
Assessing patient-centeredness among medical students: The Italian translation and validation of the Patient-Practitioner Orientation Scale

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✎ **ABSTRACT.** Il presente studio ha lo scopo di valutare le proprietà psicometriche della Patient-Practitioner Orientation Scale (PPOS) in un ampio campione (N = 854) di studenti di medicina italiani iscritti al secondo anno di corso, dei sei anni accademici consecutivi. I 18 item della PPOS sono stati tradotti in italiano mediante un processo di traduzione standard/back-translation. Il modello di misurazione della PPOS è stato testato attraverso una serie di analisi fattoriali confermatriche. È stata calcolata anche la misurazione dell'invarianza multi-gruppo tra maschi e femmine. Infine, validità convergente e composite reliability di Raykov sono state adottate come indicatori della consistenza interna della PPOS. I risultati supportano i due fattori originali denominati Caring e Sharing, ma la versione italiana della PPOS prevede solo 8 dei 18 item del questionario originale. La PPOS-8-IT ha dimostrato di essere uno strumento di autovalutazione valido ed affidabile per misurare l'approccio centrato sul paziente degli studenti di medicina italiani. La PPOS-8-IT potrebbe essere utilizzata al fine di valutare e monitorare nel tempo l'atteggiamento degli studenti di medicina italiani nei confronti della relazione medico-paziente per scopi formativi, valutativi e di ricerca.

✎ **SUMMARY.** This study aimed to evaluate the psychometric properties of the Italian version of the Patient-Practitioner Orientation Scale (PPOS) in a large sample (N = 854) of Italian second-year medical students from six consecutive academic years. The 18 items of the PPOS were translated into Italian using a standard translation/back-translation process. The construct validity of the PPOS was established with Confirmatory Factor Analyses. Multi-group measurement invariance between males and females was also performed. Finally, convergent validity and Raykov's composite reliability were used as indicators of PPOS internal consistency. Results supported the two original factors labeled Caring and Sharing, but the validated Italian version of the PPOS includes 8 items out of the 18 of the original questionnaire. The PPOS-8-IT resulted in a reliable and valid self-report measure of patient-centeredness among Italian undergraduate medical students. The PPOS-8-IT might be used for assessing and monitoring the attitudes of Italian medical students towards the doctor-patient relationship for educational, evaluative, and research purposes.

Keywords: Confirmatory Factor Analysis, Convergent Validity, Internal Consistency

INTRODUCTION

Contemporary medicine is characterized by two paradigms: biomedical *evidence-based medicine* and bio-psycho-social *patient-centered medicine* (Bensing, 2000). In the health field, the bio-psycho-social perspective led to the transition from a doctor-centered medicine to a medicine centered on the patient and a more egalitarian doctor-patient relationship. In this theoretical framework, healthcare professionals have to face not only the patients' disease with their technical knowledge (to *cure*), but they are also asked to deal with the patients' human needs of warm, comprehension, and attachment (to *care*) (De Valck, Bensing, Bruynooghe & Batenburg, 2001). The patient takes the role of a partner along a shared process of information (Thorne, Oliffe & Stajduhar, 2013), power and treatment decisions (Kaba & Sooriakumaran, 2007).

The patient-centered approach to treatment is associated with high levels of patient satisfaction (Chan & Azman, 2012) adherence (Cvengros, Christensen, Hillis & Rosenthal, 2007), treatment compliance (Robinson, Callister, Berry & Dearing, 2008), empathic therapeutic relationship (Pinto et al., 2012), physical health of different patient groups (de Boer, Delnoij & Rademakers, 2013) and change in their lifestyle (Epstein, 2005). It has been also shown that the patient-centered medicine decreases the health care costs (Mead & Bower, 2002) and benefits the health professionals reducing the levels of work-related stress, burnout syndrome (Nelson et al., 2014), complaints and litigations (Fallowfield, 2008).

