Transdiagnostic Approach and Obsessive Compulsive Disorder

Tanılar Üstü Yaklaşım ve Obsesif Kompulsif Bozukluk

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ABSTRACT

The categorical approach of traditional psychiatric nosology has been a forceful approach for a very long time for explaining psychological disorders which are defined by symptom based diagnostic categories. However, in recent years, the importance of the "transdiagnostic" approach which is a new classification system is increasing. The transdiagnostic approach aims to examine dimensionally the common cognitive, behavioral, interpersonal and biological processes underlying many psychopathologies away from the categorical approach that classifies psychopathologies according to observable symptoms. This approach intends to treat the disorders through the common underlying processes and risk factors, thus heterogeneous and comorbid symptoms are better addressed and diagnostic categories that may change during treatment are avoided. In this review study, the current problems in diagnosing based on classification and gaps in the field were examined, and the approach itself was proposed as a solution. RDoC (Research Domain Criteria) which is a new classification system for psychiatric disorders within the scope of the approach, has created a new structure using modern research approaches in genetics, neuroscience and behavioral sciences. In the present study, the definition and emergence of the transdiagnostic approach, obsessive compulsive disorder and RDoC in the context of transdiagnostic approach and transdiagnostic treatment are explained. This review is intended to be a resource for both basic psychopathology research and the development of treatment methods within the framework of a transdiagnostic approach.
Keywords: Transdiagnostic approach, Research Domain Criteria, comorbidity, obsessive compulsive disorder

ÖZ

Psikiyatrik bozuklukların açıklanmasında geleneksel psikiyatrik nozolojinin kategorik yaklaşımı uzunca bir süredir hakim yaklaşım olmuş ve bozukluklar belirtilere dayalı tanı kategorileriyle tanımlanmıştır. Ancak son yıllarda geleneksel tanı sınırlarının ötesine uzanan yeni sınıflandırma sistemi olan "transdiagnostic" yani "tanılar üstü" yaklaşımın önemi giderek artmaktadır. Yaklaşım, psikopatolojileri gözlemlenebilir belirtilere göre sınıflandıran kategorik yaklaşımdan uzaklaşıp boyutsal olarak pek çok psikopatolojinin altında yatan ortak bilişsel, davranışsal, kişilerarası ve biyolojik süreçlerin incelenmesini amaçlamaktadır. Belirtilerin ötesinde bozuklukların altında yatan ortak süreçler ve risk faktörleri üzerinden tedavi etmeyi böylelikle heterojen ve eştanı belirtileri daha iyi ele alabilmeyi ve tedavi sırasında değişebilen tanı kategorilerinden uzak kalmayı hedeflemektedir. Bu derleme makalesi ile sınıflandırmaya dayalı tanı konmasındaki mevcut sorunların ne olduğu ve alandaki boşluklar incelenmiş, yaklaşımın kendisi bir çözüm önerisi olarak sunulmuştur. Bu kapsamda psikiyatrik bozukluklar için yeni bir sınıflandırma sistemi girişimi olan RDoC (Research Domain Criteria - Araştırma Alanı Ölçütleri); genetik, sinirbilim ve davranış bilimlerindeki modern araştırma yaklaşımlarını kullanarak yeni yapı ortaya koymuştur. Bu çalışmada tanılar üstü yaklaşımın tanımı ve ortaya çıkışı, tanılar üstü yaklaşım bağlamında obsesif kompulsif bozukluk ve RDoC, tanılar üstü tedavi yaklaşımı aktarılmıştır. Bu derleme çalışmasının tanılar üstü yaklaşım çerçevesinde hem temel psikopatoloji araştırmalarında hem de tedavi yöntemlerinin geliştirilmesinde kaynak olması amaçlanmıştır.
Anahtar sözcükler: : Tanılar üstü yaklaşım, araştırma alanı ölçütleri, eştanı, obsesif kompulsif bozukluk

Introduction

The increasing prevalence of psychiatric disorders reveals the necessity of further research to improve the available knowledge in this area. For more than half a century, the common way of conceptualizing psychological disorders has been to group them into taxonomic classification systems by categorizing diagnoses according to related symptoms. Psychiatric nosology (classifiation of diseases according to etiology, pathogenesis, or symptoms) is traditionally represented by ICD (International Classification of Disease) and DSM (The Diagnostic and Statistical Manual of Mental Disorders), which are based on categorically classified diagnoses

(APA 2013). However, in recent years, the importance of the transdiagnostic approach, which radically leaves the traditional diagnostic criteria and goes beyond taxonomy, has been increasing in explaining psychiatric disorders.The prefix "trans," which comes from Latin, means through or beyond (Fusar-Poli et.al., 2019), and, therefore, the approach is referred to as a transdiagnostic literature. This approach has been proposed as an alternative to single diagnosis protocols to better handle the processes underlying the disorders and their associated comorbidities. In this context, transdiagnostic approach focuses on symptoms dimensionally, explores the biopsychosocial processes underlying the disorder, and lays out a framework for treating comorbidities. As a result, explaining psychopathological disorders from a transdiagnostic framework will aid conceptual understanding of the complex comorbid patterns in disorders (McHugh et al.2009) and increase the number of treatment approaches that address comorbid disorders simultaneously (Mills and Marel 2013). Although transdiagnostic approach has been studied with different classes of disorders, very few studies have been conducted on the explanation of obsessive compulsive disorder (OCD) according to this approach.

This compliance has two purposes. The first one is to convey the definition of the concept of transdiagnostics and how this approach was formed. The second one is to illuminate OCD within the framework of the transdiagnostic approach and explain the relationship between some concepts and OCD within the framework of this approach.

Definition of Transdiagnostic Approach

Transdiagnostic approach, which is thought to reflect the common process (temperament, cognitive, emotional, behavioral, and interpersonal) underlying many psychopathologies in recent years, can be defined as an attempt to learn the common psychological processes underlying clinical symptoms rather than focusing on separate diagnostic categories. The transdiagnostic process is defined as the mechanism that may be a risk factor or a susceptibility factor for the disorder, and these processes cover the areas of attention, memory, thinking, reasoning, and behavior. Therefore, in this sense, the idea of transdiagnostic might be seen as a "building block" related to psychiatric diseases (Harvey et al.2004).

Defining the boundaries between normal and abnormal behavior in the field of mental health has been one of the most basic fundamental research topics in the literature (Widiger and Clark, 2000). In this definition, two opposing views have been debated over the years. The first is the "split" approach, which suggests that defining a larger number of diagnoses is the best way to understand mental disorders. The second is the "lumper" approach, which emphasizes the similarities between psychopathologies and proposes multidimensional psychopathology models (Cuthbert 2005, Barlow et al. 2014). Transdiagnostic approach emerged as a middle ground between these two views (Harvey et al. 2004, Kring and Sloan 2009) and aims to emphasize the common aspects of different psychopathologies (Norton and Paulus 2017). The utility of existing psychiatric classifications based on categorical diagnoses such as ICD and DSM have still been discussed. Studies report that the approach of categorizing diagnoses by "splitting" with DSM-5 may decrease their validity while increasing their reliability (Barlow et al. 2014).

Since disorders have some common etiological and maintenance variables, the primary goal of the development of the transdiagnostic approach is to produce a better categorization system beyond the current categorical diagnostic classification. Another goal is the proliferation of psychopathology-specific treatment guidelines and the use of interventions or treatments specific to psychopathology for comorbidities (Newby et al. 2015). To formulate classification, conceptualization, and treatment frameworks for mental diseases, studies that adopt a transdiagnostic approach aim to perform research that focuses on common features that indicate psychopathology rather than symptom-focused studies. Moving from a single diagnostic approach to a transdiagnostic conceptualization is an important paradigm shift in the treatment of mental disorders. The "transdiagnostic" approach has become a potential alternative in this context in recent years. This approach is expected to make it better at classifying and treating mental disorders, moving beyond and reducing the existing categorical diagnosis system.

Emergence of the Transdiagnostic Approach

The American National Institute of Mental Health (NIMH) aimed to develop research guidelines that reject traditionally defined symptom based diagnoses and emphasize the mechanisms underlying disorders. Therefore, it was stressed that clinical structures should be defined on the basis of their neurobiological validity and the Research Domain Criteria (RDoC) project was started (Insel et al. 2010). Unlike DSM criteria established by the American Psychiatric Association, this research project aimed to generate a biologically valid framework for

understanding mental disorders. In this context, RDoC is actually an attempt to create a new classification system for mental disorders. The RDoC project, created by NIMH under the direction of Thomas Insel for the diagnosis of psychiatric disorders, defines it based on the identification of symptoms that tend to cluster together clinically and whether these symptoms occur, recur, or become chronic. RDoC embodies the essence of the "lumper" approach as it classifies disorders based on dimensional and multiple analyses rather than symptom-based assessment (Insel 2013). RDoC decides to move away from diagnostic categories toward multiple methodologies and units of analysis. This conceptual framework is designed to integrate various types of information including genetic, molecular, cellular, behavioral, physiological, and self-reported reports (Cuthbert & Kozak, 2013). On the other hand, RDoC is not intended to serve as a diagnostic guide or to replace existing diagnostic systems. The goal is to comprehend the nature of mental problem and illness in terms of different degrees of biological and psychological system malfunction and to offer deeper understanding of the underlying biological and cognitive processes that result in illness. In addition, another aim is to explain how this approach can shed light on some important points in psychopathology research and to emphasize the contribution made to the transdiagnostic approach with the data obtained from existing case control studies (Goschke 2014).

