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Alterações nas Funções Executivas no Transtorno Obsessivo-Compulsivo: Uma Revisão Sistemática da Literatura

Executive Functions' Alterations In Obsessive-Compulsive Disorder: A Systematic Literature Review

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Resumo

Obsessive-compulsive disorder (OCD) is a debilitating neuropsychiatric disorder characterized by persistent obsessive and compulsive symptoms. Dysfunctions in two inhibitory systems related to cognitive and behavioral processes are believed to be associated with the pathophysiology of OCD. These dysfunctions can affect not only the cognitive and behavioral symptoms, but also the neuropsychological deficits observed in this disorder, such as attention, memory, planning, and decision-making. This study presents a systematic literature review aiming to investigate alterations in executive functions in individuals with OCD. The search was conducted in the Scopus and Scielo databases, resulting in a final sample of 13 articles that met the inclusion criteria. The results indicated deficiencies in executive functions and non-verbal memory in patients with OCD when compared to healthy control groups. However, there were inconsistencies in the results across studies, possibly due to the variety of tests used and the complexity of the disorder. Therefore, it is important to consider factors such as cultural differences, medication use, and socioeconomic factors when interpreting the results, as these aspects can influence the study outcomes. Additionally, there are still gaps in understanding the alterations in executive functions in patients with OCD, requiring further research for a better comprehension of this relationship.

Keywords: Obsessive-Compulsive Disorder; Executive Function; Neuropsychology.

Abstract

O transtorno obsessivo-compulsivo (TOC) é um transtorno neuropsiquiátrico debilitante caracterizado por sintomas obsessivos e compulsivos persistentes. Acredita-se que disfunções em dois sistemas inibitórios relacionados a processos cognitivos e comportamentais estejam associadas à fisiopatologia do TOC. Essas disfunções podem afetar não apenas os sintomas cognitivos e comportamentais, mas também os déficits neuropsicológicos observados nesse transtorno, como atenção, memória, planejamento e tomada de decisões. Este estudo apresenta uma revisão sistemática da literatura com o objetivo de investigar alterações nas funções executivas em indivíduos com TOC. A busca foi realizada nas bases de dados Scopus e Scielo, resultando em uma amostra final de 13 artigos que atenderam aos critérios de inclusão. Os resultados indicaram deficiências nas funções executivas e na memória não verbal em pacientes com TOC quando comparados a grupos de controle saudáveis. No entanto, houve inconsistências nos resultados entre os estudos, possivelmente devido à variedade de testes utilizados e à complexidade do transtorno. Portanto, é importante considerar fatores como diferenças culturais, uso de medicamentos e fatores socioeconômicos na interpretação dos resultados, pois esses aspectos podem influenciar os resultados do estudo. Além disso, ainda existem lacunas na compreensão das alterações nas funções executivas em pacientes com TOC, sendo necessárias mais pesquisas para uma melhor compreensão dessa relação.

Palavras-chave: Transtorno Obsessivo-Compulsivo; Função Executiva; Neuropsicologia.

Resumen

El trastorno obsesivo-compulsivo (TOC) es un trastorno neuropsiquiátrico debilitante caracterizado por síntomas obsesivos y compulsivos persistentes. Se cree que las disfunciones en dos sistemas inhibidores relacionados con los procesos cognitivos y conductuales están asociadas con la fisiopatología del TOC. Estas disfunciones pueden afectar no sólo a los síntomas cognitivos y conductuales, sino también a los déficits neuropsicológicos observados en este trastorno, como la atención, la memoria, la planificación y la toma de decisiones. Este estudio presenta una revisión sistemática de la literatura con el objetivo de investigar las alteraciones

en las funciones ejecutivas en personas con TOC. La búsqueda se realizó en las bases de datos Scopus y Scielo, resultando una muestra final de 13 artículos que cumplieron con los criterios de inclusión. Los resultados indicaron deficiencias en las funciones ejecutivas y la memoria no verbal en pacientes con TOC en comparación con grupos de control sanos. Sin embargo, hubo inconsistencias en los resultados entre los estudios, posiblemente debido a la variedad de pruebas utilizadas y la complejidad del trastorno. Por lo tanto, es importante considerar factores como las diferencias culturales, el uso de medicamentos y los factores socioeconómicos al interpretar los resultados, ya que estos aspectos pueden influir en los resultados del estudio. Además, todavía existen lagunas en la comprensión de las alteraciones en las funciones ejecutivas en pacientes con TOC, lo que requiere más investigaciones para una mejor comprensión de esta relación.

Palabras Clave: *Trastorno Obsesivo Compulsivo; Función Ejecutiva; Neuropsicología.*

Introduction

Obsessive-compulsive disorder (OCD) is a neuropsychiatric disorder characterized by the presence of obsessions and/or compulsions that significantly interfere with everyday life (American Psychiatric Association [APA], 2023). Obsessions are recurrent, intrusive, and unwanted thoughts or impulses applied according to rules that need to be rigidly adopted (Ribeiro et al., 2021). On the other hand, compulsions are repetitive behaviors or mental acts performed in response to obsessions or according to rules that must be strictly followed (APA, 2023).