The growing interest in the psycho-social aspects of medicine has led researchers to develop numerous instruments in order to evaluate the patient-centered attitude, such as the Patient Reaction Assessment (Galassi, Schanberg & Ware, 1992), the Patient Perception of Patient Centeredness (Stewart et al., 2000), the Consultation Care Measure (Little et al., 2001), the Perceived Involvement in Care Scale (Smith, Winkel, Egert, Diaz-Wionczek & DuHamel, 2006), and the Component of Primary Care Instrument (Malouin, Starfield & Sepulveda, 2009).

Over other instruments, the *Patient-Practitioner Orientation Scale (PPOS)* has the benefit of evaluating the *caring* and the *sharing* attitudes of students, physicians and other healthcare professionals providing the same questionnaire (Trapp & Stern, 2013). The original version of PPOS (Krupat, Hiam, Fleming & Freeman, 1999), tested with a sample of medical students at first year, contained 35 items reduced to 20 items after the statistical analyses. This preliminary study found good psychometric characteristics

of the instrument with an overall alpha level of .89 (*Caring* subscale $\alpha = .84$, and *Sharing* subscale $\alpha = .85$).

The current version of PPOS (Krupat et al., 2000), tested with a sample of undergraduate psychological students, was reduced from 20 to 18 items, but the factors (*Caring* and *Sharing*) were confirmed. In addition to the *Caring* and *Sharing* scores obtained with the mean of the nine items in each dimension, the mean of all items represents a *Total* score ranging from 1 (respondent has a doctor-centered or paternalistic disposition) to 6 (respondent has a patient-centered or egalitarian disposition). The initial validation studies tested the internal consistency of the questionnaire and found adequate reliability ranging from .73 to .88 (Haidet et al., 2001; Krupat, Bell, Kravitz, Thom & Azari, 2001; Krupat et al., 2000). Although there are not any formal validation studies that tested the predictive and convergent validity of the PPOS, in the literature there are several research works that compared PPOS scores to relevant clinical outcomes. PPOS has been associated to patients' satisfaction and trust (Krupat et al., 2001; Krupat et al., 2000), to effective communication in medical encounters (Street, Krupat, Bell, Kravitz & Haidet, 2003), and increased patient engagement (Shaw, Woiszwillo & Krupat, 2012). Moreover, the patient-centered orientation during doctor-patient communication has been found positively correlated with self-reported empathy among medical students (LaNoue & Roter, 2018).

Considering the importance of patient-centeredness and its clinical advantages, the PPOS has been translated and validated into several languages worldwide (Grilo, Santos Rita, Carolino, Gomes & dos Santos, 2018; Mudiyanse, Pallegama, Jayalath, Dharmaratne & Krupat, 2015; Paul-Savoie, Bourgault, Gosselin, Potvin & Lafrenaye, 2015; Pereira et al., 2013). In Italy, to our knowledge, there are only some qualitative studies regarding the patient-centeredness (Lamiani, Leone, Meyer & Moja, 2011). This study aimed to verify the psychometric characteristics of the Italian version of the PPOS.

METHOD

Measures

– *Patient-Practitioner Orientation Scale (PPOS)*

This self-report questionnaire is composed of 18 items rated on a six-point Likert scale (from “strongly agree” to “strongly

disagree”). It was developed to evaluate two dimensions of patient-centeredness, named respectively *Caring* and *Sharing* (Krupat et al., 2000). The *Caring* dimension (8 items) refers to the respondent’s belief regarding the importance for practitioners to consider patients as a whole (emotions, fears, interests, and beliefs) rather than only a disease. High levels of *Caring* mean that the respondent believes in a holistic and supporting approach. The *Sharing* dimension (8 items) reflects the respondent’s perception regarding the possibility that power, information, and control should be shared between the patient (expert of him/herself) and the physician (expert of medicine). High levels of *Sharing* highlight that the respondent believes that the patient-physician relationship should be egalitarian.

