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Executive functioning impairment in depressive and obsessive compulsive disorder: A comparative study

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Abstract

Background: Both Obsessive-Compulsive Disorder (OCD) and Depressive Disorder are debilitating and disabling in nature. Numerous studies have highlighted substantial deficits in executive functioning associated with these conditions. .

Aim: To compare impairment in executive functioning in both depressive and obsessive-compulsive disorder.

Methods: A total of sixty patients, thirty each for Obsessive compulsive Disorder and Depressive disorder fulfilling the inclusion and exclusion criteria have been selected using purposive sampling method. Modified Wisconsin card sorting Test was administered to assess the Executive functioning. Mann Whitney U test was used for statistical analysis.

Results: The mean difference between impairment in executive functioning in both Obsessive compulsive disorder and Depressive disorder is statistically significant**.**

Conclusion: The main findings of this research reveal that patients with obsessive compulsive disorder show greater impairment in executive functioning compared to those with depressive disorder.

Keywords: Executive functioning; Obsessive compulsive disorder; Depressive disorder; Executive functioning impairment; Comparative study

1. Introduction

Executive functioning is a broad term that refers to a set of cognitive processes and mental skills that enable a person to function effectively in everyday life. Executive functioning entails a wide range of skills, including planning, organization, problem solving, task initiation, self-regulation, and sustained attention. In essence, it functions as the brain's control center, managing complex tasks, decision-making, prioritization, and self-monitoring. These deficits hinder individuals' ability in interpersonal relationships, academics, occupation and they may engage in behaviors with potentially harmful consequences. [1]

Obsessive-Compulsive Disorder (OCD) is a debilitating condition characterized by persistent and unwanted thoughts, impulses, or images, often accompanied by repetitive and ritualized behaviors. Common obsessions involve fears of contamination, uncertainty, symmetry, violent or sexual thoughts, and religious concerns. Compulsions, performed to alleviate anxiety or prevent perceived harm, include repetitive actions or mental rituals. OCD significantly disrupts daily life, as individuals feel compelled to engage in these behaviors to reduce distress caused by their obsessions. [2]

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Obsessive Compulsive Disorder (OCD) is linked to challenges in executive functioning, impacting cognitive skills like planning, organization, decision-making, and impulse control. Research shows that individuals with OCD frequently face challenges in shifting attention, controlling inappropriate actions, and sustaining focused behaviors. These executive functioning deficits significantly impact the daily lives and overall well-being of those with OCD. Identifying these impairments is crucial for developing effective interventions to support people managing OCD [3]

Depression is marked by ongoing feelings of sadness, hopelessness, and a loss of interest in usual activities. Symptoms often include changes in appetite or weight, sleep problems, fatigue, trouble concentrating, feelings of worthlessness or guilt, and thoughts of death or suicide. Research shows a link between depressive disorders and impaired executive functions [4] [5]. People with depression generally score lower on executive function tests compared to healthy individuals [6]. Dysfunction in the frontal brain regions seems to contribute to these executive function deficits in those with depression. [7] [8]

Studies suggest that individuals diagnosed with Major Depressive Disorder (MDD) may experience significant impairments in executive function (EF), which could in turn affect other cognitive domains such as memory, attention etc. This proposal is based on the understanding that these abilities heavily rely on EF and prefrontal function. [9] [10]

Though considerable research exists on executive functioning impairment in obsessive-compulsive disorder (OCD) and depressive disorder separately, there's a dearth of studies comparing their executive functioning directly. Conducting such a comparative study could help bridge this gap and offer a deeper understanding regarding executive functioning impairment between depressive disorder and obsessive compulsive disorder.

Aim of the study

To compare the impairment in executive functioning in both depressive and obsessive-compulsive disorder

2. Methods

The study was initiated after getting institutional ethics committee approval [IEC Application. No.-1427, Date 16/8/23.]

