

A Turkish Adaptation of the Student Version of the Jefferson Scale of Physician Empathy

Jefferson Doktor Empati Ölçeği Öğrenci Versiyonunun Türkçe Adaptasyonu

İpek GÖNÜLLÜ¹, Derya ÖZTUNA²

¹Department of Medical Education and Informatics, School of Medicine, Ankara University, Ankara, Turkey

²Department of Biostatistics, School of Medicine, Ankara University, Ankara, Turkey

Abstract

Objective: The aim of this study was to adapt the student version of the Jefferson Scale of Physician Empathy (JSPE) to Turkish medical students in order to assess its reliability and validity, and to analyze the gender and year differences.

Materials and Methods: The student version of the JSPE was translated into Turkish using back-translation procedures, and was administered to 752 medical school students from the first to fifth years of study. To assess the dimensionality of the scale, confirmatory factor analysis (CFA) for categorical data was carried out. Internal consistency was assessed by Cronbach's alpha. Subscale scores were compared in terms of gender and year.

Results: The three-dimensional structure of the JSPE was confirmed by CFA except item 18. The internal consistencies of the subscales were 0.83, 0.70 and 0.60, respectively. There were statistically significant gender and medical school year differences in terms of "perspective taking" and "compassionate care" scores.

Conclusion: The student version of JSPE was successfully adapted, and the adapted scale can be used in Turkey. (*Marmara Medical Journal 2012;25:87-92*)

Key Words: Undergraduate medical education, Empathy, Jefferson Empathy Scale, Reliability, Validity, Confirmatory factor analysis

Özet

Amaç: Çalışmanın amacı Jefferson Doktor Empati Ölçeği öğrenci versiyonunun güvenilirlik ve geçerliliğinin değerlendirilmesi, cinsiyet ve eğitim yıllarına göre farklılıklarının analiz edilmesi için tıp fakültesi öğrencilerine adaptasyonunun yapılmasıdır.

Gereç ve Yöntem: Jefferson Doktor Empati Ölçeği öğrenci versiyonu iki yönlü çeviri yapılarak Türkçe'ye çevrilmiş ve 1.-5. sınıf düzeylerindeki 752 tıp fakültesi öğrencisine uygulanmıştır. Ölçeğin boyutluluk yapısının değerlendirilmesinde kategorik verilerde doğrulayıcı faktör analizi (DFA) kullanılmıştır. İç tutarlılık Cronbach alfa katsayısı ile değerlendirilmiştir. Alt ölçek puanları eğitim yıllarına göre farklılıkları karşılaştırılmıştır.

Bulgular: DFA, bir madde hariç ölçeğin mevcut üç boyutlu yapısını doğrulamıştır. Alt ölçekler için iç tutarlılık katsayıları sırasıyla 0,83, 0,70, ve 0,60 olarak bulunmuştur. "Perspektif alma" ve "şevkatli bakım" puanları açısından cinsiyet ve eğitim yılları arasında istatistiksel olarak anlamlı farklılık bulunmuştur.

Sonuç: Türkçe'ye adaptasyonu başarılı biçimde yapılan Jefferson Doktor Empati Ölçeği öğrenci versiyonu, Türkiye'de tıp fakültelerinde öğrenciler üzerinde kullanılabilir. (*Marmara Üniversitesi Tıp Fakültesi Dergisi 2012;25:87-92*)

Anahtar Kelimeler: Mezuniyet öncesi tıp eğitimi, Empati, Jefferson Empati Ölçeği, Güvenirlik, Geçerlilik, Doğrulayıcı faktör analizi

Introduction

Empathy which means understanding another person's feelings is a crucial aspect of professionalism in the practice of medicine.

Currently, medical educators emphasise professionalism, particularly in terms of empathy. Hojat et al.^{1,2} define empathy in patient-care situations as "a cognitive attitude that involves an ability to understand the patient's inner experiences and perspective and a

capability to communicate this understanding". In this definition there are three key terms; cognition, understanding and communication. These three key terms are very important in the construct of empathy in the context of patient care³.