RDoC contains various structures, and these structures provide information about emotion, cognition, motivation, and social behavioral systems. Measurements of structures can be made using several variables or units of analysis, including genetic, physiological, behavioral, and self-report evaluations. The information obtained using RDoC can be used to create tools that can screen for psychological disorders and to develop diagnostic systems and treatments (Insel 2010). This project has been the relevant focus of the literature, as the current conceptualization of psychiatric symptoms has remained the same for more than 100 years, and it has proven to be relatively far from the level of neuroscientific inquiry necessary for the development of new treatments for psychiatric symptoms (Maj 2016). The RDoC project, which tries to explain mental disorders on the basis of genetics, neuroscience, and behavioral fields, aims to create a new understanding in the classification of mental disorders. There are also updates in the RDoC matrix with new studies (NIHM 2018).

RDoC attempts to explain disorders by defining six basic structures: (Table 1): Negative valence systems encompass reactions to negative situations such as fear, anxiety, or loss. Positive valence systems enclose responses to positive situations such as reward-seeking behavior. Cognitive systems subsume all cognitive processes such as attention, memory, perception, language, and cognitive control. Social processes involve how one relates to other people. Arousal and regulatory systems comprise homeostatic regulation of content such as sleep and energy balance. Sensorimotor systems involve maintaining and controlling motor behavior. Under each of these large areas are multiple structures. Explanations of peculiar disorders are made based on these structures: genes, molecules, cells, circuits, physiology, behavior, self-reports, and approaches (Kozak and Cuthbert 2016). By highlighting the similarities of traditional psychiatric diagnoses, measurements with these aid in better understanding the neural mechanisms underlying disorders.

Table 1. RDoC matrix (NIHM 2018)

Genes	Molecules	Cells	Circuits	Physiology	Behavior	Self-Report	Paradigms
RDoC Matrix							
Negative Valence Systems	Positive Valence Systems		Cognitive Systems		Social Processes	Arousal and Regulatory Systems	Sensorimotor Systems
Acute Threat (Fear)	Reward Responsiveness		Attention		Affiliation and Attachment	Arousal	Motor Actions
Potential Threat (Anxiety)	Reward Learning		Perception		Social Communication	Circadian Rhythms	Agency and ownership
Sustained Threat	Reward Valuation		Declarative Memory		Perception and understanding of self	Sleep and wakefulness	Habit
Loss			Language		Perception and understanding of others		Innate motor patterns
Frustrative Nonreward			Cognitive Control				
			Working Memory				

RDoC: Research Domain Criteria

A Transdiagnostic Approach to OCD

Classification of psychological disorders has been based on clinical variation and overlap of symptoms or complexity of underlying neurobiological and psychological mechanisms. The difficulty of classification is also valid for comorbidities, and the boundaries within disorders have been the subject of constant debate in the literature. The conceptualization of disorder in relation to phenomenologically similar psychopathologies influences diagnostic evaluation and clinical interventions to identify relevant mechanisms in the context of etiology. Suggestions have been made to move away from the use of DSM categories to create new and biologically based transdiagnostic factors that may play an important role in multiple disorders (Robbins et al. 2012, Cuthbert and Kozak 2013). Its purpose is to develop evidence-based drugs and to establish a medical model. The transdiagnostic approach emphasizes that diagnostic tools for OCD should focus on improving treatments both behaviorally and pharmacologically and identify possible risk factors for early intervention in the future. To this end, new types of longitudinal studies are needed that can evaluate which cognitive tests or brain metrics have the most clinically useful properties (Gillan Fineberg and Robbins 2017).

OCD phenomenology in its current form is difficult to fit into the OCD matrix, as the RDoC matrix needs to be expanded to fully explain some aspects of OCD symptomatology. More research is required to determine which RDoC constructs are crucial for understanding OCD. While most of the existing studies in the literature focus on negative value systems and positive value systems, less attention has been paid to other structures that may play an important role in OCD, such as cognitive systems, social processes, arousal and regulatory systems, and sensory-motor systems. An OCD-specific description is provided below for the constructs of the RDoC matrix, which is based on the transdiagnostic approach.

1. Negative Valence Systems

The vast majority of treatment research on OCD contains the negative value system of the RDoC matrix. The negative value system is associated with anxiety and fear, as it includes responses to disturbing situations or contexts (Insel et al. 2010). How the supradiagnostic approach works will be explained in detail through the two "Acute Threat" and "Potential Threat" under the Negative Value Systems. Studies on how these two subconstructs fit into OCD are based on genes, molecules, cells, circuits, physiology, behavior, self-reports, and approaches. The negative values system is a particularly important area of the RDoC matrix for research on OCD. The majority of studies addressing OCD treatment in the framework of the transdiagnostic approach refer to the negative valence system encased in the RDoC matrix.

This scheme specifies "Potential threat", which is defined as an anxiety reaction that is distant, ambiguous or low in probability (NIHM 2018). Anxiety remains at the centre stage in the lives of many individuals with OCD and such individuals tend to exhibit high anxiety sensitivity (Zeitlin and McNally 1993), overestimation of threat (Kalanthroff et al. 2017), and harm avoidance (Pallanti et al. 2017). Potential threat is generally associated with uncertainty and individuals with OCD report severe discomfort with uncertainty (Pushkarskaya et al. 2015; Jacoby and Abramowitz, 2017). The neural circuits and mechanisms underlying anxiety have been examined extensively in both humans and animals. The amygdala, hippocampus, bed nucleus of the stria terminalis (BNST), frontal cortex and hypothalamus are among the structures that play a role in the emergence of anxiety (response to possible and unclear threat) and fear (reaction to acute threat) (Calhoon and Tye, 2015, Avery et al. 2016). Furthermore, avoidance of uncertainty is associated with the activity between the amygdala and frontal insula and with the cortical connection (Admon et al. 2012; Grupe and Nitschke, 2013). In neurological terms, however, the response to potential threat (anxiety) is reported to be interrelated with high cortisol levels (Elnazer and Baldwin, 2014).

The RDoC matrix differentiates between acute threat (fear) and potential threat (anxiety). Animal studies on the underlying mechanisms of the experience of fear report that the amygdala plays an especially important role in this circuit (Calhoon and Tye 2015). Animal studies indicate that the amygdala does assume a central role in the regulation of acute threat (fear) but anxiety is more closely associated with a small nucleus called BNST situated in the ventral telencephalon in close proximity to the ventral striatum, insula, amygdala, hippocampus, and hypothalamus (Davis et al. 2010, Avery et al. 2016). This distinction between responses to acute and potential threats is also supported by pharmacological studies. Common anti-anxiety medications including benzodiazepines and SSRIs alleviate chronic fear/anxiety behaviours but remain ineffective against certain types of fears. Nevertheless, Buspirone, a 5-HT1A agonist, is able to alleviate phasic yet chronic fear behaviours (Miles et al. 2011).

2. Positive Valence Systems

Positive valence systems are defined as the systems that are primarily responsible for responses to positive motivational situations or contexts, such as reward-seeking and habituation. There are a series of processes under "Reward Learning", one of the constructs of this definition that are associated with OCD. Reward Learning refers to processes when a novel reward occurs or a reward is provided repeatedly (Insel et al. 2010). "Habit Learning", a concept included under reward learning, describes sequential, repeated, motor or cognitive behaviors that is triggered by a variety of stimuli and, once initiated, can be completed without constant conscious oversight (NIHM 2019). Habits are a normal part of human experience and reinforce the reliability of routine behaviours. However, excessive reliance on habits that do not fit the situation or frequently lead to undesired consequences may cause some problems. The association between habits and compulsions are important for the transdiagnostic approach to OCD symptomatology. The relaxation that follows the occurrence of a compulsion negatively reinforces and thus strengthens the behaviour (Pittenger et al. 2017). In the scope of this association, which is supported by anatomical data, the cortico-striatal circuit, long known to have a role in the pathophysiology of OCD, was observed to be associated with habit formation and maintenance (Graybiel 2008). Habits are operationally characterised as learned behaviours that are maintained regardless of whether they are motivated by an ongoing pursuit of a goal (Dickinson 1985, Gillan 2017). One way to describe a behaviour as a habit would be the devaluation of consequences, whereby the consequence has come to be associated with a behaviour that is either undesired or no longer necessary. For example, if a mouse in a cage can press a button to get food but continues to press the button even when it is not hungry, the behaviour of pressing the button may be considered to have become a habit. Animal experiments have been carried out to examine compulsive behaviours and habitual behaviours, which collectively have an important place in OCD (Gillan, Fineberg and Robbins, 2016; Fineberg et al. 2018). The circuits and neural processes underlying habit learning have been studied extensively in animal models (Smith and Graybiel 2016, Graybiel 2018) and an imbalance between goal-oriented behaviour and habitual behaviour was found to be associated with anomalies in cortico-basal ganglion circuits (Graybiel 2018).