The pathophysiology of OCD has been associated with dysfunctions in two inhibitory systems: 1) the cognitive inhibitory process, which occur as a function of obsessive symptoms, and 2) the behavioral inhibitory process, which occur as a function of compulsive symptoms (Chamberlain et al., 2005). It is also important to highlight that the relationship between these two inhibitory processes is complex and dynamic. Furthermore, failures in these inhibitory systems may also be related to most of the neuropsychological deficits found in OCD in terms of attention, memory, planning and decision-making (Chamberlain et al., 2005; Shin et al., 2008).

Therefore, understanding the neurobiological mechanisms underlying OCD is crucial on the development of effective treatments for this complex clinical condition. The study by Melo and Sampaio (2021), for example, suggests that the symptomatic features of OCD are associated with deficits in executive functions (EF). Executive functions are complex cognitive aspects that play decisive roles in the individual's cognitive, emotional and social regulation (Lezak et al., 2012).

A meta-analysis conducted by Shin et al. (2006), using a sample of 88 selected studies, was performed to investigate the presence of cognitive dysfunction in individuals affected with OCD. Results indicated that the group experienced impairments on tasks that measure visuospatial memory, executive function, verbal memory, and verbal fluency. However, their auditory attention was preserved. Deficiency in executive function influences an individual's behavior in their everyday life, limiting their ability to adapt to demands or changes in their environment (Fournet et al., 2019). Neuropsychological studies suggest that deficits in executive function are associated with damage or dysfunction in the prefrontal cortex and disruption of relevant neural pathways (Fournet et al., 2019).

Objective

Thus, the present study aims to investigate executive functions' alterations in people with OCD. Specifically, we aim to analyze and describe the main findings of studies that investigated cognitive changes in this population, in addition to observing what are the main variations associated with OCD.

Materials and Methods

This study is a systematic literature review focused on an investigation into executive functions' alterations associated with people affected by OCD. It follows the PRISMA guidelines for systematic reviews (Page et al., 2021). Systematic reviews adopt a replicable method, being a scientific, transparent and detailed process aimed at minimizing biases through an exhaustive bibliographical research (Tranfield et al., 2003).

Search Strategies

From February 14 to 16, 2023, searches were carried out in the Scopus and Scielo databases, which traditionally index research focused on Psychology. Searches were limited to the manuscript's title, abstract, and keywords, using the following search strategy: ("Transtorno Obsessivo-Compulsivo" OR "TOC" OR "OCD" OR "Obsessive-Compulsive Disorder" OR Trastorno Obsesivo Compulsivo) AND ("funções executivas" OR "executive functions" OR "funciones ejecutivas"). Filters were used to restrict the

results to peer-reviewed scientific manuscripts, published in English, Portuguese, and Spanish from 2018 to 2023 (five years interval). The following criteria were adopted to include articles: (1) is related to OCD, (2) addresses changes in executive function associated with OCD, (3) is an empirical study, and (4) has an adult sample. Articles that did not follow these criteria were excluded.

Data Collection

Identification and selection of manuscripts was carried out by two independent judges, who were experts in the field. In case of disagreement between them, a third judge had the final decision. The two judges initially independently analyzed the titles, abstracts, and keywords of all manuscripts, in order to select and elect the ones that answered the research question. Eligible articles were analyzed in full and then included, or not, in the analysis corpus.

Data Extraction and Analysis

The judges who participated in this stage worked independently to extract relevant data from the manuscripts included in the analysis corpus. In case of disagreement between the judges, a third judge was called in (the same as in the previous step). The following information was extracted from the manuscripts: (1) Authors and year, (2) title, (3) study aims, and (4) main results.

Finally, complementary analyzes were performed in the full-texts using the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRaMuTeQ). IRaMuTeQ analyzes textual structure and organization, making it possible to observe the relationships between the lexical worlds that are most frequently enunciated in research material (Camargo & Justo, 2013). Descending Hierarchical Classification (CHD) was performed, and a dendrogram was developed with the classes that emerged, disregarding words with $\chi^2 < 3.80$ ($p < 0.05$), as they were not sufficiently associated with the class.

Results

In a first search, 149 manuscripts were found in Scopus and 27 in Scielo, of which 24 were selected after reading the abstracts. Of these total, only 21 were analyzed by the

judges, considering that three were repeated manuscripts. The judges agreed to remove three papers that were systematic reviews and 18 went on to the eligibility analysis, where five articles that did not directly refer to changes in executive functions related to OCD were excluded. Therefore, 13 articles remained in the final sample (**Figure 1**).

Figure 1.

