Relationship between Empathy and Personality Traits in Students of a Public Sector Medical University

Naeem Liaqat[1], Maria Ata[2], Nida-e-Haider[3]

[1] Fellow, Nationwide Children's Columbus, Ohio, USA.

[2,3] Final Year MBBS student, Rawalpindi Medical University.

Author's Contribution	**Corresponding Author**	**Article Processing**
[1,2,3] *Conception of study*	*Dr. Naeem Liaqat,*	*Received: 28/06/2021*
[1,3] *Experimentation/Study conduction*	*Fellow,*	*Accepted: 23/05/2022*
[1] *Analysis/Interpretation/Discussion*	*Nationwide Children's Columbus,*	
[1,2,3] *Manuscript Writing*	*Ohio, United States of America.*	
[1,2] *Critical Review*	*Email: simsonian.chaudary@gmail.com*	
[2] *Facilitation and Material analysis*		

Abstract

Introduction: Empathy among medical students and doctors, is a rather unexplored part of medical flora and fauna which may vary with each personality.

Objective: To determine the correlation between empathy and personality traits of final-year medical students.

Materials and Methods: This cross-sectional study was conducted at Rawalpindi Medical University, Pakistan. A total of 144 medical students were included in the study. For personality traits assessment and empathy assessment, Big Five Inventory and Interpersonal Reactivity Index were used. All the data were analyzed using SPSS version 20.

Results: The mean score for the empathy scale was found to be 61.25 ± 10.0. Females were more empathetic than males in all subscales but pointedly so in the empathetic concern scale. Overall empathy scale was strongly correlated with Agreeableness and Neuroticism (P<0.001). Perspective taking scale was positively related to Agreeableness and openness, the Empathy concern scale was positively related to Agreeableness, and Personal Distress was positively related to Conscientiousness and Neuroticism. The demographic factors of age and gender explained only 1.7%, 6.8%, 2.4%, and 2.0% of the variance in the four scales of empathy. After adjustment for age and gender, perspective taking was positively associated with Agreeableness and Openness and Personal distress was associated with Agreeableness, Neuroticism, and Openness.

Conclusion: We conclude that personality traits have a substantial correlation with empathy and its subscales. So we need to evaluate the personality of a medical student and tailor a set of rules for each individual consistent with their persona to develop empathy for them.

Keywords: Big Five; Personality; Empathy; Medical students; Pakistan.

Introduction

In literature, empathy is defined as the ability to understand and share the feelings of another person i.e. "to put yourself in someone's shoe". From a medical viewpoint, empathy is elaborated as a physician's ability to relate to and comprehend a patient's physical and emotional circumstances.[1] In a doctor-patient interaction, empathy build up on part of the doctor helps to improve patient compliance and satisfaction. It also helps cut down the unnecessary economic burden on the patient.[2]

Characteristic traits, of certain healthcare providers, help to categorize them according to their personality types and serve to interpret the empathy index of those individuals. For example, clinicians with great emotional intellect or high emotional quotient (EQ) generally demonstrate an extensively empathic and flexible façade.[3] Many research studies, conducted to assess the level of empathy in medical students, show that scholars at the commencement of their medical schooling have a greater magnitude of empathy which progressively declines as they sail through their careers. So when they get to virtually deal with the patients on their own, they just have shards of the trait left.[4]

In a study[3], authors included 150 medical students and found a significant correlation between empathy and each of the five domains of personality. Note that for neuroticism, the correlation was inverse, while for the other four domains, the correlation was positive. MAGALHA˜ ES[5] included 350 medical students from six entering classes and found significant and positive correlations between the total score on the Empathy scale and Openness to Experience (r¼0.22, p50.01), Agreeableness (r¼0.24, p50.01), and Conscientiousness (r¼0.14, p50.05). The magnitudes of correlations between personality and scores of self-reported empathy were low, ranging from _0.01 to 0.24. In another study, authors[6] have found positive significant correlations between the total score of the Empathy scale either with agreeableness (r¼0.628, p50.001) and openness to experience (r¼0.522, p50.001). However, insufficient studies have been conducted among medical students in Pakistan on the vital subject matter of empathy[7,8], and none of them has ever considered the correlation of empathy with personality traits. So we planned this study with the objective to determine the correlation between personality traits and empathy among medical students of a public sector medical college in Pakistan.