Lillo et al. consider that empathy involves cognition and is thus distinguished from sympathy⁴ which is a predominantly affective or emotional attribute opposed to empathy⁵. Both concepts involve sharing, but empathetic physicians share their understanding, whereas sympathetic physicians share their emotions with their patients^{2,6}. In this case empathy, almost always leads to positive clinical outcomes, whereas sympathy in excess will be detrimental to objectivity in clinical decision making³. Understanding can be represented by the physician's ability "to stand in a patient's shoes without leaving his or her own personal space and" to view the world from the patient's perspective without losing sight of his or her professional responsibilities¹. Further, a physician's capability to communicate this understanding, the patient's inner experiences and perspective is also required for empathy². To understand a patient's inner experiences and feelings and to view the outside world from the patient's perspective will help the physician to foster the patient's satisfaction, improve compliance with the health condition and increase physician's ability to properly diagnose and treat.

Evolving changes in the health care system such as increasing technology-based diagnosis and waning bedside interactions, strains the physician-patient relationship, and empathy becomes important and timely in medical education. Many changes within the health-care system that undermine empathy in therapeutic relationships have stimulated medical educators to begin studying the development and correlates of physician empathy and its contribution to clinical outcomes. Enhancing empathic engagement in patient care is one of the important tasks of medical education⁷. A meaningful interpersonal relationship is assumed to be important for better clinical outcomes, so physicians should be educated not only in the biomedical aspect of disease but also in the psychosocial factors of illness. Thus, it has become increasingly important for medical educators to evaluate the level of empathy in medical students in order to provide an appropriate education.

The Jefferson Scale of Physician Empathy (JSPE) was developed as a self-report scale by researchers at Jefferson Medical College in the United States to measure empathy specifically in medical students, physicians or health professionals within the context of the physician-patient relationship^{1,2,5,8,9}. The JSPE has two versions, one for students (S-Version) and one for physicians and other health professionals (HP-Version), and includes 20 items to measure the three underlying constructs of empathy (perspective taking, compassionate care, and standing in patient's shoes). It has been proved that the JSPE has satisfactory psychometric properties^{2,9,10}.

Empathy like other personal qualities varies among individuals, because it depends upon developmental, experimental, social, educational and other endogenous and exogenous factors. It also varies in different cultures because of cultural norms, social learning and also different medical curriculums. It has been

reported that there were changes in empathy among medical students as they progress through medical school¹¹. It is important to record these differences and their effects in different cultures while developing educational programs.

JSPE has been translated into 38 languages and has been used in many countries to date⁵. The results of previous validation studies (e.g. Mexican, Polish, Japanese, Italian and Korean) have shown satisfactory psychometrics of the scale and a number of similarities and differences have been illustrated^{4,12-16}. The differences among the countries suggest that different cultures or medical curriculums may influence empathy measures and outcomes¹.

The importance of determining the factors that affect empathy in medical students has long been recognized by Turkish researchers¹⁷. However, there is no adapted or original measurement tool that can be used to determine empathy in medical students in Turkey. Consequently, it is necessary to adapt and use the JSPE in medical schools. The primary purpose of this study was to adapt the student version of JSPE to the Turkish population and examine the reliability and validity of it for use in Turkish medical schools. In addition to the psychometric properties of the JSPE, empathy score differences were tested in terms of gender and year.

Method

Participants

This study has been applied on students between the 1st and 5th years of study during 2008 and 2009 at Ankara University School of Medicine (AUSM) in Turkey. Volunteers, who completed the JSPE, were not compensated for their participation.

The medical curriculum in AUSM which runs a 6-year programme comprises 3 years of preclinical work followed by 3 years of clinical work (2 years of clerkships and one year's internship). Turkish medical schools are undergraduate schools which start after high school. Thus, Turkish medical students are likely to be younger than U.S. medical students. Classes in communication skills are arranged during the 1st, 2nd, and 3rd years, and these include 6 hours of class and 1 hour of standardized patient interview in each year.

Instrument

In this study, the student version (S-Version) of the JSPE, translated into Turkish was used. The S-version was developed to measure medical students' attitudes toward empathic physician-patient engagement in the context of patient care. Psychometric properties of this scale have been previously reported^{1,2,5,9-11}.

The scale includes 20 items (10 items positively worded and 10 items negatively worded) answered on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The score interval is 20-140, higher scores show higher empathic consistency.