Prisma Diagram

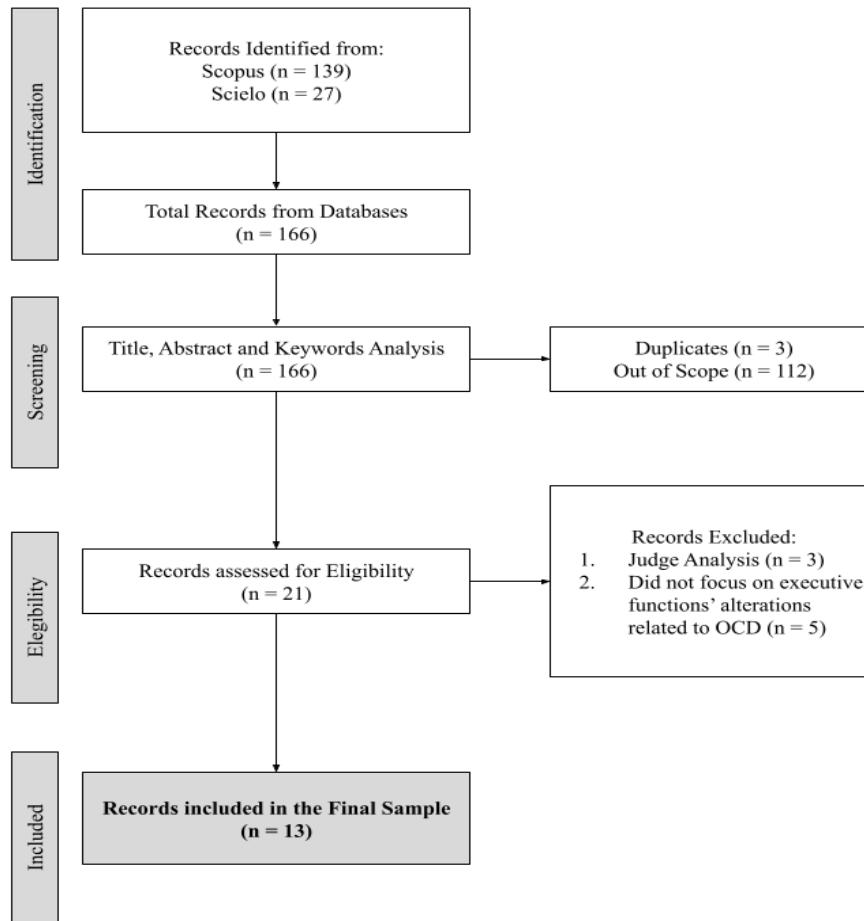


Table 1 presents the sample characterization for a better understanding of the studies that were found.

Table 1.

Sample Characteristics (N = 13).

Manuscript Number	Aims	Sample	Measures	Main Results
1	To investigate the effects of anterior capsulotomy on the cognitive function of patients with refractory OCD	14 patients with treatment-refractory OCD, 14 patients with untreated OCD, and 14 as a control group	WASI, WMS-R, WCST, Y-BOCS	Surgical patients showed higher levels of improvement in verbal memory, visual memory, visuospatial skills, and EF than non-surgically treated OCD patients
2	Provide a heuristic decision tree for developing customized assessment protocols for OCD patients	29 OCD patients and 29 healthy participants	MSSE, Digit S, PALT, Corsi S, Corsi BT, FAB, TMT, TOL, PF, SF	Using three neuropsychological tests and two VMET scores, it was possible to discriminate OCD patients from the CG
3	To investigate the effects of SSRI on EF in OCD patients, relatives of OCD patients and healthy controls	24 OCD, 13 first-degree relatives without OCD symptomatology and 28 healthy participants	TOL	Impairments in executive planning in OCD patients
4	To assess EF in OCD patients, compared to a healthy GC	66 OCD patients and 35 healthy participants	Y-BOCS, OCSA, WCST, and TOL	Patients with OCD showed EF deficits in the areas of changing scenery, inhibitory control, working memory, and planning ability
5	To explore the interaction between EF, anxiety, and compulsive checking behavior in patients with OCD	51 OCD patients and 47 healthy participants	MINI, Y-BOCS, OCI-R, BAI, and BDI	Patients with OCD showed significantly higher anxiety and impairments in working memory compared to CG participants
6	To analyze response trajectory, cognitive flexibility and WM in patients with OCD, GAD and SAD	89 patients diagnosed with OCD (n = 31), SAD (n = 27) e GAD (n = 31)	Y-BOCS, PSWQ, LSAS, BDI, BAI, WCST, SCWT, WAIS-IV, WMS-III, RIST	The OCD group showed the worst results in cognitive flexibility and verbal working memory. EF were influenced by the level of obsessions and anxiety and by the use of pharmacotherapy
7	To examine whether patients with OCD have gray matter abnormalities in regions related to EF	27 OCD patients and 29 healthy participants	BDI, STAI, DEQ, and Y-BOCS	Abnormal lateralization in OCD may contribute to the onset of obsessive-compulsive symptoms and EF impairment