3. Cognitive Systems

Cognitive systems are responsible for a variety of cognitive processes and encompass such constructs as attention, language, cognitive control, and working memory. Most areas encased in this construct function through the regulation of other systems in the brain and therefore, the relevant constructs interact with other RDoC constructs. Among these areas, "Cognitive Control" is a system that modulates cognitive and emotional systems to bring out a goal-oriented behaviour and is, as a mechanism, activated in the process of selecting appropriate responses among alternatives (Insel et al. 2010). Disruptions in cognitive control may contribute to the occurrence or maintenance of various disorders by way of their impact on emotional or cerebral processes (Anderzhanova et al. 2017). Given the fact that compulsion stems from a disruption in the ability to employ goal-oriented strategies to control behaviour (Voon 2015, Gillan et al. 2017, Fineberg 2018), cognitive control is a construct of influence in OCD. Impairment in cognitive control is especially associated with dysfunction in the orbitofrontal cortex (OFC), and abnormalities in OFC are frequently detected in functional imaging studies on OCD (Haber 2017).

4. Social Processes

The social process structure has four substructures: self-perception and understanding, social communication (verbal and nonverbal), affiliation and attachment, and social communication (verbal and nonverbal). The RDoC defines attachment as selected relationship as a result of the establishment of a social tie and affiliation as having pleasant social contacts with other individuals. Social communication is defined as a dynamic process involving both receptive and productive aspects used for exchange of socially relevant information. Self-awareness and cognitive/emotional processes or representations involved in making judgments about oneself are the definitions of self-perception and self-understanding. Finally, perceiving and understanding others are defined as the processes or representations of being aware of other entities, accessing information about them, and using reasoning and judgment about them in the face of cognitive or emotional states (Insel, et al. 2010).

There are various definitions provided in literature for empathy; however, there are two universally acknowledged components to this concept, namely cognitive skills for perspective-taking and emotional responses to others' feelings (Jackson et al. 2015). Pino et al. (2016) compared the ability to represent one's own or others' mental states (mentalizing) and sharing the inner states of others (experience sharing) between individuals diagnosed with OCD and control subjects. The authors found a deficit in mentalizing skills (ability

to understand others' knowledge, beliefs, emotions, intentions, and mental states) of individuals with OCD when compared to control subjects. In the context of experience sharing, the OCD group was observed to be able to empathise with the emotional experience of other people in positive situations (positive valence system) yet to fail to exhibit the same empathy in negative situations (negative valence system). The ability to describe and show emotion through facial expressions plays an important part in human social interaction. Bersani et al. (2012) examined the ways in which individuals with schizophrenia and obsessive-compulsive disorder experience and display emotions. For the purposes of this study, the authors recorded videos of facial actions of individuals with schizophrenia, individuals with obsessive-compulsive disorder, and healthy controls utilising the Facial Action Coding System (FACS), which is essentially based on the anatomical analysis of facial muscle activation and relaxation. Individuals with schizophrenia and obsessive-compulsive disorder exhibited more incongruent emotive feelings and facial expressions when compared to healthy controls. This finding may be considered a result of the two disorders having a common neurological origin.

5. Arousal and Regulatory Systems

The arousal and regulatory systems are responsible for creating the activation of the nervous system and ensuring the proper regulation of systems such as sleep and energy. Arousal, circadian rhythms, and sleep-wakefulness are the three basic constructs (Insel et al. 2010). Sleep disorders are quite common in obsessive compulsive disorder; 48% of patients report these disorders (Paterson et al. 2013). In comparison studies with OCD patients and healthy controls, it was found that OCD patients mostly had a decrease in sleep duration and quality, and an increase in nighttime awakenings (Hohagen et al. 1994; Voderholzer et al. 2007). In addition, poor sleep quality was associated with the severity of OCD symptoms (Robinson et al. 1998). A meta-analysis study shows that sleep disturbance, especially the deterioration in sleep duration, is associated with OCD (Nota et al. 2015). Kluge et al. (2007) conducted polysomnography (a sleep study recording relevant data overnight) on a group of subjects with and without OCD and found disruptions in the REM period among individuals with OCD. Furthermore, some individuals with OCD were observed to exhibit disruptions/shortening in the SOREM period (the phase covering the first 15 minutes after sleep onset) and the same individuals were found to have significantly more severe OCD symptoms.

6. Sensory Motor Systems

Sensory-motor systems are mainly responsible for controlling, executing, and improving motor behavior. This system was added to the RDoC matrix in 2019 and is aimed at helping develop effective treatments by identifying the role of this construct and its subconstructs in disorders (NIMH 2019). Most of the studies in the literature covering motor systems have essentially focused on psychotic disorders and more specifically schizophrenia and only a handful of studies actually examined motor system abnormalities comparatively in the context of different diagnoses. One such study looked into the behaviours appearing as symptoms of Catatonia (reduced motor activities, extreme negativism, not speaking, muscle stiffness, and resistance to being moved, etc.) and found that individuals with OCD had significantly lower levels of catatonia when compared to individuals with schizophrenia but higher levels of catatonia when compared to healthy controls (Bolton et al. 1998). Russo et al. (2014), addressing the issue of sensory-motor integration, found better reductions in "short-latency afferent inhibition" in drug naïve OCD patients compared to healthy individuals using the Transcranial Magnetic Stimulation (TMS) technique, which allows for the testing of inhibition and arousal circuits by stimulating brain cells that potentially improve communication between different parts of the brain. Short-latency afferent inhibition refers to the modulation of motor response by sensory stimulation through peripheral electrical nerve stimulation achieved with motor cortex stimulation with TMS (with short interstimulus intervals of 20 ms) (Tokimura et al. 2000). This study supports the argument that OCD actually stems from a disruption in the sensory-motor area and implies that a dysfunction of sensory-motor integration may play an important role in the appearance of motor compulsions.

The Transdiagnostic Approach to OCD and Associated Disorders

Fontenelle et al. (2020) researched the RDoC constructs of relevance for disorders associated with OCD. The authors identified these constructs using the Delphi technique, which is a method for consensus commonly employed in mental health research to reach the most reliable agreement on a certain matter in a group of experts. The authors, using this method, identified world-renowned experts with clinical or research experience in OCD and associated disorders relying on certain criteria (at least 5 years of experience, a track record of more than 50 peer-reviewed journal articles, and fluency in written and spoken English). The experts thus identified

were then categorized into lists according to their specialization, years of service, number of publications, countries, and institutions, and the sample were invited to take part in the research study by email. The invitation was extended to 71 individuals, 46 of whom confirmed their participation, but in the end, there were 34 experts taking part in the study. The study found the following constructs to be of significance: "Habits" in the Reward Learning construct of the positive valence systems and "Response Selection/Inhibition" and "Performance Monitoring" in the Cognitive Control construct of the cognitive systems in the RDoC, as well as "Compulsivity", which is not included in the RDoC framework, but was considered to have relevance.

In this context, Habits, as a subconstruct, refers to sequential, repetitive, motor, or cognitive behaviours appearing unconsciously when elicited by internal or external triggers. Examples include compulsive, repetitive, or stereotypical behaviours. Response Selection; Inhibition/Suppression refers to the process of selecting the appropriate action in response to a stimulus in contrast with goal-oriented behaviour. When the response elicited by the stimulus remains inadequate in meeting the needs of the context, it may result in suppression. Performance monitoring refers to the system that is responsible for modulating cognitive and emotional systems, serves goal-oriented behaviours, and allows for feedback learning making it possible to make behavioural adjustments as a means to optimising desired behaviours. Finally, compulsivity is defined as the tendency to repeat behaviours that appear as a means of harm avoidance or anticipation of negative outcomes due to a disruption in the cognitive control system (NIHM 2017). These three RDoC constructs considered to be of relevance to OCD and associated disorders are consistent with the conventional theoretical OCD model covering emotion, cognition, and behaviour (Oberbeck et al. 2013). Even though compulsivity has not yet been added to the RDoC matrix, there are studies in the literature that point out to its relevance and argue for its inclusion in the RDoC system (Figee et al., 2016; Fontenelle et al., 2020). However, future research protocols should incorporate specific studies measuring and assessing a variety of constructs (genes, molecules, cells, circuits, and physiological processes, etc.).

