

The impact of personality traits on clinical practice

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ABSTRACT

Background. In terms of personality, medical challenges consist in a wide spectrum of interindividual differences which impose a high level of creativity in order to face and overpass these daily challenges. Thus, clinical communication was proven to be strongly related to creativity.

Aim. The aim of this study was to compare personality traits in both medical students and young residents.

Material and methods. We performed a correlational, cross-sectional study on residents and students from clinical years (years IV to VI) of "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology, Târgu Mureș between July 2021 and December 2021, who agreed to answer both BWAS and DECAS scales in order to assess their creativity and personality traits.

Results. In terms of residents, we found a significant positive correlation between Openness and Extraversion ($r = 0.6742$, $p < 0.0001$), a negative correlation between Openness and Agreeability ($r = -0.4601$, $p = 0.0138$), a negative correlation with Agreeability ($r = -0.4088$, $p = 0.0308$) and a significant positive correlation between Conscientiousness and BWAS revised Scale ($r = 0.4192$, $p = 0.0264$). Contrariwise, we observed a negative significant correlation between Agreeability and Creativity since we found negative correlations between Agreeability and both BWAS Original Scale ($r = -0.4132$, $p = 0.0289$), and BWAS Revised Scale ($r = -0.4637$, $p = 0.0129$).

For the students from the clinical years we observed a significant negative correlation with both Conscientiousness ($r = -0.2681$, $p = 0.0401$) and Agreeability ($r = -0.3883$, $p = 0.0024$) in term of Extraversion, a negative correlation with Extraversion ($r = -0.2681$, $p = 0.0401$) and a significant positive correlation between Openness and BWAS revised Scale ($r = 0.2803$, $p = 0.0315$).

We found a significant difference for BWAS original scale, $p < 0.0001$ and for BWAS revised scale, $p < 0.0001$, and extraversion, $p = 0.0130$, suggesting that students express a higher creativity level when compared to residents.

Conclusions. Personality traits and communication skills in health-care providers represent two mandatory conditions for an effective doctor-patient relationship. Our study revealed a higher BWAS scores in students suggesting that students have a higher creativity level when compared to residents. In addition, our study suggests that residents with increased Openness might associate a higher level of Extraversion and a lower level of Agreeability. We also noticed that students with an increased level of Openness seem to be more creative.

Keywords: personality traits, clinical practice, residents, students from clinical years

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INTRODUCTION

Personality and its impact on individual's professional satisfaction represents one of the most debated topics in multiple areas, especially the medical one since medical profession should be mainly characterized by empathy. Communication skills in young residents are definitely influenced by personality traits since personality mirrors the different ways in expressing emotions, feelings, thinking and behavior (1). Thus, we might define a strong dialogue between personality traits and communication skills in medical field which will definitely express a great impact on patient's outcome by influencing his adherence to the recommended treatment. Moreover, the physician should aim to develop a strong partnership with his patients based on mutual trust, respect and understanding to obtain the most accurate information related to the patient's history, and to provide the best of care to the patient and his family. Physician should be able to shape his personality according to the patient's need and family dynamics for assuring a patient centered care. The achievement of this concept in daily practice clearly depends on effective communication, which is mostly related to the doctor's personality traits (2,3). Albeit long forgotten, communication skills along with training for shaping personality traits should be mandatory during medical education to prepare the students for entering their residency and to develop appropriate and effective relationships with their future patients.

Multiple scales were developed for the assessment of human personality among which probably the most common is the 'big five model', which is used to define the following five dimensions of personality: openness, extraversion, conscientiousness, agreeability and neuroticism or emotional stability (4). This model was used in multiple studies reported worldwide and is meant to assess the qualities of several personality traits (5,6). Nevertheless, its use in medical field is scarce although it could provide extremely important information in medical students by predicting their future professional success based on the assessment of personality traits (7). Medical universities should implement this assessment of personality traits in medical students early during medical education or even better before they enter the university to guide better the choice of their profession or to develop appropriate specific training for those with improper development of certain personality traits. It was underlined that each of the 5 personality dimensions comprised in the 'big five model' has 6 facets as it follows: openness – aesthetics, fantasy, actions, feelings, ideas, values; extraversion – gregariousness, assertiveness, warmth, activity, positive emotions, excitement-seeking; conscientiousness – competence, du-

tifulness, order, achievement striving, deliberation, self-discipline; agreeability – trust, altruism, compliance, straightforwardness, modesty, tender-mindedness; neuroticism – vulnerability, impulsiveness, anxiety, depression, angry hostility, self-consciousness (8).

