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Preparation and validation of a Brazilian Clinical Empathy Scale (EBEC): pilot test

Elaboração e validação da Escala Brasileira de Empatia Clínica (EBEC): teste-piloto

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ABSTRACT

Introduction: Empathy, which is a crucial element of humanism, has been the subject of increasing interest in medical education. In the context of the healthcare professions, empathy in patient care is an attribute that involves understanding the patient's experiences, pain, suffering, and concerns combined with the ability to communicate that understanding and an intention to help. Despite the development of practices that encourage empathy in medical students, a challenge in academic life is measuring this ability.

Objective: To develop and validate a Brazilian scale of empathy in the context of clinical care.

Method: Pilot study of construction and validation of a psychometric scale, carried out in five stages: (1) Definition of the dimensions of the construct based on a literature review; (2) Items submitted to theoretical analysis with judges specialized in the subject, aiming to identify the pertinence of the item within the construct; (3) carrying out a pre-test with the target population to assess the understanding of the items (4) validation of the scale with application to 207 Brazilian medical students (5) application of statistical tests that help in the validation of the scale.

Result: At the end of the study, the created Empathy Scale contained 21 items, with Likert scale responses, distributed in two factors: empathic understanding and empathic action, which presented good proposed reliability (>0.842) and good internal consistency (latent H >0.879 and observed H >0.864) with a total explained variance of 44.95%.

Conclusion: The application of the clinical empathy scale, in medical students, resulted in an instrument that met the criteria of semantic and cultural adequacy and revealed preliminary evidence of validity.

Keywords: Health education. Empathy. Medical students.

RESUMO

Introdução: *A empatia, um elemento primordial do humanismo, tem sido alvo de crescente interesse no ensino médico. No contexto das profissões de saúde, a empatia no atendimento ao paciente é um atributo que envolve a compreensão das experiências, da dor, do sofrimento e das preocupações do paciente combinados com a capacidade de comunicar esse entendimento e uma intenção de ajudar. Apesar do desenvolvimento de práticas que estimulam a empatia nos estudantes de Medicina, um desafio presente na vida acadêmica é mensurar essa habilidade.*

Objetivo: *Este estudo teve como objetivos elaborar e validar uma escala brasileira de empatia no contexto do atendimento clínico.*

Método: *Trata-se de estudo-piloto de construção e validação de uma escala psicométrica, realizado em cinco etapas: 1. definição das dimensões do construto baseada em revisão da literatura; 2. itens submetidos à análise teórica com juízes especializados no tema, objetivando identificar a pertinência do item dentro do construto; 3. realização de um pré-teste com a população-alvo visando avaliar o entendimento dos itens; 4. validação da escala com aplicação a 207 estudantes de Medicina brasileiros; 5. aplicação de testes estatísticos que auxiliam na validação da escala.*

Resultado: *Ao final do estudo, a escala de empatia elaborada continha 21 itens, com respostas em escala de Likert, distribuídos em dois fatores: compreensão empática e ação empática, que apresentaram boa confiabilidade proposta (> 0,842) e boa consistência interna (H-latente > 0,879 e H-observado > 0,864) com total de variância explicada de 44,95%.*

Conclusão: *A aplicação da escala de empatia clínica em estudantes de Medicina resultou em um instrumento que atendeu aos critérios de adequação semântica e cultural, e revelou evidências preliminares de validade.*

Palavras-chave: *Ensino em Saúde; Empatia; Estudantes de Medicina.*

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INTRODUCTION

Conceptually, empathy is considered in phenomenological philosophy as the union or fusion with other beings or objects. In psychology, it is considered as an indirect experience of an emotion close to the emotion experienced by another person. This complicity with the other's situation culminates in the potential to think and develop social or emotional support[1]. According to Sampaio et al.[2], the relationship between affectivity and cognition are important for the internalization and construction of principles that govern the individual's behavior in society. Empathy is, therefore, a multidimensional construct that involves different levels of affectivity, cognition and behavior[3]. Through the affective component, the emotional states of others are shared, while the cognitive and behavioral components are responsible for the ability to reason about the mental states of other people and consider communication and help actions[4].

