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Memory Functioning Impairment In Depressive And Obsessive Compulsive Disorder: A Comparative Study

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Abstract

Background: Obsessive-Compulsive Disorder and Depressive Disorder are profoundly distressing, affecting the mental, emotional, and behavioral aspects of life. Numerous studies have highlighted substantial deficits in memory functioning associated with these conditions. .**Aim:** To compare impairment in memory functioning in both depressive and obsessive-compulsive disorders.**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. PGI- Memory scale was administered to assess the memory functioning. Mann Whitney U test was used for statistical analysis. **Results:** The mean difference between impairment in memory functioning in both Obsessive compulsive disorder and depressive disorder is statistically significant**. Conclusion:** The main findings of this research reveal that patients with depressive disorder show greater impairment in memory functioning compared to those with obsessive compulsive disorder.

Keywords: Memory functioning, obsessive compulsive disorder, depressive disorder, memory functioning impairment, comparative study

Introduction

Memory is a fundamental cognitive function that encompasses the processes of encoding, storing, and retrieving information, allowing individuals to retain knowledge over time and utilize it for future actions(Zlotnik G., Vansintjan A. (2019), Sridhar S, Khamaj A, Asthana MK.2023). The memory process consists of three primary stages: encoding, storage, and retrieval. During the encoding phase, sensory input is transformed into a format that can be processed by the brain, with various methods of encoding existing, including visual, acoustic, and semantic coding. The effectiveness of this process can be influenced by factors such as attention and emotional significance (Squire et al., 2004; Lee et al., 2017; Serences, 2016).

Memory impairment defined as having trouble in remembering information, which makes it hard to learn and recall things. This can happen for many reasons, including brain conditions, injuries, or mental health issues. For example, Alzheimer's disease (AD) often starts with problems in working memory (the ability to hold and use information temporarily) and long-term memory. These memory problems are linked to changes in the brain, like shrinkage of the hippocampus and changes in how brain cells connect (Jahn, H. (2013).

A major issue linked to memory impairment is the loss of independence. People may find it challenging to perform routine activities, such as handling finances, keeping track of appointments, or completing daily responsibilities (Preeyam K. Parikh,et.al,2016). This can result in greater dependence on caregivers or family members, potentially straining relationships and reducing the quality of life for everyone involved. Additionally, memory impairment is frequently associated with other cognitive challenges, including difficulties with attention and executive functioning, which can further exacerbate the struggles individuals face. Understanding the problems associated with memory impairment is crucial for developing effective treatment strategies and support systems that address the needs of affected individuals and their families.

Obsessive-Compulsive Disorder (OCD) is a common mental health condition marked by obsessions—persistent, intrusive thoughts that provoke intense anxiety—and compulsions, which are repetitive actions undertaken to reduce that anxiety. The disorder impacts roughly 1% to 3% of the population, with symptoms typically appearing during childhood or adolescence, often causing significant disruption to daily life (Brock H et.al.,2024).

Patients with obsessive-compulsive disorder (OCD) frequently exhibit various memory impairments, particularly in episodic memory, which affects their ability to recall personal experiences. Research indicates that OCD patients often struggle with directed forgetting, where they recall fewer necessary items while remembering unnecessary ones, suggesting deficits in both retrieval and encoding processes. A study found that OCD patients recalled significantly fewer relevant words compared to healthy controls, indicating a smaller directed forgetting effect in these individuals (Konishi M,2011).

Moreover, OCD has been associated with memory hoarding behaviors, where individuals feel compelled to remember excessive details to avoid forgetting, leading to anxiety and compulsive behaviours. A review highlighted that OCD patients may have impaired confidence in their memory judgments and exhibit a bias towards remembering threatening information(Muller, J., & Roberts, J. E. (2003) (Dar, R., Sarna, N.et.al (2022).These cognitive biases contribute to their compulsive behaviours, as they often engage in rituals like checking due to uncertainty about their memories. Additionally, research has shown that OCD patients perform poorly on tasks assessing both verbal and non-verbal memory, particularly with complex visual stimuli and their own actions. They tend to have lower scores in various memory assessments compared to healthy controls, indicating significant impairments in episodic and semantic memory (Mani, A., Khabir, L., Kordiyan, S., & Sahraian, A. (2023).

Depression is a significant mental health disorder characterized by persistent sadness, hopelessness, and a lack of interest in activities that were once enjoyable. It affects millions globally and can severely impair daily functioning. The American Psychiatric Association classifies depression into various types, including Major Depressive Disorder (MDD) and Persistent Depressive Disorder (Dysthymia), with symptoms that must last for at least two weeks for a diagnosis of MDD(Wang H. et.al,2021). Common symptoms include sleep disturbances, appetite changes, feelings of worthlessness, and suicidal thoughts (Moncrieff, J., Cooper, R.E., Stockmann, T. *et al.* ,2023). The World Health Organization estimates that over 280 million people suffer from depression worldwide, emphasizing its global impact and the need for effective treatment strategies (Wang H,et.al2021).

