International Journal of Education and Cognitive Sciences
Volume 1, Number 1, 31-39, July 2020
https://iase-ijeas.com
ISSN: 3041-8828

Comparison of Metacognitive Beliefs and Measures of Executive Functions in Individuals with Obsessive-Compulsive Disorder (OCD) and Depression with Normal Individuals

Leyla Tehrani [a]*, Khadija Abolmaali [b]

[a] *M.A student of clinical psychology, Azad university of Rodehen, Rodehen, Iran*
[b] *Assistant professor of educational psychology, Azad university of Rodehen, Rodehen Iran*

Keywords:
Obsessive-compulsive disorder
Depression
Metacognitive beliefs
Executive functions

Abstract

This study was carried out with the purpose of determining the extent of differences in metacognitive beliefs and scales of executive functions in people with OCD and depression with normal people. The study population consists of patients with OCD, depression and normal people. Due to non-interference of the researcher in the variables, the method of this study is causal-comparative. The sample of the study consists of 90 subjects with OCD, depression and normal individuals (each group 30 people) selected by purposive sampling method. The tools used in the study include Beck's Depression Inventory (BDI), distress tolerance, Maudsley's Obsessive-Compulsive Inventory (MOCI) and the Wisconsin test. Data analysis was carried out using analysis of variance and post hoc tests. The result of variance analysis showed that there is a significant difference among groups in metacognitive beliefs and executive functions aspects ($p<0.001$). Due to the differences between people suffering from OCD and depression with ordinary people in metacognitive beliefs and executive functions, it is necessary to pay enough attention to weaknesses of these variables in these people while treating them.

* **Corresponding author: Email:** leilatehraniazad@gmail.com

1. Introduction

Obsessive-Compulsive Disorder (OCD) is a common disorder among other mental disorders, in a way that in Diagnostic and statistical manual of mental disorders fourth fifth revised edition (DSM-V), depression is diagnosed as the third most common disease after phobia, and drug dependency disorder, at the same time OCD is the fourth most common disorder (American Psychiatric Association, 2000; 2013). The extension of prevalence and complexity of these two disorders on one hand and their individual and social effects on the other hand have led theorists, researchers, and clinicians to assess different aspects of these disorders and theorize on their pathology, prevention and treatment and offer various models, but they are still largely unknown (Koçak, Nalçacı, Özgüven, Nalçacı & Ergenç, 2010). According to the fifth Diagnostic and Statistical Manual of Mental Disorders (DSM-5), OCD is a debilitating disorder that forces the person to perform forced or useless things, and be obsessed with annoying thoughts with repeated and unwanted intrusive thoughts. The main feature of these obsessions and compulsions (thoughts and behaviors) is not being enjoyable to the patient, but the patient continues to apply to ruminating thoughts and repeat the actions so that his discomfort may reduce. OCD is a disorder, which is identified with annoying recurrent thoughts, impulses and repeated images (McKay et al., 2004). The thoughts, impulses and images are usually considered absurd, unacceptable and irresistible from a compatible person's point of view. These obsessions are associated with discomfort, anxiety, and neutralization (compensation). With the development of the disease, the patient spends a lot of his daily time on the obsessive preoccupation or obsessive behavior. Stress and anxiety from this non-effective performance influence and sometimes disrupt social, family and personal life (Franklin, Conrad, Aldana & Hough, 2011). Another common acute psychological disorder, which is associated with feeling of hopelessness, sadness, lack of motivation and hope, loss of confidence and pessimism is depression (Dear et al., 2013). Depression has affected more than 340 million people worldwide (Greden, 2001). The World Health Organization has predicted that by 2020, depression will be the second major health problems in the world. Twelve-month prevalence rate of this disorder is estimated to be about 2.9 - 12.6% (Kenny & Williams, 2007). Major depression affects different people in different ways. Most people who have major depression are constantly sad, or do not enjoy activities they used to or experience a combination of these two modes (Katon, Lin & Kroenke, 2007). Obvious symptoms of depression include sadness, lack of interest in activities that are usually fun, periods of crying, consecutive feeling of sin, loneliness, hopelessness or worthlessness, changes in sleep and appetite, low energy, suicide or attempt thoughts and low self-esteem. The important point is that these characteristics are variable during the day and in the morning they are usually at the weakest point (Krystal, Thakur & Roth, 2008). By analyzing variables of this study, it becomes clear that cognitive deficits, particularly in executive functions and metacognitive beliefs of depressed people and people with OCD have clearly been shown in various studies (Biringer et al., 2005; Paelecke-Habermann, Pohl & Leplow, 2005). Executive functions refer to a set of cognitive processes used in the management of targeted behavior (Locascio, Mahone, Eason & Cutting, 2010). Recent studies have shown that deficits in executive function in people with depression and obsessive-compulsive disorder, continues to exist with milder intensity even after treatment. In general, executive functions represents the cognitive processes like attention to stability and change, dominant response inhibition, maintaining information in working memory and planned responses. The study examining the relationship between depression and executive functions have found that depression and obsession are associated with deficits in executive functions such as planning, attention and inhibition (Rao, Reddy, Kumar, Kandavel & Chandrashekar, 2008; Koçak et al., 2010). Metacognition includes the process of thinking about thinking and knowing about what we know and do not know and the ability to control one's own thoughts. In other words, metacognition deals with psychological structure of events and processes involved in controlling, changing and

