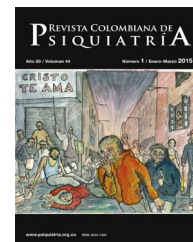


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Original article

Personality Factors in Empathy an Approach in
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ABSTRACT

Introduction: Personal factors play an important role in health services. Empirical evidence points to personality and empathy as determinants of health care. Although the relationship is documented, there is much debate about the benefits and interactions in the formative processes.

Objective: The present study aims to explore the relationship between personality and empathy as a total factor, from the cognitive and affective part and in its subprocesses adjusting for sociodemographic variables.

Results: The results suggest that personality explains 33% of total empathy and 27% of both affective and cognitive empathy at the same time. Kindness shows the strongest association with all levels of empathy, and openness to experience shows a relevant role for empathy with a cognitive profile and an association with emotional joy. Neuroticism is associated with affective as well as empathic stress, while extraversion seems to be associated with affective and with no tendency for cognitive, leaving conscientiousness with the opposite profile.

Conclusions: The consideration of personality and empathy links in undergraduate health science careers may support a basis for intervention and improvement in curricula and taking into account these linked factors for health care delivery.

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Factores de personalidad en la empatía: un enfoque en estudiantes de Ciencias de la Salud

R E S U M E N

Palabras clave:

Empatía
Empatía cognitiva
Empatía afectiva
Salud pública

Introducción: Los factores personales desempeñan un papel importante en los servicios sanitarios. Las pruebas empíricas apuntan a la personalidad y la empatía como factores determinantes de la atención sanitaria. Aunque la relación está documentada, hay mucho debate sobre los beneficios y las interacciones en los procesos formativos.

Objetivo: El presente estudio pretende explorar la relación entre personalidad y empatía como factor total, desde la parte cognitiva y afectiva y en sus subprocesos ajustando por variables sociodemográficas.

Resultados: Los resultados sugieren que la personalidad explica el 33% de la empatía total y el 27% de la empatía afectiva y cognitiva al mismo tiempo. La amabilidad muestra la asociación más fuerte con todos los niveles de empatía, y la apertura a la experiencia muestra un papel relevante para la empatía con un perfil cognitivo y una asociación con la alegría afectiva. El neuroticismo se asocia tanto con el estrés afectivo como con el empático, mientras que la extraversión parece asociarse con el afectivo y sin tendencia al cognitivo, dejando a la concienciación con el perfil opuesto.

Conclusiones: La consideración de los vínculos entre personalidad y empatía en las carreras universitarias de ciencias de la salud puede apoyar una base para la intervención y mejora en los planes de estudio y teniendo en cuenta estos factores vinculados para la prestación de servicios sanitarios.

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Health service providers have different personal situations that affect their service delivery. Personal factors influence the outcome of their service during meetings within their attention. Empathy and personality are key factors needed for processes inside a person (i.e., behaviour, individual differences, emotion regulation, altruism, compassion, and prosocial behaviour). Previous scientific papers have shown that the personal characteristics of health providers may influence a different set of factors considered as quality indicators among health services.¹⁻⁵

Empathy has a documented link with Interpersonal Emotion Regulation (IER) capabilities and strategies to change others' thinking.⁶⁻⁸ Recent findings associate personal distress (affective empathy dimension) with two cognitive strategies to change others' thinking: cognitive change and situation modification.⁹ Also, personality traits could influence even the form in which you perceive your health and the health outcomes.¹⁰ Analyzing personal settings as complex and single factors (i.e. empathy-cognitive/affective and personality-Big Five) is necessary to have a better understanding of these interactions.

On the one hand, personality has the Big Five approach that is the most used for research¹¹ and strong evidence across studies. On the other hand, empathy has cognitive and affective approaches and their role is currently under discussion. In the health services context, there is evidence that the incidence of such traits is better to understand human processes and carry health benefits. Empathy is commonly understood as "putting yourself in the other's shoes". It has been linked with many mental processes such as perspective-taking, prosocial

behaviour, empathic concern, personal distress, and emotion regulation, among others.¹²⁻¹⁶ These empathy subprocesses are currently discussed in literature if they belong to one ability or subprocesses than act together.^{8,17-19} Despite theoretical modelling and current discussion, there is extensive evidence that documents the relationship between empathy-personality and health indicators.²⁰⁻²⁷

First, empirical research of health professionals shows that palliative care volunteers have higher empathy scores related to agreeableness, extraversion, and openness to the experience.²⁸ Physicians in training, openness and fantasy were related to personal distress and neuroticism.²⁹ Also, personality explains perspective-taking, empathic concern, and personal distress in medical students. Within, neuroticism has shown a strong relation with personal distress, perspective-taking, and openness to the experience.³⁰ Agreeableness, openness to the experience, and conscientiousness (responsibility) were positively related to empathy.²¹ Also, there is transcultural evidence that personality predicts 45% of the total empathy coefficient in four countries.³¹

