medical practice [3]. Empathy causes people to imagine themselves in the position of others or better understand their conditions. Hojat et al. (2002), from Jefferson Medical College, stated that empathy is a cognitive attribute that involves an

ability to understand the patient's pain, suffering, and perspective combined with a capability to communicate this understanding and an intention to help [4].

Empathy is a multidimensional concept that includes cognitive and affective components. Although there is no agreement about the exact definition of the concept of empathy in the literature, a consensus has been achieved based on which affective empathy is defined as the ability to share emotional experiences with other, while cognitive empathy is the ability to subjectively understand others that allows one to infer the emotional and mental status of other [5,6].

Studies have shown that emotional relations based on empathy could have positive impacts on health outcomes [3,7]. Empathetic approaches to health care have been reported to be associated with increased participation of patients, facilitated appropriate prognosis, increased patient satisfaction, reduced level of patient stress, and decreased medical error rate [8]. In addition, empathy of therapists is one of the main factors involved in patient care which can enhance therapeutic effects and the therapist-patient relations. In an empathy-based relationship, patients experience higher levels of trust, more easily accept clinical decisions, and feel more satisfied with medical services. On the other hand, the medical staff will benefit from better therapeutic relationships, higher job satisfaction, and fewer cases of prosecution due to malpractice. Therefore, empathy training to physicians and medical students, as the future healthcare providers in the health system, should be one of the major objectives in the design of training programs and evaluation of students in clinical disciplines [9]. In this regard, medical universities can play a positive role in the development of students' perceptions of empathy [10].

The results of a study conducted by William et al. (2015) entitled "Empathy levels in 12 disciplines of medicine and health care" in Australia showed that a significant improvement was observed in the mean score of empathy after an intervention and women had higher empathy scores than men. Empathy scores were significantly different between students of the first year and the fifth year, as it reduces among the upper-year students

[11]. Shariat et al. (2013) stated that the overall score of empathy was 101.4 and female students had significantly higher scores than males. The results of a comparison between different educational stages of clinical training and internship (Basic sciences- three years before entering the hospital) showed that empathy scores presented a decreasing trend as students go to higher stages of education [2]. In most studies, it has been believed that erosion of empathy is associated with factors such as learning areas, hidden curriculum, difficulties of students in coping with stressors of medical education, and weak role of modeling in academic and clinical work environments [12,13]. Despite the importance of empathy in medical students and health professionals, when students of medicine and dentistry faculties become a senior, the level of empathy for patients declines among them. These findings are a warning to managers and faculty members of educational institutions. Therefore, they are recommended adopt appropriate strategies to prevent this erosion and help students to achieve a better understanding of patients [14]. Hence, it is necessary to make sure faculties of medical sciences that students can achieve the most important communicative skill; that is empathy for patients [15].

In Iran, few studies have been conducted on this subject that most of them were focused on medical students [2], dentistry students [16], and physicians [17]. Hence, the present research aims to study the level of empathy for patients among students of Zanjan University of Medical Sciences.

Methods

The present research was a cross-sectional study which was carried out in faculties affiliated to Zanjan University of Medical Sciences in 2016. The study population included all students studying in faculties of Medicine, Dentistry, Pharmacy, Nursing and Midwifery, and Paramedicine in Zanjan University of Medical Sciences who deal with patients during their courses of training. Based on similar studies and assuming the level of empathy, the sample size was determined to be 322 students; considering $p = 70\%$ [8,10]; type one statistical error (α)

