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Adult ADHD and pathological narcissism: A retrospective-analysis

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ABSTRACT

Adult attention deficit hyperactivity disorder (ADHD) is often associated with personality pathology. However, only few studies have been conducted on the link between ADHD and pathological narcissism (PN), with or without a diagnosis of narcissistic personality disorder (NPD). In order to fill this gap, PN and NPD were assessed in 164 subjects suffering from ADHD, with several other measures including ADHD severity, quality of life, depression, anxiety, impulsivity, and emotion dysregulation (ED). We found that a significant proportion of ADHD patients suffered from NPD, and that both narcissistic grandiosity and vulnerability were associated with ADHD hyperactivity and impulsivity symptoms, but not with inattentive symptoms. These two dimensions seemed to be negatively associated with well-being and positively associated with most of the other studied psychiatric dimensions except ED, the latter being only associated with vulnerability, even after adjustment on borderline symptoms. Overall, despite important limitations that limit the generalizability of our findings to the overall ADHD population (notably linked to selection bias), we believe that this exploratory study sheds light on the potential clinical relevance of narcissistic pathology in adult ADHD patients.

1. Introduction

Attention deficit hyperactivity disorder (ADHD) is a common disorder affecting around 2.8% of the adult population (Fayyad et al., 2017), and is characterized by the presence of hyperactive-impulsive and/or inattentive symptoms with onset since childhood, i.e. 12 years old (American Psychiatric Association, 2013). ADHD is associated with functional impairment in many areas (social, emotional, professional, see (Agarwal et al., 2012) and with several comorbid psychiatric disorders, including personality disorders (PD) (Bernardi et al., 2012; Katzman et al., 2017). If the presence of comorbidities is often linked to poorer outcomes and to lower quality of life in ADHD patients (Biederman, 2004), the nature of the relationship between these comorbidities and the ADHD diagnosis is unclear, especially regarding the roles played by each in the development, clinical severity, and functional impairment on the other. This issue may be even more important regarding the comorbidity between ADHD and personality pathology.

Indeed, PDs are common in ADHD patients. In a study of more than 34000 US adults published in 2012, Bernardi and colleagues found that ADHD was associated with an increased risk of borderline (33.69%), narcissistic (25.16%), schizotypal (22.42%), antisocial (18.86%) and histrionic (10.74%) PD, among others, independently of the effects of other psychiatric comorbidities (Bernardi et al., 2012). Given the high prevalence of these disorders, many authors have emphasized the need for research on the role of ADHD in their development (Matthies and Philipsen, 2016), but also on their impact on ADHD presentations and treatment outcomes. An example can be found in the research on the borderline personality disorder (BPD)/ADHD comorbidity (Weiner et al., 2019). Indeed, childhood ADHD may play a role in the development of BPD, with at least 14% of those diagnosed with ADHD in childhood later receiving a diagnosis of BPD (Matthies et al., 2011; Weiner et al., 2019). Moreover, the presence of BPD in ADHD patients is

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associated with more severe presentations on many dimensions (Ditrich et al., 2021). Finally, some authors have shown that the presence of 2 or more PDs in ADHD patients was associated with a decreased treatment response compared with subjects with 1 or no PDs (Marchant et al., 2010). Altogether, the relationships between ADHD and personality pathology seems complex and multi-leveled, and research on this outcome remains scarce.

Narcissism is an old concept that has been the subject of many debates over the years. Nowadays, many experts consider that narcissism is fundamentally linked with self-esteem regulation (Nook et al., 2022; Pincus and Lukowitsky, 2010; Weinberg et al., 2019). The word "narcissism" refers to a normal function that consists in the ability to regulate self-esteem without depending on admiration, social validation or self-enhancement (healthy narcissism). This function can be impaired, thus resulting in self-esteem dysregulation (pathological narcissism) (Pincus and Lukowitsky, 2010). Daily-life experience of narcissistic patients has been described as follows: when facing situations threatening their positive self-image and idealized vision of what they should or could be, these patients may start to experience intense feelings of shame, anger or envy, leading to the use of maladaptive strategies to restore self-esteem (Nook et al., 2022; Weinberg et al., 2019). Two non-exclusive facets of pathological narcissism have been described, depending on the type of strategies used: the first is marked by grandiosity (i.e., intense and inappropriate use of self-enhancement strategies), and the other by vulnerability (i.e. social withdrawal, depression, anger and shame). Within-patient patterns of fluctuation between grandiose and vulnerable states are often observed (Edershile and Wright, 2021; Pincus and Lukowitsky, 2010). In terms of psychiatric category, narcissistic personality disorder (NPD) is defined in the DSM-V as "a pervasive pattern of grandiosity (fantasy or behavior), need for admiration, and with lack of empathy" and consists in 9 criteria (with a total amount of 5 or more criteria required to make the diagnosis) (Mitra and Fluyau, 2023). Finally, it is important to note that, over the last decades, the NPD diagnosis has been criticized because of its overemphasis on grandiosity (Cain et al., 2008). Thus, several authors have suggested that the concept of pathological narcissism may be more useful in clinical practice (e.g., (Drozek and Unruh, 2020).

Self-esteem issues are frequent in ADHD patients (Cook et al., 2014; Newark et al., 2016), especially when untreated (Harpin et al., 2016). However, only a small number of studies have investigated the link between ADHD and narcissism, and the few that have been conducted mostly focused on the NPD diagnosis, without studying dimensionally the two main dimensions of narcissism and their link with ADHD symptomatology. This seems problematic given the high prevalence rates of NPD in adult ADHD populations, which has been found to be up to 29.8% in a study published in 2016 assessing 349 adults affected with ADHD, making it the most second most prevalent PD in adult ADHD (Jacob et al., 2016). Moreover, narcissistic traits have been found to be linked with a higher rate of drop-out in ADHD treatment trials (Gift et al., 2016), and certain aspects of narcissism have been linked to more severe outcomes in ADHD-related constructs like depression (Erkoreka and Navarro, 2017), aggression (Kjærvik and Bushman, 2021), emotion dysregulation (Ponzoni et al., 2021), or in disorders frequently comorbid with ADHD (e.g. in Gilles de la Tourette syndrome (Trillini and Müller-Vahl, 2015).

In this context, our aim was to study the prevalence of narcissistic pathology (with or without a diagnosis of NPD) in ADHD patients, and its potential links with ADHD symptoms/outcomes. We did not have any prespecified hypotheses on this issue, given the small amount of already conducted research. Our goal was to offer an overall description of these links to set new research pathways regarding this important clinical aspect.

2. Methods

PN and NPD were assessed in 164 subjects (mean age = 36.5 (11.6), 104 (63.4%) females) suffering from ADHD and seeking treatment in our specialized unit. Briefly, our unit is specialized in the assessment and treatment of adult ADHD and BPD through evidence-based programs. Patients are usually self-referred or referred by either their general practitioner or a mental health care professional. The inclusion criteria for participation in the present study were: 1°) Being at least 18 years old 2°) Having a diagnosis of ADHD made with the ACE + interview and 3°) Providing informed consent for participation in the study and use of health data for research purposes. The study was approved by the Ethics Committee of the Geneva University Hospitals (no. 2021-00694). Part of the sample used in this study was also used in two other studies (Baggio et al., 2022; Blay et al., in press-a).

2.1. Procedure

Patients were assessed for adult ADHD using a clinician-administered, semi-structured diagnostic interview: the *ADHD Child Evaluation* + (ACE+). The ACE+ is a semi-structured interview used to assess the presence of ADHD using criteria from the ICD-10 and the DSM-5 (Young, 2016). Moreover, patients presenting with borderline and narcissistic symptoms undertook the *Structured Clinical Interview for DSM-IV Personality Disorders adapted for DSM-5* (SCID, (First et al., 2013), and BPD and NPD were coded as present or absent based on the DSM-5 criteria. Thus, patients that did not undertake the SCID were thus considered as negative for these two diagnoses. Other personality disorders than BPD and NPD were not assessed because of time restrictions. Finally, other psychiatric disorders were clinically assessed, including major depressive disorder, bipolar disorder, anxiety disorders, obsessive-compulsive disorder, post-traumatic stress disorder, autism spectrum disorder, and substance use disorders. To note, the presence/absence of these disorders was also collected using medical records and information provided by other clinicians involved in patients' care. Finally, narcissistic traits, ADHD, depressive, anxiety, impulsivity and emotion dysregulation symptomatology were assessed using self-report tools undertaken at arrival in our unit.