The transdiagnostic approach to OCD and accompanying disorders may be clarified further with information on a study addressing error-related brain activity. There is an etiological challenge in identifying the myriad genetic, epigenetic, and environmental factors contributing to the development of OCD, an effort further complicated by the need to determine the interrelations between these factors (Pauls et al. 2014). The relatively new concepts of RDoC and endophenotypes are expected to be instrumental in overcoming these challenges. The term endophenotype is used to divide behavioural symptoms into phenotypes with a genetic connection and represent genetic, biological, or psychological factors which are assumed to be etiologically close to genes and disease mechanisms (Gottesman and Gould 2003). In order for a disorder to be defined as an endophenotype, it must be transmitted with the other condition, must be genetically inherited, detectable in the active or passive states of the condition, and must be found at a higher incidence among family members without the condition than the general population (Ulaş et al. 2008). A study setting off to determine electrical brain signals to identify endophenotypes by measuring electrical activity that occurred after individuals made errors during various choice tasks and as a result, found an increase in electrical waves called amplitudes among OCD patients (Endrass and Ullsperger 2014, Riesel 2019). However, amplitudes can also be observed in the presence of certain symptoms that do represent the essential characteristics of OCD but are shared by other disorders, as well, including repetitive behaviours (Manoach and Agam 2013), worry (Moser et al. 2013), , control (Weinberg et al. 2015), and anxiety tendency (Cavanagh and Shackman 2014). Similarly, increase in amplitudes is not a finding unique to OCD and has been observed in the presence of generalized anxiety disorder (GAD), social anxiety, health anxiety, and, albeit less consistently, depression (Manoach and Agam 2013, Endrass et al. 2014, Weinberg et al. 2015, Gillan et al. 2017, Riesel et al. 2017). On the contrary, lower amplitudes were found to be pronounced in schizophrenia, bipolar disorder (Minzenberg et al. 2014), and substance abuse disorder (Manoach and Agam 2013, Gillan et al. 2017). In light of the conclusions of all of the studies above, brain activity is described as a promising transdiagnostic endophenotype expressed in the form of a decrease or an increase in neural error signals for different types of psychopathologies. In addition, Riesel et al. (2019) measured "error-related negativity" (ERP), which stands for negativity in the electrophysiological marker that represents the changes in dopamine in case of an error made in cognitive tasks and found increased amplitudes in the electrical activity signals called "error-related negativity" among individuals with OCD and their first-degree relatives without OCD and anxiety disorder. Similarly, decreased ERN amplitudes were identified among the non-substance-using first-degree relatives of individuals with substance abuse disorder. The conclusions of these research studies support the utilisation of variations in ERN (increased or decreased) arising from changes in neural error signals as a transdiagnostic endophenotype and point out to a common aetiology shared with comorbidities.

Transdiagnostic Treatment

Transdiagnostic models are expected to improve therapy outcomes, particularly in comorbid situations. The transition from impacting differences between disorders to common aspects and shared processes has affected the development of transdiagnostic treatments. Therefore, transdiagnostic approach focuses on the common aspects of disorders rather than the symptom differences between disorders, and the client is taught a number of basic skills to apply across the wide range (McManus 2010).

Although the evidence for "transdiagnostic treatments" is quite limited, studies are still in progress (Norton et al. 2004, McEvoy and Nathan 2007, Norton 2008, Norton et al. 2008, Norton and Philipp 2008). While it is unclear whether the change resulting from the treatment result is caused by transdiagnostic approach factors or other factors that may be common to all psychotherapies, current research and meta-analytical studies also support the effectiveness of transdiagnostic approach. (DeRubeis et al. 2005, Stiles et al. 2008, Farchione 2012, Reinholt 2014, Dear 2015, Newby et al. 2015, Pearl and Norton 2017, Tulbure 2018, Fusar-Poli et al. 2019). However, experimental studies are needed to determine whether or not transdiagnostic approaches are advantageous compared to disorder specific treatments.

In order to effectively use the various interventions defined as "transdiagnostic", it is necessary to establish a technical background. Some criteria have been suggested to determine what the methods of transdiagnostic intervention will be based on and whether they can be accepted. These criteria can be a good starting point for determining the transdiagnostic treatment definition. Firstly, Mansell and colleagues (2009) have put forward some criteria to determine whether a concept can be considered transdiagnostic. In order to analyze a psychological variable as being transdiagnostic, it should be evaluated both in a clinical and non-clinical sample, it should be present in at least four disorders, and the appearance of the transdiagnostic structure in all disorders should be examined. Treatments that handle multiple diagnoses provide several advantages compared to single diagnostic protocols, thus new psychological interventions are developing that directly target diagnoses. Sauer Zavala and colleagues (2017) have identified three broad treatment categories to explain how to perform the transdiagnostic treatment: Universally Applied Therapeutic Principles, Modular Treatment, Shared Mechanism Treatment.

Universally applied therapeutic principles usually include explanations on how treatment should be implemented based on traditional psychotherapy methods (psychodynamic, cognitive behavioral therapy, and mindfulness based therapies). It represents the existence of techniques that are universally and traditionally applied to the majority of psychopathology. It guides the course of treatment without explicitly considering whether all disorders treated with a particular technique are maintained by the same basic processes and whether all disorders are treated (Sauer Zavala et al. 2017). To give an example of the universally applied therapeutic principles, in the framework of cognitive therapy, patients are encouraged to identify cognitive distortions and reevaluate their experiences more realistically, while patients focus more on acceptance, cognitive separation, and awareness within the framework of acceptance and commitment therapy (Norton 2016).

Modular treatment represents the approach in which relevant intervention strategies are used to address issues presented by the client, regardless of diagnosis. In other words, it involves defining commonly used strategies to address specific problems rather than focusing on diagnosis, and these strategies are in a structure that can be shaped or changed in order of use according to the patient's requirements. Therefore, it can be considered an experimental approach, not a theoretical one. This method is thought to provide clinicians with higher efficiency because it allows clinicians to choose from evidence-based therapeutic strategies to create a consultative specific treatment (Sauer Zavala et al. 2017).

Shared mechanism treatment designs explain the mechanisms that are effective in the development and maintenance of these comorbid disorders.Interventions in this category are aimed more at underlying common mechanisms related to a class of disorder than at treatment (Sauer Zavala et al. 2017). Exposure practices can be shown as an example of shared mechanical treatments used in the treatment of anxiety disorders. Exposure involves encouraging the person to repeatedly approach the feared stimulus. The inclusion of exposure in the treatment of disorders such as OCD, GAD, and PTSD is based on the idea that the dangerous situation associated with the feared stimulus or the repeated preoccupation with anxiety provoking objects or situations eliminates anxiety (Sauer Zavala et al. 2017).

Treatments that handle multiple diagnoses provide several advantages compared to single diagnostic protocols, thus new psychological interventions are developing that directly target diagnoses. Many clinicians' criticism of the guidelines used for treatment of specific diagnoses has resulted in the emergence of transdiagnostic

treatment. Unified Protocol (Barlow et al. 2011), Transdiagnostic Cognitive Behavioral Therapy (Norton and Paulus 2016), Transdiagnostic Cognitive Behavioral Therapy for Eating Disorders (Fairburn et al. 2009), Group Anxiety Treatment Protocol (Norton 2012), Internet-Based Unified Protocol (Titov ve et al. 2010, Newby et al. 2013) are examples of the most applied and investigated diagnoses.

The most common Unified Protocol (UP) (Barlow and Arc, 2017) have significant findings associated with the treatment of disorders such as depression (Boswell et al. 2014), chronic pain (Allen et al. 2012), borderline personality disorder (Lopez et al. 2015) and anxiety disorders (Laposa et al. 2017, Reinholt et al. 2017). Unified Protocol (UP) consists of a total of 12–18 individual therapy sessions, each lasting between 50 and 60 minutes. The sessions are held weekly, but sessions can be scheduled once every two weeks. There are a total of eight modules which are: building motivation, psychoeducation, understanding emotions for treatment, mindful emotion awareness, cognitive flexibility, countering emotional behaviors, understanding and confronting physical sensations, emotion exposures, relapse prevention, and patients are encouraged to complete all of the modules (Barlow et al. 2011). As can be understood from the modules, UP is an emotion-oriented treatment approach. In a basic sense, the treatment is designed to help patients learn how to face and experience disturbing emotions and how to react to their emotions in more harmonious ways.