Empathy has been shown to play a vital role in health professions within quality indicators like reducing professionals' diagnostic mistakes, improving clinical outcomes, and better adherence to treatment.³²⁻³⁶ Also, the importance of the relationship between personality and empathy has been documented in university medical students,^{21,27,37-39} psychology students⁴⁰⁻⁴² and nursing students.⁴³⁻⁴⁵ Despite this evidence, more research is needed to clarify cognitive and affective empathy influences as single traits and their relation with personality factors.

Table 1 – Descriptive statistics and correlations between the variables in the study.

Variables	Mean	SD	2	3	4	5	6	7	8	9	10	11	12
1. Perspective taking	3.81	0.56	.390**	.251**	.506**	.854**	.458**	.756**	.080*	.420**	.160**	-.112**	.311**
2. Emotional understanding	3.69	0.51	1	.140**	.330**	.796**	.278**	.607**	.246**	.198**	.156**	-.077*	.337**
3. Empathic stress	2.86	0.71		1	.275**	.231**	.841**	.639**	0.03	.263**	-0.00	.245**	0.04
4. Empathic joy	4.18	0.54			1	.506**	.730**	.738**	.201**	.373**	.166**	-.095*	.284**
5. Cognitive empathy	3.75	0.44				1	.442**	.824**	.189**	.376**	.192**	-.122**	.379**
6. Affective empathy	3.52	0.50					1	.861**	.137**	.386**	.085*	.123**	.182**
7. Empathy coefficient	3.63	0.40						1	.186**	.440**	.156**	0.003	.309**
8. Extraversion	3.24	0.79							1	.205**	.107**	-.231**	.299**
9. Agreeableness	3.73	0.54								1	.246**	-.247**	.213**
10. Responsibility	3.65	0.59									1	-.247**	.164**
11. Neuroticism	3.01	0.71										1	-.145**
12. Openness to experience	3.81	0.54											1

Note. Standard deviation (SD), Spearman univariate correlation.

* $p < .05$.

** $p < .01$.

Source: Author elaboration.

The present research

In this research, we aim to explore the relationship between empathy as a complete trait, as their cognitive and affective trait and the Big Five personality factors adjusting the models for sex, age and career, to describe and detail the magnitude of personality for empathy as (a) total coefficient (affective + cognitive), (b) affective, and cognitive traits and (c) single components, to clarify the interactions.

Method

Study design

The study is analytic cross-sectional.

Participants

Participants were recruited by snowball sampling through the Centro Universitario de Ciencias de la Salud (CUCS) through a class invitation which included: $N = 590$, $\bar{x} = 20.88$ years, $\sigma = 2.52$, 130 (22%) males, Nurses 384 (65.1%), Nutritionists 90 (15.3%), Physicians 20 (3.4%), and Psychologists 95 (16.1%). All the participants answered an informed consent and were not compensated for participation.

Measures

The Big Five-Factor inventory

($\alpha = 0.77$) consists of 44 questions that assess five personality factors: extraversion (EX, 8 items, $\alpha = 0.84$), responsibility (RE, 9 items, $\alpha = 0.77$), openness to experience (OE, 10 items, $\alpha = 0.77$), neuroticism (NE, 8 items, $\alpha = 0.77$), and agreeableness (AG, 9 items, $\alpha = 0.67$). The response options are presented on a Likert scale of 5 options (1 "Totally disagree" to 5 "Totally agree"). An example: "I see myself as someone who..." "1. – Is very talkative".⁴⁶

The Empathy Cognitive and Affective Test (TECA, the Spanish abbreviation)

($\alpha = 0.82$) consists of 33 questions that assess four scales: empathic joy (EJ, 8 items, $\alpha = 0.75$), perspective taking (PT, 8 items, $\alpha = 0.70$), empathic stress (ES, 8 items, $\alpha = 0.70$), and emotional understanding (EU, 9 items, $\alpha = 0.62$). The response options are presented on a Likert scale of 5 options (1 "Totally disagree" to 5 "Totally agree"). The item examples are omitted due to a confidentiality agreement with the editorial.⁴⁷

Construction variables procedure

Personality and empathy variables were calculated by taking the average of the individual items: cognitive (PT, EU), affective (ES, EJ), and empathy coefficient was calculated by the average of the empathy scales. The analysis was performed using SPSS V.23, the Step-forward method using null modelling to control for interaction and confusion effects. Also, variance inflation factor (VIF) for collinearity. We ran seven multiple linear regression analyses setting all the seven empathy variables coefficient (EC), affective (AE), cognitive (CE), and their scales (PT, EU, ES, EJ) as the predicted variable and the Big Five as the predictor and adding sex, age, and career into each model for adjusting purposes due to the population variability.