2.1. Research design

Cross-sectional design used for the study

2.2. Sample

Total of 60 patients, 30 for Obsessive compulsive disorder and 30 for depressive disorder were selected as sample for the study using purposive sampling method

2.3. Inclusion criteria

- Patient with obsessive compulsive disorder meeting the diagnostic criteria of ICD11
- patient with depressive disorder meeting the diagnostic criteria of ICD 11
- participant age group between 20-45 years
- patient who have minimum secondary education

2.4. Exclusion criteria

- patients having other mental and behavioural disorders

2.5. Tools to be used

Socio Demographic Sheet- The patients' socio-demographic information collected using a self-prepared semi-structured socio-demographic sheet. It contains the registration number, name, age, gender, religion, residence, habit, education, marital status, employment, and socioeconomic position.

Modified Wisconsin Card Sorting Test [MWCST] The modified Wisconsin card sorting test is a modification of the popular Wisconsin card sorting test. David J. Schretlen presented M-WCST in 2010. It is based on a card sorting test designed by Grant and Berg. It consists of 48 response cards and four key cards. It is used to assess cognitive flexibility, set shifting, problem-solving ability, and abstract reasoning, all of which are fundamental components of executive functioning. It has been standardized for usage by people aged 19 to 92 years. According to previous study, its reliability

measures are adequate, with a number of right categories of 0.65, a number of preservative mistakes of 0.64, and an executive functioning component of 0.50 during a two-year test-retest interval. When it comes to test validity, it correlates well other tests used for comparable purposes, with TMT r ranging from 0.52 to 0.51, which explains its construct validity.

2.6. Procedure

This research was carried out at the Mental Health Institution (COE), S.C.B. Medical College and Hospital in Cuttack. 60 subjects were purposefully chosen based on multiple inclusion and exclusion criteria, 30 for obsessive compulsive disorder and 30 for depressive disorder. Following the administration of the evaluation tool- Modified Wisconsin Card Sorting Test [MWCST] to the patients, their consent was obtained, and the confidentiality of the information was ensured. The data received from the assessment instrument was then coded, and the findings were produced by quantitative examination of the data

2.7. Statistical analysis

After the data were gathered, they underwent additional editing, coding and SPSS entry before the relevant statistical tests were run. The Chi-square test was used to analyze the homogeneity of the two groups and Mann-Whitney U test was used to determine the difference between two groups.

3. Results

Table 1 Socio demographic characteristics

Variables	**Obsessive compulsive disorder**	**Depressive disorder**	**Mann-Whitney U**	**P**
Age	M ±SD 31.7±6.99	M ±SD 30.6±7.03	410	0.554
			Chi square	
Gender	Frequency	Frequency	2.40	0.12
	Female: 63.3%	Female:56.7%		
	Male:36.3%	Male:43.3%		
Education	10^{th}:26.7%	10^{th}:30%	0.742	0.69
	12^{th}:40%	12^{th}:46.7%		
	Graduation:33.3%	Graduation:23.3%		
Marital status	Unmarried:46.7%	Unmarried:30%	3.27	0.071
	Married:63.3%	Married : 70%		

The above table presents a thorough comparison of four demographic variables: age, gender, education, and marital status—between people with OCD and those with depression. The two groups were compared statistically to see if there were any noteworthy differences.

In terms of age, the groups with OCD are 31.7 years old on average (SD = 6.99) while the groups with depression disorders are 30.6 years old on average (SD = 7.03). After comparing these age distributions using a Mann-Whitney U test, a p-value of 0.554 and a U value of 410 were obtained. Given that the p-value is greater than the 0.05 cut-off, the age difference between the two groups is not statistically significant.

When it comes to gender, 63.3% of OCD sufferers are female, while 56.7% of participants with Depressive Disorder are male. When gender distributions were compared using a Chi-square test, the results showed a p-value of 0.12 and a Chi-square value of 2.40. There doesn't seem to be a gender difference that is noteworthy between these two groups. Participants were divided into groups based on education, which included graduation, 10th grade, or 12th grade. Thirty-three percent were graduates, forty percent had completed their twelfth grade, and twenty-seven percent had finished their tenth. Thirty percent had finished the tenth grade, forty-six percent had finished the twelfth, and twenty-three

percent had graduated from the group with depression. A Chi-square test found no significant difference in education levels, with a Chi-square value of 0.742 and a p-value of 0.69.

