VALIDATION OF SLOVENIAN VERSION OF JEFFERSON SCALE OF EMPATHY FOR STUDENTS

VALIDACIJA SLOVENSKE RAZLIČICE JEFFERSONOVE LESTVICE EMPATIJE ZA ŠTUDENTE

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Abstract

Objective: *Empathy is the most frequently mentioned humanistic dimension of patient care and is considered to be an important quality in physicians. The importance of fostering the development of empathy in undergraduate students is continuously emphasised in international recommendations for medical education. Our aim was to validate and adapt the Slovenian version of the Jefferson Scale of Empathy– Students version (JSE-S) on a sample of first-year medical students.*

Methods: *First-year students of the Medical faculty in Ljubljana participated in the research. JSE-S version, a self-administered 20-item questionnaire, was used for collecting the data. Descriptive statistics at the item level and at the scale level, factor analysis, internal consistency and test-retest reliability (two weeks after the first administration) of the JSE-S were performed.*

Results: *234 out of 298 (response rate 78.5%) students completed JSE-S. The mean score for the items on the 7-point Likert scale ranged from 3.27 (SD 1.72) to 6.50 (SD 0.82). The mean score for the scale (possible range from 20 to 140) was 107.6 (from 71 to 131, SD 12.6). Using factor analysis, we identified six factors, describing 57.2% of total variability. The Cronbach alpha as a measure of internal consistency was 0.79. The instrument has good temporal stability (test-retest reliability ICC = 0.703).*

Conclusion: *Findings support the construct validity and reliability of JSE-S for measuring empathy in medical students in Slovenia. Future research is required to evaluate factors contributing to empathy.*

Key words: empathy, Jefferson scale of empathy, students, validation, Slovenia

Izvleček

Namen: *Empatija je najpogosteje omenjena človeška lastnost v odnosu do bolnika in predstavlja pomembno vrednoto v zdravniškem poklicu. Krepitev empatičnega odnosa pri študentih medicine je pogosto poudarjena v mednarodnih smernicah za medicinsko izobraževanje. Namen raziskave je bil validacija in adaptacija slovenske variante študentske različice Jeffersonove lestvice za merjenje empatije na vzorcu študentov prvega letnika medicine.*

Metode: *V raziskavo so bili vključeni študentje prvega letnika Medicinske fakultete v Ljubljani. Podatke smo zbrali s pomočjo študentske različice Jeffersonove lestvice – vprašalnika z 20 vprašanji, ki so ga izpolnili študentje. Naredili smo osnovno statistično analizo posameznih vprašanj, analizo celotne lestvice, faktorsko analizo ter analizo notranje konsistentnosti in časovne stabilnosti lestvice štirinajst dni po prvem izpolnjevanju.*

Rezultati: *234 od skupno 298 študentov je sodelovalo v raziskavi in izpolnilo vprašalnik. Povprečna vrednost za posamezno vprašanje na 7-stopenjski Likertovi lestvici se je gibala od 3,27 (SD 1,72) do 6,50 (SD 0,82). Povprečna vrednost celotne lestvice (mogoč razpon od 20 do 140) je bila 107,6 (od 71 do 131, SD 12,6). S faktorsko analizo smo prepoznali šest faktorjev, s katerim smo pojasnili 57,2 % celotne variabilnosti. Cronbach alfa kot merilo notranje konsistentnosti je znašal 0,79. Potrdili smo časovno stabilnost lestvice (ICC = 0,703).*

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Zaključek: *Potrdili smo veljavnost in zanesljivost slovenske variante študentske različice Jeffersonove lestvice za merjenje empatije. Potrebno bo nadaljnje raziskovanje, ki bo pojasnilo dejavnike, ki prispevajo k empatiji.*

Ključne besede: empatija, Jeffersonova lestvica empatije, študentje, validacija, Slovenija

1 INTRODUCTION

Patient care is becoming more and more complex, and modern medical technology is not a replacement for a professional physician-patient relationship. Empathy is the most frequently mentioned humanistic dimension of patient care and an essential component of the physician-patient relationship. An extensive review of the literature on empathy by Morse describes the four components of the multidimensional concept of empathy. These include emotive - the ability to subjectively experience and share another person's psychological state or intrinsic feelings, moral - an internal altruistic force that motivates the practice of empathy, cognitive - the helper's intellectual ability to identify and understand another person's feelings and perspective from an objective distance and behavioural - communicative response to convey understanding of another person's perspective (1).