Materials and Methods

This cross-sectional study was conducted at Rawalpindi Medical University, Rawalpindi, Pakistan. The total duration of the study was 2 months, from June 2019 to July 2019. After approval from the Ethical review board of our university, this study was started. Using a 5% margin of error and 80.5 power of the test, 144 sample size is calculated based on r=0.232 between Big Five Inventory (BFI) and empathy.[9] A total of 144 final-year medical students of our university were included in this study. We used 2 standardized questionnaires in this study. In order to assess personality traits, we used the BFI inventory having 44 items. All 44 items are scored on a Likert scale ranging from strongly agree[5] to strongly disagree.[1] Some of the items are scored as reverse and it gauges the personality in 5 domains namely Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. In order to assess Empathy in this study, we used Interpersonal Reactivity Index (IRI). It is a validated instrument having 28 items which are scored on a Likert scale ranging from "Does not describe me well" to "Describes me very well"(0 to 4). It measures Empathy on four scales namely Perspective Taking, Fantasy, Empathic Concern, and Personal Distress scale.[10] There is no cut-off value in this scale and it is reported as a continuous scale and higher scores indicate more Empathy of the participant. For sampling, we used non-probability continuous sampling. All 144 participants were asked to fill in proforma. In order to maintain anonymity, only verbal count for individuals in the study was sought. They were asked to fill proforma by paper and pencil and it contained demographic details, a BFI questionnaire, and an IRI questionnaire. All the data were analyzed using SPSS version 20. The demographic variables were presented as descriptive statistics. The personality traits and empathy scores for scales according to IRI were presented as Mean and Standard Deviation (SD). The student's t-test was used to compare it for gender. To assess the correlation, person correlation was used. Then Hierarchical regression analysis (HMR) was done and 2 blocks of variables were used in the regression model in the following steps: Step 1: demographic characteristics; Step 2: five personality traits. The variance of empathy scores was explained by the relative importance of variables that were retained in the final model as the standardized β. Standardized parameter estimates (the standardized β) were used to compare the magnitudes

of the correlations across independent variables. The fit of the model was assessed with the R2 value.

Results

A total of 144 participants were included in this study. The mean age of the participants was found to be 22.91 ± 0.989 years. Most of the participants in this study were female (n=117, 81.3%). Regarding the empathy scale, the mean score for the empathy scale was found to be 61.25 ± 10.0. On the subject of its subscales, the highest score was obtained for Perspective taking subscale. Females were more empathetic than males in all subscales of Empathy but a significant difference was noted in the empathetic concern subscale. All data is given in Table 1. Regarding personality traits, all data is given in Table 2.

Overall empathy scale was strongly correlated with Agreeableness and Neuroticism (P<0.001). Perspective taking scale was positively related to Agreeableness and openness, the Empathy concern scale was positively related to Agreeableness, and Personal Distress was positively related to Conscientiousness and Neuroticism. All data are given in Table 3.

The demographic factors of age and gender explained only 1.7%, 6.8%, 2.4%, and 2.0% of the variance in the four scales of empathy, including perspective taking, empathic concern, personal distress, and fantasy scale respectively. However, the big five personality traits accounted for 19.4%, 6.3%, 26.4%, and 4.6% of the variance in perspective taking, empathic concern, personal distress, and fantasy scale respectively. After adjustment for age and gender, perspective taking was positively associated with Agreeableness and

Openness. Also, Personal distress was associated with Agreeableness, Neuroticism, and Openness. All data is given in table 4.

Table 1: Empathy score and its subscales in this study

	Total score	*Male (n=27)*	*Female (n=117)*	*P-Value*
Personality taking	15.99 ± 4.37	15.0 ± 4.66	16.22 ± 4.29	0.192
Fantasy scale	14.31 ± 3.66	13.77 ± 2.96	14.43 ± 3.81	0.403
Empathic concern scale	15.84 ± 3.27	14.07 ± 3.78	16.24 ± 3.01	0.002
Personal distress scale	15.1 ± 4.82	13.59 ± 4.54	15.45 ± 4.83	0.071
Total empathy scale	61.25 ± 10.01	56.44 ± 8.98	62.35 ± 9.94	0.005

Table 2: Personality of participants according to BFI

	Total score	*Male (n=27)*	*Female (n=117)*	*P-Value*
Extroversion	23.96 ± 5.28	22.22 ± 4.67	24.36 ± 5.35	0.057
Agreeable-ness	32.84 ± 5.62	31.44 ± 6.71	33.16 ± 5.31	0.153
Conscientiousness	29.15 ± 5.70	29.88 ± 5.50	28.98 ± 5.76	0.459
Neuroticism	25.58 ± 5.82	24.11 ± 5.81	25.92 ± 5.79	0.145
Openness	34.41 ± 5.80	34.22 ± 7.20	34.12 ± 5.47	0.940

Table 3: Correlation of Empathy and BFI

Variables		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1.	Personality taking scale	1									
2.	Fantasy scale	.195*	1								
3.	Empathic concern scale	.244**	.097	1							
4.	Personal Distress scale	.126	.129	.263**	1						
5.	Overall Empathy scale	.649**	.545**	.595**	.670**	1					
6.	Extroversion	.160	.101	.147	-.133	.091	1				
7.	Agreeableness	.377**	-.011	.194*	.058	.252**	.274**	1			
8.	Conscientiousness	.081	.073	.111	.243**	-.019	.395**	.184*	1		
9.	Conscientiousness	-.097	.091	.098	.483**	.256**	.338**	-.134	.421**	1	
10.	Openness	.347**	.145	.072	-.134	.164	.136	.327**	.158	-.008	1