Cognitive impairment is recognized as a core feature of major depressive disorder (MDD). Research indicates that cognitive deficits, including issues with memory, attention, and executive function, persist even after the remission of depressive symptoms. This ongoing cognitive dysfunction can significantly impact an individual's functional recovery and overall quality of life. Studies have shown that individuals with MDD often experience reduced hippocampal volume, which is critical for memory processing, further linking depression to memory impairment(Pan, Z.,et.al2019).(Perini G, et.al,2019).

Memory impairment particularly episodic memory impairment is pronounced in depressed individuals. A study revealed that people living with depression tend to over-generalize their autobiographical memories, recalling fewer details about their life experiences. This cognitive bias can exacerbate feelings of hopelessness and low self-esteem (Schweizer S,et.al 2017). Furthermore, semantic memory deficits have been observed, where individuals struggle to recall factual knowledge. A comprehensive review indicated that depression affects various cognitive domains, including semantic memory, which can hinder learning and comprehension (Colwell, M.J., Tagomori, H., Chapman, S. *et al)*

Despite extensive research on Depressive Disorder and Obsessive-Compulsive Disorder (OCD), limited comparative studies exist on memory functioning impairments in these conditions. Understanding their distinct cognitive profiles is essential for improving diagnosis and tailoring interventions. This study seeks to fill this gap by examining both common and distinct memory impairments, thereby enhancing clinical understanding and care.

Aim of the study

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

Methods

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

Research design

Cross-sectional design used for the study

Sample

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

Inclusion criteria

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

Exclusion criteria

- ✓ Patients having other mental and behavioural disorders.

Tools to be used

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.

PGI Memory Scale

The PGI memory scale was designed and standardized in 1997. The scale was designed by Dwarka Prasad and N.N. Wig. It has 10 subsets: 1) remote memory; 2) recent memory; 3) mental balance; 4) attention and Concentration 5) delayed recall; 6) immediate recall; 7) retention for similar pairings; 8) retention for dissimilar pairs; 9) visual retention; and 10) recognition. The scale was standardized on adult volunteers aged 20 to 45. The test retest reliability and validity range from 0.69 to 0.85. PGIMS has a correlation coefficient of 0.71 with Boston's Memory Scale and 0.85 with Wechsler's Memory Scale.

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- PGI-Memory scale 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

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 analyse the homogeneity of the two groups and Mann-Whitney U test was used to determine the difference between two groups.

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
Gender	frequency	Frequency	**Chi square** 2.40	0.12
	Female: 63.3% Male:36.3%	Female:56.7% Male:43.3%		
Education	10^{th}:26.7% 12^{th}:40% Graduation:33.3%	10^{th}:30% 12^{th}:46.7% Graduation:23.3%	0.742	0.69
Marital status	Unmarried:46.7% Married:63.3%	Unmarried:30% Married : 70%	3.27	0.071

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 memory functioning impairment between the two groups

Subtest	OCD **(M ±SD)**	Depression (M ±SD)	Mann Whitney U	P	Mean rank (OCD)	Mean rank (Depression)
Remote memory	7.5±0.77	4.07±1.20	11.5	< .001	45.12	15.88
Recent memory	3.8 ±0.88	4.4±0.93	273.0	0.006	24.60	36.40
Mental balance	6.37±1.52	4.97±1.15	215.0	< .001	38.33	22.67
Attentive and concentration	15.97±6.55	15.8±3.25	397.0	0.436	28.73	32.27
delayed recall	6.57±2.17	5.4±1.32	317.0	0.047	34.93	26.07
Immediate recall	7.2±2.39	8.6±1.94	294.0	0.020	25.30	35.70
Retention for similar pairs	3.93±1.14	3.83±1.17	428.5	0.745	31.22	29.78
Retention for dissimilar pairs	10.3±2.62	10.93±2.39	388.0	0.360	28.43	32.57
Visual retention	8.93±2.62	7.77±1.97	303.0	0.029	35.40	25.60
Recognition	6.8±2.5	6.83±2.23	444.5	0.941	30.32	30.68
Sub total	77.37±8.79	72.6 ±6.42	304.5	0.032	35.35	25.65

The table provides a comparative analysis of memory functioning between individuals with Obsessive-Compulsive Disorder (OCD) and those with Depressive Disorder, highlighting differences across various memory-related subtests. Remote memory was significantly better in the OCD group (M = 7.5, SD = 0.77) compared to the depression group (M = 4.07, SD = 1.20), with a Mann-Whitney U value of 11.5 ($p < 0.001$), indicating greater impairment in remote memory among individuals with depression. Recent memory, however, was better in the depression group (M = 4.4, SD = 0.93) than in the OCD group (M = 3.8, SD = 0.88), with a U value of 273.0 ($p = 0.006$), suggesting more pronounced deficits in recent memory in OCD.