Procedures

The JSPE was translated into Turkish by three bilingual medical doctors. By using the back-translation procedure, the original translated version was sent to another three bilingual medical

doctors to ensure the accuracy of the translation and they were asked to translate the Turkish version back into English. Back-translators were not aware of the intent and concepts underlying the scale¹⁶. Then a committee (one of the authors, one psychiatrist, one professor of ethics and a bilingual translator) was constituted in order to produce a final version based on the reviewed, three back-translated versions. In 2008-2009, we distributed the final translated version of the JSPE to the 1st, 2nd, 3rd, 4th and 5th year students during their regular classes, they took the test individually, and were told that the instrument was about empathy, the results would be used for research purposes. The study was approved by the University's Research Ethics Committee.

The psychometric properties of a scale are determined through a range of analyses. This includes tests for reliability and validity. Reliability is concerned with the consistency of the scale. Validity is concerned with whether the scale measures the characteristic it purports to measure.

The most common form of reliability test for a self-completed scale in a Likert format, such as the present scale, is internal consistency and this was tested by Cronbach's alpha coefficient¹⁸. Usually a reliability of 0.70 is required for analysis at the group level, and values of 0.85 and higher for individual use¹⁹.

The validity of the student version of JSPE was examined by confirmatory factor analysis (CFA). In order to assess whether the data would fit the proposed model for "Perspective taking", "Compassionate care" and "Standing in the Patient's Shoes" components, a three-factor CFA for categorical data was applied with a weighted least (WLSM)X2 estimation with robust standard errors and mean- and variance-adjusted statistics. Items with path weights below 0.40 or those with the proportion of explained variance (R^2) below 0.30 were eliminated. The following goodness-of-fit indices were used to assess the degree of fit between the model and the sample: Comparative Fit Index (CFI; >0.90: acceptable, >0.95: excellent), Tucker-Lewis Index (TLI; >0.90: acceptable, >0.95: excellent) and root-mean-square error of approximation (RMSEA; <0.08: acceptable, <0.05: excellent)²⁰.

After the CFA, a Mann-Whitney U test and a Kruskal-Wallis variance analysis were used to compare the (sub)scale scores in terms of gender and year, respectively. The post-hoc test for Kruskal-Wallis variance analysis was used to perform pairwise comparisons. Mean±standard deviation (SD) [median (minimum-maximum)] was used as descriptive statistics. $p<0.05$ was considered as statistically significant. Data were analyzed using the Statistical Package for the Social Sciences (SPSS 11.5), and MPlus²¹.

Results

The study sample consisted of 752 participants from first to fifth years with varying numbers of students at AUSM in Turkey. In terms of year levels, the distribution of the total sample was as follows: first year 256 (34.0%), second year 169 (22.5%), third

year 160 (21.3%), fourth year 80 (10.6%) and fifth year 87 (11.6%). Among the students indicating their genders ($n=725$), 374 (51.6%) of them were male.

Confirmatory Factor Analysis

In our study, the 20 items were subjected to three-factor CFA to confirm the structure of empathy. According to factor loadings, R^2 and goodness-of-fit statistics, a three-factor structure was confirmed for the student version of the Jefferson Scale of Physician Empathy. Items and factor loadings are given in Table I. Except for Item 18, all 19 items loaded 0.40 or higher. The data showed a reasonable fit to the model, in which CFI=0.915, TLI=0.967 and RMSEA=0.065.

Item 18, "Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members" loaded on the "compassionate care" component with a factor loading of below 0.40 (-0.010). The underlying reason for this could be that this item may have lost its accuracy after it had been translated into Turkish. It may need more careful adaptation in wording, without the losing intended key concept. Cultural factors could be another reason because strong personal bonds between the Turkish family members are very common and are very important elements of our family life. Also the personal bonds between the Turkish family members are stronger than Western cultures, but more studies should be done to justify the underlying reason.

Reliability

The internal consistencies of the components were adequate at the factor level with Cronbach's alphas of 0.83, 0.70 and 0.60 for the "perspective taking", "compassionate care" and "standing in the patient's shoes" components respectively.

Group Differences

We assessed the gender and year differences for the factor scores, and found that there were statistically significant gender and year differences in terms of "perspective taking" and "compassionate care" scores (Table II). While the empathy scores for "perspective taking" were higher for females ($p=0.001$), those for "compassionate care" and "standing in the patient's shoes" were higher for males ($p<0.001$ and $p=0.286$, respectively). For the examination of the year differences, only "compassionate care" factor scores were found to be statistically significantly different ($p<0.001$). Post-hoc tests showed that there were differences between 1st - 2nd, 1st - 3rd, 1st - 5th, 2nd-3rd and 2nd-4th years.