Results

The correlation analyses showed that empathy scales have a significant moderate association. In contrast, personality scales had shown lower associations between their scales. Empathy and personality show moderate and significant association with agreeableness and openness to experience, lower association with extraversion and responsibility, and no relationship with neuroticism (Table 1).

As a general overview, personality explains 33% of the empathic coefficient, 27% of affective empathy, and cognitive empathy percentage of the variance. The predictive relations showed that agreeableness has higher coefficients for the empathic coefficient, affective empathy, and cognitive empathy ($\beta = 0.43, 0.42, 0.30$). Openness to experience

was related to cognitive empathy and empathic coefficient ($\beta = 0.31, 0.20$), neuroticism to affective empathy and empathic coefficient ($\beta = 0.22, 0.14$), extraversion to affective empathy, and empathic coefficient ($\beta = 0.09, 0.08$). Finally, responsibility has a small significant coefficient for cognitive empathy ($\beta = 0.09$).

Empathy scales are mainly explained by agreeableness (EU: $\beta = 0.39$, ES: $\beta = 0.36$, EJ: $\beta = 0.31$, PT: $\beta = 0.30$); openness to experience (EU: $\beta = 0.24$, PT: $\beta = 0.22$, EJ: $\beta = 0.15$); extraversion (EU: $\beta = 0.17$, EJ: $\beta = 0.11$, PT: $\beta = -0.09$); responsibility (EU: $\beta = 0.11$). Neuroticism has a unique relation (ES: $\beta = 0.32$); perspective taking (26%); and empathic joy (23%) have a higher explanation of the variance by personality scales, while empathic stress (20%) and emotional understanding (16%) has lower coefficients.

Sex has shown a significant coefficient for empathic coefficient, affective empathy and cognitive empathy for the dimensions and half the scales perspective taking and empathic joy, age just influences in affective empathy and empathic stress, career shows effect just for perspective taking for all health science carriers (Table 2).

Discussion

We aim to evaluate the influence that personality has on empathy in health science students. Correlational analysis showed a similar pattern to other studies³⁰ however, our study shows lower Rho's and a higher negative association with Neuroticism. Also, emotional understanding and empathic coefficient have shown a similar pattern but slightly higher Rho in our study. The sample constitution may explain these differences because we include more career diversity in health professions.

Regression models have shown a 33% variance for the empathic coefficient; similar results were reported by Melchers³² in a cross-cultural study for empathy quotient: USA (45.6%), China (29.1%), Germany (26.8%), and Spain (14.3%). Our results also document that affective and cognitive empathy get the same 27% variance explanation pointing to a similar/equal influence for cognitive and affective dimensions.

In general overview, agreeableness has a higher coefficient among empathy dimensions, followed by openness to experience, but only for empathic coefficient and cognitive empathy. These trends are similar to other studies.^{31,42,48} The strongest predicting association of neuroticism is with affective empathy and empathic coefficient showing a low coefficient for cognitive empathy, contrary to the Chinese Song's study.³⁰

In contrast, a Melchers³² study has shown a relationship with the neuroticism-empathic coefficient only for the Chinese population, denoting a unique pattern for these populations, a fact that may support the cultural differences hypothesis. In the same sense, these could be considered professional physician's traits in China. Neuroticism has a consistent relationship with stress scales (i.e., personal distress, empathic stress) as a part of affective empathy within all review studies. Extraversion has a negligible influence on the empathic coefficient and cognitive empathy results, contrary

Table 2 – Multivariate regressions models.