0.05 and also acceptable error (d) as 0.05. In order to prevent the reduction of the required number of samples for data analysis and increase the confidence, 30% was added to the sample size and thus the total number of samples was determined to be 420. After determining the sample size for each faculty, the participants were selected using stratified sampling method and then simple random sampling within each faculty. Accordingly, the share of each faculty in the sample was specified and then simple random sampling was done using random numbers. Jefferson Scale of Empathy was used for collecting the required data and information. This questionnaire is a standard tool which is widely used to assess empathy in medical and health professions. This scale has been standardized and translated into 38 languages and has shown an acceptable validity and reliability in previous studies [5]. Jefferson Scale of Empathy consists of 20 items based on 7-point Likert scale. There are two versions of Jefferson Scale of Empathy: one for the measurement of empathy for patients in an empathy-based relationship between the patient and the therapist and the other for medical students and health professionals (HP-Version) [1]. The latter version of this scale was used in the present study. In this version, 13 items were modified by replacing the word "doctor" with the term "health care provider" [15]. The validity and reliability of this scale have been assessed and approved by Shariat *et al.* in Iran [9]. This questionnaire includes three subscales of perspective taking (with 10 items), compassionate care (with 8 items), and standing in the patient's shoes (with 2 items). In addition to the main items, this questionnaire involves demographic data of studied students (gender, years of education, educational stage, etc.). The items were scored based on a 7-point Likert scale from 1 to 7 (7: Completely agree, 6: Agree, 5: Slightly agree, 4: No comment, 3: Slightly disagree, 2: Disagree, and 1: Completely disagree). The maximum score for the corresponding options in any area of the questionnaire was determined with regard to the number of items. Higher scores indicate higher and more desirable levels of empathy. The total score of this scale ranges between 20 and 140. In addition, the total score of items related to three

subscales of perspective taking, compassionate care, and standing in the patient's shoes was in the range of 10-70, 8-56, and 2-14, respectively. To determine the level of empathy, scores in the range of 20-60, 61-100, and 101-140 were regarded as the low, moderate, and high level of empathy, respectively [18]. Since the sum of scores for each dimension was different taking into account the number of items, scores will be presented as the mean total scores, as in similar studies [9,11].

To determine the reliability of the questionnaire, Cronbach's alpha was used. For this purpose, the questionnaire was initially distributed among 20 students of the population and then Cronbach's alpha coefficients were calculated for it. Based on the results, Cronbach's alpha coefficient for the whole questionnaire and subscales of perspective taking, compassionate care, and standing in the patient's shoes was obtained 0.82, 0.84, 0.76, and 0.71, respectively.

In this study, a questioner was selected among the educational affairs staff of each faculty. After a brief description of the goals and process of data collection (anonymity of forms and significance of students' participation), the questionnaire was distributed among students of different faculties. The respondents were provided with a written guide in the beginning of the questionnaire and they were assured that their information will be kept confidential and the data will be reported as overall results.

For data analysis, descriptive statistics such as frequency and mean and multivariate analyses for describing the relationship between empathy and individual characteristics of students were used. Kolmogorov-Smirnov test was also used to examine the normal distribution for quantitative data. The results of this test showed that the data obtained from this study had normal distribution. Hence, independent t-test and one-way ANOVA were used for studying the significance of different between the mean values of different groups. All statistical analyses were performed in SPSS-16 at a significance level of $P < 0.05$.

Results

Out of the 420 questionnaires distributed among the respondents, 408 questionnaires were fully

filled out and returned, making for a response rate of 97%. According to the results, 43% of the respondents aged 21-24. In terms of gender, 60.2% of the respondents were female and the rest of them were male. About 69.6% of students were passing the pre-hospital (theoretical) period of their study. In addition, 31.9% of students participated in this study were newcomers and 30.4% of them were in their fourth year of study or higher. Most respondents (34.8%) were students of Medicine. The total score of empathy was 103.5 ± 16 . Therefore, it can be concluded that the empathy level among the studied students is average or higher. The lowest and highest scores in empathy were obtained in subscales of

“standing in the patient’s shoes” and “compassionate care”, respectively.

The mean and standard deviation of empathy score for male and female students were obtained 102.15 ± 5.2 and 103.16 ± 2.4 , respectively. Scores of empathy subscales, except “perspective taking”, were higher in female students than male ones. In other words, the overall level of empathy and subscales of “compassionate care” and “standing in the patient’s shoes” are higher in women than men. Independent t-test showed that there is a significant difference between male and female students in terms of the mean score of “perspective taking”, “compassionate care”, and “standing in the patient’s shoes” (Table 1).