Table 2. Barlow Unified Protocol (Barlow et al. 2011, 2018)		
Module #	Modules	Focus in Session
1	Building Motivation for Treatment Engagement	Increasing the patient's readiness and motivation for behavior change, Articulating the positive and negative aspects of change and identifying steps to achieve goals
2	Psychoeducation and Understanding Emotions	Recognizing the nature of emotions, components of emotional experience, concept of learned responses, monitoring emotions, noticing common triggers and environmental conditions
3	Mindful Emotion Awareness	Teaching patients to stay in present and to observe and notice emotional experiences (including thoughts, sensations and behaviors) objectively without judging them, using mindfulness and emotional exercises
4	Cognitive Flexibility and Reappraisal	Teaching recognizes the role of maladaptive appraisals on emotions, changing maladaptive thinking, and strategies for assessing situations more flexibly to individuals.
5	Countering Emotional Behaviors	Teaching individuals to cope with emotion driven behaviors including behavioral avoidance, cognitive avoidance, and reassurance seeking.
6	Understanding and Confronting Physical Sensations	Exposure to stress related physical sensations to better understand the relationship between bodily sensations and thoughts/behaviors
7	Emotion Exposures	Exposure to negative emotions arising in situations unrelated to the situation itself and triggers related to intrinsic and extrinsic emotions designed to increase contextual learning
8	Relapse Prevention	To review treatment concepts, discuss further progress, and identify strategies to preserve gains and prepare for future challenges

Transdiagnostic Treatment of OCD

Transdiagnostic therapies are heterogeneous interventions that can be used to treat several disorders and address a wider range of disorders. Considering comorbidities of OCD, transdiagnostic treatment may facilitate the simultaneous treatment of symptoms associated with multiple diagnoses. Therefore, it allows the emergence of therapeutic approaches that target processes that link OCD and other disorders. In the study conducted by Allen and Barlow (2009) using UP in adults with primary diagnosis of OCD, it was found that emotion regulation training by using UP, which aims to prevent emotional avoidance, increase emotional awareness, and improve clients' tolerance to disturbing emotions, leads to a decrease in the severity of OCD. In a different study, UP was equally effective with exposure therapy in 33 adults with a primary diagnosis of OCD (Barlow et al. 2017).

Transdiagnostic cognitive behavioral therapy (tCBT) based on UP was applied to OCD patients with depression and anxiety disorders (generalized anxiety disorder, social phobia, or unspecified anxiety disorder), and it has been shown to be effective with tCBT in the treatment of OCD. Participants were randomly assigned to either the immediate treatment group or the delayed treatment group, and pre-test post-test, and one-month follow-up evaluations were obtained during the treatment process of 20 sessions, each of which lasted 1 hour. According to the results, it was observed that the severity and frequency of the OCD symptoms, the dimensions of the disorder, and its functionality decreased. This study demonstrates that transdiagnostic treatment enhances both the diagnosis and comorbidity (Saed et al., 2015). Mirdamadi and Izadi (2022) used a semi-experimental design with pre-test post-test and a control group to investigate the effectiveness of transdiagnostic treatment

on anxiety sensitivity, thought fusion, and obsessive symptoms in individuals with OCD. The results demonstrated that transdiagnostic treatment was significantly effective in reducing anxiety sensitivity, thought fusion, and obsessive symptoms of the individual with obsessive-compulsive disorder in the experimental group compared to the control group. In another study treated with the Unified Protocol for children and adolescents (UP C/A), OCD symptoms were found to be reduced (Fujisato et al. 2021).

Conclusion

Although the diagnosis approach has been valid for a long time by categorizing mental illnesses, there is consensus that suitable treatment methods for this classification may not be appropriate in research and clinical practices. Therefore, studies on transdiagnostic approaches that move beyond traditional diagnostic boundaries are increasing rapidly to understand psychological disorders. The advantages of concentrating on the common processes underlying the disorder(s) rather than treating the disorders based on diagnosis will help the transdiagnostic approach gain traction. Eliminating distinctions within psychiatric taxonomies opens up new ways of classifying disorders and provides a basis for new areas of treatment.

Transdiagnostic treatments encompass a heterogeneous group of interventions that target a broader spectrum of disorders and can be applied to treat several disorders simultaneously. Recently, the term "transdiagnostic" has been used to refer to a wide variety of psychological processes and treatment approaches and has been used to make a descriptive reference to psychological structures observable in disorders. However, research on transdiagnostic processes is still in its early stages because the precise nature of the core mechanisms underlying various disorders has yet to be known (Barlow et al. 2014).

Examining OCD-related fields and structures according to different units of analysis (genes, circuits, behavior, etc.) within the framework of RDoC will increase our knowledge about the pathogenesis, classification, and treatment of OCD. Considering that RDOC structures are not independent of each other (Kalanthroff et al. 2017), it will be important to explain the shared mechanisms among disorders with multidimensional studies. Thus, it will pave the way for treatments targeting neurobiological processes. Although efficacy studies within the scope of transdiagnostic treatment of OCD show that symptoms can be reduced, there is a research gap in the literature on transdiagnostic treatment programs for OCD, which is important for new studies.

Since there are few studies on the transdiagnostic approach in our language, it is intended to present an overview of the approach in this review. It is important to carry out studies on the effectiveness of transdiagnostic treatments with systematic reviews or meta-analyses.

References

Adam Y, Meinlschmidt G, Gloster AT, Lieb R (2012) Obsessive- compulsive disorder in the community, 12- month prevalence, comorbidity and impairment. Soc Psychiatry Psychiatr Epidemiol, 47:339–349.

Admon R, Bleich-Cohen M, Weizmant R, Poyurovsky M, Faragian S, Hendler T (2012) Functional and structural neural indices of risk aversion in obsessive-compulsive disorder (OCD). Psychiatry Res, 203:207–213

Allen LB, Tsao JC, Seidman LC, Ehrenreich-May J, Zeltze LK (2012) A unified, transdiagnostic treatment for adolescents with chronic pain and comorbid anxiety and depression. Cogn Behav Pract, 19:56-67.

APA (2013) Diagnostic and Statistical Manual of Mental Disorders (5th ed.). Washington, DC, American Psychiatric Association.

Anderzhanova E, Kirmeier T, Wotjak CT (2017) Animal models in psychiatric research: The RDOC system as a new framework for endophenotype-oriented translational neuroscience. Neurobiol Stress, 7:47–56.

Avery SN, Clauss JA, Blackford JU (2016) The human BNST: Functional role in anxiety and addiction. Neuropsychopharmacology. 41:126–141.

Barlow DH, Allen LB, Choate ML (2004) Toward a unified treatment for emotional disorders. Behav Ther, 35:205-230.

Barlow DH, Ellard KK, Fairholme CP, Farchione TJ, Boisseau CL, Allen LB et al. (2011) The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders: Client Workbook. New York, Oxford University Press.

Barlow DH, Farchione TJ, Bullis JR, Gallagher MW, Murray-Latin H, Sauer-Zavala S et al. (2017) The unified protocol for transdiagnostic treatment of emotional disorders compared with diagnosis-specific protocols for anxiety disorders: A randomized clinical trial. JAMA psychiatry, 74:875-884.

Barlow DH, Farchione TJ, Fairholme CP, Ellard KK, Boisseau CI, Allen LB et al. (2011) Unified protocol for transdiagnostic treatment of emotional disorders (therapist guide) New York, Oxford University Press.

Barlow DH, Lehman CL (1996) Advances in the psychosocial treatment of anxiety disorders, Implications for national health care. Arch Gen Psychiatry, 53:727–735.

Barlow DH, Sauer-Zavala S, Carl JR, Bullis JR, Ellard KK (2014) The nature, diagnosis, and treatment of neuroticism: Back to the future. Clin Psychol Sci, 2:344–365.

Bennett-Levy J, Butler G, Fennel M, Hackmann A, Mueller M, Westbrook D (2004) The Oxford Guide to Behavioural Experiments in Cognitive Therapy. New York, Oxford University Press.

Berking M, Wupperman P (2012) Emotion regulation and mental health, recent findings, current challenges, and future directions. Curr Opin Psychiatry, 25, 128-134.

Bersani G, Bersani FS, Valeriani G, Robiony M, Anastasia A, Colletti C. et al. (2012) Comparison of facial expression in patients with obsessive-compulsive disorder and schizophrenia using the Facial Action Coding System: A preliminary study. Neuropsychiatr Dis Treat, 8:537-547.

Bolton D, Gibb W, Lees A, Raven P, Gray JA, Chen E et al. (1998) Neurological soft signs in obsessive compulsive disorder: standardised assessment and comparison with schizophrenia. Behav Neurol, 11:197-204

Boswell JF, Anderson LM, Barlow DH (2014) An idiographic analysis of change processes in the unified transdiagnostic treatment of depression. J Consult Clin Psychol, 82:1060-1071.

Buckner JD, Keough ME, Schmidt NB (2007) Problematic alcohol and cannabis use among young adults, The roles of depression and discomfort and distress tolerance. Addict Behav, 32:1957–1963

Calhoon GG, Tye KM (2015) Resolving the neural circuits of anxiety. Nat Neurosci, 18:1394–1404.

Carpenter RW, Trul TJ (2013) Components of emotion dysregulation in borderline personality disorder, A review. Curr Psychiatry Rep, 15:335.

Cavanagh J, Shackman A. (2014) Frontal midline theta reflects anxiety and cognitive control: meta-analytic evidence. J Physiol Paris, 109:3–15.

Chen YW, Dilsaver SC (1995) Comorbidity for obsessivecompulsive disorder in bipolar and unipolar disorders. Psychiatry Res, 59:57–64

Craske MG (2012) Transdiagnostic treatment for anxiety and depression. Depress Anxiety, 29:749–753.

Cuthbert BN (2005) Dimensional models of psychopatholgy, Research agenda and clinical utility. J Abnorm Psychol, 114:565–569.

Cuthbert BN, Kozak MJ (2013) Constructing constructs for psychopathology, the NIMH research domain criteria. J Abnorm Psychol, 122:928–937.

