Measurement Properties of an Arabic Version of the Jefferson Scale of Empathy (JSE) in Moroccan Medical Students

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Abstract

Introduction: Empathy is an essential communication skill in the doctor-patient relationship. In fact, measuring its level in medical students is becoming increasingly important. There is a Lack of tools to measure it in Morocco. The aim of this study was to validate the Arabic version of the Jefferson Scale of Empathy (JSE) among Moroccan medical students.

Methods: The questionnaire was translated from its original English version to Arabic in accordance with international guidelines for cross-cultural adaptation of self-report measures. After translation and transcultural adaptation, the final Arabic version was administered to a sample of Moroccan medical students. Descriptive statistics at the item level and at the scale level were calculated. The internal consistency, reproducibility, criterion, and construct validity were assessed. A multitrait scale analysis was used to examine construct validity. To measure criterion validity, the Arabic JSE scale was correlated to a visual analog scale (VAS), measuring the level of empathy. The mean of score was compared by gender, year of medical training, and specialty preference using the Student (t) and ANOVA tests. All statistical analyses were performed by SPSS, Version 26.

Results: A total of 201 students participated in the study. The average empathy score was 105.1±13.4. It was higher in female than male students (P=0.003). The Cronbach alpha was 0.76. The instrument has moderate test-retest reliability (ICC=0.6). The results showed a positive and significant correlation between Arabic JSE and VAS (r=0.28, P<0.0001). The multitrait scaling analysis by testing convergent and discriminant validity confirmed the original scale structure.

Conclusion: The adapted Moroccan version of the Jefferson Scale of Empathy proved to be a valid instrument. It demonstrated an acceptable reliability and validity. Indeed, it can be used in national studies to measure empathy in medical students.

Keywords: Empathy, Medical student, Validation, Psychometrics

Introduction

Interpersonal skills, including communication skills, are the pillars of a good doctor-patient relationship and the keys to a successful medical consultation. Medical students must acquire these skills before graduation. Many countries, such as America and Canada, consider communication skills a core competency and an essential learning objective for medical students and practitioners (1, 2). In British medical schools, students are admitted based on tests of intellectual and communication skills in addition to academic knowledge (3). In China, interpersonal and communication skills are required in residency programs by the China Accreditation Council for Higher Medical Education (4). Empathy is one of these skills. Its definition is multidimensional, including a cognitive, emotional, and affective component. For Hojat and colleagues, empathy is essentially cognitive. It is defined as "the ability to understand another person's inner experiences and feelings and a capability to view the outside world from the other person's perspective" (5). Its primary role in the development of the doctor-patient relationship and the well-being of patients and physicians is well documented in the literature (6).

As such, it is becoming increasingly important to measure the level of empathy in medical students because it can serve as a reference for medical education decision makers to make changes to the curriculum to increase the level of empathy in students during medical training. The measurement of the level of empathy highlights the need for a psychometrically sound and valid instrument in order to obtain relevant results. Several scales are used in the measurement of empathy in medical students (7). The Jefferson Scale of Empathy (JSE) remains one of the most used. It has been translated and validated in several languages and has demonstrated robust validity (8).

The research on patient-physician communication in the Arab context is limited. Some studies (9-13) have measured the level of empathy in Arabic medical students using different scales that are not validated or contextually appropriate, and this calls into question the validity of the results. In Morocco, communication skills among medical students are not well studied. The study of Jaafari et al. (10) is the only one that has studied the level of empathy and its determinants among Moroccan students. However, empathy in this study was measured using the Jefferson scale in its French version, which was not validated in our country.

The aim of this study was to transculturally adapt and examine the validity and reliability of the Arabic version of the JSE among Moroccan students.

