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NEUROPSYCHOLOGICAL PROFILE ASSOCIATED WITH BORDERLINE PERSONALITY DISORDER: A CLINICAL STUDY IN FEMALES

PERFIL NEUROPSICOLÓGICO ASOCIADO AL TRASTORNO LÍMITE DE LA PERSONALIDAD: UN ESTUDIO CLÍNICO EN MUJERES

PERFIL NEUROPSICOLÓGICO ASSOCIADO AO TRANSTORNO DE PERSONALIDADE LIMÍTROFE: UM ESTUDO CLÍNICO EM MULHERES

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A B S T R A C T

Numerous studies have identified neurocognitive impairments in borderline personality disorder (BPD), particularly in executive functions (EF). However, findings have been inconsistent. This study aimed to evaluate the neuropsychological functioning of a clinical sample of women diagnosed with BPD receiving outpatient treatment. A total of 71 women (M(SD) = 28.5(6.5) years) were assessed using standardized neuropsychological tests measuring attention, memory, and EF, including the Trail Making Test, Stroop Test, Symbol Digit Modalities Test, Digit Span, Verbal Fluency, and Rey Auditory Verbal Learning Test. The results indicate widespread impairments in attention, processing speed, cognitive flexibility, and inhibitory control, while verbal fluency and working memory remained within normative limits. Learning and memory performance exhibited a progressive decline over time compared to normative data. These findings support the hypothesis that young adult women with BPD experience broad neuropsychological impairments, with relative preservation in some cognitive domains. The observed decline in learning capacity underscores the need for tailored neuropsychological rehabilitation programs and psychotherapeutic adaptations to mitigate cognitive difficulties in this population.

Keywords: Borderline Personality Disorder; neuropsychology; executive functions; neurocognitive impairments.

Palabras clave: Trastorno Límite de la Personalidad; neuropsicología; funciones ejecutivas; deterioro neurocognitivo.

Palavras-chave: Transtorno de Personalidade Limítrofe; neuropsicologia; funções executivas; comprometimento neurocognitivo.

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R E S U M E N

Numerosos estudios han identificado deterioro neurocognitivo en el trastorno límite de la personalidad (TLP), particularmente en las funciones ejecutivas (FE). Sin embargo, los hallazgos han sido inconsistentes. Este estudio tuvo como objetivo analizar el funcionamiento neuropsicológico en una muestra clínica de mujeres con diagnóstico de TLP en tratamiento ambulatorio. Se evaluó a 71 mujeres (M(DE) = 28.5(6.5) años) mediante pruebas neuropsicológicas estandarizadas para medir atención, memoria y FE, utilizando el Trail Making Test, Stroop Test, Symbol Digit Modalities Test, Span de Dígitos, Fluencia Verbal y Rey Auditory Verbal Learning Test. Los resultados evidenciaron dificultades generalizadas en atención, velocidad de procesamiento, flexibilidad cognitiva y control inhibitorio, mientras que la fluidez verbal y la memoria de trabajo se mantuvieron dentro de los límites normativos. El rendimiento en aprendizaje y memoria mostró un deterioro progresivo en comparación con los datos normativos. Estos hallazgos respaldan la hipótesis de que las mujeres jóvenes con TLP presentan alteraciones neuropsicológicas extendidas, con una relativa preservación en algunos dominios cognitivos. El deterioro observado en la capacidad de aprendizaje subraya la necesidad de implementar programas específicos de rehabilitación neuropsicológica y adaptar las intervenciones psicoterapéuticas para mitigar las dificultades cognitivas en esta población

R E S U M O

Diversos estudos identificaram comprometimento neurocognitivo no transtorno de personalidade limítrofe (TPB), principalmente nas funções executivas (FE). Entretanto, os resultados têm sido inconsistentes. O objetivo deste estudo foi analisar o funcionamento neuropsicológico em uma amostra clínica de mulheres com diagnóstico de TPB em tratamento ambulatorial. Setenta e uma mulheres (M(SD) = 28,5(6,5) anos) foram avaliadas por meio de testes neuropsicológicos padronizados para medir a atenção, a memória e as FE, usando o Trail Making Test, o Stroop Test, o Symbol Digit Modalities Test, o Digit Span, a Fluência Verbal e o Rey Auditory Verbal Learning Test. Os resultados mostraram dificuldades generalizadas na atenção, velocidade de processamento, flexibilidade cognitiva e controle inibitório, enquanto a fluência verbal e a memória de trabalho permaneceram dentro dos limites normativos. O desempenho em aprendizado e memória apresentou deterioração progressiva em comparação com os dados normativos. Esses achados apóiam a hipótese de que as mulheres jovens com TPB apresentam deficiências neuropsicológicas generalizadas, com relativa preservação em alguns domínios cognitivos. O prejuízo observado na capacidade de aprendizado ressalta a necessidade de implementar programas específicos de reabilitação neuropsicológica e adaptar intervenções psicoterapêuticas para atenuar as dificuldades cognitivas nessa população.

CLINICAL AND EPIDEMIOLOGICAL ASPECTS OF BPD

Borderline Personality Disorder (BPD) is a complex psychiatric condition that typically emerges during adolescence and becomes fully manifest in early adulthood (Bohus et al., 2021; Winsper, 2021). Clinically, BPD is characterized by persistent emotional dysregulation, marked impulsivity, and engagement in high-risk behaviors, including suicide attempts, self-harm, and substance abuse. Additionally, individuals with BPD frequently exhibit identity disturbances, instability in personal goals and interpersonal relationships, and cognitive dysfunctions, including dissociative symptoms and transient paranoid ideation triggered by stress (American Psychiatric Association [APA], 2022; Leichsenring et al., 2023, 2024).

Although symptom remission is possible, BPD frequently leads to long-term functional and psychosocial impairment, particularly among women (Álvarez-Tomás et al., 2019; Culina et al., 2024). The estimated prevalence of BPD in the general population ranges from 1% to 3%, yet it is disproportionately represented in clinical settings (APA, 2022; Jin, 2023). While women account for up to 75% of diagnosed cases, some studies suggest that this sex-based prevalence estimate may be influenced by diagnostic biases or methodological limitations (Bozzatello et al., 2024).

BPD is highly comorbid with other psychiatric disorders, including mood and anxiety disorders, substance use disorders, eating disorders, post-traumatic stress disorder (PTSD), and attention-deficit/hyperactivity disorder (ADHD) (APA, 2022). It also frequently coexists with other personality disorders (Shah & Zanarini, 2018), further complicating its clinical presentation and treatment.

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NEUROPSYCHOLOGY OF BPD: EXECUTIVE DYSFUNCTION AND COGNITIVE IMPAIRMENTS

The neuropsychological aspects of BPD have been a subject of clinical interest for decades (Burgess, 1991; Ruocco, 2005). Research has increasingly emphasized executive functions (EFs) as a key factor in the etiopathogenesis and progression of BPD (Folesani et al., 2022; Mosiolek et al., 2018). EFs have been proposed as a potential endophenotype or neurobiological marker underlying the disorder (Nigg et al., 2017; Xiao et al., 2024).

EFs constitute a multidimensional cognitive construct involving a set of interrelated processes that regulate goal-directed behavior, reinforcement-based learning, and adaptive responses to contextual demands (Koechlin, 2016; Miyake et al., 2000). Factorial models classify EFs into three core domains: inhibition (inhibitory control), updating (working memory), and shifting (cognitive flexibility), which together support problem-solving, reasoning, and planning—critical skills for cognitive and behavioral adaptation (Diamond, 2013, 2020).

Neuropsychological deficits in BPD have been strongly associated with executive dysfunction (Gvirts et al., 2012; Haaland et al., 2009; López-Villatoro et al., 2023). Some studies suggest that impairments in inhibitory control (Silbersweig et al., 2007), working memory (Hagenhoff et al., 2013), and cognitive flexibility (Nilsson et al., 2021) may be pathognomonic of BPD, shaping its core behavioral manifestations.

Moreover, deficits in inhibitory control have been linked to self-harming behaviors (Ruocco, 2005; Ruocco et al., 2012; Ruocco & Carcone, 2016). Non-Suicidal Self-Injury (NSSI) has also been associated with deficits in cognitive flexibility (Nilsson et al., 2021; Wang et al., 2023) and impairments in attentional shifting (Drabble et al., 2014).