A frequently used definition of empathy is that of Hojat and colleagues: Empathy is a predominantly cognitive (rather than emotional) attribute that involves an understanding (rather than feeling) of experiences, concerns and perspectives of the patient combined with the capacity to communicate this understanding. Verbal and non-verbal communication of the physician results in a helpful therapeutic action (2- 4).

Empathy must not be confused with sympathy. Empathic and sympathetic orientations toward patient care are two different measurable entities. The distinction between the terms "empathy" and "sympathy" has been summarised in this way: empathic physicians share their understanding, while sympathetic physicians share their emotions with the patients (5, 6).

Empathy has many positive effects on patient care. The patients of physicians who are able to provide empathic communication report more on their symptoms and concerns and receive more illness-specific information. An empathic relationship also increases patients' participation and enablement and improves patients' adherence to treatment and satisfaction (7).

The aim of medical education is transforming individuals from medical students with broad clinical knowledge to professional physicians with the ability to use a bio-psycho-social model of patient care, taking into account cultural and existential dimensions (8). Medical students' values appear to change slightly during medical education, but the medical education process is associated with changes in certain students' qualities and attributes, among them being also students' empathy (2,9,10).

Entrance criteria for medical schools in Slovenia are heavily science-oriented. Students enter medical school just after graduation from high school at the age of 18 or 19 years. Besides teaching clinical knowledge, it is necessary for medical schools to educate students about the importance of empathy as an integral part of professionalism in medicine (11-13), which is necessary in enabling holistic approach as a main concept of patient care (8).

The first step in teaching for improvement of the level of empathy is assessment of empathy. 36 instruments for measuring empathy have been recognised. Eight of them demonstrate evidence of reliability, internal consistency and validity (14); six of them are self-rated measures. One of the most frequently used instruments for the measurement of empathy is the Jefferson Scale of Physician Empathy (JSE), which describes empathy as a multidimensional concept (15, 16).

The Jefferson scale has been translated into 42 languages, including also the Slovenian language for a students' version of the JSE, and used in more than 50 countries around the world (15, 17). In several academic medical centres, it is used as a major research instrument. The fostering of development of empathy in undergraduate students is continuously emphasised in international recommendations for medical education. In European countries (18,19) and worldwide (20-23), students' empathy has been already measured and followed. Besides, there have been attempts to adapt curricula to influence the students' empathy (24-26).

We have not measured the empathy of medical students in Slovenia yet. The first step in the measurement of empathy is validation of the instrument for measuring empathy (JSE-S) in the Slovenian language. The aim of our study was to validate and adapt the Slovenian version of JSE-S.

2 METHODS

2.1 Study population

Of the 298 first-year medical students of the Medical faculty in Ljubljana, 234 (response rate 78.5%)

voluntarily completed the JSE-S. We defined students who declined to participate or failed to answer at least 16 questions (80%) in the questionnaire as non-responders. In a sample of 80 students, we tested the test-retest reliability two weeks after the first admission. The study was conducted in academic year 2011/12; data were gathered between 30 November and 24 December 2011.

2.2 Instrument

The student version of JSE (S-version) used in this study includes 20 items answered on a seven-point Likert scale (1 - strongly disagree, 7 - strongly agree). To decrease the confounding effect of the "acquiescence response style" (e.g. the tendency to constantly agree or disagree: yea-, naysayers), 10 of the statements in the questionnaire had positive and 10 of them had negative connotation.

The total score of the scale ranges from 20 to 140, with higher value indicating a higher degree of empathy. In calculation of the total score, we inverted the scale for the answers to questions with a negative connotation. Original JSE is a three-dimensional instrument with the following three dimensions: compassionate care, standing in the patient's shoes and perspective taking (3).

We used the back translation method for translating the original English version of the questionnaire into Slovenian (27). The JSE-S was first translated into the Slovenian language by two independent translators with medical knowledge. Using the back translation procedure, three independent translators familiar with both languages translated the questionnaire back to English. The fourth person checked the three back translated versions in order to detect inconsistencies. Any differences were resolved by consensus. The back translated English version was compared with the original English version to ensure that no loss of meaning or context occurred during the translation process.

