

## DEPRESSIVE SYMPTOMS, TEMPERAMENT/CHARACTER, AND ATTENTION DEFICIT/HYPERACTIVITY DISORDER TRAITS IN MEDICAL STUDENTS SEEKING COUNSELING

Chiara Rapinesi<sup>1</sup>, Georgios D. Kotzalidis<sup>1</sup>, Antonio Del Casale<sup>1,2</sup>, Mariangela Ferrone<sup>1</sup>,  
Alessandro Vento<sup>3</sup>, Gemma Callovini<sup>1</sup>, Martina Curto<sup>1</sup>, Stefano Ferracuti<sup>1</sup>, Gabriele Sani<sup>1</sup>,  
Maurizio Pompili<sup>1</sup>, Giuseppe Familiari<sup>4</sup>, Paolo Girardi<sup>1,2</sup> & Gloria Angeletti<sup>1</sup>

<sup>1</sup>NESMOS (Neurosciences, Mental Health, and Sensory Organs) Department, Sapienza University,  
School of Medicine and Psychology, Sant'Andrea Hospital, Rome, Italy

<sup>2</sup>Department of Psychiatric Rehabilitation, P. Alberto Mileno Onlus Foundation,  
San Francesco Institute, Vasto, CH, Italy

<sup>3</sup>Faculty of Psychology, "Guglielmo Marconi" University, Rome; Mental Health Department ASL RM 2  
and Addictions' Observatory (ODDPSS), Rome, Italy

<sup>4</sup>Department of Anatomical, Histological, Forensic and Locomotor Apparatus Sciences; Sapienza University,  
School of Medicine and Psychology, Sant'Andrea Hospital, Rome, Italy

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### SUMMARY

**Background:** To investigate depressive symptoms, temperament, and attention deficit/hyperactivity disorder traits in medical students, comparing those who sought psychological counseling with those who did not seek it.

**Subjects and methods:** We assessed 49 students seeking counseling (mean age=24.4 years, SD=4.07) and 49 noncounseling controls (mean age=21.7 years, SD=2.6). Participants were assessed for depressive symptoms with the Beck Depression Inventory-II, for temperament/character dimensions using the Temperament and Character Inventory-Revised, and for attention deficit/hyperactivity symptoms using the Adult ADHD Self-Report Scale.

**Results:** Counseling-seeking students were more likely to have attention deficit/hyperactivity symptoms, scored higher on the Beck Depression Inventory-II and on the Temperament and Character Inventory-Revised Harm avoidance, and lower on the Temperament and Character Inventory-Revised Self-Directedness, compared to controls.

**Conclusions:** Medical students applying for counseling should be carefully assessed for depressive symptoms, attention deficit/hyperactivity symptoms, and temperament characteristics; depressive and attention deficit/hyperactivity symptoms could be the focus of counseling interventions.

**Key words:** medical students – counseling - mental health - attention deficit/hyperactivity – temperament – character - depression

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### INTRODUCTION

Student Psychological Counseling Services were increasingly instituted in colleges and universities in post-World War US (Blos 1946), and thereafter in Europe. These services usually provide psychotherapy based on various approaches and report their results with variable outcomes (Breakwell 1987). During the last decade of the 20<sup>th</sup> Century, while apparently psychological problems remained stable, psychoactive drug use increased five-fold in users of college counseling centers in the US (Schwartz 2006). However, in university students, psychological problems were found to be increasing in developed countries in both prevalence and severity, especially anxiety and depression (Hunt & Eisenberg 2010). Worldwide counseling services established for university students aim to avoid the adverse consequences of psychological problems of university students in their everyday and academic life. They are mainly focused on addressing the most common problems, but have heretofore failed to control for the

impact that past or current ADHD might have on academic performance. In fact, when focusing on hidden problems, ADHD proves to be a major predictor of academic failure in newly admitted university students (Pottinger et al. 2009).

