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Dysfunctional Belief Related to OCD and Personality Types

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Abstract

Several studies have established that dysfunctional beliefs are crucial in the development of Obsessive Compulsive Disorder (OCD). This study explores the relation between personality traits and dysfunctional beliefs linked to OCD. The research focused on three belief domains established by the Obsessive Compulsive Cognitions Working Group (OCCWG): 1) Overestimating threats and feeling overly responsible, 2) Believing intrusive thoughts are highly significant and must be controlled, and 3) Striving for perfection and struggling with uncertainty. A sample of 20 individuals diagnosed with OCD and 20 individuals without the disorder, aged 20 to 40, was assessed. Personality traits were measured using the Eysenck Personality Questionnaire (EPQ-R), and dysfunctional beliefs were evaluated using the Obsessive Belief Questionnaire (OBQ-44). Among OCD patients, there was a significant positive correlation between neuroticism and perfectionism/intolerance of uncertainty. In contrast, among nonclinical individuals, a significant positive correlation was found between extraversion and overestimating threats/responsibility, and a negative correlation between psychoticism and perfectionism/intolerance of uncertainty. These findings suggest relationship between personality traits and dysfunctional beliefs.

Keywords: Obsessive compulsive disorder, Dysfunctional belief, Personality types

1. Introduction

Several studies have established the fact that 'Dysfunctional Belief' (DB) plays a key role in the causation of Obsessive Compulsive Disorder (Jonathan et.al. 2005, Angela et. al. 2011, Jessica et. al. 2010). But the underlying factors associated with the development of such 'DB' have not yet been thoroughly focused. Thus, after reviewing the literature, this present study was an attempt to investigate the relationship between personality and dysfunctional beliefs considered to underlie OCD symptoms. Obsessive Compulsive Disorder is characterized by the presence of obsessions and/or compulsions. Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted and that in most individuals cause marked anxiety and distress. On the other hand, compulsions are repetitive behaviors or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly (DSM 5, 2013). Most individuals with OCD have both obsessions and compulsions and this is equally true for both adults and children (DSM 5, 2013). Salkovskis (1985, 1989) was among the first to propose that many individuals with OCD possess dysfunctional beliefs involving blame and responsibility. Extending the theoretical work of Rachman (1997), Salkovskis (1996), and others, the Obsessive Compulsive

Cognitions Working Group (OCCWG, 1997, 2005) empirically derived the following three domains of dysfunctional beliefs considered to underlie OCD symptoms: 1) Overestimation of threat/ Inflated Responsibility, 2)

Beliefs about the importance of, and need to control intrusive thoughts, and 3) Perfectionism and intolerance of uncertainty. Researchers have proposed several pathways that can lead to ‘Dysfunctional Beliefs’. Different personality traits may predispose one to possess dysfunctional beliefs. Binvenuti et al (2004) studied the distribution of normal personality traits in individuals with and without lifetime anxiety disorders in the general population of eastern Baltimore. Individuals with Obsessive-Compulsive Disorder tended to be high in neuroticism and average in extraversion.

Thus, the aim of the present study was to study the relationship between dysfunctional belief (Overestimation of threat/ Inflated Responsibility, Beliefs about the importance of, and need to control intrusive thoughts, and Perfectionism and intolerance of uncertainty) (OCCWG, 1997, 2005) and personality types (Extraversion, Neuroticism and Psychoticism).

2. Methodology

Hypotheses

1. There is no significant relationship between Extraversion and inflated responsibility/ overestimation of threat.
2. There is no significant relationship between Extraversion and importance of and control over thoughts.
3. There is no significant relationship between Extraversion and perfectionism/intolerance of uncertainty.
4. There is no significant relationship between Neuroticism and inflated responsibility/ overestimation of threat.
5. There is no significant relationship between Neuroticism and importance of and control over thoughts.
6. There is no significant relationship between Neuroticism and perfectionism/intolerance of uncertainty.
7. There is no significant relationship between Psychoticism and inflated responsibility/ overestimation of threat.
8. There is no significant relationship between Psychoticism and importance of and control over thoughts.
9. There is no significant relationship between Psychoticism and perfectionism/intolerance of uncertainty.

Description of the variables

Personality: “Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustment to his environment” (Allport, 1937). According to Eysenck there are three major dimensions of personality, i.e Extraversion (E), Neuroticism (N), and Psychoticism (P). Eysenck regarded all three factors as part of normal personality structure and all three are bipolar. Eysenck’s Personality Questionnaire (EPQ-R) will be used for the present study to assess these personality dimensions.

Dysfunctional belief: Obsessive Compulsive Cognitions Working Group (OCCWG, 1997, 2005) empirically derived the following three domains of dysfunctional beliefs related to OCD: 1) Overestimation of threat/ Inflated Responsibility, 2) Beliefs about the importance of, and need to control intrusive thoughts, and 3) Perfectionism and intolerance of uncertainty which are abbreviated as RT, ICT and PC respectively in Obsessive belief questionnaire (OBQ-44), which will be used in the present study for assessing dysfunctional beliefs related to OCD. These domains of dysfunctional belief can be described as:

- 1) Overestimation of threat/ Inflated Responsibility (RT): Individuals with OCD evidence exaggerated estimates of the probability and costs of negative events and believe themselves to be personally responsible for causing or preventing any disastrous consequences associated with obsessional thoughts.
- 2) Beliefs about the importance of, and need to control intrusive thoughts (ICT): Individuals with OCD believe that the mere presence of intrusive thoughts indicates that such thoughts are very meaningful. They also believe that complete control over such intrusions is both necessary and possible.