Davis M, Walker DL, Miles L, Grillon C (2010) Phasic vs sustained fear in rats and humans: role of the extended amygdala in fear vs anxiety. Neuropsychopharmacology, 35:105–135.

Dear BF, Staples LG, Terides MD, Karin E, Zou J, Johnston L et al. (2015) Transdiagnostic disorder-specific and clinician-guided, versus self-guided internet-delivered treatment for generalized anxiety disorder and comorbid disorders, a randomized controlled trial. J Anxiety Disord, 36,63-77.

DeRubeis RJ, Brotman MA, Gibbons CJ (2005) A conceptual and methodological analysis of the nonspecifics argument. Clin Psychol (New York), 12:174–183.

DeVeaugh-Geiss J (1993) Diagnosis and treatment of obsessive compulsive disorder. Annu Rev Med, 44:53-61.

Dickinson A. (1985) Actions and habits: The development of behavioral autonomy. Philos Trans R Soc Lond B Biol Sci, 308:67–78.

Douglas HM, Moffi TE, Dar R, McGee R, Silva P (1995) Obsessive- compulsive disorder in a birth cohort of 18- year- olds, prevalence and predictors. J Am Acad Child Adolesc Psychiatry, 34:1424 – 1431.

Dudley R, Kuyken W, Padesky CA (2011) Disorder specific and trans-diagnostic case conceptualisation. Clin Psychol Rev, 31:213-224.

Eaton NR, Rodriguez-Seijas C, Carragher N, Krueger RF (2015) Transdiagnostic factors of psychopathology and substanc use disorders, a review. J Affect Disord, 188:22-27.

Ellis A (1962) Reason and Emotion in Psychotherapy. Oxford, Lyle Stuart.

Ellis AJ, Vanderlind WM, Beevers CG (2013) Enhanced anger reactivity and reduced distress tolerance in major depressive disorder. Cognit Ther Res, 37:498–509.

Elnazer HY, Baldwin DS (2014) Investigation of cortisol levels in patients with anxiety disorders: a structured review. Curr Top Behav Neurosci, 18:191–216.

Endrass T, Ullsperger M (2014) Specificity of performance monitoring changes in obsessive-compulsive disorder. Neurosci Biobehav Rev, 46: 124–138.

Enns MW, Cox BJ, Borger SC (2001) Correlates of analogue and clinical depression, A further test of the phenomenological continuity hypothesis. J Affect Disord, 66:175–183.

Fairburn CG, Cooper Z, Doll HA, O'Connor ME, Bohn K, Hawker DM (2009) Transdiagnostic cognitive-behavioral therapy for patients with eating disorders, a two-site trial with 60-week follow-up. Am J Psychiatry, 166:311–319.

Farchione TJ, Fairholme CP, Ellard KK, Boisseau CL, Thompson-Hollands J, Carl JR et al. (2012) Unified protocol for transdiagnostic treatment of emotional disorders, A randomized controlled trial. Behav Ther, 43:666-678.

Figee M, Pattij T, Willuhn I, Luigjes J, van den Brink W, Goudriaan A et al. (2016) Compulsivity in obsessive-compulsive disorder and addictions. Eur Neuropsychopharmacol, 26:856–868.

Fineberg NA, Apergis-Schoute AM, Vaghi MM, Banca P, Gillan CM, Voon V (2018) Mapping compulsivity in the DSM-5 obsessive compulsive and related disorders: cognitive domains, neural circuitry, and treatment. Int J Neuropsychopharmacol, 21:42-58.

Fink P, Ørnbøl E, Toft T, Sparle KC, Frostholm L, Olesen F (2004) A new, empirically established hypochondriasis diagnosis. Am J Psychiatry, 161:1680–1691.

Foa EB, Grayson JB, Steketee GS, Doppelt HG, Turner RM, Latimer PR (1983) Success and failure in the behavioral treatment of obsessive-compulsives. J Consult Clin Psychol, 51:287–297.

Fontenelle LF, Oldenhof E, Moreira-de-Oliveira ME, Abramowitz JS, Antony MM, Cath D et al. (2020) A transdiagnostic perspective of constructs underlying obsessive-compulsive and related disorders, an international Delphi consensus study Aust N Z J Psychiatry, 54:719-731.

Frank MJ, Woroch BS, Curran T (2005) Error-related negativity predicts reinforcement learning and conflict biases. Neuron, 47:495-501.

Fujisato H, Kato N, Namatame H, Ito M, Usami M, Nomura T et al. (2021) The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders among Japanese children: A pilot study. Front Psychol, 25:12.

Fusar-Poli P, Solmi M, Brondino N, Davies C, Chae C, Politi P et al. (2019) Transdiagnostic psychiatry, a systematic review. World Psychiatry, 18:192-207.

Glashouwer KA, Vroling MS, de Jong PJ, Lange WG, de Keijser J (2013) Low implicit self-esteem and dysfunctional automatic associations in social anxiety disorder. J Behav Ther Exp Psychiatry, 44:262–270.

Gillan CM, Fineberg NA, Robbins TW (2017) A trans-diagnostic perspective on obsessive-compulsive disorder. Psychol Med, 47:1528–1548.

Gillan C (2017) Habits and goals in OCD. In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):161-170. New York, Oxford University Press.

Goldner EM, Cockell SJ, Srikameswaran S (2002) Perfectionism and eating disorders. In Perfectionism, Theory, research, and treatment (Eds GL Flett, PL Hewitt):319–340. Washington DC, American Psychological Association.

Gorka SM, Ali B, Daughters SB (2012) The role of distress tolerance in the relationship between depressive symptoms and problematic alcohol use. Psychol Addict Behav, 26:621–626.

Gottesman II, Gould TD (2003) The endophenotype concept in psychiatry: etymology and strategic intentions. Am J Psychiatry, 160:636-45.

Graybiel AM (2008) Habits, rituals, and the evaluative brain. Annu Rev Neurosci, 31:359–387.

Goschke T (2014) of decision-making and cognitive control as transdiagnostic mechanisms of mental disorders, Advances, gaps, and needs in current research. Int J Methods Psychiatry, 23:41–57.

Gratz KL, Weiss NH, Tull MT (2015) Examining emotion regulation as an outcome, mechanism, or target of psychological treatments. Curr Opin Psychology, 3:85-90.

Grupe DW, Nitschke JB (2013) Uncertainty and anticipation in anxiety: an integrated neurobiological and psychological perspective. Nat Rev Neurosci, 14:488–501.

Haber SN (2017) Neurocircuitry underlying obsessive-compulsive disorder: Neural networks underlying reward and action selection. In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):201-211. New York, Oxford University Press.

Harvey AG (2002) Trouble in bed, The role of pre–sleep worry and intrusions in the maintenance of insomnia. J Cogn Psychother, 16:161–177.

Harvey A, Murray G, Chandler R., Soehner A. (2011) Sleep disturbance as transdiagnostic, Consideration of neurobiological mechanisms. Clin Psychol Rev, 31:225–235.

Harvey AG, Watkins E, Mansell W, Shafran R (2004) Cognitive Behavioural Processes Across Psychological Disorders: A Transdiagnostic Approach to Research and Treatment. New York, Oxford University Press.

Hewitt PL, Flett GL (1991) Perfectionism in the self and social contexts, Conceptualization, assessment and association with psychopathology. J Pers Soc Psychol, 60:456–470.

Hewitt PL, Flett GL (1993) Dimensions of perfectionism, daily stress, and depression, a test of the specific vulnerability hypothesis. J Abnorm Psychol, 102:58-65.

Hogue A, Dauber S (2013) Diagnostic profiles among urban adolescents with unmet treatment needs, comorbidity and perceived need for treatment. J Emot Behav Disord, 21:18-32.

Hohagen F, Lis S, Krieger S, Winkelmann G, Riemann D, Fritsch-Montero R et al. (1994) Sleep EEG of patients with obsessive-compulsive disorder. Eur Arch Psychiatry Clin Neurosci, 243:273–8.

Insel T, Cuthbert B, Garvey M, Heinssen R, Pine DS, Quinn K et al. (2010) Research domain criteria (RDOC): toward a new classification framework for research on mental disorders. Am J Psychiatry, 167:748–751.

Jackson PL, Meltzoff AN, Decety J (2005) How do we perceive the pain of others? A window into the neural processes involved in empathy. Neuroimage, 24:771–779.

Jacoby RJ, Abramowitz JS (2017) Intolerance of uncertainty. In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):171-178. New York, Oxford University Press.

Juster HR, Heimberg RG, Frost RO, Holt CS, Mattia JI, Faccenda K (1996) Social phobia and perfectionism. Pers Individ Dif, 21:403–410.

Kalanthroff E, Anholt GE & Simpson HB(2017) Research domain criteria and OCD: An oxymoron? In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):689-702. New York, Oxford University Press.

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE (2005) Lifetime prevalence and age- of- onset distributions of DSM- IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry, 62:593–602.

Kluge M, Schüssler P, Dresler M, Yassouridis A, Steiger A (2007) Sleep onset REM periods in obsessive compulsive disorder. Psychiatry Res, 30:29-35.