8	To assess EF in Chinese patients with OCD and a CG	46 patients with OCD and 45 healthy controls	Y-BOCS, IED, SOC, PAL, SWM, and SST	There were no significant differences between groups on any of the cognitive tests
9	Characterize OCD patients with poor insight	57 OCD patients and 53 healthy controls	TBTP, CVLT, TMT, and Rey complex figures	The neuropsychological profile of patients with poor insight is different from patients with good insight, showing differences in EF tests
10	To determine the contribution of EF and reinforcement sensitivity in predicting OCD symptoms	365 women	BRIEF, OCI, and SPSRQ-RC	Impaired EF in cognition and reinforcement sensitivity in motivation contribute to the emergence or maintenance of OCD symptoms
11	To compare risky decision-making, decision-making in ambiguity and cold EF between OCD patients and a CG	62 OCD patients and 48 healthy participants	IGT, STROOP, and WCST	The group with OCD showed EF impairment, in addition to the worst performance in risky decision-making
12	To compare EF and non-verbal memory among bodybuilders with MD symptoms, men with OCD symptoms and a CG	30 bodybuilders, 30 OCD patients, and 30 college students	DMS, Y-BOCS, SCWT, WCST and Rey complex figures test	The OCD group had limited EF ability in inhibitory control and cognitive flexibility, in addition to moderate visuospatial deficits in nonverbal memory
13	To investigate the ability to distinguish between OCD patients and healthy individuals based on memory and EF	90 OCD patients and 92 healthy participants	WMS-III, SCWT, and SCST	Patients with OCD showed worse performance in immediate memory, general memory, working memory and response continuity

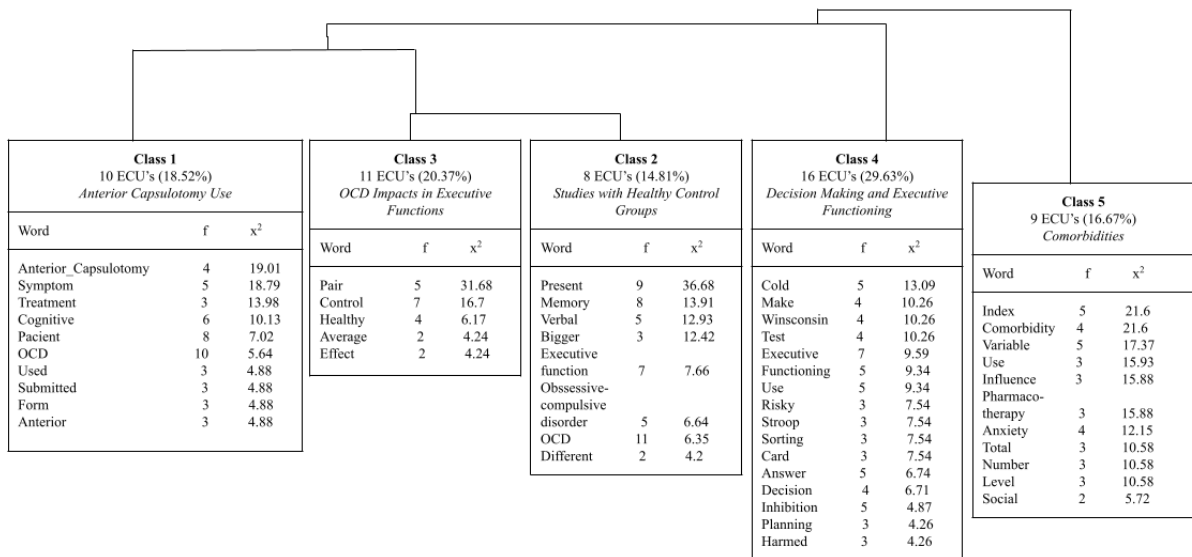
Notes: 1 = Gong et al. (2018); 2 = Pedroli et al. (2019); 3 = Lochner et al. (2020); 4 = Youssef et al. (2020); 5 = Wang et al. (2023); 6 = Rosa-Alcázar et al. (2021); 7 = Bowen et al. (2021); 8 = Ren et al. (2021); 9 = Manarte et al. (2021); 10 = Amani & Keyvanlo (2022); 11 = GünGör et al. (2018); 12 = Figueroa et al. (2017); 13 = Hamidian et al. (2022). BDI = Beck's Depression Inventory, BRIEF = Behavior Rating Inventory of Executive Functions, CG = Control Group, CORSI BT = Corsi Block Task, CORSI S = Corsi Span, CVLT = California Verbal Learning Test, DEQ = Dry Eye Questionnaire, DIGIT S = Digit Span Test, FAB = Frontal Assesment Battery, GAD = Generalized Anxiety Disorder, IED = Intra-Extra Dimensional Set Shift, LSAS = Liebowitz Social