Students completed the questionnaire individually in the classroom. We explained to them that the instrument was a questionnaire about empathy and that we would like to use the results for a research project.

In a sample of 80 students, we assessed the test-retest reliability two weeks after the first admission in order to test whether the results for the same individual on different occasions are the same.

2.3 Analysis of the data

We calculated the mean value and the standard deviation (SD) for each item, the item to total correlation and the total scale if item deleted. The total score as the sum of all items based on the JSE scoring algorithm was calculated. We also presented SD, range and quartiles. To compare empathy score for male and female students, we applied the t-test for two independent samples. The level of significance was set to $p<0.05$. We calculated the Cronbach alpha to assess the internal consistency aspect of reliability of the instrument. Usually, a reliability of 0.70 is required for analysis at the group level and values of 0.85 and higher at the individual level (28). The test-retest reliability was calculated two weeks after the first admission using the ICC coefficient.

Validity of the JSE-S was examined by confirmatory factor analysis (principal component analysis with varimax rotation). Factors with eigenvalue greater than 1 were retained.

All calculations were conducted using IBM SPSS Statistics version 21 for Windows.

2.4 Ethical approval

The research protocol was approved by the national ethical committee on 31 January 2011. Number of approval was 143/02/11.

3 RESULTS

3.1 Descriptive analysis at the item level

Descriptive analysis at the item level

234 out of 298 (response rate 78.5%) students completed the JSE-S. There were 162 female (69.2%) and 72 male (30.8%) students. The average age of the students was 19.3 years (from 18 to 46 years, SD 2.3 years, skewness 7.6). The mean score of the items ranged from 3.27 (SD 1.72) for item "Health care providers should not allow themselves to be influenced by strong personal bonds between patients and their family members" to 6.50 (SD 0.82) for item "Patients feel better when their health care providers understand their feelings". Table 1 presents descriptive analysis at the item level.

Table 1. *Descriptive analysis at the item level. SD is standard deviation, ITC is the item to total correlation and SID is the total scale if item deleted.*

Tabela 1. *Deskriptivna statistika posameznih vprašanj. SD je standardna deviacija, ITC je korelacija med posamezno spremenljivko in celotno lestvico, SID pa je vrednost lestvice, če odstranimo posamezno spremenljivko.*

No. Št.	Item Vprašanje	Mean Povprečje	SD	ITC	SID
1	Physicians' understanding of their patients' feelings and the feelings of their patients' families does not influence medical or surgical treatment. Če zdravnik razume čustva svojih bolnikov in čustva njihove družine, to ne vpliva na medicinsko ali kirurško zdravljenje.	5.20	1.76	0.26	102.39
2	Patients feel better when their physicians understand their feelings. Bolniki se bolje počutijo, če zdravniki razumejo njihova čustva.	6.50	0.82	0.40	101.05
3	It is difficult for a physician to view things from patients' perspectives. Za zdravnika je težko videti stvari z bolnikovega stališča.	4.65	1.27	0.08	102.96
4	Understanding body language is as important as verbal communication in physician-patient relationships. Razumevanje govorice telesa je pri odnosu zdravnik-bolnik prav tako pomembno kot besedno sporazumevanje.	5.87	1.32	0.34	101.71
5	A physician's sense of humour contributes to a better clinical outcome. Zdravnikov smisel za humor prispeva k boljšemu kliničnemu izidu.	3.89	1.78	0.23	103.70
6	Because people are different, it is difficult to see things from patients' perspectives. Ker se ljudje razlikujemo, je težko videti stvari z bolnikovega stališča.	4.75	1.40	0.23	103.33
7	Attention to patients' emotions is not important in history taking. Pri anamnezi upoštevanje bolnikovih čustev ni pomembno.	5.66	1.38	0.50	101.92
8	Attentiveness to patients' personal experiences does not influence treatment outcomes. Upoštevanje bolnikovih osebnih izkušenj ne vpliva na izid zdravljenja.	5.42	1.50	0.50	102.11
9	Physicians should try to stand in their patients' shoes when providing care to them. Zdravniki bi se morali pri obravnavi bolnikov poskusiti postaviti v njihov položaj.	5.24	1.24	0.45	102.27
10	Patients value a physician's understanding of their feelings which is therapeutic in its own right. Bolniki cenijo zdravnikovo razumevanje čustev, kar je samo po sebi terapevtsko.	5.73	1.20	0.35	101.79
11	Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence on medical or surgical treatment. Bolnikove bolezni lahko pozdravi le zdravljenje z zdravili ali ali kirurško zdravljenje; zato čustvene vezi med zdravniki in njihovimi bolniki nimajo pomembnega vpliva na zdravljenje z zdravili ali kirurško zdravljenje.	5.85	1.43	0.54	101.66
12	Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints. Spraševanje bolnikov o dogajanju v njihovem zasebnem življenju ne pomaga pri razumevanju njihovih telesnih težav.	5.90	1.24	0.34	101.62