Kring AM, Sloan DS (2009) Emotion Regulation and Psychopathology, A Transdiagnostic Approach to Etiology and Treatment. New York, Guilford Press.

Kozak MJ, Cuthbert BN (2016) The NIMH Research Domain Criteria initiative: Background, issues, and pragmatics. Psychophysiology, 53:286–297.

Laposa JM, Mancuso E, Abraham G. & Loli-Dano L (2017) Unified protocol transdiagnostic treatment in group format, A preliminary investigation with anxious individuals. Behav Modif, 4:253-268.

Lopez ME, Stoddard JA, Noorollah A, Zerbi G, Payne LA, Hitchcock CA et al. (2015) Examining the efficacy of the unified protocol for transdiagnostic treatment of emotional disorders in the treatment of individuals with borderline personality disorder. Cogn Behav Pract, 22:522-533.

Macatee RJ, Capron DW, Schmidt NB, Cougle JR (2013) An examination of low distress tolerance and life stressors as factors underlying obsessions. J Psychiatr Res, 47:1462–1468.

Maj M (2016) Narrowing the gap between ICD/ DSM and RDOC constructs, possible steps and caveats. World Psychiatry. 15:193-194.

Mancusi L, McKay D, & Olatunji B. (2017) Disgust and obsessive-compulsive disorder In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):101-112. New York, Oxford University Press.

Manoach DS, Agam Y (2013) Neural markers of errors as endophenotypes in neuropsychiatric disorders. Front Human Neurosci, 7:350.

Mansell W, Harvey A, Watkins E, Shafran R (2009) Conceptual foundations of the transdiagnostic approach to CBT. J Cogn Psychother, 23:6–19.

McEvoy PM. & Nathan P (2007) Effectiveness of cognitive behavior therapy for diagnostically heterogeneous groups, A benchmarking study. J Consult Clin Psychol, 75:344–350.

McEvoy PM, Nathan P, Norton PJ (2009) Efficacy of transdiagnostic treatments, A review of published outcome studies and future research directions. J Cogn Psychother, 23:20–33.

McEvoy PM, Watson H, Watkins, ER, Nathan P (2013) The relationship between worry, rumination, and comorbidity, Evidence for repetitive negative thinking as a transdiagnostic construct. J Affect Disord, 151:313–320.

McManus F, Shafran R., Cooper Z. (2010) What does a "transdiagnostic" approach have to offer the treatment of anxiety disorders? Br J Clin Psychol, 49:491–505.

Mills RK, Murray HW, Barlow DH (2009) Balancing fidelity and adaptation in the dissemination of empirically-supported treatments, The promise of transdiagnostic interventions. Behav Res Ther, 47:946-953.

Miles L, Davis M, Walker D (2011) Phasic and sustained fear are pharmacologically dissociable in rats. Neuropsychopharmacology, 36:1563–1574.

Mills K, Marel C (2013) International data on the prevalence and correlates of comorbid substance use and psychiatric disorders. In Principles of Addition, Comprehensive Addictive Behaviours and Disorders Vol.1 (Ed P Miller):481-488. London, UK, Academic Press.

Minzenberg MJ, Gomes GC, Yoon JH, Swaab TY, Carter CS (2014) Disrupted action monitoring in recent-onset psychosis patients with schizophrenia and bipolar disorder. Psychiatry Res, 221:114–121

Mirdamadi M, Izadi F (2022) The effectiveness of transdiagnostic treatment on anxiety sensitivity, thought fusion and reduction of symptoms in people with obsessive-compulsive disorder. Research in Clinical Psychology and Counseling, 11:57-76.

Moor S, Vartanian LR, Touyz SW, Beumont PJV (2004) Psychopathology of EDNOS patients: To whom do they compare? Clin Psychol (Aust Psychol Soc), 8:70–75.

Moser JS, Moran TP, Schroder HS, Donnellan MB, Yeung N (2013) On the relationship between anxiety and error monitoring: a meta-analysis and conceptual framework. Front Hum Neurosci, 7:466.

Mowrer OH (1947) On the dual nature of learning—A re-interpretation of conditioning and problem-solving. Harv Educ Rev, 17:102–148.

Newby JM, Mackenzie A, Williams AD, McIntyre K, Watts S, Wong A et al. (2013) Internet cognitive behavioural therapy for mixed anxiety and depression, a randomized controlled trial and evidence of effectiveness in primary care. Psychol Med, 43:2635–2648.

Newby JM, McKinnon A, Kuyken W, Gilbody S, Dalgleish T (2015) Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. Clin Psychol Rev, 40:91-110.

NIHM (2018) The National Institute of Mental Health. RDOC Matrix. https://www.nimh.nih.gov/research/research-funded-by-nimh/RDoC/constructs/RDOC-matrix (Accessed 3.2.2022)

NIHM (2019) The National Institute of Mental Health. RDoC Matrix. https://www.nimh.nih.gov/research/research-funded-by-nimh/RDOC/constructs/sensorimotor-systems. (Accessed 3.2.2022)

Norton PJ (2008) An open trial of transdiagnostic cognitive–behavioral group therapy for anxiety disorders. Behav Ther, 39:242–250.

Norton PJ (2012) A randomized clinical trial of transdiagnostic CBT for anxiety disorder by comparison to relaxation training. Behav Ther, 43:506–517

Norton PJ, Barrera TL (2012) Transdiagnostic,versus diagnosis-specific CBT for anxiety disorders, A preliminary randomized controlled trial. Depress Anxiety, 29:874–882.

Norton PJ, Hayes SA, Hope DA (2004) Effects of a transdiagnostic group treatment for anxiety on secondary depressive disorders. Depression and Anxiety, 20:198–202

Norton PJ, Hayes SA, Springer JR (2008) Transdiagnostic cognitive-behavioral group therapy for anxiety, Outcome and process. Int J Cogn Ther, 1:266–279.

Norton PJ, Paulus DJ (2016) Towards a unified treatment for emotional disorders, Update on the science and practice. Behav Ther, 47:854–868.

Norton PJ, Philipp LM (2008) Transdiagnostic approaches to the treatment of anxiety disorders, A quantitative review. Psychotherapy (Chic), 45:214–226.

Nota JA, SharkeyKM, Coles ME (2015) Sleep, arousal, and circadian rhythms in adults with obsessive–compulsive disorder: A meta-analysis. Neurosci Biobehav Rev, 51:100–107.

Obsessive Compulsive Cognitions Working Group (1997) Cognitive assessment of obsessivecompulsive disorder. Behav Res Ther, 35:667-681.

O'Cleirigh CO, Ironson G (2007) Does distress tolerance moderate the impact of major life events on psychosocial variables and behaviors important in the management of HIV? Behav Ther, 38:314–323.

Olatunji BO, Wolitzky-Taylor KB (2009) Anxiety sensitivity and the anxiety disorders, A meta-analytic review and synthesis. Psychol Bull, 135:974–999.

Padesky CA, Greenberger D (1995) Clinician's Guide to Mind Over Mood. New York, Guilford Press.

Pallanti S, Barnes J, Pittenger C, & Eisen J (2017) Incompleteness and harm avoidance. In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):93-100. New York, Oxford University Press.

Pallanti S, Grassi G, Sarrecchia ED, Cantisani A, Pellegrini M (2011) Obsessive-compulsive disorder comorbidity, clinical assessment and therapeutic implications. Front Psychiatry, 2:70.

Paterson JL, Reynolds AC, Ferguson, SA, Dawson D (2013) Sleep and obsessive-compulsive disorder (OCD) Sleep Med Rev, 17:465-474.

Paulus DJ, Talkovsky AM, Heggeness LF, Norton PJ (2015) Beyond negative affectivity, A hierarchical model of global and transdiagnostic vulnerabilities for emotional disorders. Cogn Behav Ther, 44:389–405.

Pearl SB, Norton PJ (2017) Transdiagnostic,versus diagnosis specific cognitive behavioural therapies for anxiety, a meta-analysis. J Anxiety Disord, 46:11–24.

Pino MC, De Berardis D, Mariano Mallante F, Serroni N, Valchera A. et al. (2016) Two systems for empathy in obsessive-compulsive disorder: mentalizing and experience sharing. Braz J Psychiatry. 38:307-313.

Pittenger C, Gruner P, Adams TA, Kelmendi B (2017) Etiological models of OCD: Anxiety, obsession, compulsion, completeness. In Obsessive-Compulsive Disorder: Phenomenology, Pathophysiology, and Treatment (Ed C Pittenger):669-682. New York, Oxford University Press.

Pushkarskaya H, Tolin D, Ruderman L, Kirshenbaum A, Kelly JM, Pittenger C, Levy I. (2015) Decision-making under uncertainty in obsessive-compulsive disorder. J Psychiatr Res, 69:166–173.

Raines AM, Capron DW, Bontempo AC, Dane BF, Schmidt NB (2014) Obsessive compulsive symptom dimensions and suicide, The moderating role of anxiety sensitivity cognitive concerns. Cognit Ther Res, 38:660–669.