Methods

Jefferson scale of empathy (JSE)

The Jefferson Scale of Empathy (JSE) is a questionnaire developed to measure the level of empathy, created by Hojat and colleagues (14). The JSE includes 20 Likert scale items, which are scored from 1 (strongly disagree) to 7 (strongly agree). The 20 items are classified according to one of three subscales: "perspective Taking" (10 items), "compassionate Care" (8 items), and "standing in the patient's shoes" (2 items). The total score is obtained by summing all items. Total scores range from 20 to 140, with higher scores indicating a higher degree of empathy. Three versions of JSE are available: HP-Version: for administration to physicians and other health professionals, S-Version: for administration to medical students and HPS-Version: for administration to students in all health professions other than medicine. The medical student version was a subject to cross-cultural validation and adaptation in this study.

Validation study

This study was conducted following two steps: the first one was related to the transcultural adaptation procedure and the second one was the evaluation of the psychometrics properties of the Moroccan version of the scale.

Transcultural adaptation step

Before starting the translation process, we took the agreement of Thomas Jefferson University. The questionnaire was translated from its original English version to Arabic in accordance with international guidelines for cross-cultural adaptation of self-report measures (15, 16). Two independent bilingual translators did the initial translation from English to Arabic. An expert committee was formed to produce the pre-final version of the translation. The committee members included epidemiologists, from the Epidemiology and Clinical Research Laboratory and medical students. Two additional independent translators independently back-translated the pre-final version from Arabic to English. This version was compared with the original version.

The pre-final version of the translated questionnaire was tested on a small sample (10 students). After completing the translated questionnaire, the students were asked whether

they encountered any difficulty in understanding. This approach allowed us to ensure that the translated items retained the same meaning as the original items and that there was no confusion regarding the Arabic version of the questionnaire.

Evaluation of the psychometrics properties step

The Streiner curve (17) was used to determine sample size: for an ICC of 0.70 and a precision of±0.10, the minimal size was 100 participants.

The study was conducted at the Faculty of Medicine and Pharmacy, Sidi Mohamed Ben Abdellah University of Fez, Morocco. Students from the 1st to 7th year of medical training whose maternal language is Arabic were included. We excluded medical students who did not speak Arabic and those who refused to participate. The participants were asked through their secured academic e-mails, to answer a questionnaire comprising:

Sociodemographic data: age, gender, year of medical training, specialty preference.

A visual analog scale (VAS) measuring level of empathy: it was used as the criterion of validity due to the lack of a validated empathy measurement scale in Morocco. It varies from 0 to 10: 0 indicates a low level of empathy, and 10 a high level of empathy.

The translated Arabic version of the JSE-S: it was administered twice to the students to assess reliability**.**

Statistical analysis

For the Scoring of the Arabic JSE-S, the guidelines of scoring provided by the Thomas Jefferson University were used: Items 1, 3, 6, 7, 8, 11, 12, 14, 18, and 19 are scored in reverse (strongly agree=1; strongly disagree=7), while the remaining items are scored directly (strongly disagree=1; strongly agree=7). The total score is the sum of the scores for all items.

The normality of the Moroccan JSE-S score was tested by the Kolmogorov test. Descriptive statistics (frequencies, means, and standard deviations) were used for the description of score and student characteristics. The student (t) test was used to analyze the empathy levels stratified by gender. To establish statistically significant differences between empathy levels of different years of medical students and preferred career choice, analysis of variance (ANOVA) was used.

The internal consistency of the questionnaire was calculated using the Cronbach alpha. A value of 0.70 or higher is considered an acceptable value (18).

The contribution of each item to the total score was calculated using Item-total score correlations. The correlations coefficients were calculated based on the responses to each item and the total JSE score minus the corresponding item. Correlation values > 0.20 were considered satisfactory (19).

The test-retest reliability was assessed by the interclass correlation coefficient (ICC). Values less than 0.5, between 0.5 and 0.75, between 0.75 and 0.9, and greater than 0.90 are indicative of poor, moderate, good, and excellent reliability, respectively (20).