In terms of personality, medical challenges also consist in a wide spectrum of interindividual differences which impose a high level of creativity in order to face and overpass these daily challenges. Thus, clinical communication was proven to be strongly related to creativity (9). It is a reality that physicians have to act creatively and continuously develop creativity in order to improve each day their clinical work and the relationship with their patients (10).

AIM

Based on the previously mentioned statements, the aim of this study was to compare personality traits in both medical students and young residents.

MATERIALS AND METHODS

Study design

We performed a correlational, cross-sectional study on residents and students from "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology, Târgu Mureș between July 2021 and December 2021, who agreed to answer both BWAS and DECAS scales in order to assess their creativity and personality traits.

Participants

Our study included residents and students from clinical years (years IV to VI) of the "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology Târgu Mureș, regardless of their specialty. The residents included in the study benefited by communication training during university, or other types of training focused on shaping personality traits or creativity, while the included students had no previous training in this area. The exclusion criteria consisted in refusal to sign the informed consent and subjects who did not fill both questionnaires. Thus, all subjects completed and signed the informed consent regarding their inclusion in the study prior to being enrolled in the study. Each individualized report consisted of the participants' particular scores at different personality dimensions that were explored, as well as creativity levels.

Measures

The DECAS personality inventory is a psychometric tool conceived by Sava A. et al. in order to

assess the personality depending on five major personality factors (11). Thus, the abbreviation DECAS comes from D - Deschidere (Openness), E - Extraversiune (Extraversion), C - Conștiinciozitate (Conscientiousness), A - Agreabilitate (Agreeability), S - Stabilitate emoțională (Emotional Stability). The DECAS personality inventory is based on two factors for preserving the psychometric properties of the instrument, i.e. the RD (random answers) - a score higher than 70 T-levels resulting in the invalidation of the protocol and the AP (Approval) validation scale, which is a sensitive factor to the subject's tendency to respond more frequently with "True" or on the contrary with "False". A score higher than 65 of the T quotas, or a score lower than 35 of the T quotas is equivalent to the invalidation of the protocol (11).

The Barron Welsh Art Scale (BWAS) represents a non-verbal instrument used in order to evaluate creativity (12). BWAS encompasses 86 items depicted as images, rated on a dichotomous scale with "Yes" or "No" as response alternatives to the question whether subjects like a certain image or not. A higher score at BWAS equals an elevated level of creativity.

Compliance with ethical standards

This study was approved by the Ethics Committee of the University of Medicine, Pharmacy, Sciences and Technology from Târgu Mureș (No. 1157/20.10.2020 and No. 1439/08.07.2021), and the participants signed an informed consent prior to their inclusion in the study.

Statistical analysis

The statistical analysis comprised both elements of descriptive statistics (frequency, percentage, mean, median, standard deviation, and calculation of 95% confidence intervals), and elements of inferential statistics. The Shapiro-Wilk test was used to identify the distribution of the analyzed data series. The Spearman and the Pearson tests were applied to quantify the magnitude of the correlation between the assessed variables. We used Spearman correlation where the data series did not pass the normality test (without Gaussian distribution) and Pearson correlation where both series complied to Gaussian distribution. In order to compare the means, we applied t-Student test for unpaired data and Mann-Whitney test for comparison of medians. The chosen significance threshold for the p-value was 0.05. The statistical analysis was performed using the GraphPad Prism software trial version.

RESULTS

Of the 98 resident who were invited to participate in the study, only 38 agreed to sign the informed consent and only 28 residents filled out both

questionnaires. Our final sample consisted of 24 (85.71%) females and 4 (14.29%) males, with a mean age of 29.61 ± 4.263 years.