Beyond self-harming behaviors, individuals with BPD exhibit significant deficits in planning, decision-making, and decision quality (Bajzát et al., 2023; López-Villatoro et al., 2020; Ruocco, 2005). Executive dysfunction, particularly in cognitive control, problem-solving, decision-making, and memory processes, has been strongly associated with increased suicidality (da Silva et al., 2018; LeGris et al., 2012; Richard-Devantoy et al., 2014, 2015; Rutter et al., 2020) and reduced treatment adherence (Mak & Lam, 2013).

Neuroimaging studies further support the involvement of executive dysfunction in BPD, revealing functional impairments in prefrontal and limbic regions (Chan et al., 2020; Franczak et al., 2024; Yang et al.,2016). These neural alterations are believed to contribute to the cognitive and emotional dysregulation characteristic of the disorder.

CONTROVERSIES AND ALTERNATIVE EXPLANATIONS

Despite strong evidence linking executive dysfunction to BPD, its role in the disorder remains a subject of debate. Some studies report no significant differences between individuals with BPD and the general population in key domains such as inhibitory control and cognitive flexibility (Hurtado et al., 2016; Kunert et al., 2003). These findings suggest that executive dysfunction in BPD may be influenced by co-occurring psychological factors rather than constituting a core feature of the disorder (Unoka & Richman, 2016).

Additionally, some studies have questioned the specificity of EF deficits in BPD. A meta-analysis by Leichsenring et al. (2023) reported heterogeneous findings, suggesting that observed neuropsychological impairments may not be unique to BPD but rather reflect shared deficits across various psychiatric conditions.

While some neuropsychological tests have shown potential utility in identifying behavioral profiles (Kaplan, 2020; Piñeiro et al., 2008; Ruocco, 2005), no consistent or distinct neurocognitive pattern has been established for BPD, possibly due to the clinical heterogeneity of the disorder (López-Villatoro et al., 2023; McClure et al., 2016). Moreover, the relationship between neuropsychological dysfunctions and specific clinical symptoms, such as somatic manifestations of BPD or suicidal behavior, remains insufficiently characterized (Seres et al., 2009; Ghanem et al., 2016; Veerapandian et al., 2023). Emerging evidence suggests that adverse childhood experiences (ACEs), particularly childhood sexual abuse, may contribute to neurocognitive

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variability in BPD, potentially influencing executive function deficits and memory impairments (Bozzatello, et al., 2023; Grecucci et al., 2023).

Alternative explanations propose that observed cognitive impairments may stem from pharmacological interference (Vai et al., 2021) or may characterize only a specific BPD subgroup (Bustamante et al., 2009; Kalpakci et al., 2018). Additionally, methodological constraints—such as variability in sample age, the inherent clinical heterogeneity of BPD, and discrepancies in pharmacological treatment—further complicate the interpretation of neuropsychological findings (Sampedro et al., 2021).

Study Objectives

This study aimed to analyze neuropsychological functioning in attention, memory, and executive functions. It focused on young women diagnosed with BPD receiving outpatient treatment within the Public Health System of Spain. Neuropsychological test scores were standardized to assess potential neurocognitive impairments in the evaluated domains. Furthermore, this study examines the role of neuropsychological assessments in refining clinical evaluations, enhancing suicide risk assessment, and optimizing treatment strategies for individuals with BPD.

METHOD

Design

This study employed a descriptive, cross-sectional, correlational, and naturalistic observational design.

Participants

The study population consisted of 71 women diagnosed with BPD, according to the criteria of the International Classification of Diseases, 10th edition (ICD-10; World Health Organization, 1992). Participants were aged 20 to 35 years (M = 28.5, SD = 6.5). Table 1 provides a summary of the sample's sociodemographic and clinical characteristics.

Table 1. *Descriptive Statistics of the Sample*

Variable	Category	n	%
Educational Level	Compulsory Secondary Education	31	43.7
	High School	40	56.3
Work or Academic Activity	No	50	70.7
	Yes	21	29.3
Alcohol and Drug Use	No	27	38.0
	Yes	44	62.0
Sexual Abuse	No	32	45.1
	Yes	39	54.9
Non-Suicidal Self-Injury (NSSI)	No	5	7.0
	Yes	66	93.0
Suicide Attempts	No	12	16.7
	Yes	59	83.3
Gender-Based Violence	No	37	52.1
	Yes	34	47.9
Eating Disorder	No	31	43.7
	Yes	40	56.3
Dissociation	No	35	45.5
	Yes	36	54.5

Note. n = frequency; % = percentage.

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Inclusion and Exclusion Criteria

The inclusion criteria required participants to be between 18 and 35 years old and to have a clinical diagnosis of BPD based on ICD-10 criteria.

The exclusion criteria included the presence of a comorbid psychotic spectrum disorder, a history of severe substance abuse or dependence within the three months prior to assessment, a Body Mass Index (BMI) below 16, the presence of neurological disorders, or intellectual disability. Participants who regularly used cannabis for emotional regulation and engaged in occasional recreational substance use were included; however, they were required to abstain from substance use for at least 24 hours prior to evaluation.

All participants had previously received non-specific psychotherapeutic interventions for BPD, with varying levels of treatment intensity, which were not specified. Participants continued their symptomatic pharmacological treatment (Treatment as Usual, TAU), following best practice guidelines (Carrasco & Pérez-Lombardo, 2019; Pascual et al., 2023).

Instruments

Clinical and Psychopathological Measures

•Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) (First et al., 1999). A clinician-administered, semi-structured interview designed to diagnose personality disorders.

•Millon Clinical Multiaxial Inventory-IV (MCMI-IV) (Millon, 2018). A clinical inventory that assesses various personality traits and their psychopathological manifestations.

•Borderline Symptom List (BSL-23) (Bohus et al., 2009; Soler et al., 2013). A self-administered scale used to evaluate subjective BPD symptoms experienced in the past week.

•Adult ADHD Rating Scale (ADHD-RS) (DuPaul et al., 1998; Pereira et al., 2024). A self-report measure used to assess ADHD symptoms in adults.

•Barratt Impulsiveness Scale (BIS-11) (Patton et al., 1995; Oquendo et al., 2001). A self-report questionnaire that evaluates attentional, motor, and non-planning impulsiveness.

Neuropsychological Tests

•Stroop Color and Word Test (Golden, 1978, 2007, 2020). Measures cognitive flexibility and interference control.

•Trail Making Test (TMT-A and TMT-B) (Reitan, 1958). Assesses attention, psychomotor speed, and cognitive flexibility. Completion time for each part was recorded.

•Symbol Digit Modalities Test (SDMT) (Smith, 1973, 2002). Evaluates processing speed and attention. Participants were given 90 seconds to complete the task, with the total number of correct responses recorded.

•Rey Auditory Verbal Learning Test (RAVLT) (Rey, 1958): Assesses verbal memory and learning using a 15-word recall paradigm.

•Verbal Fluency (VF) Test (Artiola i Fortuny et al., 1999): Measures language processing and executive function. Both Phonemic Verbal Fluency (PVF) and Semantic Verbal Fluency (SVF) were assessed with a 60-second time limit per task.

•Digit Span Task (DS) (Wechsler, 2012): Evaluates working memory, attention, and short-term verbal memory. The Forward Digit Span (FDS) and Backward Digit Span (BDS) subtests from the Wechsler Adult Intelligence Scale-Fourth Edition (WAIS-IV) were used.

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Procedure

Participants were recruited from outpatient units and referred to an intensive outpatient treatment unit for personality disorders at the Hospital Universitario de Gran Canaria Dr. Negrín (HUGCDN; Spain) between December 2022 and June 2023.

BPD diagnosis was confirmed using the SCID-II. Additionally, symptom severity and comorbid conditions were assessed using the Borderline scale of the MCMI-IV, the BSL-23, the BIS-11, and the ADHD-RS. The validated Spanish versions of these instruments were used.

The neuropsychological evaluation was conducted individually during the third treatment session, lasted approximately 40 minutes, and was performed by a clinical psychologist with specialized training in neuropsychology. The order of test administration was: RAVLT (encoding, 5 trials), DGS, SDMT, TMT (A and B), Stroop, VF, and RAVLT (delayed recall). At the time of the neuropsychological assessment, participants had maintained stable pharmacological treatment for at least two weeks prior to evaluation.