For mental balance, the OCD group scored higher (M = 6.37, SD = 1.52) than the depression group (M = 4.97, SD = 1.15; $p < 0.001$), indicating greater impairment in this domain among individuals with depression. Attention and concentration showed no significant difference between the groups ($p = 0.436$). Delayed recall was better in the OCD group (M = 6.57, SD = 2.17) compared to the depression group (M = 5.4, SD = 1.32; $p = 0.047$), while immediate recall was higher in the depression group (M = 8.6, SD = 1.94) than in the OCD group (M = 7.2, SD = 2.39; $p = 0.020$). These findings suggest greater impairment in delayed recall for the depression group and in immediate recall for the OCD group. Subtests evaluating retention for similar pairs, retention for dissimilar pairs, and recognition did not show statistically significant differences between the groups. However, visual retention was significantly better in the OCD group (M = 8.93, SD = 2.62) compared to the depression group (M = 7.77, SD = 1.97; $p = 0.029$), indicating more impairment in visual retention in depression.

Overall, the total cognitive subtest score was higher in the OCD group (M = 77.37, SD = 8.79) than in the depression group (M = 72.6, SD = 6.42; $p = 0.032$), suggesting that individuals with depression exhibit greater overall impairment in memory functioning compared to those with OCD. These findings reveal distinct patterns of memory deficits in the two groups, with depression being associated with more severe impairment.

Discussion

Research suggests that Individuals with depression often exhibit significant difficulties in recalling remote memories. Research indicates that depressed patients tend to have impaired recollection, particularly for positive autobiographical memories, while their memory for negative events may be enhanced. This overgeneralization in memory retrieval reflects a bias towards negative experiences and can hinder the ability to recall specific past events (Dillon DG, Pizzagalli DA,2018).

Depression is linked to cognitive impairments that affect mental balance, including attention and concentration. These deficits can disrupt the encoding and retrieval processes necessary for effective memory function. Patients may struggle with maintaining focus, which can lead to challenges in recalling both recent and remote memory(Sekhon S, Marwaha R.s). Delayed recall is notably affected in depressed individuals, who often struggle to retrieve information after a period has passed. This impairment is particularly pronounced in tasks requiring the retrieval of specific details from memory, indicating that depression disrupts the processes involved in consolidating and accessing memories over time (Yin J, John A, Cadar D,2024).

A review article indicates that OCD is associated with impairments in both verbal and non-verbal episodic memory, particularly affecting immediate recall tasks. It highlights the relationship between compulsive behaviours and memory deficits, suggesting that doubts about one's memory can drive compulsions (Muller, J., & Roberts, J. E. 2004). Another study demonstrated selective cognitive deficits in patients with OCD, including impairments in spatial working memory and recognition tasks. These deficits were not observed in matched controls or patients with unipolar depression, indicating specific challenges with immediate recall and memory processing unique to OCD (Purcell R et.al).

Conclusion

This study aimed to compare memory functioning impairments in individuals with Obsessive-Compulsive Disorder (OCD) and Depressive Disorder, offering insights into their distinct cognitive profiles. The findings highlight significant differences in memory domains between the two groups, emphasizing the unique patterns of cognitive impairments associated with each condition.

Participants with depression exhibited more pronounced overall memory impairment compared to those with OCD, as reflected in their lower total memory scores. Specifically, individuals with depression demonstrated significant deficits in remote memory, mental balance, and visual retention, suggesting that these domains are particularly affected in depressive disorders. Additionally, delayed recall was more impaired in the depression group, further underscoring their challenges in memory retrieval.

In contrast, individuals with OCD showed greater deficits in recent memory and immediate recall, consistent with previous research linking OCD to impairments in encoding and retrieval processes. These findings may be attributed to the characteristic cognitive biases in OCD, such as memory distrust and excessive checking behaviour's, which may interfere with efficient memory processing.

While both groups exhibited impairments in various memory subdomains, specific areas such as attention and concentration, retention for similar pairs, retention for dissimilar pairs, and recognition showed no significant differences, indicating overlapping cognitive challenges.

Limitation

While the results of this study align with previous research, there are several limitations that need to be addressed. For example, relying solely on the PGI Memory Scale may not fully capture certain memory types, such as procedural or working memory. Additionally, the study's small sample size of 60 participants (30 from each group) may restrict the generalizability of the findings to a broader population. The absence of longitudinal data also limits the study's ability to understand how memory impairment progresses over time in both conditions, which is crucial for identifying potential interventions and understanding the natural trajectory of memory decline.

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