Our study found no correlation between the age of the included residents and neither BWAS (BWAS original scale $r = -0.3023$, $p = 0.1180$; BWAS revised scale $r = -0.2826$, $p = 0.1451$), or the DECAS components, i.e. Openness, Extraversion, Conscientiousness, Agreeability and Emotional Stability. All the aforementioned correlations were detailed in Table 1.

TABLE 1. The Spearman correlation between DECAS personality inventory, BWAS and age in residents

Parameters	Age		
	r coefficient	95% Confidence Interval	p value*
D (Openness)	0.2717	-0.1243 to 0.5931	0.1619
E (Extraversion)	0.3074	-0.08585 to 0.6177	0.1116
C (Conscientiousness)	-0.07752	-0.4473 to 0.3149	0.6950
A (Agreeability)	-0.1140	-0.4763 to 0.2814	0.5635
S (Emotional stability)	0.002905	-0.3806 to 0.3856	0.9883
BWAS (original)	-0.3023	-0.6142 to 0.09142	0.1180
BWAS (revised)	-0.2826	-0.6007 to 0.1127	0.1451

*Barron Welsh Art Scale (BWAS), DECAS scale [D - Deschidere (Openness), E - Extraversiune (Extraversion), C - Conștiinciozitate (Conscientiousness), A - Agreabilitate (Agreeability), S - Stabilitate emoțională (Emotional stability)], * Spearman correlation was used, $p < 0.05$ (2-tailed)*

Of the 123 clinical years students who were invited to participate in the study, only 59 students filled out both questionnaires. Our final sample consisted of 53 (89.83%) females and 6 (10.17%) males, with a mean age of 23.81 ± 1.824 years.

Our study found no correlation between the age of the included students from clinical years and neither BWAS (BWAS original scale $r = -0.01137$, $p = 0.9319$; BWAS revised scale $r = 0.02813$, $p = 0.8325$), or the DECAS components, i.e. Openness, Extraversion, Conscientiousness, Agreeability and Emotional Stability. All the previously mentioned correlations were described in Table 2.

We also assessed the differences regarding DECAS parameters in both residents and students (Table 3 and Table 4). Thus, in terms of residents, we found a significant positive correlation between Openness and Extraversion ($r = 0.6742$, $p < 0.0001$), pointing out that higher Openness scores were related to increased Extraversion. Contrariwise, we encountered a negative significant correlation between Openness and Agreeability ($r = -0.4601$, $p = 0.0138$), indicating that increased Openness was associated with lower Agreeability scores.

Regarding Extraversion, we encountered a significant positive correlation with Openness ($r = 0.6742$, $p < 0.0001$), suggesting that higher Extraversion scores were related to increased Openness.

TABLE 2. The Spearman correlation between DECAS personality inventory, BWAS and age in clinical years' students

Parameters	Age		
	r coefficient	95% Confidence Interval	p value*
D (Openness)	-0.08269	-0.3387 to 0.1847	0.5335
E (Extraversion)	0.08190	-0.1855 to 0.3380	0.5374
C (Conscientiousness)	-0.05771	-0.3163 to 0.2088	0.6642
A (Agreeability)	-0.1318	-0.3819 to 0.1363	0.3196
S (Emotional Stability)	0.09329	-0.1744 to 0.3481	0.4822
BWAS (original)	-0.01137	-0.2739 to 0.2528	0.9319
BWAS (revised)	0.02813	-0.2370 to 0.2893	0.8325

Barron Welsh Art Scale (BWAS), DECAS scale [D – Deschidere (Openness), E – Extraversiune (Extraversion), C – Conștiinciozitate (Conscientiousness), A – Agreeabilitate (Agreeability), S – Stabilitate emoțională (Emotional stability)], * Spearman correlation was used, $p < 0.05$ (2-tailed)

Concerning Conscientiousness, we noticed a significant negative correlation with Agreeability ($r = -0.4088$, $p = 0.0308$), indicating that increased Conscientiousness was associated with lower Agreeability scores.

In terms of Agreeability, we found a significant negative correlation with both Openness ($r = -0.4601$, $p = 0.0138$), and Conscientiousness ($r = -0.4088$, $p = 0.0308$), pointing out that higher Agreeability scores were associated with lower Openness and Conscientiousness.

