

• **Personality traits and empathic abilities: A predictive study on medical students**

Traços de personalidade e habilidades empáticas: Um estudo preditivo em estudantes de medicina

Rasgos de personalidad y habilidades empáticas: Un estudio predictivo de los estudiantes de medicina

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Resumo: Algumas características do médico são importantes para a qualidade da relação que é estabelecida com o paciente. Entre elas, estão a empatia e a personalidade. O principal objetivo deste estudo foi investigar a associação entre empatia e personalidade na população de estudantes de medicina da Universidade Federal de Pernambuco (UFPE): Especialmente se os fatores da empatia podem prever os fatores da personalidade. Os participantes foram 197 alunos do curso de Medicina da UFPE que completaram os instrumentos de autorelatado: Escala Multidimensional de Reatividade Emocional (EMRE) para avaliação da empatia em seus quatro fatores (Consideração Empática, Angústia Pessoal, Fantasia e Tomada de Perspectiva) e Inventário dos Cinco Grandes Fatores da Personalidade (IGFP-5) para investigação dos fatores da personalidade (Neuroticismo, Extroversão, Abertura, Amabilidade e Conscienciosidade). Para avaliar o poder preditivo da empatia sobre personalidade foi realizada a Análise de Regressão, na qual se adotou o método Enter. A MANOVA foi realizada para avaliar a associação de empatia com as variáveis idade, período letivo e gênero, objetivo secundário deste estudo. Os resultados mostraram que Extroversão é predito positivamente pela Consideração Empática e negativamente pela Angústia Pessoal. Amabilidade foi predita por Consideração Empática e Tomada de Perspectiva. Neuroticismo foi predito por Preocupação Empática, e Fantasia foi predito negativamente por Tomada de Perspectiva. Abertura foi predita por Tomada de Perspectiva e nenhuma predição foi encontrada para Conscienciosidade. Os resultados indicaram associação positiva entre empatia e sexo feminino. Como conclusão deste estudo tem-se que determinados fatores da empatia são capazes de predizer fatores da personalidade específicos.

Palavras-chave: estudantes de medicina, empatia, personalidade.

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Abstract: *Some characteristics of physicians have an important effect on the quality of the relationships that they establish with their patients. Among these are empathy and personality traits. The main objective of this study was to investigate the relationship between empathy and personality traits among medical students. The study specifically focused on whether empathy constructs can predict personality traits among medical students. The participants included 197 students from a public Brazilian medical school who completed the following self-reported instruments: Davis's Interpersonal Reactivity Index (IRI) was used to assess empathy through its four constructs (Empathic Concern, Personal Distress, Fantasy and Perspective Taking) and the Big Five Inventory (BFI) was used to investigate personality traits (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness). Regression Analysis was performed, adopting the Enter method to assess the extent to which empathy predicts specific personality traits. A MANOVA was realized to evaluate the associations between empathy and the variables of age, school semester and gender. The results showed that Extraversion is positively predicted by Empathic Concern and negatively predicted by Personal Distress. Agreeableness was found to have positive relations with Empathic Concern and Perspective Taking. Similarly, Neuroticism was found to be positively related to Empathic Concern and Fantasy but negatively related to Perspective Taking. Openness was found to be positively related to Perspective Taking but no relation was found for Conscientiousness. A positive association was found between empathy and the female gender. Among the participants, it was possible to find specific associations between empathy and different personality traits. In the population of this study, female students scored significantly higher on measures of empathy than male students.*

Keywords: *medical students, empathy, personality.*

Resumen: *Algunas características del médico son importantes para la calidad de la relación que se establece con el paciente. Estas incluyen la empatía y la personalidad. El objetivo principal de este estudio fue investigar la asociación entre empatía y personalidad en la población de estudiantes de medicina de la Universidad Federal de Pernambuco (UFPE). Sobre todo si los factores de la empatía pueden predecir los factores de personalidad. Los participantes fueron 197 estudiantes de medicina de la UFPE que completaron los instrumentos de autorelato: Escala Multidimensional de la Reactividad Emocional (EMRE) para evaluar la empatía en sus cuatro factores (Consideración Empática, Angustia Personal, Fantasía y Toma de Perspectiva) y el Inventario de los Cinco Grandes Factores de la Personalidad (IGFP-5) para la investigación de los factores de personalidad (Neuroticismo, Extraversión, Apertura, Amabilidad y Escrupulosidad). Para evaluar el poder predictivo de la empatía sobre la personalidad se llevó a cabo el análisis de regresión, que adoptó el método Enter. La MANOVA se realizó para evaluar la asociación de la empatía con las variables edad, sexo y periodo lectivo, como objetivo secundario de este estudio. Los resultados mostraron que la extroversión se predice de manera positiva y negativamente por la angustia personal. La amabilidad se predice por la Consideración Empática y la Toma de Perspectiva. El Neuroticismo fue predicho por la Consideración Empática y la Fantasía se predijo negativamente por la Toma de Perspectiva. La Apertura fue predicha*