- 3) Perfectionism and intolerance of uncertainty (PC): Individuals with OCD show inability to tolerate mistakes or imperfection, as well as the strong need for a guarantee of safety.

Sample

20 patients with OCD and 20 nonclinical subjects aged between 20 to 40 years were selected for the study. Purposive sampling technique was used for this study.

Inclusion criteria for patient group

- Individuals suffering from Obsessive compulsive disorder with no other prominent co-morbid disorders.
- Individuals between age group of 20 to 40 years.
- Individuals with minimum educational qualification of H.S passed.
- Both married and unmarried individuals were included for the study.
- Individuals from Middle Income Group i.e people with a monthly income of between Rs 31,000 to Rs. 62,000 and Lower Income Group i.e people with a monthly income of between Rs 16,000 and Rs 31,000 (Housing and Area Development Authority, 2013).
- Both males and females were included.
- Only right handed individuals were included.

Inclusion criteria for nonclinical group

- The age group of Individuals were between 20 to 40 years.
- Minimum educational qualification of the individuals were H.S passed.
- Both married and unmarried individuals were included for the study.
- Individuals from Middle Income Group i.e people with a monthly income of between Rs 31,000 to Rs 62,000 and Lower Income Group i.e people with a monthly income of between Rs 16,000 and Rs 31,000 (Housing and Area Development Authority, 2013).
- Both male and females were included.
- Only right handed individuals were included.

Exclusion criteria for patient group

- Individuals suffering from Obsessive compulsive disorders with other prominent co-morbid disorders were excluded.
- Individuals under medication were excluded.
- Patients with other organic illness were excluded.
- Individuals having any physical disability were excluded.

Exclusion criteria for nonclinical group

- Individuals with any organic illness were excluded.

Tools

Screening tools

Yale-Brown Obsessive Compulsive Scale (Y-BOCS): The scale was designed by Wayne Goodman and his colleagues. Internal consistency is reported to be high for the total Y-BOCS scale, with Cronbach's alphas ranging from .88 to .91 (Goodman et al., 1989). The YBOCS tends to have large correlations with other Obsessive Compulsive measures ($r = 0.17$ to 0.77) which indicates that the YBOCS has good convergent validity. This will be used as a selection test for each patient.

General Health questionnaire (GHQ28): GHQ was developed by the psychiatrist Sir David Goldberg in Manchester, UK (later London, UK). Reliability coefficients have ranged from 0.78 to 0.95 in various studies. This will be used for each nonclinical subject as screening test.

Obsessive Beliefs Questionnaire(OBQ-44): The OBQ-44 was developed by Obsessive Compulsive Cognitions Working Group. The measure of internal consistency with Cronbach's alphas ranging from .79 to .96 across the six belief subscales, and acceptable to high test-retest reliability for subscales ranging from .48 to .82 (OCCWG,2001; 2003).

Eysenck's Personality Questionnaire-R: This questionnaire was developed by Hans Eysenck. Test retest reliabilities of this test mostly lying in the .80 to .90 region.

3. Procedure

Before conducting this study permission will be taken from each hospital authority. Furthermore, before administration of tests individual consent will be taken from each patient/ subject. During administration of tests for each patient/ subject, same sequence will be followed.

In case of each patient after the independent diagnosis by two OPD psychiatrists, Y-BOCS will be administered for further screening. Similarly in case of each non-clinical subject GHQ 28 will be administered as screening tool. Subjects getting score above 4 will be discarded from the final selection. Considering the objectives and hypothesis correlation was used as statistical tool.

4. Results and discussion

The present study investigated the relationship between dysfunctional belief (DB) and dimensions of personality. Here three domains of DB given by Obsessive Compulsive Cognitions Working Group (OCCWG, 1997, 2005) i.e 1) Overestimation of threat/ Inflated Responsibility, 2) Beliefs about the importance of, and need to control intrusive thoughts, and 3) Perfectionism and intolerance of uncertainty were correlated with the three dimensions of personality i.e psychoticism, neuroticism and extraversion.

Table 1: Correlation values between Dysfunctional belief and personality domains for clinical sample.

Type of dysfunctional belief	Psychoticism	Neuroticism	Extraversion
RT	.029	.901	.225
PC	.123	.451*	-.154
ICT	.002	.163	.163

*Significant at 0.05 level.

Among the three domains of dysfunctional belief and three dimensions of personality, only perfectionism has positive significant correlation with neuroticism, which denotes that patients with OCD who are unable to tolerate mistakes or imperfection and has strong need for a guarantee of safety tends to be high in neuroticism dimension of personality. Thus it can be said that OCD patients having traits, such as anxious, moody, tensed, shy, emotional with guilt feelings and low self-esteem are more likely to develop this dysfunctional belief (DB) called Perfectionism and intolerance of uncertainty (PC), and thus more susceptible to develop Obsessive compulsive disorder. This finding is supported by the studies conducted on OCD patients by Nishimura et.al, 1998 and Binenvenu et.al, 2004.

Table 2: Correlation values between Dysfunctional belief and personality domains for nonclinical sample.

Type of dysfunctional belief	Psychoticism	Neuroticism	Extraversion
RT	-.132	-.363	.535*
PC	-.479*	-.118	-.054
ICT	.007	-.049	.122

*Significant at 0.05 level.