Anxiety Scale, MD= Muscle dysmorphia, MSSE= Mental State Short Exam, OCI = Obsessive-Compulsive Inventory, PAL = Paired-associate learning, PALT = Paired-Associate Learning Test, PF = Phonemic Fluency Test, PSWQ = Penn State Worry Questionnaire, RIST = Reynolds Intellectual Screening Test, SAD = Social Anxiety Disorder, SCWT = Stroop Color Word Test, SF = Semantic Fluency Test, SOC = Cambridge Socks, SPSRQ-RC = Sensitivity to Punishment and Reward Questionnaire, SST = Stop Signal Task, STAI = State-Trait Anxiety Inventory, SWM = Spatial Work Memory, TBTP = Toulouse Piéron Test, TMT = Trail Making Test, TOL = Tower of London Test, VMET = Virtual Multiple Errands Test, WAIS-IV = Wechsler Adult Intelligence Scale-IV, WASI = Wechsler Abbreviated Scale of Intelligence, WCST = Wisconsin Card Sorting Test, WMS-III = Wechsler Memory Scale-III, WMS-R = Wechsler Memory Scale-Revised, Y-BOCS = Yale-Brown Obsessive-Compulsive Scale

To better understand the results, a descending hierarchical analysis (DHA) was performed. The corpus consisted of 13 texts, separated into 78 text segments (TS), with the retention of 54 TSs (69.23%). 2,826 occurrences emerged (words, forms, or vocables). The analyzed content was then categorized into five classes: Class 1 – “Anterior Capsulotomy Use”, with 10 TS (18.52%), Class 2 – “Studies with healthy control groups”, with 11 TS (20.37%), Class 3 – “OCD impacts in executive functions”, with 8 TS (14.81%), Class 4 – “Decision-making and executive functioning”, with 16 TS (29.63%), and Class 5 – “Comorbidities”, with 9 TS (16.67%) (see **Figure 2**).

Figure 2.

Dendrogram.



Note: ECU = Elementar Context Unity.

Class 1 – “Anterior Capsulotomy Use”

This class comprises 18.52% (f = 10 TS) of the total corpus analyzed and manuscripts 1, 2, 3, 5, 8 and 12 are the ones that most represent it. It refers to the effects of Anterior Capsulotomy as a treatment option for patients with OCD, which can not only reduce the symptoms of the disorder, but also mitigate moderate cognitive deficits.

“[...] findings suggest that Anterior Capsulotomy not only reduces OCD symptoms, but also attenuates moderate cognitive deficits.” (Gong et al., 2018).

Class 2 – “Studies with healthy control groups”

It comprises 14.81% (f = 8 TS) of the total corpus analyzed, and refers to studies with healthy control groups to assess executive functions, mostly seeking to collect data on neuropsychological differences in comparison with groups of individuals with OCD. Manuscripts 1, 4, 5, 6, 7, 12 and 13 appeared in this class.

“[...] seeking to evaluate executive functions in patients with a primary diagnosis of OCD compared to a healthy control group in order to understand

the impact of this disorder on the patient's neuropsychological state.” (Gong et al., 2018).

Class 3 – “OCD impacts in executive functions”

Comprises 20.37% (f = 11 TS) of the total corpus, including manuscripts 1, 2, 3, 4, 9 and 13. This class focus on the impacts of OCD on executive functions, such as visuospatial deficits in non-verbal memory and impairments in working memory.

“[...] OCD patients had significantly higher anxiety and impairments in visuospatial working memory function compared with healthy patients [...]” (Wang et al., 2023).

Class 4 – “Decision-making and executive functioning”

This class comprises 29.63% (f = 16 TS) of the total corpus, and is the class with the highest number of TSs, referring to complications related to OCD. It also emphasizes the worsening of decision-making and cold executive functioning. This class includes manuscripts 1, 3, 4, 6, 10, 11 and 13.

“[...] patients with OCD had a worse performance in risky decision-making and cold executive functioning. There was a link between risky decision-making performance and impaired cold executive functions.” (GünGör et al., 2018).

Class 5 – “Comorbidities”

Finally, Class 5 comprises 16.67% (f = 9 TS) of the total corpus and is represented by articles 2, 3, 4, 6, 7 and 13, referring to comorbidities that, together with OCD, alter executive functions, emphasizing the anxiety.

“[...] comorbidities such as use of pharmacotherapy, level of anxiety and obsessions were variables that influenced the performance of executive functions [...] patients with OCD and social or generalized anxiety are considered some variables that can influence the results of non-verbal reasoning [...]” (Rosa-Alcázar et al., 2021).

Discussão

In this systematic review, we discussed different studies that investigated the relationship between Obsessive-Compulsive Disorder (OCD) and executive functions.