por la Toma de Perspectiva y no se encontró ninguna predicción para la Escrupulosidad. Los resultados indicaron una asociación positiva entre la empatía y el sexo femenino. Como conclusión de este estudio tenemos que ciertos factores de la empatía son capaces de predecir los factores de personalidad específicos.

Palabras clave: *Estudiantes de medicina, empatía, personalidad.*

Introduction

The quality of medical care is influenced not only by technical skills but also by the interpersonal sphere (Larson & Yao, 2005). Empathy greatly contributes toward facilitating the construction of interpersonal relationships in a helping context (Reynolds & Scott, 1999). It has been shown that in the health care field, patients may experience some outcomes when exposed to empathic treatment from physicians. Among the established results, it is possible to find an increase in the effectiveness of medical treatment through enhanced patient engagement in the process. Once practitioners begin to act empathically, patients are more likely to provide information, seek clarifications, and take an interest in acting as collaborators in their own treatment, which is reflected in their willingness to take medications, attend follow-up appointments, and make lifestyle changes (Bayne, Neukrug, Hays, & Britton, 2013).

Empathy can be defined as the responses of one individual to the observed experiences of another (Formiga *et al.*, 2011). Empathy can be analyzed taking a multidimensional approach and has been referred to as a construct that embraces the affective and cognitive domains, thereby reflecting on behavior. The cognitive domain refers to the capacity to understand another person's situation, or, in other words, to see the world from the perspective of another person. On the other hand, the affective domain is the ability to share this other person's feelings (Davis, 1983).

It is known that the capacity to empathize varies according to biological and psychological traits. Studies on medical students have found that women show more empathy than men (Bylunda & Makoul, 2002; Hojat *et al.*, 2002a). Another variable that should logically be related to empathy is personality, although previously findings on the medical population are inconsistent (Hasan *et al.*, 2013; Hojat *et al.*, 2005). There is also no consensus in the literature regarding which aspects of empathy are important for outcomes relative to the physician-patient relationship (Halpern, 1999; Hojat *et al.*, 2002b).

In studies on personality, the five-factor model (FFM) is broadly accepted due to its universal replicability. The FFM is based on evidence that there is a common human personality structure that can be divided into five dimensions or traits. These dimensions are usually referred to as Neuroticism (N), Extraversion (E), Openness to experience (O), Agreeableness (A), and Conscientiousness

(C). Each of these dimensions includes a large set of more specific traits or facets (McCrae & Costa, 1997).

Given the importance of empathy for the quality of the physician-patient relationship and its potential to influence patient treatment outcomes, many studies investigate the association between empathy and biopsychosocial variables among the medical population. This study's main objective is to investigate whether scores for specific empathy constructs predict the personality traits of medical students. A secondary objective is to determine whether there are any associations between empathy and the variables of gender, age and medical school year.

Method

Study Participants

We conducted a cross-sectional inferential study of 197 fourth- (44% of the sample), sixth- (15% of the sample) and eighth-semester (41% of the sample) students at the Federal University of Pernambuco Medical School, which is a public Brazilian university. Male students represent 47% of the sample, whereas female students account for 53%. We used a nonprobabilistic sample composed of students who volunteered to participate in the study when asked.

Procedure

All data were collected during a class ceded to this research by professors. Pattern explanations about the study were given and students who wanted to participate were asked to stay in the classroom. Ethics approval was provided by the Research Ethics Committee of the University. All participants gave written informed consent prior to their participation and completed the survey voluntarily. Standard instructions to fill out the questionnaires were provided.

Instruments

We considered both affective and cognitive elements to be important to investigations of empathy because positive associations have been found between them. Furthermore, students from the fourth, sixth and eighth semesters have little clinical experience. For these two reasons, we chose to use the Davis's Interpersonal Reactivity Index (IRI), a generic instrument used to measure empathy, rather than an instrument designed specifically for the medical population, which would consider only the cognitive dimension as important for that sample.

The Brazilian validated version of the IRI is a self-reported measure including 21 items answered on a five-point Likert-type scale ranging from "Describes me very well" to "Does not describe me very well". The questionnaire rates empathy according to four constructs: Empathic Concern (seven items) and Personal

Distress (six items), which measure affective empathy; and Fantasy (seven items) and Perspective Taking (six items), which measure cognitive empathy. Validation studies of this scale indicate good psychometric properties as measured by a Cronbach's α value greater than 0.70.

For our investigation of personality, we choose to use the Brazilian validated version of the Big Five Inventory (BFI), which is composed 32 self-reported items. Like the IRI, this instrument uses a five-point Likert-type scale ranging from "Describes me very well" to "Does not describe me very well" for all of its items. The BFI aims to measure the five personality dimensions: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. Collected biodemographic data include age, gender and medical school semester.

Statistics

Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows (SPSSWIN) version 21. Given the previously established guidance that empathic constructs can predict certain personality traits, further investigation was conducted using a Regression Analysis and adopting the Enter method. We also performed a MANOVA to investigate the association between empathy and medical school semester (fourth semester = 1, sixth semester = 2 and eighth semester = 3), age (group 1 = under 21 and group 2 = 21 years) and sex (male = 1 and female = 2).

Results

As shown in Table 1, through the Pearson's Correlation, we were able to find that Empathic Concern and Personal Distress satisfactorily explain the trait of Extraversion ($F [4/196] = 3.56, p < 0.001; R_{\text{multiple}} = 0.07, R^2_{\text{adjusted}} = 0.05$). In relation to the Conscientiousness trait, significant results were not observed ($F [4/196] = 1.49, p < 0.22; R_{\text{multiple}} = 0.03, R^2_{\text{adjusted}} = 0.01$). Agreeableness was significantly predicted by Empathic Concern and Perspective Taking ($F [4/196] = 17.68, p < 0.01; R_{\text{multiple}} = 0.52, R^2_{\text{adjusted}} = 0.25$). The trait of Neuroticism was positively explained by Empathic Concern and Fantasy, but had a negative relation with Perspective Taking ($F [4/196] = 12.19, p < 0.01; R_{\text{multiple}} = 0.45, R^2_{\text{adjusted}} = 0.19$). Finally, the Openness trait was significantly explained by Perspective Taking ($F [4/196] = 6.72, p < 0.01; R_{\text{multiple}} = 0.12, R^2_{\text{adjusted}} = 0.11$).

When we associated the students' semesters, ages and genders with the empathy constructs, we only found significant positive associations between gender and empathy. As can be seen in Table 2, women scored higher than men on Empathic Concern, Personal Distress and Fantasy. The associated Wilks Lambdas found were 0.84. With regard to Perspective Taking, no significant variations were found.

Table 1 - Multiple Analysis Regression of personality traits with empathy constructs as predictors

Personality Traits	Empathy Construct	β	t
Extraversion	Empathic Concern	0.24	2.20*
	Perspective Taking	-0.10	-1.23
	Personal Distress	-0.37	-3.19*
	Fantasy	0.11	0.99
Conscientiousness	Empathic Concern	-0.19	-1.70
	Perspective Taking	0.12	1.47
	Personal Distress	-0.04	-0.36
	Fantasy	0.04	0.37
Agreeableness	Empathic Concern	0.48	4.85*
	Perspective Taking	0.25	3.46*
	Personal Distress	-0.19	-1.83
	Fantasy	-0.01	-0.09
Neuroticism	Empathic Concern	0.25	2.48*
	Perspective Taking	-0.31	-4.15
	Personal Distress	-0.05	-0.48
	Fantasy	0.28	2.70*
Openness	Empathic Concern	-0.13	-1.21
	Perspective Taking	0.18	2.23*
	Personal Distress	0.21	1.89
	Fantasy	0.16	1.48

Note: * $p < 0.01$.

Table 2 - Average empathy constructs scores according to gender

Empathy Constructs	Men		Women		Statistics	
	Average	SD	Average	SD	F	p<
EC	26.39	0.45	29.55	0.46	(1.196) = 22.81	0.05
PT	19.83	0.50	22.61	0.45	(1.196) = 17.14	0.05
FS	18.99	0.60	22.61	0.54	(1.196) = 17.14	0.05

Note: SD = Standard Deviation.

