

## On The Relationship of Short Term Memory and Obsessive Compulsive Disorder with Checking Features

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### ABSTRACT

The aim of this research was to investigate the relationship between STM and OCD with checking features. We hypothesized patients having OCD with checking features get involved in checking rituals as a result of not trusting their STM's and hence have weaker memory compared to normal population. We used WMS (IV) to test memory and DSM IV-TR to diagnose the presence of disorder.

The results showed weaker memory in the following subtypes of WMS in the patient's group: Spatial addition, Symbol span and design memory. In addition the total mean scores were lower for the patient's group compared to the non-patient's. And corrected scores in patient's group were higher for women compared to men.

The results of this research may help with developing a new approach in the treatment of OCD with checking features which is based on improving memory.

**KEYWORDS:** Short Term Memory, Obsessive Compulsive Disorder, Checking Rituals, Wechsler Memory Scale

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### INTRODUCTION

Obsessive-compulsive disorder (OCD) is an anxiety disorder in which time-people have recurring, unwanted thoughts, ideas or sensations (obsessions) that make them feel driven to do something repetitively (compulsions). The repetitive behaviors, such as hand washing, checking on things, or cleaning, can significantly interfere with a person's daily activities and social interactions. OCD often begins in childhood, adolescence or early adulthood. OCD is equally common in men and women and knows no geographic, ethnic, or economic boundaries.

OCD is far more prevalent than once thought. In a 2001 World Health Organization mental health report, it was estimated that, in the year 2000, OCD was among the top 20 causes of illness-related disability, worldwide, for individuals between 15 and 44 years of age. Moreover, many other research reports cite OCD as the fourth most common mental illness after phobias, substance abuse, and major depression. Obsessive-compulsive disorder (OCD) among adults in the United States has an estimated 12-month prevalence of 1.2 percent and an estimated lifetime prevalence of 2.3 percent [1,2]. Females are affected at a slightly higher rate than males in adulthood, although males are more commonly affected in childhood [2,3].

OCD patients' friends and families may experience discomfort or anger by seeing their endless and irresistible need for washing hands, doorknobs or counting bathroom tiles, checking everything they have done for countless times, etc. OCD has negative impact on relationships, especially the ones with family members, which may result in different psychological disorders like MDD or GAD. Another problem patients may experience as a consequence of having the illness is feeling exhausted and having sleep related problems. About one third of the patients with OCD have MDD as a co-morbid disease and the risk for suicide is high for all OCD patients [4].

The high prevalence and the subsequent problems patients experience show the importance and necessity of investigating more on the issue, especially in the case of treatment.

One of the common forms of OCD is OCD with checking rituals, which is the concern of this article. People with compulsive checking doubt their actions and worry about being responsible for a mistake. Compulsive checkers repeatedly check things (oven turned off, door locked, etc.) that associate with harm or danger. Patients report that they are not sure if they have really done something or just think they have [5]. So they do an action over and over again [6]. As a result of this doubt they get continuously involved in checking obsessions and rituals. The question is that if problems in patients' memory is responsible for their doubts. Memory is defined as mental process that enables the brain to save experiences and perceives, keep and recall them later [7]. There are some researches done to test the existence of deficiencies in compulsive checkers' memory [8]. The findings are ambiguous.

Mir Aqayi and et al. (2013) conducted a research to compare patients having OCD with PTSD in relation to verbal and nonverbal memory. The sample consisted of 20 patients with PTSD, 15 with OCD and 17 without any specified disorder. The results showed weaker function in nonverbal memory in patients with OCD compared to control group [9]. Another research conducted by Majlesi and et al. (2008) showed weaker short spatial memory in patients with OCD compared to normal population [10]. A research conducted by Chelbianlou and et al. (2008) showed that compulsive checkers have bias in remembering threatening objects and they are less sure in regards to their memory. It seems the problem with compulsive checkers is related to metamemory. In other words, the problem is not about deficiencies in remembering or recalling things, but a decreased amount of confidence with what the person recalls [11]. Compulsive checkers have also bias in remembering things which arouse emotions [12]. Patients with OCD have delay in recalling things [13]. A research investigated the relationship between believes about general characteristics of memory and OCD symptoms. Metamemory in this research included memory and related procedures like general memory and decision making abilities, attention, concentration and perfectionism standards about memory. The results showed metamemory factors are related to checking symptoms in OCD [14]. Pathologic doubt that is common in OCD patients is theoretically related to deficiencies in memory. Experimental evidence about these deficiencies are ambiguous. However, in many researches it's been suggested that OCD patients have a low level of confidence in their memories. The results of a study showed when OCs are encountered with threatening stimulants, their level of confidence in remembering the stimulants decreases [15]. The findings about relationship between memory and obsessive checking suggest three different conclusions:

1. The main source of uncertainty and doubt in OCD patients is a general failure in memory [16].
2. OCD patients have problems related to memory only when encountered with stimulants and activities including a threat [17].
3. OCD patients have problems with trusting their memories which results in their doubts.

The findings don't offer enough information about the specific domains of memory OCs have problems with. They also don't offer clinical appliance of the findings. According to the high prevalence of OCD and the problems it causes for the patients like relationship problems and other psychological disorders, it's important to find new approaches for its treatment. We conducted this research to investigate the STM function in obsessive checkers.

We hypothesized patients having OCD with checking features get involved in checking rituals as a result of not trusting their STM's and hence have weaker memory compared to normal population. The results of this research may help with developing a new approach in the treatment of OCD with checking features which is based on improving memory.

## **MATERIALS AND METHODS**

### **1. METHOD**

The research method was correlational. In this method an appropriate sample is chosen, variables to be measured are identified and an appropriate instrument is chosen for collecting data. Descriptive statistical indexes are used to accept or reject a hypothesis.

### **2. POPULATION**

Dezful<sup>1</sup> has three health centers and the population in this research was considered the adult patients who visited these centers.

### **3. SAMPLE**

Patients were diagnosed with OCD with checking features based on DSM-IV-TR by a psychiatrist or a psychologist. 20 of these patients were assigned to the patients group randomly. And 20 of those not diagnosed with OCD were assigned to the control group likewise. The groups were matched according to the demographic characteristics.

### **4. Instruments**

WMS IV (Wechsler Memory Scale) was used to measure patients' memories. WMS takes about 15 minutes to complete. It's designed according to the different age groups. Here is the information provided by WMS:

1. Learning and immediate recalling
2. Attention and concentration
3. Orientation
4. Long term memory recalling

The scale includes 7 subtypes as follows:

1. Spatial addition
2. Symbol span

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<sup>1</sup>Dezful is a city in and the capital of Dezful County, Khuzestan Province, Iran.

3. Design memory
4. General cognitive screener
5. Logical memory (I, II)
6. Verbal paired associates (I, II)
7. Visual reproduction (I, II)

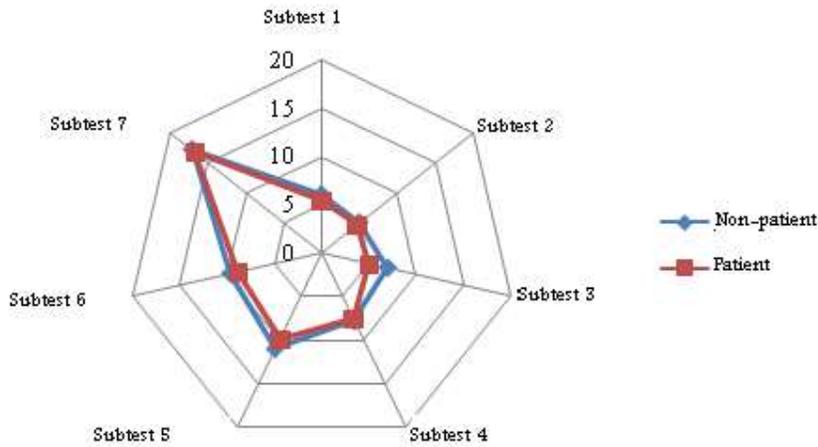
**5. DATA ANALYSIS**

SPSS was used to analyze the data. Mean and Variance were used as central measures. Therefore, t-student was used. The results are mentioned here.

**Comparison between all of the subtests in patient and non-patient group**

Here is the spider diagram for the means of the seven subtests in patient and non-patient group.