In addition, our study revealed a positive correlation between Conscientiousness and Creativity based on the significant positive correlation between Conscientiousness and BWAS revised Scale ($r = 0.4192$, $p = 0.0264$). Contrariwise, we observed a negative significant correlation between Agreeability and Creativity since we found negative correlations between Agreeability and both BWAS Original Scale ($r = -0.4132$, $p = 0.0289$), and BWAS Revised Scale ($r = -0.4637$, $p = 0.0129$). All the assessed parameters were described in Table 3.

We also assessed the differences in DECAS parameters of students from clinical years (Table 4).

Regarding Extraversion, we encountered a significant negative correlation with both Conscientiousness ($r = -0.2681$, $p=0.0401$) and Agreeability ($r = -0.3883$, $p=0.0024$), suggesting that higher Extraversion scores were related to lower Conscientiousness and lower Agreeability scores.

Concerning Conscientiousness, we noticed a significant negative correlation with Extraversion ($r = -0.2681$, $p=0.0401$), indicating that increased Conscientiousness was associated with lower Extraversion scores.

In terms of Agreeability, we found a significant negative correlation with Extraversion ($r = -0.3883$, $p=0.0024$), pointing out that higher Agreeability

scores were associated with lower Extraversion.

In addition, our study revealed a positive correlation between Openness and Creativity based on the significant positive correlation between Openness and BWAS revised Scale ($r = 0.2803$, $p = 0.0315$). All the assessed parameters were described in Table 4.

Considering that residents benefited from communication skills training as medical students, we compared the parameters the parameters between residents and students, which also benefited of training in this area. We found a significant difference for BWAS original scale, $p < 0.0001$ and for BWAS revised scale, $p < 0.0001$, and extraversion, $p = 0.0130$, suggesting that students express a higher creativity level when compared to residents. The comparison of the two groups was detailed in Table 5.

DISCUSSIONS

Undoubtable, the medical profession is the most challenging of all due to its great impact on individual's life, economy and physician's academic performance. Regardless of the profession, academic performance and professional satisfaction are influenced by personality traits and the acknowledgement of this influence might improve the outcome of professional achievements. It is true that genetic background is responsible for up to 80% of the variance in personality traits (13), but we must focus on those which might be developed or improved with proper training courses. Based on the major influence of genetic background on personality traits, we might explain the lack of correlation between age and DECAS dimensions in our study. Nevertheless, an initial thorough assessment of personality traits in order to determine the main gaps that are worth of improvement would be of great benefit especially in medical education. Contrariwise, in terms of age and creativity, our study revealed an interesting finding proving that students display a greater level of creativity when compared to residents. BWAS was used so far for assessing creativity mainly in patients with schizophrenia or bipolar disorders (14,15). In addition, this scale was used for assessing creativity levels by comparing patients with mood disorders, highly-creative individuals and healthy control (16). The study of Strong et al. proved that creativity might be increased by a proper development of neuroticism and openness, which might enable two of the most important features related to creativity, i.e. cognitive and affective dimensions (17). These findings seem to be supported by our study since we identified in residents a strong positive correlation between Conscientiousness and creativity levels. Moreover, we noticed in our sample of residents a negative correlation between Agreeability and BWAS scale

TABLE 3. The Pearson correlation between different types of personality in residents