It has been already an established fact that ‘Dysfunctional Belief’ (DB) plays a key role in the causation of Obsessive Compulsive Disorder (Jonathan et.al. 2005, Angela et. al. 2011, Jessica et. al. 2010). According to the findings of this present study, in case of nonclinical sample, a significant correlation was found between the Overestimation of threat/ Inflated Responsibility domain of DB and extraversion dimension of personality. Thus individuals with inability to tolerate mistakes or imperfection, as well as the strong need for a guarantee of safety are tends to be high in extraversion dimension of personality. In other words, persons having personality traits such as sociable, lively, active, assertive, carefree, dominant, active, venturesome and sensation seeking are more likely to develop the dysfunctional belief named Overestimation of threat/ Inflated Responsibility. According to a study done by Franks (1956) on partial- reinforcement among introverts and extraverts, introverts are better able than extraverts to get rid of the inhibition they develop. Thus, from this point of view it can be said that, extraverts are unable to inhibit the dysfunctional beliefs they develop and thus they overestimate the threats which they perceive from their environment and are more likely to acquire the dysfunctional belief of Overestimation of threat/ Inflated Responsibility which is related to OCD.

On the other hand, negative significant correlation was found between Perfectionism and intolerance of uncertainty(PC) and psychoticism dimension of personality. Thus individuals having personality traits such as aggressive, cold, egocentric, unempathic, impersonal, tough minded and creative are less likely for developing inability to tolerate mistakes or imperfection and has less need for a guarantee of safety. Eysenck in his dimensional approach of personality (1975,1976), claimed that psychoticism provides a useful dimension in describing poorly controlled behaviour in nonclinical individuals. In other words, as individuals with high score on psychotic dimension are less likely control mistakes in their behaviours and feel less need to be perfect. Thus, they are less susceptible to develop the dysfunctional belief of Perfectionism and intolerance of uncertainty(PC) responsible for OCD.

Thus for clinical sample, it can be concluded from the above study that- 1. There is no significant relationship between Extraversion and inflated responsibility/ overestimation of threat. 2. There is no significant relationship between Extraversion and importance of and control over thoughts. 3. There is no significant relationship between Extraversion and perfectionism/intolerance of uncertainty. 4. There is no significant relationship between Neuroticism and inflated responsibility/ overestimation of threat. 5. There is no significant relationship between Neuroticism and importance of and control over thoughts. 6. There is a significant relationship between Neuroticism and perfectionism/intolerance of uncertainty. 7. There is no significant relationship between Psychoticism and inflated responsibility/

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overestimation of threat. 8. There is no significant relationship between Psychoticism and importance of and control over thoughts. 9. There is a significant relationship between Psychoticism and perfectionism/intolerance of uncertainty.

5. References

Abramowitz, J. S., Khandker, M., Nelson, B. J., & Rygwall, R. (2006). The role of cognitive factors in the pathogenesis of obsessive-compulsive symptoms: A prospective study. *Behaviour Research and Therapy*, 44(9), 1361–1374. <https://doi.org/10.1016/j.brat.2005.09.011>

Abramowitz, J. S., Nelson, C. A., Rygwall, R., & Khandker, M. (2007). The cognitive mediation of obsessive-compulsive symptoms: A longitudinal study. *Journal of Anxiety Disorders*, 21(1), 91–104.

Alonso, P., Orbegozo, A., Pujol, J., López-Solà, C., Fullana, M. À., Segalàs, C., Real, E., Subirà, M., Martínez-Zalacaín, I., Menchón, J. M., Harrison, B. J., Cardoner, N., & Soriano-Mas, C. (2013). Neural correlates of obsessive-compulsive related dysfunctional beliefs. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 47, 25–32.

Alvarez, J. A., & Emory, E. (2006). Executive function and the frontal lobes: A meta-analytic review. *Neuropsychology Review*, 16(1), 17–42.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

Archibald, S. J., & Kerns, K. A. (1999). Identification and description of new tests of executive functioning in children. *Child Neuropsychology*, 5(2), 115–129. <https://doi.org/10.1076/chin.5.2.115.3167>

Banich, M. T., Milham, M. P., Atchley, R., Cohen, N. J., Webb, A., Wszalek, T., Kramer, A. F., Liang, Z. P., Wright, A., Shenker, J., & Magin, R. (2000). fMRI studies of Stroop tasks reveal unique roles of anterior and posterior brain systems in attentional selection. *Journal of Cognitive Neuroscience*, 12(6), 988–1000. <https://doi.org/10.1162/08989290051137521>

Barbey, A. K., Koenigs, M., & Grafman, J. (2013). Dorsolateral prefrontal contributions to human working memory. *Cortex*, 49(5), 1195–1205. <https://doi.org/10.1016/j.cortex.2012.05.022>

Bejerot, S., Schlette, P., Ekselius, L., Adolfsson, R., & von Knorring, L. (2007). Personality disorders and relationship to personality dimensions measured by the Temperament and Character Inventory in patients with obsessive-compulsive disorder. *Acta Psychiatrica Scandinavica*, 98(3), 243–249.

Bienvenu, O. J., Samuels, J. F., Costa, P. T., Reti, I. M., Eaton, W. W., & Nestadt, G. (2004). Anxiety and depressive disorders and the five-factor model of personality: A higher and lower order personality trait investigation in a community sample. *Depression and Anxiety*, 20(2), 92–95. <https://doi.org/10.1002/da.20026>

Bienvenu, O. J., & Stein, M. B. (2003). Personality and anxiety disorders: A review. *Journal of Personality Disorders*, 17(2), 139–151.