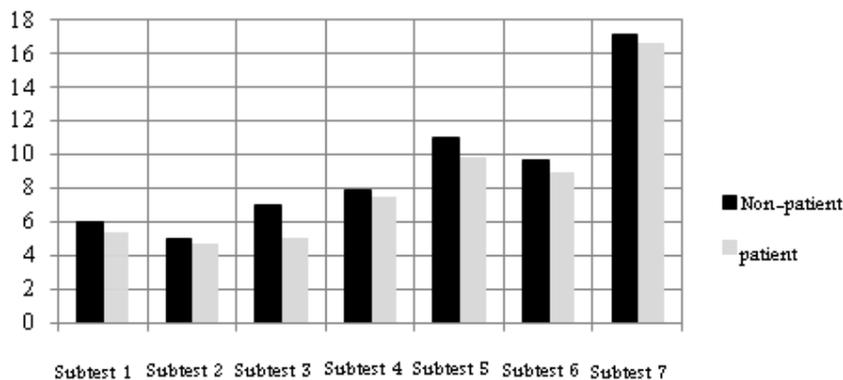
Diagram 1. Spider diagram of the comparison between the means of subtests 1 to 7 in patient and non-patient group



In diagram 1, square and rhombus dots are representative of means for subtests of patient group and non-patient respectively. Grades in patient group is lower than the non-patient in all subtests. A better understanding of this is achieved by looking through diagram 2.

Diagram 2. Bar chart of the comparison between the means of subtests 1 to 7 in patient and non-patient group

		T-test for equality of means					Sig. (2-tailed)	95% confidence interval of difference	
		Mean difference	Std. Error difference	t	df	Lower		upper	
Subtest 1	Equal variances assumed	0.6500	0.19568	3.322	38	0.002	0.2539	1.0461	
	Equal variances not assumed	0.6500	0.19568	3.322	19.000	0.004	0.2404	1.0596	



**Determining the significance of the differences between subtests in the two groups**

### A. Spatial Addition

There was a significant difference between the means of the two groups in Spatial Addition.

### B. Symbol Span

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 2	Equal variances assumed	0.3500	0.1956	1.789	38	0.082	-0.0461	0.7461
	Equal variances not assumed	0.3500	0.1956	1.789	19	0.090	-0.0596	0.7596

There was a significant difference between the means of the two groups in Symbol Span.

### C. Design Memory

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 3	Equal variances assumed	2.0500	0.7694	2.664	38	0.011	0.4924	3.6076
	Equal variances not assumed	2.0500	0.7694	2.664	33.442	0.012	0.4854	3.6146

There was a significant difference between the means of the two groups in Design Memory.

### D. General Cognitive Screener

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 4	Equal variances assumed	0.3500	0.9808	0.357	38	0.723	-1.6355	2.3355
	Equal variances not assumed	0.3500	0.9808	0.357	29.753	0.724	-1.6538	2.3538

There was no significant difference between the means of the two groups in General Cognitive Screener.

### E. Logical Memory (I &II)

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 5	Equal variances assumed	1.2000	0.7495	1.601	38	0.118	-.3174	2.7174
	Equal variances not assumed	1.2000	0.7495	1.601	23.942	0.123	-0.3472	2.7472

There was no significant difference between the means of the two groups in Logical Memory (I &II).

### F. Verbal Paired Associates (I & II)

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 6	Equal variances assumed	0.7500	1.1474	0.654	38	0.517	-1.5730	3.0730
	Equal variances not assumed	0.7500	1.1474	0.654	35.958	0.518	-1.5773	3.0773

There was no significant difference between the means of the two groups in Verbal Paired Associates (I & II).

**G. Visual Reproduction (I & II)**

		T-test for equality of means						
		Mean difference	Std. Error difference	t	df	Sig. (2-tailed)	95% confidence interval of difference	
							Lower	upper
Subtest 7	Equal variances assumed	0.4000	0.7469	0.536	38	0.596	-1.1121	1.9121
	Equal variances not assumed	0.4000	0.7469	0.536	31.934	0.596	-1.1216	1.9216

There was no significant difference between the means of the two groups in Visual Reproduction (I & II).

**6. CONCLUSION**

The privilege of this study to the similar ones are as the following. One is about the sample size which was more compared to similar studies. The other thing is that it investigated STM (Short Term Memory) specifically and not memory as a general concept. It also investigated different subtests of the WMS.