Summarily, the majority of the 13 studies showed alterations in the executive functions, corroborating Shin et al. (2014) previous meta-analysis. Furthermore, using a descending hierarchical analysis, we observed five main classes: Anterior Capsulotomy Use, Studies with healthy control groups, OCD impacts in executive functions, Decision-making and executive functioning, and Comorbidities.

Starting with Class 1, Anterior Capsulotomy (AC) is a neurosurgical treatment option for OCD. The study by Gong et al. (2018) observed that improvements in clinical symptoms for OCD patients can occur as early as one month after surgery and be sustained, with 78.6% of patients responding to therapy within 12 months. These results are corroborated by a review conducted by Pepper et al. (2020): analyzing studies spanning from 1961-2018, this research observed that 73% patients presented a clinical response after AC using the Yale-Brown Obsessive Compulsive Scale as a criterion. A recent meta-analysis by Gupta et al. (2024) presented similar results. Thus, future studies can further investigate AC's impacts specifically on executive functions.

Eleven studies compared healthy control groups with groups of individuals with OCD (although only seven appeared in the correspondent Class). Results revealed significant differences, such as worse executive planning in patients with OCD when compared to healthy controls, with a tendency towards impaired response and change in configuration (GünGör et al., 2018; Lochner et al., 2020; Youssef et al., 2020). Results also indicated lower performance on memory tasks, deficits in visuospatial working memory, and higher levels of anxiety (Hamidian et al., 2022; Wang et al., 2023). In Pedroli et al. (2019), for example, executive functions in OCD patients and controls were investigated using the Virtual multiple errands test (VMET) and a classic neuropsychological battery. The results showed clear differences in executive functions between patients with OCD and the control group, with, for example, OCD patients showing more errors and lower divided attention. These results are similar to a previous study that aimed to validate VMET for cognitive assessment in OCD patients (La Paglia et al., 2014).

Abnormalities in the bilateral putamen, left pallidum, and right cranio-orbital foramen were identified in individuals with OCD, suggesting a relationship with this disorder's pathology and main symptoms. These findings support the idea that OCD is an early neurodevelopmental disorder, with abnormal patterns of cortical folding and

lateralization potentially serving as biomarkers for early identification of the condition (Bowen et al., 2021). Therefore, these studies, using healthy control groups, provide consistent evidence of neuropsychological effects and differences in executive functions within individuals with OCD.

Classes 3 and 4 specifically focused on OCD's impacts on the executive functions. These results emphasized that OCD was associated with a wide variety of deterioration in executive function, such as inhibitory control: specifically, this variable can be related to the inability to inhibit repetitive thoughts and behaviors, as suggested by Uhre et al. (2022). In agreement with this statement, individuals with OCD performed worse on tests such as the Wisconsin Card Sorting Test (WCST), Tower of London (ToL) and Stroop Test, indicating impairments in the ability to change the focus of attention and response inhibition (GünGör et al., 2018; Manarte et al., 2021; Youssef et al., 2020).

However, not all indicators showed statistically significant differences between groups, revealing inconsistencies in the literature regarding executive function deficits in OCD patients. Specifically, Ren et al. (2021) didn't observe significant results in a sample of Chinese patients, with sociodemographic and cultural variables being highlighted as possible explanations for the inconsistent results. This inconsistency can also be attributed to the tests and the different indices calculated, as well as the complex nature of OCD. Future studies can compare the relationship between OCD and executive functions using the same tests in different cultures, aiming to further test this variable's impacts on the results.

Furthermore, studies in Classes 3 and 4 demonstrated a significant relationship between the severity of OCD symptoms and executive function domains (Figueroa et al., 2017; GünGör et al., 2018; Manarte et al., 2021; Youssef et al., 2020). The research by Amani and Keyvanlo (2022), for example, investigated the role of executive functions and reinforcement sensitivity in predicting OCD. The results obtained suggest that emotional control, initiation and working memory are associated with OCD and can be used as predictors of this disorder. Emotional control proved to be a crucial factor, as individuals unable to manage their emotional responses may experience prolonged and intense episodes of distress, leading to anxiety and the development of OCD. Furthermore, a correlation was found between working memory and OCD, possibly due

to compulsive selection behaviors, as patients with OCD have difficulty distinguishing between real and imaginary memories.

The relationship between executive functions, anxiety and checking behavior was also investigated in a study by Wang et al. (2023). Results indicated that anxiety can consume cognitive resources and interfere with central executive functions. Furthermore, individuals with OCD tend to be more likely to resort to checking behavior as a compensatory strategy to deal with deficits in working memory. Higher working memory capacity has also been found to play a protective role against compulsive checking behavior, especially in situations of intense anxiety (Wang et al., 2023).