Bohne, A., Savage, C. R., Deckersbach, T., Keuthen, N. J., Jenike, M. A., Caffier, B. T., & Wilhelm, S. (2006). Visuospatial abilities, memory, and executive functioning in trichotillomania and obsessive-compulsive disorder. *Journal*

of *Clinical and Experimental Neuropsychology*, 27(4), 385–399. <https://doi.org/10.1080/13803390490520418>

Calamari, J. E., Cohen, R. J., Rector, N. A., Szacun-Shimizu, K., Riemann, B. C., & Norberg, M. M. (2006). Dysfunctional belief-based obsessive-compulsive disorder subgroups. *Behaviour Research and Therapy*, 44(9), 1347–1360.

Calleo, J. S., Hart, J., Björgvinsson, T., & Stanley, M. A. (2010). Obsessions and worry beliefs in an inpatient OCD population. *Journal of Anxiety Disorders*, 24(8), 903–908.

Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: The Meta-Cognitions Questionnaire and its correlates. *Journal of Anxiety Disorders*, 11(3), 279–296.

Cavedini, P., Ferri, S., Scarone, S., & Bellodi, L. (1998). Frontal lobe dysfunction in obsessive-compulsive disorder and major depression: A clinical-neuropsychological study. *Psychiatry Research*, 78(1-2), 21–28.

Cha, C. B., & Nock, M. K. (2009). Emotional intelligence is a protective factor for suicidal behaviour. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48(4), 422–430.

Chakraborty, A., & Banerji, G. (1975). Ritual, a culture specific neurosis and obsessional states in Bengali culture. *Indian Journal of Psychiatry*, 17(4), 273–283.

Ciesielski, K. T., Hämäläinen, M. S., Lesnik, P. G., Geller, D. A., & Ahlfors, S. P. (2005). Increased MEG activation in OCD reflects a compensatory mechanism specific to the phase of a visual working memory task. *NeuroImage*, 24(4), 1180–1191.

Clark, D. A., & Purdon, C. L. (1995). The assessment of unwanted intrusive thoughts: A review and critique of the literature. *Behaviour Research and Therapy*, 33(8), 967–976.

Cordeiro, T., Sharma, M. P., Thennarasu, K., & Reddy, Y. C. J. (2015). Symptom dimensions in obsessive-compulsive disorder and obsessive beliefs. *Indian Journal of Psychological Medicine*, 37(4), 403–408.

Crino, R., & Andrews, G. (1996). Obsessive-compulsive disorder and Axis I comorbidity. *Journal of Anxiety Disorders*, 10(1), 37–46. [https://doi.org/10.1016/0887-6185\(95\)00033-X](https://doi.org/10.1016/0887-6185(95)00033-X)

Cucchi, M., Bottelli, V., Cavadini, D., Ricci, L., Conca, V., Ronchi, P., & Smeraldi, E. (2012). An explorative study on metacognition in obsessive-compulsive disorder and panic disorder. *Comprehensive Psychiatry*, 53(5), 546–553.

Cunill, R., Castells, X., & Simeon, D. (2008). Relationships between obsessive-compulsive symptomatology and severity of psychosis in schizophrenia: A systematic review and meta-analysis. *The Journal of Clinical Psychiatry*, 70(1), 70–82.

Das, R., & Raychaudhuri, S. (2016). Disease severity and social adjustment of patients with obsessive compulsive disorder from West Bengal. *The International Journal of Indian Psychology*, 3(4).

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64, 135–168. <https://doi.org/10.1146/annurev-psych-113011-143750>

Dittrich, W. H., Johansen, T., Metcalfe, L., & Landro, N. I. (2012). Cognitive performance and specific deficits in OCD symptoms dimensions: IV. Impairments in manual movements control. *German Journal of Psychiatry*, 15(1), 32–40.

Extremera, N., & Fernández-Berrocal, P. (2005). Perceived emotional intelligence and life satisfaction: Predictive and incremental validity using the Trait Meta-Mood Scale. *Personality and Individual Differences*, 39(5), 937–948.

Fenger, M. M., Gade, A., Adams, K. H., Hansen, E. S., Bolwig, T. G., & Knudsen, G. M. (2009). Cognitive deficits in obsessive-compulsive disorder on tests of frontal lobe functions. *Nordic Journal of Psychiatry*, 59(1).