*Significant at the 0.05 level (two-tailed) ** Significant at the 0.01 level (two-tailed)

Table 4: The results of hierarchical linear regression analyses

Variables	Perspective taking (β)		Empathic concern (β)		Personal distress (β)		Fantasy scale (β)	
	Step1	Step2	Step1	Step2	Step1	Step2	Step1	Step2
Step 1								
Age	-0.337	-0.150	0.028	0.55	0.029	0.011	-0.127	-0.098
Gender	0.970	0.780	0.269	0.235	0.160	0.068	0.033	0.022
Step 2								
Extraversion		0.144		0.075		0.014		0.117
Agreeableness		0.367**		0.146		0.179**		-0.092
Conscientiousness		0.081		0.150		-0.044		0.075
Neuroticism		0.112		0.18		0.484**		0.143
Openness		0.344**		0.001		-0.182**		0.136
F	1.240	6.698**	5.183**	2.953**	1.704	7.826**	1.414	1.368
R^2	0.017	0.211	0.068	0.132	0.024	0.250**	0.020	0.066
ΔR^2	0.017	0.194	0.068	0.063	0.024	0.264**	0.020	0.046

*Significant at the 0.05 level (two-tailed) ** Significant at the 0.01 level (two-tailed)*

Discussion

The objective of this study was to determine the correlation between personality traits and empathy among medical students. It was found that the big five personality traits accounted for 19.4%, 6.3%, 26.4%, and 4.6% of the variance in perspective taking, empathic concern, personal distress, and fantasy scale respectively. Also, agreeableness and Neuroticism were strongly associated with overall empathy scores. In a comparable study by Mooradian TA, it was found that agreeableness and Neuroticism were closely related to different scales of empathy.[11] Regarding medical students, studies have shown that different personality traits are strongly correlated with empathy scales. It has been confirmed by studies from Portugese[5], China[12,] and America.[13] A study that included a sample from four countries including China, Germany, Spain, and the United States of America found that Agreeableness and Conscientiousness were the most dominant predictors of empathy.[14] Previously it has been shown that agreeableness, which represents the person being more adjustable, cooperative, understanding, and helpful, is more correlated with empathy. Similarly, we have noticed it to be associated with perspective taking and empathic concern. As some authors consider empathy as Cognitive (perspective taking and fantasy) and emotional (empathic concern and personal distress)[12], we found the cognitive domain to be positively correlated with Agreeableness and Openness. The emotional domain was correlated more with Agreeableness, Conscientiousness, and Neuroticism. Neuroticism and Consciousness which

share the feature of being less emotionally stable and becoming distressed after seeing others in trouble make sense to be more associated with an emotional domain of empathy. It also shows the importance of inculcating these particular traits among medical students as the incidences of violence against healthcare workers is on the rise globally and generally the trust in doctors has dropped drastically.

We found in this study that scores of empathy are higher in females than males in all subscales but this difference is significant for the Empathic concern scale and overall empathy score. Although in our study, females quite outnumbered the opposite gender, this skewness is commonly seen in our country among medical students as usually, 70% of students are females. A cross-sectional study was conducted including medical students, trainees, post-graduate residents, and specialists in Poland. They found the highest empathy score for female doctors and it was lowest among male post-graduate residents.[15] In another study from USA, empathy score was found significantly higher among females than males.[3] Many other studies have confirmed the finding of higher empathy among females as compared to males.[16-18] At the same time, some studies have shown no difference between the two genders in terms of empathy scores.[19] Empathy is a complex concept having a large number of factors that may affect it. Some authors have suggested that empathy changes with growing age and as the experience increases, the level of empathy also increases.[20] However, some later studies have negated the concept.[12] Age, gender, and the experience of the physician are not the only factors that may influence empathy, rather it is the depiction of the whole personality and experiences of a person which

are difficult to have complied in a single study. As conflict among healthcare staff particularly junior doctors is also escalating worldwide, we need to look into factors triggering this upsurge of conflicts. Many studies emphasize the importance of empathy in the resolution of conflicts.[21] So empathy is an amalgam of many factors and the most important of them may be the personality traits, which nurture over the years in everyone's peculiar circumstances.[22] So our study has many implications, particularly for grooming a new generation of doctors in our setup. We want to highlight the importance of adding empathy to the curriculum of third-world countries like ours and conducting well-organized training sessions and workshops depending on certain personality-carrying students so that they may get enlightened for their future and may become good physicians. Another previous study underlines the rotation of medical students into the hospitals and clinical settings earlier so that they may encounter the patients and acquire a better insight into the empathy concept.[17]

The strength of this study lies in that; it judges the correlation between personality traits and empathy among medical students of Pakistan as compared to inadequate literature available on the topic in our country. However, there are a few limitations also. First Curb, is a single-center study, so its results cannot be applied to other institutions. Then, it is a cross-sectional study and does not contemplate the change in empathy score over a period of time. Therefore, we recommend studies including medical students of different nations and cultures to determine the correlation, so that an amenable statement may be put forth.