Table 1: The mean score of empathy and its subscales among students of Zanjan University of Medical Sciences by gender in 2016

Gender	Perspective taking	Compassionate care	Standing in the patient’s shoes	Empathy
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Male	53.23 (8.7)	40.8 (8.4)	8.35 (2.86)	102.5 (15.23)
Female	50.7 (11)	42.76 (7.42)	9.67 (2.64)	103.19 (16.39)
Total	51.46 (10.4)	42.23 (7.78)	9.29 (2.77)	103 (16.05)
P value*	0.028	0.03	< 0.001	0.34

*Independent sample T-test

Comparison of the mean scores of the pre-hospital (theoretical stage before entering the clinical training) students and those passing the clinical period indicated that the mean score of empathy for students in the theoretical stage (105.9) is higher than that of students passing their

internship (96.3). In other words, students show a higher level of empathy for patients during their theoretical period. This difference was statistically significant in the mean score of empathy and subscales of “perspective taking” and “compassionate care” (Table 2).

Table 2: The mean score of empathy and its subscales among students of Zanjan University of Medical Sciences by educational stages in 2016

Educational phase	Perspective taking	Compassionate care	Standing in the patient’s shoes	Empathy
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Basic	53.1 (10.17)	43.38 (7.5)	9.42 (2.8)	105.9 (15.9)
Clinical	47.7 (10.18)	39.58 (7.78)	9 (2.7)	96.3 (14.16)
P value*	< 0.001	< 0.001	0.16	< 0.001

*Independent sample T- test

empathy and the three subscales for students in the fourth year of study or higher was less than

the mean scores of those in the beginning of their education (Table 3).

Table 3: The mean score of empathy and its subscales among students of Zanjan University of Medical Sciences by year of study in 2016

Educational year	Perspective taking	Compassionate care	Standing in the patient's shoes	Empathy
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
First	56.3 (9.27)	44.63 (7.9)	9.37 (2.9)	105.6 (15.9)
Second	53.3 (10.3)	42.64 (6.8)	9.46 (2.7)	107.5 (16.07)
Third	51.7 (11.6)	43.04 (7.4)	9.46 (2.6)	104.3 (15.9)
Fourth and higher	47.7 (10.2)	39.5 (7.8)	9 (2.7)	96.2 (14.1)
F-value	8.59	8.54	0.67	11.68
p value	< 0.001	< 0.001	0.56	< 0.001

***One –way ANOVA test**

The mean score of empathy in students of Dentistry was higher than that of students in other faculties. In terms of empathy subscales, the highest mean scores of “perspective taking”, “compassionate care”, and “standing in the patient's shoes” were obtained by students

studying in faculties of Dentistry, Pharmacy, and Nursing and Midwifery, respectively. A significant difference was found between students of different faculties in the mean score of overall empathy and subscales of “perspective taking” and “standing in the patient's shoes” (Table 4).

Table 4: The mean score of empathy and its subscales among students of Zanjan University of Medical Sciences by faculty in 2016

Faculty	Perspective taking	Compassionate care	Standing in the patient's shoes	Empathy
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Medicine	52.5 (8.9)	41.5 (7.5)	9.4 (2.6)	103.5 (14.9)
Pharmacology	54.5 (10.6)	43.9 (7.6)	9.6 (2.4)	108.1 (17.9)
Dental	56.8 (9.2)	41.8 (10.4)	7.5 (3.3)	105.8 (17.2)
Nursing and midwifery	44.4 (11.8)	42.3 (8.04)	9.8 (2.6)	96.6 (15.6)
Paramedical	52.4 (8.2)	42.1 (6.8)	8.9 (2.9)	103.4 (14)
F-value	15.49	1.12	4.95	5.64
P value	< 0.001	0.34	0.001	< 0.001

One –way ANOVA test*Discussion**

The present research aimed to study the level of empathy for patients among students of Zanjan University of Medical University. The study findings indicated that the mean score of empathy among the respondents is above the average. From the perspective of students, “compassionate care” and “standing in the patient's shoes”, respectively, are the most and the least important subscales of empathy. This indicates the positive attitude of students toward more compassionate care for patients during the treatment process.