All procedures followed ethical standards in accordance with the Declaration of Helsinki (World Medical Association, 2013). Ethical approval was obtained from the Ethics Committee for Research of HUGCDN (CEIm Las Palmas, Protocol V. 14/11/2022, Code: 2022-506-1). Participant data were fully anonymized, and evaluation results did not influence clinical management.

Data Analysis

Descriptive statistics were calculated, including mean, standard deviation, and quartiles for quantitative variables, while absolute and relative frequencies were reported for qualitative variables. The Kolmogorov-Smirnov test was used to assess normality in quantitative variables.

To ensure standardization of neuropsychological test scores, specific normative data were applied. SDMT, TMT, and DGS were standardized according to the norms published by Tamayo et al. (2012). For VF, standardization was based on the norms proposed by Casals-Coll et al. (2013). The Stroop Test scores were converted to T-scores using the norms for the young adult Spanish population (ages 16–44) (Golden, 2007). Finally, RAVLT was standardized following the norms established by Strauss et al. (2006).

RESULTS

Clinical Profile

Table 2.

Results of Complementary Clinical Assessment Tests

Scale	Subscale	M(SD)	Min.	Md	Max.	Kolmogorov Test
BSL-23	General	63 (17.5)	22	67	92	<0.001
	Behavior	10.8 (8.5)	1	8	40	<0.001
BIS-11	Total	72.8 (12.5)	47	75	105	0.048
	Attentional	22 (3.9)	15	21.5	32	0.031
	Motor	27 (7.0)	11	28	40	0.014
	Non-planning impulsiveness	23.7 (7.7)	4	24	40	0.014
ADHD-RS		31.1 (11.6)	4	30	51	0.051
MCMI-IV	Borderline	93.6 (19.1)	42	101	109	<0.001

Note. BSL-23= Borderline Symptom List 23; BIS-11= Barratt Impulsiveness Scale; ADHD-RS= Adult ADHD Rating Scale; MCMI-IV= Millon Clinical Multiaxial Inventory-IV.

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On the MCMI-IV Borderline Scale, participants' scores exceeded the clinical threshold for high severity (>85). In the BSL-23 general subscale, scores above 63 were obtained. No established Spanish normative reference is available for the assessing behavior supplement.

Scores on the BIS-11 subscales were elevated across all dimensions: attentional, motor, and non-planning impulsiveness. In the ADHD-RS, the mean subjective score exceeded the cutoff thresholds proposed for the inattentive (≥21 points) and combined (≥24 points) ADHD subtypes.

Neuropsychological Profile

The scores obtained in each task and their standardization are presented in Table 3.

Table 3.

Scores on SDMT, TMT, FDS, BDS, PVF, and SVF

Test	M(SD)	SS	Pc	Z-score
SDMT	46.4 (11.0)	7	11-18	-1
TMT A	34.6 (15.2)	7	11-18	-1
TMT B	92.5 (48.6)	7	11-18	-1
FDS	5.6 (1.1)	9	29-40	-0.33
BDS	4.0 (1.0)	8	19-28	-0.66
PVF	15.2 (4.9)	8	19-28	-0.66
SVF	20.2 (5.3)	8	19-28	-0.66

Note. SDMT= Symbol Digit Modalities Test; TMT A= Trail Making Test Part A; TMT B=Trail Making Test part B; FDS= Forward Digit Span subtest from the Wechsler Adult Intelligence Scale (WAIS IV); BDS= Backward Digit Span subtest from the Wechsler Adult Intelligence Scale (WAIS IV); PVF= Phonological Verbal Fluency task using the letter “p”; SVF = Semantic Verbal Fluency or Semantic Category Evocation of animals. SS = Scalar Score; Pc = Percentile.

Performance on the SDMT, TMT-A, and TMT-B was one standard deviation below the mean. Scores on the DGS (forward and backward), PVF, and SVF were within the low-average range, between -1 SD and the mean.

In the Stroop Test (Table 4), participants obtained altered scores in the W, C, and CW tasks, while R-Int task scores were below average but not impaired.

Table 4.

Stroop Color and Word Test scores.

Task	PD	T	Z
Word (W)	92.2 (17.2)	36	-1.33
Color (C)	57.3 (14.6)	34	-1.66
Color-Word (CW)	34.2 (12.4)	35	-1.5
Resistance to interference (R-Int)	-1 (7.7)	46	-0.33

Note. M = Mean; SD = Standard Deviation; T Score = Standardized Score; Z Score = Standardized Score (Normal Distribution).

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The RAVLT scores, including encoding trials (1–5), Total recall, and Delayed Recall (DR), are presented in Table 5. Results were stratified into two age subgroups (20–29 and 30–39 years) and compared with the Strauss et al. (2006) norms.

Table 5.

Comparison of Mean Scores Obtained in the RAVLT Test

Trial	Strauss et al. (2006) 20-29	20-29 (N=31)	Strauss et al. (2006) 30-39	30-39 (N=40)
1	7.2 (1.6)	5.7 (1.9)	7.3 (1.9)	5.1 (2.3)
2	9.8 (2.0)	8.5 (2.5)	10 (2.2)	7.9 (2.4)
3	11.3 (2.1)	10.3 (3.3)	11.5 (2.1)	9.5 (2.5)
4	11.7 (2.0)	11.1 (3.1)	12.4 (2.1)	10.8 (2.7)
5	12.3 (2.2)	11.5 (2.5)	12.4 (2.0)	11.5 (2.7)
Total[1]	52.3 (8)	47.2 (9.1)	53.6 (8.3)	44.9 (10.5)
DR[2]	11.2 (2.5)	10.2 (3.4)	11.4 (2.4)	9.4 (3.3)

Note. RAVLT=Rey Auditory Verbal Learning Test.
[1]Total refers to the sum of all words recalled in Trials 1 through 5.
[2]Delayed Recall (DR) refers to the number of words remembered 30 minutes after the encoding process. The second and fourth columns present scores proposed by Strauss et al. (2006).

The 20–29 age subgroup obtained scores ranging from low-average to -1 SD across encoding trials, Total recall, and DR. The 30–39 age subgroup had scores within the low-average to -1 SD range in encoding trials 2, 3, 4, and 5, but scored below -1 SD in trial 1, Total Recall, and DR.

DISCUSSION

Neuropsychological assessment has been instrumental in identifying cognitive impairments in BPD and has been proposed as a tool for differentiating profiles, behavioral patterns, and specific clinical characteristics (LeGris & van Reekum, 2006; López-Villatoro et al., 2024; Piñeiro et al., 2008). The findings of this study reinforce previous research indicating generalized neurocognitive deficits in BPD (Arza et al., 2009; Leichsenring et al., 2023, 2024). However, it is essential to recognize that EFs are interdependent with attentional, mnemonic, and other executive processes, often overlapping in function and neural substrates (Onandia-Hinchado et al., 2019, p.49). Therefore, EFs should not be assessed using a single test, as they involve multiple cognitive domains that interact dynamically (Portellano-Pérez & García-Alba, 2014, p.203).

This study identified deficits in attention and processing speed, as indicated by SDMT, TMT-A, and Stroop W and C scores, reinforcing previous evidence of neurocognitive dysfunction in BPD, particularly in these domains (Arza et al., 2009; Portella et al., 2011; Ruocco, 2005; Thomsen et al., 2017). Impairments in cognitive flexibility and inhibitory control were observed in TMT-B and Stroop CW, reinforcing prior research on executive dysfunction in BPD (López-Villatoro et al., 2023; McClure et al., 2016; Nilsson et al., 2021). Additionally, older participants exhibited learning and memory deficits in the RAVLT, suggesting potential age-related cognitive decline in this clinical population. However, despite preserved performance in verbal fluency and working memory tasks, the overall neuropsychological profile suggests a generalized impairment across multiple cognitive domains.

Previous studies have linked executive function impairments to frontal dysfunction, particularly in tasks assessing inhibition (TMT-B, Stroop, and VF), which have been correlated with higher rates of suicidality and NSSI history in BPD (LeGris et al., 2006, 2012; Williams et al., 2015). The poor performance on TMT-B, a well-established measure of cognitive flexibility, has been consistently reported in relation to NSSI in BPD (Nilsson et al., 2021) and higher treatment dropout rates (Fertuck et al., 2012).