Attention deficit hyperactivity disorder (ADHD) is a common behavioral disorder diagnosis in children and adolescents, often associated with cluster B personality disorders, and has a prevalence of 3%-5% among US school-age children (National Institutes of Health 2000). A widely used comprehensive account of personality is based on Cloninger's model of temperament and character (Cloninger 1999). Although patterns of temperament and character have been documented in people with attention-deficit/hyperactivity disorder (ADHD), findings are inconsistent, with the only consistent finding regarding the high scores on Novelty seeking (Smalley et al. 2009). This is to be expected, as people with high Novelty seeking tend to be impulsive, quick-tempered, easily bored, and behaving disorderly (Cloninger 1999), all of which are common symptoms of ADHD.

Usually studies investigate temperament/character measures as relating to clinically diagnosed ADHD, but do not use self-report scales to relate sub-threshold ADHD symptoms to temperament/character traits. One study correlating ASRS with TCI in patients with eating disorders (Fernández-Aranda et al. 2013), found a positive association between ADHD symptoms and Novelty Seeking and a negative one with Self-Directedness in patients with eating disorders; however, limiting to anorexia nervosa, ADHD symptoms were associated with high Cooperativeness, lower Reward Dependence, and Self-Directedness.

The aim of this study was to investigate depressive symptoms, temperament, and attention deficit/hyperactivity disorder (ADHD) symptoms in medical students who applied for counseling and to compare them with a matched control group of medical students who did not apply for counseling.

## SUBJECTS AND METHODS

### Setting

The study was conducted in Counseling Center of the Sant'Andrea Hospital, Rome, Italy, where the university counseling service is free for all students asking for help. All help-seeking students obtain consultation. The service provides four sessions of psychological consultation, then the counselor can judge whether it was enough to solve the student's psychological problem or that psychotherapy and/or pharmacotherapy are needed; in the latter case, treatment is provided.

### Participants

A total of 98 university students were recruited for completing a test battery; these consisted of 49 help-seekers at the counseling center of the Sant'Andrea Hospital, Rome (counseling group (Cnsl)), and of a comparison group of 49 students contacted through their teachers during classes (noncounseling group (Ctrl)). Mean age of Cnsl was 24.4 years (standard deviation (SD)=4.06), while that of Ctrl was 21.7 years (SD=2.60). The recruitment period was January 2013 to October 2014.

Descriptive characteristics for the two samples are shown in Table 1.

### Measures

#### Assessment tools

The Beck Depression Inventory, version II (BDI-II) was used to assess depressive symptoms; this is a 21-item self-rated questionnaire to measure depressive symptoms in clinical and nonclinical populations (Beck et al. 1996). Each item is rated on a Likert-type scale

ranging from 0 (absent) to 3 (unbearable). Scores of 0-13 indicate no or minimal depression, 14-19 mild, 20-28 moderate, and 29-63 severe depression. Temperament was assessed using Temperament and Character Inventory-Revised (TCI-R) (Cloninger 1999), a 240-item self-questionnaire, where participants respond on a 5-point Likert scale ranging from 1 (definitively false) to 5 (definitively true). It provides a measure of biosocial personality model based on four temperaments (Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD), and Persistence (PS)) and three characters (Self-directedness (SD), Cooperativeness (CO), and Self-transcendence (ST)). NS relates to exploratory behaviors and activation in response to novel stimuli; HA denotes the individual's inclination to behavioral inhibition when facing potentially dangerous stimuli and his/her ability to anticipate negative effects; RD concerns relational and affective skills but also others dependencies; PS characterizes industrious, hardworking, and stable people, despite frustration and fatigue. Concerning character, SD is based on self-autonomy; this self-concept engenders feelings of personal integrity, honor, self-esteem, effectiveness, leadership, and hope; CO is based on the concept of self as an integral part of humanity or society; this self-concept are generates feelings of community, compassion, consciousness, and charity; finally, ST is based on the concept of self as an integral part of the universe and its source; this self-concept are derived feelings of mystical participation, religious faith, and unconditional equanimity and patience (Cloninger 1999). ADHD was assessed with the Adult ADHD Self-Report Scale (ASRS-v1.1) (Kessler et al. 2005), a checklist of 18 questions about symptoms that are based on DSM-IV/IV-TR ADHD diagnostic criteria and highlighting ADHD symptom manifestation in adults (Kessler et al. 2005). On the original 18-item test, only six were found to be predictive of and consistent with ADHD symptoms, and these items constitute the ASRS-A subscale, while the other 12 items constitute the ASRS-B subscale, for which no total score is calculated or used for any purpose. The ASRS-A subscale yields both a total score and a measure of probability of having adult ADHD. Furthermore, the scale is bidimensional, with an Inattention score, i.e., the sum of the items 1-4 and 7-11, and a Hyperactivity score, which is the sum of the items 5-6 and 12-18. Each item is rated on a Likert scale, where 1 is never, 2 is rarely, 3 is sometimes, 4 is often, and 5 is very often. The actual diagnosis of ADHD can only be made on the basis of a detailed history and mental status examination; in fact, this test is provided for educational purposes only, and cannot be used to diagnose ADHD in a nonclinical setting. The checklist and its scoring system were developed jointly by the World Health Organization (WHO) and by the Workgroup on Adult ADHD.