interpreting thinking (Wells & Cartwright-Hatton, 2004). Salkovskis (1989) was the first person who suggested that people with OCD and depressed dysfunctional beliefs are engaged with blaming and responsibility thoughts about damage happened to themselves and others. Given the importance and impact of these disorders on mental health, this study intends to deal with the differences in beliefs and executive function in people with OCD and depression with ordinary people.

2. Method

The method of this study is a causal-comparative post hoc.

2.1. Participants

The population consists of patients with obsessive-compulsive disorder and depression that referred to three clinics in Tehran in 2014, and have received OCD and depression diagnosis by a psychiatrist as well as by Beck Inventory and MOCI. Samples of normal individuals were selected from among those who were roughly the same age, gender and had similar years of schooling with that of depressed and OCD people. Normal people were selected through clinical interviews, in which it was made clear that they had no previous psychiatric history or visiting psychologist, no psychological disorders and brain damage, and none of their first-degree relatives have a mental illness. Sampling method was targeted. In depressed group, only people were selected whose score on Beck Depression Inventory was more than 15? In obsessive-compulsive disorder group, only the people were evaluated that based on Maudsley`s Obsessive-Compulsive Inventory their score was at least 1.5 standard deviation above average.

2.2. Measurement

2.2.1. Beck depression inventory

Beck depression inventory was first proposed and published by Beck, Ward and Mendelson (1961) and then revised and copyrighted in 1978 (Beck, 1978). The long form and cost of the BDI indicated the severity of major depressive disorder. According to Beck- report analysis of symptoms the concurrent validity scales was 0.79, test-retest reliability scales 0.67 (Beck, Steer & Carbin, 1988). Dobson and Mohammad Khani (2005) reported alpha coefficient of 0.92, coefficient of two-halves test of 0.89 and one- week- interval test- retest reliability of 0.94 for BDI.

2.2.2. Meta Cognitive Questionnaire (MCQ)

This questionnaire has 30 items, items that are calculated by a 4-degree Likert scale. MCQ-30 analyzes cognitive aspects in five separate subscales that include Positive beliefs about worrying, Negative beliefs about uncontrollability and risk, Beliefs about cognitive competence, General negative beliefs associated with the need to control and Metacognitive beliefs associated with cognitive consciousness. Cronbach's alpha coefficient of the questionnaire and its components are reported around 0.72 to 0.93. Its reliability by test-retest for the entire test after a period of 18 to 22 days is reported as 0.75 and for the subscales from 0.59 to 0.87 have been reported (Wells & Cartwright-Hatton, 2004). The internal consistency of this test in Iran by Cronbach's coefficient method is reported as 0.91 for the whole scale and 0.71 to 0.87 for subscales scales in the range of 0.71 to 0.87 have been reported (Shirinzadeh Dastgerdi, 2008).

