

**METACOGNITIVE AND COGNITIVE MECHANISM
OF OBSESSIVE COMPULSIVE DISORDER: THE
ROLE OF MEMORY CONFIDENCE AND FEELING
OF KNOWING JUDGMENTS**

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İSTANBUL, 2014

METACOGNITIVE AND COGNITIVE MECHANISM OF OBSESSIVE COMPULSIVE
DISORDER: THE ROLE OF MEMORY CONFIDENCE AND FEELING OF KNOWING
JUDGMENTS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
BAHÇEŞEHİR UNIVERSITY

BY

SILA DERİN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF ARTS
IN
THE DEPARTMENT OF CLINICAL PSYCHOLOGY

DECEMBER 2014

THE REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES

CLINICAL PSYCHOLOGY

Name of the thesis: Metacognitive and Cognitive Mechanism of Obsessive Compulsive Disorder: The Role of Memory Confidence and Feeling of Knowing Judgments

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Date of the Defense of Thesis: 18.12.2014

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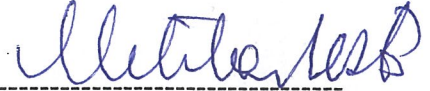
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ABSTRACT

METACOGNITIVE AND COGNITIVE MECHANISM OF OBSESSIVE COMPULSIVE DISORDER: THE ROLE OF MEMORY CONFIDENCE AND FEELING OF KNOWING JUDGMENTS

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Clinical Psychology

Supervisor: Assoc. Prof. Metehan Irak

December 2014, 156 pages

There were three main goals of this study: (a) to investigate different memory mechanisms (visual spatial memory, working memory and episodic memory) in people with obsessive-compulsive disorder (OCD) and to compare their memory performance with subclinical and healthy control participants, (b) to compare feeling-of-knowing (FOK) performance of three mentioned groups using episodic memory task, and (c) to evaluate the quality of life in patients with OCD. The study was conducted on 33 adult participants which were divided into three equal groups (clinical group, subclinic group, and healthy control group) and participation in the study carried out on a voluntary basis. Participants in the clinical group was admitted to the Mental Health Outpatient Clinic at Yedikule Surp Pırgiç Armenian Hospital, Istanbul, for treatment of Obsessive Compulsive Disorder primarily meeting criteria for OCD on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). The severity of OCD and OC dimensional symptom profiles of the patients were assessed by a psychiatrist, a clinical

psychologist and researcher using Yale-Brown Obsessive Compulsive Scale (Y-BOCS). Subclinical and healthy control participants of the study were undergraduate students at Bahcesehir University. All participants completed the self-rated psychological measures (Socio-Demographic Information Form, Beck Anxiety Inventory (BAI, patients only), Maudsley Obsessive Compulsive Inventory (MOCI), Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), Meta-Cognitions Questionnaire-30 (MCQ-30) and World Health Organization Quality of Life Questionnaire-BREF (WHOQOL-BREF). Beside, a series of computerized cognitive tasks were conducted to examine memory performance. The results reveal that there is some impairment in the cognitive functions among OCD patients and such impairments are most likely secondary to dysfunctional executive controls. Additionally, although the present findings provided mixed and inconclusive picture concerning the possibility of general memory deficit in OCD patients, there was also strong evidence that OCD is related to low memory confidence. Furthermore, there were no general memory deficits among OCD patients other than memory confidence problems. Besides, the present study revealed that OCD patients seem not only have reduced confidence on their own memory, but also on their future memory performance. The memory impairment affects meta-memory rather than memory accuracy. Also, in the context of quality of life, OCD patients' physical health and psychological health were much more impaired than both subclinical and healthy control participants'. These findings were discussed in light of relevant literature and future directions for research and clinical practice were recommended.

Key words: Obsessive-compulsive disorder, Memory, Memory confidence, feeling of knowing, and Quality of life

ÖZ

OBSESİF KOMPULSİF BOZUKLUKTA ÜST-BİLİŞSEL VE BİLİŞSEL İŞLEVLER: BELLEĞE DUYULAN GÜVEN VE BİLME HİSSİ KARARLARININ ROLÜ

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Klinik Psikoloji

Tez Danışmanı: Doç. Dr. Metehan Irak

Aralık, 2014, 156 sayfa

Bu çalışmanın, üç amacı vardır. İlki, Obsesif Kompulsif Bozukluk (OKB) tanısı almış hastalar ile sağlıklı bireyler ve subklinik obsesif belirtileri olan bireylerin bellek işlevleri açısından (görsel uzamsal bellek, çalışma belleği ve olaysal bellek) farklı olup olmadığını incelemektir. İkinci olarak sözü edilen üç grubun olaysal bellek altında ölçülen bilme hissi kararları açısından farklı olup olmadıklarını test etmektir. Üçüncü olarak ise, obsesif kompulsif bozuklukta yaşam kalitesinin sağlıklı ve subklinik obsesif belirtileri olan bireyler ile karşılaştırılması hedeflenmiştir. Çalışma, Ruhsal Bozukluklar Tanısal ve Sayımsal El Kitabı-Yeniden Gözden Geçirilmiş Dördüncü Baskı (DSM-IV-TR) ölçütlerine göre OKB tanısı konulmuş ve Yedikule Surp Pırgıç Ermeni Hastanesi'nde ayaktan tedavi görmekte olan 11 hasta ve Bahçeşehir Üniversitesi'nde öğrenim görmekte olan 11 subklinik obsesif belirtisi olan birey ve 11 sağlıklı birey olmak üzere toplam 33 katılımcı ile yürütülmüştür. Katılımcılara, Sosyodemografik BilgiFormu, Maudsley Obsesif Kompulsif Soru Listesi (MOKSL), Beck Depresyon

Envanteri (BDE), Durumluk ve Sürekli Kaygı Envanteri (DSKE), Üstbiliş Ölçeği-30 (ÜBÖ-30) ve Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği Kısa Formu (DSÖYKÖ-KF) uygulanmıştır. Beck Anksiyete Envanteri (BAE) ve Yale-Brown Obsesyon Kompulsiyon Ölçeği (YBOKÖ) ise sadece hasta grubuna uygulanmıştır. Ayrıca, bellek işlevlerini ölçmek için tüm katılımcılara sözü edilen bellek ve bilme hissi görevleri uygulanmıştır. Sonuçlar, OKB hastalarının görsel uzamsal bellek, çalışma belleği ve olaysal bellek performanslarının sağlıklı ve subklinik katılımcıların performanslarına göre daha düşük olduğunu göstermiştir. OKB’de görülen bu söz konusu düşük performans yürütücü işlev bozukluğunun bir sonucu gibi görünmektedir. Ayrıca, OKB hastalarının sağlıklı kontrol ve subklinik katılımcılardan özellikle belleğe duyulan güven açısından farklılaştıkları ve belleklerine daha az güvendikleri görülmüştür. Bunun yanı sıra, OKB’de bellek bozukluklarının bilişsel süreçteki akıcılıktan çok üst-bellek işlevlerini etkilediği saptanmıştır. Bu bağlamda, OKB hastaları bilme hissi kararlarının doğruluğu açısından da özellikle sağlıklı katılımcılardan farklılık göstermiş ve gelecekteki bellek performanslarına dair gerçek performansları ile tutarsız ve daha zayıf tahminlerde bulunmuşlardır. Son olarak, DSÖYKÖ-KF ‘nun özellikle bedensel ve ruhsal sağlık alt ölçeklerinde OKB hastalarının sağlıklı ve subklinik katılımcılardan daha düşük puan aldıkları gözlenmiştir. Bu bulgular, ilgili literatür ışığı altında tartışılmıştır. Ayrıca, gelecekteki çalışmalara ve klinik uygulamalara yönelik önerilerde bulunulmuştur.

Anahtar kelimeler: Obsesif kompulsif bozukluk, Bellek, Belleğe olan güven, Bilme Hissi ve Yaşam kalitesi

,

*To my parents, to my sister, and also to
Soner with love and thanks...*

ACKNOWLEDGMENTS

I would never have been able to finish my study without the guidance of my advisor, help from friends, and support from my family.

I would like to express my deepest gratitude to my advisor, Assoc. Prof. Metehan Irak, for his excellent guidance, caring, patience, and providing me with an excellent atmosphere for doing research. You encouraged me to go one step further in my thinking, patiently corrected my writing and pushed me thinking from different perspectives.

I would like to thank to my jury members, Assist. Prof. İlke Sine Egeci and Dr. Oya Mortan Sevi. You provided constructive and beneficial feedbacks for this thesis. Also, you were helpful with relieving my anxiety during the defense.

Special thanks goes to Dr. Ceren Korulsan Ögütçen, and once again Dr. Oya Mortan Sevi, who assessed the severity of OCD and OC dimensional symptom profiles of the patients in hospital and helped me count patients in my research. My research would not have been possible without their helps. Also, I would like to express my grateful thanks to Assist. Prof. Doruk Uysal Irak for your contributions during the process of finding subclinical and healthy control participants for my research.

This research also could not have been done without the support of lab assistants. I am thankful to Can Soylu and Dicle Çapan, who were always willing to help and give their best suggestions.

I would like to owe thanks to my dear friends, Deniz Asolar, Esin Enisoğlu Tilbe, Sabire Durusoy, Uğur Evren Bakıcı, and Ecem Olçum for your encouragement and sharing my anxiety. You always listened patiently all my complaints and encouraged me to overcome emotional

burnouts. Also, I would like to express special thanks to my dear friend, Aslı Büyükgüngör for your lovely support and comments on my English. I am deeply grateful to Soner Elmas for handling my all emotional ups and downs during this process. You were always there cheering me up and stood by me through the good times and bad.

I would also like to thank my parents, my sister, my sister's husband, and my cousin. They were always supporting me and encouraging me with their best wishes not only during this thesis process, but also throughout my life. I could not complete my degree without your continued support and patience.

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CHAPTER 1

INTRODUCTION

1.1. Clinical Characteristics of Obsessive Compulsive Disorder

1.1.1. Obsessive Compulsive Disorder

Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by intrusive thoughts that produce uneasiness, apprehension, fear, or worry by repetitive behaviors aimed at reducing the associated anxiety or by a combination of such obsessions and compulsions (Aksoy, 2006; Soomro, 2012). Among the anxiety disorders on the Diagnostic and Statistical Manual of Mental Disorders- Fourth Edition (DSM-IV) (American Psychiatric Association, 1994), OCD is defined especially by excessive negatively-valenced cognitions. It is emphasized that excessive-valenced cognitions are seen in obsessions which are unwanted and repetitive thoughts, impulses, or images that are inappropriate or detrimental and cause distress or anxiety (American Psychiatric Association, 1994). Compulsions, on the other side, are rigid behaviours such as checking or mental acts such as counting things that occur in response to reduce the anxiety associated with obsessions (American Psychiatric Association, 1994).

Individuals with OCD rarely have one or two symptoms because vast majority of them experience both obsessions and compulsions (Heyman, Mataix-Cols, and Fineberg, 2006). The most common obsessions are fear of causing harm to someone else, fear of harm coming to self, fear of contamination, need for symmetry or exactness, sexual and religious obsessions, fear of behaving unacceptably, and fear of making a mistake. Besides, the most common compulsions are classified into two categories namely, behaviours as cleaning, handwashing, checking, ordering and arranging, hoarding asking for reassurance and mental acts as counting, repeating words silently, ruminations neutralising thoughts (Heyman et al., 2006; Kumar, Reddy, Krishna, and Manikanta, 2013).

OCD is a chronic debilitating disorder that leads to severe psychological problems, relationship issues and affects negatively one's social functionality and quality of life (Camlı, Turkçapar and Sargin, 2012). Several studies confirmed that the severity of symptoms is related to diminished quality of life (Hauschildt, Jelinek, Randjbar, Hottenrott, Moritz, 2010; Macy et al., 2013; Speisman, 2012). When compared to general population and individuals with other psychiatric disorder, OCD has greater impact on quality of life (Macy et al., 2013). It was reported that the quality of life of individual diagnosed with OCD was similar to schizophrenics' as part of mental health, but worse than individuals' with depression (Bobes et al., 2001). Especially, spending time on obsessions and compulsions, avoidance of situations which trigger obsessions and compulsions and specific symptoms related to obstacles in academic, occupational and social functions reduce a quality of life among individuals with OCD (Simson, Stein, and Hermann, 2013; Sorensen, Kirkeby, and Thomsen, 2004). Besides, the influence of medical and psychiatric comorbidity, level of insight and

treatment duration must be take into account (Akdede, Alptekin, Akvardar, and Kıtıs, 2005; Besiroglu et al., 2007; Eisen et al., 2006; Rodriguez-Salgado et al., 2006).

1.1.2. Assessment and Diagnosis of OCD

OCD is a clinically heterogeneous and consists of multidimensional symptoms that are related to psychological, behavioral and neuropsychological functions (do Rosario-Campos et al., 2006; Lawrence et al, 2006). It is emphasized that vast majority of experts also admitted that the heterogeneity of OCD with multiple dimensions which are specified as contamination/cleaning, cleaning symmetry/order/repeating/counting, hoarding, harm (aggressive) obsessions and checking, and sexual and religious obsessions (Mataix-Cols, Pertusa, and Leckman, 2007).

Lately, it is suggested a model which classifies obsessions into two types as autogeneous obsessions and reactive obsessions (Lee and Telch, 2005). Autogeneous obsessions are defined as unrealistic thoughts, impulses or images without explicit trigger which include sexual, religious and aggressive obsessional themes. Such obsessions tend to be ego-dystonic and unacceptable. In contrast, reactive obsessions are defined as relatively more realistic thoughts, impulses or images about contamination, mistakes and asymmetry with explicit trigger (Camli et al., 2012; Lee, Kwon, Kwon, and Telch, 2005; Lee and Telch, 2005).

Even though extensive reviews of alternative scales are available in literature, obsessive compulsive symptomatology is widely measured Yale-Brown Obsessive Compulsive Scale (Y-BOCS) developed by Goodman and colleagues (1989) which is

used to rate symptom severity only, not to establish diagnosis. In recent meta-analysis of twenty-one symptom category-based factor analyses which was conducted to reduce the phenomenological heterogeneity of OCD by using Y-BOCS, at least four symptom dimensions as symmetry obsessions and repeating, ordering, and counting compulsions; forbidden thoughts: aggression, sexual, religious, and somatic obsessions and checking compulsions, cleaning and contamination, and hoarding obsessions and compulsions were generated (Bloch, Landeros-Weisenberger, Rosario, Pittenger, & Leckman, 2008).

Now that OCD contains divergent symptoms at the diagnostic level, clinical classification of the disorder has been controversial. For the diagnosis of OCD, DSM IV and International Classification of Diseases- Tenth Edition (ICD 10) have been used for many years. In both DSM IV and ICD 10, it is required that obsessional symptoms or compulsive acts, or both must be present for a definite diagnosis (Aksoy, 2006). However, while OCD takes part in chapter, namely *Anxiety Disorders* in the DSM IV because of excessive anxiety and worry associated with obsessions, it takes part in chapter, namely *Neurotic, Stress-related and Somatoform disorders* in the ICD 10 (Bayraktar, 1997).

Recently, there are some changes in the classification of the disorder. In the fifth edition of DSM, the major change for OCD is that it is no longer considered as anxiety disorder and takes part in separate chapter, namely *Obsessive Compulsive and Related Disorders* which also include body dysmorphic disorder and trichotillomania (hair-pulling disorder), as well as two new disorders: hoarding disorder and excoriation (skin-picking) disorder (Thomsen, 2013). Even though there are conflicting views among

experts regarding the new clinical classification of OCD in the DSM V, it is also considered by most mental health professionals especially in the United States that there may be some advantages to remove OCD from anxiety disorders and count it in separate chapter due to its condition requiring different conceptual, evaluation and multidimensional approach from the others (Hollander, Braun, and Simeon, 2008; Mataix-Cols et al., 2007; Pertusa, Frost, and Mataix-Cols, 2010; Stein et al., 2010). On the other hand, it is stated that the new classification of OCD seems to be incomplete (Storch, Abrmowitz and Goodman, 2008) and more research is still needed to extend the value of a dimensional approach (Sar, 2010; Sulkowski et al., 2011).

1.1.2.1. The DSM IV Classification of OCD

Diagnostic criteria for OCD on the DSM IV which was took into consideration by the psychiatrist in current study inclusion criteria for clinical group participants are as following:

A. Either obsessions or compulsions:

Obsessions as defined by (1), (2), (3), and (4):

(1) recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress.

(2) the thoughts, impulses, or images are not simply excessive worries about reallife problems

(3) the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or action.

(4) the person recognizes that the obsessional thoughts, impulses, or images are a product of his or her own mind (not imposed from without as in thought insertion).

Compulsions as defined by (1) and (2):

(1) repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to rules that must be applied rigidly.

(2) the behaviors or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviors or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive.

B. At some point during the course of the disorder, the person has recognized that the obsessions or compulsions are excessive or unreasonable. Note: This does not apply to children.

C. The obsessions or compulsions cause marked distress, are time consuming (take more than 1 hour a day), or significantly interfere with the person's normal routine, occupational (or academic) functioning, or usual social activities or relationships.

D. If another Axis I disorder is present, the content of the obsessions or compulsions is not restricted to it (e.g. preoccupation with food in the presence of an Eating Disorder; hair pulling in the presence of Trichotillomania; concern with appearance in the presence of Body Dysmorphic Disorder; preoccupation with drugs in the presence of a Substance Use Disorder; preoccupation with having a serious illness in the presence of Hypochondriasis; preoccupation with sexual urges or fantasies in the presence of a Paraphilia; or guilty ruminations in the presence of Major Depressive Disorder).

E. The disturbance is not due to the direct physiological effects of a substance (e.g. a drug of abuse, a medication) or a general medical condition.

Specify if:

With Poor Insight: if, for most of the time during the current episode, the person does not recognize that the obsessions and compulsions are excessive or unreasonable.

1.1.3. Epidemiology of OCD

OCD generally occurs during the period of childhood or adolescence and continues into one's life (Hollander et al., 1996; Irak and Tekcan, 2009; Simson, Stein, and Hermann, 2013). The mean age of onset of obsessive-compulsive disorder (OCD) ranges from 21.9 to 35.5; 65% of cases start by age before 25 years (Bayar and Yavuz, 2008). In the United States, the mean age of onset is approximately 19.5 years; 25% of cases start by age 14 years (Kessler, Chiu, Demler, & Walters, 2005; Ruscio, Chiu, Stein, and Kessler., 2010). Males have an earlier age of onset than females (Binbay et al., 2013; Karadag et al., 2006; Ruscio et al., 2010; Simson et al., 2013). Besides, age at onset appears to have different features and causes related to psychological, behavioral, environmental and neuropsychological. When compared to late-onset OCD, early-onset OCD is associated with more severe symptom rates and higher rates of compulsions (Dell'Osso et al., 2013; do Rosario-Campos et al., 2001; Sobin, Blundell, and Karayiorgou, 2000; Tükel et al., 2005). Therefore, early and late forms of OCD is supposed to evaluate and identify separately in the context of etiology, clinical course and treatment response (Geller et al., 2001; Sobin et al., 2000).

Previously, the prevalence of OCD symptoms was not considered to be widespread in the general population (Bayar and Yavuz, 2008; Stein et al., 1997). However, only

during the last decade, the prevalence of OCD symptoms has found to be remarkably higher and more common than previously believed (Bayar and Yavuz, 2008; Murray and Lopez, 1997; Stein et al., 1997; Somers, Goldner, Waraich, and Hsu, 2006; Torres et al., 2006; Valeni-Basile et al., 1996). In the first Global Burden of Disease (GBD) study, OCD emerged as the tenth highest cause of disability in the world (Murray and Lopez, 1996). The lifetime prevalence of the disorder in general population ranges from 2% to 3% (Irak and Tekcan, 2009; Karamustafahoglu and Yumrukcal, 2011; Kessler et al., 2005; Ruscio et al., 2010). Even though estimates of prevalence vary slightly across countries and also studies depending on different cultural and sociodemographic characteristics, and methodology, most researches in this field have similar findings and are consistent with each other.

In the prior report from the large-scale *NIMH Epidemiologic Catchment Area* (ECA) study by Karno et al., 1988, it was found that OCD lifetime prevalence across five U.S. communities (excluding individuals with comorbid schizophrenia, major depression or organic brain syndrome; Tourette's disorder) ranged from 1.9% to 3.3% and higher rates of OCD in women than in men (Hollander et al., 1996; Stein et al., 1997). In another large epidemiological study from seven countries (United States, Canada, Puerto Rico, Germany, Taiwan, Korea, and New Zealand) by Weismann et al., 1994, it was reported similar high lifetime prevalences and also higher rates of OCD in women than in men (Hollander et al., 1996).

In recent years, there are also some community studies and reviews which comprehensively examine the prevalence of the disorder. In one of these, research carrying out with 1808 individuals, it was reported that OCD twelve month prevalence

estimates was 1.1% (Kessler et al., 2005) and in another, one month prevalence estimate was 1.1 % (Torres et al., 2006). After the review of findings from 12 epidemiological studies from 1987 to 2004, it was reported that OCD lifetime prevalence ranged from 0.5% to 3.2% (Somers et al., 2006). In another recent review of findings from 15 studies, it was indicated that life time prevalence estimate was 1.1 % (Baxter et al., 2014).