- Fisher, P. L., & Wells, A. (2008). Metacognitive therapy for obsessive-compulsive disorder: A case series. *Journal of Behavior Therapy and Experimental Psychiatry*, 39(2), 117–132.
- Freeston, M. H., Rhéaume, J., & Ladouceur, R. (1996). Correcting faulty appraisals of obsessional thoughts. *Behaviour Research and Therapy*, 34(5-6), 433–446.
- Fullana, M. À., Cols, D. M., Trujillo, J. L., Caseras, X., Serrano, F., Alonso, P., Vallejo, J., & Torrubia, R. (2010). Personality characteristics in obsessive-compulsive disorder and individuals with subclinical obsessive-compulsive problems. *British Journal of Clinical Psychology*, 43(4), 387–398.
- Gelder, M., Harrison, P., & Cowen, P. (2010). *Shorter Oxford textbook of psychiatry*. Oxford University Press.
- Greisberg, S., & McKay, D. (2003). Neuropsychology of obsessive-compulsive disorder: A review and treatment implications. *Clinical Psychology Review*, 23(1), 95–117.
- Grisham, J. R., Steketee, G., & Frost, R. O. (2008). Interpersonal problems and emotional intelligence in compulsive hoarding. *Depression and Anxiety*, 25(9), 63–71.
- Grøtte, T., Solem, S., Vogel, P. A., Güzey, I. C., Hansen, B., & Myers, S. G. (2015). Metacognition, responsibility, and perfectionism in obsessive-compulsive disorder. *Cognitive Therapy and Research*, 39(1), 49–50.
- Hall, C. S., & Lindzey, G. (1997). *Theories of personality* (4th ed.). Wiley.
- Hartston, H. J., & Swerdlow, N. R. (1999). Visuospatial priming and Stroop performance in patients with obsessive compulsive disorder. *Neuropsychology*, 13(3), 447–457.
- Heiden, C., Rossen, K., Dekker, A., Damstra, M., & Deen, M. (2016). Metacognitive therapy for obsessive-compulsive disorder: A pilot study. *Journal of Obsessive-Compulsive and Related Disorders*, 9, 24–29.
- Henseler, I., Gruber, O., Kraft, S., Krick, C., Reith, W., & Falkai, P. (2008). Compensatory hyperactivations as markers of latent working memory dysfunctions in patients with obsessive-compulsive disorder: An fMRI study. *Journal of Psychiatry and Neuroscience*, 33(3), 209–215.
- Irak, M., & Tosun, A. (2008). Exploring the role of metacognition in obsessive-compulsive and anxiety symptoms. *Journal of Anxiety Disorders*, 22(8), 1316–1325. <https://doi.org/10.1016/j.janxdis.2008.01.012>
- Jacobsen, C. F. (1938). Studies of cerebral function in primates. *Comparative Psychology Monographs*, 13(63), 1–68.
- Jaisoorya, T. S., Janardhan Reddy, Y. C., Nair, B. S., Rani, A., Menon, P. G., Revamma, M., Jeevan, C. R., Radhakrishnan, K. S., Jose, V., & Thennarasu, K. (2017). Prevalence and correlates of obsessive-compulsive disorder and subthreshold obsessive-compulsive disorder among college students in Kerala, India. *Indian Journal of Psychiatry*, 59(1), 56–62.
- Jaisoorya, T. S., Janardhan Reddy, Y. C., & Srinath, S. (2003). The relationship of obsessive-compulsive disorder to putative spectrum disorders: Results from an Indian study. *Comprehensive Psychiatry*, 44(4), 317–323.
- Janeck, A. S., Calamari, J. E., Riemann, B. C., & Heffelfinger, S. K. (2003). Too much thinking about thinking?: Metacognitive differences in obsessive-compulsive disorder. *Journal of Anxiety Disorders*, 17(2), 181–195.
- Julien, D., O'Connor, K. P., Aardema, F., & Todorov, C. (2006). The specificity of belief domains in obsessive-compulsive symptom subtypes. *Personality and Individual Differences*, 41(6), 1205–1216.
- Kalatzis, I., Piliouras, N., Glotsos, D., Ventouras, E., Papageorgiou, C., Rabavilas, A., Soldatos, K., & Cavouras, D. (2005). Signal analysis methods to discriminate between obsessive-compulsive disorder (OCD) patients and healthy controls. *International Conference on Experiments/Process/System Modelling/Simulation/Optimization*, 1.