To assess criterion validity, Pearson correlation (r) was employed. It varies from − 1 to 1, where 0 is no correlation, 1 is total positive correlation, and − 1 is total negative correlation (21).

A multitrait scale analysis was used to examine construct validity: This analysis is based on the determination of correlation coefficients between the different items and scales to measure item convergence and item discrimination (22). Item convergence is considered satisfactory if the correlation coefficient between an item and its own scale is greater than 0.40. Item discrimination was satisfactory if each item had a higher correlation with its own scale rather than with scales measuring other concepts.

Based on the correlation coefficients, we calculated the percentage of success:

Percentage of success in item convergence: Number of item-scale correlations greater than 0.40/total number of item-scale correlations.

Percentage of success in item discrimination: Number of correlations of items with their own scales significantly higher than correlations with other scales/total number of item-scale correlations.

All statistical analysis was performed using SPSS, Version 26. The significant level was kept at 0.05.

Ethical Considerations

This study was approved by the Ethics Committee of Hassan II University Hospital (Ref 10/2022). The students were informed of the purpose and conditions related to the study, the anonymous nature of the data, and the liberty of participation. This information served as the basis for informed consent from each respondent. Anonymity and confidentiality were respected for all participants.

Results
Description of population

A total of 201 medical students were included in the study; 79 (39.3%) were in the 1st cycle

(1st and 2nd year), 70 (34.8%) in the 2nd cycle (3rd,4th and 5th year), and 52 (25.9%) in the 3rd cycle (6th and 7th year). The average age of the participants was 21.0±2.5 years, and 149 (74.1 %) were female. Table 1 shows the description of participants.

Description of the JSE-S score

The average empathy score was 105.1±13.4, with a minimum of 75 and a maximum of 137. Descriptive statistics at item levels indicated the mean score for the items ranging from 2.99±1.77 for item 18 to 6.37±1.08 for item 14. Table 2 shows the description of the total score and different items.

The average score was higher in female students (106.8±13.4 vs 100.3±12.5) (P=0.003). Empathy score decreased in the 2nd cycle and then increased in the 3rd cycle but the difference was not statistically significant (p=0.08). Empathy score was not associated with specialty preference (P=0.34) (Table 1).

Internal consistency

The overall JSPE summary score showed acceptable internal consistency (alpha=0.76). The values, if single items are deleted, are similar to the overall alpha (between 0.73 and 0.76) suggesting that the items did not affect the reliability of the measure (Table 2).

Table 1: Description of the population and comparison of JSE-S scale by gender, year of training and specialty preference (n=201)

Variables	n (%)	Level of empathy (Mean±SD)	P
Age (Mean±SD)	21.0±2.5		
Gender			0.003
Male	52(25.9)	100.3±12.5	
Female	149(74.1)	106.8±13.4	
Year of medical training			0.08
1st cycle (1st and 2nd year)	79(39.3)	107.1±13.7	
2nd cycle (3rd ,4th and 5th year)	70(34.8)	102.2±13.5	
3rd cycle (6th and 7th year)	52(25.9)	105.9±12.5	
Preference of specialty			0.34
Medical specialty	64(31.8)	105.2±11.4	
Surgical specialty	63(31.4)	106.9±14.2	
Undecided	74(36.8)	103.5±13.4	

SD: Standard Deviation; % Percentage.