2.2.3. Maudsley compulsive inventory (MOCI)

It is the most widely used scales for evaluation of OCD symptoms. The questionnaires' mainly focused on a wide scope of problems related to the patients with OCD contains 30 questions (Rachman & Hodgson, 1980). Each question had two parts of correct and wrong response. Test has four subscales measuring consisted of five subtests; checking 9 items, slowness 11 items, cleaning 11 items, doubting subtest of the psychometric 7 items. According to the Ranchman the psychometric properties of the instrument were satisfied in terms of Dodgson investigation the convergent and divergent validity including test-retest reliabilities Norman, Davies, Malla, Cortese and Nicholson (1996).

2.2.4. Wisconsin card sorting test (west)

WSCT was yield to determine an individual competence in abstract reasoning and ability to change problem- solving strategies when needed By Berg, 1948. Period skill of planning, organization,

abstract reason, concept formation, certain cognitive function and maintain perseverative responses (PR) as well as non- perseverative responses (NPR)(Barceló, 2001). Based on WSCT, total number of categories among Schizophrenia, bipolar disorder and normal people were (0.60) Rossi, Arduini, Daneluzzo, Bustini, Prosperini and Stratta (2000). And with details the Schizophrenia (0.49), bipolar disorder (0.40) and normal people was (0.90) so the differences between groups were too significant. Other research groups have shown that clinically differentiate between psychiatric conditions and neurological groups (for example, schizophrenia, mood disorders, and head injury) by WCST problem .which may this is due to dysfunction of the frontal lobe is involved in all groups (Rempfer, Hamera, Brown & Bothwell, 2006).

3. Results

In this section, research data has been analyzed using SPSS.21 software in descriptive and inferential statistics levels. At first, average and standard deviation of variables have been presented and then to test the hypothesis multivariate and univariate variance analyses have been used.

Table1. Mean and standard deviation of the variables in three groups of the research

Variable	Group (N=30)	Mean	Standard Deviation
Total score of metacognition	Normal	81.36	3.11
	Depressed	76.46	2.96
	OCD	76.55	4.05
Positive worry beliefs	Normal	18.27	1.25
	Depressed	14.93	1.46
	OCD	14.59	1.25
Negative metacognitive beliefs	Normal	12.33	1.44
	Depressed	15.57	1.10
	OCD	15.79	2.96
Beliefs about cognitive competence	Normal	18	2.94
	Depressed	15.40	1.06
	OCD	15.44	1.12
Negative beliefs about thoughts	Normal	12.36	1.32
	Depressed	14.80	0.96
	OCD	14.86	0.87
Cognitive self-awareness	Normal	20.40	1.45
	Depressed	15.77	1.30
	OCD	15.86	1.43
Preservation error	Normal	4.23	1.14
	Depressed	6.03	1.18
	OCD	5.57	1.11
Floors	Normal	5.80	0.77
	Depressed	4.20	0.66
	OCD	3.43	0.84
Incorrect answers	Normal	16.90	2.04
	Depressed	19.30	1.17
	OCD	21.93	2.84

The table above shows the descriptive findings of the study. As is clear, the average of variables in the studied groups has some differences. Before using multivariate ANOVA, first test box table is checked

to evaluate the similarity per-assumptions of the covariance matrix.

Table2. Box's M for similarity pre-assumptions of the covariance matrix

Box's M	F	Significance level
12.96	2.09	0.05

By examining the above table, it is determined that the same condition for covariance matrix has been observed and by comply with other pre-assumptions, F test does not face any limitations.

Table3. Results of multivariate analysis of variance to compare variables in the three groups

	Value	F	Degree of freedom of hypothesis	Degrees of freedom error	Significance level
Pillai's Trace	1.12	11.36	18	158	0.001
Wilks' Lambda	0.06	25.19	18	156	0.001
Hotelling's Trace	11.30	48.35	18	154	0.001
Roy's Largest Root	11.03	96.86	9	79	0.001

With significance of MANOVA test, it is concluded that at least one of the variables is significant. Therefore, univariate tests were assessed to determine which of the variables was significant.