13	Physicians should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language. Zdravniki bi morali z upoštevanjem bolnikovih nebesednih znakov in govorice telesa poskusiti razumeti, kaj se dogaja v bolnikovem umu.	5.31	1.58	0.49	102.17
14	I believe that emotion has no place in the treatment of medical illness. Mislim, da čustva ne sodijo v zdravljenje bolezni.	5.93	1.31	0.52	101.60
15	Empathy is a therapeutic skill without which the physician' s success is limited. Empatija je terapevtska veščina, brez katere je uspeh zdravnika omejen.	5.71	1.37	0.58	101.86
16	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. Zdravnikovo razumevanje čustvenega stanja bolnikov in njihovih družin je pomemben del odnosa zdravnik-bolnik.	5.94	1.17	0.46	101.63
17	Physicians should try to think like their patients in order to render better care. Zdravniki bi morali poskusiti razmišljati kot njihovi bolniki, kar bi jim omogočilo nuditi boljšo oskrbo.	4.65	1.44	0.43	102.87
18	Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members. Zdravniki si ne bi smeli dovoliti, da nanje vplivajo tesne osebne vezi z bolniki in njihovimi družinskimi člani.	3.27	1.72	0.04	104.31
19	I do not enjoy reading non-medical literature or the arts. Ne prebiram rad nemedicinske literature in ne uživam v umetnosti.	6.45	1.18	0.19	101.07
20	I believe that empathy is an important therapeutic factor in medical treatment. Mislim, da je empatija pomemben terapevtski dejavnik pri zdravljenju.	6.10	1.16	0.61	101.43

3.2 Data analysis at the scale level

209 (89.3%) students answered all the items. The mean score for the scale with possible range from 20 to 140 was 107.6 (from 71 to 131, SD 12.6). Table 2 shows the descriptive statistics for the JSE-S.

Table 2.   Descriptive statistics for the JSE-S.
Tabela 2. Deskriptivna statistika za JSE-S.

Statistics/Statistika	Value Vrednost
Mean / Povprečje	107.6
Range / Interval	71-131
Standard error of mean / Standardna napaka povprečja	0.868
25th percentile / 25. percentil	100.5
50th percentile / 50. percentil	109.0
75th percentile / 75. percentil	117.0
Alpha reliability estimate / Ocena zanesljivosti Alfa	0.79
ICC (test-retest reliability) / ICC (zanesljivost "test-retest")	0.703

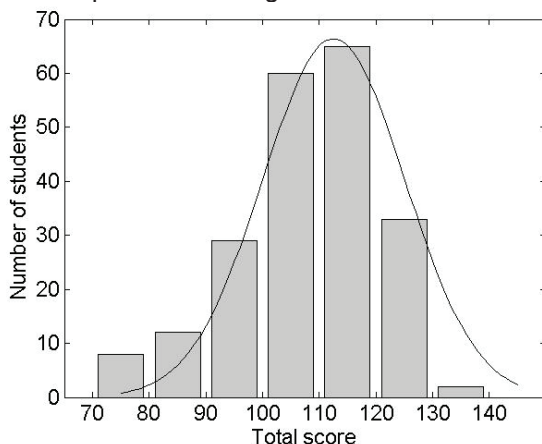Distribution of students based on the total score on the JSE-S is presented in Figure 1.

Figure 1. *Students' empathy assessed by the Jefferson scale. Higher total score means more empathic behaviour of the students.*

Slika 1. *Empatija študentov na osnovi Jeffersonove lestvice. Višji rezultat pomeni bolj empatično obnašanje študentov.*

We found that the level of empathy was higher for female than male students (109.2 vs. 103.5, difference 5.7, standard error of difference 1.9, t-test, p=0.003).