Thus, empathy is a skill that allows you to perceive and understand the feelings and perspective of others, encompassing cognitive, affective and behavioral components[5-7]. The *cognitive component*, called perspective taking, correlates with the capacity to put yourself in someone else's place and deduce their feelings, without necessarily experiencing them. This component is considered vital for social interactions, as it allows understanding and predicting behaviors[5,8]. The *affective* component is based on sharing and understanding the emotional states of others (mirror neurons), in which the actions observed in others are represented internally in the observer's brain[6,7,9]. The *behavioral* component (empathic concern) is related to the motivation to care for vulnerable individuals[6,8,10].

Several strategies have been tested for developing empathy in medical students[7,11-17]; however, measuring this skill remains a challenge. Scales have been developed to measure empathy in different scenarios, such as the Empathy Inventory (EI), which assesses empathy in the context of social interaction situations[6], the CARE scale, which assesses the patient's perception of empathy in the context of clinical care[18] and the Interpersonal Reactivity Index, which assesses the affective and cognitive dimensions of empathy in the context of social relationships[5]. However, in medical education, the most often used is the Jefferson Scale of Physician Empathy - JSPE, which assesses empathy in the context of the doctor-patient relationship[19], predominantly considering the cognitive attribute of empathy, not addressing its affective component. Despite being commonly used to measure empathy in healthcare environments, a recent systematic review found inconsistencies in some psychometric properties of the JSPE, which despite demonstrating structural validity, internal consistency and convergent validity, shows that the evidence is limited regarding the properties of reliability, measurement error and cross-cultural validity[20].

Thus, considering the importance of empathy in the academic development, a scale is necessary that addresses the affective and cognitive component of the construct and that is culturally and linguistically closer to the scenario of Brazilian students. This study aims to develop a scale that would evaluate the attitudes of Brazilian medical students regarding empathy in healthcare environments. This is based on the assumption that a person's attitude can be accessed through their communication or demonstration, with the attitude being essentially a mental disposition of a potential action[21].

METHOD

Study design

Pilot study of construction and validation of a psychometric scale, carried out in five stages.

In the first stage, the dimensions of the construct were defined based on a literature review. The Brazilian Clinical Empathy Scale (EBEC, *Escala Brasileira de Empatia Clínica*) was constructed to measure the cognitive and affective components of empathy in the context of clinical care. The construction of the items was based on an extensive literature review on the theoretical concept of the construct and its components. Thirty-seven items were created, related to the three pillars of empathy: perspective taking, empathic understanding and empathic concern.

Perspective taking was defined as the health professional's capacity to understand what the patient experiences, thinks and feels based on their perspective, paying attention to non-verbal communication and body language[19]. This domain is related to cognitive skills: information processing, reasoning, evaluation and communication empathy[22].

Emotional sharing has been defined as the capacity to understand and share the emotional states of others (mirror neurons), in which the actions observed in others are represented internally in the observer's brain[7,22]. Emotional sharing assesses feelings of anxiety, apprehension and discomfort in tense interpersonal contexts[23].

Empathic concern was defined as the capacity to experience feelings of compassion and concern for others[23]. It refers to the motivation to care for vulnerable individuals and decide on the actions to be taken to solve the encountered problems[7].

To capture differences in responses, a 5-point Likert-type response scale was chosen (1 - fully disagree; 2 - partially disagree; 3 - neither agree nor disagree; 4 - partially agree; 5 - fully agree). Finally, it was decided to use bidirectional responses, with items written in a positive and negative way, to allow detecting the consistency and bias of the responses[24].

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In the second stage, the Items were submitted to theoretical analysis with ten judges specialized in the topic, aiming to identify the relevance of the item within the construct, as well as the clarity of the language. The items were initially distributed into the components of empathy according to the definitions described in the literature. For the theoretical analysis of the items in the proposed instrument, the content validity technique was used, regarding language clarity and practical relevance. The content validity coefficient (CVC) proposed by Hernandez-Nieto[25] was calculated for each item of the instrument (CVC_c) and for the instrument as a whole (CVC_t). The judges were asked to score each of the 37 items using a scale ranging from 1 to 5 to assess the level of adequacy of language clarity (1 → easy to understand and 5 → difficult to understand) and the level of practical relevance (1 → little relevant and 5 → very relevant). For the assessment related to language clarity, the scale was inverted. The cutoff point adopted to determine satisfactory levels for language clarity and relevance was $CVC_c \geq 0.80$ for each of the items and $CVC_t \geq 0.80$ for the instrument in general.

In the third stage, the final version obtained after content validity was submitted to a pre-test with 30 medical students, representing the instrument's target audience. These students were presented with the prepared scale and asked to give their opinion on the clarity and understanding of the items to assess whether each item measured what was desired.

The fourth stage consisted in the validation of the scale, which was applied to 207 Brazilian medical students. Participants were recruited from August to September 2021, via WhatsApp or email and the study was conducted by completing an online questionnaire via Google Forms. The instrument contained a sociodemographic questionnaire addressing the following variables: name; age; gender, course semester, marital status; institution; family income; desired specialty; experience with severe illness in the family; presence of chronic illness and the version of the Brazilian Clinical Empathy Scale (EBEC). Before filling out the form, the student had to read and agree to the Informed Consent Form. The "snowball" technique was used for the recruitment. Initially, the invitation was sent to medical students with whom the researchers had contact, belonging to the following institutions: Unifenas-BH, UFMG and UFJF. These students were then asked to send the invitation to other students at their institution and other Brazilian medical education institutions. The inclusion criteria for the study were: being 18 years old or over, being regularly enrolled in a medical course in semesters with clinical practice; have agreed to participate in the research and sign the free and informed consent form (TCLE, *Termo de consentimento livre e esclarecido*). The exclusion criteria were: failure to fully complete the questionnaire and the participant's declared desire to leave the study.

The fifth stage consisted in applying statistical tests to help validate the scale. The descriptive measures Minimum, Maximum, Median (Q_2), Quartiles (Q_1 and Q_3), Mean, Standard Deviation (SD) and Confidence Interval of the mean were used, in addition to absolute (n) and relative frequencies (%) as measures to describe the results of the studied variables.

To explore the factorial structure of the initial version of the EBEC, an Exploratory Factor Analysis (EFA) was carried out. The analysis was implemented using a polychoric matrix. The decision on the number of factors to be retained was made using the Parallel Analysis technique with random permutation of the observed data[26] and the rotation used was Robust Promin[27] – non-orthogonal.

Model adequacy was assessed using the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index / Tucker Index. -Lewis (TLI) / Non-normed Fit Index (NNFI). According to the literature, RMSEA values must be less than 0.08, with a 95% confidence interval not reaching 0.10, and CFI and TLI values must be greater than 0.90, or preferably, 0.95[28].

Factor stability was assessed using the H index[27]. The *H* index evaluates how well a set of items represents a factor, and H values can vary from 0 to 1. High *H* values (> 0.80) suggest a well-defined latent variable (Factor). Finally, the discrimination parameter and item thresholds were evaluated using Reckase parameterization[29]. All results were considered significant for a significance probability of less than 5% ($p < 0.05$), therefore providing at least 95% confidence in the presented conclusions. The software used was FACTOR.

RESULTS

The sample included 207 students, from the 4th to the 6th year of the medical course, from private and public Brazilian institutions. In this group, the age distribution was: 76.8% aged 20 to 25 years old, 14.5% aged 26 to 30 years old and 8.7% aged over 30 years old. The majority of students were female (73.4%), single (94.7%), with a family income above R$5,000.00 (84.1%), intending to pursue a clinical specialty (56.5%), with serious illness in the family (74.9%) and without a chronic illness (86.5%). Moreover, the largest proportion of students who participated in this research were in the 4th year (51.7%) of the medical course (Table 1).

Statistical analysis of the proposed scale

The version of the scale that was sent to the students contained 34 items. The analysis of student responses to each of the 34 items on the scale showed there was polarization in

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the extremes of the response scale in six of the items, where more than 85% of students indicated the answer 1 or 5 (items 1, 2, 9 , 21, 26, and 29). This result indicates that these questions are not discriminative, compromising the assessment of the reliability of the domains, and were, therefore, discarded.

An Exploratory Factor Analysis (EFA) was carried out with the remaining 28 items, which indicated the need to remove 6 more items that showed low rotational factor loading (PROMIN method). Therefore, a second exploratory factor analysis was carried out with the remaining 22 items, which indicated the need to remove one more item due to low factor loading. A new exploratory factor analysis was performed and the remaining 21 items showed satisfactory factor loadings. A Parallel Analysis was then carried out, which suggested the presence of two factors (latent variables) that were called: (1) empathic understanding – which involves a cognitive-affective bond and (2) empathic action – which involves a cognitive-behavioral component. (Table 2). It is important to highlight that the Unidimensionality indicators "Unidimensional Congruence (UniCo = 0.867)", "Explained Common Variance (ECV = 0.774)" and Mean of Item Residual Absolute Loadings (MIREAL = 0.267)[27] did not support the unidimensionality of the scale. The suitability parameters of this model are shown in Table 3.

The final version of the proposed scale consists of 21 items distributed across two domains (Chart 1). The Empathic Understanding domain consists of items 3, 4, 8, 9, 12, 17, 20 and the Empathic Action domain consists of items 1*, 2*, 5, 6*, 7, 10, 11*, 13* , 14*, 15, 16*, 18, 19, 21*. The sum of the scores obtained in each item must be considered to analyze empathy. The questions marked with an asterisk (*) had the scale direction reversed. There is no cutoff value, but the higher the score, the greater the student's empathetic attitude.

Influence of sociodemographic variables on empathy measured by EBEC

The students' level of empathy, measured by the proposed scale, was high (above 4 on a scale of a maximum score of 5), in both factors. When comparing sociodemographic data with the scale scores, it was identified that females had higher scores in the two scale factors. Students who intend to pursue the clinical specialty; those who have experienced serious illness in the family and who have a chronic illness had higher scores on the empathic understanding factor (cognitive-affective) (Table 4).

Table 1. Distribution of students according to the sociodemographic variables of interest, overall

Variable	Frequency	
	N (207)	%
Sex		
Male	55	26.6
Female	152	73.4
Age group (years)		
20 to 25 years	159	76.8
26 to 30 years old	30	14.5
> 30 years	18	8.7
Age (years)		
Mean ± SD	24.7 ± 4.3	
Mean C.I (95%)	(24.1; 25.3)	
Median (Q1 – Q3)	23.0 (22.0 – 25.0)	
Minimum - Maximum	20.0 – 42.0	
Marital status		
Single	196	94.7
Married / Common-law marriage	9	4.3
Divorced / Separated	2	1.0
Year at the medical course		
4th year (7th and 8th semesters)	107	51.7
5th year (9th and 10th semesters)	64	30.9
6th year (11th and 12th semesters)	36	17.4
Family income		
Above R$ 5,000.00	174	84.1
Up to R$ 5,000.00	33	15.9
Desired specialty		
Doesn't know	2	1.0
Family and Community Medicine	3	1.4
Clinical specialty	117	56.5
Surgical specialty	69	33.3
Management area	0	0.0
Complementary exam area	1	0.5
Other	15	7.3
Have you ever experienced a serious illness in the family?		
Yes	155	74.9
No	52	25.1
Do you have any chronic disease?		
Yes	28	13.5
No	179	86.5

Source: Study data.
Abbreviations: SD: Standard deviation; CI of the mean: 95% confidence interval of the mean.

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Table 2. Factor structure (Factor loadings) of the items that constitute the Brazilian Clinical Empathy Scale.

Items	FACTOR 1	FACTOR 2
Item 5	-0.044	**0.343**
Item 11i	0.129	**0.648**
Item 12	**0.460**	-0.022
Item 14	**0.748**	0.018
Item 15	0.253	**0.448**
Item 16i	-0.041	**0.507**
Item 17	0.175	**0.440**
Item 18	**0.654**	0.206
Item 19	**0.951**	-0.321
Item 20i	0.197	**0.450**
Item 22i	-0.276	**0.545**
Item 23	**0.891**	-0.233
Item 24i	0.026	**0.525**
Item 25i	-0.269	**0.926**
Item 27i	0.201	**0.462**
Item 28i	-0.057	**0.626**
Item 30	**0.402**	0.275
Item 31	0.136	**0.423**
Item 32i	-0.230	**0.347**
Item 33	**0.714**	-0.043
Item 34i	0.014	**0.607**
Composite Reliability	*0.871*	*0.843*
H - Latent	0.902	0.880
H – Observed	0.891	0.865

Source: Study data.

Table 3. Evaluation of factor analysis parameters for the final model of the clinical empathy scale.

Suitability parameters	Ideal values	Values observed in the study
KMO (Total MSA)	≥ 0.60	0.59
Bartlett sphericity test (p)	< 0.05	< 0.0001
χ^2 / *gl*	< 3	1.5
RMSEA	≥ 0.50	0.048
Composite reliability	≥ 0.50	≥ 0.843
TLI	> 0.95	0.967
UniCo	< 0.95	0.867
ECV	< 0.85	0.774
MIREAL	> 0.30	0.267
Total Variance Explained	≥ 50%	44.95%
Factorial load of the questions	> 0.35	0.343 to 0.951

Source: Study data.

Chart 1. Brazilian Clinical Empathy Scale.

INSTRUCTIONS **This questionnaire contains 21 statements related to the context of clinical care. Please indicate your level of agreement or disagreement for each of the statements by marking the appropriate number on a 5-point scale, where the higher number indicates the highest level of agreement.**	I fully disagree	I partially disagree	I neither agree nor disagree	I partially agree	I fully agree
The patient's feelings about their clinical condition should not interfere with the therapeutic decision.	①	②	③	④	⑤
The patient's personal problems unrelated to their health status should not be considered.	①	②	③	④	⑤
To understand the patient, I must imagine how I would feel if I were in the same situation as them.	①	②	③	④	⑤
I often become emotionally involved with the patient's story.	①	②	③	④	⑤

Continue...

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Chart 1. Continuation.

INSTRUCTIONS **This questionnaire contains 21 statements related to the context of clinical care. Please indicate your level of agreement or disagreement for each of the statements by marking the appropriate number on a 5-point scale, where the higher number indicates the highest level of agreement.**	I fully disagree	I partially disagree	I neither agree nor disagree	I partially agree	I fully agree
Reflecting on the patient's desires and needs at the time of the consultation helps in the therapeutic conduct.	1	2	3	4	5
The formal record of the anamnesis is more important than eye contact.	1	2	3	4	5
The patient's life history is as important as their disease.	1	2	3	4	5
Showing concern for the patient's feelings is an important component of the consultation.	1	2	3	4	5
I often feel distress when the patient has a serious illness.	1	2	3	4	5
The patient's emotions should not interfere with the recording of the anamnesis.	1	2	3	4	5
I must always indicate the best treatment, regardless of its financial impact on the patient's life.	1	2	3	4	5
If the patient has a serious illness, I am worried even after the end of the consultation.	1	2	3	4	5
The patient's personal beliefs and convictions should not interfere with the therapeutic conduct.	1	2	3	4	5
I believe that complaints of emotional origin should not be considered in the creation of the therapeutic plan.	1	2	3	4	5
I should only ask questions related to the patient's health status in the consultation.	1	2	3	4	5
I should avoid talking about the patient's family issues at the time of the consultation.	1	2	3	4	5
I believe that my assistance in the consultation is better when I consider the patient's wishes.	1	2	3	4	5
The needs of the patient's family members should be considered in the care plan.	1	2	3	4	5
I must consider the patient's social context as secondary to their health problems.	1	2	3	4	5
Reflecting on my feelings when I know the patient's story increases my desire to help them.	1	2	3	4	5
The patient's family relationships should not interfere with the care plan.	1	2	3	4	5

Source: Study data

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Table 4. Influence of sociodemographic variables on the Brazilian Clinical Empathy Scale (EBEC) score.

Variable	Empathetic understanding		Empathetic action	
	Mean (SD)	p	Mean (SD)	p
Sex				
Male	3.76 (0.72)	**0.003**	3.91 (0.49)	**0.001**
Female	4.10 (0.61)		4.18 (0.48)	
Age group (years)				
20 to 25 years	3.99 (0.66)	0.818	4.14 (0.48)	0.068
26 to 30 years old	4.06 (0.73)		3.92 (0.54)	
> 30 years	4.07 (0.55)		4.19 (0.50)	
Year at the medical course				
4th year (7th and 8th semesters)	4.04 (0.69)	0.760	4.17 (0.43)	0.149
5th year (9th and 10th semesters)	4.00 (0.57)		4.07 (0.54)	
6th year (11th and 12th semesters)	3.94 (0.72)		4.00 (0.59)	
Family income				
Above R$ 5,000.00	3.99 (0.67)	0.353	4.11 (0.51)	0.883
Up to R$ 5,000.00	4.10 (0.59)		4.10 (0.43)	
Desired specialty				
Clinical specialty	4.10 (0.62)	**0.023**	4.12 (0.44)	0.493
Surgical specialty	3.86 (0.73)		4.07 (0.59)	
Have you ever experienced a serious illness in the family?				
Yes	4.16 (0.61)	**0.002**	4.13 (0.49)	0.406
No	3.75 (0.73)		4.06 (0.51)	
Do you have any chronic disease?				
Yes	4.26 (0.60)	**0.024**	4.23 (0.59)	0.129
No	3.97 (0.66)		4.09 (0.68)	

Source: Study data
Abbreviations: SD: Standard deviation; CI of the mean: 95% confidence interval of the mean.

DISCUSSION

The results of the study showed that EBEC has a model comprising two factors that were called empathic understanding (cognitive-affective) and empathic action (cognitive-behavioral). In the EMPATHIC UNDERSTANDING domain, the items are related to perspective taking, conceptualized as the health professional's capacity to understand what the patient experiences, thinks and feels from their perspective[19], as well as emotional sharing, which is the capacity to understand and share the emotional states of others (mirror neurons).

The EMPATHIC ACTION domain covers items related to perspective-taking, which allows predicting behaviors and empathic concern, which is related to actions to be taken to solve the encountered problems[7].

In the proposed scale, it was not possible to highlight the three components of the construct reported in the literature, but rather two factors. Given these results, we can infer that the concepts of the components of empathy are closely linked to each other, which makes their discrimination difficult. Paro et al.[30], when validating Jefferson's empathy scale, found a change in the domain of some items, which was justified by the hypothesis of a different view of Brazilian students in relation to the construct.

According to Davis[31], empathy is related to a series of factors that come into play whenever there is someone's emotional experience, therefore proposing an integrated approach that identifies the joint role of cognition and affection. Thus, sharing emotions (affective component) without perspective taking and the regulatory processes involved (cognitive component), takes the form of emotional contagion or sympathy. Similarly, accurately perceiving someone's thoughts and feelings, without experiencing compassion and interest in their well-being, does not translate into an empathetic manifestation[32]. According to Sampaio et al.[2], the relationship between affectivity and cognition is important for the internalization

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and construction of principles that govern the individual's behavior in society.

The scale developed in this study showed satisfactory Composite Reliability measures and replicability estimates ($H > 0.80$), that is, the generated factors are replicable and appropriate according to the factorial load measurements found. According to Rogers[33], the observed H index indicates how much the set of items represents the common factor. Its value ranges from zero to one and values above 0.80 suggest a good definition of the latent variable, which will potentially be more stable in future studies. The latent H index reflects the estimated replicability when the items are interpreted as continuous variables and the observed H index reflects the estimated replicability when the items are interpreted as ordinal variables, such as Likert-type measures[33].

It was observed that the female sex showed higher scores in the two factors of the scale. According to Batchelder et al.[34], the female advantage is more evident in the affective components, including affective reactivity, and less evident in the cognitive components, revealing that women are more naturally in tune with emotional states and are more likely to react and respond to emotions and feelings of others.

Students who intend to pursue the clinical specialty, those who have experienced serious illness in the family or who have a chronic illness had higher scores in the Empathic Understanding component of the scale (cognitive-affective bond). Bailey[35] showed that medical students who intended to work in a clinical area had a higher empathy score than those who planned to work in surgical areas. Studies carried out with doctors showed the same pattern as that observed in this study carried out with medical students. In a study carried out with 704 doctors, using the *Jefferson Scale of Empathy* (JSE), those involved in the clinical area obtained higher scores than those in the surgical and imaging areas[36]. It was also observed by Batenburg et al.[37] that final year interns who prefer general practice as a specialty showed more empathetic attitudes than interns in the surgical area.

Another important point is the relationship between empathy levels and the presence of one's own illness or that of family members. A study conducted by Esquerda et al.[38] with 191 medical students revealed greater empathy among those who had already experienced illness among family members, friends or personally. These data are in line with our study, which suggests experience as a relevant factor for the development of empathic ability.

These results reveal a positive point of this study by demonstrating that the proposed empathy scale was sensitive in detecting, as mentioned in the literature, the influence of some sociodemographic variables on empathy, which could suggest an external validity of the instrument. The intention to promote comparison with external validity criteria is highlighted, aiming to test items that were not consistent in the studied sample, as well as the discriminatory power of the scale.

Thus, we can infer that the new empathy scale developed in this study showed preliminary evidence of validity, having the distinction of differentiating the cognitive-affective (Empathic Understanding) and cognitive-behavioral (Empathic Action) components of the construct, allowing the identification of factors that affect each component.

It is worth noting that the EBEC, like several instruments used to assess clinical empathy, is a self-report scale, which may have limited conclusions as it depends on self-knowledge and presents the possibility of response bias, with the respondent potentially tending to socially accepted answers. Some studies have identified the lack of correlation between empathy levels obtained by self-assessment instruments and patients' perceptions and suggest that the patients should be included in the empathy assessment process[39].

More studies should be carried out using the scale proposed in this study to demonstrate its reliability, validity and stability.

FINAL CONSIDERATIONS

The model proposed for the Brazilian Clinical Empathy Scale, consisting of 21 items distributed into two factors: Empathic Understanding and Empathic Action, met the criteria of semantic and cultural adequacy, in addition to demonstrating preliminary evidence of validity. Using this instrument, it was possible to identify that the female sex, choosing a clinical specialty, having a chronic illness or having cases of serious illness in the family are predictive factors for empathy.

AUTHORS' CONTRIBUTION

Alexandre Tadeu Azevedo Generoso: actively participated in the research design, data collection, data analysis, discussion of results, and writing of the manuscript. Júlia Coutinho Cordeiro: actively participated in the research design, data collection, data analysis, and discussion of the results. José Maria Peixoto: actively participated in the research design, data collection, data analysis, discussion of results, writing of the manuscript, review and approval of the final version of the manuscript, guiding the entire process. Eliane Perlatto Moura: actively participated in the research design, data collection, data analysis, discussion of results, writing of the manuscript, review and approval of the final version of the manuscript, guiding the entire process.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