Finally, Class 5 focused on OCD comorbidities. Rosa-Alcázar et al. (2021), for example, aimed to analyze the influence of comorbidities and pharmacotherapy on executive function within each clinical group. The results showed that the comorbidity affected the cognitive and verbal response inhibition in the OCD and generalized anxiety disorder (GAD) groups, while medication influenced visuospatial working memory in all clinical groups. The level of both obsessions and anxiety also influenced executive functions differently. Regarding comorbidity in OCD, a previous study across seven countries showed that this is common among patients with this disorder: specifically, major depressive disorder, and anxiety disorders (GAD and phobias) are commonly co-occurring diagnoses (Brakoulias et al., 2017). Both this data and the results observed in the present review point out to a need of further investigating if executive functions are impacted by OCD, its comorbidities or if a combination of both factors has different effects.

Overall, these studies suggest that OCD is associated with psychological dysfunction, as well as deficits in executive and cognitive functions. However, it is important to point out that many factors can influence the data, including culture, medication status, and other socioeconomic factors. Therefore, further research is needed to fully understand the pathophysiology of OCD and how it affects cognitive and executive functions.

Conclusion

Based on the examined data, we can conclude that the Obsessive-Compulsive Disorder (OCD) is associated with dysfunctions in executive and cognitive functions. This systematic review revealed differences between individuals with OCD and healthy control groups in several areas such as executive planning, visuospatial working memory, and inhibitory control. Furthermore, abnormalities in specific driving regions have been identified in patients with OCD, suggesting a relationship between the pathology of the disorder and obsessive-compulsive symptoms.

However, it is important to emphasize that the literature still presents inconsistencies regarding deficits in executive functions in patients with OCD, which can be attributed to the wide variety of tests and indices used, as well as the complexity and heterogeneity of the disorder itself. Some studies highlight the relationship between the severity of OCD symptoms and performance in executive functions, suggesting that symptomatology may play an important role in the variability of results. In addition, factors such as cultural differences, medication status, and other socioeconomic factors may influence study results, highlighting the need to consider these factors in future research.

References

- Amani, M., & Keyvanlo, S. (2022). Executive Functions and Reinforcement Sensitivity in Women with Obsessive Compulsive Symptoms. *Iranian Journal of Psychiatry, 17*(2), 177. doi: 10.18502/ijps.v17i2.8908
- American Psychiatric Association. (2023). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). Porto Alegre: Artmed.
- Brakoulias, V., Starcevic, V., Belloch, A., Brown, C., Ferrao, Y. A., Fontenelle, L. F., ... Viswasam, K. (2017). Comorbidity, age of onset and suicidality in obsessive-compulsive disorder (OCD): An international collaboration. *Comprehensive Psychiatry, 76*, 79–86. doi:10.1016/j.comppsy.2017.04.002

- Bowen, Z., Changlian, T., Qian, L., Wanrong, P., Huihui, Y., Zhaoxia, L., ... & Mingtian, Z. (2021).
Gray matter abnormalities of orbitofrontal cortex and striatum in drug-naive adult patients with obsessive-compulsive disorder. *Frontiers in Psychiatry, 12*, 674568. doi: 10.3389/fpsy.2021.674568
- Camargo, B. V., & Justo, A. M. (2013). IRAMUTEQ: Um software gratuito para análise de dados textuais. *Temas em Psicologia, 21*(2), 513–518. doi: 10.9788/TP2013.2-16
- Chamberlain, S. R., Blackwell, A. D., Fineberg, N. A., Robbins, T. W., & Sahakian, B. J. (2005).
The neuropsychology of obsessive compulsive disorder: The importance of failures in cognitive and behavioural inhibition as candidate endophenotypic markers. *Neuroscience & Biobehavioral Reviews, 29*(3), 399–419. <https://doi.org/10.1016/j.neubiorev.2004.11.006>
- Figuerola, M. A., Contreras Troya, T., Juárez López, S., Aldana González, G., & Valencia Cruz, A. (2018). Estudio neuropsicológico de la dismorfia muscular y del trastorno obsesivo-compulsivo. *Universitas Psychologica, 17*(3), 42-51. doi: 10.11144/javeriana.upsy17-3.endm
- Fournet, N., Achachi, O., Roy, A., Besnard, J., Lancelot, C., Le Gall, D., & Bouvard, M. (2019). Função executiva prejudicada na vida cotidiana: um preditor de recaída do TOC?. *Journal of Behavioral and Brain Science, 9*, 90-107. doi: 10.4236/jbbs.2019.93008
- Gong, F., Li, P., Li, B., Zhang, S., Zhang, X., Yang, S., ... & Wang, W. (2018). A study of cognitive function in treatment-refractory obsessive-compulsive disorder treated with capsulotomy. *Journal of Neurosurgery, 128*(2), 583-595. doi: 10.3171/2016.9.JNS152494
- Gupta, R., Chen, J. W., Hughes, N. C., Hamo, M., Jean-Baptiste, S., Paulo, D. L., Chanbour, H.,
Fan, R., Ye, F., Vadali, A., Cmelak, A., & Bick, S. K. (2024). Benefits of stereotactic radiosurgical anterior capsulotomy for obsessive-compulsive disorder: A meta-analysis. *Journal of Neurosurgery*, Online First. doi:10.3171/2024.1.JNS231537
- La Paglia, F., La Cascia, C., Rizzo, R., Cangialosi, F., Sanna, M., Riva, G., & La Barbera, D. (2014). Cognitive assessment of ocd patients: Neurovr vs neuropsychological test. *Studies in*