Table4. Results of univariate variance analysis

Variable	$SS_{(df=2)}$	MS	F	Sig.	Effect Size
Metacognition	469.5	234.7	20.23	0.001	0.32
Positive worry beliefs	245.5	122.9	60.21	0.001	0.58
Negative Metacognitive beliefs	232.2	111.6	28	0.001	0.39
Beliefs about cognitive competence	132	66	17.72	0.001	0.29
Negative beliefs about thoughts	120.7	60.4	52.34	0.001	0.54
Cognitive self-awareness	418.4	209.2	107.1	0.001	0.71
Preservation	55.02	27.5	20.52	0.001	0.32
Floors	87.48	43.74	74.67	0.001	0.63
Incorrect answers	380.2	190.1	41.68	0.001	0.48

As the above table shows, in all nine variables of metacognition and its dimensions (positive worry beliefs, negative metacognitive beliefs, beliefs about cognitive competence, negative beliefs about thoughts and cognitive self-awareness) as well as measures of executive functions (preservation, number of floors and incorrect answers) there are significant differences between the three groups. Grouping variable explains 32, 58, 39, 29, 54, 71, 32, 63 and 48% of the above variables. Now, in order to find that this difference is between which groups, we check LSD post hoc test.

Table4. The results of post hoc test in the dimensions of metacognitive beliefs

Variable	Groups		Mean	Se	Sig.
Positive worry beliefs	Normal	Depressed	3.33	0.36	0.001
		OCD	3.68	0.36	0.001
	Depressed	OCD	0.35	0.36	0.35
Negative metacognitive beliefs	Normal	Depressed	-3.23	0.51	0.001
		OCD	-3.46	0.52	0.001
	Depressed	OCD	-0.23	0.52	0.66
Beliefs about cognitive competence	Normal	Depressed	2.60	0.49	0.001
		OCD	2.55	0.50	0.001
	Depressed	OCD	-0.04	0.49	0.92
Negative beliefs about thoughts	Normal	Depressed	-2.43	0.27	0.001
		OCD	-2.49	0.27	0.001
	Depressed	OCD	-0.06	0.27	0.82
Cognitive self-awareness	Normal	Depressed	4.63	0.36	0.001
		OCD	4.54	0.36	0.001
	Depressed	OCD	-0.10	0.36	0.79

As is clear from the above table, there are significant differences in the dimensions of Metacognitive beliefs (positive worry beliefs, negative metacognitive beliefs, beliefs about cognitive competence, negative beliefs about thoughts and cognitive self-awareness) between individuals in normal group with people in depression and OCD group. This is while, there was no significant difference between OCD and depression groups in any of the meta-cognition dimensions (positive worry beliefs, negative metacognitive beliefs, beliefs about cognitive competence, negative beliefs about thoughts and cognitive self-awareness).

4. Discussion

This study was carried out with the purpose of determining the extent of differences in Metacognitive beliefs and scales of executive functions in people with OCD and depression with normal people. Data analysis showed that there are significant differences among the three groups in the scales of metacognition beliefs and measures of executive functions (preservation, number of floors and incorrect answers). The results showed no significant differences in preservation between OCD and depression group. In other words preservation shows the lack of flexibility in a person. The higher number of floors reflects improved performance (growing), the number of floors in normal people is more than depressed people and OCD people had the least number of floors. OCD group had more incorrect answer than depressed people and ordinary people had the least wrong answers indicating that instead of having a lot of anxiety, ordinary people focus more on the responses and give more correct answers.

In explaining these findings, it can be said that: Two dimensions of human thinking are cognition and metacognition. Cognition is awareness of internal and subjective dimensions, but metacognition is a force beyond human cognition and means thinking about the thinking process and the ability to control the thoughts. In other words, metacognition deals with psychological structures, knowledge of the events and processes working in control, change and interpretation of thinking.

In this regard, cognitive theories on emotional disorders such as schema theory are based on the principle that mental disorders are associated with disturbances in thinking, in particular disorders such as OCD and depression which are defined with automatic negative thoughts and distorted interpretation of stimuli and events (Biabangard, 2002). On the other hand, Wells and Matthews' emotional disorder model directly link thinking type

and metacognition with emotional vulnerability and emotional disorders. The link is in form of the relationship of three dimensions of negative metacognitive beliefs with psychological dysfunction including "anxiety related to the uncontrollability," "danger, cognitive trust" and "beliefs associated with the need to control thoughts" are (Spada, Nikcevic, Moneta & Wells, 2008). So metacognition is considered as an important factor in causing and continuing of emotional disorders such as obsessive-compulsive disorder (Jacobi, Calamari & Woodard, 2006) and depression (Spada et al., 2008).