Table 2: Description and reliability of the JSE-S scale

	Mean±SD	Min	Max	Cronbach alpha if item deleted	CI-CT
Understanding patients' feelings influences treatment (1).	4.91±2.19	1	7	0.76	0.23**
Understanding makes patients feel better (2).	6.26±1.12	3	7	0.74	0.38***
Viewing patients' perspectives (3).	3.54±1.67	1	7	0.76	0.12*
Understanding body language in communication (4).	5.82±1.55	1	7	0.75	0.27***
Sense of humor and clinical outcomes (5).	5.50±1.56	1	7	0.74	0.37***
Taking patients' perspectives (6).	3.19±1.68	1	7	0.76	0.08
Attention to patients' emotions (7).	6.16±1.34	1	7	0.75	0.24**
Attention to patients' personal experiences (8).	5.74±1.54	1	7	0.76	0.17*
Standing in patients' shoes (9).	4.71±1.94	1	7	0.73	0.50***
Understanding is therapeutic to patient (10).	5.63±1.57	1	7	0.73	0.48***
Patient-physician emotional ties in medical treatment (11).	6.19±1.23	1	7	0.75	0.27***
Life events in understanding physical complaints (12).	4.97±1.82	1	7	0.74	0.45***
Non-verbal cues and body language in understanding patients (13).	5.74±1.46	1	7	0.74	0.40***
Place of emotion in medical treatment (14).	6.37±1.08	1	7	0.75	0.32***
Empathy and clinical success (15).	5.18±1.61	1	7	0.73	0.57***
Understanding emotions in patient-clinician relationship (16).	5.98±1.29	1	7	0.73	0.59***
Thinking like patients for better care (17).	4.22±2.02	1	7	0.73	0.49***
Physician influenced by patients' personal bonds (18).	2.99±1.77	1	7	0.77	0.01
Enjoy literature and arts (19).	6.17±140	1	7	0.76	0.14
Empathy as a therapeutic factor (20).	5.76±1.39	1	7	0.73	0.55***
Total score	105.1±13.4	75	137	0.76	

JSE: Jefferson Scale of Empathy; SD: Standard Deviation; CI-CT: Corrected Item-Total Correlation ; ***: P<0, 0001, ** : P<0,001, * : P<0.01.

Item- total correlation

The results showed that 17 items had a positive and significant correlation, with a correlation coefficient ranging from 0.12 for item 3 to 0.59 for item 16. The correlations of the items 6, 18, and 19 and the total score were the lowest and non-significant (r=0.08, 0.01 and 0.05, respectively) (Table 2).

Reproducibility

We collected test/retest data from 51 patients. The intra-class correlation coefficient was 0.6 for the total score demonstrating moderate reproducibility.

Criterion validity

The comparison of the total score with the VAS scale showed a positive and significant correlation (r=0.28, P<0.0001).

Construct validity

As shown in Table 3, there is a strong correlation between the items and their respective domains (correlation coefficient mostly above

0.40). However, the relationship between the item and the other domains is weak.

The perspective taking and standing in patient shoes scales demonstrated 100% item-convergence (r: 0.54 – 0.77 and 0.9 respectively) and 100% item-discriminance (r: -0.13-0.53 and -0.24-0.26, respectively) (Table 4).

Discussion

This study aimed to adapt and validate an Arabic version of JSE in Moroccan medical students. Our findings showed that this Arabic version of the JSE-S had acceptable psychometric properties, which supports its utilization among Moroccan medical students.

The results indicate that the Arabic version of the JSE S-version is internally consistent and this is similar to most of the other translations (23-29). Item-total correlation demonstrated that items 6, 18, and 19 had the lowest correlation, which was similar to other studies (23, 28, 30, 31). This could be due to the negative wording and inverted scoring of these items and may require further evaluation.

Table 3: Construct validity: Correlation coefficient (r) among items and scales of JSE

	Perspective taking	Compassionate care	Standing in patient' shoes
Understanding makes patients feel better (2).	0.65*	0.03	-0.24
Understanding body language in communication (4).	0.54*	-0.02	-0.10
Sense of humor and clinical outcomes (5).	0.60*	0.09	-0.11
Standing in patients' shoes (9).	0.62*	0.22	0.15
Understanding is therapeutic to patient (10).	0.74*	0.08	-0.11
Non-verbal cues and body language in understanding patients (13).	0.63*	0.07	-0.11
Empathy and clinical success (15).	0.77*	0.22	-0.15
Understanding emotions in patient-clinician relationship (16).	0.77*	0.22	-0.16
Thinking like patients for better care (17).	0.60*	0.31	0.07
Empathy as a therapeutic factor (20).	0.72*	0.23	-0.11
Understanding patients' feelings influences treatment (1).	0.10	0.60*	0.15
Attention to patients' emotions (7).	0.11	0.42*	0.26
Attention to patients' personal experiences (8).	-0.02	0.61*	0.12
Patient-physician emotional ties in medical treatment (11).	0.16	0.49*	0.08
Life events in understanding physical complaints (12).	0.53	0.38*	-0.09
Place of emotion in medical treatment (14).	0.18	0.50*	0.15
Physician influenced by patients' personal bonds (18).	-0.12	0.44*	0.20
Enjoy literature and arts (19).	-0.05	0.38*	0.12
Viewing patients' perspectives (3).	-0.06	0.21	0.90*
Taking patients' perspectives (6).	-0.13	0.23	0.90*

*Significance at level of 0.0001.

Table 4: Construct validity: multitrait scaling analysis of the Moroccan JSE

Scales	Convergence (r, % success)*	Discriminance (r, % success) **
Perspective taking	0.54-0.77, 100	-0.13-0.53, 100
Compassionate care	0.38-0.60, 75	-0.02-0.31, 100
Standing in patient shoes	0.90, 100	-0.24-0.26, 100

r: correlation coefficient, % percentage; JSE: Jefferson Scale of Empathy; *Number of item-scale correlations greater than 0.40 / total number of item-scale correlations; **Number of correlations of items with own scales significantly higher than correlations with other scale/total number of item-scale correlations.

The test-retest reliability of JSP-S is not well studied in the literature. The current Arabic version demonstrated moderate reliability. The Slovenian (29) and Italian (32) versions reported a good reliability. A poor reliability was observed in the German version (31).

Construct validity was assessed using multitrait scaling analysis by testing the convergent and discriminant validity of items. This analysis demonstrated satisfactory results and confirmed the hypothesized scale structure, implying that the translation of the items is appropriate. The JSE-S scale has shown good construct validity in various studies using different methods (25, 26, 32, 33).

This study showed that the average empathy score of Moroccan medical students is similar to that of Japanese (34), Iranian (35) and South African (30) students but lower than that of French (23), Spanish (26), American (14), German (31) and Mexican (36) medical students. The score variability can be explained by differences in curriculum, social and cultural factors in different countries.

Empathy scores were significantly higher in female students, which is consistent with the literature (26, 32, 36, 37). Several hypotheses are generated to explain the difference between the levels of empathy between the genders: the first is related to the fact that the networks supporting empathy are modulated differently according to gender (38). Other authors have explained these differences by genetic and biological factors (39).

This study is the first, to our knowledge, to validate an Arabic version of JSE in medical students. Although all students were recruited from a single medical school, they could be representative of the population of Moroccan medical students, as they come from different towns in the region. Indeed, the composition of the sample takes into account possible social and cultural differences between the students. The absence of other validated measures of empathy was a limitation for the measurement of criterion validity in this study. To overcome this limitation, we tested criterion validity using a visual analog scale.

Conclusion

In conclusion, the Arabic version of the JSE is a psychometrically robust measure of empathy. It demonstrated an acceptable reliability and validity, which are comparable to those reported in other languages. Indeed, it can be used in studies assessing empathy and its determinants among medical students in Morocco. The results derived from this version could contribute to cross-cultural comparisons. The translated version can also be a reference for further cross-cultural adaptation and validation in other Arab countries.

Authors' Contribution

SB: methodology, formal analysis and writing original draft, HA: data collection, IEH and SEF: formal analysis, KER: investigation, conceptualization and review. All authors contributed to the discussion, read and approved the manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated resolved.

Conflict of Interests

The authors declare that there is no conflict of interests.

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