	D			E			C			A			S		
	r	95% CI	p	r	95% CI	p	r	95% CI	p	r	95% CI	p	r	95% CI	p
D	1			0.6742	0.4022 to 0.8368	< 0.0001	0.1052	-0.2790 to 0.4603	0.5944	-0.4601	-0.7112 to -0.1050	0.0138	0.1261	-0.2592 to 0.4769	0.5224
E	0.6742	0.4022 to 0.8368	< 0.0001	1			0.05995	-0.3204 to 0.4236	0.7619	-0.2447	-0.5662 to 0.04211	0.2095	0.3051	-0.07677 to 0.6090	0.1144
C	0.1052	-0.2790 to 0.4603	0.5944	0.05995	-0.3204 to 0.4236	0.7619	1			-0.4088	-0.6785 to -0.04211	0.0308	0.09399	-0.2893 to 0.4513	0.6343
A	-0.4601	-0.7112 to -0.1050	0.0138	-0.2447	-0.5662 to 0.1414	0.2095	-0.4088	-0.6785 to -0.04211	0.0308	1			-0.02809	-0.3971 to 0.3487	0.8872
S	0.1261	-0.2592 to 0.4769	0.5224	0.3051	-0.07677 to 0.6090	0.1144	0.09399	-0.2893 to 0.4513	0.6343	-0.02809	-0.3971 to 0.3487	0.8872	1		
BWAS original	0.2373	-0.1490 to 0.5608	0.2240	-0.1880	-0.5244 to 0.1991	0.3380	0.3227	-0.05742 to 0.6210	0.0940	-0.4132	-0.6813 to -0.04729	0.0289	0.06775	-0.3133 to 0.4300	0.7319
BWAS revised	0.3016	-0.08062 to 0.6065	0.1188	-0.07479	-0.4358 to 0.3069	0.7052	0.4192	0.05453 to 0.6852	0.0264	-0.4637	-0.7134 to -0.1095	0.0129	0.09508	-0.2883 to 0.4522	0.6303

Barron Welsh Art Scale (BWAS), DECAS scale [D - Deschidere (Openness), E - Extraversiune (Extraversion), C - Conștiințiozitate (Conscientiousness), A - Agreeabilitate (Agreeability), S - Stabilitate emoțională (Emotional stability)]. *p < 0.05 (2-tailed), **p < 0.01 (2-tailed), ***Person correlation was used

TABLE 4. The Pearson correlation between different types of personality in clinical years' students

	D			E			C			A			S		
	r	95% CI	p	r	95% CI	p	r	95% CI	p	r	95% CI	p	r	95% CI	p
D	1			0.1099	-0.1504 to 0.3561	0.4072	0.1340	-0.1264 to 0.3772	0.3114	-0.05270	-0.3047 to 0.2062	0.6918	-0.1607	-0.4003 to 0.09958	0.2241
E	0.1099	-0.1504 to 0.3561	0.4072	1			-0.2681	-0.4905 to -0.01282	0.0401	-0.3883	-0.5862 to -0.1468	0.0024	0.1659	-0.09427 to 0.4048	0.2093
C	0.1340	-0.1264 to 0.3772	0.3114	-0.2681	-0.4905 to -0.01282	0.0401	1			-0.1108	-0.3568 to 0.1496	0.4036	-0.1124	-0.3582 to 0.1480	0.3967
A	-0.05270	-0.3047 to 0.2062	0.6918	-0.3883	-0.5862 to -0.1468	0.0024	-0.1108	-0.3568 to 0.1496	0.4036	1			0.01089	-0.2459 to 0.2663	0.9348
S	-0.1607	-0.4003 to 0.09958	0.2241	0.1659	-0.09427 to 0.4048	0.2093	-0.1124	-0.3582 to 0.1480	0.3967	0.01089	-0.2459 to 0.2663	0.9348	1		
BWAS original	0.2166	-0.04188 to 0.4479	0.0994	-0.1324	-0.3758 to 0.1281	0.3176	-0.1089	-0.3551 to 0.1515	0.4117	-0.06000	-0.3114 to 0.1992	0.6517	0.1015	-0.1588 to 0.3486	0.4442
BWAS revised	0.2803	0.02607 to 0.5005	0.0315	-0.1584	-0.3984 to 0.1019	0.2309	-0.1460	-0.3876 to 0.1145	0.2700	-0.03130	-0.2852 to 0.2267	0.8140	0.1729	-0.08713 to 0.4108	0.1904

Barron Welsh Art Scale (BWAS), DECAS scale [D - Deschidere (Openness), E - Extraversiune (Extraversion), C - Conștiințiozitate (Conscientiousness), A - Agreeabilitate (Agreeability), S - Stabilitate emoțională (Emotional stability)]. *p < 0.05 (2-tailed), **p < 0.01 (2-tailed), ***Person correlation was used

TABLE 5. Comparison of BWAS and DECAS scales between residents and clinical years' students