In comprehensive research carrying out with 2073 individual who met full DSM IV criteria, it was found that lifetime and twelve month prevalence estimates were 2.3% and 1.2%, respectively. Besides, it was reported that the most common compulsive behaviours were checking (79.3%) and hoarding (62.3 %) (Ruscio et al., 2010).

In Turkey, there are also various epidemiological studies on OCD. Findings are similar to the prevalence rates of most epidemiological studies around the world. In only and first large scale research namely, *Mental Health Profile Of Turkey* by Erol et al., 1998, it was reported that twelve month prevalence of OCD was 0.5% and more common in women than in men. As of 2000, the number of epidemiological studies in anxiety disorders has been tend to decrease in Turkey and there are few qualified studies in this field (Binbay et al., 2013). In a recent review of findings from 5 epidemiological studies with different samples from 2004 to 2010, it was indicated that incidence rates ranged from 2.2% to 5.9% (Binbay et al., 2013).⁴

1.1.4. Comorbidity

The comorbidity of other psychiatric disorders in OCD is very common (Ayuso-Mateos, 2006). The presence of comorbid condition significantly affects severity of

symptoms, clinical course and treatment response (Amerio, Odone, Liapis, and Ghaemi, 2014; Lochner et al., 2014). The most common comorbid conditions in adults with OCD are other anxiety disorders and mood disorders (most commonly major depressive disorder) (Angst et al., 2004; Fineberg, Fourie, Gale, and Sivakumaran, 2005; Karadag et al., 2006; Karamustafalioglu et al., 2009; Keskin and Tamam, 2014; Milanfranchi et al., 1995; Noel, Lewis, Francis and Mezo, 2013; Steketee, Chambless, and Tran, 2001; Torres et al., 2006; Viswanath et al., 2012). In the National Comorbidity Survey Replication (NCS-R), it was reported that the most common complications of OCD were other anxiety disorders (75.8%), mood disorders (63.3%), impulse-control disorders (55.9%) and substance use disorders (38.6%) (Ruscio et al., 2010). In other research, it was reported that the most common comorbid anxiety disorders were specific phobia (48.3%), followed by generalized anxiety disorder (33.3%), panic disorder (28.3%), social phobia (26.7%), agoraphobia (10%), and post-traumatic stress disorder (5%) (Tamam, Saygili, and Unal, 2003). Besides, substance use (most commonly in men), body dysmorphic disorder, trichotillomania (hair-pulling disorder), and excoriation (skin-picking) disorder also occur more frequently among individuals diagnosed with OCD than in those without the disorder (Blom et al., 2011; Cuzen et al., 2014; Lochner et al., 2005; Lovata et al., 2012;; Tezcan, Ulkeroglu, Kuloglu, and Atmaca, 1996; Tukul, Tihan, and Ozturk, 2013). Eventually, in terms of DSM IV Axis II disorders, comorbidity rates for OCD and personality disorders range from 52% to 83% (Bayar and Yavuz, 2008). However, no specific relation between OCD and personality disorders is reported and results from different studies are still in discussion (Diaferia et al., 1997; Friberg et al., 2012; Lochner et al., 2011; Wu, Clark, and Watson, 2006).

On the other side, in some cases, OCD becomes a comorbid condition. Particularly, it is much more common among individuals with schizophrenia or schizoaffective disorder, bipolar disorder, eating disorders such as anorexia nervosa and bulimia nervosa, and Tourette's disorder (Frias-Ibanez, Sevillano, and Hernando, 2014; Kaye et al., 2004; Keskin and Tamam, 2014; Schirmbeck and Zink, 2013; Palanti et al., 2011).

1.2. Etiology

Although there are several evidence based studies regarding the etiology of OCD, the causes of the disorder are still unknown (Akpinar, 2007; Freeston et al., 2006; Karshioğlu and Yuksel, 2007). OCD is commonly thought to be etiologically heterogeneous as well and the interaction of genetic and environmental factors (Freeston et al., 2006; Kim and Kim, 2006; Stein, 1999; Vasconcelos et al., 2006). However, it is not known whether the heterogeneity of the disorder indicates totally, or comparatively different etiological factors (Iervolino et al., 2011).

1.2.1. Biological Factors

In recent years, researches which emphasize biological nature of OCD have been increasingly developing. Initially, twin studies have strongly suggested that OCD can be inherited (Bloch and Pittenger, 2010; Kim and Kim, 2006; Pauls, 2010). According to the reports from various twin studies, there are different concordance rates between monozygotic (MZ) and dizygotic (DZ) twins and MZ twins have higher concordance rates ranges from 45% to 87% than DZ twins (Bayar and Yavuz, 2008; Bayraktar, 1997; Bloch and Pittenger, 2010; Hudziak et al., 2004; Iervolino et al., 2011; Pauls, 2010,

2008; van Grootheest, Cath, Beekman, and Boomsma, 2005). In terms of assessing the heritability of the disorder, these studies are crucial due to the fact that MZ twins are genetically identical (Bloch and Pittenger, 2010). However, vast majority of twin studies have important limitations such as different sample sizes and inconsistent diagnostic criteria among each other (Kim and Kim, 2006).

Family studies also have been conducted to evaluate the heritability of the disorder. After a meta-analysis of family studies in OCD, it was reported that the first-degree relatives of OCD patients were about four-fold more likely to be diagnosed with OCD than relatives of controls (Pauls, 2008). According to the Hopkins OCD Family Study, first-degree relatives of individuals with OCD also seem to have a higher risk of developing tic disorders, skin picking and trichotillomania, body dysmorphic disorder, and somatoform disorders when compared to other psychiatric disorders (Bienvenu et al., 2000; Grados et al., 2001). However, some evidence from family studies suggests that the patterns of transmission of OCD in families can be associated with not only shared genetic, but also shared environmental factors. Therefore, these studies are considered to be the representation of circumstantial evidence of heritability of psychiatric disorders (Pauls, 2008).

In addition to findings from twin and family studies, structural/functional neuroimaging and pharmacological studies is a recently developing field (Bloch and Pittenger, 2010; Pauls, 2008; Rauch, 2000; Rosenberg and Hanna, 2000). In the realm of neuroimaging studies, some evidence demonstrate that the hyperactivation of ventral prefrontal cortical regions such as orbitofrontal cortex, anterior cingulate cortex, striatum insula, caudate nucleus, thalamus and basal ganglia play an important role in

the manifestation and maintenance of the disorder (Chamberlain et al., 2005; Fava et al., 2014; Friedlander and Desrocher, 2007; Hajcak and Simons, 2002; Huey et al., 2008; Karshoglu and Yuksel, 2007; Pauls, 2008; Rosenberg et al., 2004; Rosenberg and Hanna, 2000; Szesko et al., 2004; Tamm, Menon, and Reiss, 2002; Viard et al., 2005; Whiteside, Port, and Abramowitz, 2004;). Additionally, evidence from recent studies suggest that dorsolateral prefrontal cortex has also an impact (Nakao et al., 2005; Rotge et al., 2008; Russell et al., 2003). Besides, metabolic changes in dopaminergic and most commonly serotonergic pathways are considered to play a role in the pathogenesis of OCD (Bloch and Pittenger, 2010; Grunblatt, Hauser, and Walitza, 2014; Stein and Ludik, 2000; Westenberg, Fineberg, and Denys, 2007). According to pharmacological studies, selective serotonin reuptake inhibitors (SSRIs) result in decreased symptoms of OCD and changes in activation of the brain regions as mentioned above (Gilbert et al., 2000; Grunblatt, Hauser, and Walitza, 2014; Nakao et al., 2005; Rosenberg et al., 2004; Saxena et al., 2002; Vaswani, Linda, and Ramesh, 2003).

Taken all together, these kind of studies are crucial to clarify the heterogeneity and genetic complexity of OCD and pave the way the development of new neurodiagnostic and more profitable treatment approaches (Rauch, 2000; Rosenberg and Hanna, 2000).

1.2.2. Psychological Factors

Several psychological theories have been proposed for OCD to understand causes of the disorder. In the early 20th century, the psychoanalytic theories of OCD was widespread (Koran, 2007; Topcuoglu, 2003). In view of the psychoanalytic theory of OCD, obsessive compulsive behaviors as defensive psychological responses to unconscious impulses stem from an expression of hostile impulses by child against

mother (McWilliams, 2009; Topcuoglu, 2003). The development of such symptoms is associated with regression to the anal-sadistic stage of psychosexual development which is distinctive with aggression and basic ambivalence conflict. The ambivalence features of this stage leads to magical thinking which plays an important role in the psychopathology and pathogenesis of obsessive-compulsive disorder and result in superstitious compulsive acts (Kempke and Luyten, 2007; Koran, 2007). Besides, the imbalance of ego defense mechanisms such as displacement, isolation, undoing and reaction formation gives rise to anxiety due to the fear of behaving in an unacceptable way or thinking disturbing aggressive or sexual ideas or images (Kempke and Luten, 2007). Nevertheless, psychoanalytical explanations of OCD are still controversial and have lost its significance due to evidence-based explanations of biological models and behavioral model (Bayraktar, 1997).

By contrast with psychoanalytical explanations, the behavioral model of OCD based on Mowrer's (1960) two factor model emphasizes the process of classical and operant conditioning (Carmin, 2005; Taylor, Abramowitz, and McKay, 2007). According to the model, in first process by classical conditioning, neutral stimuli becomes specific stimuli related to threatening thoughts or images, such as associating sexual images with contamination and gives rise to anxiety. During second process, this anxiety is maintained by operant conditioning in which individuals discover that some certain rituals, only provided tentative relief such as washing hands, reduce anxiety (Mineka and Zinbarg, 2006; Taylor et al., 2007). Although the behavioral model of OCD are found simple explanation, it is also considered to be important due to their contribution to the development of effective treatment techniques such as exposure and response prevention (Carmin, 2005).

Among several theories, cognitive behavioral models of OCD have provided a better understanding with range of empirical support and lead to the development of more effective treatments (Frost and Steketee, 2002). According to these models, OCD particularly results from dysfunctional appraisals of intrusions and maladaptive beliefs about one's own thoughts and thinking process (Clark, 1999; Foa and Kozak, 1997; Frost and Steketee, 2002; Salkovskis, 1999; Taylor et al., 2007). According to the model by Salkovskis, intrusive thoughts are disturbing because of that these involve one's inflated responsibility for having such thoughts, for harm to oneself or other related to such thoughts or for neutralizing acts such as compulsions, reassurance seeking and avoidance to prevent harm (Salkovskis, 1999). In terms of maladaptive beliefs about one's own thoughts and thinking process, Cognitive research by Obsessive Compulsive Cognitions Working Group (OCCWG) (1997) identified six main belief domains that have an impact on the development of intrusive thoughts, namely: inflated personal responsibility, over-importance of thought, beliefs about the importance of controlling one's thoughts, overestimation of threat, intolerance for uncertainty, and perfectionism (OCCWG, 1997). Besides, it is recently reported that there are both high correlation between these domains and symptoms of OCD and high intercorrelation between these domains (Taylor, Kyrios, Thordarson, Steketee and Frost, 2002). Subsequently, three dominant factor emerged, namely: responsibility and threat estimation, perfectionism and intolerance for uncertainty, and importance and control of thoughts (OCCWG, 2005).

On the other side, according to Well's theory of Self-Regulatory Executive Function (S-REF), metacognition also play an important role in the development and maintenance of the disorder (Cucchi et al., 2012). Metacognitive models focus on the

importance of thinking processes, and the content of thoughts (Ress and Anderson, 2013). In the metacognitive model of OCD, there are some explanations about the importance of self perceptions and assumptions in the context of responses to intrusions. For instance, Ranchman (1997) postulates that the main reason of the development and maintenance of OCD is “catastrophic misinterpretations” (Ranchman, 1997; Shafran, 1999). According to Ranchman, the possibility of catastrophic misinterpretations is increased by two cognitive biases. While the first bias contains the conviction that thinking about unpleasant things make them possible to occur in real life, the second bias contains the conviction that having morally unacceptable thoughts is equivalent to acting immorally. Because of these two biases which take part in the concept of “thought-action fusion” (TAF), intrusive thoughts become more distressing (Ranchman, 1997; Shafran, 1999).

1.2.3. Neuropsychological Factors

Within the framework of cognitive and neurocognitive models, changes in different cognitive functions such as attention, memory, executive function and metacognition play a big role to underlie emotional disturbances and in perpetuating the repetitive behaviors that characterize the disorder (Irak and Tekcan, 2009; Muller and Roberts, 2003; Rachman and Randsky, 1999; Ress and Anderson, 2013), and the vast majority of neuropsychological dysfunctions are associated with most commonly executive functions which refer to cognitive process that regulates one’s ability to organize thoughts and activities, reasoning and problem solving (Abramowitch, Abramowitz and Mittelman, 2013; Olley, Malhi, and Sachdev, 2007).

On the subject of cognitive functions in OCD, it is stated that OCD seems to be associated with selective attention biases favoring threatening stimuli resulted in increased anxiety, and negative priming (NP) (cognitive inhibition) regarding such stimuli (Kuelz, Hohagen andVoderholzer, 2004; Muller and Roberts, 2003). In a study using with Stroop task comprising semantic manipulation with fear-related words, OCD patients' performance on such words were found to be slower when compared to healthy controls' (Foa et al., 1993). In another study, Tata and colleagues (1996) reported that OCD patients were more vigilant for contamination-related words than high trait anxious controls.

In a study using with modified NP paradigm with idiographically-selected words, it was also reported that OCD patients exhibited NP for no priming and threat words and facilitation for only neutral words (Amir, Cobb and Morrison 2008). Besides, Amir, Najimi and Morrison (2009) found the same effect for attention bias towards threat-related words in OCD patients. In another study, Irak and Flament (2009) also reported attentional bias towards threat relevant words among sub-clinical checkers when compared to non-checkers, but they emphasized that this difference was independent from type of attention.

It was also found attentional biases for emotional information among individuals with OCD. In the study using with emotional Stroop color-naming test and including two different conditions, namely: subliminal and supraliminal, Unoki and colleagues (1999) reported that OCD patients were slower in both naming the background color of subliminal emotional words and responding anxiety-relevant and compulsion-relevant words than healthy controls.

Although many studies have demonstrated that there are selective attention bias among OCD patients, type of stimuli associated with this bias is still controversial (Irak and Tekcan, 2009). Empirical researches, which mention the existence of attentional bias for threat in anxiety, have also shown that there is an attentional bias for not only threat-relevant stimuli but also positive emotional stimuli (Ruiz-Caballero and Bermudez 2010).

In literature, there are also some researches about inhibitory deficits in OCD using with directed forgetting paradigm which is considered to be associated with selective encoding among OCD patients (Irak and Tekcan, 2009). Wilhem, McNally, Baer and Florin (1996) reported that while OCD patients had more difficulty in the ability to forget negative words compared to positive and neutral ones, healthy controls' performance was not affected from word type. In another study, it was found that OCD patients exhibited greater impairment in forgetting for OCD-relevant words than nonanxious and anxious controls, particularly in recognition test (Tolin, Hamlin, and Foa, 2002).

In a recent study under two conditions: List and Item with emotionally neutral everyday words, it was reported that OCD patients' and healthy controls' performance on recalling the number of F-cued words was similar. However, OCD patients recalled fewer R-cued words than healthy controls (Konishi et al., 2011).

In terms of memory impairments, many studies with OCD and sub-clinical OCD participants have focus on memory confidence for remembering self-actions in the context of episodic memory which refers to memory for recollection of autobiographical

events, situations and experiences (Muller and Roberts, 2003). It is emphasized that OCD is characterised by significant levels of distrust in memory. Particularly, repeated compulsive checking behaviours cause increased level of distrust in memory (Alcolado and Radomsky, 2011; Coles, Radomsky and Horng, 2006; Harkin and Kessler, 2009; Hermans et al., 2008; Jelinek, Moritz, Heeren, and Naber, 2006; Linovski, Kalanthroff, Henik and Anholt, 2013; Medway and Jones, 2013; Rubenstein et al., 1993; van den Hout and Kindt, 2003; Zermatten, Van Der Linden, D'Argembeau and Cheschi, 2008). McDonald, Antony, Macleod and Richter (1997) reported that OCD checking is not related to memory impairments only but rather that checking in OCD is a symptom of decreased confidence in memory. In another study, it is stated that patients with OCD showed less confidence in attention and memory, that confidence in attention also was associated with checking behavior and caused increased levels of distrust in attention (Hemans et al., 2008). Omori and colleagues (2007) found that executive attention function had great impact on episodic memory in OCD patients and checkers in comparison to washers had more memory confidence problems in terms of inhibition, cognitive flexibility and multi-tasking.

Other crucial factor leading decline of memory confidence among compulsive checkers is thought to be inflated responsibility (Moritz et al., 2006). Radomsky, Ranchman and Hammond (2001) reported that compulsive checkers exhibited more positive memory bias for threat-relevant stimuli under high responsibility conditions than under low responsibility conditions. Besides, under no responsibility condition, no memory bias detected. Results indicated that responsibility seems to have greater influence on confidence in memory than on memory itself (Radomsky et al., 2001).

Recently, the psychological models of OCD emphasise the importance of metacognitive process. Researches in the realm of the effect of metacognitive beliefs, metacognitive monitoring and metacognitive control of emotional states on the psychopathology of the disorder have been increasing (Nelson et al., 1999). It is stated that misinterpretations of one's intrusive thoughts, images, and impulses are more determinative than thoughts, images and impulses themselves in OCD and give rise to anxiety (Aardema, O'Connor and Emmelkamp, 2006; Dogan, Solak, Ozdel and Turkcapar, 2013; Fisher and Wells, 2004; Irak and Tosun, 2008; Myers and Wells, 2013; Nelson, Stuart, Howard and Crowley, 1999; Pazvantoglu et al., 2013; Purdon and Clark, 1999;). Besides this, it is reported that metacognitive beliefs are associated with cognitive confidence in OCD and thus, research on metacognition in OCD is needed to carry out the study of memory (Hermans et al., 2008). Tuna, Tekcan, and Topcuoglu (2005) stated that memory confidence problems in OCD patients may have been secondary to general metacognitive beliefs, such as the belief that their memory was generally poor. In this respect, researches on metamemory defined as one kind of one type of metacognition which includes self-awareness of one's own memory and *feeling of knowing* (FOK) judgments about one's future memory performance also support evidence that OCD patients demonstrate memory confidence problems. For instance, Nedeljkovic and Kyrios (2007) reported that OCD patients seemed to have reduced confidence on their own memory and FOK. Similar findings have been reported by Boduroglu, Tekcan, and Kapucu (2014), Moritz, Ruhe, Jelinek and Naber (2009), Nedeljkovic, Moulding, Kyrios and Doron (2009), Randomsky, Dugas, Alcolado and Lavoie (2014), Randomsky, Gilchrist, and Dussault (2006), Tolin and colleagues (2001); Tuna and colleagues (2005), and Zitterl and colleagues (2001). Congruently,

Kikul, Vetter, Lincoln and Exner (2011) reported significant effect of metacognitive beliefs also on visual spatial memory, which refers to memory for processing and encoding of visual information.

In addition, the important thing is that metamemory is greatly affected from memory impairments in OCD patients rather than memory accuracy (Moritz, Kloss, Eckstaedt and Jelinek, 2009; van den Hout and Kindt, 2003). Furthermore, Irak (2005) found that FOK performance related with types of memory, and metacognitive and executive function process may have similar aspects.

In literature, results from researches about the relationship between compulsive symptoms and memory problems are controversial (Irak and Tekcan, 2009). According to many researches regarding the role of memory in OCD, the results are described as continuum at best (Hermans et al., 2008). After the review of experimental findings from 46 OCD memory studies, Harkin and Kessler (Harkin and Kessler, 2011) reported that impairments on visual spatial memory and working memory, which refers to memory for storing and managing information from complex cognitive tasks such as learning and reasoning, are also most commonly observed in OCD, memory impairment is secondary factor to executive dysfunction, and it is possible to identify three common factors as executive-functioning efficiency, binding complexity, and memory load. In another review of the experimental findings from 88 studies, it is stated that patients with OCD showed significantly lower performance particularly in tasks that measured visuospatial memory, executive function, verbal memory and verbal fluency, and in the ability to recall complex visual stimuli (Shin, Lee, Kim and Kwon, 2013).

In recent study carrying out with 68 OCD patients and 65 healthy controls, it is reported that OCD patients were impaired in spatial recognition memory and spatial working memory (Dittrich, Johansen, Fineberg, and Landro, 2011). According to results, it is suggested that spatial memory impairments is secondary to executive system components such as an inability to carry out detailed attentional and goal-oriented strategies to support visuospatial recognition memory. Many recent studies also emphasise that visual spatial memory and working memory are impaired in OCD and related with mostly executive functioning efficiency (Sharma et al., 2012; Tumkaya et al., 2013).