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The Stroop CW and R-Int tasks are widely used to assess inhibitory control, a key cognitive deficit in BPD (Silbersweig et al., 2007; Wingenfeld et al., 2009). While R-Int scores are conventionally used to measure resistance to interference, the test manual (Golden, 2020) cautions against their use when W and C scores fall below -1 SD. Given this limitation, the CW task was prioritized to ensure a more reliable assessment of inhibitory control, confirming significant deficits within the study sample.

These deficits have clinical relevance, as CW task scores are linked to daily functioning impairments (Mosiolek et al., 2018), while R-Int scores have been associated with suicidality risk and clinical recovery in BPD (LeGris et al., 2012; Wingenfeld et al., 2009). Considering the critical role of inhibitory control and cognitive flexibility in emotional regulation and adaptive behavior, individuals with severe inhibitory control deficits may struggle with impulse suppression, behavioral adaptation to contextual demands, and problem-solving, increasing the risk of dysfunctional coping mechanisms and psychosocial distress (Nilsson et al., 2021).

Verbal fluency tasks are widely employed to assess information processing efficiency and are recognized as core indicators of executive functioning (Portellano-Pérez & García-Alba, 2014, p.215; Aita et al., 2018). In this study, PVF and SVF scores fell below the mean but remained within normative limits, suggesting that lexical access and cognitive flexibility were not substantially impaired. Working memory, as measured by the DS task, followed the expected pattern, with BDS scores consistently lower than FDS scores (Donolato et al., 2017; Tamayo et al., 2012). Although performance in DS tasks was classified as low-average, these results indicate that working memory in BPD remains relatively preserved, albeit with some inefficiencies that could affect higher-order cognitive processing and adaptive functioning.

Impairments in both immediate and long-term verbal memory have been consistently documented in BPD, with potential implications for therapeutic engagement and cognitive functioning (Kurtz & Morey, 1999; Kaplan, 2020; Vai et al., 2021). Findings indicate lower scores in encoding and recall performance in BPD participants, particularly in the 30–39 age subgroup, which contrasts with normative data that typically show age-related improvements in memory function (Strauss et al., 2006). The observed pattern of cognitive decline over a relatively short time frame raises questions about a potential atypical neurodevelopmental trajectory in BPD, warranting further investigation.

Executive dysfunction, impulsivity, and emotional dysregulation are frequently co-occurring features in BPD, as reported in previous research (Gagnon, 2017; Leichsenring et al., 2023, 2024; Palomares et al., 2019). Among the factors that may modulate cognitive dysfunction in BPD, adverse childhood experiences (ACEs) have been identified as potential contributors to neuropsychological variability (Bozzatello et al., 2023; Rosa et al., 2023, Thomsen et al., 2017). Some evidence suggests that individuals with BPD who have a history of sexual abuse may exhibit more pronounced deficits in executive functioning and memory performance compared to those without such experiences, highlighting the relevance of trauma-informed neuropsychological research. Identifying neuropsychological subtypes of BPD could aid in personalized interventions, reducing treatment dropout risk and improving suicidality management strategies (Arza et al., 2009; Kaplan, 2020).

With growing evidence supporting cognitive rehabilitation in BPD, future research should focus on developing targeted interventions aimed at improving executive functioning and memory performance (Gupta & Kumari, 2023; Pascual et al., 2015; Vita et al., 2018). Cognitive remediation approaches that enhance attentional control, cognitive flexibility, and impulse regulation have shown effectiveness in promoting daily functioning and improving treatment adherence. Incorporating neuropsychological interventions into psychotherapeutic models could further optimize outcomes, particularly for individuals with pronounced executive impairments. A more detailed characterization of cognitive profiles in BPD may facilitate the refinement of psychotherapeutic strategies, ensuring that interventions are tailored to each patient's cognitive strengths and challenges.

Clinical Implications and Contributions

This study underscores the clinical importance of neuropsychological assessment in BPD, emphasizing its role in guiding personalized therapeutic approaches. Our findings suggest that standardized neurocognitive evaluations may help characterize cognitive profiles in BPD, allowing for tailored interventions that address specific functional vulnerabilities.

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Additionally, this study reinforces the role of inhibitory control and cognitive flexibility deficits as critical factors influencing treatment adherence and suicidality risk.

Given the well-documented association between memory dysfunction and suicidality in BPD, along with evidence of distinct deficits in problem-solving, integrating targeted interventions into therapeutic frameworks may be beneficial (Kaplan, 2020; Paris, 2021). Specifically, addressing both reduced autobiographical memory specificity and impaired problem-solving abilities could enhance emotional regulation, strengthen crisis management, and mitigate cognitive rigidity. Such interventions may, in turn, reduce stress vulnerability and decrease the likelihood of maladaptive responses to challenging situations (Darvishi et al., 2023; da Silva et al., 2018; Williams et al., 2006, 2007).

For clinical professionals, these findings highlight the relevance of integrating neurocognitive assessment into routine BPD evaluation to inform treatment planning. Deficits in attention, processing speed, inhibitory control, and memory function may necessitate modifications in psychotherapeutic interventions, such as adjusting session pacing, incorporating structured learning techniques, and implementing cognitive remediation strategies (Laffite et al., 2024).

For students and researchers, this study provides empirical support for the neuropsychological underpinnings of BPD, contributing to the ongoing discussion on cognitive endophenotypes and targeted interventions.

Limitations and Future Directions

This study presents several limitations that should be considered when interpreting its findings. First, the sample consisted exclusively of young adult women, limiting the generalizability of the results to other age groups and male populations. Additionally, the absence of a control group restricts direct comparisons with non-BPD individuals. However, the sample remains clinically representative, as participants were referred from specialized outpatient units, reducing selection bias. Future research should incorporate more diverse samples to enhance the external validity of neurocognitive findings in BPD.

A second limitation concerns the challenges inherent in assessing EFs in BPD. Due to the interconnected nature of cognitive domains, neuropsychological tests often capture overlapping influences from attentional, mnemonic, and emotional regulation processes, making it difficult to disentangle EF impairments from broader cognitive dysfunctions (García-Molina et al., 2018, p. 61). Furthermore, the high clinical heterogeneity and frequent comorbidities observed in BPD may contribute to significant variability in neurocognitive performance, further complicating the interpretation of test results.

Additionally, this study did not analyze the potential influence of ACEs, particularly sexual abuse, on neurocognitive dysfunction in BPD. Given previous evidence suggesting that ACEs may modulate executive functioning and memory performance, future studies should explicitly investigate this relationship to determine its impact on neuropsychological variability in BPD.

Another important consideration is the phenomenon of apparent competence (Linehan, 1993). This concept suggests that individuals with BPD may appear cognitively intact in structured environments but struggle significantly in emotionally charged or high-demand situations. Such discrepancies highlight the need for ecologically valid assessments, which can more accurately capture the real-world implications of cognitive impairments (Mancuso et al., 2024; Mirchi et al., 2024).

Despite these limitations, this study provides valuable clinical insights, as it includes patients undergoing routine psychiatric treatment, complementing findings from controlled clinical trials (Chodankar, 2021). Future research should determine whether EF impairments in BPD represent a stable cognitive trait, or a progressive dysfunction influenced by clinical variables such as emotional dysregulation and comorbidities. Additionally, further investigation is needed to assess the effectiveness of cognitive remediation strategies in improving daily functioning and symptom management in BPD patients.

A promising direction for future research is to examine whether neurocognitive deficits in BPD vary across clinical profiles, particularly in relation to ACEs. Given the well-documented association between ACEs and alterations in executive functioning and memory performance, further investigation into their role in cognitive heterogeneity among individuals with

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BPD may offer deeper insight into the mechanisms driving these deficits. Identifying neuropsychological subtypes of BPD based on trauma history could enhance the development of targeted interventions and optimize treatment strategies.

Longitudinal studies should examine whether memory and executive function deficits in BPD remain stable over time or fluctuate in response to emotional states and cognitive demands. Understanding these dynamics would provide critical insights into whether these impairments represent enduring cognitive traits or are influenced by situational and emotional variables. This distinction is essential for refining personalized treatment approaches, ensuring that psychotherapeutic interventions are tailored to each patient's cognitive profile, strengths, and vulnerabilities.