Discussion

The present study aimed to test the hypothetical predictions of empathy constructs with regard to specific personality traits in the context of a Brazilian medical school. We used the IRI to investigate empathy and the BFI to investigate personality. From the Regression Analysis, we found that specific empathic

abilities predict specific personality traits. Empathic Concern, for example, which refers people's to feelings toward each other and the motivation to help people in need, danger or handicap (Davis, 1980), explained the traits of Extraversion and Agreeableness. This makes sense because the former trait is related to people who are active, expansive, sociable and have positive emotions and the latter, being a trait associated with altruism, comprises the characteristics of pleasantness, cooperation and affection (John, Naumann, & Soto, 2008).

Perspective Taking, which refers to an individual's cognitive ability to put himself in other people's shoes, recognizing and inferring what they think and feel (Davis, 1980), also showed a significant regressive beta for the Agreeableness trait. The explanation for this finding is similar to that for Empathic Concern. Perspective Taking also predicted the Openness trait. Since this personality trait is expressed in attributes such as flexibility, tolerance and exploration of new experiences (John *et al.*, 2008), it makes sense that it would be predicted by Perspective Taking.

Extraversion was predicted by Personal Distress, although an inverse association was found in this case. This can be clearly understandable if we think about the expansiveness of extroverted people, and how they are involved with positive emotions, while also considering the concept of Personal Distress. This is because the empathic construct of Personal Distress is more related to negative feelings, such as discomfort, annoyance and displeasure directed toward the self when the individual imagines the suffering of another person (Davis, 1980).

Unexpectedly, we found that there were no negative associations between Neuroticism and any of the empathic constructs. Neuroticism is associated with nervous, tense and worried people who tend to have more emotional instability and feel distressed when making contact with the world (Caspi, Roberts, & Shiner, 2005). A study conducted in Portugal also failed to find negative associations between empathy and Neuroticism (Magalhães, Costa, & Costa, 2012). We did, however, find positive relations between Neuroticism and Empathic Concern, Perspective Taking and Fantasy. Given these findings, we can suggest that people with higher levels of Neuroticism can safely empathize with others.

It is not possible to make more specific comparisons between our results and those of other studies itemizing the empathy constructs and the personality traits because similar studies do not follow the Empathic Concern, Personal Distress, Fantasy and Perspective Taking framework (Costa *et al.*, 2014; Hojat *et al.*, 2005). Due to the more general nature of sex, it was possible to compare our findings with those of other studies regarding this trait. In the Medical Psychology literature, it is widely accepted that female physicians and medical students are more empathetic than their male counterparts (Hojat, Louis, Maxwell, & Gonnella, 2011).

In our research, we found this same result for Empathic Concern, Fantasy, and Perspective Taking. Higher levels of empathy among female medical professionals may suggest that, in general, women provide medical assistance that is more based on understanding the experiences and feelings of patients (Hojat *et al.*, 2002a) and are able to express more caring attitudes (Eagly & Steffen, 1984). This may justify the fact that their consultations generate significantly higher satisfaction levels among patients (Bertakis, Helms, Callahan, Azari, & Robbins, 1995).

Our findings show that there is no association between empathy and the variables of age and medical school semester. Many studies have been conducted to evaluate whether levels of empathy vary over the course of medical school (Colliver, Conlee, Verhulst, & Dorsey, 2010). The best way to perform this type of investigation is through longitudinal research. Studies using this type of design showed no significant variations (Lim, Moriarty, Huthwaite, Gray, Pullon, & Gallagher, 2013; Brazeau, Schroeder, Rovi, & Boyd, 2011).

Some cross-sectional studies also found the same results (M. Tavakol, Dennick, & S. Tavakol, 2011; Imran, Awais Aftab, Haider, & Farhat, 2013). However, others researches found significant differences in the levels of empathy between groups from different school years, although the variations found in these studies do not follow a regular pattern (Kataoka, Koide, Ochi, Hojat, & Gonnella, 2009; Magalhães, Salgueira, P. Costa, & M. J. Costa, 2011). Given these inconclusive results, we suggest that a meta-analysis should be conducted to better understand the findings of previous studies.

Conclusion

The findings of this study suggest that empathy and personality traits are associated. Most personality traits were predicted by specific constructs of empathy and possible explanations for these results were provided. However, further research is suggested with the objective of understanding the relations among the examined variables in greater depth.

Although our results and those of other studies did not find any variations among the levels of empathy when comparing groups from different stages of the, the issue of whether empathy levels are maintained over the course of medical school remains unknown. This is because some other investigations did find differences in empathy over the course of medical school. As expected, women recorded higher levels for most of the empathy constructs than men.

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Recebido: 05/04/2017 / Corrigido: 06/06/2017 / Aceito: 06/06/2017.