Taken all together, although results from different studies are inconsistent, range of empirical evidences has demonstrated impairment in the cognitive functions among individuals with OCD (Abramowitch et al., 2013; Shin et al., 2013), and generally, confounding factors as educational level, symptom severity, medication status and comorbid disorders have not great impact on such impairments in OCD patients (Shin et al., 2013).

1.3. Treatment

In the early 1960s, the disorder was thought as untreatable condition (Foa, 2010). Particularly, traditional approaches and early behavioral therapy had been unsuccessful in effectively reducing anxiety related with OCD symptoms (Foa, 2010; Gelatly et al., 2014). For many years, as an alternative to traditional therapy and pharmacotherapy approaches, Cognitive Behavioral Therapy (CBT) have been widely implemented for the treatment of OCD and there is an empirical evidence of its efficacy (Foa, 2010;

Gelatly et al., 2014; Hertenstein et al., 2012; Mancebo et al., 2011; Ougrin, 2011; Soomro, 2012; Warren and Thomas, 2001; Wilhelm et al., 2005; Wilson and Roman, 2007). After the systematic review of findings from 27 randomized placebo-controlled trials studies, it was reported that CBT was highly effective among adults with anxiety disorder (Hofmann and Smits, 2008).

Within the framework of cognitive behavioral conceptualizations, main components of the treatment are assessment and information gathering, psycho-education, identification of dysfunctional thinking patterns, exposure and response prevention (ERP) technique, and relapse prevention technique (Doron and Moulding, 2009; Koran et al., 2007; Whittal and McLean, 1998). It is stated that notably ERP based on Behavior Therapy (BT) conceptualizations which focus on facing situations that emerge intense anxiety (“exposure”), and refraining from avoidance behaviours (“response prevention”) are highly effective in breaking the dysfunctional response cycle and reducing anxiety related with OCD symptoms (Abramowitz, 1997; Bolton et al., 2011; Bouvard and Kaiser, 2006; Doron and Moulding, 2009; Foa, 2010; Foa, Franklin and Moser, 2002; Mancebo et al., 2011; Seibell and Hollander, 2014; Simpson et al., 2008; Soomro, 2012; Walsh and McDougle, 2011; Whittal, Thordarson and McLean, 2005; Williams et al., 2013). However, CBT techniques are found to be only effective in the presence of both obsessions and compulsions, but not highly effective in the presence of only obsessions and their long term outcomes are obscure (Fisher and Wells, 2008; Fitt and Rees, 2012), and in the presence of greater symptom severity, co-morbidity with severe depression and personality disorders (Doron and Moulding, 2009). Thus, need for alternative treatments have been increasing in recent years (Simons, Schneider, and Dalhmann, 2006).

In literature, it is emphasized that new treatment rationale namely, Metacognitive Therapy, have been coming up with its effectiveness in treatment of OCD due to its purpose of modifying the negative appraisals of intrusive thoughts and metacognitive processing such as beliefs about the importance and power of thoughts which are crucial to the development and maintenance of OCD symptoms (Andouz, Dolatshahi, Moshtagh, and Dadkhah, 2012; Bjorguinsson, Hart and Heelfinger, 2007; Fitt and Rees, 2012; Fisher and Wells, 2008; Simons et al., 2006). On the other hand, it is stated that more comprehensive researches in this field are essential (Fisher and Wells, 2008). Even though, there is also need to carry out more researches, the other prominent alternative in terms of treatments for OCD, Cognitive Behavioral Group Therapy (CBGT) and Behavioral Group Therapy (BGT) with most commonly using exposure and response prevention techniques were also found to be as effective as individual therapy with good long term compliance (Braga, Cordioli, Niederauer, and Manfro, 2005; Cordioli et al., 2002; Himle et al., 2001; McLean et al., 2001; O'Connor et al., 2005).

In some cases, the initial success can be difficult to maintain in the long term with using behavioral or cognitive therapies only. It is stated that pharmacotherapy based on serotonergic antidepressants such as selective serotonin reuptake inhibitors (SSRIs) appear to be substantially associated with long term outcome (Bloch et al., 2013). Especially in severe cases, instead of CBT or BT techniques as a part of the treatment of OCD solely, combining cognitive and behavioral approaches with pharmacotherapy is widespread approach in recent years (Cottraux, Bouvard and Millier, 2005; Cuijpers et

al., 2014; Heyman et al., 2006; Hu et al., 2012; Kellner, 2010; Knopp et al., 2013; Lack, 2012; Ladouceur, Freeston, and Gagnon, 1996; Pittenger et al., 2005).

Seldomly, other treatment options such as psychiatric hospitalization, residential treatment, transcranial magnetic stimulation, and deep brain stimulation are also implemented in the event that pharmacological and psychotherapeutic approaches are not effective enough (Kumar, Reddy, Krishna, and Manikanta, 2013).

1.4. Goals of the Study

Since range of empirical evidences has demonstrated impairment in the cognitive functions among individuals with OCD, researches that mention the role of such impairments in the manifestation and maintenance of the disorder in both clinical sample of adults and children have become field of interest in the last decade (Aydin and Oyeckin, 2013). Such researches are considered to be critical for better understanding of the etiology of the disorder and estimating which treatment approaches could be more effective and be more beneficial (Aydin and Oyeckin, 2013). However, more evidence is still required as to the efficacy of cognitive impairments to explain the etiology of the disorder in empirical researches in comparison to hypothetical researches (Aydin and Oyeckin, 2013; Shin et al., 2013).

As previously mentioned, there are different cognitive functions such as attention, memory, and executive function that play a big role to underlie emotional disturbances and in perpetuating the repetitive behaviors that characterize the disorder. In the present study, variations in memory performance with respect to different memory types were

investigated only. In order to clarify the notion that OCD patients most likely show memory impairments and particularly memory confidence problems, the main goal of the study is to investigate memory mechanisms in people with obsessive-compulsive disorder (OCD) by focusing on performance on the visual spatial memory task, working memory task and episodic memory task. It was hypothesized that OCD patients will exhibit decreased accuracy and confidence, and increased response time in certain memory tasks in comparison to subclinical and healthy control groups.

Besides, in order to test another assumption that OCD patients seem to have not only reduced confidence on their own memory, but also on their future memory performance, the second aim of the study is to examine metamemory (FOK) performance by measuring for only episodic memory task in people with OCD. It was hypothesized that OCD patients will exhibit reduced confidence on their future memory performance on episodic memory task in comparison to subclinical and healthy control groups.

Finally, now that several studies have indicated the greater impact of OCD on quality of life when compared to general population and individuals with other psychiatric disorder (Hauschildt et al, 2010; Macy et al., 2013; Speisman, 2012), it is also considered to be important to point out this concept in the present study. Accordingly, the third aim of the study is to evaluate the quality of life in patients with OCD. It was hypothesized that OCD patients will demonstrate worse quality of life than subclinical and healthy control groups.

CHAPTER 2

METHOD

2.1. Participants

The study was conducted on 33 adult participants (24 females, 9 males) which were divided into three equal groups as clinical group ($n = 11$), subclinic group ($n=11$) and healthy control ($n=11$) group. Participants' ages ranged from 20 to 36 years ($M = 24.18$, $SD = 3.80$) and participation in the study carried out on a voluntary basis. Participants in the clinical group was admitted to the Mental Health Outpatient Clinic at Yedikule Surp Pırgiç Armenian Hospital, Istanbul, for treatment of Obsessive Compulsive Disorder primarily meeting criteria for OCD on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994).

Following previous research (e.g. Zucker, 2004; MacDonald, Antony, Macleod, and Richter, 1997; Gibbs, 1996; Rubenstein, Peynircioglu, Chambless, and Pigott 1993), those who received a score of 7 to 10 on MOCI total score were classified as sub-clinical participants, and those with MOCI total score of 0 to 5 as healthy control participants.

For all participants, exclusion criteria was: (1) any clinically significant and/or unstable medical condition, including cardiovascular, respiratory, hematology, neurological and endocrine diseases; (2) history of neurological disorder or head injury; (3) current use of medication with central nervous system effects; (4) substance use disorder; (5) mental retardation; (6) color blindness; (7) for OCD subjects, a current diagnosis of major depressive disorder, anxiety disorder other than OCD, attention-deficit hyperactivity disorder (ADHD) or psychotic disorder; (8) for controls, any lifetime psychiatric and neurological disorder. (9) do not have at least primary school diploma.

2.1.1. Sociodemographic Characteristics

The sample for this study was comprised of 33 participants, 27.3% (n=9) male, and 72.7% (n=24) were female. Participants' ages ranged from 20 to 36 years ($M = 24.18$, $SD = 3.80$). 87.9% of participants are single, and 12.1% are married.

Regarding level of education, 60.6% of participants reported having a high school degree, 27.3% have undergraduate degree, 6.1% have an graduate degree, and 6% have a less than high school degree.

In terms of working situation, 66.7% of participants reported being unemployed but not looking for a work, and 33.3% were employed. 27.3% of participants reported an income of more than 5000 TL, 15.2% of participants reported an income of 3001-5000 TL, 12.1% of participants reported an income of 2001-3000 TL, 9.1% of participants reported an income of 1501-2000 TL, 27.3% of participants reported an income of 774-1500 TL, and 9.1% of participants reported an income of less than 774 TL.

According to the participants' probable lifetime history of a psychiatric disorder, 33.3% of participants have a lifetime history of OCD (clinical group), and 66.7% have not a lifetime history of a psychiatric disorder.

81.8% of OCD patients reported that they had been receiving combined treatment (pharmacotherapy and cognitive behavioral therapy) and their treatment durations ranged from 1 week to 12 weeks. Besides, 18.2% reported that they had been receiving only pharmacotherapy and their treatment durations ranged from 2 weeks to 24 weeks.

Among all participants, only 12 of 33 reported a family history of a psychiatric disorder. The most common diagnosis was major depression (21.2%), followed by OCD (6.1%), and any other anxiety disorder (9.1%). Besides, among patients with OCD, only 7 of 11 reported a family history of a psychiatric disorder. The most common diagnosis was major depression (11.8%), followed by any other anxiety disorder (5.9%), and OCD (2.9%).

2.2. Instruments and Cognitive Tasks

2.2.1. Visual Spatial Memory Task

This task is framed as a visual spatial memory task. The task presented to the participants with 40 nonsense shapes at a time for 1000 ms on a divided by a white line in the middle of the black computer screen. The half of these shapes randomly appeared on the right side and the other of half on the left side in a sequence. In the 1st phase (learning), participants were asked to monitor and learn the location of shapes.

In the 2nd phase (recognition), the same 40 nonsense shapes were presented in different order, and participants were instructed to remember the place of the shapes. Participants had to click on left button of the mouse in case of the shape was presented in the same place with previous phase, or the right button of the mouse in case of the shape was presented in the different place with previous phase . Duration of the presentation of each shape was 2000 ms. A practice section was carried out before the experiment for each participants. Reaction time for correct responses, reaction time for total responses, and total reaction time were recorded and calculated.

2.2.2. Episodic Memory Task

In this task direct forgetting paradigm was used. Task consisted of 44 noun-noun word pairs within the range of 5 to 8 letters on a grey computer screen. These words were randomly selected from *Turkish Word Frequency Dictionary* (Goz, 2003).

All participants were tested individually. Each participant was seated in front of a computer screen and informed that this would be a memory task where they were presented with some word pairs. They were also told that each word was presented for 2000 ms on the screen followed by an instruction regarding that word; an “RRRRR” indicated that they needed to remember that word, and an “FFFFF” meant that word could be forgotten, because they were not asked to remember those words. Each word was presented for 2000ms, followed by the instruction to remember or to forget, which remained on the screen for 3000ms. Participants saw 44 word pairs consisting of 40 experimental words and 4 buffer words. Half of the experimental words were followed by an instruction to remember and the other half by an instruction to forget. The buffer

words were always followed by an “RRRRR” instruction, and were not included in the statistical analyses. Across participants, each word was followed by an instruction to remember or to forget equally often.

In the 2nd phase (recall) of the experiment, the participant received the all the first words without their pairs. The participants also received an instruction as ‘do not consider the both “RRRRR” and “FFFFF” instructions and try to remember each pair of the words’. The participants gave their answers via using a Q-Turkish keyboard. After they gave their answer, they also rated their confidence using with a 6-point Likert type rating scale (“1” meant that ‘I am definitely not sure’, “6” meant that ‘I am definitely sure’) for each response. If they did not remember the pair of the word, they wrote “YOK” and clicked 1 for confidence. In the 3rd phase, for the words they failed to remember in the second phase, they were asked to give a FOK judgment based on the following instruction: “Even though you don’t remember the answer now, it doesn’t mean that you have forgotten it completely. To what extent could you pick the correct answer from among several choices in a future task?” Participants were asked to use a 6-point Likert-type rating scale for their FOK judgment (1: I definitely will not be able to find the correct answer, 6: I definitely will be able find the correct answer). After completion of the cued-recall and FOK judgments, participants were given a recognition test, in which each cue word was presented along with five alternatives and then participants were asked to use a 6-point Likert-type rating scale for their confidence judgment. In episodic memory task reaction times for level of confidence of total responses, correct responses, and false responses, level of confidence reaction time, and FOK accuracy (gamma correlation score) were recorded and calculated. Besides, for

recall performance : number of correct responses, number of false responses, level of confidence of correct responses, reaction time for level of confidence of correct responses, level of confidence of false responses, and reaction time for level of confidence; for feeling of knowing: level of confidence; and for recognition performance: number of correct responses, number of false responses, and level of confidence of correct responses were also recorded and calculated to analyze effect of directed forgetting paradigm and group status on episodic memory performance.

2.2.3. Working Memory Task

The task consisted of 3 phases and stimuli were letters and were presented against a grey background within a 2 (columns) by 3 (rows) matrix covering an area of 300 x 420 pixels. After 1000 ms fixation cross, in the first phase these 4 letters were presented randomly in 4 of the 6 possible locations and participants had ms to encode the identity and the location of each letter. After 500 ms, in the second phase the probe-1 question requested the location of a specific letter. Participants indicated the location via the mouse and were instructed that they had a little time to answer (2000ms) (to keep Working Memory delay constant). In the third phase whether the probe-1 letter had or had not been part of the encoded set created the resolvable vs. misleading (irresolvable) trials. In a baseline condition probe-1 was omitted to measure working memory performance on the primary task under ideal conditions.

A 500 ms interstimulus interval (ISI) separated probe-1 and probe-2. Since baseline trials did not include the intermediate probe-1 a grey screen was shown for 5500 ms between encoding and probe-2 (equaling the ISI between encoding and probe-2 on the other trial types). Probe-2 was the actual memory test for each trial and requires

participants to indicate if a letter was correctly located with respect to the originally encode set (2000ms). In all trials the probe-2 letter had been a part of encoded set in terms of identity while the probe location was correct only on 50% of the trials. Finally, a scale was displayed prompting participants to indicate their degree of confidence in their probe 2 response (6 levels: 1= totally certain to 6= totally uncertain). In working memory task reaction time for correct responses in Probe 1, reaction time for correct responses in Probe 2, and total reaction time in Probe 2 were recorded and calculated. Besides, reaction time in Probe 2, and reaction time for level of confidence in Probe 2 were also recorded and calculated to compare effect of trial type and group status on working memory performance.

2.2.4. Socio-Demographic Information Form

Socio-Demographic Information Form is the semi-structured form generating by researcher with the aim of determining participants' age, gender, education level, income level, marital status, individual hand preference, the probable lifetime history of any psychiatric disorder and medical conditions, and family history of any psychiatric disorder and medical conditions.

2.2.5. Yale-Brown Obsessive Compulsive Scale (Y-BOCS)

Yale-Brown Obsessive Compulsive Scale (Y-BOCS) developed by Goodman and colleagues (1989), measures severity and types of OCD symptoms. The scale is clinician-rated and interviews are conducted by trained psychologists, expert in the diagnosis of OCD and other anxiety disorders. The interview has a considerable

interrater reliability, ranging from .80 to .98, a good internal consistency, ranging from .69 to .91 (Goodman et al., 1989).

The Y-BOCS is divided into two sections as obsessive and compulsive and consist of 19 items in total. However, first 10 items are assessed with the exception of items 1b and 6b. Each item is rated from 0 (no symptoms) to 4 (extreme symptoms) (total range, 0 to 40), with separate subtotals for severity of obsessions (sum of items 1 through 5) and compulsions (sum of items 6 through 10). The scores for each subs range from 0 to 20. The score of 25 or more is considered moderately severe, a score of 30 or more is considered severe, and a score of more than 35 is considered very severe.

Items 17 and 18 which are originated from Clinical Global Impressions Scale (CGI), gives a measure of the clinical severity and level of healing in OCD patients. Besides this, item 11 provides information about the insight of OCD patients.

Validity and reliability of the Turkish version of Y-BOCS was demonstrated by Karamustafalıoğlu and colleagues (1993) (as cited in Aydemir and Koroglu, 2006). The Cronbach Alpha coefficient was .82 for the first interview and was .81 for the second interview. Item-total correlation coefficients were ranged from .37 to .70 for the first interview and were ranged from .20 to .80 for the second interview. The interview has a considerable interrater reliability, .96 for the full scale, .94 for the obsession subscale and .96 for the compulsion subscale.

2.2.6. Maudsley Obsessive Compulsive Inventory (MOCI)

The Maudsley Obsessive Compulsive Inventory (MOCI) developed by Hodgson and Rachman (1977), is a 30-item self-report questionnaire that measures the severity and type of OCD symptoms on four subscales as cleaning, checking, slowness and doubting (Aydemir and Koroglu, 2006). Validity of the Turkish version was demonstrated by Erol and Savaşır (1988) in both healthy and clinical samples (as cited in Aydemir and Koroglu, 2006). As distinct from the original form, The Turkish version consists of 37 items in total adding to 7 items from MMPI and rumination subscale. Each item is rated on a true-false questionnaire with 0 indicating “False” and 1 indicating “True”.

The MOCI showed good test–retest reliability for the full-scale (.88) and moderate reliability for subscales (checking .78, washing .84, doubting .66 and slowness .59). The Cronbach Alpha coefficient was .86 for the full-scale and ranging from .61 to .65 for subscales. Principal component analysis showed that the Turkish version of the scale is different from the original MOCI and have three subscales as “cleanliness-niceness”, “obsessive thought” and “slowness and control” in place of four subscales.

2.2.7. Meta-Cognitions Questionnaire-30 (MCQ-30)

The original 65-item *Meta-Cognitions Questionnaire (MCQ)* developed by Cartwright-Hatton and Wells (1997) to assess the level of anxiety of patients with different anxiety disorders, including Generalized Anxiety Disorder, Obsessive Compulsive Disorder, Hypochondriasis, and Panic Disorder. An adapted version of the scale, the MCQ-30, was later developed by Wells and Cartwright-Hatton (2004). Similar to the original scale, the authors reported that the MCQ-30 is comprised of five

factors, namely, positive beliefs, uncontrollability and danger, cognitive confidence, need to control thoughts, and cognitive self-consciousness. (Tosun and Irak, 2008). These items are rated on a 5-point Likert type scale (0: disagree strongly, 4: agree strongly). Total score is 120 and a high score on the MCQ-30 indicates high dysfunctional or negative metacognitive beliefs.

Validity and reliability of the Turkish version was demonstrated by Tosun and Irak (2008). In an adaptation study using the MCQ-30 on a Turkish population, inter-item correlations for the MCQ-30 ranged from .090 to .764, which was consistent with the original version. The Turkish version showed good test re-test reliability, ranging from .40 to .94 for the full scale and from .70 to .85 for the subscales. The Cronbach Alpha coefficient was .86 for the full-scale and supported good internal consistency. According to the reliability and validity analyses of the Turkish version of the scale, the MCQ-30 has adequate psychometric properties in a Turkish sample. An exploratory factor analysis showed that the Turkish version of the scale is consistent with the original version and had five-components, which matched the same factor structure as the original version. In addition, fit indices from confirmatory factor analysis suggested a good fit to a five-factor model consistent with the original MCQ-30 (Tosun and Irak, 2008). With regard to the Pearson's correlations, the authors reported that MOCI and STAI-T, each of the MCQ-30 subscales and their total scores were significantly and positively correlated with measures of trait anxiety and measures of OCD symptoms (Tosun and Irak, 2008).

2.2.8. State-Trait Anxiety Inventory (STAI)

Strait-Trait Anxiety Inventory (STAI) developed by Spielberger and his colleagues (1970) is a 40-item self-reported questionnaire to assess both state and trait anxiety separately (Aydemir and Koroglu, 2006). *State Anxiety Inventory* refers to how a person is feeling at the time of a perceived threat and is considered temporary. *Trait Anxiety Inventory* is usually perceived as how people feel across typical situations that everyone experiences on a daily basis. Each scale consists of 20 different questions and each item is rated on a 4-point Likert type scale (1: not at all, 4: very much so) Scores range from 20 to 80, with higher scores correlating with greater anxiety.

The reliability and validity of the Turkish version was demonstrated by Oner and LeCompte (1983) in both healthy and clinical samples (Aydemir and Koroglu, 2006). They showed that Kuder-Richardson alpha coefficients ranged from .83 to .87 for trait anxiety and .94–.96 for state anxiety. Item remainder reliability ranged .34–.72 for trait anxiety and .42–.85 for state anxiety. Test– retest reliability ranged .71–.86 for trait anxiety and .26–.68 for state anxiety. According to the reliability and validity analyses of the Turkish version of the scale, the STAI have adequate psychometric properties in a Turkish sample.