Finally, future research should incorporate ecologically valid neurocognitive assessments to better capture real-world cognitive challenges, particularly in situations involving emotional distress and interpersonal conflict. This approach could enhance treatment strategies by identifying individual variability in cognitive resilience and vulnerability, leading to more effective cognitive remediation and psychotherapeutic interventions that accommodate the specific neurocognitive difficulties of individuals with BPD.

CONCLUSIONS

The findings of this study support the hypothesis that young adult women with BPD exhibit widespread neuropsychological impairments, particularly in attention, processing speed, cognitive flexibility, and inhibitory control. Although verbal fluency and working memory remained within normative limits, performance in these domains was consistently below the mean, suggesting relative inefficiencies that could affect higher-order cognitive processes.

Regarding learning and memory performance, results indicate that participants with BPD demonstrated reduced encoding and recall abilities compared to normative data, with evidence suggesting a progressive decline over time. While not all cognitive domains were impaired, the breadth and clinical significance of the affected processes point to a pervasive neurocognitive dysfunction that may influence both clinical outcomes and daily functioning.

These findings highlight the need for future research to conduct a more granular analysis of learning and memory capacity in younger BPD populations, incorporating narrower age ranges and diverse clinical characteristics to determine whether these impairments are consistent across the disorder or representative of specific clinical subtypes. Additionally, longitudinal studies should explore whether executive and memory dysfunctions in BPD represent stable cognitive traits or are influenced by emotional dysregulation and situational stressors.

From a clinical perspective, these results reinforce the importance of integrating targeted neuropsychological rehabilitation programs into treatment frameworks. Preventive interventions and tailored psychotherapeutic strategies should be developed to mitigate cognitive difficulties that could compromise treatment adherence and overall functional outcomes. Practical adjustments, such as reducing session duration for individuals with attentional impairments and modifying the complexity and pacing of psychoeducational content for patients with mnemonic and learning difficulties, may enhance engagement, cognitive adaptation, and long-term therapeutic efficacy.

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REFERENCIAS

Aita, S. L., Beach, J. D., Taylor, S. E., Borgogna, N. C., Harrell, M. N., & Hill, B. D. (2018). Executive, language, or both? An examination of the construct validity of verbal fluency measures. Applied Neuropsychology: Adult, 26(5), 441–451. https://doi.org/10.1080/23279095.2018.1439830

Álvarez-Tomás, I., Ruiz, J., Guilera, G., & Bados, A. (2019). Long-term clinical and functional course of borderline personality disorder: A meta-analysis of prospective studies. European psychiatry : the journal of the Association of European Psychiatrists, 56, 75–83. https://doi.org/10.1016/j.eurpsy.2018.10.010

American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.). American Psychiatric Association Publishing.

Arza, R., Díaz-Marsa, M., López-Micó, C., de Pablo, N. F., López-Ibor, J. J., & Carrasco, J. L. (2009). Alteraciones neuropsicológicas en el trastorno límite de la personalidad: estrategias de detección [Neuropsychological dysfunctions in personality borderline disorder: detection strategies]. Actas espanolas de psiquiatria, 37(4), 185–190.

Artiola-i-Fortuny, L., Hermosillo, D., Heaton, R. K., & Pardee, R. E. (1999). Manual de normas y procedimientos para la batería neuropsicológica en español. mPress.

Bajzát, B., Soltész, P., Soltész-Várhelyi, K., Lévay, E. E., & Unoka, Z. S. (2023). Impaired decision-making in borderline personality disorder. Frontiers in psychology, 14, 1109238. https://doi.org/10.3389/fpsyg.2023.1109238

Bohus, M., Kleindienst, N., Limberger, M. F., Stieglitz, R. D., Domsalla, M., Chapman, A. L., Steil, R., Philipsen, A., y Wolf, M. (2009). The short version of the Borderline Symptom List (BSL-23): development and initial data on psychometric properties. Psychopathology, 42(1), 32–39. https://doi.org/10.1159/000173701

Bohus, M., Stoffers-Winterling, J., Sharp, C., Krause-Utz, A., Schmahl, C., & Lieb, K. (2021). Borderline personality disorder. Lancet (London, England), 398(10310), 1528–1540. https://doi.org/10.1016/S0140-6736(21)00476-1

Bozzatello, P., Blua, C., Brasso, C., Rocca, P., & Bellino, S. (2023). The Role of Cognitive Deficits in Borderline Personality Disorder with Early Traumas: A Mediation Analysis. Journal of clinical medicine, 12(3), 787. https://doi.org/10.3390/jcm12030787

Bozzatello, P., Blua, C., Brandellero, D., Baldassarri, L., Brasso, C., Rocca, P., & Bellino, S. (2024). Gender differences in borderline personality disorder: a narrative review. Frontiers in psychiatry, 15, 1320546. https://doi.org/10.3389/fpsyt.2024.1320546

Burgess J. W. (1991). Relationship of depression and cognitive impairment to self-injury in borderline personality disorder, major depression, and schizophrenia. Psychiatry research, 38(1), 77–87. https://doi.org/10.1016/0165-1781(91)90054-s

Bustamante, M. L., Villarroel, J., Francesetti, V., Ríos, M., Arcos-Burgos, M., Jerez, S., Iturra, P., Solari, A., & Silva, H. (2009). Planning in borderline personality disorder: evidence for distinct subpopulations. The world journal of biological psychiatry : the official journal of the World Federation of Societies of Biological Psychiatry, 10(4 Pt 2), 512–517. https://doi.org/10.1080/15622970903079481

Carrasco, J. L., & Pérez-Lombardo, M. (2019). Tratamiento farmacológico de los Trastornos de la Personalidad. Revisiones En Psicofarmacología, 5(1). https://doi.org/10.24875/rpsic.m19000004

Casals-Coll, M., Sánchez-Benavides, G., Quintana, M., Manero, R. M., Rognoni, T., Calvo, L., Palomo, R., Aranciva, F., Tamayo, F., & Peña-Casanova, J. (2013). Spanish normative studies in young adults (NEURONORMA young adults project): norms for verbal fluency tests. Neurologia (Barcelona, Spain), 28(1), 33–40. https://doi.org/10.1016/j.nrl.2012.02.010

Chan, C. C., Vaccaro, D. H., Rose, N. L. J., Kessler, L. E., & Hazlett, E. A. (2020). Neuroimaging in personality disorders. En C. W. Lejuez & K. L. Gratz (Eds.), The Cambridge Handbook of Personality Disorders (pp. 3-19). Cambridge University Press. https://doi.org/10.1017/9781108333931.003

Chodankar D. (2021). Introduction to real-world evidence studies. Perspectives in clinical research, 12(3), 171–174. https://doi.org/10.4103/picr.picr_62_21

Culina, I., Ranjbar, S., Maillard, P., Martin-Soelch, C., Berney, S., Kolly, S., André, J., Conus, P., & Kramer, U. (2024). Symptom domains and psychosocial functioning in borderline personality disorder. Borderline personality disorder and emotion dysregulation, 11(1), 10. https://doi.org/10.1186/s40479-024-00255-2

da Silva, A. G., Malloy-Diniz, L. F., Garcia, M. S., Figueiredo, C. G. S., Figueiredo, R. N., Diaz, A. P., & Palha, A. P. (2018). Cognition As a Therapeutic Target in the Suicidal Patient Approach. Frontiers in psychiatry, 9, 31. https://doi.org/10.3389/fpsyt.2018.0003

Darvishi, N., Farhadi, M., Azmi-Naei, B., & Poorolajal, J. (2023). The role of problem-solving skills in the prevention of suicidal behaviors: A systematic review and meta-analysis. PloS one, 18(10), e0293620. https://doi.org/10.1371/journal.pone.0293620

Drabble, J., Bowles, D. P., & Barker, L. A. (2014). Investigating the role of executive attentional control to self-harm in a non-clinical cohort with borderline personality features. Frontiers in behavioral neuroscience, 8, 274. https://doi.org/10.3389/fnbeh.2014.00274

Diamond, A. (2013). Executive functions. Annual Review of Psychology, 64,135-168. https://doi.org/10.1146/annurev-psych-113011-143750

Diamond A. (2020). Executive functions. Handbook of clinical neurology, 173, 225–240. https://doi.org/10.1016/B978-0-444-64150-2.00020-4