Discussion

As empathy is essential for the patient-physician relationship, improving medical students' empathy is one of the important tasks of medical education. Development and manifestation of empathy in the patient care context is a function of experimental and psychosocial factors, as well as cultural factors. Cross-cultural differences in norms, ethnicity, religious beliefs, and sex stereotyping can influence empathic engagement during clinical encounters¹. Awareness of cultural peculiarities can improve

Table I. Items and factor loadings of the items in the student version of the JSPE

Items	Perspective taking	Compassionate care	Standing in the patient's shoes
I believe that empathy is an important therapeutic factor in medical treatment (20)	0.771		
Patients value a physician's understanding of their feelings which is therapeutic in its own right (10)	0.762		
Physicians' understanding of the emotional status of their patients, as well as that of their families, is one important component of the physician-patient relationship (16)	0.760		
Physicians should try to think like their patients in order to render better care (17)	0.652		
Physicians should try to stand in their patients' shoes when providing care to them (9)	0.639		
Empathy is a therapeutic skill without which the physician's success is limited (15)	0.638		
Understanding body language is as important as verbal communication in physician-patient relationships (4)	0.593		
Physicians should try to understand what is going on in their patients' minds by paying attention to their nonverbal cues and body language (13)	0.557		
Patients feel better when their physicians understand their feelings (2)	0.549		
A physician's sense of humor contributes to a better clinical outcome (5)	0.392		
Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence in medical or surgical treatment (11)		0.829	
I believe that emotion has no place in the treatment of medical illness (14)		0.744	
Attention to patients' emotions is not important in history taking (7)		0.669	
Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints (12)		0.494	
Attentiveness to patients' personal experiences does not influence treatment outcomes (8)		0.491	
I do not enjoy reading nonmedical literature or the arts (19)		0.450	
Physicians' understanding of their patients' feelings and the feelings of their patients' families does not influence medical or surgical treatment (1)		0.438	
It is difficult for a physician to view things from patients' perspectives (3)			1.149
Because people are different, it is difficult to see things from patients' perspectives (6)			0.400

Table II. The gender and year differences for the factor scores of the student version of the JSPE

	Perspective taking	p	Compassionate care	p	Standing in the patient's shoes	p
Gender	Male	5.40±0.97 [5.50 (1.00-7.00)]	2.42±1.02 [2.29 (1.00-6.57)]	<0.001	3.75±1.36 [4.00 (1.00-7.00)]	0.286
	Female	5.64±0.88 [5.80 (2.60-7.00)]	2.14±0.86 [2.00 (1.00-5.33)]		3.63±1.34 [3.50 (1.00-7.00)]	
Year	1	5.54±0.91 [5.70 (1.40-7.00)]	2.42±0.85 [2.29 (1.00-5.29)]	<0.001	3.73±1.35 [4.00 (1.00-7.00)]	0.082
	2	5.56±1.03 [5.80 (1.00-7.00)]	2.05±0.93 [1.86 (1.00-5.43)]		3.44±1.34 [3.50 (1.00-7.00)]	
	3	5.44±0.89 [5.50 (1.00-7.00)]	2.29±1.04 [2.00 (1.00-5.71)]		3.91±1.36 [4.00 (1.00-7.00)]	
	4	5.42±0.98 [5.40 (2.50-7.00)]	2.37±0.96 [2.29 (1.00-5.17)]		3.74±1.26 [4.00 (1.00-7.00)]	
	5	5.56±0.92 [5.70 (2.30-7.00)]	2.15±1.03 [2.00 (1.00-6.57)]		3.64±1.40 [4.00 (1.00-7.00)]	

empathic understanding which is the essence of a meaningful patient-physician relationship². Empathy is influenced by a number of factors apart from cultural factors, including variation in the selection and education of medical students, the availability of appropriate role-models and the medical curriculum.