**Table 1.** Socio-demographic and clinical characteristics of the study groups

	Counseling (n=49)	Controls (n=49)	F/ $\chi^2$	P
Age (mean $\pm$ SD)	24.40 $\pm$ 4.07	21.7 $\pm$ 2.60	861	<0.001
Sex (% Males)	32.2(19)	30.6(15)	0.03	0.513
Substance Abuse (%)			0.90	0.254
No	89.8	83.7		
Yes	10.2	16.3		
Psychotherapy (%)			3.95	0.139
No	71.4	85.7		
Yes, lifetime	24.5	14.3		
Yes, current	4.1	0.0		
Psychotropic drugs (%)			2.75	0.253
No	86.4	91.8		
Yes, lifetime	13.6	6.1		
Yes, current	0.0	2.0		
Sleep (hours) (mean $\pm$ SD)	7.28 $\pm$ 1.24	7.39 $\pm$ 1.06	1426	0.902

P-values refer to the ANOVA 1 way test for the continuous variables and to the Chi-squared test for the categorical variables; P-values below the threshold of statistical significance ( $p < 0.05$ ) are indicated in italics

**Table 2.** Differences between the two groups in Temperament, Depression, and ADHD scales

	Counseling (n=49)	Controls (n=49)	F	p
ASRS Total Score	3.75 $\pm$ 2.03	2.51 $\pm$ 1.00	14.859	<0.001
ASRS Inattention	2.08 $\pm$ 1.25	1.40 $\pm$ 0.81	9.923	0.002
ASRS Hyperactivity	1.67 $\pm$ 1.00	1.10 $\pm$ 0.51	12.536	0.001
TCI-t-NS	53.17 $\pm$ 8.88	52.80 $\pm$ 8.54	0.044	0.835
TCI-t-HA	62.70 $\pm$ 9.89	56.94 $\pm$ 9.47	8.674	0.004
TCI-t-RD	50.16 $\pm$ 10.26	46.08 $\pm$ 10.95	3.627	0.060
TCI-t-P	41.36 $\pm$ 10.90	44.26 $\pm$ 10.57	1.785	0.185
TCI-c-SD	40.10 $\pm$ 10.07	44.73 $\pm$ 9.07	5.724	0.019
TCI-c-C	46.97 $\pm$ 9.10	46.82 $\pm$ 9.29	0.008	0.930
TCI-c-ST	43.92 $\pm$ 10.50	41.47 $\pm$ 12.20	1.134	0.290
BDI-II total score	17.06 $\pm$ 8.77	10.14 $\pm$ 8.47	15.774	<0.001

Adult ADHD percent diagnoses refer to the encoding of the ASRS-A scale; these could be compared with the diagnoses established through the use of the SCID-I only in the C group. P-values refer to the one-way ANOVA for continuous variables and Chi-squared test for categorical variables. P-values below the threshold of statistical significance ( $p < 0.05$ ) are indicated in italics.