Donolato, E., Giofrè, D., & Mammarella, I. C. (2017). Differences in Verbal and Visuospatial Forward and Backward Order Recall: A Review of the Literature. Frontiers in psychology, 8, 663. https://doi.org/10.3389/fpsyg.2017.00663

Drabble, J., Bowles, D. P., & Barker, L. A. (2014). Investigating the role of executive attentional control to self-harm in a non-clinical cohort with borderline personality features. Frontiers in behavioral neuroscience, 8, 274. https://doi.org/10.3389/fnbeh.2014.00274

DuPaul, G. J., Anastopoulos, A. D., Power, T. J., Reid, R., Ikeda, M. J., & McGoey, K. E. (1998). ADHD Rating Scale–IV--Home Version [Database record]. APA PsycTests. https://doi.org/10.1037/t59101-000

ISSN: 0718-4123
DOI: 10.7714/CNPS/19.1.205

Fertuck, E. A., Keilp, J., Song, I., Morris, M. C., Wilson, S. T., Brodsky, B. S., & Stanley, B. (2012). Higher executive control and visual memory performance predict treatment completion in borderline personality disorder. Psychotherapy and psychosomatics, 81(1), 38–43. https://doi.org/10.1159/000329700

First, M.B., Gibbon, M., Spitzer, R.L., Williams, J.B.W., & Smith, L. (1999). Entrevista clínica estructurada para los trastornos del eje II del DSM-IV. Masson.

Folesani, F., Belvederi Murri, M., Biancosino, B., Costa, S., Zerbinati, L., Caruso, R., Nanni, M. G., Toffanin, T., Ferrara, M., Purdon, S. E., & Grassi, L. (2022). The screen for cognitive impairment in psychiatry in patients with borderline personality disorder. Personality and mental health, 16(4), 279–289. https://doi.org/10.1002/pmh.1539

Franczak, Ł., Podwalski, P., Wysocki, P., Dawidowski, B., Jędrzejewski, A., Jabłoński, M., & Samochowiec, J. (2024). Impulsivity in ADHD and Borderline Personality Disorder: A Systematic Review of Gray and White Matter Variations. Journal of Clinical Medicine, 13(22), 6906. https://doi.org/10.3390/jcm13226906

Gagnon, J. (2017). Defining borderline personality disorder impulsivity: Review of neuropsychological data and challenges that face researchers. Journal of Psychiatry and Psychiatric Disorders, 1(3). 154–176. https://doi.org/10.26502/jppd.2572-519X0015

García Molina, A. (2018). Evaluación neuropsicológica de las funciones ejecutivas. Editorial Síntesis.

Ghanem, M., El-Serafi, D., Sabry, W., el Rasheed, A.H., Razek, G.A., Soliman, A. y Amar, W. (2016) Executive dysfunctions in borderline personality disorder: Correlation with suicidality and impulsivity. Middle East Current Psychiatry, 23(2), 85-92. https://doi.org/10.1097/01.XME.0000481457.55394.66

Golden, C.J. (1978). Stroop Color and Word Test. A manual for clinical and experimental uses. Stoelting Company.

Golden, C.J. (2007). Stroop: Test de colores y palabras. TEA Ediciones.

Golden, C.J. (2020). STROOP. Test de Colores y palabras - Edición Revisada. (B. Ruiz-Hernández, T. Luque y F. Sánchez-Sánchez, adaptadores). TEA Ediciones.

Gupta, A., & Kumari, S. (2023). Effect of cognitive retraining treatment in mild to moderate depressive disorders. Psicologia, reflexao e critica : revista semestral do Departamento de Psicologia da UFRGS, 36(1), 28. https://doi.org/10.1186/s41155-023-00269-9

Grecucci, A., Dadomo, H., Salvato, G., Lapomarda, G., Sorella, S., & Messina, I. (2023). Abnormal Brain Circuits Characterize Borderline Personality and Mediate the Relationship between Childhood Traumas and Symptoms: A mCCA+jICA and Random Forest Approach. Sensors (Basel, Switzerland), 23(5), 2862. https://doi.org/10.3390/s23052862

Gvirts, H. Z., Harari, H., Braw, Y., Shefet, D., Shamay-Tsoory, S. G., & Levkovitz, Y. (2012). Executive functioning among patients with borderline personality disorder (BPD) and their relatives. Journal of affective disorders, 143(1-3), 261–264. https://doi.org/10.1016/j.jad.2012.05.007

Hagenhoff, M., Franzen, N., Koppe, G., Baer, N., Scheibel, N., Sammer, G., Gallhofer, B., & Lis, S. (2013). Executive functions in borderline personality disorder. Psychiatry research, 210(1), 224–231. https://doi.org/10.1016/j.psychres.2013.05.016

Haaland, V. Ø., Esperaas, L., & Landrø, N. I. (2009). Selective deficit in executive functioning among patients with borderline personality disorder. Psychological medicine, 39(10), 1733–1743. https://doi.org/10.1017/S0033291709005285

Hurtado, M. M., Triviño, M., Arnedo, M., Roldán, G., & Tudela, P. (2016). Are executive functions related to emotional intelligence? A correlational study in schizophrenia and borderline personality disorder. Psychiatry research, 246, 84–88. https://doi.org/10.1016/j.psychres.2016.09.027

Jin J. (2023). Borderline Personality Disorder. JAMA, 329(8), 692. https://doi.org/10.1001/jama.2023.1012

Kalpakci, A., Ha, C., & Sharp, C. (2018). Differential relations of executive functioning to borderline personality disorder presentations in adolescents. Personality and mental health, 12(2), 93–106. https://doi.org/10.1002/pmh.1410

Kaplan, B., Yazici Gulec, M., Gica, S., & Gulec, H. (2020). The association between neurocognitive functioning and clinical features of borderline personality disorder. Revista brasileira de psiquiatria (Sao Paulo, Brazil: 1999), 42(5), 503–509. https://doi.org/10.1590/1516-4446-2019-0752

Koechlin E. (2016). Prefrontal executive function and adaptive behavior in complex environments. Current opinion in neurobiology, 37, 1–6. https://doi.org/10.1016/j.conb.2015.11.004

Kunert, H. J., Druecke, H. W., Sass, H., & Herpertz, S. C. (2003). Frontal lobe dysfunctions in borderline personality disorder? Neuropsychological findings. Journal of personality disorders, 17(6), 497–509. https://doi.org/10.1521/pedi.17.6.497.25354

Kurtz, J. E., & Morey, L. C. (1999). Verbal memory dysfunction in depressed outpatients with and without borderline personality disorder. Journal of Psychopathology and Behavioral Assessment, 21(2), 141–156. https://doi.org/10.1023/A:1022108506069

Laffite, H., Díaz-Garrido, J.A., Zúñiga, R., Martínez-Huidobro, M.F., & Hernández-Fleta, J.L. (2023). Acceptance and Recovery Therapy by Levels for Psychosis (ART): A Context-Centred Model. In Díaz-Garrido, J.A., Zúñiga, R., Laffite, H., & Morris, E (coords.). Psychological Interventions for Psychosis. Towards a Paradigm Shift. Springer.

LeGris, J., & van Reekum, R. (2006). The neuropsychological correlates of borderline personality disorder and suicidal behaviour. Canadian journal of psychiatry. Revue canadienne de psychiatrie, 51(3), 131–142. https://doi.org/10.1177/070674370605100303

LeGris, J., Links, P. S., van Reekum, R., Tannock, R., & Toplak, M. (2012). Executive function and suicidal risk in women with Borderline Personality Disorder. Psychiatry research, 196(1), 101–108. https://doi.org/10.1016/j.psychres.2011.10.008

Leichsenring, F., Heim, N., Leweke, F., Spitzer, C., Steinert, C., & Kernberg, O. F. (2023). Borderline Personality Disorder: A Review. JAMA, 329(8), 670–679. https://doi.org/10.1001/jama.2023.0589

Leichsenring, F., Fonagy, P., Heim, N., Kernberg, O. F., Leweke, F., Luyten, P., Salzer, S., Spitzer, C., & Steinert, C. (2024). Borderline personality disorder: a comprehensive review of diagnosis and clinical presentation, etiology, treatment, and current controversies. World psychiatry : official journal of the World Psychiatric Association (WPA), 23(1), 4–25. https://doi.org/10.1002/wps.21156

Linehan, M. M. (1993). Cognitive-behavioral treatment of borderline personality disorder. Guilford Press.