Health Technology and Informatics, 199, 40–44.
<https://pubmed.ncbi.nlm.nih.gov/24875687/>

Lezak, M.D., Howieson, D.B., Bigler, E.D., & Tranel, D. (2012). *Neuropsychological assessment*.

5th ed. New York: Oxford University Press.

Lochner, C., Chamberlain, S. R., Kidd, M., Taljaard, L., Fineberg, N. A., Robbins, T. W., & Stein, D. J. (2020). The effects of acute serotonin challenge on executive planning in patients with obsessive–compulsive disorder (OCD), their first-degree relatives, and healthy controls. *Psychopharmacology*, 237, 3117-3123. doi: 10.1007/s00213-020-05597-7

Manarte, L., Andrade, A. R., do Rosário, L., Sampaio, D., Figueira, M. L., Morgado, P., & Sahakian, B. J. (2021). Executive functions and insight in OCD: a comparative study. *BMC psychiatry*, 21(1), 1-11. doi: 10.1186/s12888-021-03227-w

Melo, M. C. M. G.; & Sampaio, L. R. (2021). Funcionamento executivo em adultos com Transtorno Obsessivo-Compulsivo: Uma revisão sistemática da literatura. *Neuropsicologia Latinoamericana*, 13(3).
https://neuropsicolatina.org/index.php/Neuropsicologia_Latinoamericana/article/view/683

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>

Pedroli, E., La Paglia, F., Cipresso, P., La Cascia, C., Riva, G., & La Barbera, D. (2019). A computational approach for the assessment of executive functions in patients with obsessive–compulsive disorder. *Journal of clinical medicine*, 8(11), 1975. doi: 10.3390/jcm8111975

Pepper, J., Zrinzo, L., & Hariz, M. (2020). Anterior capsulotomy for obsessive-compulsive disorder: A review of old and new literature. *Journal of Neurosurgery*, 133(5), 1595–1604. doi: 10.3171/2019.4.JNS19275

Ren, H., Li, H., Huang, J., Zhang, N., Chen, R., Liu, W., ... & Zhang, C. (2021). Executive Functioning in Chinese Patients With Obsessive Compulsive Disorder. *Frontiers in Psychiatry*, 12, 1498. doi: 10.3389/fpsy.2021.662449

Ribeiro, S. D. S., Passos, P. R. C., & Carvalho, M. R. D. (2021). Evidências neurobiológicas de viés atencional no transtorno obsessivo-compulsivo: revisão

sistemática. *Psicologia: Teoria e Pesquisa*, 37, e37212. doi: 10.1590/0102.3772e37212

- Rosa-Alcázar, A. I., Rosa-Alcázar, Á., Martínez-Esparza, I. C., Storch, E. A., & Olivares-Olivares, P. J. (2021). Response inhibition, cognitive flexibility and working memory in obsessive-compulsive disorder, generalized anxiety disorder and social anxiety disorder. *International Journal of Environmental Research and Public Health*, 18(7), 3642. doi: 10.3390/ijerph18073642
- Shin, NY, Lee, TY, Kim, E., & Kwon, JS (2014). Funcionamento cognitivo no transtorno obsessivo-compulsivo: uma meta-análise. *Medicina psicológica*, 44 (6), 1121-1130. doi: 10.1017/S0033291713001803
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222. <https://doi.org/10.1111/1467-8551.00375>
- Uhre, V., Larsen, K., Herz, D., Baaré, W., Pagsberg, A., & Siebner, H. (2022). Inhibitory control in obsessive compulsive disorder: A systematic review and activation likelihood estimation meta-analysis of functional magnetic resonance imaging studies. *NeuroImage: Clinical*, 36, 103268. <https://doi.org/10.1016/j.nicl.2022.103268>
- Wang, P., Yan, Z., Chen, T., Cao, W., Yang, X., Meng, F., ... & Li, Z. (2022). Visuospatial working memory capacity moderates the relationship between anxiety and OCD related checking behaviors. *Frontiers in Psychiatry*, 13, 2996. doi: 10.3389/fpsy.2022.1039849
- Youssef, A. M., AbouHendy, W. I., Elshabrawy, A., & Amin, S. I. (2020). Executive function in obsessive compulsive disorder at Zagazig University Hospitals: a case-control study. *Middle East Current Psychiatry*, 27(1), 1-10. doi: 10.1186/s43045-020-00033-0