2.2. Self-report tools

Socio-demographic questionnaire. As described in our previous studies, sociodemographic variables were collected using a short questionnaire assessing age, gender, level of education, employment status and marital status.

Narcissism self-report instruments. Narcissism personality traits were investigated using the *Narcissistic Personality Inventory* (NPI) and the *Pathological Narcissism Inventory* – Brief form (PNI).

The NPI is a self-report questionnaire, initially created as a 54-items scale (R. N. Raskin and Hall, 1979). Later, shorter versions have been developed (40-items (R. Raskin and Terry, 1988), 16-items and 13-items (Gentile et al., 2013) to increase its usability in clinical practice and research. In this study, we used the 13-items French version. The NPI 13-items has three subscales (namely grandiose exhibitionism, entitlement/exploitativeness and leadership/authority) and has suitable internal consistency (Cronbach's $\alpha = 0.73$) (Gentile et al., 2013). To note, the NPI only measures narcissistic grandiosity.

The PNI is a 52-items self-report questionnaire developed in 2009 by Pincus and colleagues (Pincus et al., 2009). A brief version of 28-items has been previously validated in French language (Diguer et al., 2020). We used the latter in the present study. The PNI measures seven components of pathological narcissistic functioning (namely, exploitativeness, self-sacrificing self-enhancement, grandiose fantasies, contingent self-esteem, devaluing, entitlement rage and hiding the self). These components divide into two higher order factors that relate to the two phenotypic themes of narcissism (narcissistic grandiosity and narcissistic vulnerability). For the present study, we used the higher order composites proposed by Shoenlenber original validation study (Schoenleber et al., 2015) (i.e., narcissistic grandiosity as the average of

exploitativeness, self-sacrificing self-enhancement and grandiose fantasies (Cronbach's α = 0.82-0.85) and narcissistic vulnerability as the average of contingent self-esteem, devaluing, entitlement rage and hiding the self (Cronbach's α = 0.88).

ADHD scales. For assessment of ADHD-specific symptoms, we used the *Wender-Utah Rating Scale* (WURS-25), the *Adult ADHD Self-Report Scale* (ASRS v1.1), the *Adult ADHD Quality Of Life* (AAQoL), and *the Conners' Adult ADHD Rating Scale* (CAARS). Regarding childhood, the WURS-25 items version is a short version of the original WURS (Baylé et al., 2003; Caci et al., 2010; Ward, 1993) and consists in a retrospective assessment of ADHD symptoms in childhood, with good internal consistency (Cronbach's α = 0.84) (Baylé et al., 2003). Regarding current symptom severity, the ASRS-v1.1 (Kessler et al., 2005) is an 18-items self-report questionnaire evaluating both ADHD dimensions (inattention and hyperactivity/impulsiveness). The ASRS-v1.1 also has good internal consistency (Cronbach's α = 0.88) (Adler et al., 2006). The CAARS 26-items is a short version of the original CAARS (Conners et al., 1999) and explores four dimensions (inattention/memory problems, hyperactivity/restlessness, impulsivity/emotional liability, and problems with self-concept). The CAARS-26 also has good internal consistency (Cronbach's α = 0.81-0.88 for men; 0.80-0.85 for women). Finally, regarding ADHD-related quality of life, the AAQoL scale is a 29-items self-report questionnaire assessing quality of life of adults with ADHD in four domains (life productivity, psychological health, relationships and life outlook), with great internal consistency (Cronbach's α = 0.93). A greater quality of life is indicated by a higher score (Brod et al., 2006).

Other psychometric scales. We used the *Beck Depression Inventory* (BDI, (Beck et al., 1988; Bourque and Beaudette, 1982) for the assessment of depressive symptoms (Cronbach's α = 0.86). Moreover, we used the *State Trait Anxiety Inventory,* trait subscale (STAI, (Spielberger et al., 1983) for the assessment of trait anxiety (Cronbach's α = 0.86 to 0.95). We used the short form of the *UPPS-P Impulsive Behavior Scale* (Billieux et al., 2012; Lynam et al., 2006) for the assessment of five domains of impulsivity: negative urgency, positive urgency, lack of premeditation, lack of perseverance and sensation seeking (Cronbach's α = 0.70-0.84). Finally, we used *the Difficulties in Emotion Regulation Scale – 18 items* (DERS-18; (Victor and Klonsky, 2016) for the assessment of emotion dysregulation, using only the total score (Cronbach's α = 0.91).

2.3. Statistical analysis

As PNI subscores were normally distributed as well as NPI after being squared, we performed linear regressions to test the associations between NPI total score, PNI grandiosity and PNI vulnerability as dependent variables and clinical and demographic characteristics of the sample. Analyses were adjusted on age and gender as these dimensions were either significantly associated with one or more of the dependent variables. In addition, our sample was enriched by patients suffering from comorbid borderline personality disorder (BPD), mainly due to selection bias causing over-representation of this comorbidity, as we are not only a facility dedicated to the care of adults suffering with ADHD, but also to the care of BPD patients. Thus, we also adjusted on BPD status to ensure that the observed associations between narcissistic dimensions and variables traditionally associated with BPD (such as those related to emotion dysregulation or suicidal behaviors) were not driven by this comorbidity. We did not correct for multiple testing given that it is not mandatory in exploratory study (Bender and Lange, 2001). Thus, associations reaching a p value ≤ 0.05 were considered significant. Analyses were conducted with StataSE 16.0 (StataCorp, 2013).

3. Results

3.1. Participants characteristics

The characteristics of the 164 adults ADHD patients are resumed in Table 1, and the mean scores, standard deviations, and number of patients for each scale are available in Table 2. The NPI was filled out by all the 164 participants. The other scales were filled out by only a part of our sample. The included patients were mostly ADHD mixed type or inattentive type (48.8% mixed-type, 40.8% inattentive type, 10.6% hyperactive type). 29.9% had a history of psychiatric hospitalization, 31.7% had a history of suicide attempt, and half of them had a history of non-suicidal self-injury. Most of them were single (44.5%), did not have children (56.7%) and were employed at the time of the inclusion (57.9%). 15.9% of our sample was taking psychostimulant medication. Finally, concerning lifetime psychiatric comorbidities, the most common comorbidities were substance use disorder (51.8%), major depressive disorder (50.6%) and borderline personality disorder (44.5%), and we found a prevalence of 9.5% for narcissistic personality disorder.

Table 1
Socio-demographic characteristics and comorbidity of the overall sample.

Socio-demographic characteristics	N	%
Number of patients	**164**	
Attentive type	67	40.8
Hyperactive type	17	10.4
Mixed type	80	48.8
Gender		
Male	60	36.6
Female	104	63.4
History of hospitalization		
Yes	49	29.9
No	115	70.1
History of suicide attempts		
Yes	52	31.7
No	112	68.3
History of nonsuicidal self-injury		
Yes	82	50
No	82	50
Civil state		
Single	73	44.5
In a relationship	65	39.6
Separated	26	15.9
Number of children		
0	93	56.7
1	23	14.0
2	31	18.9
3	17	10.4
Employment		
Yes	95	57.9
No	69	42.1
Use of psychostimulant medication		
Yes	26	15.9
No	138	84.1
Comorbid Disorder		
Major Depressive Disorder	83	50.6
Eating Disorder	23	14.0
Substance Use disorder	85	51.8
Anxiety Disorder	46	28.1
Bipolar Disorder/Schizo-Affective Disorder	20	12.2
Borderline Personality Disorder	73	44.5
Narcissistic Personality Disorder[a]	9	9.5

[a] Only 95 patients were assessed by the SCID for NPD (the percentage was made on these patients).

3.2. Associations with NPI

All the associations with the NPI can be found in Table 3. NPI was not associated with history of hospitalization, NSSI, suicide attempt, or use of psychostimulant medication. Concerning comorbid psychiatric disorders, NPI was positively associated with NPD (b = 0.61; 95%CI from 0.24 to 0.99; p = 0.001) and negatively with eating disorders (b = −1.29; 95%CI from −2.49 to −0.09; p = 0.036) and anxiety disorders (b = −1.05; 95% CI from −1.93 to −0.18; p = 0.019). NPI was not significantly associated with any other comorbid disorder. Concerning ADHD and other psychometric scales, NPI was not associated with any of the investigated measures.