López-Villatoro, J. M., Diaz-Marsá, M., Mellor-Marsá, B., De la Vega, I., & Carrasco, J. L. (2020). Executive Dysfunction Associated with the Primary Psychopathic Features of Borderline Personality Disorder. Frontiers in psychiatry, 11, 514905. https://doi.org/10.3389/fpsyt.2020.514905

ISSN: 0718-4123
DOI: 10.7714/CNPS/19.1.205

López-Villatoro, J. M., Diaz-Marsá, M., Rico-Perez, A., Fernandez-Rodrigues, V., Ayad-Ahmed, W., Galvez-Merlin, A., & Carrasco, J. L. (2023). Neurocognitive profile associated with borderline personality disorder: building specific indices of executive function. Actas espanolas de psiquiatria, 51(5), 220–228.

López-Villatoro, J. M., Diaz-Marsá, M., Ayad-Ahmed, W., Rico-Pérez, A., Perez-Diez, I., Galvez-Merlin, A., Prittwitz, C., & Carrasco, J. L. (2024). A Cluster Analysis of Neuropsychological Impairment in Borderline Personality Disorder: Identifying a Neurocognitive Subtype Linked to Attention Deficit Hyperactivity Disorder. Clinical psychology & psychotherapy, 31(3), e2979. https://doi.org/10.1002/cpp.2979

Mak, A. D., & Lam, L. C. (2013). Neurocognitive profiles of people with borderline personality disorder. Current opinion in psychiatry, 26(1), 90–96. https://doi.org/10.1097/YCO.0b013e32835b57a9

Mancuso, V., Sarcinella, E. D., Bruni, F., Arlati, S., Di Santo, S. G., Cavallo, M., Cipresso, P., & Pedroli, E. (2024). Systematic review of memory assessment in virtual reality: evaluating convergent and divergent validity with traditional neuropsychological measures. Frontiers in human neuroscience, 18, 1380575. https://doi.org/10.3389/fnhum.2024.1380575

McClure, G., Hawes, D. J., & Dadds, M. R. (2016). Borderline personality disorder and neuropsychological measures of executive function: A systematic review. Personality and mental health, 10(1), 43–57. https://doi.org/10.1002/pmh.1320

Millon, T., Grossman, S. y Millon, C. (2018). Inventario Clínico Multiaxial de Millon-IV (MCMI-IV). Pearson.

Mirchi, Z., Kheirkhah, M. T., Khosrowabadi, R., Fadardi, J. S., & Ramezani, M. (2024). Development of a real-world simulated instrument for evaluating visuospatial working memory: a preliminary psychometric study on older adults. BMC geriatrics, 24(1), 548. https://doi.org/10.1186/s12877-024-05140-9

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "Frontal Lobe" tasks: a latent variable analysis. Cognitive psychology, 41(1), 49–100. https://doi.org/10.1006/cogp.1999.0734

Mosiołek, A., Gierus, J., Koweszko, T., & Szulc, A. (2018). Evaluation of the relationship between cognitive functioning in patients with borderline personality disorder and their general functioning. Psychiatria polska, 52(1), 33–44. https://doi.org/10.12740/PP/OnlineFirst/62657

Nigg, J. T., Jester, J. M., Stavro, G. M., Ip, K. I., Puttler, L. I., & Zucker, R. A. (2017). Specificity of executive functioning and processing speed problems in common psychopathology. Neuropsychology, 31(4), 448–466. https://doi.org/10.1037/neu0000343

Nilsson, M., Lundh, L., Westrin, Å., & Westling, S. (2021). Executive functioning in psychiatric patients with deliberate self-harm, as compared with a psychiatric and a healthy comparison group. Journal of clinical and experimental neuropsychology, 43(3), 225–237. https://doi.org/10.1080/13803395.2021.1894094

Onandia-Hinchado, I., Sánchez-SanSegundo, M., & Oltra-Cucarella, J. (2019). Evaluación neuropsicológica de los Procesos Atencionales. Síntesis.

Oquendo, M., Baca-García, E., Graver, R., Morales, M., Montalban, V., Mann, J. y Barratt, E. (2001). Spanish adaptation of Barratt Impulsiveness Scale (BIS). European Journal of Psychiatry, 15, 147-55.

Palomares, N., García-Andrade, R., Arza, R., Portella, M. J., Díaz-Marsá, M., López-Micó, C., & Carrasco, J. L. (2019). Neuropsychological findings in recent onset schizophrenia and borderline personality disorder: a comparison study. Actas españolas de psiquiatría, 47(1), 7–15.

Pascual, J. C., Palomares, N., Ibáñez, Á., Portella, M. J., Arza, R., Reyes, R., Feliu-Soler, A., Díaz-Marsá, M., Saiz-Ruiz, J., Soler, J., & Carrasco, J. L. (2015). Efficacy of cognitive rehabilitation on psychosocial functioning in Borderline Personality Disorder: a randomized controlled trial. BMC psychiatry, 15, 255. https://doi.org/10.1186/s12888-015-0640-5

Pascual, J. C., Arias, L., & Soler, J. (2023). Pharmacological Management of Borderline Personality Disorder and Common Comorbidities. CNS drugs, 37(6), 489–497. https://doi.org/10.1007/s40263-023-01015-6

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. Journal of Clinical Psychology, 51(6), 768–774. https://doi.org/10.1002/1097-4679(199511)51:6<768::AID-JCLP2270510607>3.0.CO;2-1

Pereira, A., Richarte, V., Fadeuilhe, C., Corrales, M., García, E., & Ramos-Quiroga, J. A. (2024). ADHD Rating Scale (ADHD-RS): Validation in Spanish in adult population according to the DSM-5. Spanish journal of psychiatry and mental health, 17(1), 46–50. https://doi.org/10.1016/j.sjpmh.2023.06.002

Piñeiro, M. Cervantes, J.J., Ramírez, M., Ontiveros, M. y Ostrosky, M (2008). Evaluación de las funciones ejecutivas, inteligencia e impulsividad en mujeres con trastorno límite de la personalidad (TLP). Revista Colombiana de Psicología, 17(1), 105-114.

Portella, M. J., Soler, J., Tejero, A., Barrachina, J., Barrachina, J., Tiana, T., Pascual, J. C., Alvarez, E., & Pérez, V. (2011). Lentificación del procesamiento de la información en el trastorno límite de la personalidad: el paradigma de Stroop emocional [Slow processing in borderline personality disorder: the emotional Stroop paradigm]. Actas espanolas de psiquiatria, 39(6), 356–362.

Portellano-Pérez, J.A. y García-Alba, J. (2014). Neuropsicología de la atención, las funciones ejecutivas y la memoria. Síntesis.

Reitan, R. M. (1958). Validity of the Trail Making Test as an indicator of organic brain damage. Perceptual and Motor Skills, 8, 271–276. https://doi.org/10.2466/PMS.8.7.271-276

Rey, A. (1958). L'examen clinique en Psychologia. Presses Universitaires de France.

Richard-Devantoy, S., Berlim, M. T., & Jollant, F. (2014). A meta-analysis of neuropsychological markers of vulnerability to suicidal behavior in mood disorders. Psychological medicine, 44(8), 1663–1673. https://doi.org/10.1017/S0033291713002304

Richard-Devantoy, S., Berlim, M. T., & Jollant, F. (2015). Suicidal behaviour and memory: A systematic review and meta-analysis. The world journal of biological psychiatry : the official journal of the World Federation of Societies of Biological Psychiatry, 16(8), 544–566. https://doi.org/10.3109/15622975.2014.925584

Rosa, M., Scassellati, C., & Cattaneo, A. (2023). Association of childhood trauma with cognitive domains in adult patients with mental disorders and in non-clinical populations: a systematic review. Frontiers in psychology, 14, 1156415. https://doi.org/10.3389/fpsyg.2023.1156415

Ruocco A. C. (2005). The neuropsychology of borderline personality disorder: a meta-analysis and review. Psychiatry research, 137(3), 191–202. https://doi.org/10.1016/j.psychres.2005.07.004

ISSN: 0718-4123
DOI: 10.7714/CNPS/19.1.205

Ruocco, A. C., Amirthavasagam, S., & Zakzanis, K. K. (2012). Amygdala and hippocampal volume reductions as candidate endophenotypes for borderline personality disorder: a meta-analysis of magnetic resonance imaging studies. Psychiatry research, 201(3), 245–252. https://doi.org/10.1016/j.pscychresns.2012.02.012