In Turkey, there is no adapted or original scale to determine medical students' levels of empathy. In this study, the student version of JSPE was adapted to the Turkish population. The student version of JSPE has three factors; perspective taking, compassionate care, and standing in patient's shoes. Perspective taking which is the most important component of empathy, can be acquired and used in everyday life and there is an outcome consistent with that reported for the general population²³. The other two components of empathy are both specific to the patient-physician relationship². In this study, we examined the reliability and validity of the Turkish version of the student version of JSPE, and our findings supported the three-dimensional structure that emerged in the American sample except Item 18 that loaded on "compassionate care" component with a factor loading of below 0.40. The main reason for this situation could be related to translation or cultural differences. The reliability of the student version of JSPE for the "perspective taking" factor was as high as in its original English form, and the others were adequate. The internal consistency of "standing in patient's shoes" factor has a Cronbach alpha of 0.60 for two items. This Cronbach alpha value can be considered not too bad, when compared with the values of other items. Thus, our findings indicate that the Turkish student version of JSPE has satisfactory psychometric properties as a measure of empathy in Turkish medical students and could be used to identify crucial factors to effective empathy education in future studies.

Although the student version of JSPE has a three-dimensional structure, we could not find any articles examining the group differences (such as gender, year, etc.) in terms of these three components^{2,4,12-15}.

We found that the empathy scores for "perspective taking" were higher for females, whereas those for "compassionate care" and "standing in the patient's shoes" were higher for males. As the "perspective taking" is a skill that can be gained and used in everyday life, there is a popular belief that women are more prone to value interpersonal relationships and have more competent understanding of emotions and caring attitude^{1,2,7,9,14}. The finding obtained in this study verified and strengthened this assumption. However, the higher scores for "compassionate care" and "standing in the patient's shoes" components in favour of male students could be explained by the structure of these components which were both specific to the patient-physician relationship. Also, the empathy scores could be affected by other extrinsic factors which are attributed to empathy, such as the interpersonal style in caring, role-modeling, socialization. As a result, these findings are difficult to explain and more empirical evidence and researches are needed.

The decline of the empathy scores of students during their medical school years has been demonstrated previously. According to the present study, when the years were compared cross-sectionally, there is a decline in the medical school years in Turkey too. Statistically significant declines were observed on the

"compassionate care" factor scores and post hoc tests showed that first years had higher scores than second, third and fifth years. These findings are consistent with previous findings of Hojat et al.¹¹ although their study showed a significant decline in mean empathy scores in the third year of medical school. They found statistically significant declines especially in 5 items of the JSPE of which 4 measure the "compassionate care" component. Newton et al.²⁴ also reported a drop in vicarious emotional empathy (measured by Balanced Emotional Empathy Scale- BEES) during medical school.

These findings suggest that an erosion of empathy occurs during medical education. Further research is needed to investigate the reasons and timing of this erosion. Lack of role models, changes in the health care system, a high volume of materials to learn, time pressure, patient and environmental factors can affect the medical students' visions of the importance of human interactions and empathy in patient encounters. It is very important for medical educators to discern exactly the causes of the decline and to make profound changes in medical education by developing appropriate educational programs. In this context, we are also planning to conduct a longitudinal study to follow the same group of students in different stages of medical education in order to examine changes in each stage.

Further studies are also needed among Turkish medical students with larger samples and with other medical schools in the country. These studies will help us to better understand and characterize the effects of medical education on Turkish medical students' empathic skills.

In conclusion, this study has shown that the student version of JSPE can be applied to the medical school students in Turkey with the exception of Item 18, "Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members" in the original scale. The underlying reason could be a translation error that it has lost its accuracy after it had been translated into Turkish or there may have been cultural differences. As a result to determine the reason further researches should be done. Also the gender and medical school year findings of this study need further research to justify the results.

Student version of Turkish JSPE can be used efficiently to determine the empathy levels of the medical students in terms of "perspective taking", "compassionate care" and "standing in the patient's shoes" components.

References

- Hojat M. Empathy in Patient Care: Antecedents, Development, Measurement, and Outcomes. New York, NY: Springer, 2007. doi:10.1007/0-387-33608-7
- Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: Definition, measurement, and relationship to gender and specialty. *Am J Psychiatry* 2002; 159:1563-9. doi:10.1176/appi.ajp.159.9.1563
- Hojat M. Ten approaches for enhancing empathy in health and human services cultures. *J Health Hum Serv Adm* 2009;31:412-50.
- Lillo MD, Cicchetti A, Scalzo AL, Taroni F, Hojat M. Jefferson Scale of Physician Empathy: Preliminary psychometrics and group comparisons in Italian physicians. *Acad Med* 2009;84:1198-202.
- Hojat M, Mangione S, Nasca TJ, et al. The Jefferson Scale of Physician Empathy: Development and preliminary psychometric data. *Educ Psychol Meas* 2001;61:349-65. doi:10.1177/00131640121971158