Table 2
Psychometric scores.

Scale	N	Mean	SD
ADHD scales			
WURS-25	151	57.5	17.8
ASRS			
Inattention	98	25.1	6.3
Hyperactivity	98	21.8	7.2
AAQOL			
Total	133	48.0	12.5
CAARS-26			
Inattention	80	15.9	5.0
Hyperactive	80	9.5	4.1
Impulsivity	80	8.2	4.1
Self-Concept	80	11.7	4.2
Total	80	45.3	12.3
ACE			
Total Childhood			
Inattention	142	6.3	2.7
Hyperactivity	142	4.7	2.9
Total Adult			
Inattention	146	6.7	2.3
Hyperactivity	146	4.9	2.8
Narcissism scales			
NPI	164	3.5	2.7
PNI			
Grandiosity	160	2.27	1.01
Vulnerability	160	2.12	0.94
Other scales			
BDI-II	152	24.5	14.0
STAI			
Trait	138	55.7	12.3
UPPS-20			
Negative Urgency	94	11.4	3.3
Positive Urgency	94	12.4	3.0
Lack of Premeditation	94	9.2	3.1
Lack of Perseverance	94	10.1	3.0
Sensation Seeking	94	10.6	3.4
DERS-18	81	55.4	23.8

Abbreviations: AAQOL = Adult ADHD Quality of Life Questionnaire; ACE = ADHD Child Evaluation; ASRS = Adult Self-Report Scale; BDI = Beck Depression Inventory II; CAARS-26 = Conners Adult ADHD Rating Scales, 26 items; DERS-18 = Difficulties in Emotion Regulation Scale, 18 items; NPI = Narcissistic Personality Inventory; PNI = Pathological Narcissism Inventory; STAI = State-Trait Anxiety Inventory; UPPS-20 = UPPS Impulsive Behavior Scale, 20 items; WURS-25 = Wender-Utah Rating Scale, 25 items.

3.3. Associations with PNI grandiosity subscale

All the associations with the PNI grandiosity (PNIg) sub-score can also be found in Table 3. Concerning participant characteristics, PNIg score was only significantly associated with a history of hospitalization (b = 0.36; 95%CI from 0.03 to 0.69; p = 0.03). Concerning comorbid disorder, PNIg score was only negatively associated with eating disorder (b = - 0.54; 95%CI from −1.00 to −0.08; p = 0.022), and positively associated with NPD (b = 1.08; 95%CI from 0.3 to 1.86; p = 0.007). Concerning ADHD scales, PNIg score was positively associated with WURS-25 score (b = 0.01; 95%CI from 0.001 to 0.02; p = 0.023), the hyperactive subscore of ASRS (b = 0.04; 95%CI from 0.02 to 0.07; p = 0.002) and the hyperactive/impulsivity/self-concept subscores and the total scores of the CAARS (respectively, b = 0.06, 0.08, 0.06, 0.03; 95% CI from 0.01 to 0.12, 0.03 to 0.13, 0.01 to 0.11, 0.01 to 0.04; p = 0.022, 0.002, 0.016, 0.002). PNIg was also negatively associated with AAQOL total score (b = −0.03; 95%CI from −0.04 to −0.02; p < 0.0001). All the other associations with ADHD scales were non-significant. Finally, PNIg score was positively associated with BDI total score (b = 0.01; 95%CI from 0.002 to 0.03; p = 0.020), STAI trait score (b = 0.02; 95%CI from 0.003 to 0.03; p = 0.018), and the UPPS negative urgency subscore (b = 0.08; 95%CI from 0.02 to 0.13; p = 0.008). All the other associations were non-significant.

Table 3
Associations between characteristics or psychometric scores *and* NPI, PNI vulnerability subscale and PNI grandiosity subscale (associations reaching a p value < 0.05 are highlighted in bold).

Variable	NPI *Estimates [95% CI]*	PNI Grandiosity *Estimates [95% CI]*	PNI Vulnerability *Estimates [95% CI]*
Characteristics			
History of hospitalization	b = - 0.19 [-1.08 to 0.68]	**b = 0.36 [0.03 to 0.69]**	**b = 0.48 [0.17 to 0.79]**
History of suicide attempt	b = - 0.44 [-1.35 to 0.44]	b = 0.13 [-0.22 to 0.47]	**b = 0.34 [0.02 to 0.66]**
History of NSSI	b = - 0.01 [-0.85 to 0.81]	b = 0.20 [-0.11 to 0.52]	**b = 0.39 [0.09 to 0.68]**
Comorbid Disorder			
Major Depressive Disorder	b = - 0.34 [-1.19 to 0.51]	b = 0.14 [-0.18 to 0.46]	b = −0.02 [-0.33 to 0.29]
Eating Disorder	**b = - 1.29 [-2.49 to -0.09]**	**b = -0.54 [-1.00 to -0.08]**	b = −0.05 [-0.49 to 0.40]
Substance Use disorder	b = 0.05 [-0.76 to 0.86]	b = 0.25 [-0.58 to 0.55]	b = 0.21 [-0.08 to 0.49]
Anxiety Disorder	**b = - 1.05 [-1.93 to -0.18]**	b = −0.12 [-0.45 to 0.22]	b = −0.05 [-0.37 to 0.28]
Bipolar Disorder/ Schizo-Affective Disorder	b = - 0.47 [-1.69 to 0.75]	b = −0.19 [-0.65 to 0.26]	b = 0.09 [-0.34 to 0.53]
Borderline Personality Disorder	b = 0.28 [-0.09 to 0.17]	b = 0.27 [-0.06 to 0.599]	**b = 0.40 [0.09 to 0.71]**
Narcissistic Personality Disorder	**b = 0.61 [0.24 to 0.99]**	**b = 1.08 [0.30 to 1.86]**	b = 0.7 [-0.11 to 1.54]
ADHD scales			
WURS-25	b < 0.01 [-0.02 to 0.03]	**b = 0.01 [0.001 to 0.02]**	**b = 0.02 [0.01 to 0.03]**
ASRS			
Inattention	b = - 0.03 [-0.11 to 0.06]	b = 0.02 [-0.01 to 0.05]	b = 0.01 [-0.016 to 0.04]
Hyperactivity	b = 0.07 [-0.01 to 0.14]	**b = 0.04 [0.02 to 0.07]**	**b = 0.03 [0.01 to 0.06]**
AAQOL			
Total	b = - 0.02 [-0.06 to 0.01]	**b = -0.03 [-0.04 to -0.02]**	**b = -0.03 [-0.04 to -0.02]**
CAARS-26			
Inattention	b = - 0.02 [-0.014 to 0.09]	b = 0.03 [-0.01 to 0.07]	b = 0.03 [-0.02 to 0.07]
Hyperactive	b = 0.13 [-0.004 to 0.27]	**b = 0.06 [0.01 to 0.12]**	**b = 0.06 [0.02 to 0.11]**
Impulsivity	b = 0.08 [-0.072 to 0.22]	**b = 0.08 [0.03 to 0.13]**	**b = 0.09 [0.04 to 0.14]**
Self-Concept	b = - 0.09 [-0.24 to 0.05]	**b = 0.06 [0.01 to 0.11]**	**b = 0.06 [0.01 to 0.11]**
Total	b = 0.01 [-0.04 to 0.06]	**b = 0.03 [0.01 to 0.04]**	**b = 0.03 [0.01 to 0.04]**
ACE			
Total Childhood			
Inattention	b = - 0.01 [-0.18 to 0.15]	b < 0.01 [-0.05 to 0.06]	b = −0.01 [-0.07 to 0.05]

(*continued on next page*)

Table 3 (*continued*)