Abbreviations: ASRS-A – Screening subscale of the Adult ADHD Self Report Scale; BDI-II – Beck Depression Inventory-II; TCI – Temperament and Character Inventory, c-C - character, cooperativeness; c-SD - character, self-directedness; c-ST - character, self-transcendence; t-HA - temperament, harm avoidance; t-NS - temperament, novelty seeking; t-P - temperament, persistence; t-RD - temperament, reward dependence

## Procedure

Participants were recruited from the Counseling Centre of the Sant'Andrea Hospital, Rome, and from university classes. The study has been conducted according to the 1964 Helsinki Principles of Human Rights of the World Medical Association and subsequent modifications. All participants provided written, informed consent and were guaranteed anonymity. All participants completed a socioepidemiological data collection sheet and were subsequently evaluated with the above-mentioned tools. Both counseling (Cnsl) and controls (Ctrl) underwent SCID-I (First et al. 2002) and SCID-II (First et al. 1997) clinical interviews for DSM-IV-TR axis I and II (personality disorders) diagnoses, respectively.

## Statistics

We carried-out 1-way ANOVA to detect significant differences between the Cnsl and Ctrl groups for continuous variables. We used the chi-squared test for categorical variables in intergroup comparisons. We used the SPSS 22.0 version for all analyses.

## RESULTS

### Between-groups comparisons for clinical and demographic characteristics

The demographic and clinical characteristics of Cnsl and Ctrl are shown in Tables 1 and 2. Cnsl participants were significantly older than Ctrl (mean age of Cnsl,

24.4 years, SD=4.06 vs. Ctrl, 21.7 years, SD=2.60,  $p < 0.001$ ;  $F = 15.523$ ). No other significant differences in sociodemographic characteristics were found between the two groups (Table 1).

Cnsl scored higher than Ctrl on total BDI-II ( $p = 0.003$ ;  $F = 9.301$ ;  $Q = 2234.939$ ). Cnsl scored significantly higher on the t-HA scale of the TCI ( $p = 0.004$ ;  $F = 8.674$ ;  $Q = 811.469$ ) and lower on the c-SD ( $p = 0.019$ ;  $F = 5.724$ ;  $Q = 525.806$ ) with respect to Ctrl (Table 2). Regarding the ADHD diagnostic screening subscale, Cnsl scored significantly higher on ASRS-A ( $p = 0.002$ ;  $F = 9.923$ ;  $Q = 11.112$ ) and ASRS-B ( $p = 0.001$ ;  $F = 12.536$ ;  $Q = 8.000$ ) than Ctrl. Of the 18 Cnsl participants diagnosed as probable or highly probable adult ADHD, 16 (88.89%) saw their diagnosis confirmed through the SCID-I and parents' interviews. Our samples did not score differently on other TCI subscales.

## DISCUSSION

This study assessed ADHD symptoms, temperament and character dimensions, as well as depressive dimensions in medical students (comparing those who sought counseling with those who did not). Cnsl participants scored higher than Ctrl participants on both ADHD and depression measures and on harm avoidance, whereas they scored lower on self-directedness.

Despite increasing interest on the etiology, assessment, and treatment of ADHD, few studies have focused on personality variables associated with ADHD symptoms in university students.

To our knowledge, this study is the only one that differentiated counseling from noncounseling populations while investigating conjointly ADHD symptoms, depression and temperament/character. We found our counseling population to be significantly older than their mates recruited at classes. One reason might be that people are likely to seek counseling when they have poor academic performance after some time.