– *Interpersonal Reactivity Index (IRI)*

Empathy was measured using two out of the four subscales of the Italian validated version of the Interpersonal Reactivity Index (IRI) (Albiero, Ingoglia & Lo Coco, 2006; Davis, 1980). Respondents are asked to indicate how much each item describes them on a 5-point Likert scale ranging from 0 (“does not describe me well”) to 4 (“describes me very well”). The two IRI subscales included in the present study were: (1) the *Empathic Concern* (EC) which quantifies the emotional side of empathy and assesses feelings of compassion and concern for misfortunes of other people, and (2) the *Perspective Taking* (PT) which evaluates the cognitive domain of empathy and measures the spontaneous propensity to adopt the psychological point of view of other people. In this study, the Cronbach’s alpha values for EC and PT subscales were, respectively, .74 and .81.

Translation

In order to develop the Italian version of the PPOS questionnaire, authors have obtained from the original author permission to translate and develop the instrument in the Italian context. The 18 items of the PPOS scale were translated and adapted using a standard translation/back-translation process (Brislin, 1986). First, the PPOS items were translated into Italian. A second translator, blind to the original English items, back-translated the Italian version into English. Bilingual fluency was required by both translators. The English back-translation was then compared to the original. If the items did not coincide, a

second translation was made and then translated again by the second translator until translations overlapped. After a pilot administration of the scale to five Italian medical students, minor changes were implemented to maximize the comprehensibility of the items.

Procedure

Students were recruited on campus after class, adopting a convenience sampling method. A set of paper-and-pencil questionnaires was administered at the beginning of each second course year. Participation was voluntary, and informed consent was signed by all individual participants included in the study before the beginning of the questionnaires’ compilation. The questionnaires’ administration took place in the classroom and took nearly 30 minutes to complete. A researcher was always on hand to answer questions. This research was previously approved by the university ethical committee.

Strategy of data analyses

The strategy of data analyses was based on standard procedures for instrument development (Veronese & Pepe, 2017) based on Confirmatory Factor Analysis (CFA). CFA is a data analysis technique that provides both numerical support and practical information about the construct validity of a given quantitative model of measurement. As suggested by Judd, Jessor and Donovan (1986) all rights reserved, the assumption of uni-dimensionality (M_1 , all items loading on a single latent factor) of underlying constructs was initially tested. Then, the original factor structure of PPOS (M_2 ; Krupat et al., 2000) was tested in order to assess its degree of fit with empirical data. Such an attempt was made in order to assess discriminant validity and to compare goodness-of-fit indexes of a single-factor model of measurement with a nested comparison model consisting of all the instrument’s features.

As usual, in the framework of CFA, absolute, and relative fit indexes comparing reproduced co-variance matrix with empirical data were adopted. The following indexes were evaluated: χ^2 , Normed-Chi Square (NC), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). Model fit was considered robust

if $NC < 2.0$, $RMSEA < .08$, CFI and $TLI > .95$ (Morin, Marsh & Nagengast, 2013).

In order to provide additional information about the ecological validity of the Italian resulting version of PPOS, the best fitting model supported by CFA was taken as the baseline model of measurement for testing factorial invariance across gender. Measurement invariance between male and female students would imply that the relations among underlying dimensions and observed variables did not significantly vary as a function of gender (Pepe, Addimando & Veronese, 2017; Veronese & Pepe, 2013). The gender groups were selected for comparison because they were expected to differ about levels of patient-centeredness (Wahlqvist, Gunnarsson, Dahlgren & Nordgren, 2010). If the quantitative model of measurement was found to cover the same constructs in males and females, this would provide further evidence for justifying confidence in generalizing results across groups.

To this end, four levels of invariance (configural invariance, metric invariance, strong invariance, and full construct invariance) were assessed using Multi-Group Confirmatory Analysis (MGCFA). Measurement equivalence across gender groups was rejected if the $\Delta\chi^2$ between the two models (baseline vs nested model) was statistically significant. For the other fit indexes (ΔCFI , $\Delta RMSEA$, ΔTLI), the parameter for rejecting invariance was set at $\Delta > .01$, corresponding to a p level of .01 (Chen, 2007).