The results of this study in terms of the overall level of empathy are consistent with the findings of Shariat et al. [2], Hasan *et al.* in Kuwait [19], and Jabbarifar et al. [16]. In a study entitled “Empathy in medical students in Iran”, Shariat et al. (2013) showed that the overall mean score of empathy is equal to 101.04, and the highest and the lowest score of empathy was related to subscales of “compassionate care” and “standing in the patient's shoes”, respectively [2]. Hasan et al. reported that the mean score of empathy of medical students in Kuwait is 104.6±16.3, which

is at a level above the average [19]. Jabbarifar et al. (2011) also showed that the mean score of empathy is equal to 85.97 and 90.61, respectively, for assistants and students of the dentistry general course [16].

The values obtained in the present study for the overall level of empathy were lower than those reported by Di Lillo et al. [1], Williams et al. [11], and Sherman and Cramer [20]. The study of Di Lillo et al. entitled "Scale of empathy for physicians: preliminary profile of Italian physicians" showed that the total score of empathy ranged between 39 and 140. In addition, the mean and median scores were 115.15 ± 1.5 and 118, respectively. The 25th and 75th percentiles also ranged between 108 and 126 [1]. Williams et al. (2015) conducted a study in Australia entitled "Level of empathy in 12 disciplines of medicine and health professions" and their results showed that the mean score of empathy before and after the intervention was determined to be 114.3 and 120.6, respectively. The physicians participated in their study believed that social skills should be developed during the general and specialty medical training [11]. In a study entitled "Changes in empathy levels among students of dentistry schools in the US", Sherman and Cramer reported that the mean score of empathy is equal to 117.7 [20].

The study findings also indicated that scores of overall empathy and its subscales, except "perspective taking", are higher in female students than male ones. In other words, the overall level of empathy and subscales of "compassionate care" and "standing in the patient's shoes" are higher in women than men. This is consistent with the results of Shariat et al. [2], Hasan et al. [19], Sherman and Cramer [20], Fjortoft et al. [21], Hitomi et al. [22], and Hashemipour et al. [23]. Shariat et al. (2012) showed that the mean score of empathy was 98.9 for male and 102.75 for female students, which suggests significantly higher scores of women [2]. The results of Hasan *et al.* showed that there is a significant difference between male and female students in terms of empathy level, as the mean score of empathy was 100.6 for men and 107.1 for women ($P=0.003$) [19]. The findings of a study conducted by Sherman and Cramer in the US

indicated that the empathy score of women is significantly higher than men [20]. Hitomi et al. also reported that female physicians are better than their male counterparts in active participatory behaviors, positive talk, psychosocial counseling, emotional talks, and psychosocial questions [22]. Fjortoft et al. showed that the mean score of empathy in female students (112.8 ± 11.3) is significantly higher than that of male ones (106.13 ± 3.1) [21]. In a study entitled "Assessment of the validity and reliability of the Farsi version of JSPE-HP", Hashemipour et al. concluded that the score of empathy in female students of Medicine and Dentistry was higher than male students [23].

The results of this study also showed that the mean score of empathy and its subscales for pre-hospital (theoretical stage) students was higher than those passing their internship. Younger students obtained a greater mean score of empathy and the mean score of students in the fourth year of study or higher was lower compared to the newcomers. In other words, the level of empathy decreases as students go to higher stages of education. This is consistent with the findings of Shariat *et al.* [1], Nandini [24], Hashemipour et al. [23], and Nunes et al. [18].