Finally, marital status comparison showed that 30 percent of people with depression disorder were single, whereas 46.7% of people with OCD were not married. P-value was 0.071 and the result of a Chi-square test was 3.27. The standard level of statistical significance ($p > 0.05$) was not met by this difference, despite the fact that it was virtually significant.
As a whole, the demographic characteristics (age, gender, education, and marital status) did not reveal any statistically significant differences between the groups with OCD and Depressive Disorder, while the marriage status difference was almost significant.

Table 2 Comparison of executive functioning impairment between the two groups

Variable	OCD	DEPRESSION	MANN WHITNEY U	P	Mean difference
Executive functioning	M ±SD 64.4±9.75	M ±SD 69.4±9.66	299	0.039	-5.00

The table shows a comparison of executive performance between those who have depression and people who have obsessive compulsive disorder (OCD).The mean executive functioning score for people with OCD is 64.4, and their standard deviation is 9.75, meaning that there is some variation in their scores from the norm. On the other hand, the average score of those with Depressive Disorder is higher at 69.4, and their standard deviation is also similar at 9.66. Based on this, it appears that individuals with Depressive Disorder outperformed those with OCD in terms of executive functioning tests on average.

When the executive functioning scores of the two groups were compared using the Mann-Whitney U test, the results showed a U value of 299 and a p-value of 0.039. The statistical significance of the difference in executive functioning between the two groups is indicated by the fact that the p-value is less than the customary threshold of 0.05. The average score difference between the OCD and Depressive Disorder groups was -5.00, indicating a small impairment in executive functioning for OCD sufferers relative to Depressive Disorder sufferers. In summary, the table indicates a substantial difference in the two groups' executive functioning, with those with OCD scoring worse on average than those with depression.

4. Discussion

A research was conducted systematically to review cognitive flexibility, inhibitory control, and working memory in OCD patients. It found consistent evidence of executive impairments, particularly in tasks requiring cognitive flexibility and inhibitory control, suggesting that these deficits are more pronounced in OCD than in depression, which support this current research[11][12].

Another research indicated that OCD patients demonstrated significant impairments in executive functions such as set-shifting and planning abilities compared to healthy controls and patients with depression, emphasizing the unique cognitive profile of OCD [13]. A study comparing cognitive deficits among OCD patients and those with major depressive disorder found that OCD patients exhibited more pronounced executive function deficits, particularly in tasks requiring cognitive flexibility and inhibition [14]. A meta-analysis consolidating data from multiple studies indicated that OCD patients consistently performed worse on measures of executive functioning compared to both healthy controls and individuals with depression, underscoring the distinct nature of cognitive impairments associated with OCD.[15]

5. Conclusion

This comparative study was conducted to explore and better understand the executive functioning deficits in individuals with chronic Obsessive-Compulsive Disorder (OCD) and those diagnosed with depressive disorder. The findings revealed that individuals with OCD exhibited significantly higher levels of executive dysfunction compared to those with depressive disorder. These results align with existing literature, which consistently highlights the pronounced challenges faced by people with OCD in areas requiring advanced cognitive skills. Specifically, individuals with OCD experience severe difficulties in tasks that involve planning, adaptability, and problem-solving.

Limitations

Although the findings of this study are consistent with earlier research, some limitations should be addressed. For instance relying just on the MWCST (Modified Wisconsin Card Sorting Test). The MWCST may not capture all aspects of executive functioning, such as planning and decision-making. Furthermore, the study's very small sample size of 60 individuals (30 from each group) may limit the findings' generalizability to a larger population. The lack of longitudinal data further hinders the study's capacity to comprehend the evolution of executive impairment over time in both illnesses, which is critical for identifying possible intervention and comprehending the natural course of executive functioning decline.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Clark, C. A. C., Sheffield, T. D., Chevalier, N., Nelson, J. M., Wiebe, S. A., & Espy, K. A. (2013). Charting early trajectories of executive control with the shape school. Developmental Psychology, 49(8), 1481–1493. https://doi.org/10.1037/a0030578