2.2.9. Beck Anxiety Inventory (BAI)

Beck Anxiety Inventory (BAI) developed by Beck, Epstein, Brown and Steer (1988), is a 21-item self-report questionnaire to assess the presence and severity of anxiety symptoms (as cited in Oner, 2006). Each item is rated on a 4-point Likert type scale with increasing scores from 0 to 3 indicating from 1 to 4 as follows “not at all”, “somewhat”,

“moderately so”, “very much so”. Scores range from 0 to 63, with higher total scores indicating more severe anxiety symptoms. The cut-offs are as follows 0–7: minimal anxiety; 8–15: mild anxiety; 16–25: moderate anxiety; and 26–63: severe anxiety.

The BAI was adapted into Turkish in 1996 by Ulusoy, Sahin and Erkmen with acceptable reliability and validity findings. The Cronbach Alpha coefficient was .92 for the full-scale and supported good internal consistency. Test– retest reliability ranged .67–.75. According to the reliability and validity analyses of the Turkish version of the scale, the BAI has adequate psychometric properties in a Turkish sample. Principal component analysis showed that the Turkish version of the scale had two components as “somatic symptoms” and “subjective anxiety”. With regard to the Pearson’s correlations, the authors reported that total scores of BDA was significantly and positively correlated with the scores of Beck Hopelessness Scale, Automatic Thoughts Questionnaire, BDI and STAI (Oner, 2006).

2.2.10. Beck Depression Inventory (BDI)

Beck Depression Inventory (BDI) developed by Beck (1961), is a 21-item self-report questionnaire to assess the presence and severity of depressive symptoms in the context of vegetative, cognitive, emotional and motivational (Hisli, 1988). Each multiple-choice item is rated on a 4-point Likert type scale with increasing scores from 0 to 3. Scores range from 0 to 63, with higher total scores indicating more severe depressive symptoms. The cut-offs are as follows 0–17: minimal depression; 18–29: moderate depression; and 30–63: severe depression (Hisli, 1988).

The BDI was adapted into Turkish in 1988 by Hisli with acceptable reliability and validity findings in both university students and clinical samples. The Cronbach Alpha coefficient was .80 for the full-scale. The Turkish version showed good split half reliability with .74. Principal component analysis showed that the Turkish version of the scale had six-components. However, the author reported that four of six-components were found more interpretable as “hopelessness”, “negative emotions about one’s own self”, “anxiety about one’s own body” and “feelings of guilt”. With regard to the Pearson’s correlations, the author reported that total scores of BDI was significantly and positively correlated with the scores of depression subscale of MMPI.

2.2.11. World Health Organization Quality of Life- BREF (WHOQOL-BREF)

The WHOQOL-BREF is a 26-item self-reported questionnaire to assess the individual's perceptions in the context of their culture and value systems, and their personal goals, standards and concerns which measure the following broad domains: physical health, psychological health, social relationships, and environment in last two weeks. The World Health Organization Quality of Life (WHOQOL) project was initiated in 1991 to develop an international cross-culturally comparable quality of life assessment instrument. The WHOQOL were developed collaboratively in a number of centres worldwide, and have been widely field-tested (Skevington, Lotfy, and O’Connell, 2004).

The Turkish version of the WHOQOL-BREF was demonstrated by Eser and his colleagues (1999) in both healthy and clinical samples. WHOQOL-BREF Turkish version consists of 27 items. 24 of 27 items are universally adopted for the WHOQOL-BREF in four domains: physical health, psychological health, social relationships, and

environment, plus one additional item that is entitled as social pressure. Each item is rated on a 5- point Likert scale and the domain scores are transformed on a scale from 0 to 100 to enable comparisons to be made between domains composed of unequal numbers of items. The Turkish version showed good test re-test reliability, ranging from .57 to .81 for the full scale and from .61 to .71 for the subscales. The Cronbach Alpha coefficient supported good internal consistency, ranging from .53 to .83 for the subscales. According to the reliability and validity analyses of the Turkish version of the scale, WHOQOL-BREF have adequate psychometric properties in a Turkish sample. With regard to the Pearson's correlations, the authors reported that WHOQOL-BREF and its subscales and their total scores were significantly and positively correlated with WHOQOL-100 and its subscales.

2.3. Procedure

All participants participated with informed, voluntary, and written consent. The study protocol, including the Participant Information and Consent Forms, had been approved by the Yedikule Surp Pırgiç Armenian Hospital Ethical Committee. The severity of OCD and OC dimensional symptom profiles of the patients were assessed by a psychiatrist, a clinical psychologist and researcher with using *Yale-Brown Obsessive Compulsive Scale* prior to experimental tasks. Same day after the first visit, the experimental tasks were completed. All participants completed the self-rated clinical and psychological measures namely, *Socio-Demographic Information Form*, *Maudsley Obsessive Compulsive Inventory*, *Beck Depression Inventory*, *State-Trait Anxiety Inventory*, *Meta-Cognitions Questionnaire-30*, and *World Health Organization Quality of Life Questionnaire- BREF* just after experimental tasks. *Beck Anxiety Inventory* was

completed only by patients. The questionnaires were administered in one session. During the same session, all participants were took part in three different computerized behavioral memory experiments designed by Bahcesehir University Brain and Cognition Research Laboratory. Experimental tasks contain episodic memory, visual spatial memory and working memory tasks. All tasks were administered on a Toshiba personal computer with 15.6" rectangular 1366 by 768 pixel computer display screen in a quite testing room in the Yedikule Surp Pırgiç Armenian Hospital for patients and at the Bahcesehir University Brain and Cognition Research Laboratory for sub-clinical and healthy control participants. Subclinical and healthy control participants who were students in Bahcesehir University were included in the study by obtaining permission from course instructors. Administration of clinical interview and questionnaire and administration of the memory tasks took approximately 60-120 minutes for each participant to complete.

CHAPTER 3

RESULT

Prior to analyses, data were screened for missing values, as well as univariate and multivariate outliers without including clinical group data ($n = 11$) because of the potential that data collected in clinical trials often include outliers. With the use of a $p < .001$ criterion for Mahalanobis distance, there were no multivariate outliers. On the other hand, there was only one outlier in subclinical group identified as univariate using z-scores ($|z| \geq 3.30$). After deleting univariate outlier, analyses were carried out on 33 subjects.

3. 1. Group comparisons on psychological measures

The mean scores and standard deviations for MCQ-30 total and subscales, MOCI total and subscales, Y-BOCS, BDI, BAI, STAI-T, and WHOQOL-BREF subscales, according to group status are presented at Table 1. The scores on the severity of OCD symptoms as measured by the Y-BOCS for clinical group were the following: $M = 28.54$, $SD = 5.2$. This result indicated that participants in clinical group had moderately severe O-C symptoms. In addition to this, the scores on the severity of anxiety symptoms as measured by the BAI for clinical group were the following:

$M = 15.73$, $SD = 8.37$. This result showed that participants in clinical group had mild anxiety symptoms.

MANOVA was conducted to examine the effect of group status on the scores of MCQ-30 total and subscales. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). The multivariate tests indicated a significant group effect, *Wilk's* $\lambda = .215$; $F(10, 52) = 6.01$; $p < .001$; $\eta^2 = .536$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the MCQ-30 total scores, $F(2, 30) = 23.61$; $p < .001$; $\eta^2 = .611$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 77.36$, $SD = 12.42$) was significantly different than the subclinical group ($M = 57.27$, $SD = 7.43$) and healthy control group ($M = 52.54$, $SD = 5.77$). There was also significant difference between three groups in terms of uncontrollability and danger subscale, $F(2, 30) = 40.103$; $p < .001$; $\eta^2 = .728$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 22.36$, $SD = 4.38$) was significantly different than the subclinical group ($M = 12.45$, $SD = 2.42$) and healthy control group ($M = 10.64$, $SD = 2.76$). Additionally, there was significant difference between three groups in terms of cognitive self-consciousness subscale, $F(2, 30) = 5.063$; $p < .05$; $\eta^2 = .252$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 14.91$, $SD = 2.98$) was significantly different than the healthy control group ($M = 11.54$, $SD = 2.29$). Finally, there was significant difference between three groups in terms of need to control thoughts subscale, $F(2, 30) = 14.384$; $p < .001$; $\eta^2 = .490$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 14.91$, $SD = 2.98$) was significantly different than the subclinical group

($M = 10.45$, $SD = 2.62$) and healthy control group ($M = 8.36$, $SD = 2.54$). On the other hand, group effect was not significant on positive beliefs and cognitive confidence subscales.

MANOVA was also conducted to examine the effect of group status on the scores of MOCI total and subscales. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). The multivariate tests indicated a significant group effect, *Wilk's* $\lambda = .105$; $F(12, 50) = 8.698$; $p < .001$; $\eta^2 = .676$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the MOCI total scores $F(2, 30) = 47.832$; $p < .001$; $\eta^2 = .761$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 23.09$, $SD = 8.28$) was significantly different than the subclinical group ($M = 8.54$, $SD = 1.04$) and healthy control group ($M = 3.64$, $SD = 1.03$). There was also significant difference between three groups in terms of checking subscale, $F(2, 30) = 51.182$; $p < .001$; $\eta^2 = .773$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 5.73$, $SD = 2.05$) was significantly different than the subclinical group ($M = 1.45$, $SD = 0.82$) and healthy control group ($M = 0.27$, $SD = 0.64$). Subsequently, there was significant difference between three groups in terms of washing subscale, $F(2, 30) = 13.661$; $p < .001$; $\eta^2 = .447$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 5.73$, $SD = 3.38$) was significantly different than the subclinical group ($M = 2.54$, $SD = 1.21$) and healthy control group ($M = 1.09$, $SD = 0.83$). Additionally, there was significant difference between three groups in terms of slowness subscale, $F(2, 30) = 22.71$; $p < .001$; $\eta^2 = .602$. Post hoc comparisons using the Tukey HSD test indicated that the mean score

for the clinical group ($M = 4.54$, $SD = 1.92$) was significantly different than the subclinical group ($M = 1.45$, $SD = 0.82$) and healthy control group ($M = 1.09$, $SD = 0.94$). Besides, there was significant difference between three groups in terms of doubt subscale, $F(2, 30) = 33.112$; $p < .001$; $\eta^2 = .688$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 5.09$, $SD = 1.58$) was significantly different than the subclinical group ($M = 2.00$, $SD = 1.09$) and healthy control group ($M = 1.09$, $SD = 0.83$). Finally, there was significant difference between three groups in terms of rumination subscale, $F(2, 30) = 48.892$; $p < .001$; $\eta^2 = .765$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 4.72$, $SD = 1.35$) was significantly different than the subclinical group ($M = 1.36$, $SD = 1.12$) and healthy control group ($M = 0.36$, $SD = 0.67$).

Additionally, MANOVA was conducted to examine the effect of group status on BDI, STAI-T and STAI-S total scores. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). The multivariate tests indicated a significant group effect, *Wilk's* $\lambda = .347$; $F(6, 56) = 6.514$; $p < .001$; $\eta^2 = .411$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the BDI total scores, $F(2, 30) = 20.57$; $p < .001$; $\eta^2 = .578$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 19.82$, $SD = 9.38$) was significantly different than the subclinical group ($M = 5.18$, $SD = 4.68$) and healthy control group ($M = 3.54$, $SD = 4.34$). There was also significant difference between three groups in terms of STAI-T total scores, $F(2, 30) = 17.21$; $p < .001$; $\eta^2 = .534$. Post

hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 51.1$, $SD = 2.14$) was significantly different than the subclinical group ($M = 38.36$, $SD = 1.22$) and healthy control group ($M = 40.00$, $SD = 1.51$). On the other hand, there was no significant difference between three groups in terms of the STAI-S total scores.

Finally, MANOVA was conducted to examine the effect of group status on WHOQOL-BREF subscales. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). The multivariate tests indicated a significant group effect, *Wilk's λ* = .507; $F(8, 54) = 2.73$; $p < .05$; $\eta^2 = .288$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups on physical subscale, $F(2, 30) = 11.605$; $p < .001$; $\eta^2 = .436$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 54.87$, $SD = 21.91$) was significantly different than the subclinical group ($M = 78.25$, $SD = 11.12$) and healthy control group ($M = 86.68$, $SD = 12.98$). There was also significant difference between three groups on psychological subscale, $F(2, 30) = 9.67$; $p = .001$; $\eta^2 = .392$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 44.69$, $SD = 27.89$) was significantly different than the subclinical group ($M = 73.86$, $SD = 8.95$) and healthy control group ($M = 75.76$, $SD = 13.28$). Additionally, there was significant difference between three groups on social subscale, $F(2, 30) = 6.24$; $p < .05$; $\eta^2 = .294$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 50.00$, $SD = 27.64$) was significantly different than the healthy control group ($M = 81.82$, $SD = 18.18$). Finally, there was significant difference between three groups on environment subscale, $F(2, 30) = 3.73$; $p < .05$; $\eta^2 = .199$. Post

hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 62.12$, $SD = 17.84$) was significantly different than the healthy control group ($M = 76.01$, $SD = 7.58$).

Table 3. 1. Means (standard deviations) for MCQ-30 total and subscales, MOCI total and subscales, Y-BOCS, BDI, BAI, STAI-T, and WHOQOL-BREF subscales according to group status

	Healthy Control ($n = 11$)	Subclinical ($n = 11$)	Clinical ($n = 11$)
	M (SD)	M (SD)	M (SD)
MCQ-30 total	52.54 (5.77)	57.27 (7.43)	77.36 (12.42)
Uncontrollability and danger	10.64 (2.76)	12.45 (2.42)	22.36 (4.38)
Cognitive self-consciousness	11.54 (2.29)	12.91 (2.12)	14.91 (2.98)
Need to control thoughts	8.36 (2.54)	10.45 (2.62)	15.91 (4.64)
MOCI total	3.64 (1.03)	8.54 (1.04)	23.09 (8.28)
Checking	0.27 (0.64)	1.45 (0.82)	5.73 (2.05)
Washing	1.09 (0.83)	2.54 (1.21)	5.73 (3.38)
Slowness	1.09 (0.94)	1.45 (0.82)	4.54 (1.92)
Doubt	1.09 (0.83)	2 (1.09)	5.09 (1.58)
Rumination	0.36 (0.67)	1.36 (1.12)	4.72 (1.35)
BDI total	3.54 (4.34)	5.18 (4.68)	19.82 (9.38)
STAI-T total	40 (1.51)	38.36 (1.22)	51.1 (2.14)
WHOQOL-BREF			
Physical	86.68 (12.98)	78.25 (11.12)	54.87 (21.91)
Psychological	75.76 (13.28)	73.86 (8.95)	44.69 (27.89)
Social	81.82 (18.18)	71.97 (17.58)	50 (27.64)
Environment	76.01 (7.58)	74.24 (11.39)	62.12 (17.84)
Y-BOCS total			28.54 (5.2)
BAI total			15.73 (8.37)

3.2. Group comparisons on memory performances

3. 2. 1. Episodic memory performance across groups

Two sets of analyses were carried out. The first analysis (“main analysis”) was performed to evaluate the participants’ general performance throughout the episodic memory task. The second set of analysis was performed to examine the effect of instruction on participants’ episodic memory performance.

The mean scores and standard deviations for episodic memory performance, according to group status are presented at Table 2. MANOVA was conducted to examine the effect of group status on the episodic memory performance. As explained at method section, six scores were calculated under the task, namely: reaction times for level of confidence of total responses, correct responses, false responses, level of confidence reaction time, and FOK accuracy (gamma correlation score). Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). The multivariate tests indicated a significant group main effect, *Wilk's* $\lambda = .371$; $F(12, 50) = 2.677$; $p < .05$; $\eta^2 = .391$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of reaction time for level of confidence of total responses, $F(2, 30) = 5.42$; $p < .05$; $\eta^2 = .265$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1204.23$, $SD = 272.92$) was significantly different than the subclinical group ($M = 981.32$, $SD = 103.9$) and healthy control group ($M = 1006.95$, $SD = 72.97$). There was also significant difference between three groups in terms of reaction time for level of confidence of correct responses, $F(2, 30) = 4.57$; $p < .05$; $\eta^2 = .234$. Post hoc comparisons using the Tukey HSD test

indicated that the mean score for the clinical group ($M = 1179.63$, $SD = 262.62$) was significantly different than the subclinical group ($M = 967.06$, $SD = 113.34$). Additionally, There was significant difference between three groups in terms of reaction time for level of confidence of false responses, $F(2, 30) = 5.101$; $p < .05$; $\eta^2 = .254$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1225.71$, $SD = 295.02$) was significantly different than the subclinical group ($M = 1000.68$, $SD = 118.23$) and healthy control group ($M = 1002.15$, $SD = 86.42$). Besides, there was significant difference between three groups in terms of reaction times of high level of confidence, $F(2, 30) = 5.341$; $p < .05$; $\eta^2 = .263$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1180.02$, $SD = 248.51$) was significantly different than the subclinical group ($M = 964.67$, $SD = 86.9$). There was also significant difference between three groups in terms of reaction times of low level of confidence, $F(2, 30) = 7.625$; $p < .05$; $\eta^2 = .337$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1365.16$, $SD = 383.82$) was significantly different than the subclinical group ($M = 1014.34$, $SD = 142.68$) and healthy control group ($M = 1016.32$, $SD = 94.19$). Finally, there was significant difference between three groups in terms of FOK accuracy, $F(2, 30) = 6.36$; $p < .05$; $\eta^2 = .298$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 0.14$, $SD = 0.22$) was significantly different than the healthy control group ($M = 0.48$, $SD = 0.21$).

Table 3. 2. Means (and standard deviations) for episodic memory performance according to group status

	Healthy Control (<i>n</i> = 11)	Subclinical (<i>n</i> = 11)	Clinical (<i>n</i> = 11)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Reaction time for level of confidence of total responses	1006.95 (72.97)	981.32 (103.9)	1204.23 (272.92)
Reaction time for level of confidence of correct responses	1016.58 (86.66)	967.06 (113.34)	1179.63 (262.62)
Reaction time for level of confidence of false responses	1002.15 (86.42)	1000.68 (118.23)	1225.71 (295.02)
Reaction times of high level of confidence	1026.52 (81.51)	964.67 (86.9)	1180.02 (248.51)
Reaction times of low level of confidence	1016.32 (94.19)	1014.34 (142.68)	1365.16 (383.82)
FOK accuracy	0.48 (0.21)	0.31 (0.25)	0.14 (0.22)

3. 2. 1. 1. The Effect of directed forgetting paradigm and group status on episodic memory performance

A 2 (instruction) x 3 (group status) mixed factorial design analysis of variance was conducted to analyze effect of directed forgetting paradigm (instruction) and group status on episodic memory performance. In this study, this design consisted of one within subject variable instruction (remember and forget) and one between subject variable (group status). In addition, dependent variables were for recall performance, namely: number of correct responses, number of false responses, level of confidence of correct responses, reaction time for level of confidence of correct responses, level of confidence of false responses, and reaction time for level of confidence; for feeling of

knowing: level of confidence; and for recognition performance: number of correct responses, number of false responses, and level of confidence of correct responses.