The results of Shariat et al. showed that the level of empathy reduces with the years of study, as they found that the mean score of empathy was 105.5 three years before entering the hospital and then reduced to 99.7 during the clinical education (from the fourth to the sixth year) and 96.8 during the internship [2]. Nandini conducted a study entitled "Do the medical schools reduce the empathy of students?" and showed that the empathy score of students is equal to 118.5 in the first year of study and then reduces to 106.6 at the end of the fourth year. The highest decrease (reduction) of empathy was observed in the third year of Medicine, that is the first year of clinical experience for students. Empathy score did not change in the first two years but significantly reduced at the end of the third year and continued in the subsequent years [24].

Studies have shown that students do not lack empathy and do not lose it during medical education. Instead, what most students are in a challenge with is the last part of the definition of

empathy, that is the ability to communicate with patients. This challenge seems to be more prominent in the third year of medical education which can be attributed to the discrete nature of clinical experience and the new competitive responsibility of students. However, since empathy affects clinical outcomes such as prescription of right medicines, it is worth considering [24, 25].

Hashemipour and Karami [23] conducted a study entitled "Assessment of the validity and reliability of the Farsi version of JSPE-HP" and showed that the first-year Medicine and Dentistry students obtained a significantly higher score of empathy than other students ($P=0.03$). Researchers have also reported that there is a decline in the level of empathy among medical students during their course of study. This is more evident at the end of the second year and third year of medical faculty and during the period of clinical training. Various theories have been proposed to explain the decline in the level of empathy in higher stages of medical education. Involvement of technology in medical decisions, working under the supervision of senior doctors, and trying to raise income are some of the reasons mentioned for this decline. Other potential causes include long working hours, dependence on technology, negative experiences, burnout of students, and limited interaction with the patients [18].

The findings of the present study indicated that there is a significant difference between faculties of Zanjan University of Medical Sciences in terms of the overall score of empathy and its subscales (Table 4), as the overall score of empathy in students of Faculty of Nursing and Midwifery was lower than that of other students. The highest score of empathy was observed in students of Faculty of Pharmacy, and students of Dentistry obtained the highest scores on the subscale of "perspective taking".

The study findings suggested that the level of empathy among students was average and higher. In addition, the level of empathy among female students was higher than male ones. Another finding of this study was that the level of empathy decreases as students go to higher stages of education.

One of the limitations of this study was its conduction in only one university which makes it difficult to generalize the findings to other populations. Hence, it is recommended that the same study to be conducted at the national and regional levels. Moreover, separate studies could be carried out on the theoretical and clinical periods of education.

Based on the findings of the present study and given the positive impact of empathy on treatment outcomes [11] and the importance of patient-centered care with high quality, it is necessary to improve the level of empathy as a basic quality for health and medical human resources [7]. In addition, subscales of empathy should be taught in training course of students. Therefore, instructors should emphasize empathy and understanding of patients during the teaching process in order to prepare students for playing their role in health centers and hospitals. On the other hand, since empathy is a basic and human aspect in the relationship between the therapist (doctors, paramedics, nurses, etc.) and the patient [26], it is recommended that some contents on empathy be included in the curriculum of clinical disciplines.

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References

1. Di Lillo M, Cicchetti A, Lo Scalzo A, Taroni F, Hojat M,. The Jefferson Scale of Physician Empathy: Preliminary Psychometrics and Group