Here is what this study suggests for future compulsive checking treatment. As the results of this study showed, there are some deficiencies in the memory of compulsive checkers. Therefore, the cognitive therapies and psychotropic medications can focus on improving memory in these patients.

**REFERENCES**

- 1) Kessler RC, Chiu WT, Demler O, et al. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62:617.
- 2) Ruscio AM, Stein DJ, Chiu WT, Kessler RC. The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. *Mol Psychiatry* 2010; 15:53.
- 3) Weissman MM, Bland RC, Canino GJ, et al. The cross national epidemiology of obsessive compulsive disorder. The Cross National Collaborative Group. *J Clin Psychiatry* 1994; 55 Suppl:5.
- 4) Keith Hawton, Paul. M. Salkovskis, Joan Kirk, David M. Clark (1989). *Cognitive behaviour therapy for psychiatric problems: a practical guide*. Oxford Medical Publications.
- 5) J. Mark G. Williams, Fraser N. Watts, Colin M. MacLeod, Andrew Mathews (1997). *Cognitive psychology and emotional disorders*, 2nd edition. Wiley publication.
- 6) Benjamin J. Sadock, Virginia A. Sadock (2010). *Kaplan and Sadock's Pocket Handbook of Clinical Psychiatry*, 5th Edition. Wolters Kluwer.
- 7) Shams and et al. (2007). The prevalence of obsessive-compulsive disorder in adolescents. *The journal of cognitive science* 2007; 36: 50-59
- 8) Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorders*. Chichester: Wiley.
- 9) Ali M. Mir Aqayi, Alireza Moradi, Jafar Hasani, Vafa Rahimi, Jafar Mirzayi (2013). Comparing OCD patients with PTSD patients in relation to verbal and nonverbal memory. *Journal of Medical Science of Kermanshah*, 2013; 62: 49-60
- 10) Nooshin Majlesi, Safiye Behzadi, Hamze Ganji (2008). Comparing reaction time, short spatial memory and cognitive inhibition between OCD patients and normal population. *Journal of mentality and behavior*, 2008; 10: 83
- 11) Gholamreza Chelbianlou, Ali Goudarzi., Hasan Haqshenas, Mohamadreza Taqavi, (2008). The effect of responsibility on bias and confidence in memory in compulsive checkers. *The journal of psychiatry and psychology of Iran*, 2008; 55: 419
- 12) Hojjatollah Farahani, Hossein Naeli, Hossein Molavai, Hamid T. Neshat Doust (2005). The role of emotional arousal in attention and memory bias in OCD patients. *The journal of developmental psychology: Iranian psychologists*, No 3: 207

- 13) Exner, et. al., Metacognition and episodic memory in obsessive-compulsive disorder, *Journal of Anxiety Disorders*, Volume 23, Issue 5, June 2009, Pages 624-631.
- 14) C. Exner, et. al., Metacognition and episodic memory in obsessive-compulsive disorder, *Journal of Anxiety Disorders*, Volume 23, Issue 5, June 2009, Pages 624-631.
- 15) M. Nedeljkovic and M. Kyrios, Confidence in memory and other cognitive processes in obsessive-compulsive disorder, *Behaviour Research and Therapy*, Volume. 45, Issue 12, December 2007, Pages 2899-2914.
- 16) Reed,G.F.(1977).The obsessional – compulsive experience: A phenomenological reemphasis. *Philosophy and Phenomenological Research*, 37, 381-385.
- 17) 17-1  
Tolin,D.F.,Abramowitz,T.S.,Brigidi,D.,Amir,N.,Street,G.P.,& Foa,E.B. (2001).Memory and memory confidence in obsessive-compulsive disorder.  
*Behavior Research and Therapy*,39,913-927.
- 17-2  
Constans,T.I.,Foa,E.B.,Franklin,M.E.,& Mathews,A. (1995). Memory for actual and imagined events in OC checkers.*Behavior Research and Therapy*, 33, 665-671.
- 17-3  
Radomsky,A.S.,& Rachman,S.(1999). Memory bias in obsessive-compulsive disorder (OCD).  
*Behavior Research and Therapy*, 37, 605-618