3.2.1.1.1. Recall Performance

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on number of correct responses in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 11.98$; $p < .05$; $\eta^2 = .28$. The multivariate tests indicated a significant instruction effect, *Wilk's λ* = .715; $F(1, 30) = 11.98$; $p < .05$; $\eta^2 = .28$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for "Remember" instruction ($M = 2.1$, $SD = 2.56$) was significantly different than the "Forget" instruction ($M = .56$, $SD = .79$). On the other hand, other main and interaction effects were not significant on recall performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable number of false responses in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). Sphericity Assumed indicated that the variances for each set of difference scores were not equal. The multivariate tests indicated that there was no significant instruction effect on the number of false responses in recall phase. Sphericity Assumed indicated that the variances for each set of difference scores were equal for interaction effect, $F(2, 30) = 3.86$; $p < .05$; $\eta^2 = .205$. The multivariate tests indicated that there was significant interaction between group status and instruction on

the number of false responses in recall phase, *Wilk's* $\lambda = .795$; $F(2, 30) = 3.86$; $p < .05$; $\eta^2 = .205$. Post hoc comparisons using the Paired samples t-test indicated that there was a significant difference in the numbers of false responses of only control group for “Remember” ($M = 3.91$, $SD = .73$) and “Forget” ($M = 1.73$, $SD = .37$) instructions, $t(10) = 4.35$; $p \leq .001$. On the other hand, other main effects were not significant on recall performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on level of confidence of correct responses in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 7.99$; $p < .05$; $\eta^2 = .21$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .79$; $F(1, 30) = 7.99$; $p < .05$; $\eta^2 = .21$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for the “Remember” instruction ($M = 3.48$, $SD = 2.56$) was significantly different than the “Forget” instruction ($M = 1.09$, $SD = 2.43$). On the other hand, other main and interaction effects were not significant on recall performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on reaction time for level of confidence of correct responses in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 9.36$; $p < .05$; $\eta^2 = .238$. The multivariate tests indicated a significant

instruction effect, *Wilk's* $\lambda = .762$; $F(1, 30) = 9.36$; $p < .05$; $\eta^2 = .238$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for the “Remember” instruction ($M = 4608.1$, $SD = 4509.73$) was significantly different than the “Forget” instruction ($M = 2184.91$, $SD = 2850.22$). On the other hand, other main and interaction effects were not significant on recall performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on level of confidence of false responses in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 8.5$; $p < .05$; $\eta^2 = .221$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .779$; $F(1, 30) = 8.5$; $p < .05$; $\eta^2 = .221$. The Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for the “Remember” instruction ($M = 2.85$, $SD = 1.14$) was significantly different than the “Forget” instruction ($M = 2.17$, $SD = 1.08$). On the other hand, other main and interaction effects were not significant on recall performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on reaction time for level of confidence in recall phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 14.04$; $p \leq .001$; $\eta^2 = .319$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .681$; $F(1, 30) = 14.04$; $p \leq .001$; $\eta^2 = .319$. Post hoc comparisons using the Bonferroni test

($p < .05$) indicated that the mean value for the “Remember” instruction ($M = 6658.5$, $SD = 2845.17$) was significantly different than the “Forget” instruction ($M = 6012.14$, $SD = 2536.88$). In addition, Sphericity Assumed indicated that the variances for each set of difference scores were equal for interaction effect, $F(2, 30) = 7.89$; $p < .05$; $\eta^2 = .345$. The multivariate tests indicated that there was significant interaction between group status and instruction on the confidence rating reaction time in recall phase, *Wilk's* $\lambda = .655$; $F(2, 30) = 7.89$; $p < .05$; $\eta^2 = .345$. Post hoc comparisons using the Paired samples t-test indicated that there was a significant difference in the reaction time for level of confidence of control group for “Remember” ($M = 6904.6$, $SD = 804.76$) and “Forget” ($M = 5638.86$, $SD = 762.22$) instructions, $t(10) = 4.8$; $p \leq .001$ and the reaction time for level of confidence of subclinical group for “Remember” ($M = 7502.36$, $SD = 1039.03$) and “Forget” ($M = 6520.16$, $SD = 879.04$) instructions, $t(10) = 3.78$; $p < .05$. On the other hand, Test of Between-Subject Effects indicated that there was no significant difference between healthy control, subclinical and clinical groups in terms of the reaction time for level of confidence in recall phase.

3.2.1.1.2. Feeling of Knowing

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on level of confidence. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 23.19$; $p < .001$; $\eta^2 = .436$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .564$; $F(1, 30) = 23.19$; $p < .001$; $\eta^2 = .436$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value

for the “Remember” instruction ($M = 3.15$, $SD = .95$) was significantly different than the “Forget” instruction ($M = 2.78$, $SD = .77$). In addition, Sphericity Assumed indicated that the variances for each set of difference scores were equal for interaction effect, $F(2, 30) = 10.55$; $p < .001$; $\eta^2 = .413$. The multivariate tests indicated that there was significant interaction between group status and instruction on the level of confidence, *Wilk's* $\lambda = .587$; $F(2, 30) = 10.55$; $p < .001$; $\eta^2 = .413$. Post hoc comparisons using the Paired samples t-test indicated that there was a significant difference in the level of confidence of control group for “Remember” ($M = 3.46$, $SD = .22$) and “Forget” ($M = 2.83$, $SD = .12$) instructions, $t(10) = 3.79$; $p < .05$ and the level of confidence of subclinical group for “Remember” ($M = 3.37$, $SD = .14$) and “Forget” ($M = 2.77$, $SD = .13$) instructions, $t(10) = 8.39$; $p < .001$. On the other hand, Test of Between-Subject Effects indicated that there was no significant difference between healthy control, subclinical and clinical groups in terms of the level of confidence.

3.2.1.1.3. Recognition Performance

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on number of correct responses in recognition phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 19.3$; $p < .001$; $\eta^2 = .391$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .601$; $F(1, 30) = 19.3$; $p < .001$; $\eta^2 = .391$. Post hoc comparisons using the Bonferroni test ($p < .001$) indicated that the mean value for the “Remember” instruction ($M = 8.61$, $SD = 2.86$) was significantly different than the “Forget” instruction ($M = 11.21$,

$SD = 3.18$). On the other hand, other main and interaction effects were not significant on recognition performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on numbers of false responses in recognition phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 25.86$; $p < .001$; $\eta^2 = .463$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .537$; $F(1, 30) = 25.86$; $p < .001$; $\eta^2 = .463$. Post hoc comparisons using the Bonferroni test ($p < .001$) indicated that the mean value for the "Remember" instruction ($M = 7.24$, $SD = 3.35$) was significantly different than the "Forget" instruction ($M = 10.18$, $SD = 3.11$). On the other hand, other main and interaction effects were not significant on recognition performance.

Repeated Measures MANOVA was conducted to evaluate the effect of instruction as within subject variable on level of confidence of correct responses in recognition phase. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 27.47$; $p < .001$; $\eta^2 = .478$. The multivariate tests indicated a significant instruction effect, *Wilk's* $\lambda = .522$; $F(1, 30) = 27.47$; $p < .001$; $\eta^2 = .478$. Post hoc comparisons using the Bonferroni test ($p < .001$) indicated that the mean value for the "Remember" instruction ($M = 3.84$, $SD = .91$) was significantly different than the "Forget" instruction ($M = 3.35$, $SD = .92$). On the other hand, other main and interaction effects were not significant on recognition performance.

3.2.2. Visual spatial memory performance across groups

The mean scores and standard deviations for visual spatial memory performance, according to group status are presented at Table 3. MANOVA was conducted to examine the effect of group status on the visual spatial memory performances namely, reaction time for correct responses, reaction time for total responses, and total reaction time. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). The multivariate tests indicated a significant group main effect, *Wilk's λ* = .721; $F(4, 58) = 2.574$; $p < .05$; $\eta^2 = .151$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the reaction time for total responses, $F(2, 30) = 5.65$; $p < .05$; $\eta^2 = .274$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1567.7$, $SD = 105.86$) was significantly different than the subclinical group ($M = 1291.35$, $SD = 256.96$). There was also significant difference between three groups in terms of reaction time for correct responses, $F(2, 30) = 5.70$; $p < .05$; $\eta^2 = .275$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1505.77$, $SD = 105.07$) was significantly different than the subclinical group ($M = 1252.88$, $SD = 227.29$). Additionally, there was significant difference between three groups in terms of total reaction time, $F(2, 30) = 5.65$; $p < .05$; $\eta^2 = .274$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 62707.73$, $SD = 4234.5$) was significantly different than the subclinical group ($M = 51654.27$, $SD = 102278.31$).

Table 3. 3. Means (standard deviations) for visual spatial memory performance according to group status

	Healthy Control (<i>n</i> = 11)	Subclinical (<i>n</i> = 11)	Clinical (<i>n</i> = 11)
	<i>M</i> (<i>SD</i>)	<i>M</i> (SD)	<i>M</i> (SD)
Reaction time for total responses	1361.14 (208.27)	1291.35 (256.96)	1567.7 (105.86)
Reaction time for correct response	1314.08 (195.11)	1252.88 (227.29)	1505.77 (105.07)
Total reaction time	54445.64 (8330.77)	51654.27 (102278.31)	62707.73 (4234.5)

3. 2. 3. Working memory performance across groups

Two sets of analyses were carried out. The first analysis (“main analysis”) was performed to evaluate the participants’ general performance throughout the working memory task. The second set of analysis was performed to examine the effect of trial type on participants’ working memory performance.

The mean scores and standard deviations for working memory performance, according to group status are presented at Table 4. MANOVA was conducted to examine the effect of group status on the working memory performance namely, reaction time for correct responses in Probe 1, reaction time for correct responses in Probe 2, and total reaction time in Probe 2. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). The multivariate tests indicated a significant group main effect, *Wilk's* $\lambda = .647$; $F(6, 56) = 2.270$; $p = .05$; $\eta^2 = .196$. Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the

reaction time for correct responses in Probe 1, $F(2, 30) = 4.293$; $p < .05$; $\eta^2 = .223$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 2881.87$, $SD = 175.16$) was significantly different than the healthy control group ($M = 2745.78$, $SD = 85.63$). There was also significant difference between three groups in terms of reaction time for correct responses in Probe 2, $F(2, 30) = 6.65$; $p < .05$; $\eta^2 = .307$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 1954.26$, $SD = 334.14$) was significantly different than the subclinical group ($M = 1601.68$, $SD = 223.6$) and healthy control group ($M = 1626.48$, $SD = 173.92$). Additionally, there was significant difference between three groups in terms of total reaction time in Probe 2, $F(2, 30) = 6.414$; $p < .05$; $\eta^2 = .300$. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the clinical group ($M = 2008.02$, $SD = 371.62$) was significantly different than the subclinical group ($M = 1617.2$, $SD = 229.34$) and healthy control group ($M = 1662.37$, $SD = 210.92$).

Table 3. 4. Means (standard deviations) for working memory performance across groups

	Healthy Control ($n = 11$)	Subclinical ($n = 11$)	Clinical ($n = 11$)
	M (SD)	M (SD)	M (SD)
Reaction time for correct responses in Probe 1	2745.78 (85.63)	2753.74 (82.62)	2881.87 (175.16)
Reaction time for correct responses in Probe 2	1626.48 (173.92)	1601.78 (223.6)	1954.26 (334.14)
Total reaction time in Probe 2	1662.37 (210.92)	1617.2 (229.34)	2008.02 (371.62)

3. 2. 3. 1. The Effect of trial type (Resolvable vs. Misleading) and group status on working memory performance

A 2 x 3 mixed factorial design analysis of variance was conducted to compare the effect of trial type and group status on working memory performance. In this study, this design consisted of one within subject variable (trial type) with two trials and one between subject variable (group status). Independent variables were groups (healthy control, clinical and subclinical) and different trial types which defined as “Resolvable” and “Misleading”. In addition, dependent variable was working memory performance, namely, reaction time in Probe 2, and reaction time for level of confidence in Probe 2.

3. 2. 3. 1.1. Working Memory Performance in Probe 2

The Mean scores and standard deviations for working memory performance in Probe 2, according to trial type are presented at Table 5. Repeated Measures MANOVA was conducted to evaluate the effect of trial type as within subject variable on reaction time. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had not been violated ($p > .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 4.5$; $p < .05$; $\eta^2 = .13$. The multivariate tests indicated a significant trial type effect, *Wilk's* $\lambda = .87$; $F(1, 30) = 4.5$; $p < .05$; $\eta^2 = .13$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for the “Misleading” trial ($M = 1797.92$, $SD = 321.5$) was significantly different than the “Resolvable” trial ($M = 1727.15$, $SD = 352.01$). In addition, Tests of Between-Subjects Effects indicated that there was significant difference between three groups in terms of the reaction time, $F(2, 30) = 6.414$; $p < .05$; $\eta^2 = .30$. Post hoc comparisons using the Tukey HSD test

indicated that the mean score for the clinical group ($M = 2008.02$, $SD = 336.8$) was significantly different than the control ($M = 1662.37$, $SD = 228$) and subclinical ($M = 1617.2$, $SD = 237.7$) groups. On the other hand, there was no significant interaction between group status and trial type on the reaction time in Probe 2.

Repeated Measures MANOVA was conducted to evaluate the effect of trial type as within subject variable on reaction time for level of confidence. Box's Test of Equality of Covariance Matrices indicated that the assumption of homogeneity of covariance had been violated ($p < .05$). Sphericity Assumed indicated that the variances for each set of difference scores were equal, $F(1, 30) = 7.87$; $p < .05$; $\eta^2 = .208$. The multivariate tests indicated a significant trial type effect, *Wilk's* $\lambda = .792$; $F(1, 30) = 7.87$; $p < .05$; $\eta^2 = .208$. Post hoc comparisons using the Bonferroni test ($p < .05$) indicated that the mean value for the "Misleading" trial ($M = 873.71$, $SD = 211.91$) was significantly different than the "Resolvable" trial ($M = 986.41$, $SD = 266.7$). On the other hand, other main and interaction effects were not significant in Probe 2.

Table 3. 5. Means (standard deviations) for working memory performance in Probe 2 according to trial type

	Trial Type	
	Resolvable	Misleading
	<i>M</i> (SD)	<i>M</i> (SD)
Reaction time	1727.15 (352.01)	1797.92 (321.5)
Reaction time for level of confidence	986.41 (266.7)	873.71 (211.91)

CHAPTER 4

DISCUSSION

4.1. Cognitive Functions in OCD

The present study explored memory mechanisms in people with OCD by focusing on performance on the visual spatial memory task, working memory task and episodic memory task with examining differences between OCD patients, subclinical and healthy controls participants. Feeling-of-knowing performance under episodic memory task was also investigated. Our results indicate that while OCD patients had not difficulties in recognizing and recalling items in all certain memory tasks, they generally exhibited long delayed response performance and they were less confident in terms of self-report confidence ratings for their recognition judgments in comparison to subclinical and healthy control groups. In addition, compared to subclinical and healthy control groups, OCD patients have extensive lack of confidence about their future performance. Besides, directed forgetting effect was not smaller in OCD patients than in subclinicals and healthy controls in the present study. All participants had difficulty in the ability to

particularly recall F-cued words. Results also showed that all participants gave higher confidence ratings for R-cued words in both recall and recognition phases. In terms of response confidence, all participants showed long delayed response performance on recalled R-cued words. In the context of the effect of directed forgetting paradigm as an encoding condition on FOK judgments, OCD patients did not show less confidence in terms of prediction remembering and forgetting information compared to subclinical and healthy control groups.

Despite using different tasks from one another, a number of researches have noted that OCD patients exhibit episodic memory impairment, particularly verbal episodic memory problems. Researches, which mention the verbal episodic memory problems among individuals with OCD, have shown that there are no differences between OCD patients and healthy individuals in terms of recall or recognition of verbal information (Ceschi et al., 2003; Foa, Amir, Gershuny, Molnar, and Kozak, 1997; Kivircik et al., 2005; McDonald et al., 1997; Tolin et al., 2001), but OCD patients show episodic memory impairment, particularly long delayed response performance compared to healthy individuals (Savage et al., 2000; Tallis, Pratt, and Jamani, 1999; Tükel et al., 2012; Tuna et al., 2005; Zitterl et al., 2001).

Consistent with previous researches, our results showed that there are no differences between OCD patients, subclinical and healthy individuals in terms of recall or recognition of number of verbal information under episodic memory task using with 44 noun-noun word pairs which are not semantically related. Inconsistently, there are no significant differences between OCD patients, subclinical and healthy individuals in terms of long delayed response performance regarding recall or recognition of verbal

information. Put simply, this findings support the notion that impairment in encoding strategies, particularly difficulties using semantic clustering encoding strategies leads to verbal episodic memory problems. Because, it is stated that OCD patients fail to efficiently reduce the load of the encoding set and thus, episodic memory impairments could mostly emerge in verbal tasks using with semantic clustering (Harkin and Kessler, 2011). In other words, verbal episodic memory problems may be secondary factor executive dysfunction. In a study, Deskersbach and colleagues (2004) reported that while OCD patients showed lower performance on recalling semantic words compared to healthy controls, and they had not difficulties in recalling non-semantic words. According to these results, it is emphasized that long- delay recall impairment are mediated by difficulties using verbal organizational strategies for OCD patients. Similar findings have been reported by Savage and colleagues (2000), and Sawamura and colleagues (2005), impairment in encoding strategies as a leading factor for verbal episodic memory problems.

As mentioned in the introduction section, in terms of memory impairments, many studies with OCD and sub-clinical OCD participants have focus on memory confidence for remembering for self-actions. McNally and Kohlbeck (1993) reported that OCD checkers' and OCD non-checkers' performances on memory for actions and reality monitoring are not significantly differing from healthy controls'. However, OCD patients show memory confidence problems rather than healthy controls. Likewise, other studies (e.g. Hermans et al 2003; Tolin et al 2001) reported that OCD patients show lower confidence in their memory also compared to anxious and non-anxious controls. They stated that obsessional doubts of OCD patients represent impairment in memory

confidence rather than impairment in memory itself. On the other hand, Muller and Roberts (2003) pointed out that such studies have used mostly self-report measures of confidence which is problematic in OCD patients just because that “doubt” is a distinctive feature of the disorder. Therefore, alternative methods of measuring confidence in OCD patients are essential as the method which involve the use of reaction times for making recognition decisions in McDonald and colleagues’ (1997) study. They reported that OCD checkers seem to be impaired only in their confidence ratings regarding their episodic memories. In another study, Henson, Rugg, Shallice, and Dolan (2000) reported that OCD patients demonstrated long delayed response performance on low confidence judgments rather than high confidence judgments.

By using the method which is similar to McDonald and colleagues’ (1997) study, deficits in memory confidence among individuals with OCD compared to subclinicals and healthy controls was investigated in the present study. As in Henson and colleagues’ (2000) study, our results also showed that such impairment in memory confidence was observed in OCD patients’ reaction times for level of confidence of their recognition judgments. In the present study, OCD patients exhibited long delayed response performance on level of confidence of total responses and false responses, and low level of confidence rather than both subclinical and healthy control groups. Additionally, OCD patients exhibited long delayed response performance compared to subclinical group in terms of level of confidence of correct responses and high level of confidence. In parallel with previous studies, results showed that although three groups are not significantly differ on measures of recall and recognition, OCD patients are less confident than subclinical and healthy control groups in terms of self-report confidence ratings for their recognition judgments.

The other important notion is that metacognitive beliefs are associated with cognitive confidence in OCD (Hermans et al., 2008), and memory confidence problems in OCD patients may have been secondary to general metacognitive beliefs, such as the belief that their memory was generally poor (Tuna et al., 2005). Metacognition is the key factor to understand relationships between OCD symptoms and anxiety. Previous studies (e.g. Irak and Tosun, 2008; Wells and Cartwright-Hatton, 2004) showed that trait anxiety and obsessive compulsive symptoms had one common meta-cognitive predictor, namely the uncontrollability and danger. Also mediation analysis models indicated that metacognition fully mediated the relationship between anxiety and O-C symptoms (Irak & Tosun, 2008). Number of researches comprising different methods (e.g., Moritz et al., 2009; Nedeljkovic and Kyrios, 2007; Nedeljkovic et al., 2009; Randomsky et al., 2014; Randomsky et al., 2006) have noted that OCD patients exhibit diminished self-awareness of their own memory. Using FOK judgments to investigate metamemory process, Tuna and colleagues (2005) reported that OCD patients seemed to have decreased FOK judgments about their future memory performance for verbally threat-relevant and neutral information. In the present study using FOK judgments for only verbally neutral information, deficits in metamemory among OCD patients were examined. Consistently with previous results, our findings indicated that OCD patients were less confident about their future recognition memory performance, particularly compared to healthy controls. In other words, OCD patients were less able to reliably predict their future performance (FOK accuracy) than healthy controls.

In the context of meta-memory process in OCD patients, there are important aspects of present findings. First, these findings support the notion that OCD patients have

extensive lack of confidence about their future performance, and it seems to be secondary to general metacognitive beliefs. Moreover, this confidence problem is not limited to only verbally threat-relevant information, but also verbally neutral information. Second, as mentioned above, memory confidence problems in OCD patients are not limited to already recalled information, but extended to confidence in their ability to remember currently unrecalable information. These findings support the idea that memory impairment affects meta-memory rather than memory accuracy. Finally, as Tuna and colleagues (2005) suggested a similar observation in their own study, it is also considered important to point out such observation in the present study that OCD patients are prone to their one low FOK rating for unrecognized information that leads to generalizing such rating to their whole performance and underestimating their ability in remembering verbal information.

As mentioned in the introduction section, there are some researches to examine not only inhibitory deficits in OCD using with directed forgetting paradigm, but also memory processes using with such paradigm in various clinical and healthy samples (Amir and Kozak, 2002). For instance, Wilhelm and colleagues (1996) reported that while OCD patients had more difficulty in the ability to forget negative words compared to positive and neutral ones, healthy controls' performance was not affected from word type. Similar findings have been also reported by Böhne, Keuthen, Tuschen-Caffier, and Wilhelm (2005), and Tolin and colleagues (2002). In a recent study under both list and item conditions with emotionally neutral everyday words, it was reported that OCD patients' and healthy controls' performance on recalling the number of F-cued words was similar. However, OCD patients recalled fewer R-cued words than healthy controls (Konishi et al., 2011). By contrast with the previous researches, Moritz, Rietschel,

Jelinek, and Bauml (2011) reported that OCD patients were not worse than healthy controls in terms of recollection of both to-be-forgotten neutral and threat-relevant words and response confidence. This finding seems to be opposite to a general memory deficit model suggesting that OCD patients recollect items worse than healthy individuals, and they have a selectively better memory for threat-relevant information compared to neutral information.