Conclusion

We conclude that personality traits have a substantial correlation with empathy and its subscales. So we need to evaluate the personality of a medical student and tailor a set of rules for each individual consistent with their persona to develop empathy for them.

References

1.   Baron-Cohen S, Wheelwright S. The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. J Autism Dev Disord. 2004;34(2):163-75.
2.   Ha JF, Longnecker N. Doctor-patient communication: a review. Ochsner J. 2010;10(1):38-43.
3.   Bertram K, Randazzo J, Alabi N, Levenson J, Doucette JT, Barbosa P. Strong correlations between empathy, emotional intelligence, and personality traits among podiatric medical students: A cross-sectional study. Educ Health (Abingdon). 2016;29(3):186-94.
4.   Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. Acad Med. 2009;84(9):1182-91.
5.   Magalhaes E, Costa P, Costa MJ. Empathy of medical students and personality: evidence from the Five-Factor Model. Med Teach. 2012;34(10):807-12.
6.   Lourinho I, Severo M. Are personality traits really weak/moderate predictors of empathy? Medical teacher. 2013;35(7):611.
7.   Ayub A, Khan RA. Measuring empathy of medical students studying different curricula; a causal comparative study. J Pak Med Assoc. 2017;67(8):1238-41.
8.   Tariq N, Rasheed T, Tavakol M. A quantitative study of empathy in Pakistani medical students: A multicentered approach. Journal of primary care & community health. 2017:2150131917716233.
9.   Barrio Vd, Aluja A, García LF. Relationship between empathy and the Big Five personality traits in a sample of Spanish adolescents. Soc Behav Personal. 2004;32(7):677-81.
10.   Davis MH. A multidimensional approach to individual differences in empathy. JSAS Catalog of Selected Documents in Psychology. 1980;10:85.
11.   Mooradian TA, Davis M, Matzler K. Dispositional empathy and the hierarchical structure of personality. Am J Psychol. 2011;124(1):99-109
12.   Song Y, Shi M. Associations between empathy and big five personality traits among Chinese undergraduate medical students. PloS one. 2017;12(2):e0171665.
13.   Toto RL, Man L, Blatt B, Simmens SJ, Greenberg L. Do empathy, perspective-taking, sense of power and personality differ across undergraduate education and are they inter-related? Advances in health sciences education: theory and practice. 2015;20(1):23-31.
14.   Melchers MC, Li M, Haas BW, Reuter M, Bischoff L, Montag C. Similar personality patterns are associated with empathy in four different countries. Frontiers in psychology. 2016;7:2
15.   Bratek A, Bulska W, Bonk M, Seweryn M, Krysta K. Empathy among physicians, medical students and candidates. Psychiatria Danubina. 2015;27 Suppl 1:S48-52.
16.   Chen DC, Kirshenbaum DS, Yan J, Kirshenbaum E, Aseltine RH. Characterizing changes in student empathy throughout medical school. Medical teacher. 2012;34(4):305-11.
17.   Wen D, Ma X, Li H, Liu Z, Xian B, Liu Y. Empathy in Chinese medical students: psychometric characteristics and differences by gender and year of medical education. BMC medical education. 2013;13:130.
18.   Shariat SV, Habibi M. Empathy in Iranian medical students: measurement model of the Jefferson scale of empathy. Medical teacher. 2013;35(1):e913-8.
19.   Lee BK, Bahn GH, Lee WH, Park JH, Yoon TY, Baek SB. The Relationship between Empathy and Medical Education System, Grades, and Personality in Medical College Students and Medical School Students. Korean journal of medical education. 2009;21(2):117-24.
20.   Austin EJ, Evans P, Magnus B, O'Hanlon K. A preliminary study of empathy, emotional intelligence and examination performance in MBChB students. Medical education. 2007;41(7):684-9.
21.   Fitness J, Curtis M. Emotional intelligence and the Trait Meta-Mood Scale: Relationships with empathy, attributional complexity, self-control, and responses to interpersonal conflict. Sensoria: A Journal of Mind, Brain & Culture. 2005;1(1):50-62
22.   Cassels TG, Chan S, Chung W. The role of culture in affective empathy: Cultural and bicultural differences. Journal of Cognition and Culture. 2010;10(3):309-26.