Rasmussen SA, Eisen JL (1992) The epidemiology and clinical features of obsessive compulsive disorder. Psychiatr Clin, 15:743-758.

Rector NA, Szacun-Shimizu K, Leybman M (2007) Anxiety sensitivity within the anxiety disorders, Disorder-specific sensitivities and depression comorbidity. Behav Res Ther, 25:1967– 1975.

Rector NA, Man V, Lerman B (2014) The expanding cognitive-behavioural therapy treatment umbrella for the anxiety disorders, Disorder-specific and transdiagnostic approaches. Can J Psychiatry, 59:301–309.

Reinholt N, Krogh J (2014) Efficacy of transdiagnostic cognitive behaviour therapy for anxiety disorders, a systematic review and meta-analysis of published outcome studies. Cogn Behav Ther, 43:171-184.

Reinholt N, Aharoni R, Winding C, Rosenberg N, Rosenbaum B, Arnfred S (2017) Transdiagnostic group CBT for anxiety disorders, The unified protocol in mental health services. Cogn Behav Ther, 46:29-43.

Riesel A, Klawohn J, Grützmann R, Kaufmann C, Heinzel S, Bey K et al. (2019) Error-related brain activity as a transdiagnostic endophenotype for obsessive-compulsive disorder, anxiety and substance use disorder. Psychol Med, 49:1207–1217.

Robbins TW, Gillan CM, Smith DG, de Wit S, Ersche KD (2012) Neurocognitive endophenotypes of impulsivity and compulsivity, towards dimensional psychiatry. Trends Cogn Sci 16: 81–91.

Robinson D, Walsleben J, Pollack S, Lerner G. (1998) Nocturnal polysomnography in obsessive-compulsive disorder. Psychiatry Res, 80:257–63.

Roemer L, Lee JK, Salters-Pedneault K, Erisman SM, Orsillo SM, Mennin DS (2009) Mindfulness and emotion regulation difficulties in generalized anxiety disorder, Preliminary evidence for independent and overlapping contributions. Behav Ther, 40:142–154.

Ruscio AM, Stein DJ, Chiu WT, Kessler RC (2010) The epidemiology of obsessive- compulsive disorder in the National Comorbidity Survey Replication. Mol Psychiatry, 15:53-63.

Russo M, Naro A, Mastroeni C, Morgante F, Terranova C, Muscatello MR et al. (2014) Obsessive-compulsive disorder: A "sensory-motor" problem? Int J Psychophysiol, 92:74-78.

Saboonchi F, Lundh L, Ost L. (1999) Perfectionism and self-consciousness in social phobia and panic disorder with agoraphobia. Behav Res Ther, 37:799–808.

Saed O, Masjedi A, Taremian F, Bakhtyari M, Morsali Y (2015) The efficacy of Transdiagnostic Cognitive Behavior therapy on reducing symptoms severity of Obsessive Compulsive Disorder with co-occurring anxiety and mood disorders. International Journal of Applied Behavioral Sciences, 2(4):1-10.

Sassaroli S, Lauro LJR, Ruggiero GM, Mauri MC, Vinai P, Frost R (2008) Perfectionism in depression, obsessive–compulsive disorder and eating disorders. Behav Res Ther, 46:757–765.

Sauer-Zavala S, Gutner CA, Farchione TJ, Boettcher HT, Bullis JR, Barlow DH (2017) Current definitions of "transdiagnostic" in treatment development, A search for consensus. Behav Ther, 48:128-138.

Selby EA, Anestis M, Bender T, Joiner TE (2009) An exploration of the emotional cascade model in borderline personality disorder. J Abnorm Psychol, 118:375–387

Selby EA, Joiner TE (2009) Cascades of emotion, The emergence of borderline personality disorder from emotional and behavioral dysregulation. Rev Gen Psychol, 13:219–229.

Selby EA, Joiner TE (2013) Emotional cascades as prospective predictors of dysregulated behaviors in borderline personality disorder. Personal Disord, 4:168–174.

Shoan E, Hall K, Moulding R, Bryce S, Mildred H,Staiger PK (2017) Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderlin personality disorders, A systematic review. Clin Psychol Rev, 57:141-163.

Smith KS, Graybiel AM (2016) Habit formation. Dialogues Clin Neurosci, 18:33–43.

Stiles WB, Barkham M, Mellor-Clark J, Connell J (2008) Effectivesss of cognitive behavioural, person-centered, and psychodynamic therapies in UK primary care routinepractice, Replicationwith a larger sample. Psychol Med, 38:677–688.

Storch EA, Wu MS, Small BJ, Crawford EA, Lewin AB, Horng B et al. (2014) Mediators and moderators of functional impairment in adults with obsessive– compulsive disorder. Compr Psychiatry, 55:489–496.

Şahin AE (2001) Eğitim araştırmalarında Delphi tekniği kullanımı. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 20

Taylor S, Koch WJ, Woody S, McLean P (1996) Anxiety sensitivity and depression, How are they related. J Abnorm Psychol, 105:474–479.

Titov N, Andrews G, Johnston L, Robinson E, Spence J. (2010) Transdiagnostic internet treatment for anxiety disorders, A randomized controlled trial. Behav Res Ther, 48:890–899.

Tokimura H, Di Lazzaro V, Tokimura Y, Oliviero A, Profice P, Insola A et al. (2000) Short latency inhibition of human hand motor cortex by somatosensory input from the hand. J Physiol, 523:503-513.

Tolin DF, Worhunsky P, Maltby N (2006) Are "obsessive" beliefs specific to OCD?, A comparison across anxiety disorders. Behav Res Ther, 44:469-480.

Torres AR (2016) The road to improvement in obsessive-compulsive disorder. Lancet Psychiatry, 3:695–697.

Torres AR, Fontenelle LF, Shavitt RG, Ferrão YA, do Rosário MC, Storch EA et al. (2016) Comorbidity variation in patients with obsessive-compulsive disorder according to symptom dimensions, results from a large multicentre clinical sample. J Affect Disord, 190:508–516.

Tulbure BT, Rusu A, Sava FA, Sălăgean N, Farchione TJ (2018) A web-based transdiagnostic intervention for affective and mood disorders, Randomized controlled trial. JMIR Mental Health, 5:e36.

Tull MT, Gratz KL (2008) Further examination of the relationship between anxiety sensitivity and depression: The mediating role of experiential avoidance and difficulties engaging in goal-directed behavior when distressed. J Anxiety Disord, 22:199–210.

Turk CL, Heimberg RG, Luterek JA, Mennin DS, Fresco DM (2005) Emotion dysregulation in generalized anxiety disorder, A comparison with social anxiety disorder. Cognit Ther Res, 29:89–106.

Ulaş H, Taşlıca S, Alptekin K (2008) Şizofrenide nörofizyolojik, nörokognitif genetik belirleyicilerin (endofenotip) yeri. Klinik Psikiyatri Dergisi, 11:12-19.

Valleni- Basile LA, Garrison CZ, Jackson KL, Waller JL, McKeown RE, Addy CL et al. (1994) Frequency of obsessive-compulsive disorder in a community sample of young adolescents. J Am Acad Child Adolesc Psychiatry. 33:782–791 .

Valleni-Basile LA, Garrison CZ, Jackson KL, Waller JL, McKeown RE, Addy CLet al. (2015) Disorders of compulsivity: a common bias towards learning habits. Mol Psychiatry, 20:345–352.

Wahl K, Ehring T, Kley H, Lieb R, Meyer A, Kordon A et al. (2019) Is repetitive negative thinking a transdiagnosticprocess? A comparison of key processes of RNT in depression, gener-alized anxiety disorder, obsessive-compulsive disorder, and communitycontrols. J Behav Ther Exp Psychiatry, 64:45–53.

Weinberg A, Dieterich R, Riesel A (2015) Error-related brain activity in the age of RDOC: a review of the literature. Int J Psychophysiol, 98:276–299

Weinberg A, Kotov R, Proudfit GH (2015) Neural indicators of error processing in generalized anxiety disorder, obsessive-compulsive disorder, and major depressive disorder. J Abnorm Psychol, 124:172–185

Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu HG, Lee CK et al. (1998) Crossnational epidemiology of obsessive-compulsive disorder. CNS Spectr, 3:6–9 .

Wheaton MG, Mahaffey B, Timpano KR, Berman,NC., Abramowitz JS (2012) The relationship between anxiety sensitivity and obsessive-compulsive symptom dimensions. J Behav Ther Exp Psychiatry, 43:891–896

Widiger TA, Clark LA. (2000) Toward DSM-V and the classification of psychopathology. Psychol Bull, 126:946–963.

Zavos HMS, Rijsdijk FV, Eley TC (2012) A longitudinal, genetically informative, study of associations between anxiety sensitivity, anxiety and depression. Behav Genet, 42:592–602.

Zeitlin SB, McNally RJ (1993) Alexithymia and anxiety sensitivity in panic disorder and obsessive-compulsive disorder. Am J Psychiatry, 150:658–660.