- Kar, S., & Dasgupta, S. (2016). Adaptation of a self-report emotional intelligence scale. *Indian Journal of Community Psychology, 12*(2), 244–249.
- Khanna, S., Gururaj, G., & Sriram, T. G. (1993, March 9-12). *Epidemiology of obsessive-compulsive disorder in India* [Paper presentation]. First International Obsessive-Compulsive Disorder Congress.
- Lizeretti, N. P., & Extremiera, N. (2011). Emotional intelligence and clinical symptoms in outpatients with generalized anxiety disorder (GAD). *Psychiatric Quarterly, 82*(3), 253–260.
- Marcelo, L. B., Kulisevsky, J., Gironell, A., & Heras, J. A. (1996). Obsessive-compulsive disorder associated with brain lesions: Clinical phenomenology, cognitive function, and anatomic correlates. *Neurology, 47*(2), 353–361.
- Martin, A., Wiggs, C. L., Altemus, M., Rubenstein, C., & Murphy, D. L. (1995). Working memory as assessed by subject-ordered tasks in patients with obsessive-compulsive disorders. *Journal of Clinical and Experimental Neuropsychology, 17*(5), 786–792. <https://doi.org/10.1080/01688639508405167>
- Meiran, N., Diamond, G. M., Toder, D., & Nemets, B. (2011). Cognitive rigidity in unipolar depression and obsessive compulsive disorder: Examination of task switching, Stroop, working memory updating and post-conflict adaptation. *Psychiatry Research, 185*(1-2), 149–156.
- Moritz, S., Birkner, C., Kloss, M., Jahn, H., Hand, I., Haasen, C., & Krausz, M. (2002). Executive functioning in obsessive-compulsive disorder, unipolar depression, and schizophrenia. *Archives of Clinical Neuropsychology, 17*(5), 477–483.
- Moritz, S., Jacobson, D., Kloss, M., Fricke, S., Rufer, M., & Hand, I. (2004). Examination of emotional Stroop interference in obsessive-compulsive disorder. *Behaviour Research and Therapy, 42*(6), 671–682.
- Moritz, S., Peters, M. J. V., Larøi, F., & Lincoln, T. M. (2010). Metacognitive beliefs in obsessive-compulsive patients: A comparison with healthy and schizophrenia participants. *Cognitive Neuropsychiatry, 15*(6), 531–548. <https://doi.org/10.1080/13546801003783508>
- Muller, J., & Roberts, J. E. (2005). Memory and attention in obsessive-compulsive disorder: A review. *Journal of Anxiety Disorders, 19*(1), 1–28.
- Myers, S. G., Fisher, P. L., & Wells, A. (2008). Belief domains of the Obsessive Beliefs Questionnaire-44 (OBQ-44) and their specific relationship with obsessive-compulsive symptoms. *Journal of Anxiety Disorders, 22*(3), 475–484.
- Nakao, T., Nakagawa, A., Nakatani, E., Nabeyama, M., Sanematsu, H., Yoshiura, T., Togao, O., Tomita, M., Masuda, Y., Yoshioka, K., Kuroki, T., & Kanba, S. (2009). Working memory dysfunction in obsessive-compulsive disorder: A neuropsychological and functional MRI study. *Journal of Psychiatric Research, 43*(8), 784–791.
- Nestadt, G., Samuels, J., Riddle, M. A., Liang, K. Y., Bienvenu, O., Hoehn-Saric, R., Grados, M., & Cullen, B. (2001). The relationship between obsessive-compulsive disorder and anxiety and affective disorders: Results from the Johns Hopkins OCD Family Study. *Psychological Medicine, 31*(3), 481–487. <https://doi.org/10.1017/S0033291701003579>
- Niemeyer, H., Moritz, S., & Pietrowsky, R. (2013). Responsibility, metacognition and unrealistic pessimism in obsessive-compulsive disorder. *Journal of Obsessive-Compulsive and Related Disorders, 2*(2), 119–129. <https://doi.org/10.1016/j.jocrd.2013.01.001>
- Nishimura, R., Hosoba, T., Ide, M., & Seiwa, H. (1998). The influence of obsessive-compulsive neurosis patients' premorbid personality on obsessive-compulsive symptoms and efficacy of medication. *Psychiatry and Clinical Neurosciences, 52*(3), 303–309.

- Obsessive Compulsive Cognitions Working Group. (1997). Cognitive assessment of obsessive-compulsive disorder. *Behaviour Research and Therapy*, 35(7), 667–681.
- Obsessive Compulsive Cognitions Working Group. (2001). Development and initial validation of the obsessive beliefs questionnaire and the interpretation of intrusions inventory. *Behaviour Research and Therapy*, 39(8), 987–1006.
- Obsessive Compulsive Cognitions Working Group. (2005). Psychometric validation of the obsessive belief questionnaire and interpretation of intrusions inventory - Part 2: Factor analyses and testing of a brief version. *Behaviour Research and Therapy*, 43(11), 1527–1542.
- Otero, T. M., & Barker, L. A. (2014). The frontal lobes and executive functioning. In *Handbook of executive functioning* (pp. 29–44). Springer.
- Owen, A. M. (1997). The functional organization of working memory processes within human lateral frontal cortex: The contribution of functional neuroimaging. *European Journal of Neuroscience*, 9(7), 1329–1339. <https://doi.org/10.1111/j.1460-9568.1997.tb01487.x>
- Pardo, J. V., Pardo, P. J., Janer, K. W., & Raichle, M. E. (1990). The anterior cingulate cortex mediates processing selection in the Stroop attentional conflict paradigm. *Proceedings of the National Academy of Sciences*, 87(1), 256–259. <https://doi.org/10.1073/pnas.87.1.256>
- Peles, E., Weinstein, A., Sason, A., Adelson, M., & Schreiber, S. (2014). Stroop task among patients with obsessive-compulsive disorder (OCD) and pathological gambling (PG) in methadone maintenance treatment (MMT). *CNS Spectrums*, 19(6), 509–518.
- Penadés, R., Catalán, R., Andrés, S., Salamero, M., & Gastó, C. (2005). Executive function and nonverbal memory in obsessive-compulsive disorder. *Psychiatry Research*, 133(1), 81–90.
- Purdon, C. (2008). Unacceptable obsessional thoughts and covert rituals. In *Clinical handbook of obsessive-compulsive and related problems* (pp. 61–75). Johns Hopkins University Press.
- Purdon, C., & Clark, D. A. (1999). Metacognition and obsession. *Clinical Psychology and Psychotherapy*, 6(2), 102–110.
- Rachman, S. (1980). Emotional processing. *Behaviour Research and Therapy*, 18(1), 51–60. [https://doi.org/10.1016/0005-7967\(80\)90069-8](https://doi.org/10.1016/0005-7967(80)90069-8)
- Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy*, 35(9), 793–802.
- Rachman, S. A. (2002). Cognitive theory of compulsive checking. *Behaviour Research and Therapy*, 40(6), 625–639.
- Rachman, S. (2004). Fear of contamination. *Behaviour Research and Therapy*, 42(11), 1227–1255.
- Rachman, S., & de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy*, 16(4), 233–248.
- Rachman, S. J., & Hodgson, R. (1980). *Obsessions and compulsions*. Prentice Hall.
- Rao, N. P., Janardhan Reddy, Y. C., Kumar, K. J., Thennarasu, K., & Chandrasekhar, C. R. (2008). Are neuropsychological deficits trait markers in OCD? *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 32(6), 1574–1579.
- Reber, A. S., & Reber, E. S. (2001). *The Penguin dictionary of psychology*. Penguin Books.
- Rector, N. A., Hood, K., Richter, M. A., & Bagby, R. M. (2002). Obsessive-compulsive disorder and the five-factor model of personality: Distinction and overlap with major depressive disorder. *Behaviour Research and Therapy*, 40(10), 1205–