Variable	NPI *Estimates [95% CI]*	PNI Grandiosity *Estimates [95% CI]*	PNI Vulnerability *Estimates [95% CI]*
Hyperactivity	b = 0.06 [-0.09 to 0.21]	b = 0.03 [-0.03 to 0.08]	b = 0.04 [-0.02 to 0.09]
Total Adult			
Inattention	b = - 0.12 [-0.30 to 0.07]	b = 0.04 [-0.02 to 0.09]	b = −0.01 [-0.08 to 0.05]
Hyperactivity	b = 0.12 [-0.03 to 0.27]	b = 0.01 [-0.05 to 0.08]	b = 0.05 [-0.002 to 0.11]
Other scales			
BDI-II	b = - 0.01 [-0.04 to 0.02]	**b = 0.01 [0.002 to 0.03]**	**b = 0.02 [0.01 to 0.03]**
STAI			
Trait	b = - 0.02 [-0.05 to 0.02]	**b = 0.02 [0.003 to 0.03]**	**b = 0.02 [0.01 to 0.03]**
UPPS-20			
Negative Urgency	b = 0.06 [-0.11 to 0.23]	**b = 0.08 [0.02 to 0.13]**	**b = 0.09 [0.04 to 0.15]**
Positive Urgency	b = 0.07 [-0.12 to 0.25]	b = 0.05 [-0.01 to 0.12]	**b = 0.06 [0.004 to 0.12]**
Lack of Premeditation	b = 0.05 [-0.13 to 0.23]	b = 0.03 [-0.03 to 0.09]	b = 0.03 [-0.03 to 0.09]
Lack of Perseverance	b = - 0.08 [-0.27 to 0.11]	b = 0.05 [-0.02 to 0.09]	b = 0.05 [-0.01 to 0.11]
Sensation Seeking	b = 0.14 [-0.04 to 0.30]	b = 0.03 [-0.03 to 0.09]	b = 0.04 [-0.02 to 0.09]
DERS-18	b = - 0.01 [-0.03 to 0.02]	b = 0.01 [-0.001 to 0.02]	**b = 0.01 [0.004 to 0.02]**

Abbreviations: AAQOL = Adult ADHD Quality of Life Questionnaire; ACE = ADHD Child Evaluation; ASRS = Adult Self-Report Scale; BDI = Beck Depression Inventory II; CAARS-26 = Conners Adult ADHD Rating Scales, 26 items; DERS-18 = Difficulties in Emotion Regulation Scale, 18 items; NPI = Narcissistic Personality Inventory; PNI = Pathological Narcissism Inventory; STAI = State-Trait Anxiety Inventory; UPPS-20 = UPPS Impulsive Behavior Scale, 20 items; WURS-25 = Wender-Utah Rating Scale, 25 items.

3.4. Associations with PNI vulnerability subscale

All the associations with the PNI vulnerability (PNIv) sub-score can also be found in Table 3. Concerning participant characteristics, PNIv score was positively associated with a history of hospitalization (b = 0.48; 95%CI from 0.17 to 0.79; p = 0.003), suicide attempt (b = 0.34; 95%CI from 0.02 to 0.66; p = 0.04) and NSSI (b = 0.39; 95%CI from 0.09 to 0.68; p = 0.01). Concerning comorbid disorders, PNIv score was only positively associated with BPD (b = 0.40; 95%CI from 0.09 to 0.71; p = 0.012). Concerning ADHD scales, PNIv score was positively associated with WURS-25 score (b = 0.02; 95%CI from 0.01 to 0.03; p < 0.0001), the ASRS hyperactivity subscore (b = 0.03; 95%CI from 0.01 to 0.06; p = 0.01) and the CAARS hyperactive/impulsivity/self-concept subscores and total score (respectively, b = 0.06, 0.09, 0.06, 0.03; 95%CI from 0.02 to 0.11, 0.04 to 0.14, 0.01 to 0.11, 0.01 to 0.04; p = 0.008, 0.0004, 0.021, 0.001). It was also negatively associated with AAQOL total score (b = - 0.03; 95%CI from - 0.04 to – 0.02; p < 0.0001). All the other associations with ADHD scales were non-significant. Finally, concerning the other psychometric scales, PNIv score was positively associated with BDI total score (b = 0.02; 95%CI from 0.01 to 0.03; p < 0.0001), STAI trait score (b = 0.02; 95%CI from 0.01 to 0.03; p = 0.001), the UPPS negative and positive urgency subscores (respectively, b = 0.09, 0.06; 95%CI from 0.04 to 0.15, 0.004 to 0.12; p = 0.001, 0.038) and the DERS total score (b = 0.01; 95%CI from 0.004 to 0.02; p = 0.003). All the other associations were non-significant.

Given the associations we found between PNIv score, BPD diagnosis, and BPD-relevant outcomes (hospitalization, suicide attempt, impulsivity and emotion dysregulation), we controlled these associations on the BPD status to see if they remained significant. We found that the association was still significant for history of hospitalization (b = 6.59; p = 0.012) and DERS score (b = 0.15; p = 0.02) but became non-significant for history of suicide attempt and for impulsivity. These results indicated that the association between history of hospitalization, emotion dysregulation, and the PNI vulnerability sub-score cannot be fully explained by the BPD status.

4. Discussion

The aim of the present study was to explore the prevalence of narcissistic pathology (with or without a diagnosis of NPD) in ADHD patients, and its potential links with ADHD symptoms/outcomes. We found that 9,5% of our ADHD patients sample suffered from NPD, and that both dimensions of narcissism assessed with the PNI were associated with ADHD hyperactivity and impulsivity symptoms but not with inattentive symptoms. These dimensions of narcissism were also associated with several aspects of psychosocial dysfunction, including anxiety, depression, negative urgency impulsiveness or poor quality of life. Moreover, narcissistic vulnerability only was also associated with emotion dysregulation, even after adjustment on borderline symptoms. Finally, no significant association was found between NPI and ADHD symptoms, severity or comorbidities.

The NPD prevalence rate found in this sample was 10 times superior to the prevalence of NPD in general population, that is around 1% when we consider functional impairment associated with disorder (Trull et al., 2010). If this comparison should be taken with great caution given the differences in terms of sampling methods between Trull's study and ours (large cohort conducted in the US general population for the first, and small cohort gathered in an ADHD specialized unit for the second), the high prevalence we found is in line with another study that used the same sampling method (inclusion of in- and outpatients referred to a tertiary referral center specialized in ADHD) (Jacob et al., 2016), even though the prevalence of NPD was higher in the latter (29.8%). This aspect could be explained by an uneven distribution of gender in our cohort (104 females to 60 males). Indeed, research have shown that males score higher on narcissistic grandiosity but equally on vulnerability compared to females (Weidmann et al., 2023). Thus, our sample may be more representative of the vulnerable facet of narcissism that of grandiose. This is even more plausible given that our sample was composed of treatment-seeking patients and that narcissistic patients seeking outpatient treatment are mostly vulnerable (Pincus et al., 2014). These considerations may explain the high prevalence of BPD, given the NPD diagnosis mostly captures highly grandiose patients (Baggio et al., 2022; Cain et al., 2008), and given that females are more frequently diagnosed with borderline and histrionic personality disorders and males with NPD (Schulte Holthausen and Habel, 2018). All these aspects suggest that a more balanced distribution of genders in our sample could have increased the prevalence of NPD and decrease the observed prevalence of BPD.

Our second main finding was that the ADHD hyperactivity/impulsivity dimension (as assessed by both the ASRS and the CAARS-26) was associated with both dimensions of narcissism, but not ADHD inattention. To our knowledge, our study is the first to show that different phenotypical aspects of narcissism associate differently with both ADHD dimensions. The fact that the main dimension of ADHD linking the latter with pathological narcissism is hyperactivity/impulsivity reminds of similar observations conducted in ADHD children. Some evidence shows that ADHD children present a specific tendency for inflated self-views called positive illusory bias (PIB), meaning that ADHD children tend to over-estimate their competences in the areas where they are actually

deficient (social, academic, athletic) (Hoza et al., 2004; Owens et al., 2007; Owens and Hoza, 2003). Given that inflated self-views are a hallmark of narcissistic functioning, several authors speculate on the developmental relationship between PIB and later adult pathological narcissism (Grafeman et al., 2011). Moreover, PIB seems to be associated with externalizing behaviors like hyperactivity, impulsivity or aggression, and significantly less with internalizing tendencies like depression and anxiety (David and Kistner, 2000; Grafeman et al., 2011; Owens et al., 2007; Owens and Hoza, 2003), and externalizing tendencies seem to predict more PIB (Volz-Sidiropoulou et al., 2016). Some studies even suggest to that PIB and externalizing could have a common neuropsychological ground, like deficits of frontal lobe with executive dysfunction (Séguin et al., 2004), cognitive and metacognitive functioning (Martin et al., 2020; Poissant, 2004) and limitations in pragmatic language (Crisci et al., 2022).

But how can we understand this association between PIB and externalization? One hypothesis is that PIB develops as a defense mechanism against rejection from others caused by externalization. Thus, PIB may be a self-protective function, meaning that the child with ADHD presenting repeated externalizing behaviors might develop a tendency to over-estimate his competences to be spared from the aversive emotional experience of being exposed as dysfunctional (Diener and Milich, 1997; Owens et al., 2007; Volz-Sidiropoulou et al., 2016). In this context, our findings of a wider association between severity of outcomes in ADHD and narcissistic vulnerability (see below) make sense. Narcissistic vulnerability as evaluated by PNI (PNIv), more than grandiosity (PNIg), evaluates the strong emotional responses in context of inter-personal challenges, like the shame of recognition-dependency or the need to hide one's faults (Pincus et al., 2009). It could be the case that PNIv measures the fundamental vulnerabilities and defensive needs at the origins of PIB, defensive needs that could be more prevailing in the case of severe ADHD with externalizing tendencies and emotion dysregulation. For now, it is impossible to establish the right causal hierarchy between externalization, emotion dysregulation, PIB, and narcissistic vulnerability in ADHD patients, and further enquiry is vastly needed to disentangle this complex relationship.

We also found that narcissistic grandiosity and vulnerability were positively associated with a history of hospitalization, anxiety, depression, negative urgency impulsiveness, and negatively with quality of life. This suggests that the presence of narcissistic comorbidity in ADHD can significantly impact well-being and outcomes. However, only narcissistic vulnerability was associated with history of suicide attempts, history of non-suicidal self-injury, positive urgency impulsiveness and difficulties with emotional regulation. These results suggest that narcissistic vulnerability may indicate a clinical picture marked by a more significant emotional and behavioral dysregulation. This is in line with previous studies that indicate that narcissistic vulnerability is a more dysfunctional aspect of narcissism (Euler et al., 2018) and is associated with higher level of emotion dysregulation (Ponzoni et al., 2021; Zhang et al., 2015). Emotion dysregulation has even been found to mediate the relation between narcissistic vulnerability and some severe pathological manifestations like suicidal ideation (Ponzoni et al., 2021) or interpersonal aggression (Caffarel, 2019). Finally, to account for a possible impact of comorbid borderline symptoms on clinical severity, and given the high prevalence of BPD in our sample, we adjusted the abovementioned associations on BPD status. It was interesting to observe that history of hospitalization and difficulties with emotion regulation were still significantly associated to narcissistic vulnerability after adjustment for BPD status. This suggests that BPD doesn't fully explain the more severe dysfunction associated with narcissistic vulnerability.

The discussion around the role played by both BPD and pathological narcissism in the clinical severity of ADHD patients raises questions on the common grounds and differences between these three disorders. Indeed, the differentiation between them (or the identification of comorbidities) is a common clinical challenge for clinicians working with these populations (Kernberg and Yeomans, 2013), especially in presence of transdiagnostic features such as emotion dysregulation (Blay et al., 2024). Our readers may thus need some guidance on how to spot narcissistic traits in their ADHD patients and on how to distinguish them from borderline traits or classic ADHD traits. For this matter, we believe that clinicians should focus on the investigation of the patient's interpersonal style. This aspect have been largely described in a recent publication (Blay et al., 2024), but briefly, these three disorders are characterized by significant differences in terms of interpersonal functioning. ADHD typical interpersonal styles, especially in hyperactive type, is characterized by talkativeness, excitability, impulsivity, and novelty seeking. These patients may have interpersonal issues linked to logistical or organizational issues, or to reproaches of distractibility and inattention. However, in presence of narcissistic traits, ADHD patients may present also with a dependency on external admiration, validation or reassurance, leading to interpersonal conflicts or withdrawal when facing self-esteem threats. Patients with such comorbidity may also present with a tendency towards arrogance, devaluation of others and victimization. Moreover, in presence of borderline traits, ADHD patients may present also with intense and chaotic relationships fluctuating between idealization and devaluation, leading to interpersonal conflicts in the face of real or imagined rejection, and with large relational dependency to regulate emotions and identity diffusion (American Psychiatric Association, 2013; Blay et al., 2024; Kernberg and Yeomans, 2013). Finally, when facing ADHD patients with clear emotion dysregulation, we believe clinicians should not only investigate interpersonal style but may also focus on what *triggers* emotion dysregulation, given that these three disorders differ on the latter aspect. Indeed, while ADHD-only patients are mostly triggered by impatience and boredom, ADHD with narcissistic traits may also be triggered by threats to self-esteem and positive self-image (Nook et al., 2022; Weinberg et al., 2019), and those with borderline traits may also be triggered by real or imagined rejection challenging their emotional and identity dependency towards the object of relationship (Gunderson, 2014).

However, there are numerous limitations in our study that should be considered. First, our study underlines the impact of the tool used to assess both ADHD and narcissism on the associations found. Regarding childhood ADHD symptoms, we found a lack of association with both dimensions of narcissism when ADHD was assessed using the semi-structured interview ACE+, whereas we found positive associations with both grandiosity and vulnerability when ADHD was assessed using the WURS-25. Similarly, we found a complete lack of association between both dimensions of narcissism and adult hyperactive symptoms assessed using the ACE+, whereas we found significant associations using the ASRS and the CAARS scales. Such discrepancy between interviewer-rated and patient-rated symptomatology has been described in previous studies on ADHD or other psychiatric dimensions such as depression (e.g., (Kooij et al., 2008; Uher et al., 2012; Zimmerman and Coryell, 1990). These studies underlined the importance and complementarity of both methods (Uher et al., 2012). However, the fact that both the ASRS and the CAARS indicate towards the same pattern of association with narcissism (i.e., only with hyperactive/impulsive symptoms) suggests that this dimension may be of great interest when considering the link between ADHD and narcissism, even though these results are only preliminary and should be confirmed in future studies.

On the other hand, regarding narcissism, we found a lack of significant associations between NPI scores and ADHD symptoms, dysfunction or comorbidities, despite the presence of many significant associations using the grandiosity subscale of the PNI. Such differences between the NPI and other measures of narcissism have been underlined in a recent systematic review on the link between emotion dysregulation and narcissism (Blay et al., in press-b), where different patterns of association were found depending on the scale used to assess narcissism (no or negative association for NPI; positive, negative, or no associations for PNI; positive association for Dark Triad Scales). But how can these differences between the NPI and the PNI can be explained in our study? In

our opinion, two hypotheses can be drawn. First, they seem in line with other studies that casted some doubts about the usefulness of the NPI to fully grasp narcissistic dysfunction (Pincus et al., 2009). Indeed, it has been stated that the NPI doesn't capture only the maladaptive forms of narcissism, as high values of NPI can be related to adaptative and high-functioning forms of self-esteem (Rosenthal and Hooley, 2010; Watson et al., 2006). Our results align with the latter assumption, given that NPI scores showed negative associations with eating and anxiety disorders. Thus, our results could support the hypothesis that NPI does not always measure narcissistic dysfunction. On the other hand, the PNI has also been the subject of critics regarding the construct validity of the grandiosity measure. Indeed, the grandiosity subscale of the PNI shares considerable overlap with narcissistic vulnerability (Edershile et al., 2019). Some authors have even argued for a reformulation of the PNI's higher order factor structure, in order to better encompass specific aspects of narcissistic grandiosity (Karakoula et al., 2013). The internal structure considered for this study was the same as the one proposed by the original validation study of the 28-Item PNI (Schoenleber et al., 2015), as such, it comes with some of its intrinsic limitations. This could mean that the different results we obtained with the NPI and the PNI grandiosity could be better explained by the latter's overlap with vulnerability than by the NPI's difficulties to grasp narcissistic dysfunction. Altogether, these results underline the importance of caution when interpretating our results regarding grandiosity.