Predictors	Model: personality predict empathy			Empathy coefficient			Affective empathy			Cognitive empathy			Perspective taking			Emotional understanding			Empathic stress			Emotional joy		
	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**	Estimate*	p	VIF**
Extraversion	0.08	0.02	1.21	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.22	0.22	-0.07	0.08	0.08	0.16	0.00	0.00	0.06	0.17	0.11	0.01	0.01	0.01
Responsibility	0.04	0.24	1.24	-0.01	0.78	0.05	-0.01	0.78	0.05	0.09	0.02	0.02	0.05	0.22	0.00	0.11	0.01	0.01	-0.04	0.35	0.03	0.44	0.00	0.44
Openness to experience	0.20	0.00	1.22	0.08	0.05	0.05	0.08	0.05	0.05	0.28	0.00	0.00	0.22	0.00	0.00	0.25	0.00	0.00	-0.01	0.83	0.15	0.00	0.00	0.00
Neuroticism	0.14	0.00	1.25	0.22	0.00	0.00	0.22	0.00	0.00	0.00	0.94	0.00	-0.02	0.66	0.00	0.09	0.56	0.00	0.32	0.00	-0.01	0.81	0.00	0.81
Agreeableness	0.42	0.00	1.19	0.41	0.00	0.00	0.41	0.00	0.00	0.30	0.00	0.00	0.38	0.00	0.00	0.09	0.03	0.00	0.36	0.00	0.30	0.00	0.00	0.00
R ² *	0.33	-	-	0.27	-	-	0.27	-	-	0.27	-	-	0.28	-	-	0.17	-	-	0.20	-	0.23	-	-	-
Change in R ²	0.35	0.00	-	0.28	0.00	0.00	0.28	0.00	0.00	0.29	0.00	0.00	0.29	0.00	0.00	0.18	0.00	0.00	0.21	0.00	0.25	0.00	0.00	0.00
Sex ^a	0.16	0.00	1.12	0.18	0.00	0.00	0.18	0.00	0.00	0.09	0.01	0.01	0.11	0.00	0.00	0.05	0.26	0.00	0.11	0.01	0.20	0.00	0.00	0.00
Age	0.03	0.33	1.05	0.07	0.05	0.05	0.07	0.05	0.05	-0.02	0.62	0.62	-0.02	0.59	0.00	-0.01	0.80	0.02	0.09	0.02	0.02	0.67	0.00	0.00
Nurse	0.43	0.28	1.06	0.40	0.33	0.33	0.40	0.33	0.33	0.32	0.44	0.44	1.25	0.00	0.00	-0.83	0.06	0.06	0.31	0.47	0.33	0.43	0.00	0.43
Nutritionist	0.33	0.27	1.06	0.32	0.31	0.31	0.32	0.31	0.31	0.24	0.45	0.45	0.92	0.00	0.00	-0.61	0.07	0.07	0.21	0.52	0.31	0.33	0.00	0.33
Physician	0.26	0.10	1.03	0.20	0.21	0.21	0.20	0.21	0.21	0.23	0.14	0.14	0.56	0.00	0.00	-0.21	0.21	0.21	0.12	0.46	0.21	0.19	0.00	0.19
Psychology	0.46	0.13	1.18	0.40	0.21	0.21	0.40	0.21	0.21	0.38	0.23	0.23	1.11	0.00	0.00	-0.56	0.10	0.10	0.30	0.37	0.35	0.29	0.00	0.29

^a 1 = men 2 = women.

* Adjusted coefficient.

** Variance inflation factor was the same for all models.

Source: Author elaboration.

to Song's results. Finally, responsibility has only been associated with cognitive empathy, similar to Song's and Melcher's results.

Cross-cultural studies have not found a significant difference between cultures across empathy as a total coefficient.^{46,49,50} However, other studies argue that differences across similar studies could be explained by cultural factors like life values or ethics.⁵¹

Empathy components, also have their single relation: perspective-taking has a negative relationship with extraversion, and it has a positive relationship with agreeableness and openness to experience. The negative relationship between these two could be explained by the outside focus that implies extraversion, so it's less likely to think in others if you have an outside focus. In contrast, agreeableness needs to pay attention to others, and openness to experience implies the necessity to understand what others propose. In the same sense, emotional understanding relates to openness to experience, extraversion, responsibility, and agreeableness. These associations may be explained by an emotional component needed for socialization. Empathic stress is related to agreeableness and neuroticism, and these relations may be explained by the anxiety arising from social contact. Last but not least, empathic joy is related to agreeableness, openness to experience, and extraversion. The original definition of these traits relates to high sociability skills.⁵²

Age, sex, and career were added for adjusting due to the influence documented for both constructs.^{21,24,42,53-55} Sex influence has been associated with affective empathy (Higher in women), empathic coefficient, and cognitive empathy, and age has the only significant coefficient for affective empathy. Surprisingly, career has significantly affected the perspective taking in all careers, future studies may consider analyzing these tendencies in a population-based study.

Limits and future research

The first limitation of the study is that empathy and personality scales are not fully comparable with other studies because of the different instruments or versions. These sources of variation (i.e., conscientiousness is equivalent to responsibility) may affect tendencies, so it needs to be considered with caution the extrapolation across the suites besides the trait name could be the same. Sample inequality, especially concerning sex and career, is another source of variance due to the sampling and auto-selection of participants. This limitation may be considered as an external validity limitation but not as internal, as the results support the phenomenon. Future research may explore these differences by taking into consideration paired samples or active workers. The cross-sectional nature of our study limits the generalization and warns researchers from making a causal generalization.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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