[2] Bloch, M. H., Landeros-Weisenberger, A., Rosario, M. C., Pittenger, C., & Leckman, J. F. (2008). Meta-analysis of the symptom structure of obsessive-compulsive disorder. American Journal of Psychiatry. Advance online publication. https://doi.org/10.1176/appi.ajp.2008.08020320

[3] Shin, N. Y., Lee, T. Y., Kim, E., & Kwon, J. S. (2014). Cognitive functioning in obsessive-compulsive disorder: A meta-analysis. Psychological Medicine, 44(6), 1121–1130. https://doi.org/10.1017/S0033291713001803

[4] Villarroel, M. A., & Terlizzi, E. P. (2020). Symptoms of depression among adults: United States, 2019. NCHS Data Brief (No. 379). Hyattsville, MD: National Center for Health Statistics.

[5] Warren, S. L., Heller, W., & Miller, G. A. (2021). The structure of executive dysfunction in depression and anxiety. Journal of Affective Disorders, 279, 208–216. https://doi.org/10.1016/j.jad.2020.09.132

[6] Pauls, F., Petermann, F., & Lepach, A. C. (2015). Episodic memory and executive functioning in currently depressed patients compared to healthy controls. Cognition and Emotion, 29(3), 383–400. https://doi.org/10.1080/02699931.2014.915208

[7] Levin, R. L., Heller, W., Mohanty, A., et al. (2007). Cognitive deficits in depression and functional specificity of regional brain activity. Cognitive Therapy and Research, 31(2), 211–233. https://doi.org/10.1007/s10608-007-9128-z

[8] Rogers, M. A., Kasai, K., Koji, M., Fukuda, R., Iwanami, A., Nakagome, K., Fukuda, M., & Kato, N. (2004). Executive and prefrontal dysfunction in unipolar depression: A review of neuropsychological and imaging evidence. Neuroscience Research, 50(1), 1–11. https://doi.org/10.1016/j.neures.2004.05.003

[9] Levin, R. L., Heller, W., Mohanty, A., et al. (2007). Cognitive deficits in depression and functional specificity of regional brain activity. Cognitive Therapy and Research, 31(2), 211–233. https://doi.org/10.1007/s10608-007-9128-z

[10] Jones, D. T., & Graff-Radford, J. (2021). Executive dysfunction and the prefrontal cortex. Continuum (Minneap Minn), 27(6), 1586–1601. https://doi.org/10.1212/CON.0000000000001009

[11] Abramovitch, A., & Cooperman, A. (2015). Executive impairments in obsessive-compulsive disorder. Psicothema, 27(4), 431–438.

[12] Tubío Fungueiriño, M., Fernández Prieto, M., Carvalho, S., Leite, J., Carracedo, Á., & Gonçalves, Ó. F. (n.d.). Executive impairments in obsessive-compulsive disorder: A systematic review with emotional and non-emotional paradigms.

[13] Kurt, E., Yildirim, E., & Topçuoğlu, V. (2017). Executive functions of obsessive-compulsive disorder and panic disorder patients in comparison to healthy controls. Noro Psikiyatr Ars, 54(4), 312–317. https://doi.org/10.5152/npa.2016.14872

[14] Motivala, S. J., Arellano, M., Greco, R. L., Aitken, D., Hutcheson, N., Tadayonnejad, R., O'Neill, J., & Feusner, J. D. (2018). Relationships between obsessive-compulsive disorder, depression, and functioning before and after exposure and response prevention therapy. International Journal of Psychiatry in Clinical Practice, 22(1), 40–46. https://doi.org/10.1080/13651501.2017.1351991

[15] Manarte, L., Andrade, A. R., do Rosário, L., & others. (2021). Executive functions and insight in OCD: A comparative study. BMC Psychiatry, 21, 216. https://doi.org/10.1186/s12888-021-03227-w