But the limitations of the present study are not restricted to psychometry. Indeed, the composition of our sample may have induced an important selection bias, given 1°) the highly asymmetrical gender distribution (63.4% of females), 2°) the high prevalence of BPD (44.5%), 3°) the small number of patients with hyperactive type ADHD (n = 17) (all other participants having either mixed or inattentive type) and 4°) the overall severity of our ADHD sample, as emphasized by the high rate of past hospitalization, suicide attempts, and comorbidities. Given these specificities, we want to warn our readers to not over-conclude on the generalizability of our findings to the overall population of ADHD patients, notably in terms of prevalence of NPD. Moreover, given that only BPD and NPD were assessed in our study, it is possible that patients with ADHD and without BPD and NPD also have other personality disorders that were not assessed here, which may also impact the generalizability of our findings. This is even more possible given the high comorbidity rates between ADHD and other personality disorders (e.g., antisocial) described in the introduction. Finally, even though all patients filled-out the NPI questionnaire, not all patients filled out the other self-administered psychometric scales, which may have induced an information bias. However, despite these numerous limitations, we believe that our results may be of interest, especially when considering the scarcity of research conducted on narcissism in ADHD. Indeed, they provide novel and significant insights on an understudied and potentially important aspect of personality pathology in adult with ADHD and could serve as a basis for future research.

CRediT authorship contribution statement

Miguel Duarte: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Martin Blay:** Writing – original draft, Writing – review & editing. **Roland Hasler:** Project administration, Writing – review & editing. **Eleonore Pham:** Project administration, Writing – review & editing. **Rosetta Nicastro:** Project administration, Writing – review & editing. **Marlène Jan:** Project administration, Writing – review & editing. **Martin Debbané:** Supervision, Writing – review & editing. **Nader Perroud:** Conceptualization, Methodology, Project administration, Supervision, Writing – review & editing.

Declaration of Competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Adler, L.A., Spencer, T., Faraone, S.V., Kessler, R.C., Howes, M.J., Biederman, J., Secnik, K., 2006. Validity of Pilot adult ADHD self- report scale (ASRS) to rate adult ADHD symptoms. Ann. Clin. Psychiatr. 18 (3), 145–148. https://doi.org/10.1080/10401230600801077.

Agarwal, R., Goldenberg, M., Perry, R., IsHak, W.W., 2012. The quality of life of adults with attention deficit hyperactivity disorder: a systematic review. Innovations in Clinical Neuroscience 9 (5–6), 10–21.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, fifth ed. American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596.

Baggio, S., Iglesias, K., Duarte, M., Nicastro, R., Hasler, R., Euler, S., Debbané, M., Starcevic, V., Perroud, N., 2022. Validation of self-report measures of narcissism against a diagnostic interview. PLoS One 17 (4), e0266540. https://doi.org/10.1371/journal.pone.0266540.

Baylé, F., Martin, C., Wender, P., 2003. Version française de la Wender Utah Rating Scale (WURS). Can. J. Psychiatr. 48 (2) https://doi.org/10.1177/070674370304800220, 132–132.

Beck, A.T., Steer, R.A., Carbin, M.G., 1988. Psychometric properties of the Beck depression Inventory: Twenty-five years of evaluation. Clin. Psychol. Rev. 8 (1), 77–100. https://doi.org/10.1016/0272-7358(88)90050-5.

Bender, R., Lange, S., 2001. Adjusting for multiple testing—when and how? J. Clin. Epidemiol. 54 (4), 343–349. https://doi.org/10.1016/S0895-4356(00)00314-0.

Bernardi, S., Faraone, S.V., Cortese, S., Kerridge, B.T., Pallanti, S., Wang, S., Blanco, C., 2012. The lifetime impact of attention deficit hyperactivity disorder: results from the National Epidemiologic Survey on Alcohol and related Conditions (NESARC). Psychol. Med. 42 (4), 875–887. https://doi.org/10.1017/S003329171100153X.

Biederman, J., 2004. Impact of comorbidity in adults with attention-deficit/hyperactivity disorder. J. Clin. Psychiatry 65 (Suppl. 3), 3–7.

Billieux, J., Rochat, L., Ceschi, G., Carré, A., Offerlin-Meyer, I., Defeldre, A.-C., Khazaal, Y., Besche-Richard, C., Van der Linden, M., 2012. Validation of a short French version of the UPPS-P impulsive behavior scale. Compr. Psychiatr. 53 (5), 609–615. https://doi.org/10.1016/j.comppsych.2011.09.001.

Blay, M., Bouteloup, M., Duarte, M., Hasler, R., Pham, E., Nicastro, R., Jan, M., Debbané, M., Perroud, N., in press-a. Association between pathological narcissism and emotion regulation: the role of self-mentalizing? Pers. Ment. Health.

Blay, M., Cham, M.-A., Duarte, M., Ronningstam, E., in press-b. Association between pathological narcissism and emotion dysregulation: a systematic review. Psychopathology.

Blay, M., Duarte, M., Dessouli, M.-A., Durpoix, A., Rüfenacht, E., Weibel, S., Speranza, M., Perroud, N., 2024. Proposition of a transdiagnostic processual approach of emotion dysregulation based on core triggers and interpersonal styles. Front. Psychiatr. 15 https://doi.org/10.3389/fpsyt.2024.1260138.

Bourque, P., Beaudette, D., 1982. Étude psychometrique du questionnaire de dépression de Beck auprès d'un échantillon d'étudiants universitaires francophones. [Psychometric study of the Beck Depression Inventory on a sample of French-speaking university students.]. Can. J. Behav. Sci./Rev. Can. Sci. Comport. 14 (3), 211–218. https://doi.org/10.1037/h0081254.

Brod, M., Johnston, J., Able, S., Swindle, R., 2006. Validation of the adult attention-deficit/hyperactivity disorder quality-of-life Scale (AAQoL): a disease-specific quality-of-life measure. Qual. Life Res.: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation 15 (1), 117–129. https://doi.org/10.1007/s11136-005-8325-z.

Caci, H.M., Bouchez, J., Baylé, F.J., 2010. An aid for diagnosing attention-deficit/hyperactivity disorder at adulthood: psychometric properties of the French versions of two Wender Utah Rating Scales (WURS-25 and WURS-K). Compr. Psychiatr. 51 (3), 325–331.

Caffarel, S., 2019. *Vulnerable Narcissism, Difficulties in Emotion Regulation, and Relational Aggression in College Students* [University of Southern Mississipi]. https://aquila.usm.edu/honors_theses/673.

Cain, N.M., Pincus, A.L., Ansell, E.B., 2008. Narcissism at the crossroads: phenotypic description of pathological narcissism across clinical theory, social/personality psychology, and psychiatric diagnosis. Clin. Psychol. Rev. 28 (4), 638–656. https://doi.org/10.1016/j.cpr.2007.09.006.

Conners, C.K., Erhardt, D., Sparrow, E., 1999. Conner's adult ADHD rating scales: Technical manual. Multi-Health Systems Incorporated (MHS), North, Tonawanda, NY, p. 144.

Cook, J., Knight, E., Hume, I., Qureshi, A., 2014. The self-esteem of adults diagnosed with attention-deficit/hyperactivity disorder (ADHD): a systematic review of the literature. Attention Deficit and Hyperactivity Disorders 6 (4), 249–268. https://doi.org/10.1007/s12402-014-0133-2.

Crisci, G., Cardillo, R., Mammarella, I.C., 2022. The Processes Underlying positive illusory bias in ADHD: the role of executive functions and pragmatic language Skills. J. Atten. Disord. 26 (9), 1245–1256. https://doi.org/10.1177/10870547211063646.

David, C.F., Kistner, J.A., 2000. Do positive self-perceptions have a "dark side"? Examination of the link between perceptual bias and aggression. J. Abnorm. Child Psychol. 28 (4), 327–337. https://doi.org/10.1023/A:1005164925300.

Diener, M.B., Milich, R., 1997. Effects of positive feedback on the social interactions of boys with attention deficit hyperactivity disorder: a test of the self-protective hypothesis. J. Clin. Child Psychol. 26 (3), 256–265. https://doi.org/10.1207/s15374424jccp2603_4.