1. Formiga NS. Os estudos sobre empatia: reflexões sobre um construto psicológico em diversas áreas científicas. Revista Eletrônica de Psicologia. 2012;1:1-25.
2. Sampaio AAS, Azevedo FHB, Cardoso LRD, Lima C, Pereira MBR, Andery MAPA. Uma introdução aos delineamentos experimentais de sujeito único. Interação Psicol. 2008;12(1):151-164.
3. Hojat M. Empathy in patient care: antecedents, development, measurement, and outcomes. New York: Springer; 2007.
4. Thompson NM, Uusberg A, Gross JJ, Chakrabarti B. Empathy and emotion regulation: an integrative account. Prog Brain Res. 2019;247:273-304.
5. Davis MH. Measuring individual differences in empathy: evidence for a multidimensional approach. J Pers Soc Psychol. 1983;44(1):113-126.
6. Falcone EMO, Ferreira MC, Luz RCM, Fernandes CS, Assis CF, D'Augustin JF, et al. Inventário de Empatia (IE): desenvolvimento e validação de uma medida brasileira. Aval Psicol. 2008;7(3):321-34.
7. Peixoto JM, Moura EP. Mapa da empatia em saúde: elaboração de um instrumento para o desenvolvimento da empatia. Rev Bras Educ Med.2020;44(1):e030. doi: https://doi.org/10.1590/1981-5271v44.1-20190151
8. Decety J, Cowell JM. The complex relation between morality and empathy. Trends Cogn Sci. 2014;18(7):337-9.
9. Hoffman ML. Empathy, social cognition, and moral action. In: Kurtimes WM, Gewirtz JL, editors. Handbook of moral behavior and development. Hillsdale (NJ): Lawrence Erlbaum; 1991. p. 275-301.
10. Ekman P, Goleman D. Emociones destructivas: cómo entenderlas y superarlas. Barcelona: Kairós. 2003.
11. Yazdi NA, Bigdeli S, Arabshahi SKS, Ghaffarifar S. The influence of role-modeling on clinical empathy of medical interns: a qualitative study. J Adv Med Educ Prof. 2019;7(1):35-41.
12. Bentwich ME, Gilbey P. More than visual literacy: art and the enhancement of tolerance for ambiguity and empathy. BMC Med Educ. 2017;17(1):1-9.
13. McDonald P, Ashton K, Barratt R, Doyle S, Imeson D, Meir A, et al. Clinical realism: a new literary genre and a potential tool for encouraging empathy in medical students. BMC Med Educ. 2015;15(1):1-10.
14. Daryazadeh S, Adibi P, Yamani N, Mollabashi R. Impact of a narrative medicine program on reflective capacity and empathy of medical students in Iran. J Educ Eval Health Prof. 2020;17(3):1-7.
15. Dussán KB, Leidal A, Corriveau N, Montgomery D, Eagle KA, LaHood BJ. Increasing medical trainees' empathy through volunteerism and mentorship. J Med Educ Curric Dev. 2017;4:1-5.
16. Chen AK, Kumar A, Haramati A. The effect of Mind Body Medicine course on medical student empathy: a pilot study. Med Educ Online. 2016;21(1):1-4.
17. Chen A, Hanna JJ, Manohar A, Tobia A. Teaching empathy: the implementation of a video game into a psychiatry clerkship curriculum. Acad Psychiatry. 2018;42(3):362-5.
18. Mercer SW, Maxwell M, Heaney D, Watt G. The Consultation and Relational Empathy (CARE) measure: development and preliminary validation and reliability of an empathy-based consultation process measure. Fam Pract. 2004;21(6):699-705.
19. Hojat M, Salvatore M, Thomas JN, Mitchell JMC, Joseph SG, James BE, et al. The Jefferson Scale of Physician Empathy: development and preliminary psychometric data. Educ Psychol Meas. 2001;61(2):349-65.
20. Williams B, Beovich B. A systematic review of psychometric assessment of the Jefferson Scale of Empathy using the COSMIN Risk of Bias checklist. J Eval Clin Pract. 2020;26(4):1302-15.
21. Mann PH. Métodos de investigação sociológica. Rio de Janeiro: Zahar; 1970.
22. Paiva AH, Andrade MN, Rocha MSC, Peixoto JM. Avaliação da empatia nos médicos residentes do Hospital Universitário Alzira Velano em Alfenas, Minas Gerais. Rev Bras Educ Med. 2020;43:296-304.
23. Limpo T, Alves RA, Castro SL. Medir a empatia: adaptação portuguesa do Índice de Reactividade Interpessoal. Evaluar. 2010;8(2):171-84.
24. Barnette J. Effects of stem and Likert response option reversals on survey internal consistency: if you feel the need, there is a better alternative to using those negatively worded stems. Educ Psychol Meas. 2000;60(3):361-70.
25. Hernandez-Nieto RA. Instrumentos de recolección de datos em Ciencias Sociales y Ciencias Biomédicas. Mérida: Universidad de Los Andes; 2002.
26. Timmerman ME, Lorenzo-Seva U. Dimensionality assessment of ordered polytomous items with parallel analysis. Psychol Methods. 2011;16(2):209-20.
27. Lorenzo-Seva U, Ferrando PJ. Robust Promin: a method for diagonally weighted factor rotation. Revista Peruana de Psicología. 2019;25(1):99-106.
28. Brown TA. Confirmatory factor analysis for applied research. New York: The Guilford Press; 2006.
29. Reckase MD. The difficulty of test items that measure more than one ability. Appl Psychol Meas. 1985;9(4):401-12.
30. Paro HBMS, Daud-Gallotti RM, Tibério IC, Pinto R, Martins MA. Brazilian version of the Jefferson Scale of Empathy: psychometric properties and factor analysis. BMC Med Educ. 2012;12(1):1-7.
31. Davis MH. Empathy. In: JE Stets & JH Turner (Eds.).The handbook of the sociology of emotions. New York: Springer Press; 2006.
32. Gallese V. The roots of empathy: the shared manifold hypothesis and the neural basis of intersubjectivity. Psychopathology. 2003;36(4):171-80.
33. Rogers P. Melhores práticas para sua análise fatorial exploratória: tutorial no Factor. Revista de Administração Contemporânea. 2022;26(6):1-17.
34. Batchelder L, Brosnan M, Ashwin C. The development and validation of the Empathy Components Questionnaire (ECQ). PloS One. 2017;12(1):e0169185.
35. Bailey BA. Empathy in medical students: assessment and relationship to specialty choice [dissertation]. Virginia: University of Virginia; 2001. 2024p.
36. Hojat M, Gonnella JS. Eleven years of data on the Jefferson Scale of Empathy-medical student version (JSE-S): proxy norm data and tentative cutoff scores. Med Princ Pract. 2015;24(4):344-50.
37. Batenburg V, Smal JA, Lodder A, Melker RD. Are professional attitudes related to gender and medical specialty? Med Educ. 1999;33(7):489-92.
38. Esquerda M, Yuguero O, Vinas J, Pifarré J. La empatía médica,¿ nace o se hace? Evolución de la empatía en estudiantes de medicina. Aten Primaria. 2016;48(1):8-14.
39. Cançado PVR, Moura EP, Peixoto JM. Effects of health empathy map on physician's empathic behavior perceived by the patient. Saud Pesq. 2021;14(2):261-70.