The directed forgetting paradigm effect with neutral words was also examined in the present study. In parallel with one of Bohne and colleagues' (2005) finding, results showed that there was no significant differences between three groups in terms of a number of recalled F-cued and R-cued words. All participants had difficulty in the ability to particularly recall F-cued words. In other saying, OCD patients', subclinicals' and healthy controls' performances on recalling the number of F-cued words were similar. In addition, results showed that there were also no significant differences between these three groups in terms of a number of recognized F-cued and R-cued words, and on the other hand during recall phase, all participants had difficulty in the ability to particularly recognize R-cued words. Such findings in the present study may arise from using only neutral words. Because, it is frequently suggested that OCD patients show a decreased directed forgetting effect only for the threat-relevant words (Wilhem et al., 1996) and a smaller directed forgetting effect for words with negative words than for neutral ones (Bohne, et al., 2005).

In the present study, results also showed that directed forgetting effect had impact on memory confidence as well. All participants gave higher confidence ratings for both recalled and unrecalled R-cued words than both recalled and unrecalled F-cued words.

Besides, all participants gave higher confidence ratings for recognized R-cued words than both F-cued words. In terms of response confidence, all participants showed long delayed response performance on recalled R-cued words than on recalled F-cued words. On the other hand, OCD patients were not significantly differ from other participants. These finding is consistent with one of Moritz and colleagues' (2011) finding which showed that OCD patients did not give lower confidence ratings for to-be-forgotten neutral words than healthy controls.

In the context of the effect of directed forgetting paradigm as a encoding condition on FOK judgments, studies on healthy samples address that individuals are aware of the control they have both remembering and forgetting information during FOK judgments (Friedman and Castel, 2011). However, people are much more aware of the control they have forgetting information (Friedman and Castel, 2011; Tekcan and Akturk, 2011). Congruently, all participants only gave higher FOK ratings for unrecalled R-cued words than for unrecalled F-cued words in the present study. This finding supports the evidence that directed forgetting manipulation has an impact on mostly intensity (high ratings on FOK judgments for to-be forgotten information), but not accuracy of such judgments (Tekcan and Akturk, 2001). More specifically, subclinical participants gave higher FOK ratings for both unrecalled R-cued words and F-cued words than healthy control participants. Subclinical participants showed lower confidence in predicting both remembering and forgetting information than healthy controls. But, OCD patients did not show less confidence in terms of prediction remembering and forgetting information compared to other groups. Once more, such findings may arise from using only neutral words among OCD patients.

In literature, some studies reported that difference between R-cued and F-cued words in OCD could be associated with deficits in memory confidence and meta-memory (Moritz et al., 2006; Tuna et al., 2005; Zitterl et al., 2001). However, the effects of such manipulation on FOK judgments as a meta-memory measure are still unclear (Tekcan and Akturk, 2001). To the best of our knowledge, there are not enough studies with OCD patients to explain effects of directed forgetting manipulation on FOK judgments, and how the strength of encoding relates to metamemory.

Previous studies emphasize that visuospatial memory impairment are also most commonly observed in OCD. In range of experimental studies using different cognitive tasks, it is reported that OCD patients exhibited impairments on visuospatial memory (e.g., Penades et al., 2005; Purcell, Maruff, Kyrios, and Panteles, 1998; Rampacher et al., 2010; Rubenstein et al., 1993; Simpson et al., 2006; Tallis et al., 1999), and executive-functioning efficiency, binding complexity, and memory load are identified as three common factors strongly associated with such impairment (Harkin and Kessler, 2011). Congruently, Shin and colleagues (2013) reviewed 88 experimental studies and they concluded that patients with OCD showed lower performance on visuospatial memory, long-delayed recognition performance and in the ability to recall complex visual stimuli. In addition, recent studies (e.g. Dittrich et al., 2011; Tumkaya et al., 2013) reported that OCD patients were impaired in spatial recognition memory and long-delayed recognition performance. Authors concluded that dysfunctional executive system components such as an inability to carry out binding complexity, goal-oriented strategies, and encoding strategies which may mediate visual spatial memory impairments in OCD.

To study visuospatial memory in OCD patients, experimental tasks or particular tests with geometric or nonsense shapes, which provide a basis for measurement of visuospatial impairments such as an inability to carry out processing and encoding of visual information and the visual perception of the spatial relationships of objects, are most commonly used (Harkin and Kessler, 2011). Therefore, such task requiring first learning the location of nonsense shapes and then remembering the place of the shapes (recognition) was used in the present study to properly investigate deficits in visuospatial memory among individuals with OCD. In parallel with previous studies, results showed that OCD patients demonstrated long-delayed recognition performance compared to subclinical group. On the other hand, OCD patients' performance was not significantly different from subclinical and healthy control groups' in terms of accuracy of recognized shapes. One potential explanation for these findings is the observation that OCD patients are more likely to attend to details of the shapes, and less likely to shift their attention to more complex task components compared to other participants. In other words, they showed lower performance in the ability to use organizational strategies during learning location of nonsense shapes and this inability results in long-delayed recognition performance. In this respect, they may have difficulty in storing and retrieving information from episodic memory.

Consequently, present findings support the notion that OCD patients show lower performance in tasks that measured visuospatial memory, and visual spatial memory impairments are secondary to executive system components such as an inability to carry out detailed attentional, goal-oriented strategies, and encoding strategies to support visuospatial recognition memory (Harkin and Kessler, 2011).

Studies have implicated working memory deficits as the other commonly observed memory impairment in OCD patients. These studies have mostly focused on the spatial domain of working memory (e.g., Ciesielski et al., 2007; Henseler et al., 2008; Morein-Zamir et al., 2010; Purcell et al., 1998; Sharma et al., 2012; van der Wee et al., 2003) and dysfunctional executive control in set shifting, abstract reasoning, planning ability, increased memory load and low binding complexity are identified as three common factors strongly associated with such impairment as well.

The present study also focused on the spatial domain of working memory to examine such memory deficits in OCD patients. Experimental task (i.e., as used by Harkin and Kessler, 2009), which requires encoding 2x3 matrix with 4 letters, was used. As mentioned in the method section, a set of 4 letters presented randomly in 4 out of 6 possible locations had to be encoded. Encoding is then followed by first probe letter (probe-1) which had or had not been part of the encoded set created the resolvable vs. misleading (irresolvable) trials, and participants are asked to indicate the location of a specific letter. Subsequently, participants have to indicate if second probe letter (probe-2) was correctly or incorrectly located with respect to the originally encoded set. While Probe-1 is omitted to measure working memory performance on the primary task, Probe-2 is the actual memory test for each trial. Finally, a scale was displayed prompting participants to indicate their degree of confidence in their probe 2 response.

Our results showed that OCD patients exhibited long delayed response performance on indicating the location of the letter in Probe 1 compared to healthy controls. Similarly, they also showed long delayed response performance on indicating if a letter was correctly located in Probe 2 compared to both subclinical and healthy control

participants. These findings are consistent with the finding that information processing is generally slow in OCD (Foa et al., 1993; Martin et al., 1995) and they demonstrate dysfunctional executive control in regulating alertness, sustaining effort and processing speed (Harkin and Kessler, 2011).

We also found evidence in reaction time, related to the manipulation, which contains the resolvable vs. misleading trials, was efficient across all groups. In other words, OCD patients were not slower than the other participants and all group participants showed long delayed response performance in misleading trials rather than in resolvable trials. On the contrary, all group participants showed long delayed response performance in resolvable trials rather than in misleading trials in terms of confidence ratings.

In the present study, working memory task was very easy because all conditions revealed mean accuracies over 90%. Thus, it is not surprising that there was no group difference. One potential explanation for these findings is that OCD patients exhibit lower performance in the ability to use efficient strategies, particularly in the face of more complex tasks with attention-dependent multimodal bindings (Purcell et al., 1998; van der Wee et al., 2007). Although OCD patients were not significantly different from the other participants in terms of long delayed response performance in misleading trials, one observation is that the other participants had learned more easily to ignore misleading probes than OCD patients. In other saying, the others seemed to be on the alert to recognize misleading probes, but OCD patients had difficulty in the ability to regulate their alertness in experimental context where such probes were highly frequent.

Taken all together, present findings support the evidence that OCD patients show lower performance in tasks that measured spatial working memory, and spatial working memory impairments are secondary to executive system components such as an inability to regulate alertness, sustain effort and process speed (Harkin and Kessler, 2011).

In summary, the present study demonstrated impairment in the cognitive functions as episodic memory, visual spatial memory and spatial working memory among individuals with OCD, and such impairments are most likely secondary to dysfunctional executive controls. Additionally, although the present findings provided mixed and inconclusive picture concerning the possibility of an overall memory deficit in OCD patients, there was also strong evidence that OCD is related to low memory confidence. Furthermore, consistently with previous studies (e.g., Ceschi et al., 2003; Foa et al., 1997; Jelinek et al., 2006; Kim et al., 2006; Simpson et al., 2006) , there was no real overall memory deficits among OCD patients other than memory confidence problems. Besides, the present study revealed that OCD patients seem to have not only reduced confidence on their own memory, but also on their future memory performance and, memory impairment affects meta-memory rather than memory accuracy.

4.2. Quality of Life in OCD

As mentioned in the introduction section, several studies using different Quality of Life (QOL) instruments confirmed that OCD has greater impact on QOL when compared to general population and individuals with other psychiatric disorder (Stengler, 2010). Most of these studies have used WHOQOL-BREF as a QOL instrument. Shortly, the instrument measures the following broad domains: physical health (pain and discomfort, energy and fatigue, sleep and rest, working capacity etc.),

psychological health (positive and negative feelings, self-esteem, thinking, learning, memory and concentration, body image, personal beliefs), social relationships (personal relations, sex, social support) and environment (financial resources, home environment, access to health and social care, physical environment etc.) in last two weeks. By using the WHOQOL-BREF, It was reported that all domains seem to be impaired in OCD patients (Akdede et al., 2005; Besiroglu et al., 2007; de Souza Vivan et al., 2013) and the severity of symptoms is related to diminished quality of life (Hauschildt et al, 2010; Macy et al., 2013).

Because of its importance, QOL was also investigated to assess OCD patients' perceptions in the context of their culture and value systems, and their personal goals, standards and concerns in the present study. It had been only focused on impairment of the level of the quality of OCD patients' life comparing subclinical and healthy control groups. The influence of medical and psychiatric comorbidity, level of insight and treatment duration was not investigated. In parallel with previous studies, results showed that all domains were impaired in OCD patients. More specifically, OCD patients' physical health and psychological health were much more impaired than both subclinical and healthy control participants', but their environment and social relations were more impaired than only healthy controls'. These findings are not surprising because OCD is generally accepted as chronic and severe disabling disorder that leads to severe psychological problems, relationship issues and affects negatively one's social functionality (Camli et al., 2012) and it emerged as the tenth highest cause of disability in the world (Murray and Lopez, 1996).

Such researches in the realm of QOL are considered to be one possible outcome criterion for the therapeutic process and critical for better understanding the association between QOL and clinical outcome (Stengler, 2010). In literature, some studies reported that the measurement of QOL contributes to improvement of both psychotherapy and psychopharmacological treatment in OCD (Anand et al., 2011; Bysritsky et al., 2001; Hertenstein et al., 2013; Moritz et al., 2005; Tenney et al., 2003). Accordingly, now that QOL measurements provide subjective perceptions in the context of their culture and value systems, and their personal goals, standards and concerns, such measurements could help the therapist discover which treatment approaches could be more effective and be more beneficial for the patient.

4.3. Clinical and Diagnostic Implications of the Study

Previously mentioned, there are range of studies suggesting that impairment in the cognitive functions among individuals with OCD play an important role in the manifestation and maintenance of the disorder. However, it is important to note that more evidence is still required as to the efficacy of cognitive impairments to explain the etiology of the disorder particularly in empirical researches in comparison to hypothetical researches (Aydin and Oyeckin, 2013; Shin et al., 2013). In this respect, important aspect of the present study, cognitive and metacognitive impairments among OCD patients were explained more effectively in the context of experiential continuum which provides exploring overall memory deficit with empirical methods, not only hypothetical ones. Furthermore, to the best of our knowledge, studies with clinical participants on cognitive impairment in OCD are limited in number. Accordingly, it is

also important to note that the present study has provided clues to more properly understand the cognitive mechanisms in OCD due to participation of OCD patients.

Another important aspect is that the clinical potential of present findings will likely contribute to estimate inform current therapies which changes or approaches could be more effective and be beneficial to understand and treat obsessive compulsive disorder. Particularly, in the context of cognitive behavioral therapy, such research are considered to be critical for better understanding of the etiology of the disorder and estimating which treatment approaches could be more effective and be more beneficial. Kuelz and colleagues (2006) reported significant improvement of nonverbal memory, organizational strategies, flexible, self-guided behavior and set-shifting among OCD patients after cognitive behavioral interventions. However, changes in cognitive functions among OCD patients after treatment are still controversial, and thus more effective approaches are essential (Vandborg et al., 2011). Accordingly, in view of memory confidence problems' key role in the manifestation of the disorder, cognitive-behavioral interventions that particularly target patients' confidence regarding their ability to remember information and aim to improve their confidence may help to reduce the severity of symptoms of OCD patients (Muller and Roberts, 2003).

Previously mentioned, in addition to cognitive behavioral interventions, Metacognitive Therapy (MCT) are also effective in treatment of OCD due to its purpose of modifying the negative appraisals of intrusive thoughts and metacognitive processing such as beliefs about the importance and power of thoughts which are crucial to the development and maintenance of OCD symptoms (Andouz et al., 2012; Bjorguinsson et al., 2007; Fitt and Rees, 2012; Fisher and Wells, 2008; Simons et al., 2006). One of

important aspects of metacognitive model is low confidence in memory and cognitive self-consciousness, which is described as monitoring one's own cognitive processing (Solem, 2010). It is stated that cognitive self-consciousness is particularly related to the pathology of OCD (Cattwright-Hatton and Wells, 1997; Cohen and Calamari, 2004; Janeck, Calamari, Riemann, and Heffelfinger, 2003), episodic memory impairments among OCD patients are mediated by heightened cognitive self-consciousness (Exner et al., 2009), and low confidence in memory could be associated with high cognitive self-consciousness (Solem, 2010). Considering that OCD patients seem to have both reduced confidence on their own memory and on their future memory, constitution of new metacognitive techniques, which involve modifying the high cognitive self-consciousness in relation to intrusive thoughts, and integration of such techniques with cognitive behavioral interventions will likely to be more effective in the treatment of OCD, and could help to relieve the symptoms of OCD patients as well.

4.4. Limitations of the Study

Despite of its importance and contributions, there are also some limitations of the present study. The most important one is the small number of participants. Also in literature, the vast majority of studies in the neuroscience and neuropsychology areas are based on small sample size that ranges between 10 and 20 OCD patients (Button et al., 2013; Muller and Roberts, 2003). Therefore, the probability of committing Type II error, which refers to accepting the null hypothesis when such hypothesis is false, increases. Thus, the statistical power of these studies becomes low. In other words, null results make generalizing the results to whole population difficult. Although the present findings demonstrated the selective memory impairments in OCD, it is also lack of

statistical power to identify true differences between OCD patients, subclinical and healthy control participants because of the small sample size. For this reason, it was not possible to examine the effect of the severity of OCD patients' symptoms on their cognitive performances as well. In future studies, the sample size must be enlarged for accuracy of results.

Another important fact is that OCD is a clinically heterogeneous and consists of multidimensional symptoms that are related to psychological, behavioral and neuropsychological functions (Lawrence et al, 2006; Rosario-Campos et al., 2006). Besides, these multiple dimensions are distinct from each other regarding their etiological and psychological connections (Muller and Roberts, 2003). For instance, early-onset OCD have different features and causes related to psychological, behavioral, environmental and neuropsychological when compared to late-onset OCD (Dell'Osso et al., 2013; Rosario-Campos et al., 2001; Sobin et al., 2000; Tükel et al., 2005). Therefore, it is suggested that early and late forms of OCD is supposed to evaluate and identify separately (Geller et al., 2001; Sobin et al., 2000). Despite of its importance, such heterogeneity could not examine once more because of small sample size in the present study.

On the contrary, several empirical studies have not supported the notion that cognitive impairments in OCD differentiate between subtypes (Muller and Roberts, 2003). Notwithstanding, it is believed that future studies need to compare OCD patients with different subtypes to examine cognitive deficits.

The other limitation of the present study is the selection method of subclinical participants. The majority of studies have selected individuals as a subclinical who

score high on self-report measures, most commonly on MOCI (Gibbs, 1996). However, there is not certain cut-off point of MOCI and several studies have identified subjects as nonclinical subjects on different bases such as both obsessions and compulsions, either obsessions or compulsions alone, or any subscale high score. As mentioned in the method section, following previous research (e.g. Zucker, 2004; MacDonald et al., 1997; Gibbs, 1996; Rubenstein et al., 1993), those who received a score of 7 to 10 on MOCI total score were classified as sub-clinical participants, and those with MOCI total score of 0 to 5 as healthy control participants in the present study. Thus, the function of selection method of nonclinical subjects remains controversial, also in the present study. For this reason, it is believed that true differences between OCD patients and subclinical participants could not emerge. Subclinical participants' performance was similar to OCD patients or worse on some cognitive tasks contrary to expectations. Another potential reason for that, the symptom profile of subclinicals and OCD patients may reveal similarities (Gibbs, 1996). On the other hand, subclinical obsessive compulsive symptomatology is described as the normal experiences of intrusive thoughts and neutralization, and it is hypothesized that subclinical OCD could be less severe or early form of OCD (Valleni-Basile et al., 1996). In view of such ambiguity, studies, which clarify the nature of relationship between non-clinical obsessive compulsive symptomatology and OCD, are essential. Additionally, although MOCI Turkish version was used in the study, the cut-off points have not been determined yet. It is also necessary to determine cut-off points of MOCI in order to clarify the distinctiveness of the symptom profile of subclinicals and OCD patients, and use more reliable selection method for non-clinical obsessive compulsive individuals.

In previous literature, only a few of studies included other anxiety disorders as a control group in order to compare OCD patients in terms of cognitive deficits (e.g., Airaksinen, Larsson, and Forsell, 2004; Armstrong, Zald, and Olatunji, 2011; Bannon, Gonsalvez, and Croft, 2008). This is important limitation also in the present study as it prevents from effectively determining whether some cognitive biases and deficits are specific to OCD in comparison to other anxiety disorders in general. For instance, it is stated that the pattern of episodic memory impairments are common for all anxiety disorders (Airaksinen et al., 2004), and some cognitive deficits may result from high trait anxiety regardless of anxiety subgroups (Muller and Roberts, 2003). In this respect, future studies should include other anxiety disorders as a control group in order to understand the impact of trait anxiety on cognitive deficits and whether it is possible to identify specific cognitive biases and deficits for OCD.

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APPENDIX A

YALE-BROWN OBSESSIVE COMPULSIVE SCALE (Y-BOCS)

İsim:

Tarih:

Y-BOCS SEMPTOM KONTROL LİSTESİ

Var olan tüm semptomları işaretleyiniz. Birincil semptomları "P" ile işaretleyiniz.
(Değerlendirme yapanın, hastanın bahsettiği davranışların, basit fobi veya hipokondriyazise ait değil, obsesif kompulsif bozukluğa ait olduğundan emin olması gereklidir. "s" ile işaretlenen semptomlar obsesif kompulsif bozukluğa ait olabilir veya olmayabilir.)