Diguer, L., Turmel, V., Brin, J., Lapointe, T., Chrétien, S., Marcoux, L.-A., Mathieu, V., Da Silva Luis, R., 2020. Traduction et validation en Français du Pathological Narcissism Inventory. [Translation and validation in French of the Pathological Narcissism Inventory. Can. J. Behav. Sci./Rev. Can. Sci. Comport. 52 (2), 115–120. https://doi.org/10.1037/cbs0000140.

Ditrich, I., Philipsen, A., Matthies, S., 2021. Borderline personality disorder (BPD) and attention deficit hyperactivity disorder (ADHD) revisited – a review-update on common grounds and subtle distinctions. Borderline Personality Disorder and Emotion Dysregulation 8 (1), 22. https://doi.org/10.1186/s40479-021-00162-w.

Drozek, R.P., Unruh, B.T., 2020. Mentalization-based treatment for pathological narcissism. J. Pers. Disord. 34 (Suppl. ment), 177–203. https://doi.org/10.1521/pedi.2020.34.supp.177.

Edershile, E.A., Simms, L.J., Wright, A.G.C., 2019. A Multivariate analysis of the pathological narcissism Inventory's Nomological Network. Assessment 26 (4), 619–629. https://doi.org/10.1177/1073191118766412.

Edershile, E.A., Wright, A.G.C., 2021. Fluctuations in grandiose and vulnerable narcissistic states: a momentary perspective. Journal of Personality and Social Psychology 120 (5), 1386–1414. https://doi.org/10.1037/pspp0000370.

Erkoreka, L., Navarro, B., 2017. Vulnerable narcissism is associated with severity of depressive symptoms in dysthymic patients. Psychiatr. Res. 257, 265–269. https://doi.org/10.1016/j.psychres.2017.07.061.

Euler, S., Stöbi, D., Sowislo, J., Ritzler, F., Huber, C.G., Lang, U.E., Wrege, J., Walter, M., 2018. Grandiose and vulnerable narcissism in borderline personality disorder. Psychopathology 51 (2), 110–121. https://doi.org/10.1159/000486601.

Fayyad, J., Sampson, N.A., Hwang, I., Adamowski, T., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L.H.S.G., Borges, G., de Girolamo, G., Florescu, S., Gureje, O., Haro, J.M., Hu, C., Karam, E.G., Lee, S., Navarro-Mateu, F., O'Neill, S., Pennell, B.-E., Piazza, M., et al., 2017. The descriptive epidemiology of DSM-IV adult ADHD in the World health organization World mental health Surveys. ADHD Attention Deficit and Hyperactivity Disorders 9 (1), 47–65. https://doi.org/10.1007/s12402-016-0208-3.

First, M.B., Spitzer, R.L., Gibbon, M., Williams, J.B., Lorna Smith, B., Cottraux, J., Cottraux, M., 2013. Entretien clinique structuré pour les troubles de la personnalité de l'axe II du DSM-IV.

Gentile, B., Miller, J.D., Hoffman, B.J., Reidy, D.E., Zeichner, A., Campbell, W.K., 2013. A test of two brief measures of grandiose narcissism: the Narcissistic Personality Inventory–13 and the Narcissistic Personality Inventory-16. Psychol. Assess. 25 (4), 1120–1136. https://doi.org/10.1037/a0033192.

Gift, T.E., Reimherr, F.W., Marchant, B.K., Steans, T.A., Wender, P.H., 2016. Personality disorder in adult attention-deficit/hyperactivity disorder: Attrition and Change during Long-term treatment. J. Nerv. Ment. Dis. 204 (5), 355–363. https://doi.org/10.1097/NMD.0000000000000470.

Grafeman, S.J., Bader, S.H., Davis, S.E., 2011. Narcissism, positive illusory bias, and externalizing behaviors. In: Barry, T.D. (Ed.), Narcissism and Machiavellianism in Youth: Implications for the Development of Adaptive and Maladaptive Behavior. American Psychological Association, pp. 159–173. https://doi.org/10.1037/12352-009.

Gunderson, J.G., 2014. Handbook of Good Psychiatric Management for Borderline Personality Disorder. American Psychiatric Pub.

Harpin, V., Mazzone, L., Raynaud, J.P., Kahle, J., Hodgkins, P., 2016. Long-Term outcomes of ADHD: a systematic review of self-esteem and social function. J. Atten. Disord. 20 (4), 295–305. https://doi.org/10.1177/1087054713486516.

Hoza, B., Gerdes, A.C., Hinshaw, S.P., Arnold, L.E., Pelham, W.E., Molina, B.S.G., Abikoff, H.B., Epstein, J.N., Greenhill, L.L., Hechtman, L., Odbert, C., Swanson, J.M., Wigal, T., 2004. Self-Perceptions of competence in children with ADHD and comparison children. J. Consult. Clin. Psychol. 72 (3), 382–391. https://doi.org/10.1037/0022-006X.72.3.382.

Jacob, C.P., Gross-Lesch, S., Reichert, S., Geissler, J., Jans, T., Kittel-Schneider, S., Nguyen, T.T., Romanos, M., Reif, A., Dempfle, A., Lesch, K.-P., 2016. Sex- and Subtype-related differences of personality disorders (Axis II) and personality traits in Persistent ADHD. J. Atten. Disord. 20 (12), 1056–1065. https://doi.org/10.1177/1087054714521293.

Karakoula, P., Triliva, S., Tsaousis, I., 2013. Description of the basic psychometric characteristics and the factor structure of the Greek version of the Pathological Narcissism Inventory. Psychology 20 (2), 160–175.

Katzman, M.A., Bilkey, T.S., Chokka, P.R., Fallu, A., Klassen, L.J., 2017. Adult ADHD and comorbid disorders: clinical implications of a dimensional approach. BMC Psychiatr. 17 (1), 302. https://doi.org/10.1186/s12888-017-1463-3.

Kernberg, O.F., Yeomans, F.E., 2013. Borderline personality disorder, bipolar disorder, depression, attention deficit/hyperactivity disorder, and narcissistic personality disorder: Practical differential diagnosis. Bull. Menninger Clin. 77 (1), 1–22. https://doi.org/10.1521/bumc.2013.77.1.1.

Kessler, R.C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E.V.A., Howes, M.J., Jin, R., Secnik, K., Spencer, T., 2005. The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. Psychol. Med. 35 (2), 245–256.

Kjærvik, S.L., Bushman, B.J., 2021. The link between narcissism and aggression: a meta-analytic review. Psychol. Bull. 147 (5), 477–503. https://doi.org/10.1037/bul0000323.

Kooij, J.J.S., Boonstra, M.A., Swinkels, S.H.N., Bekker, E.M., de Noord, I., Buitelaar, J.K., 2008. Reliability, validity, and utility of instruments for self-report and informant report concerning symptoms of ADHD in adult patients. J. Atten. Disord. 11 (4), 445–458. https://doi.org/10.1177/1087054707299367.

Lynam, D.R., Smith, G.T., Whiteside, S.P., Cyders, M.A., 2006. The UPPS-P: Assessing Five Personality Pathways to Impulsive Behavior, vol. 10. Purdue University, West Lafayette.

Marchant, B.K., Reimherr, F.W., Halls, C., Williams, E.D., Strong, R.E., 2010. OROS methylphenidate in the treatment of adults with ADHD: a 6-month, open-label, follow-up study. Ann. Clin. Psychiatr.: Official Journal of the American Academy of Clinical Psychiatrists 22 (3), 196–204.

Martin, C.P., Shoulberg, E.K., Hoza, B., Vaughn, A., Waschbusch, D.A., 2020. Factors relating to the presence and Modifiability of self-perceptual bias among children with ADHD. Child Psychiatr. Hum. Dev. 51 (2), 281–293. https://doi.org/10.1007/s10578-019-00929-x.

Matthies, S., Philipsen, A., 2016. Comorbidity of personality disorders and adult attention deficit hyperactivity disorder (ADHD)—review of recent findings. Curr. Psychiatr. Rep. 18 (4), 33. https://doi.org/10.1007/s11920-016-0675-4.

Matthies, S., van Elst, L.T., Feige, B., Fischer, D., Scheel, C., Krogmann, E., Perlov, E., Ebert, D., Philipsen, A., 2011. Severity of childhood attention-deficit hyperactivity disorder—a risk factor for personality disorders in adult life? J. Pers. Disord. 25 (1), 101–114. https://doi.org/10.1521/pedi.2011.25.1.101.