Finally, the factor structure of PPOS was reported for reliability evaluation via composite reliability (Raykov, 1997) and inter-class correlation coefficient (Shrout & Fleiss, 1979). Finally, convergent validity between PPOS scores and IRI scores was tested.

Preliminary exploration of the data included testing distribution assumptions (asymmetry and kurtosis values were required to fall within the range -1 , $+1$) and checking for multivariate outliers (Mahalanobis' distance was set at $p < .001$). Neither uni- nor multi-variate outliers were found. All scores reported distribution values within the suggested threshold for normality.

RESULTS

Study sample

This study enrolled a total of 900 second-year medical students from six consecutive academic years (from 2010/2011

to 2015/2016) at one Medical School in Northern Italy. 854 students completed all the questionnaires (response rate = 94.8%). The analyzed sample included 408 (47.8%) males and 446 (52.2%) females and aged from 18 to 33 years ($M = 19.93$, $SD = 1.39$). All participants were Italian.

Confirmatory Factor Analyses (CFA)

First, the uni-dimensionality of the model (M_1) was tested. The analysis of goodness of fit indexes revealed a general poor fit of the model with the empirical data [$\chi^2 (19) = 83.6$, $p < .001$, $NC = 4.18$, $NFI = .689$, $NNFI = .630$, $CFI = .735$, $RMSEA = .092$, $p < .001$] and suggested to reject the one latent dimension model. Then, the original bi-dimensional model of measurement (M_2 ; as reported by Krupat et al., 2000) was tested. Results of CFA revealed a poor fit of the model [$\chi^2 (125) = 316.6$, $p < .001$, $NC = 2.53$, $NFI = .740$, $NNFI = .779$, $CFI = .820$, $RMSEA = .045$, $p = .902$] with different indexes below the recommended cut-off point for acceptance. Analysis of resulting statistics (in particular item factor loadings) revealed that many different items reported associations with the respective latent factor below the recommended values ($\lambda < .3$) (see Figure 1).

Consequently, a third CFA (M_{2a}) was performed retaining only items satisfying statistical criteria and two latent factors (*Caring* and *Sharing*). The analysis of statistical indexes of M_{2a} suggested the acceptance of the factor structure: $\chi^2 (125) = 316.6$, $p < .001$, $NC = 2.53$, $NFI = .740$, $NNFI = .779$, $CFI = .820$, $RMSEA = .045$, $p = .902$. In particular, the saturation values were medium-high (ranging from $\lambda = .42$ to $\lambda = .68$) and three item-level errors were correlated (see Figure 2).

The key finding of MGCFA (see Table 1) was that the model of measurement of the 8-item Italian version of the PPOS (PPOS-8-IT) should be considered as invariant between male and female students only in relation to configural and metric invariance. This means that both groups share the same pattern of fixed saturation loadings and intercept values, but no other type of model constraints or equivalence. In other words, respondents did not attribute the same meaning to the latent constructs as well as the meaning of underlying items. All in all, the results indicated weak measurement invariance, suggesting caution in drawing inferences from differences in latent means and sum scores between gender-based groups (Byrne, Shavelson & Muthén, 1989).

Reliability, convergent validity, and descriptive statistics

Raykov’s composite reliability (Raykov, 1997) was used as the indicator of PPOS-8-IT scales’ internal consistency and reliability. It represents a valid alternative to common Cronbach’s α , especially because it is not based on the assumption of Tau equivalence (i.e., all loadings were set equal in the model with uncorrelated errors). Also, the intraclass correlation coefficient (ICC) was reported.

Reliability was considered poor if the ICC value was lower than .4, or the correlation was not statistically significant ($p < .05$). Results, along with descriptive statistics, are reported in Table 2, and they support the empirical adoption of the PPOS-8-IT.

Convergent validity analysis was performed by calculating Pearson’s zero-order correlation coefficients between PPOS-8-IT and IRI scores (see Table 3). Both *Caring* and *Sharing* positively correlated with EC, whereas only *Caring* was significantly correlated with PT.

Figure 1 – Results of confirmatory factor analysis of the original model of measurement of PPOS (M_2)

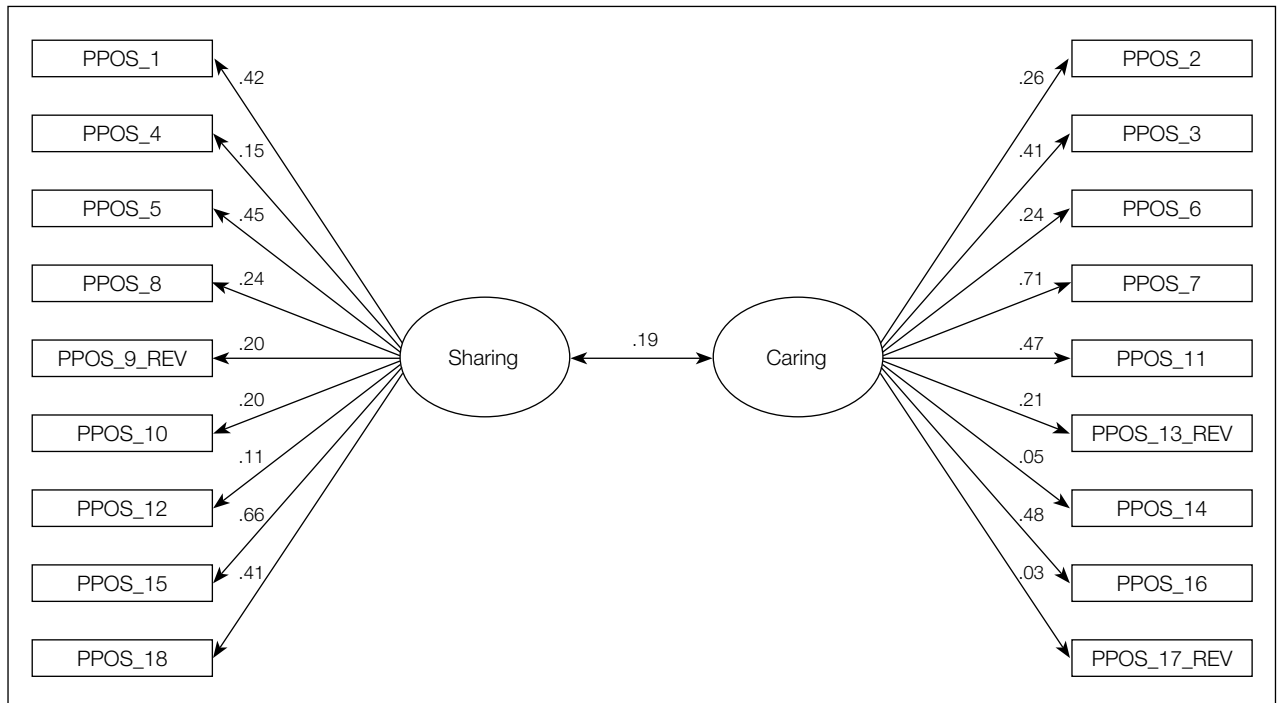


Figure 2 – Results of confirmatory factor analysis of final model of measurement of PPOS (M_{2a})

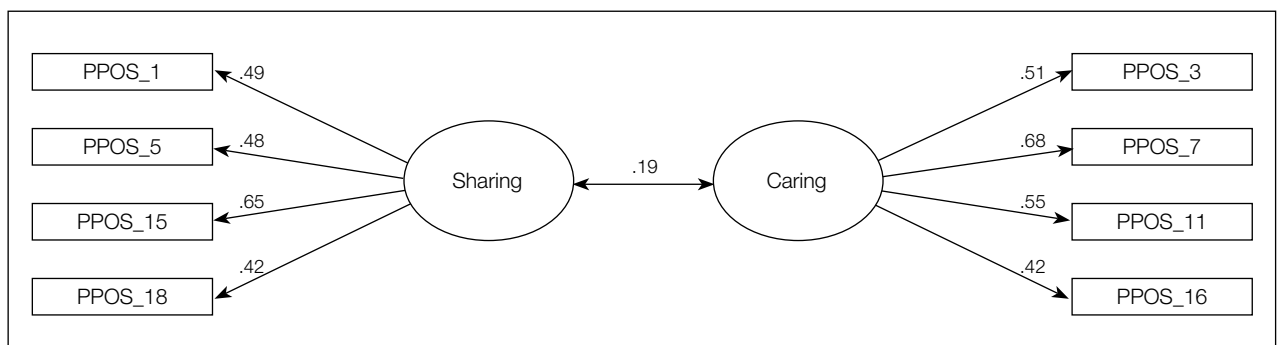


Table 1 – Multigroup CFA of PPOS-8-IT structure on the full sample (N = 854): model invariance between male and female. Only configural invariance was supported

	χ^2	df	p	$\Delta\chi^2$ (p)	Δ RMSEA	Δ CFI	Δ NNFI	AIC
Configural invariance	49.8	32	.023	–	.027	.966	.967	161.8
Metric invariance	75.2	44	.002	7.96 (.241)	.001	.008	.009	157.8
Scalar invariance	161.3	52	.001	86.1 (.001)	.026	.154	.141	222.5
Residual invariance	177.3	55	.001	16.1 (.001)	.001	.163	.134	221.6
Full invariance	291.5	63	.001	114.2 (.001)	.003	.375	.397	322.1

Legenda. df = degree of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; NNFI = Non-Normed Fit Index; AIC = Akaike Information Criterion.

Table 2 – Demographic characteristics and psychometric proprieties of PPOS-8-IT Caring and Sharing scores

Variable	%	Caring				Sharing			
		M	SD	Skewness	Cp (ICC)	M	SD	Skewness	Cp (ICC)
<i>Overall</i>	100%	4.65	.75	–.75	.71 (.58)	3.29	.87	–.042	.68 (.54)
<i>Gender</i>									
Male	47.8%	4.43	.80	–.61		3.12	.87	.11	
Female	52.2%	4.87	.65	–.71		3.45	.85	.01	
<i>Age (years)</i>									
19 or less	37.9%	4.46	.78	–.67		3.01	.88	.221	
20	43.5%	4.76	.69	–.88		3.41	.85	–.136	
21 or more	19.6%	4.77	.72	–.73		3.33	.33	–.195	

Note. Cp = Composite Reliability; ICC = Intraclass Correlation Coefficient; cut-off points for skewness [–2; +2; George & Mallery, 2010].

Table 3 – Pearson’s zero-order correlations between PPOS-8-IT and IRI subscales: the convergent validity was confirmed

Variable	1	2	3	4
1. Caring	1	.300 ^a	.343 ^a	.170 ^a
2. Sharing		1	.094 ^b	.067
3. EC			1	.258 ^a
4. PT				1

Note. Caring = PPOS-8-IT Caring; Sharing = PPOS-8-IT Sharing; EC = IRI Empathic Concern; PT = IRI Perspective Taking; ^a $p < .001$; ^b $p < .01$.

DISCUSSION

This study aimed at translating and validating the Italian version of the Patient-Practitioner Orientation Scale (PPOS) (Krupat et al., 2000) and at exploring its dimensionality in a large group of Italian undergraduate medical students. The need for a systematic test of the psychometric property of the PPOS is due to the lack of reports of this kind of data in the Italian context to date.