- Rees, C. S., & Anderson, R. A. (2013). A review of metacognition in psychological models of obsessive-compulsive disorder. *Clinical Psychologist*, 17(1), 1–8.
- Rees, C. S., & van Koesveld, K. E. (2008). An open trial of group metacognitive therapy for obsessive-compulsive disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 39(4), 451–458.
- Rice, K. G., & Pence, S. L. J. (2006). Perfectionism and obsessive-compulsive symptoms. *Journal of Psychopathology and Behavioral Assessment*, 28(2), 103–111.
- Rici, V. H. L., Arnkoff, D. B., Glass, C. R., Crawley, S. A., Ronquillo, J. G., & Murphy, D. L. (2006). The hoarding dimension of OCD: Psychological comorbidity and the five-factor personality model. *Behaviour Research and Therapy*, 44(10), 1503–1512.
- Sadock, B. J., & Sadock, V. A. (2007). *Kaplan & Sadock's synopsis of psychiatry*. Lippincott Williams & Wilkins.
- Sahu, S., & Dasgupta, S. (2011). Does student's emotional intelligence play role in their suicidal ideation. *Indian Journal of Community Psychology*, 7(1), 190–197.
- Salkovskis, P. M. (1985). Obsessional-compulsive problems: A cognitive-behavioural analysis. *Behaviour Research and Therapy*, 25(5), 571–583.
- Salkovskis, P. M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy*, 27(6), 677–682.
- Salkovskis, P. M. (1996). Cognitive-behavioral approaches to the understanding of obsessional problems. In R. M. Rapee (Ed.), *Current controversies in the anxiety disorders* (pp. 103–134). Guilford Press.
- Salkovskis, P. M., Shafran, R., Rachman, S., & Freeston, M. H. (1999). Multiple pathways to inflated responsibility beliefs in obsessional problems: Possible origins and implications for therapy and research. *Behaviour Research and Therapy*, 37(11), 1055–1072.
- Salovey, P., Stroud, L. R., Woolery, A., & Epel, E. S. (2002). Perceived emotional intelligence, stress reactivity, and symptom reports: Further explorations using the Trait Meta-Mood Scale. *Psychology and Health*, 17(5), 611–627.
- Salovey, P., Woolery, A., & Mayer, J. D. (2001). Emotional intelligence: Conceptualization and measurement. In G. J. O. Fletcher & M. S. Clark (Eds.), *The handbook of social psychology: Interpersonal processes* (pp. 279–307). Blackwell Publishers.
- Schmidtke, K., Schorb, A., Winkelmann, G., & Hohagen, F. (1998). Cognitive frontal lobe dysfunction in obsessive-compulsive disorder. *Biological Psychiatry*, 43(9), 666–673.
- Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19(4), 460–475.
- Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review*, 7(4), 351–371.
- Shafran, R., Thordarson, D. S., & Rachman, S. (1996). Thought-action fusion in obsessive compulsive disorder. *Journal of Anxiety Disorders*, 10(5), 379–391.
- Singh, A. K. (2008). *Tests, measurements and research methods in behavioural sciences*. Bharati Bhawan.
- Smith, A. H., Wetterneck, C. T., Hart, J. M., Short, M. B., & Björgvinsson, T. (2012). Differences in obsessional beliefs

and emotion appraisal in obsessive compulsive symptom presentation. *Journal of Obsessive-Compulsive and Related Disorders*, 1(1), 54–61.

Smith, E. E., & Jonides, J. (1999). Storage and executive processes in the frontal lobes. *Science*, 283(5408), 1657–1661. <https://doi.org/10.1126/science.283.5408.1657>

Solem, S., Håland, A. T., Vogel, P. A., Hansen, B., & Wells, A. (2009). Change in metacognitions predicts outcome in obsessive–compulsive disorder patients undergoing treatment with exposure and response prevention. *Behaviour Research and Therapy*, 47(4), 301–307.

Spreen, O., & Strauss, E. (1998). *A compendium of neuropsychological tests: Administration, norms, and commentary*. Oxford University Press.

Steketee, G., & Barlow, D. H. (2002). Obsessive-compulsive disorder. In *Anxiety and its disorders: The nature and treatment of anxiety and panic*. Guilford Press.

Steketee, G., Frost, R. O., & Cohen, I. (1998). Beliefs in obsessive-compulsive disorder. *Journal of Anxiety Disorders*, 12(6), 525–537.

Summerfeldt, L. J. (2008). Ordering, incompleteness and arranging. In *Clinical handbook of obsessive-compulsive and related problems* (pp. 44–60). Johns Hopkins University Press.

Summerfeldt, L. J., Kloosterman, P. H., Antony, M. M., McCabe, R. E., & Parker, J. D. A. (2011). Emotional intelligence in social phobia and other anxiety disorders. *Journal of Psychopathology and Behavioral Assessment*, 33(1), 69–78.

Tallis, F., Rosen, K., & Shafran, R. (1996). Investigation into the relationship between personality traits and OCD: A replication employing a clinical population. *Behaviour Research and Therapy*, 34(8), 649–653.