Ruocco, A. C., & Carcone, D. (2016). A Neurobiological Model of Borderline Personality Disorder: Systematic and Integrative Review. Harvard review of psychiatry, 24(5), 311–329. https://doi.org/10.1097/HRP.0000000000000123

Rutter, S. B., Cipriani, N., Smith, E. C., Ramjas, E., Vaccaro, D. H., Martin Lopez, M., Calabrese, W. R., Torres, D., Campos-Abraham, P., Llaguno, M., Soto, E., Ghavami, M., & Perez-Rodriguez, M. M. (2020). Neurocognition and the Suicidal Process. Current topics in behavioral neurosciences, 46, 117–153. https://doi.org/10.1007/7854_2020_162

Sampedro, F., Farrés, C. C. I., Soler, J., Elices, M., Schmidt, C., Corripio, I., Domínguez-Clavé, E., Pomarol-Clotet, E., Salvador, R., & Pascual, J. C. (2021). Structural brain abnormalities in borderline personality disorder correlate with clinical severity and predict psychotherapy response. Brain imaging and behavior, 15(5), 2502–2512. https://doi.org/10.1007/s11682-021-00451-6

Seres, I., Unoka, Z., Bódi, N., Aspán, N., & Kéri, S. (2009). The neuropsychology of borderline personality disorder: relationship with clinical dimensions and comparison with other personality disorders. Journal of personality disorders, 23(6), 555–562. https://doi.org/10.1521/pedi.2009.23.6.555

Shah, R., & Zanarini, M. C. (2018). Comorbidity of Borderline Personality Disorder: Current Status and Future Directions. The Psychiatric clinics of North America, 41(4), 583–593. https://doi.org/10.1016/j.psc.2018.07.009

Silbersweig, D., Clarkin, J. F., Goldstein, M., Kernberg, O. F., Tuescher, O., Levy, K. N., Brendel, G., Pan, H., Beutel, M., Pavony, M. T., Epstein, J., Lenzenweger, M. F., Thomas, K. M., Posner, M. I., & Stern, E. (2007). Failure of frontolimbic inhibitory function in the context of negative emotion in borderline personality disorder. The American journal of psychiatry, 164(12), 1832–1841. https://doi.org/10.1176/appi.ajp.2007.06010126

Smith, A. (1973). Symbol Digit Modalities Test. Manual. Western Psychological Services.

Smith, A. (2002). SDMT: Test de Símbolos y Dígitos. TEA Ediciones.

Soler, J., Vega, D., Feliu-Soler, A., Trujols, J., Soto, A., Elices, M., Ortiz, C., Pérez, V., Bohus, M., & Pascual, J. C. (2013). Validation of the Spanish version of the Borderline Symptom List, short form (BSL-23). BMC psychiatry, 13, 139. https://doi.org/10.1186/1471-244X-13-139

Strauss, E., Sherman, E. M. S., & Spreen, O. (2006). A compendium of neuropsychological tests: Administration, norms, and commentary (3rd ed.). Oxford University Press.

Tamayo, F., Casals-Coll, M., Sánchez-Benavides, G., Quintana, M., Manero, R. M., Rognoni, T., Calvo, L., Palomo, R., Aranciva, F., & Peña-Casanova, J. (2012). Estudios normativos españoles en población adulta joven (Proyecto NEURONORMA jóvenes): normas para las pruebas span verbal, span visuoespacial, Letter-Number Sequencing, Trail Making Test y Symbol Digit Modalities Test [Spanish normative studies in a young adult population (NEURONORMA young adults Project): norms for the verbal span, visuospatial span, Letter-Number Sequencing, Trail Making Test and Symbol Digit Modalities Test]. Neurología, 27(6), 319–329. https://doi.org/10.1016/j.nrl.2011.12.020

Thomsen, M. S., Ruocco, A. C., Carcone, D., Mathiesen, B. B., & Simonsen, E. (2017). Neurocognitive Deficits in Borderline Personality Disorder: Associations With Childhood Trauma and Dimensions of Personality Psychopathology. Journal of personality disorders, 31(4), 503–521. https://doi.org/10.1521/pedi_2016_30_265

Unoka, Z., & J Richman, M. (2016). Neuropsychological deficits in BPD patients and the moderator effects of co-occurring mental disorders: A meta-analysis. Clinical psychology review, 44, 1–12. https://doi.org/10.1016/j.cpr.2015.11.009

Vai, B., Cazzetta, S., Scalisi, R., Donati, A., Bechi, M., Poletti, S., Sforzini, L., Visintini, R., Maffei, C., & Benedetti, F. (2021). Neuropsychological deficits correlate with symptoms severity and cortical thickness in borderline personality disorder. Journal of affective disorders, 278, 181–188. https://doi.org/10.1016/j.jad.2020.09.060

Veerapandian, K. D., Tan, G. X. D., Majeed, N. M., & Hartanto, A. (2023). Executive Function Deficits and Borderline Personality Disorder Symptomatology in a Nonclinical Adult Sample: A Latent Variable Analysis. Brain sciences, 13(2), 206. https://doi.org/10.3390/brainsci13020206

Vita, A., Deste, G., Barlati, S., Poli, R., Cacciani, P., De Peri, L., & Sacchetti, E. (2018). Feasibility and effectiveness of cognitive remediation in the treatment of borderline personality disorder. Neuropsychological rehabilitation, 28(3), 416–428. https://doi.org/10.1080/09602011.2016.1148054

Wang, Y., Zhou, Y., Li, G., Qin, P., Wang, J., Qi, L., Li, L., Wang, Y., Wang, J., Li, J., Liang, Z., & Zhou, Y. (2023). Executive functions in non-suicidal self-injury comorbid first episode and drug-naïve depression among adolescents. Psychiatry research, 328, 115476. https://doi.org/10.1016/j.psychres.2023.115476

Wechsler, D. (2012). WAIS-IV. Wechsler Adult Intelligence Scale--Fourth Edition (WAIS-IV) (spanish version). Manual de aplicación y corrección. Pearson.

World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. JAMA, 310(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. World Health Organization.

Williams J. M. (2006). Capture and rumination, functional avoidance, and executive control (CaRFAX): Three processes that underlie overgeneral memory. Cognition & emotion, 20(3-4), 548–568. https://doi.org/10.1080/02699930500450465

Williams, J. M., Barnhofer, T., Crane, C., Herman, D., Raes, F., Watkins, E., & Dalgleish, T. (2007). Autobiographical memory specificity and emotional disorder. Psychological bulletin, 133(1), 122–148. https://doi.org/10.1037/0033-2909.133.1.122

Williams, G. E., Daros, A. R., Graves, B., McMain, S. F., Links, P. S., & Ruocco, A. C. (2015). Executive functions and social cognition in highly lethal self-injuring patients with borderline personality disorder. Personality disorders, 6(2), 107–116. https://doi.org/10.1037/per0000105

Wingenfeld, K., Rullkoetter, N., Mensebach, C., Beblo, T., Mertens, M., Kreisel, S., Toepper, M., Driessen, M., & Woermann, F. G. (2009). Neural correlates of the individual emotional Stroop in borderline personality disorder. Psychoneuroendocrinology, 34(4), 571–586. https://doi.org/10.1016/j.psyneuen.2008.10.024

Winsper, C. (2021). Borderline personality disorder: Course and outcomes across the lifespan. Current Opinion in Psychology, 37, 94-97.

Xiao, Q., Shen, L., He, H., Wang, X., Fu, Y., Ding, J., Jiang, F., Zhang, J., Zhang, Z., Grecucci, A., Yi, X., & Chen, B. T. (2024). Alteration of prefrontal cortex and its associations with emotional and cognitive dysfunctions in adolescent borderline personality disorder. European child & adolescent psychiatry, 10.1007/s00787-024-02438-2. Advance online publication. https://doi.org/10.1007/s00787-024-02438-2

Yang, X., Hu, L., Zeng, J., Tan, Y., & Cheng, B. (2016). Default mode network and frontolimbic gray matter abnormalities in patients with borderline personality disorder: A voxel-based meta-analysis. Scientific reports, 6, 34247. https://doi.org/10.1038/srep34247