The results of this study provide evidence for a robust, reliable, and valid questionnaire, loading onto the two original factors (labeled *Caring* and *Sharing*). However, the version of the instrument developed in this study counts eight items, ten items less than the original questionnaire. The ten items were excluded for empirical and numerical reasons. Our results show that the PPOS-8-IT is composed of two subscales each made by four items, confirming the original *Caring* and *Sharing* factors. Previous studies have already shown some difficulties in confirming good psychometric properties of the original 18-item PPOS. A German validation (Kiessling, Fabry, Fischer, Steiner

& Langewitz, 2013) proposed a 12-item version, while a Chinese validation advanced an 11-item solution (Wang et al., 2017). However, in both validation studies the two-factor structure of the questionnaire was confirmed. Comparing our data with the literature, our respondents obtained a similar pattern of those from abroad, showing higher scores in *Caring* than in *Sharing* (Krupat et al., 1999; Moore, 2008; Mudiyanse et al., 2015; Ribeiro, Krupat & Amaral, 2007; Tsimtsiou et al., 2007). This result supports the construct validity of the PPOS-8-IT.

In order to evaluate the convergent validity of PPOS-8-IT we have explored its correlation with the Interpersonal Reactivity Index (IRI) (Davis, 1980). The IRI is a multidimensional measure of empathy widely used in the medical education context (Hemmerdinger, Stoddart & Lilford, 2007) that was found highly correlated to other self-reported measures of empathy specifically developed for health students and professionals (Hojat, Mangione, Kane & Gonnella, 2005). The present study confirms the empirical relationship between patient-centered orientation and empathy attitude. Our results show that students who

are more concerned about others' feelings (emotional side of empathy) and who tend to take into consideration others' perspectives (cognitive side of empathy) are more prone to take care of the emotional needs of patients during clinical encounters. On the contrary, only the preoccupation for unfortunate others (emotional side of empathy) significantly and positively correlates with the students' attitude to consider important sharing clinical information with the patient.

In literature, patient-centeredness and empathy have been found related from both theoretical and empirical viewpoints. Empathy in clinical practice has been defined as the basis of the caring and sharing attitudes highlighted by the patient-centered approach that recognizes the patient as a whole person rather than an organic disease (Hojat, 2007; Mudiyanse, 2016). Shaw and colleagues (2012) found that scoring high in PPOS was associated with asking more questions about patients' lifestyle, providing more lifestyle advice, and more attempts at rapport-building.

Limitations

There are several limitations to our study. Lack of a divergent measure and the use of a self-report instrument to test the convergent validity are the two main limitations of this study. Objective examinations and observations of study participants' behaviours during the clinical encounters with real or simulated patients could be considered to further examine the validity of the PPOS-8-IT. Furthermore, although this study involved a large sample of Italian undergraduate medical students, our findings may not be generalized to all Italian healthcare students and professionals as our sampling population was limited to students enrolled in the second year of medical school. A replication of this study should include patients, practitioners and medical students at different stage in their educational path and from other Italian medical and healthcare institutions.

CONCLUSION

The Italian 8-item version of the PPOS has demonstrated acceptable validity and adequate reliability. In conclusion, medical educators might use the PPOS-8-IT to promote curricula and teachings in which medical students could develop the competences in patient-centered care (e.g. communicational skills, professional values, and humanism) alongside clinical skills (Cushing, 2015; Langendyk, Mason & Wang, 2016).

Practice implications

This study has significant implications for medical research and education. Having the possibility to assess quantitatively the patient-centeredness attitude may favour studies regarding the promotion of the patient-centered approach in the Italian medical professional and educational context. Also, having a validated Italian version of a questionnaire widely used internationally may enhance international cross-cultural efforts and foster discussion in the field.

Moreover, the 8-item version of the PPOS may have greater applicability than the original 18-item version in both clinical and research contexts as it is shorter and therefore it poses less burden on participants. The PPOS-8-IT might be used for assessing and monitoring the attitudes of Italian medical students towards the doctor-patient relationship for educational and evaluative purposes. This will facilitate the design, and the evaluation of training focused on patient-centered communication and bio-psycho-social care behaviors amongst medical students.

Acknowledgments

We thank medical students who participated in this study for their dedication and contributions to test the psychometric proprieties of the Italian translated version of the PPOS. We would also like to show our gratitude to Prof. Edward Krupat for his wise and helpful suggestions during this research work. We are also grateful to Dr. Selena Russo for having proofread the final version of our manuscript.

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