The importance of ADHD symptoms has been consistently underlined in scientific literature. If left untreated, ADHD symptoms like hyperactivity, inattention, and impulsiveness, may be related to behavioral, emotional, social, academic, and vocational problems, thus resulting in overall social impairment. The long-term educational, professional, psychosocial, neuropsychological, and clinical outcomes of ADHD in adult life are significantly worse than those of nonADHD people, and this is not accounted for by other coexisting psychiatric comorbidity (Biederman et al. 2012). People with past diagnosis of ADHD are likely to be educationally and professionally underachievers beyond to what can be expected from their IQ (Biederman et al. 2012). However, other common comorbid psychiatric disorders like major depressive disorder, anxiety disorder, substance use disorder,

bipolar disorder, and personality disorders add to ADHD-related social disability. In fact, some ADHD symptoms, like unstable mood, inner tension, and restlessness, may often be attributed to comorbid disorders rather than ADHD (Newcorn et al. 2007), thus further adding to the confusion about this common, yet neglected psychiatric disorder. Comorbidity with ADHD negatively affects treatment compliance, treatment response, and patient insight (Newcorn et al. 2007). Hence we need to improve ADHD assessment so to capture subclinical states and subtle nuances, because even subthreshold ADHD may cause significant impairment across various functioning domains.

Various studies have used the TCI in ADHD (or its junior counterpart, Junior Temperament and Character Inventory (JTCI)) and obtained inconsistent results, with the most consistent findings consisting in higher scores on the TCI Novelty Seeking scale, compared to other groups (reviewed in Instanes et al. 2016).

Depressive symptoms among medical students vary from 10.4% to 26.2% (Mancevska et al. 2008, Bostanci et al. 2005). Resolving psychopathology in university counseling samples has been associated with improved academic performance, while persisting psychopathology was linked to continued academic failure (Choi et al. 2010).

Our finding that SCID-I results matched those obtained in Cnsl with the ASRS-v1.1 points to the possibility that people whose ADHD diagnosis went undiagnosed while children are more likely to seek counseling after joining the university.

Paying attention to aspects of personality and psychopathology of help-seeking students may shape interventions and help implementation of counseling programs with the aim to improve their academic performance. Such programs are currently being enforced in the Midwest of the US (Maffini & Toth 2017) and aim to address issues like anxiety, depression, suicidality, and violence (Francis & Horn 2016), but to date, such programs do not deal specifically with ADHD symptoms.

## CONCLUSION

Due to the high prevalence of ADHD in adults and the importance of its early diagnosis and treatment, there is a need for more frequent screening. Our findings support the need for university intervention programs to reduce students' academic and social problems and increase their ability to seek help, as well as to reduce school drop-out and improve their quality of life. The prompt recognition of adult ADHD syndromes or subsyndromal symptoms may drive appropriate interventions and thus favorably impact students' occupational, educational, and family functioning.

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## Contribution of individual authors:

Chiara Rapinesi, Georgios D. Kotzalidis, & Gloria Angeletti, conceived and designed the study;

Chiara Rapinesi, Georgios D. Kotzalidis, Mariangela Ferrone and Gemma Callovini wrote the first draft of the manuscript;

Antonio Del Casale, Georgios D. Kotzalidis, and Martina Curto performed statistical analyses;

Gloria Angeletti, Mariangela Ferrone and Gemma Callovini visited patients and carried out clinical work;

Mariangela Ferrone, Alessandro Vento and Gemma Callovini conducted testing;

Stefano Ferracuti and Martina Curto wrote substantial portions of Methods;

Giuseppe Familiari, Maurizio Pompili, Stefano Ferracuti and Gabriele Sani discussed results,

Stefano Ferracuti, Gabriele Sani, Maurizio Pompili, Antonio Del Casale, Giuseppe Familiari, Paolo Girardi and Gloria Angeletti supervised the writing of the manuscript; all authors approved the final version of the manuscript.

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Correspondence:

Antonio Del Casale, MD, PhD

NESMOS Department (Neurosciences, Mental Health, and Sensory Organs)

School of Medicine and Psychology, Sapienza University, Rome

Sant'Andrea Hospital, Via di Grottarossa 1035-1039; 00189 Rome, Italy

E-mail: antonio.delcasale@uniroma1.it