Parameters	Clinical years' students (n=59) Means ± SD (Median values)	Residents (n=28) Means ± SD (Median values)	p value*
Age	23.81±1.824 (24.00)	29.61±4.263 (29.00)	< 0.0001*
D (Openness)	53.89±10.08 (54.40)	54.53±9.690 (55.85)	0.7812
E (Extraversion)	41.63±11.17 (42.60)	48.35±12.32 (49.10)	0.0130
C (Conscientiousness)	52.98±10.52 (52.00)	49.48±12.86 (50.35)	0.1819
A (Agreeability)	50.99±8.801 (50.50)	50.44±5.607 (50.75)	0.7269
S (Emotional Stability)	46.31±9.188 (45.30)	48.55±7.058 (49.20)	0.2590
BWAS (original)	55.08±15.54 (55.00)	20.07±10.00 (21.00)	< 0.0001
BWAS (revised)	56.59±16.41 (56.00)	22.64±9.844 (22.00)	< 0.0001*

Barron Welsh Art Scale (BWAS), DECAS scale [D - Deschidere (Openness), E - Extraversiune (Extraversion), C - Conștiințiozitate (Conscientiousness), A - Agreeabilitate (Agreeability), S - Stabilitate emoțională (Emotional stability)], * Mann Whitney test

suggesting that increased Agreeability results in a decreased level of creativity. In terms of students we noticed that students with higher Openness display an increased creativity.

Specialty choice at the end of university is probably a life-changing decision in every medical student's life and this decision should be sustained by both personal preferences as well as suitability for a certain medical field. Thus, for making a fair and long-term satisfiable decision, each student should be aware of the role of his personality traits in choosing a certain specialty. Previous studies proved that openness and agreeability might play an important role in specialty choice since it was proved that students with an increased level of openness chose medical departments, whereas those with a higher level of agreeability preferred clinical medicine (18). External factors that guide specialty choice were also related to personality traits. Thus, openness was related to satisfaction and personal interest as the most important factors in guiding specialty choice, while conscientiousness was associated mainly with personal interest (18). Our study suggested that openness is positively related to extraversion in young residents, while we found a significant negative association between openness and agreeability. Moreover, agreeability was also negatively related to conscientiousness in both students and residents included in our study. Contrariwise, in our sample of students we identified a negative significant correlation between Extraversion and both Conscientiousness and Agreeability.

These findings add a major value to those reported so far which underlined a strong positive association between empathy and both openness and agreeability (19-21). It is well-documented that medical empathy represents a cornerstone in the healthcare process being defined not only as the ability to understand patient's experiences, concerns and perspective, but also to express properly

this understanding in his aid (22). In addition to the above-mentioned facts, Gulera et al. reported also a positive association between empathy quotient and both extraversion and conscientiousness (19). Therefore, we might hypothesize that medical empathy is a well-defined feature in our sample based on the encountered associations between openness, extraversion and conscientiousness in both residents and medical students.

The limitations of this study consist in a relatively small sample included in this study, especially in terms of young residents; the fact that we assessed students from a single university in Romania, as well as residents from a single county; the lack of correlation between communication training and patient's satisfaction; the fact that we did not follow the student's after enrolling the residency program, as well as the young residents after they benefited by proper training of their personality and communication skills. Nevertheless, this is to the best of our knowledge the first study in our country and among the few international ones that assessed personality traits in both medical students and young residents.

CONCLUSIONS

Personality traits and communication skills in health-care providers represent two mandatory conditions for an effective doctor-patient relationship. Our study revealed a higher BWAS scores in students suggesting that students have a higher creativity level when compared to residents. In addition, our study suggests that residents with increased Openness might associate a higher level of Extraversion and a lower level of Agreeability. Moreover, residents who are less Agreeable seem to be more Conscientiousness. In terms of students, we underlined a significant negative correlation between Extraversion and both Conscientiousness and Agreeability emphasizing that students with overexpressed Extraversion are less Conscientious-

ness and Agreeable. We also noticed that students with an increased level of Openness seem to be more creative. Nevertheless, further studies on big-

ger samples are required in order to delineate the precise role of personality traits in clinical practice.

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