3.3 Factor analysis

Using factor analysis (principal component analysis for extraction) with varimax rotation, we described 57.2% of the total variance using six factors with eigenvalues of at least 1.0. Table 3 shows factor loadings on the JSE-S. The items belonging to the particular factor are bolded. The values of all bolded items are greater than 0.35. We labelled the factors as follows:
Factor 1: Perspective taking - 1
Factor 2: Perspective taking - 2
Factor 3: Compassionate care
Factor 4: Standing in the patient's shoes
Factor 5: Interpersonal relationship
Factor 6: Miscellaneous

Table 3. *Loadings of factors with eigenvalues of at least 1.0. Eigenvalues at the bottom of the table are taken after varimax rotation.*

Tabela 3. *Uteži faktorjev z lastnimi vrednostmi vsaj 1.0. Lastne vrednosti na dnu tabele so vzete po rotaciji varimax.*

No. Št.	Item Vprašanje	Factor 1 Faktor 1 Perspective taking - 1 Razumevanje bolnikovega videnja – 1	Factor 2 Faktor 2 Perspective taking - 2 Razumevanje bolnikovega videnja - 2	Factor 3 Faktor 3 Compassionate care Sočutna oskrba	Factor 4 Faktor 4 Standing in the patient's shoes Sposobnost postaviti se v vlogo bolnika	Factor 5 Faktor 5 Interpersonal relationship Medosebno razmerje	Factor 6 Faktor 6 Miscellaneous Razno
11	Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence on medical or surgical treatment. Bolnikove bolezni lahko pozdravi le zdravljenje z zdravili ali ali kirurško zdravljenje; zato čustvene vezi med zdravniki in njihovimi bolniki nimajo pomembnega vpliva na zdravljenje z zdravili ali kirurško zdravljenje.	0.662	0.132	0.185	0.103	0.160	-0.018

12	Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints. Spraševanje bolnikov o dogajanju v njihovem zasebnem življenju ne pomaga pri razumevanju njihovih telesnih težav.	0.698	-0.023	-0.057	-0.107	0.176	-0.092
14	I believe that emotion has no place in the treatment of medical illness. Mislim, da čustva ne sodijo v zdravljenje bolezni.	0.745	0.147	0.198	0.061	-0.061	-0.054
15	Empathy is a therapeutic skill without which the physician' s success is limited. Empatija je terapevtska veščina, brez katere je uspeh zdravnika omejen.	0.543	0.347	0.161	0.168	0.046	0.266
16	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. Zdravnikovo razumevanje čustvenega stanja bolnikov in njihovih družin je pomemben del odnosa zdravnik-bolnik.	0.443	0.434	-0.153	-0.112	0.364	0.173
20	I believe that empathy is an important therapeutic factor in medical treatment. Mislim, da je empatija pomemben terapevtski dejavnik pri zdravljenju.	0.556	0.334	0.159	0.104	0.191	0.324
2	Patients feel better when their physicians understand their feelings. Bolniki se bolje počutijo, če zdravniki razumejo njihova čustva.	0.116	0.535	-0.052	0.167	0.405	0.020
4	Understanding body language is as important as verbal communication in physician-patient relationships. Razumevanje govorice telesa je pri odnosu zdravnik-bolnik prav tako pomembno kot besedno sporazumevanje.	0.076	0.419	0.269	-0.055	0.029	0.395
9	Physicians should try to stand in their patients' shoes when providing care to them. Zdravniki bi se morali pri obravnavi bolnikov poskusiti postaviti v njihov položaj.	0.290	0.663	0.075	0.128	-0.082	-0.051