In another explanation, it can be expressed that one form of obsessive-compulsive disorder is the tendency to focus attention on thought processes that increase self-awareness that leads to the discovery of unwanted thoughts or starting disturbing thoughts. Those who believe that worry is uncontrollable and have ideas and beliefs about controlling the thoughts, usually use incompatible coping strategies, such as avoiding thinking, avoiding and suppression of thoughts. Using these strategies lead to more availability of threatening concepts in processing and exacerbating stress and negative emotions. In fact, these processes cause people to overestimate the environmental threats and underestimate their coping ability whose result is continuation of mental disorder (Spada et al., 2008).

In addition, executive functions refer to high-level cognitive issues of the individual such as will power, meaningful thoughts, planning, self-awareness and behavior self-care. The function is directly related to the health of the frontal part of the brain (Kuelz, Hohagen & Voderholzer, 2004).

This expression is defined as complex process in which the individual gets under the implementation of a series of problem-solving behavior from beginning to end. This process involves consciousness and awareness of the problem, preparation of a set of proposals to solve the problem, assessing the ability of the effectiveness of the plans, progress assessment, and comparison of the results obtained with problem condition, finishing the plan, registration of design in mind and reusing it while facing similar problems. Executive functions are in fact as intermediary between complex neural circuits that allow communication between separate areas in the frontal cortical areas and subcortical structure. Variety of psychiatric subcortical disorders, including obsessive - compulsive disorder, result from the damage to the circuitry frontal-astryatal or disorder in metabolic activity (Spada et al., 2008).

In addition, Rempfer et al., (2000) believes that neuropsychological progress in the last two decades indicated the possible effects of neuropsychological and neurobiological mechanisms in the etiology of emotional disorders such as obsession. Studying the relationship between brain and behavior in obsessive-compulsive disorder also shows the incidence of this disorder with neuropsychological abnormalities.

Furthermore, Locascio et al., (2010) shows that there are differences between people with obsessive - compulsive disorder and depression with normal people in metacognitive beliefs and executive functions. This study has examined the differences between the beliefs, and executive functions among the three groups of patients with depression disorder, obsessive-compulsive disorder and normal people and has performed no intervention to reduce symptoms of the disease. Targeted sampling method limits the external validity of the study due to lack of random sampling.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual disorders.4ed*. Washington DC.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Pub.

Barcelo, F., (2001). Does the Wisconsin Card Sorting Test (WCST) Measure Prefrontal Function? *The Spanish Journal of Psychology 1,* 79-100.

Beck, A. T., Steer, R. A., & Carbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical psychology review, 8(1),* 77-100.

Beck, A. T., Ward, C., & Mendelson, M. (1961). Beck depression inventory (BDI). *Arch Gen Psychiatry, 4(6),* 561-571.

Beck, A.T. (1978). *Depression Inventory*. Center for Cognitive Therapy, Philadelphia.

Biabangard, I. (2002). Analysis of metacognition and cognition therapy. *Cognitive science news, (4),* 67-54 [In Persian].

Biringer, E., Lundervold, A., Stordal, K., Mykletun, A., Egeland, J., Bottlender, R., & Lund, A. (2005).Executive function improvement upon remission of recurrent unipolar depression. *European Archives of Psychiatry and Clinical Neuroscience, 255(6),* 373-380.

Dear, B. F., Zou, J., Titov, N., Lorian, C., Johnston, L., Spence, J., … & Knight, R. G. (2013). Internet-delivered cognitive behavioural therapy for depression: a feasibility open trial for older adults. *Australian and New Zealand Journal of Psychiatry, 47(2)*, 169-176.

Dobson, K., & Mohammad Khani, P. (2005). A psychometric coordinates of Depression Inventory 1-2-in patients with major depressive disorder. *Quarterly of Rehabilitation, Special Issue, Mental illness, 29 (8)*, 88-83.

Franklin, D., Conrad, P., Aldana, G., & Hough, S. (2011, March). *Animal tlatoque: attracting middle school students to computing through culturally-relevant themes*. In Proceedings of the 42nd ACM technical symposium on Computer science education (pp. 453-458).ACM.

Greden, J. F. (2001). The burden of recurrent depression: causes, consequences, and future prospects. *Journal of Clinical Psychiatry, 62*, 5-9.

Jacobi, D. M., Calamari, J. E., & Woodard, J. L. (2006). Obsessive–compulsive disorder beliefs, metacognitive beliefs and obsessional symptoms: relations between parent beliefs and child symptoms. *Clinical Psychology & Psychotherapy, 13(3),* 153-162.

Katon, W., Lin, E. H., & Kroenke, K. (2007). The association of depression and anxiety with medical symptom burden in patients with chronic medical illness. *General hospital psychiatry, 29(2),* 147-155.

Kenny, M. A., & Williams, J. M. G. (2007). Treatment-resistant depressed patients show a good response to mindfulness-based cognitive therapy. *Behavior research and therapy, 45(3)*, 617-625.

Koçak, O. M., Nalçacı, E., Özgüven, H. D., Nalçacı, E. G., & Ergenç, İ. (2010). Evaluation of cognitive slowing in OCD by means of creating incongruence between lexicon and prosody. *Psychiatry research, 179(3),* 306-311.

Krystal, A. D., Thakur, M., & Roth, T. (2008). Sleep disturbance in psychiatric disorders: effects on function and quality of life in mood disorders, alcoholism, and schizophrenia. *Annals of Clinical Psychiatry, 20(1)*, 39-46.

Kuelz, A. A., Hohagen, F., & Voderholzer, U. (2004). Neuropsychological performance in obsessive compulsive disorder: A critical review. *Biological Psychology, 65,* 185-236.

Locascio, G., Mahone, E. M., Eason, S. H., & Cutting, L. E. (2010).Executive dysfunction among children with reading comprehension deficits. *Journal of Learning Disabilities, 43(5),* 441-54.

McKay, D., Abramowitz, J. S., Calamari, J. E., Kyrios, M., Radomsky, A., Sookman, D., …& Wilhelm, S. (2004). A critical evaluation of obsessive–compulsive disorder subtypes: symptoms versus mechanisms. *Clinical psychology review, 24(3),* 283-313.

Norman, R. M., Davies, F., Malla, A. K., Cortese, L., & Nicholson, I. R. (1996).Relationship of obsessive—compulsive symptomatology to anxiety, depression and schizotypy in a clinical population. *British Journal of Clinical Psychology, 35(4),* 553-566.

Paelecke-Habermann, Y., Pohl, J., & Leplow, B. (2005). Attention and executive functions in remitted major depression patients. *Journal of affective disorders, 89(1),* 125-135.

Rachman, S. J., & Hodgson, R. J. (1980). *Obsessions and compulsions*. Prentice Hall.

Rao, N. P., Reddy, Y. J., Kumar, K. J., Kandavel, T., & Chandrashekar, C. R. (2008). Are neuropsychological deficits trait markers in OCD?. *Progress in Neuro-Psychopharmacology and Biological Psychiatry, 32(6),* 1574-1579.

Rempfer, M., Hamera, E., Brown, C., & Bothwell, R. J. (2006). Learning proficiency on the Wisconsin Card Sorting Test in people with serious mental illness: What are the cognitive characteristics of good learners?. *Schizophrenia research, 87(1),* 316-322.

Rossi, A., Arduini, L., Daneluzzo, E., Bustini, M., Prosperini, P., & Stratta, P. (2000). Cognitive function in euthymic bipolar patients stabilized schizophrenic patients, and healthy controls. *Journal of psychiatric research, 34(4),* 333-339.

Salkovskis, P. M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour research and therapy, 27(6),* 677-682.

Shirinzadeh Dastgerdi, S. (2006). *The comparison of Metacognitive beliefs and responsibility among OCD, GAD and normal group*. Unpublished Thesis, Shiraz University, Iran [In Persian].

Spada, M. M., Nikčević, A. V., Moneta, G. B., & Wells, A. (2008). Metacognition, perceived stress, and negative emotion. *Personality and Individual Differences, 44(5),* 1172-1181.

Wells, A., & Cartwright-Hatton, S. (2004). A short form of the metacognitions questionnaire: properties of the MCQ-30. *Behaviour research and therapy, 42(4),* 385-396.