- Comparisons in Italian Physicians. *Acad Med.* 2009; 84(9): 1198–1202.
2. Shariat SV, Habibi M. Empathy in Iranian medical students: Measurement model of the Jefferson Scale of Empathy. *Med teach*, 2013; 35(1): e913–18.
 3. Hemmerdinger JM, Stoddart SD, Lilford RJ. A systematic review of tests of empathy in medicine. *BMC Med Educ.* 2007; 7:24.
 4. 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): 1563-69.
 5. Kataoka HU, Koide N, Hojat M, Gonnella JS. Measurement and correlates of empathy among female Japanese physicians. *BMC Med Educ.* 2012; 12: 48.
 6. Cox CL, Uddin LQ, Di Martino A, Castellanos FX, Milham MP, Kelly C. The balance between feeling and knowing: affective and cognitive empathy are reflected in the brain's intrinsic functional dynamics. *Soc Cogn Affect Neurosci.* 2012; 7(6): 727-37.
 7. Soncini F, Silvestrini G, Poscia A, et al. Public Health Physicians and Empathy. Are we really empathic? The Jefferson Scale applied to Italian resident doctors in Public Health. *Eur J Public Health*, 2013; 23(sup1): 124-68.
 8. Quince TA, Parker RA, Wood DF, Benson J. Stability of empathy among undergraduate medical students: A longitudinal study at one UK medical school. *BMC Med Educ.* 2011; 11: 90.
 9. Shariat SV, Eshtad E, Ansari S. Empathy and its correlates in Iranian physicians: A preliminary psychometric study of the Jefferson Scale of Physician Empathy. *Med teach.* 2010; 32(10): e417–e421.
 10. 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(52): 1-7.
 11. Williams B, Brown T, McKenna L, et al. Student empathy levels across 12 medical and health professions: an interventional study. *Journal of Compassionate Health Care.* 2015; 2(4): 7-12.
 12. Spencer J. Decline in empathy in medical education: how can we stop the rot? *Med Educ.* 2004; 38(9): 916-18.
 13. Thomas MR, Dyrbye LN, Huntington JL, et al. How do distress and well-being relate to medical student empathy? A multicenter study. *J Gen Intern Med.* 2007; 22(2): 177-83.
 14. Van Winkle LJ, Fjortoft N, Hojat M. Impact of a Workshop about Aging on the Empathy Scores of Pharmacy and Medical Students. *Am J Pharm Educ.* 2012; 76(1): 9.
 15. Tavakol S, Dennick R, Tavakol M. Empathy in UK medical students: differences by gender, medical year and specialty interest. *Educ Prim Care.* 2011; 22: 297–303.
 16. Jabarifar SE, Khalifesoltani FS, Nilchian F, Yousefi A, Hoseinpour K. Empathy levels in undergraduate and postgraduate dental students in Isfahan Faculty of Dentistry in 2011. *J Isfahan Dent Sch.* 2012; 7(5): 753-62. [In Persian]
 17. Shariat SV, Keykhavoli A. Empathy in Medical Residents at Iran University of Medical Sciences. *Iran J Psychiatry Clin Psychol.* 2011; 16(3): 248- 56. [In Persian]
 18. Nunes P, Williams S, Bidyadhar S, Stevenson K. A study of empathy decline in students from five health disciplines during their first year of training. *Int J Med Educ.* 2011; 2: 12-17.
 19. Hasan S N, Al-Sharqawi F, Dashti M, et al. Level of Empathy among Medical Students in Kuwait University, Kuwait. *Med Princ Pract.* 2013; 22(4): 385-89.
 20. Sherman JJ, Cramer A. A measurement of changes in empathy during dental school. *J Dent Educ.* 2005; 69(3): 338-45.
 21. Fjortoft N, Winkle LV, Hojat M. Measuring Empathy in Pharmacy Students. *Am J Pharm Educ.* 2011; 75(6): 109.
 22. Hitomi UK, Norio K, Hojat M, Gonnella J S. Measurement and correlates of empathy among female Japanese physicians. *BMC Med Educ.* 2012; 12: 48.
 23. Hashemipour M, Karami MA. Validity and Reliability of the Persian Version of JSPE-HP Questionnaire (Jefferson Scale of Physician Empathy-Health Professionals Version). *J Kerman Univ Med Sci.* 2012; 19(2): 201-11. [In Persian]

24. Nandini G. Does Medical School Erode Student Empathy? The NYU Langone Online Journal of Medicine [serial online] 2011 Aug; Available at: URL:<http://www.clinicalcorrelations.org/?p=4669>. [cited jun 5, 2016].

25. Hojat M: Empathy in patient care: antecedents, development, measurement, and

outcomes. 1sted. New York: Springer-Verlag New York; 2007.

26. Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS, Physicians' Empathy and Clinical Outcomes for Diabetic Patients. Acad Med. 2011; 86(3): 359-64.