13	Physicians should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language. Zdravniki bi morali z upoštevanjem bolnikovih nebesednih znakov in govorice telesa poskusiti razumeti, kaj se dogaja v bolnikovem umu.	0.412	0.445	0.187	-0.027	-0.002	0.221
17	Physicians should try to think like their patients in order to render better care. Zdravniki bi morali poskusiti razmišljati kot njihovi bolniki, kar bi jim omogočilo nuditi boljšo oskrbo.	0.011	0.799	0.194	-0.023	0.116	-0.120
1	Physicians' understanding of their patients' feelings and the feeling of their patients' families does not influence medical or surgical treatment. Če zdravnik razume čustva svojih bolnikov in čustva njihove družine, to ne vpliva na medicinsko ali kirurško zdravljenje.	0.110	0.045	0.727	-0.070	-0.056	-0.026
7	Attention to patients' emotions is not important in history taking. Pri anamnezi upoštevanje bolnikovih čustev ni pomembno.	0.102	0.239	0.701	0.109	0.212	0.157
8	Attentiveness to patients' personal experiences does not influence treatment outcomes. Upoštevanje bolnikovih osebnih izkušenj ne vpliva na izid zdravljenja.	0.295	0.141	0.505	0.122	0.356	-0.130
3	It is a difficult for a physician to view things from patients' perspectives. Za zdravnika je težko videti stvari z bolnikovega stališča.	-0.037	-0.038	-0.044	0.843	0.093	0.089
6	Because people are different, it is difficult to see things from patients' perspectives. Ker se ljudje razlikujemo, je težko videti stvari z bolnikovega stališča.	0.120	0.137	0.080	0.806	-0.041	-0.068

5	A physician's sense of humour contributes to a better clinical outcome. Zdravnikov smisel za humor prispeva k boljšemu kliničnemu izidu.	-0.001	-0.026	0.252	-0.120	0.748	-0.045
10	Patients value a physician's understanding of their feelings which is therapeutic in its own right. Bolniki cenijo zdravnikovo razumevanje čustev, kar je samo po sebi terapevtsko.	0.224	0.128	-0.029	0.145	0.619	0.083
18	Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members. Zdravniki si ne bi smeli dovoliti, da nanje vplivajo tesne osebne vezi z bolniki in njihovimi družinskimi člani.	0.194	-0.032	0.221	-0.067	-0.051	-0.705
19	I do not enjoy reading non-medical literature or the arts. Ne prebiram rad nemedicinske literature in ne uživam v umetnosti.	0.312	-0.174	0.257	-0.049	-0.053	0.600
	Eigenvalue Lastna vrednost	2.86	2.36	1.77	1.56	1.55	1.36
	% of explained variance % pojasnjene variance	14.31	11.72	8.83	7.80	7.75	6.78

We confirmed the multidimensionality of the concept of empathy by finding six dimensions. Our first-year medical students recognise all three dimensions of the original three-dimensional structure of the JSE-S, but they also recognised an additional two dimensions: "positive perspective on patient care" and "bio-medical perspective".

4 DISCUSSION

The findings of this study support the construct validity of the Slovenian translation of the JSE-S. Using factor analysis, we confirmed the multidimensionality of the concept of empathy; six factors explain understanding of the concept of empathy in Slovenian students. The reliability of the Slovenian version is comparable to other translated versions and is only slightly smaller than the original version. The instrument is now available for measuring empathy in medical students.

The mean values of items ranged from 3.27 to 6.50 on the seven-point Likert scale. The finding indicates that the respondents tend to be skewed toward the upper end of the scale (negative skewness). The item with the highest value was "Patients feel better when their physicians understand their feelings" (in the original version of Jefferson scale it belongs to the component named "perspective taking"), which is the most cognitive dimension of empathy, while the item with the lowest value was "Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members", which belongs to the component named "compassionate care" in the original version of JSE (3).

Empathy in first-year medical students in Slovenia is similar to that in some other European countries such as Austria (18) and Portugal (19), slightly higher than in Japan (20), Iran (23) and Kuwait (29) and lower than in the United States (3,25) and Brazil (21). Cultural

differences seem to have impact on the level of empathy in medical students at the beginning of their medical education (30). It seems that the emotional component of care is highly valued in America but less in Europe or in Asia.

The Slovenian version of the JSE-S has an acceptable level of internal consistency and test-retest stability. Internal consistency of our scale was slightly lower than internal consistency of the original questionnaire, which was 0.89 (3), and similar to most of the translations (16, 20,2 3).

As in most other studies, we confirmed higher level of empathy in females than in males (3, 4, 20, 25, 30). The gender differences in empathy should be explained with intrinsic biological factors and also with extrinsic factors, e.g. gender role expectations (3).

Our first-year medical students recognised empathy as a multidimensional concept. Six factors were recognised; the last three of them consisted of only two items. Similar results were found in Japan, where students recognised five factors (20).

Factor 1, which explains 14.3% of the variance, is a major component that could be labelled as "perspective taking". It contains six items with factor coefficients greater than 0.40. The second most important factor, which explains 11.7% of the variance and consists of five items, might also be labelled as "perspective taking". With both factors that belong to the component "perspective taking", we explained 26% of the variance (almost half of all explained variance). The "perspective taking" component has been described as a major dimension of empathy in patient care (3).

Factor 3, which explains 8.8% of variability and contains three items, might be labelled as "compassionate care". All items belonging to this component are also a part of the component "compassionate care" in the analysis made by Hojat et al. (3).

Factor 4 might be labelled as "standing in the patient's shoes". Items 3 and 6 were recognised to be a part of the domain "standing in the patient's shoes" also in the studies made by Hojat et al. (3), Tavakol et al. (16) and Kataoka et al. (20).

Factor 5 could be labelled as "interpersonal relationship". Students at the beginning of medical education seem to be very enthusiastic and try to have positive relationship to people who are their potential patients. They found humour as an important element in communication, which is helpful in establishing a good doctor-patient relationship (13).

Items of factor 6 do not have anything in common and cannot form a separate factor. It seems that students were confused when they had to answer a question asking them about their opinion about art.

The findings generally confirm the three factors of "perspective taking, compassionate care and ability to stand in the patient's shoes" that had appeared in American students (3).

The differences in understanding of empathy between Slovenian and American students might be explained by cultural differences and values in different societies. Another reason for differences in understanding of empathy might be the criteria for entering medical school, which are extremely science-oriented. High school students who are going to enter medical school tend to concentrate heavily on studying science, and they do not have much time for extracurricular activities for development of humanistic skills related to physician's professionalism.

4.1   Strengths and limitations of the study

The study was conducted on a representative sample of first-year medical students. The response rate was high. We took into account all the recommendations for validation of the instrument recommended by the authors of JSE, and our results are in line with the results published by other authors.

Our study also has some limitations. We had included only students of one out of the two medical faculties in the country. Due to similar cultural background and similar requirements for entering the medical schools in the country, we do not expect that the students of two medical schools would have different levels and understanding of empathy at the beginning of the study. Due to the cross-sectional design of the study, we did not have to estimate some important aspects of reliability and validity, including responsiveness to changes.

Our measurement of empathy using the JSE-S was self-reported. It measures a medical student's orientation to empathy, but it does not measure the student's behaviour. However, a research by Hojat and co-authors demonstrated a correlation that supports a predictive value of the JSE-S for empathic behaviour (31).

4.2   Implications for practice

Teachers should structure curricula in a way to combine professional knowledge with broad concept of humanistic personal development. Curricula that include time dedicated to discuss students' reactions to patients' care and enable participation in service activities are believed to enhance the level of students' empathy (11, 32).

It has been reported that assessed level is related to the future professional career. Empathy in "people-oriented" specialities is higher than empathy in technology-oriented specialities. The highest mean scores of empathy were found in psychiatrists, but family medicine specialists also belong to the specialities with the highest empathy scores (3). The level of empathy should be included as a part of election process of candidates for residency in family medicine.

4.3   Implications for future research

It would be interesting to know how the empathy varies from the first to the sixth year of the medical study. We believe that our curricula, especially after the Bologna changes with the implementation of early patient contact into medical teaching (13), stimulate development of humanistic values in medical students and positively influence students' empathy. In a systematic review of studies, especially those with longitudinal data, it was found that the empathy decline during the medical study and residency compromised striving toward professionalism and may threaten health care quality (33), but there were also other reports claiming that empathy can be preserved or increased through the educational process at the medical school (11, 19, 26, 34).

An important question is also whether the self-reported empathy assessed by JSE-S is related to empathic behaviour of students and later on also to the behaviour of residents and physicians in practice (30, 35). A longitudinal observation of self-reported empathy and empathic behaviour of the cohort of students from the first year of the undergraduate study to their specialist exam would be interesting.

5 CONCLUSION

Our findings provide support for the construct validity and reliability of the Slovenian translation of the student version of the Jefferson scale of empathy (JSE-S). The instrument is now available for use in national and cross-cultural studies in medical education. Further research is required to find out whether the changes in medical curricula according to the Bologna declaration have a positive impact on students' empathy. A longitudinal cohort study is needed to test variations in students' empathy throughout the medical school. It would be also beneficial to know the relationship between empathy and career preferences as well as between empathy and clinical behaviour.

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