Mitra, P., Fluyau, D., 2023. Narcissistic personality disorder. In: StatPearls. StatPearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK556001/.

Newark, P.E., Elsässer, M., Stieglitz, R.-D., 2016. Self-esteem, self-Efficacy, and Resources in adults with ADHD. J. Atten. Disord. 20 (3), 279–290. https://doi.org/10.1177/1087054712459561.

Nook, E.C., Jaroszewski, A.C., Finch, E.F., Choi-Kain, L.W., 2022. A cognitive-behavioral Formulation of narcissistic self-esteem dysregulation. FOCUS 20 (4), 378–388. https://doi.org/10.1176/appi.focus.20220055.

Owens, J.S., Goldfine, M.E., Evangelista, N.M., Hoza, B., Kaiser, N.M., 2007. A critical review of self-perceptions and the positive illusory bias in children with ADHD. Clin. Child Fam. Psychol. Rev. 10 (4), 335–351. https://doi.org/10.1007/s10567-007-0027-3.

Owens, J.S., Hoza, B., 2003. The role of inattention and hyperactivity/impulsivity in the positive illusory bias. J. Consult. Clin. Psychol. 71 (4), 680–691. https://doi.org/10.1037/0022-006X.71.4.680.

Pincus, A.L., Ansell, E.B., Pimentel, C.A., Cain, N.M., Wright, A.G.C., Levy, K.N., 2009. Initial construction and validation of the pathological narcissism Inventory. Psychol. Assess. 21 (3), 365–379. https://doi.org/10.1037/a0016530.

Pincus, A.L., Cain, N.M., Wright, A.G.C., 2014. Narcissistic grandiosity and narcissistic vulnerability in psychotherapy. Personality Disorders: Theory, Research, and Treatment 5 (4), 439–443. https://doi.org/10.1037/per0000031.

Pincus, A.L., Lukowitsky, M.R., 2010. Pathological narcissism and narcissistic personality disorder. Annu. Rev. Clin. Psychol. 6 (1), 421–446. https://doi.org/10.1146/annurev.clinpsy.121208.131215.

Poissant, H., 2004. Metacognition in Attention Deficit and Hyperactivity Disorder (ADHD) and its Link with Executive Functioning.

Ponzoni, S., Beomonte Zobel, S., Rogier, G., Velotti, P., 2021. Emotion dysregulation acts in the relationship between vulnerable narcissism and suicidal ideation. Scand. J. Psychol. 62 (4), 468–475. https://doi.org/10.1111/sjop.12730.

Raskin, R.N., Hall, C.S., 1979. A narcissistic personality Inventory. Psychol. Rep. 45 (2) https://doi.org/10.2466/pr0.1979.45.2.590, 590–590.

Raskin, R., Terry, H., 1988. A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. Journal of Personality and Social Psychology 54 (5), 890–902. https://doi.org/10.1037/0022-3514.54.5.890.

Rosenthal, S.A., Hooley, J.M., 2010. Narcissism assessment in social–personality research: does the association between narcissism and psychological health result from a confound with self-esteem? J. Res. Pers. 44 (4), 453–465. https://doi.org/10.1016/j.jrp.2010.05.008.

Schoenleber, M., Roche, M.J., Wetzel, E., Pincus, A.L., Roberts, B.W., 2015. Development of a brief version of the pathological narcissism Inventory. Psychol. Assess. 27 (4), 1520–1526. https://doi.org/10.1037/pas0000158.

Schulte Holthausen, B., Habel, U., 2018. Sex differences in personality disorders. Curr. Psychiatr. Rep. 20 (12), 107. https://doi.org/10.1007/s11920-018-0975-y.

Séguin, J.R., Nagin, D., Assaad, J.-M., Tremblay, R.E., 2004. Cognitive-neuropsychological function in Chronic Physical aggression and hyperactivity. J. Abnorm. Psychol. 113 (4), 603–613. https://doi.org/10.1037/0021-843X.113.4.603.

Spielberger, C.D., Gorsuch, R.L., Lushene, R., Vagg, P.R., Jacobs, G.A., 1983. In: Palo Alto, C.A. (Ed.), Manual for the State-Trait Anxiety Inventory. Consulting Psychologists Press STAI.

Trillini, M.O., Müller-Vahl, K.R., 2015. Narcissistic vulnerability is a common cause for depression in patients with Gilles de la Tourette syndrome. Psychiatr. Res. 230 (2), 695–703. https://doi.org/10.1016/j.psychres.2015.10.030.

Trull, T.J., Jahng, S., Tomko, R.L., Wood, P.K., Sher, K.J., 2010. Revised NESARC personality disorder diagnoses: gender, prevalence, and comorbidity with substance dependence disorders. J. Pers. Disord. 24 (4), 412–426. https://doi.org/10.1521/pedi.2010.24.4.412.

Uher, R., Perlis, R.H., Placentino, A., Dernovšek, M.Z., Henigsberg, N., Mors, O., Maier, W., McGuffin, P., Farmer, A., 2012. Self-report and clinician-rated measures of depression severity: can one Replace the other? Depress. Anxiety 29 (12), 1043–1049. https://doi.org/10.1002/da.21993.

Victor, S.E., Klonsky, E.D., 2016. Validation of a brief version of the difficulties in emotion regulation scale (DERS-18) in five samples. J. Psychopathol. Behav. Assess. 38 (4), 582–589. https://doi.org/10.1007/s10862-016-9547-9.

Volz-Sidiropoulou, E., Boecker, M., Gauggel, S., 2016. The positive illusory bias in children and Adolescents with ADHD: further evidence. J. Atten. Disord. 20 (2), 178–186. https://doi.org/10.1177/1087054713489849.

Ward, M.F., 1993. The Wender Utah Rating Scale: an aid in the retrospective diagnosis of childhood attention deficit hyperactivity disorder. Am. J. Psychiatr. 150, 885–885.

Watson, P.J., Trumpeter, N., O'Leary, B.J., Morris, R.J., Culhane, S.E., 2006. Narcissism and self-esteem in the presence of imagined others: Supportive versus Destructive object representations and the Continuum hypothesis. Imagin., Cognit. Pers. 25 (3), 253–268. https://doi.org/10.2190/40AU-00RD-CV7Q-VBPB.

Weidmann, R., Chopik, W.J., Ackerman, R.A., Allroggen, M., Bianchi, E.C., Brecheen, C., Campbell, W.K., Gerlach, T.M., Geukes, K., Grijalva, E., Grossmann, I., Hopwood, C. J., Hutteman, R., Konrath, S., Küfner, A.C.P., Leckelt, M., Miller, J.D., Penke, L., Pincus, A.L., et al., 2023. Age and gender differences in narcissism: a comprehensive study across eight measures and over 250,000 participants. Journal of Personality and Social Psychology 124 (6), 1277–1298. https://doi.org/10.1037/pspp0000463.

Weinberg, I., Finch, E., Choi-Kain, L., 2019. Implementation of good psychiatric Management for narcissistic personality disorder: good Enough or not good Enough?. In: Applications of Good Psychiatric Management for Borderline Personality Disorder: A Practical Guide. American Psychiatric Association Publishing, pp. 253–280.

Weiner, L., Perroud, N., Weibel, S., 2019. Attention deficit hyperactivity disorder and borderline personality disorder in adults: a review of their links and risks. Neuropsychiatric Dis. Treat. 15, 3115–3129. https://doi.org/10.2147/NDT.S192871.

Young, S., 2016. ACE+: a diagnostic interview of ADHD in adults. http://www.psychology-services.uk.com/.

Zhang, H., Wang, Z., You, X., Lü, W., Luo, Y., 2015. Associations between narcissism and emotion regulation difficulties: Respiratory sinus arrhythmia reactivity as a moderator. Biol. Psychol. 110, 1–11. https://doi.org/10.1016/j.biopsycho.2015.06.014.

Zimmerman, M., Coryell, W.H., 1990. Diagnosing personality disorders in the Community: a comparison of self-report and interview measures. Arch. Gen. Psychiatr. 47 (6), 527–531. https://doi.org/10.1001/archpsyc.1990.01810180027005.