Taylor, S., Abramowitz, J. S., McKay, D., Calamari, J. E., Sookman, D., Kyrios, M., Wilhelm, S., & Carmin, C. (2006). Do dysfunctional beliefs play a role in all types of obsessive-compulsive disorder? *Journal of Anxiety Disorders*, 20(1), 85–97.

Taylor, S., Coles, M., Abramowitz, J., & Tolin, D. F. (2010). How are dysfunctional beliefs related to obsessive-compulsive symptoms? *Journal of Cognitive Psychotherapy*, 24(3), 165–176.

Taylor, S. F., Kornblum, S., Lauber, E. L., Minoshima, S., & Koeppe, R. A. (1997). Isolation of specific interference processing in the Stroop task: PET activation studies. *NeuroImage*, 6(2), 81–92.

Tolin, D. F., Abramowitz, J. S., Kozak, M. J., & Foa, E. B. (2001). Fixity of belief, perceptual aberration, and magical ideation in obsessive–compulsive disorder. *Journal of Anxiety Disorders*, 15(6), 501–510.

Tolin, D. F., Brady, R. E., & Hannan, S. (2008). Obsessional beliefs and symptoms of obsessive-compulsive disorder in a clinical sample. *Journal of Psychopathology and Behavioral Assessment*, 30(1), 31–42.

Tolin, D. F., Woods, C. M., & Abramowitz, J. S. (2003). Relationship between obsessive beliefs and obsessive–compulsive symptoms. *Cognitive Therapy and Research*, 27(6), 657–669.

Trivedi, J. K., Dhyani, M., Goel, D., Sharma, S., Singh, A. P., & Sinha, P. K. (2008). Neurocognitive dysfunction in patients with obsessive compulsive disorder. *Journal of Psychiatry*, 11, 204–209.

van der Wee, N. J. A., Ramsey, N. F., Jansma, J. M., Denys, D. A., Megen, H. J. G. M., Westenberg, H. M. G., & Kahn, R. S. (2003). Spatial working memory deficits in obsessive compulsive disorder are associated with excessive engagement of the medial frontal cortex. *NeuroImage*, 20(4), 2271–2280.

- van der Wee, N. J. A., Ramsey, N. F., van Megen, H. J. M., Denys, D., Westenberg, H. G. M., & Kahn, R. S. (2007). Spatial working memory in obsessive-compulsive disorder improves with clinical response: A functional MRI study. *European Neuropsychopharmacology*, 17(1), 16–23.
- van Maanen, L., van Rijn, H., & Borst, J. P. (2009). Stroop and picture-word interference are two sides of the same coin. *Psychonomic Bulletin & Review*, 16(6), 987–999. <https://doi.org/10.3758/PBR.16.6.987>
- Viswanath, B., Janardhan Reddy, Y. C., Kumar, K. J., Thennarasu, K., & Chandrashekar, C. R. (2009). Cognitive endophenotypes in OCD: A study of unaffected siblings of probands with familial OCD. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 33(4), 610–615.
- de Vries, F. E., de Wit, S. J., Cath, D. C., van der Werf, Y. D., van der Borden, V., van Rossum, T. B., van Balkom, A. J. L. M., van der Wee, N. J. A., Veltman, D. J., & van den Heuvel, O. A. (2014). Compensatory frontoparietal activity during working memory: An endophenotype of obsessive-compulsive disorder. *Biological Psychiatry*, 76(11), 878–887.
- Watkins, L. H., Sahakian, B. J., Robertson, M., & Veale, D. M. (2005). Executive function in Tourette's syndrome and obsessive-compulsive disorder. *Psychological Medicine*, 35(4), 571–582.
- Wells, A. (1997). *Cognitive therapy of anxiety disorders: A practice manual and conceptual guide*. John Wiley & Sons Inc.
- Wells, A. (2007). Cognition about cognition: Metacognitive therapy and change in generalized anxiety disorder and social phobia. *Cognitive and Behavioral Practice*, 14(1), 18–25.
- Wells, A., & Cartwright-Hatton, S. (2004). A short form of the metacognitions questionnaire: Properties of the MCQ-30. *Behaviour Research and Therapy*, 42(4), 385–396.
- Wells, A., & Matthews, G. (1994). *Attention and emotion: A clinical perspective*. Lawrence Erlbaum.
- Wheaton, M. G., Abramowitz, J. S., Berman, N. C., Riemann, B. C., & Hale, L. R. (2010). The relationship between obsessive beliefs and symptom dimensions in obsessive-compulsive disorder. *Behaviour Research and Therapy*, 48(10), 949–954.
- Yun, J. Y., Jang, J. H., Jung, W. H., Shin, N. Y., Kim, S. N., Hwang, J. Y., & Kwon, J. S. (2017). Executive dysfunction in obsessive-compulsive disorder and anterior cingulate-based resting state functional connectivity. *Psychiatry Investigation*, 14(3), 333–343. <https://doi.org/10.4306/pi.2017.14.3.333>
- Zamir, S. M., Fineberg, N. A., Robbins, T. W., & Sahakian, B. J. (2010). Inhibition of thoughts and actions in obsessive-compulsive disorder: Extending the endophenotype? *Psychological Medicine*, 40(2), 263–272.
- Zandt, F., Prior, M., & Kyrios, M. (2009). Similarities and differences between children and adolescents with autism spectrum disorder and those with obsessive compulsive disorder: Executive functioning and repetitive behaviour. *Autism*, 13(1), 43–57.