Şimdi	Geçmişte	
		SALDIRGANLIK OBSESYONLARI
		Kendine zarar vereceğinden korkma
		Başkalarına zarar vereceğinden korkma
		Şiddet içeren veya korkutucu imgeler
		Müstehcen veya hakaret edici sözler söyleme korkusu
		Utanılacak bir şey yapmaktan korkma*
		İstenmeyen dürtüleri yapmaktan korkma (örn. arkadaşını yaralama)
		Çalacağından korkma
		Dikkatsizlik nedeniyle başkalarına zarar verme korkusu (örn. çarpma/kaçma, motorlu araç kazası)
		Olan kötü olaylardan kendinin sorumlu olacağı korkusu (örn. yangın, hırsızlık)
		Diğer
		KİRLİLİK OBSESYONLARI
		Vücut atık veya salgılarından (örn. idrar, dışkı, tükürük) kaygılanmak veya iğrenmek
		Kir veya mikroplardan kaygılanmak
		Çevre kirliliğinden aşırı kaygı duymak (örn. asbestoz, radyasyon, toksik atıklar)
		Evde kullanılan maddelerden aşırı kaygılanmak (örn. temizlik maddeleri, çözücüler)
		Kontaminasyon nedeni ile hastalanma kaygısı
		Hayvanlardan aşırı derecede korkmak (örn. böcekler)
		Yapışkan maddeler veya atıklardan rahatsız olmak
		Başkalarına hastalık etkeni bulaştırma kaygısı (saldirgan)
		Sadece kontaminasyon halinde ne hissedeceğinden kaygılanmak, sonuçları düşünmemek
		Diğer

CİNSEL OBSESYONLAR

_____	_____	Yasaklanmış veya sapıklık derecesinde cinsel düşünce, görüntü veya dürtüler
_____	_____	Çocuklar veya inest ilişki ile ilgili
_____	_____	Homoseksüel ilişkili ile ilgili*
_____	_____	Başkalarına karşı cinsel davranış (saldırgan)*
_____	_____	Diğer

BİRİKTİRME/SAKLAMA OBSESYONLARI

(Hobiler ve maddi ve manevi değeri olan eşyalar ile karıştırılmamalıdır)

_____	_____	_____
-------	-------	-------

DİNİ OBSESYONLAR

_____	_____	Kutsal şeylere karşı hürmetsizlik veya günah ile ilgili
_____	_____	Doğru/Yanlış kavramları ile aşırı ilgi
_____	_____	Diğer

EŞYALARIN SİMETRİKLİĞİ VE DÜZENİ İLE İLGİLİ OBSESYONLAR

_____	_____	Doğüstü düşünce ile birlikte (örn. eşyaların yerinde olmaması halinde annesinin başına kaza geleceği)
_____	_____	Doğüstü düşünceler olmadan

DİĞER OBSESYONLAR

_____	_____	Bilme veya hatırlama ihtiyacı
_____	_____	Belirli şeyleri söyleme korkusu
_____	_____	Doğru şeyi söyleyememe korkusu
_____	_____	Birşeyler kaybetme korkusu
_____	_____	İstenmeyen (dehşet içermeyen) görüntüler
_____	_____	Anlamsız sesler, kelimeler veya müzik duyma
_____	_____	Belirli seslerden veya gürültüden rahatsız olma*
_____	_____	Uğurlu veya uğursuz sayılar
_____	_____	Özel anlamı olan renkler
_____	_____	Batıl itikatlar
_____	_____	Diğer

SOMATİK OBSESYONLAR

- | | | |
|-------|-------|---|
| _____ | _____ | Hastalık ile ilgili* |
| _____ | _____ | Vücudun bir parçası veya görünümü ile aşırı ilgili
(örn. dismorfofobi) |
| _____ | _____ | Diğer |

TEMİZLEME/YIKAMA KOMPULSİYONLARI

- | | | |
|-------|-------|--|
| _____ | _____ | Aşırı veya törensel el yıkama |
| _____ | _____ | Aşırı veya törensel duş, banyo, diş fırçalama veya giyime ileri derecede
dikkat |
| _____ | _____ | Ev eşyalarının veya diğer cansız nesnelerin aşırı temizliği ile ilgili |
| _____ | _____ | Kirletici maddeler ile teması önleyen veya yok eden diğer önlemler |
| _____ | _____ | Diğer |

KONTROL ETME KOMPULSİYONLARI

- | | | |
|-------|-------|---|
| _____ | _____ | Kilit, ocak, alet vb.lerinin kontrolü |
| _____ | _____ | Başkalarına zarar vermediğini/vermeyeceğini kontrol etmek |
| _____ | _____ | Kendine zarar vermediğini/vermeyeceğini kontrol etmek |
| _____ | _____ | Korkunç bir şey olmadığını/olmayacağını kontrol etmek |
| _____ | _____ | Hata yapıp yapmadığını kontrol etmek |
| _____ | _____ | Somatik obsesyonlara bağlı kontroller |
| _____ | _____ | Diğer |

TEKRARLAYICI TÖRENSEL DAVRANIŞLAR

- | | | |
|-------|-------|--|
| _____ | _____ | Tekrar okuma veya yazma |
| _____ | _____ | Rutin hareketleri tekrarlama gereksinimi
(örn. kapıdan girme/çıkma, sandalyeye oturma/kalkma) |
| _____ | _____ | Diğer |

SAYMA KOMPULSİYONLARI

- | | | |
|-------|-------|-------|
| _____ | _____ | _____ |
|-------|-------|-------|

SIRALAMA/DÜZENLEME KOMPULSİYONLARI

- | | | |
|-------|-------|-------|
| _____ | _____ | _____ |
|-------|-------|-------|

BİRİKTİRME/TOPLAMA KOMPULSİYONLARI

[Hobilerden, maddi ve manevi değeri olan şeylerin toplanması ile karıştırılmamalıdır (örn. eski mektupları dikkatle okumak, eski gazeteleri düzenlemek, ufak tefek şeyleri sınıflandırmak, işe yaramaz şeyleri biriktirmek).]

DİĞER KOMPULSİYONLAR

Zihinsel törenler (kontrol veya sayma dışında)

Aşın liste hazırlama

Söyleme, sorma veya itiraf etme gereksinimi

Dokunma, vurma veya ovalama gereksinimi*

Göz kırpma veya gözlerini dikme törensi davranışları*

Kendine; başkalarına zarar gelmemesi veya kötü olaylara karşı önlem alma (kontrol etme değil)

Tören haline gelmiş yemek yeme alışkanlıkları*

Batıl davranışlar

Trikotillomani*

Kendine zarar verici veya yaralayıcı davranışlar*

Diğer

İsim:

Tarih:

HEDEF SEMPTOM LİSTESİ

OBSESYONLAR:

1.

2.

3.

KOMPULSİYONLAR:

1.

2.

3.

KAÇINMA:

1.

2.

3.

YALE-BROWN OBSESYON KOMPULSİYON ÖLÇEĞİ (9/89)

HASTA ADI: _____ Y-BOCS TOPLAM PUANI (Madde 1-10 toplamı) _____
 PROTOKOL : _____ TARİH: _____
 HEKİM: _____

1.	OBSESYONLARLA GEÇEN ZAMAN	Yok 0	Hafif 1	Orta 2	Ciddi 3	İleri 4							
<table border="1"> <tr> <td>1b.</td> <td>OBSESYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)</td> <td>Semptom yok 0</td> <td>Ortalama uzun 1</td> <td>Uzun 2</td> <td>Çok kısa 3</td> <td>Kısa 4</td> </tr> </table>							1b.	OBSESYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)	Semptom yok 0	Ortalama uzun 1	Uzun 2	Çok kısa 3	Kısa 4
1b.	OBSESYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)	Semptom yok 0	Ortalama uzun 1	Uzun 2	Çok kısa 3	Kısa 4							
2.	OBSESYONLARDAN ETKİLENME	0	1	2	3	4							
3.	OBSESYONLARDAN RAHATSIZ OLMA	0	1	2	3	4							
4.	OBSESYONLARA KARŞI DİRENME	Sürekli direnme 0	1	2	3	Tam teslimiyet 4							
		Tam kontrol 0	Yeterli kontrol 1	Orta kontrol 2	Az kontrol 3	Kontrol yok 4							
5.	OBSESYONLARIN KONTROLÜ	0	1	2	3	4							
OBSESYON ALTOPLAMI (madde 1-5 toplamı) _____													
6.	KOMPULSİYONLARLA GEÇEN ZAMAN	Yok 0	Hafif 1	Orta 2	Ciddi 3	İleri 4							
<table border="1"> <tr> <td>6b.</td> <td>KOMPULSİYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)</td> <td>Semptom yok 0</td> <td>Uzun 1</td> <td>Ortalama uzun 2</td> <td>Kısa 3</td> <td>Çok kısa 4</td> </tr> </table>							6b.	KOMPULSİYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)	Semptom yok 0	Uzun 1	Ortalama uzun 2	Kısa 3	Çok kısa 4
6b.	KOMPULSİYONSUZ GEÇEN DÖNEM (Toplam ve alttoplamlara eklemeyiniz)	Semptom yok 0	Uzun 1	Ortalama uzun 2	Kısa 3	Çok kısa 4							
7.	KOMPULSİYONLARDAN ETKİLENME	0	1	2	3	4							
8.	KOMPULSİYONLARDAN RAHATSIZ OLMA	0	1	2	3	4							
9.	KOMPULSİYONLARA KARŞI DİRENME	Sürekli direnme 0	1	2	3	Tam teslimiyet 4							
		Tam kontrol 0	Yeterli kontrol 1	Orta kontrol 2	Az kontrol 3	Kontrol yok 4							
10.	KOMPULSİYONLARIN KONTROLÜ	0	1	2	3	4							
KOMPULSİYON ALTOPLAMI (madde 1-5 toplamı) _____													
11.	OBSESYON VE KOMPULSİYONLARI HAKKINDA HASTANIN İÇGÖRÜSÜ	Mükemmel 0	1	2	3	Yok 4							
12.	KAÇINMA	Yok 0	Hafif 1	Orta 2	Ciddi 3	İleri 4							
13.	KARARSIZLIK	0	1	2	3	4							
14.	PATOLOJİK SORUMLULUK	0	1	2	3	4							
15.	YAVAŞLAMA	0	1	2	3	4							
16.	PATOLOJİK KUŞKU	0	1	2	3	4							
17.	GLOBAL CİDDİYET	0	1	2	3	4							
18.	GLOBAL DÜZELME	0	1	2	3	4							
19.	GÜVENİRLİK	MÜKEMMEL = 0	İYİ = 1	ORTA = 2	ZAYIF = 3								

APPENDIX B

MAUDSLEY OBSESSIVE COMPULSIVE INVENTORY (MOCI)

Aşağıdaki cümleleri dikkatle okuyunuz. Size uygunsa “DOĞRU”yu uygun değilse “YANLIŞ”ı daire içine alınız. Lütfen soruların hepsini cevaplandırınız.

DOĞRU YANLIŞ

1. Bana bir hastalık bulaşır korkusuyla herkesin kullandığı telefonları kullanmaktan kaçınırım.
2. Sık sık hoşla gitmeyen şeyler düşünür, onları zihnimden uzaklaştırmakta güçlük çekerim.
3. Dürüstlüğe herkesten çok önem veririm
4. İşleri zamanında bitiremediğim için çoğu kez geç kalırım.
5. Bir hayvana dokununca hastalık bulaşır diye kaygılanırım.
6. Sık sık havagazını, su musluklarını ve kapıları birkaç kez kontrol ederim.
7. Değişmez kurallarım vardır.
8. Aklıma takılan nahoş düşünceler hemen her gün beni rahatsız eder.
9. Kaza ile bir başkasına çarptığımda rahatsız olurum.

10. Her gün yaptığım basit günlük işlerden bile emin olamam.
11. Çocukken annem de babam da beni fazla sıkmaazlardı.
12. Bazı şeyleri tekrar tekrar yaptığım için işimde geri kaldığım oluyor.
13. Çok fazla sabun kullanırım.
14. Bana göre bazı sayılar son derece uğursuzdur.
15. Mektupları postalamadan önce onları tekrar tekrar kontrol ederim.
16. Sabahları giyinmek için uzun zaman harcarım.
17. Temizliğe aşırı düşkünüm.
18. Ayrıntılara gereğinden fazla dikkat ederim.
19. Pis tuvaletlere giremem.
20. Esas sorunum bazı şeyleri tekrar tekrar kontrol etmemdir.
21. Mikrop kapmaktan ve hastalanmaktan korkar ve kaygılanırım.
22. Bazı şeyleri birden fazla kontrol ederim.
23. Günlük işlerimi belirli bir programa göre yaparım.
24. Paraya dokunduktan sonra ellerimi kirli hissedirim.
25. Alıştığım işi yaparken bile kaç kere yaptığımı sayırım.
26. Sabahları elimi yüzümü yıkamak çok zamanımı alır.
27. Çok miktarda mikrop öldürücü ilaç kullanırım.
28. Her gün bazı şeyleri tekrar tekrar kontrol etmek

- bana zaman kaybettirir.
29. Geceleri giyeceklerimi katlayıp asmak uzun zamanımı alır.
30. Dikkatle yaptığım bir işin bile tam doğru olup olmadığına emin olamam.
31. Kendimi toparlayamadığım için günler, haftalar, hatta aylarca hiçbir şeye el sürmediğim olur.
32. En büyük mücadelelerimi kendimle yaparım.
33. Çoğu zaman büyük bir hata ya da kötülük yaptığım duygusuna kapılırım.
34. Sık sık kendime birşeyleri dert edinirim.
35. Önemsiz ufak şeylerde bile karar verip işe girişmeden öncedurup düşünürüm.
36. Reklamlardaki ampuller gibi önemsiz şeyleri sayma alışkanlığım vardır.
37. Bazen önemsiz düşünceler aklıma takılır ve beni günlerce rahatsız eder.

APPENDIX C

META-COGNITIONS QUESTIONNAIRE-30 (MCQ-30)

Bu anket kişilerin kendi düşüncelerine ilişkin inançlarını incelemektedir. Aşağıda bireyler tarafından ifade edilmiş bazı inanç maddeleri listelenmiştir. Lütfen her bir maddeyi okuyarak her birine ne kadar katıldığınızı uygun rakamı işaretleyerek belirtiniz (1: kesinlikle katılmıyorum; 2: kısmen katılmıyorum; 3 kısmen katılıyorum; 4: kesinlikle katılıyorum). Lütfen tüm maddeleri cevaplandırınız. Bu ankette doğru ya da yanlış cevap bulunmamaktadır.

	Kesinlikle katılmıyorum	Kısmen katılmıyorum	Kısmen katılıyorum	Kesinlikle katılıyorum
1. Endişelenmek gelecekteki problemlerden kaçınmama yardımcı olur.	(1)	(2)	(3)	(4)
2. Endişelenmem benim için tehlikelidir.	(1)	(2)	(3)	(4)
3. Aklımdan geçenlerle çok uğraşırım.	(1)	(2)	(3)	(4)
4. Endişe ede ede kendimi hasta edebilirim.	(1)	(2)	(3)	(4)
5. Bir problem üzerinde düşünürken zihnimin nasıl çalıştığının farkındayım.	(1)	(2)	(3)	(4)
6. Eğer beni endişelendiren bir düşüncüyü kontrol edemezsem ve bu gerçekleşirse, benim hatam olur.	(1)	(2)	(3)	(4)
7. Düzenliliğimi sürdürebilmem için endişe etmeye ihtiyacım var.	(1)	(2)	(3)	(4)
8. Kelimeler ve isimler konusunda belleğime güvenim pek yoktur.	(1)	(2)	(3)	(4)
9. Ne kadar engellemeye çalışırsam çalışayım, endişe verici düşüncelerim devam eder.	(1)	(2)	(3)	(4)
10. Endişelenmek kafamdaki düşünceleri düzene sokmama yardım eder.	(1)	(2)	(3)	(4)
11. Endişe verici düşünceler aklıma geldiğinde onları görmezden gelemiyorum.	(1)	(2)	(3)	(4)

12. Düşüncelerimi izlerim.	(1) (2) (3) (4)
13. Düşüncelerimi her zaman kontrol altında tutmalıyım.	(1) (2) (3) (4)
14. Belleğim zaman zaman beni yanıltır.	(1) (2) (3) (4)
15. Belirli düşüncelerimi kontrol etmediğim için cezalandırılacağım.	(1) (2) (3) (4)
16. Endişelerim beni delirtebilir.	(1) (2) (3) (4)
17. Düşündüğümün her an farkındayım.	(1) (2) (3) (4)
18. Zayıf bir belleğim vardır.	(1) (2) (3) (4)
19. Dikkatim zihnimin nasıl çalıştığıyla meşguldür.	(1) (2) (3) (4)
20. Endişelenmek bir şeylerin üstesinden gelmeme yardım eder.	(1) (2) (3) (4)
21. Düşüncelerimi kontrol edememek bir zayıflık işaretidir.	(1) (2) (3) (4)
22. Endişelenmeye başladığım zaman kendimi durduramam.	(1) (2) (3) (4)
23. Endişelenmek problemleri çözmede bana yardımcı olur.	(1) (2) (3) (4)
24. Bir yerleri hatırlama konusunda belleğime pek güvenmem.	(1) (2) (3) (4)
25. Belirli şeyleri düşünmek kötüdür.	(1) (2) (3) (4)
26. Belleğime güvenmem.	(1) (2) (3) (4)
27. Eğer düşüncelerimi kontrol edemezsem işlerimi sürdüremem.	(1) (2) (3) (4)
28. İyi çalışabilmek için endişelenmeye ihtiyacım vardır.	(1) (2) (3) (4)
29. Olayları hatırlama konusunda belleğime pek güvenmem.	(1) (2) (3) (4)
30. Düşüncelerimi sürekli gözden geçiririm	(1) (2) (3) (4)

APPENDIX D

STATE-TRAIT ANXIETY INVENTORY (STAI)

Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da **şu an için kendinizi** nasıl hissettiğinizi, ifadelerin sağ tarafındaki parantezlerden uygun olanını karalamak suretiyle belirtiniz. Doğru ya da yanlış cevap yoktur. Her hangi bir ifadenin üzerinde fazla zaman sarfetmeksizin **şu an için** kendinizi nasıl hissettiğinizi gösteren cevabı işaretleyiniz.

	Hiç	Biraz	Çok	Tamamiyle
1. Şu anda sakinim	(1)	(2)	(3)	(4)
2. Kendimi emniyette hissediyorum	(1)	(2)	(3)	(4)
3. Şu anda sinirlerim gergin	(1)	(2)	(3)	(4)
4. Pişmanlık duygusu içindeyim	(1)	(2)	(3)	(4)
5. Şu anda huzur içindeyim	(1)	(2)	(3)	(4)
6. Şu anda hiç keyfim yok	(1)	(2)	(3)	(4)
7. Başıma geleceklerden endişe ediyorum	(1)	(2)	(3)	(4)
8. Kendimi dinlenmiş hissediyorum	(1)	(2)	(3)	(4)
9. Şu anda kaygılıyım	(1)	(2)	(3)	(4)
10. Kendimi rahat hissediyorum	(1)	(2)	(3)	(4)
11. Kendime güvenim var	(1)	(2)	(3)	(4)

12. Şu anda asabım bozuk	(1)	(2)	(3)	(4)
13. Çok sinirliyim	(1)	(2)	(3)	(4)
14. Sinirlerimin çok gergin olduğunu hissediyorum	(1)	(2)	(3)	(4)
15. Kendimi rahatlamış hissediyorum	(1)	(2)	(3)	(4)
16. Şu anda halimden memnunum	(1)	(2)	(3)	(4)
17. Şu anda endişeliyim	(1)	(2)	(3)	(4)
18. Heyecandan kendimi şaşkına dönmüş hissediyorum	(1)	(2)	(3)	(4)
19. Şu anda sevinçliyim	(1)	(2)	(3)	(4)
20. Şu anda keyfim yerinde.	(1)	(2)	(3)	(4)

Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da **genel** olarak nasıl hissettiğinizi, ifadelerin sağ tarafındaki parantezlerden uygun olanını karalamak suretiyle belirtiniz. Doğru ya da yanlış cevap yoktur. Her hangi bir ifadenin üzerinde fazla zaman sarfetmeksizin **genel** olarak nasıl hissettiğinizi gösteren cevabı işaretleyiniz.

	Hemen hiçbir zaman	Bazen	Çok zaman	Hemen her zaman
1. Genellikle keyfim yerindedir.	(1)	(2)	(3)	(4)
2. Genellikle çabuk yorulurum.	(1)	(2)	(3)	(4)
3. Genellikle kolay ağlarım.	(1)	(2)	(3)	(4)
4. Başkaları kadar mutlu olmak isterim.	(1)	(2)	(3)	(4)
5. Çabuk karar veremediğim için fırsatları kaçıırım.	(1)	(2)	(3)	(4)
6. Kendimi dinlenmiş hissedirim.	(1)	(2)	(3)	(4)
7. Genellikle sakin, kendime hakim ve soğukkanlıyım.	(1)	(2)	(3)	(4)
8. Güçlüklerin yenemeyeceğim kadar biriktiğini hissedirim.	(1)	(2)	(3)	(4)
9. Önemsiz şeyler hakkında endişelenirim.	(1)	(2)	(3)	(4)
10. Genellikle mutluyum.	(1)	(2)	(3)	(4)

11. Her şeyi ciddiye alır ve endişelenirim.	(1)	(2)	(3)	(4)
12. Genellikle kendime güvenim yoktur.	(1)	(2)	(3)	(4)
13. Genellikle kendimi emniyette hissederim.	(1)	(2)	(3)	(4)
14. Sıkıntılı ve güç durumlarla karşılaşmaktan kaçınırım.	(1)	(2)	(3)	(4)
15. Genellikle kendimi hüzünlü hissederim.	(1)	(2)	(3)	(4)
16. Genellikle hayatımdan memnunum.	(1)	(2)	(3)	(4)
17. Olur olmaz düşünceler beni rahatsız eder.	(1)	(2)	(3)	(4)
18. Hayal kırıklıklarını öyle ciddiye alırım ki hiç unutamam.	(1)	(2)	(3)	(4)
19. Aklı başında ve kararlı bir insanım.	(1)	(2)	(3)	(4)
20. Son zamanlarda kafama takılan konular beni tedirgin eder.	(1)	(2)	(3)	(4)

APPENDIX E

BECK ANXIETY INVENTORY (BAI)

Aşağıda insanların kaygılı ya da endişeli oldukları zamanlarda yaşadıkları bazı belirtiler verilmiştir. Lütfen her maddeyi dikkatle okuyunuz. Daha sonra, her maddedeki belirtinin BUGÜN DAHİL SON BİR (1) HAFTADIR sizi ne kadar rahatsız ettiğini yandakine uygun yere (x) işareti koyarak belirleyiniz.