6. Nightingale SD, Yarnold PR, Greenberg MS. Sympathy, Empathy and Physician Resource Utilization. *J Gen Intern Med* 1991;6:420-3. doi:10.1007/BF02598163
7. Hojat M, Vergare M, Maxwell K, et al. The devil is in the third year: A longitudinal study of erosion of empathy in medical school. *Acad Med* 2009;84:1182-91.
8. Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' Empathy and clinical outcomes for diabetic patients. *Acad Med* 2011; 86:359- 64. doi:10.1097/ACM.0b013e3182086fe1
9. Hojat M, Gonnella JS, Nasca TJ, Mangione S, Veloski JJ, Magee M. The Jefferson Scale of Physician Empathy: Further psychometric data and differences by gender and specialty at item level. *Acad Med* 2002;77(suppl):S58-S60.
10. Hojat M, Gonnella JS, Mangione S, et al. Empathy in medical students as related to academic performance, clinical competence and gender. *Med Educ*. 2002;36:522-7. doi:10.1046/j.1365-2923.2002.01234.x
11. Hojat M, Mangione S, Nasca TJ, et al. An empirical study of decline in empathy in medical school. *Med Educ* 2004;38:934-41. doi:10.1046/j.1365-2923.2002.01234.x
12. Alcorta-Garza A, Gonzalez-Guerrero JF, Tavitias-Herrera SE, Rodriguez-Lara FJ, Hojat M. Validity of the Jefferson Scale of Physician Empathy among Mexican medical students [in Spanish]. *Salud Mental* 2005;28:57-63.
13. Kliszcz J, Nowicka-Sauer K, Trzeciak B, Nowak P, Sadowska A. Empathy in health care providers: Validation study of Polish version of the Jefferson Scale of Empathy. *Adv Med Sci* 2006;51:219-25.
14. Kataoka HU, Koide N, Ochi K, Hojat M, Gonnella JS. Measurement of empathy among Japanese medical students: Psychometrics and score differences by gender and level of medical education. *Acad Med* 2009;84:1192-7.
15. Roh MS, Hahm BJ, Lee DH, Suh DH. Evaluation of empathy among Korean medical students: A cross-sectional study using the Korean version of the Jefferson Scale of Physician Empathy. *Teach Learn Med* 2010; 22: 167-71. doi:10.1080/10401334.2010.488191
16. Guillemin F, Bombardier C, Beaton D. Cross-Cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *J Clin Epidemiol* 1993;46: 1417-32.
17. Dereboy C, Harlak H, Gürel S, Gemalmaz A, Eskin M. Tıp eğitiminde eşduyumu öğretmek / Teaching empathy in medical education. *Türk Psikiyatr Derg* 2005;16:83-9.
18. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951; 16:297-334. doi:10.1007/BF02310555.
19. Streiner DL, Norman GR. Health measurement scales. A practical guide to their development and use. 2nd ed. New York: Oxford Medical Publications. 1995:104-26.
20. Pai AL, Mullins LL, Drotar D, Burant C, Wagner J, Chaney JM. Exploratory and confirmatory factor analysis of the child uncertainty in illness scale among children with chronic illness. *J Pediatr Psychol* 2007;32:288-96.
21. Muthén LK, Muthén BO. Mplus User's Guide 5th ed. Los Angeles: CA; 1998-2007. <http://www.statmodel.com/download/usersguide>. Access date:December 2011.
22. Hojat M, Mangione S. Jefferson Scale of Physician Empathy. *Health Policy Newspaper*. 2001; 14:4 Article 5 <http://jdc.jefferson.edu/hpn/vol14/iss4/5> Access date:March 2009.
23. Davis MH. Measuring Individual Differences in Empathy: Evidence for a Multidimensional Approach *J Pers Soc Psychol* 1983;44:113-126
24. Newton BW, Barber L, Clardy J, Cleveland E. Is there hardening of the heart during medical school? *Acad Med* 2008;83:244-9.

Copyright of Marmara Medical Journal is the property of Marmara Medical Journal and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.