	Hiç	Hafif düzeyde Beni pek etkilemedi	Orta düzeyde Hoş değildi ama katlanabildim	Ciddi düzeyde Dayanmakta çok zorlandım
1. Bedeninizin herhangi bir yerinde uyuşma veya karıncalanma				
2. Sıcak/ ateş basmaları				
3. Bacaklarda halsizlik, titreme				
4. Gevşeyememe				
5. Çok kötü şeyler olacak korkusu				

6. Bař dnmesi veya sersemlik				
7. Kalp arpıntısı				
8. Dengeyi kaybetme duygusu				
9. Dehřete kapılma				
10. Sinirlilik				
11. Boęuluyormuř gibi olma duygusu				
12. Ellerde titreme				
13. Titreklik				
14. Kontrol kaybetme korkusu				
15. Nefes almada glk				
16. lm korkusu				
17. Korkuya kapılma				
18. Midede hazımsızlık ya da rahatsızlık hissi				
19. Baygınlık				
20. Yzn kızarması				
21. Terleme (sıcaklıęa baęlı olmayan)				

APPENDIX F

BECK DEPRESSION INVENTORY (BDI)

Aşağıda, kişilerin ruh durumlarını ifade ederken kullandıkları bazı cümleler verilmiştir. Her madde bir çeşit ruh durumunu anlatmaktadır. Her maddede o ruh durumunun derecesini belirleyen 4 seçenek vardır. Lütfen bu seçenekleri dikkatle okuyunuz. Son bir hafta içindeki (şu an dahil) kendi ruh durumunuzu göz önünde bulundurarak, size en uygun olan ifadeyi bulunuz. Daha sonra, o maddenin yanındaki harfin üzerine (X) işareti koyunuz.

1)	a. Kendimi üzgün hissetmiyorum b. Kendimi üzgün hissediyorum c. Her zaman için üzgünüm ve kendimi bu duygudan kurtaramıyorum d. Öylesine üzgün ve mutsuzum ki dayanamıyorum
2)	a. Gelecekte umutsuz değilim b. Gelecek konusunda umutsuzum c. Gelecekte beklediğim hiç bir şey yok d. Benim için bir gelecek olmadığı gibi bu durum değişmeyecek
3)	a. Kendimi başarısız görmüyorum b. Herkesten daha fazla başarısızlıklarım oldu sayılır c. Geriye dönüp baktığımda, pek çok başarısızlığımın olduğunu görüyorum d. Kendimi bir insan olarak tümüyle başarısız görüyorum
4)	a. Her şeyden eskisi kadar doyum (zevk) alabiliyorum b. Her şeyden eskisi kadar doyum alamıyorum c. Artık hiçbir şeyden gerçek bir doyum alamıyorum d. Bana doyum veren hiçbir şey yok. Her şey çok sıkıcı
5)	a. Kendimi suçlu hissetmiyorum b. Arada bir kendimi suçlu hissettiğim oluyor c. Kendimi çoğunlukla suçlu hissediyorum d. Kendimi her an için suçlu hissediyorum

6)	a. Cezalandırılıyormuşum gibi duygular içinde değilim b. Sanki bazı şeyler için cezalandırılabilirmişim gibi duygular içindeyim c. Cezalandırılacakmışım gibi duygular yaşıyorum d. Bazı şeyler için cezalandırılıyorum
7)	a. Kendimi hayal kırıklığına uğratmadım b. Kendimi hayal kırıklığına uğrattım c. Kendimden hiç hoşlanmıyorum d. Kendimden nefret ediyorum
8)	a. Kendimi diğer insanlardan daha kötü durumda görmüyorum b. Kendimi zayıflıklarım ve hatalarım için eleştiriyorum c. Kendimi hatalarım için her zaman suçluyorum d. Her kötü olayda kendimi suçluyorum
9)	a. Kendimi öldürmek gibi düşüncelerim yok b. Bazen kendimi öldürmeyi düşünüyorum ama böyle bir şey yapamam c. Kendimi öldürebilmeyi çok isterdim d. Eğer bir fırsatını bulursam kendimi öldürürüm
10)	a. Herkesten daha fazla ağladığımı sanmıyorum b. Eskisine göre şimdilerde daha çok ağlıyorum c. Şimdilerde her an ağlıyorum d. Eskiden ağlayabilirdim. Şimdilerde istesem de ağlayamıyorum
11)	a. Eskisine göre daha sinirli veya tedirgin sayılmam b. Her zamankinden biraz daha fazla tedirginim c. Çoğu zaman sinirli ve tedirginim d. Şimdilerde her an için tedirgin ve sinirliyim
12)	a. Diğer insanlara karşı ilgimi kaybetmedim b. Eskisine göre insanlarla daha az ilgiliyim c. Diğer insanlara karşı ilgimin çoğunu kaybettim d. Diğer insanlara karşı hiç ilgim kalmadı
13)	a. Eskisi gibi rahat ve kolay kararlar verebiliyorum b. Eskisine kıyasla şimdilerde karar vermeyi daha çok erteliyorum c. Eskisine göre karar vermekte oldukça güçlük çekiyorum d. Artık hiç karar veremiyorum
14)	a. Eskisinden daha kötü bir dış görünüşüm olduğunu sanmıyorum b. Sanki yaşlanmış ve çekiciliğimi kaybetmişim gibi düşünüyor ve üzülüyorum c. Dış görünüşümde artık değiştirilmesi mümkün olmayan ve beni çirkinleştiren değişiklikler olduğunu hissediyorum d. Çok çirkin olduğumu düşünüyorum
15)	a. Eskisi kadar iyi çalışabiliyorum b. Bir işe başlayabilmek için eskisine göre daha çok çaba harcıyorum c. Ne olursa olsun, yapabilmek için kendimi çok zorluyorum d. Artık hiç çalışmıyorum
16)	a. Eskisi kadar kolay ve rahat uyuyabiliyorum b. Şimdilerde eskisi kadar kolay ve rahat uyuyamıyorum c. Eskisine göre bir veya iki saat erken uyanıyor, tekrar uyumakta güçlük

	çekiyorum d. Eskisine göre çok erken uyanıyor ve tekrar uyuyamıyorum
17)	a. Eskisine göre daha çabuk yorulduğumu sanmıyorum b. Eskisinden daha çabuk ve kolay yoruluyorum c. Şimdilerde neredeyse her şeyden, kolayca ve çabuk yoruluyorum d. Artık hiçbir şey yapamayacak kadar yorgunum
18)	a. İştahım eskisinden pek farklı değil b. İştahım eskisi kadar iyi değil c. Şimdilerde iştahım epey kötü d. Artık hiç iştahım yok
19)	a. Son zamanlarda pek fazla kilo kaybettiğimi/aldığımı sanmıyorum b. Son zamanlarda istemediğim halde iki buçuk kilodan fazla kaybettim/aldım c. Son zamanlarda beş kilodan fazla kaybettim/aldım d. Son zamanlarda yedi buçuk kilodan fazla kaybettim/aldım
20)	a. Sağlığım beni pek endişelendirmiyor b. Son zamanlarda ağrı, sızı, mide bozukluğu, kabızlık gibi sıkıntılarım var c. Ağrı sızı gibi bu sıkıntılarım beni çok endişelendiriyor d. Bu tür sıkıntılar beni öylesine endişelendiriyor ki başka bir şey düşünemiyorum
21)	a. Son zamanlarda cinsel yaşantımda dikkatimi çeken bir şey yok b. Eskisine göre cinsel konularla daha az ilgileniyorum c. Şimdilerde cinsellikle pek ilgili değilim d. Artık cinsellikle hiç bir ilgim kalmadı

APPENDIX G

WORLD HEALTH ORGANIZATION QUALITY OF LIFE-BREF (WHOQOL-BREF)

Başlamadan önce kendinizle ilgili genel bir kaç soruyu cevaplamanızı istiyoruz. Lütfen doğru yanıtları yuvarlağa alınız ya da verilen boş yerleri doldurunuz.

Cinsiyetiniz nedir? Erkek ☐ Kadın ☐

Doğum / / (Gün/Ay/Yıl)
tarihiniz
nedir?

Gördüğünüz en yüksek eğitim derecesi nedir?

. Hiç eğitilmadım. İlkokul-ortaokul . Lise veya eşdeğeri . Yüksek

Medeni durumunuz nedir?

hiç evlenmemiş ☐ . ayrı yaşıyor
evli ☐ . boşanmış
evli gibi yaşıyor ☐ . eşi ölmüş

Şu anda bir hastalığınız var mı? . evet . hayır

Eğer şu anda sağlığınızla ilgili yolunda gitmeyen bir durum varsa, sizce bu nedir?

hastalık /sorun

Yönerge

Bu anket sizin yaşamınızın kalitesi, sağlığını ve yaşamınızın öteki yönleri hakkında neler düşündüğünüzü sorgulamaktadır. **Lütfen bütün soruları cevaplayınız.** Eğer bir soruya hangi cevabı vereceğinizden emin olamazsanız, **lütfen size en uygun görünen cevabı** seçiniz. Genellikle ilk verdiğiniz cevap en uygunu olacaktır.

Lütfen kurallarınızı, beklentilerinizi, hoşunuza giden ve sizin için önemli olan şeyleri sürekli olarak göz önüne alınız. Yaşamınızın **son iki haftasını** dikkate almanızı istiyoruz.

Örneğin bir soruda son iki hafta kastedilerek şöyle sorulabilir:

	ÖRNEK SORU	Hiç	Çok az	Orta derecede	Çokça	Tamamen
	Gereksiniminiz olan desteği başkalarından alabiliyor musunuz?	1	2	3	4	5

Son iki hafta boyunca başkalarından aldığınız desteğin miktarını en iyi karşılayan rakamı yuvarlağa almalısınız. Buna göre, eğer başkalarından çokça yardım aldıysanız, aşağıdaki gibi 4 rakamını yuvarlağa almanız gerekiyor:

	ÖRNEK SORU	Hiç	Çok az	Orta derecede	Çokça	Tamamen
	Gereksiniminiz olan desteği başkalarından alabiliyor musunuz?	1	2	3	4	5

Son iki hafta içinde, ihtiyacınız olan desteği başkalarından hiç alamadıysanız, 1 rakamını yuvarlağa almalısınız.

ŞİMDİ, Lütfen her soruyu okuyunuz, duygularınızı değerlendiriniz ve her bir sorunun ölçeğinde size en uygun olan yanıtın rakamını yuvarlağa alınız.

		Çok kötü	Biraz kötü	Ne iyi, ne kötü	Oldukça iyi	Çok iyi
1 G1	Yaşam kalitenizi nasıl	1	2	3	4	5

		Hiç hoşnut değil	Çok az hoşnut	Ne hoşnut, ne de değil	Epeyce hoşnut	Çok hoşnut
2 G4	Sağlığınızdan ne kadar hoşnutsunuz?	1	2	3	4	5

Aşağıdaki sorular son iki hafta içinde kimi şeyleri **ne kadar** yaşadığınızı soruşturmaktadır.

		Hiç	Çok az	Orta derecede	Çokça	Aşırı derecede
3 F1.4	Ağrılarınızın yapmanız gerekenleri ne derece engellediğini	1	2	3	4	5
4 F11.3	Günlük uğraşlarınızı yürütemek için herhangi bir tıbbi tedaviye ne kadar	1	2	3	4	5
5 F4.1	Yaşamaktan ne kadar keyif alırsınız?	1	2	3	4	5
6 F24.2	Yaşamınızı ne ölçüde anlamlı buluyorsunuz?	1	2	3	4	5

		Hiç	Çok az	Orta derecede	Çokça	Son derecede
7 F5.3	Dikkatinizi toplamada ne kadar başarılısınız?	1	2	3	4	5
8 F16.1	Günlük yaşamınızda kendinizi ne kadar güvende	1	2	3	4	5
9 F22.1	Fiziksel çevreniz ne ölçüde sağlıklıdır?	1	2	3	4	5

Aşağıdaki sorular son iki haftada kimi şeyleri ne ölçüde **tam olarak** yaşadığınızı ya da yapabildiğinizi soruşturmaktadır.

		Hiç	Cok az	Orta derecede	Cokça	Tamamen
10 F2.1	Günlük yaşamı sürdürmek için yeterli gücünüz kuvvetiniz var	1	2	3	4	5
11 F7.1	Bedensel görünüşünüzü	1	2	3	4	5
12 F18.1	Gereksinimlerinizi karşılamak için yeterli paranız var	1	2	3	4	5
13 F20.1	Günlük yaşantınızda gerekli bilgilere ne ölçüde ulaşabilir	1	2	3	4	5
14 F21.1	Boş zamanları değerlendirme uğraşları için ne ölçüde fırsatınız	1	2	3	4	5

Aşağıdaki sorularda, son iki hafta boyunca yaşamınızın çeşitli yönlerini ne ölçüde **iyi ya da doyurucu** bulduğunuzu belirtmeniz istenmektedir.

		Çok kötü	Biraz kötü	Ne iyi, ne kötü	Oldukça iyi	Çok iyi
15 F9.1	Hareketlilik (etrafta dolaşabilme, bir yerlere gidebilme) beceriniz nasıldır?	1	2	3	4	5

		Hiç hoşnut değil	Çok az hoşnut	Ne hoşnut, ne de	Epeyce hoşnut	Çok hoşnut
16 F 3.3	Uykunuzdan ne kadar	1	2	3	4	5
17 F10.3	Günlük uğraşlarınızı yürütebilme becerinizden ne	1	2	3	4	5
18 F12.4	Đş görme kapasitenizden ne kadar hoşnutsunuz?	1	2	3	4	5
19 F6.3	Kendinizden ne kadar	1	2	3	4	5
20 F13.3	Diğer kişilerle ilişkilerinizden ne kadar hoşnutsunuz?	1	2	3	4	5
21 F15.3	Cinsel yaşamınızdan ne kadar hoşnutsunuz?	1	2	3	4	5
22 F14.4	Arkadaşlarınızın desteğinden ne kadar	1	2	3	4	5

		Hiç hoşnut değil	Çok az hoşnut	Ne hoşnut, ne de değil	Epeyce hoşnut	Çok hoşnut
23 F17. 3	Yaşadığınız evin koşullarından ne kadar hoşnutsunuz?	1	2	3	4	5
24 F19. 3	Sağlık hizmetlerine ulaşma koşullarınızdan ne kadar hoşnutsunuz?	1	2	3	4	5
25 F23. 3	Ulaşım olanaklarınızdan ne kadar hoşnutsunuz?	1	2	3	4	5

Aşağıdaki soru son iki hafta içinde bazı şeyleri **ne sıklıkta** hissettiğiniz ya da yaşadığınıza ilişkindir.

		Hiçbir zaman	Nadiren	Ara sıra	Çoğunlu kla	Her zaman
26 F8.1	Ne sıklıkta hüzün, ümitsizlik, bunaltı, çökkünlük gibi olumsuz duygulara	1	2	3	4	5

		Hiç	Çok az	Orta derecede	Çokça	Aşırı derecede
U. 27	Yaşamınızda size yakın kişilerle (eş, iş arkadaşı, akraba) ilişkilerinizde baskı ve kontrolle ilgili zorluklarınız ne	1	2	3	4	5

Bu formun doldurulmasında size yardım eden oldu mu?

.....

Bu formun doldurulması ne kadar süre aldı?

.....

Soru formu ile ilgili yazmak istediğiniz görüş var mı?

APPENDIX H

INFORM CONSENT

Sayın Katılımcı,

Bahçeşehir Üniversitesi Klinik Psikoloji Yüksek Lisans öğrencisi Psikolog Sıla DERİN, Doç. Dr. Metehan IRAK'ın danışmanlığında Obsesif Kompulsif Bozuklukta Bilişsel Süreçler konulu tez çalışmasını yürütmektedir. Proje ekibinde ayrıca Yedikule Surp Pırgiç Ermeni Hastanesi Vakfı'nda çalışmakta olan Uzm. Dr. Ayşe Ceren Korulsan Öğütçen ve Uzm. Klinik Psikolog Oya MORTAN Sevi de yer almaktadır.

Bu çalışmanın size herhangi bir zararı bulunmamaktadır. Çalışmaya katılmayı kabul ettiğiniz takdirde, size sunulan ölçekleri ve bilgisayar ortamında gerçekleştirilecek ilgili uygulamaları tamamlamanız gerekecektir. Size verilecek olan bu ölçekleri ve bilgisayar ortamında gerçekleştirilen uygulamaları tam ve doğru bir şekilde doldurmanız/tamamlamanız çalışmanın gidişatı açısından oldukça önemlidir.

Bu çalışmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında herhangi bir sebep göstermeden çalışmadan ayrılma hakkına sahipsiniz. Araştırma kapsamında tüm kişisel bilgileriniz ve verdiğiniz cevaplar gizli tutulacaktır. Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen araştırmayı yürüten Psikolog Sıla DERİN ile iletişime geçebilirsiniz (E-Posta: siladerin@gmail.com).

Bu çalışma Yedikule Surp Pırgiç Ermeni Hastanesi Vakfı Etik Kurulu tarafından onaylanmıştır. Eğer bu araştırma projesine katılmayı kabul ediyorsanız lütfen aşağıdaki formu imzalayınız.

Ben (Katılımcının Adı-Soyadı), yukarıdaki metni okudum ve katılmam istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

Katılımcının;

Adı-Soyadı:

İmzası:

Tarih: (gün/ay/yıl): .../.../....

Telefon No:

E-mail:

Araştırmacının;

Adı-Soyadı:

İmzası:

APPENDIX I
SOCIO-DEMOGRAPHIC INFORMATION FORM

Cinsiyet: ☐ Kadın ☐ Erkek

Yaş: Doğum Tarihi (G/A/Y):

Medeni Durum: ☐ Evli ☐ Bekar ☐ Birlikte yaşıyor ☐ Diğer

Eğitim Durumu: ☐ Okuryazar değil ☐ Lise Mezunu
☐ İlkokul Mezunu ☐ Üniversite Mezunu
☐ Ortaokul Mezunu ☐ Yüksek Lisans ve üstü

Çalışma Durumu: ☐ Çalışıyor ☐ Çalışmıyor ☐ Emekli

Aylık Gelir Düzeyi: ☐ 774 TL ve altı ☐ 2001 TL -3000 TL
☐ 774 TL- 1500 TL ☐ 3001 TL-5000 TL
☐ 1501 TL-2000 TL ☐ 5001 TL ve üzeri

Renk Körlüğü: ☐ Var ☐ Yok

El Tercihi: ☐ Sağ ☐ Sol ☐ Her ikisi

Geçirdiğiniz önemli bir tıbbi rahatsızlık var mı? ☐ Evet ☐ Hayır

Varsa açıklayınız:

.....

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.....

Geçirdiğiniz tıbbi rahatsızlık ile ilgili bir tedavi aldınız mı? ☐ Evet ☐ Hayır

Varsa Açıklayınız (Tedavi Türü/ Süresi) :

.....

.....

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.....

Sürekli kullandığınız bir ilaç var mı? ☐ Evet ☐ Hayır

Varsa açıklayınız:

.....

.....

.....

.....

Geçirdiğiniz önemli bir kaza/yaralanma var mı? ☐ Evet ☐ Hayır

Varsa Açıklayınız:

.....

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.....

Geçirdiğiniz kaza/yaralanma ile kullandığınız bir ilaç var mı? ☐ Evet ☐ Hayır

Varsa açıklayınız:

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.....

Geçirdiğiniz önemli bir psikolojik ya da nörolojik bir rahatsızlık var mı?

☐Evet ☐Hayır

Varsa Açıklayınız:

.....
.....
.....
.....
.....
.....

Bu sorun ilk ne zaman başladı? Yıl:

Bunun ile ilgili bir tedavi aldınız mı? ☐ Evet ☐ Hayır

Varsa açıklayınız (Tedavi Türü/Süresi):

.....
.....
.....
.....

Ailenizde herhangi bir tıbbi rahatsızlık var mı? ☐ Evet ☐ Hayır

Varsa açıklayınız:

Anne:

Baba:

Kardeşler:

Diğer:

Ailenizde herhangi bir tıbbi rahatsızlığı olan varsa bunun ile ilgili bir tedavi aldı mı?

☐ Evet ☐ Hayır

Varsa Açıklayınız (Tedavi Türü/ Süresi):

Anne:

Baba:

Kardeşler:

Diğer:

Ailenizde herhangi bir psikolojik ya da nörolojik rahatsızlığı olan var mı?

☐ Evet ☐ Hayır

Varsa açıklayınız.

Anne:

Baba:

Kardeşler:

Diğer:

Ailenizde herhangi bir psikolojik ya da nörolojik rahatsızlığı olan varsa bunun ile ilgili bir tedavi aldı mı?

- ☐ Evet ☐ Hayır

Varsa Açıklayınız (Tedavi Türü/ Süresi):

Anne:

Baba:

Kardeşler:

Verilen Ölçekler

- ☐ Yale-Brown Obsesyon Kompulsiyon Derecelendirme Ölçeği
- ☐ Maudsley Obsesif Kompulsif Soru Listesi
- ☐ Beck Depresyon Envanteri
- ☐ Beck Anksiyete Envanteri
- ☐ Durumluk-Sürekli Kaygı Envanteri
- ☐ Üst Biliş Ölçeği-30
- ☐ Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği Türkçe Kısa Formu

Notlar: