



# *The Role of Rumination in the Relationship between Attention Deficits and Obsessive Compulsive Symptoms among Non Clinical Sample*

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**Abstract** – The aim of the study was threefold. At first it attempted to determine the link between obsessive compulsive (OC) symptomatology and attention deficit, secondly it examined the relationship between OC symptoms and rumination, and finally the study analyzed the role of rumination in the development and maintenance of OC symptoms. Total 30 non clinical adult subjects participated in the research. They completed the Obsessive Compulsive Inventory – Revised (OCI-R) and the Rumination Response Scale (RRS). Subjects' attention-identification task also was measured using computer based Cogstate. The data was analyzed using Spearman correlation and Regression and Sobel test of mediation. Findings suggest that OC symptoms have a significant association with rumination and attention deficits. However, rumination did not underline the relationship between attention deficit and obsessive compulsive symptomatology. The results were presented and discussed. It was expected that the results would help to further elucidate the role of cognitive factors in OCD and to expand the neurocognitive models of OCD.

**Keywords** - OCD, Rumination, Attention Deficits

## **I. INTRODUCTION**

Obsessive Compulsive Disorder is one of the most emotionally painful and humiliating experience for sufferers<sup>[1]</sup>. Obsessive Compulsive Disorder (OCD) is characterized by intrusive impulsive thoughts, images or impulses (Obsessions) and repetitive senseless mental and behavioral acts<sup>[2]</sup>. Until 1980's OCD was considered a rare disorder, hardly responsive to treatment<sup>[3]</sup>; today, OCD is the fourth common mental disorder as reported by the National Epidemiological Catchment Area (ECA) survey<sup>[4]</sup>. Studies have estimated the lifetime prevalence of OCD in India at 0.6%<sup>[3]</sup>. Researchers have stated that the clinical prevalence of OCD is around 2%; however obsessions and compulsions are experienced by many more individuals at a sub clinical level<sup>[5]</sup>. This high prevalence of OC symptomatology within the non OCD population has a great impact on the mental health of our society and its functioning<sup>[6]</sup>.

Obsessive Compulsive symptomatology was initially seen as a purely psychological phenomenon, but with the emerging research it is now been conceptualized as a condition that may result in deficits of neuropsychological functioning<sup>[1]</sup>. Neuropsychological functions include multiple domains of cognitive or executive functioning. Although there is a diverse range of cognitive problems associated with



psychological illness, domains which are more frequently at risk include attention, information processing and memory<sup>[7]</sup>. This study focuses on the cognitive domain of attention. Understanding the neurocognitive aspects of the disorder helps in unlocking underlying psychopathology of the disorder<sup>[8]</sup>, this study attempts to understand the link between OC symptomatology and attention that will help in determining the course, outcome and treatment strategies for the condition.

Trivedi<sup>[7]</sup> held that attention refers to the ability to focus on relevant stimuli in the environment while ignoring other stimulus (selective attention), the ability to perform certain task while ignoring distracting stimuli (focused attention) and to sustain attention on stimuli (sustained attention or vigilance). Attention difficulties are widely recognized feature of OC symptoms. Earlier studies on neurocognition established that OCD patients have attention bias towards threat related information<sup>[9]</sup>. In a study by Wiggs, Martin, Altemus and Murphy<sup>[10]</sup> it was reported that patients with obsessive compulsive symptoms suffer from hyper vigilant attention. Studies show that these individuals are not able to disregard irrelevant stimuli in the environment and may become overwhelmed by this information<sup>[11]</sup>; extraneous stimuli interfere with the processing of important stimulus and therefore, one is not able to respond optimally to the environment<sup>[12]</sup>.

Attentional deficits result in preservative responding<sup>[11]</sup>. A real world example of preservative performance is repetitive checking behavior which is seen among OCD patients. Impaired ability to sustain attention<sup>[13]</sup> and impaired visual attention<sup>[14]</sup> is also associated with OC symptoms. Obsessive compulsive symptoms thus directly contribute to increase in attention deficit however, it is also possible that an intervening variable mediates the relationship between the two. In 1979, McFall and Wollersheim gave a model to explain the symptomatology of OCD which stated that various cognitive variables mediate cognitive functioning of individuals with OC symptomatology<sup>[6]</sup>, one irrational belief they identified was rumination. As obsessive

compulsive symptoms are associated with high levels of rumination which in turn is also associated with attention deficit, rumination may be one variable that mediate the relationship between the two.

Rumination is pattern of repetitive thoughts; it is defined as a “Mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and the possible causes and consequences of these symptoms” Nolen-Hoeksema<sup>[15]</sup>. Rumination is considered as psychosocial diathesis as well as maintaining factor in several anxiety disorders<sup>[16]</sup> and is prevalent in the treatment and prevention of anxiety relevant psychopathology<sup>[17]</sup>. Ruminators in order to satisfy their self doubt analyze events in a continuous manner<sup>[15]</sup>, this is indicative of the link between rumination and OCD. In 2000, Nolen-Hoeksema, studied 1100 adult population to examine the correlation of rumination and anxiety. It was reported that rumination is linked with the development of OC symptomatology and is predictive of OCD<sup>[15]</sup>.

Rumination is also linked to attention deficits. Barbara, Shun, Sing-Hang and Nicholas<sup>[18]</sup> reported that ruminative traits are associated with attention control problems. Studies have indicated a causal relation between rumination and attention bias<sup>[19]</sup>. Rumination may result in attention deficits and is also an important construct of OCD; however, theoretical models and empirical explorations of ruminations are limited. While recent research provides preliminary evidence of the relationship between rumination and OCD, it is still not understood how rumination influences the phenomenology of OCD broadly.

The aim of the present study is threefold. First, it will help in determining the link between obsessive compulsive symptomatology and attention deficit, second it will examine the relationship between OC symptoms and rumination and third it will highlight the role of rumination as a key player in the development and maintenance of OC symptoms. It is the hope that this research will prompt to take a new look at the ways we construct and conceptualize management plans for OC symptomatology.



*Hypothesis*

It is hypothesized that:

H1: Higher score on the Obsessive Compulsive Inventory – Revised (OCI-R) will predict higher score on attention deficit.

H2: Higher score on the Rumination Inventory will be correlated with higher score on OCI-R.

H3: Rumination will function as a mediating variable between attention deficit and obsessive compulsive symptoms.

**II. METHOD**

Participants for this study consisted of 30 students (Males = 15, Females = 15). Overall, participants ranged in age from 19 to 23 years. All participants were administered the Obsessive Compulsive Inventory – Revised (OCI-R), the Rumination Response Scale (RRS) and a computerized Identification task in one session. The Obsessive Compulsive Inventory - Revised (OCI-R) is comprised of 18 items and is scored on six subscales, which show a stable factor structure and good internal consistency (Foa et al., 2002). The Ruminative Responses Scale (RRS) is a 22-item questionnaire. Although initially used with non-clinical samples, now the RRS is used with both clinical and nonclinical samples (Nolen-Hoeksema, 2000), suggesting that the RRS can assess rumination in a wide range of participants. Respondents rate RRS items on a 4-point scale from almost never to almost always. The total RRS has shown good internal consistency (coefficient alpha = .90) and acceptable retest reliability (1-year  $r = .67$ ) in an adult sample (Nolen-Hoeksema, 2000). Pearson product moment correlation was used to analyze the relationship among variables. Mediation analysis was done to illustrate the mediating role of rumination. The coefficients were calculated using SPSS.

**III. RESULT**

Descriptive statistics were calculated to represent overall performance on the scales administered. Results of these analyses are provided in Table 1.

TABLE I. DESCRIPTIVE STATISTICS

	Mean	S.D.
OCI	22.33	12.22
RI	35.66	6.51
Att	2.43	1.47

Hypothesis 1 was confirmed, in that higher scores on the OCI-R were generally associated with higher scores on Attention deficits. This hypothesis was tested using Pearson correlations. Table 2 provides results for these analyses. As observed in the Table, OCI-R was significantly correlated with Attention deficits ( $p = 0.01$ ). It is noteworthy that the linear relationship between OCI-R and attention deficits was consistently a positive relationship, thus supporting the first hypothesis. Results relating to this hypothesis indicate that those who experience more obsessive compulsive symptoms are likely to have attention deficits.

Hypothesis 2 was also confirmed, in that higher scores on OCI-R were generally associated with higher scores on the RRS. This hypothesis was tested using Pearson correlations. Table 2 provides results for these analyses. As observed in the Table, OCI-R was significantly correlated with Rumination ( $p = 0.01$ ). Similar to first hypothesis, the linear relationship between variables was consistently found to be in the positive direction, thereby supporting this hypothesis. As predicted, higher scores on the OCI-R were generally associated with higher scores on the RRS. Finding related to this hypothesis reveal that those who experience heightened OC symptomatology are more likely to ruminate.

TABLE II. CORRELATION BETWEEN OC SYMPTOMS WITH ATTENTION AND RUMINATION

	Attention	Rumination
OCI	.556**	.480**

\*\* . Correlation is significant at the 0.01 level.



Hypothesis 3 was not supported, in that rumination was not identified as a significant mediator in the relationship between obsessive compulsive symptoms and attention deficits. This hypothesis was tested using the Baron and Kenny (1986) methodology in which mediation is believed to be present when, in addition to the independent variable (OC) being significantly related to dependent variable (Attention), there is also a significant relationship between independent variable and mediator (Rumination) and significant relationship between mediator and dependent variable. The first two conditions were satisfied as stated above. The correlation coefficient for rumination and attention deficit also came out to be significant ( $p = 0.01$ ). The mediation analysis indicated mediating role of rumination as the variance of the dependent variable as explained by the independent variable reduced. However, when significance of the results were tested using the Sobel test, it didn't indicate significant mediation. The results are depicted in Table 3.

The results are supported by the executive overload model<sup>[14]</sup> which states that the attempts to control intrusive thoughts among OCD patients cause an overload on the executive system resulting in cognitive impairment. In addition, anxiety experienced due to obsessions also puts a strain on the executive functions<sup>[7]</sup>, this may account for the attention deficits among individuals with higher OC symptoms.

It was also anticipated that rumination measures would show a strong correlation with OC symptoms. The result was consistent with past researches; OC symptoms and rumination were significantly correlated with one another. This indicates that the more OC symptom severity, the higher the tendency to react with rumination in response to distress and more obsessive ruminations. Rumination involves the belief that if a person thinks about something enough one may be able to control the circumstances. This is central to OCD; OCD individuals overly focus on their thoughts as they feel responsible for its consequences.

TABLE III. REGRESSION AND SOBEL'S SCORE FOR TESTS OF MEDIATION

IV > MV	MV > DV	IV > DV	IV > DV/MV	Z
.48**	.86**	.55**	.32	0.08

\*\* . Correlation is significant at the 0.01 level.

#### IV. DISCUSSION

The present study was designed to examine theoretically plausible correlates and mediate of obsessive compulsive symptoms. The purpose was to further refine the theories of OCD. Present theories predict that individuals with obsessive compulsive symptomatology demonstrate an attention deficit; however there is limited body of literature investigating this phenomenon. The current study attempted to analyze the relationship between OC symptoms and attention deficits. Results inform that individuals with OC symptoms have greater attention deficit. This indicates that these individuals focus their attentional resources on the obsessive thoughts thereby ignoring other stimuli in the environment.

Rumination and OCD share some similar features. Their association can be linked by common processual characteristics such as intrusiveness or difficulty controlling thought. Additionally, rumination may function as a maintaining factor for OC symptoms. If confirmed by further studies, rumination maybe included as an important belief in the cognitive model of OCD. Further, the cognitive therapy for OCD also supports the relationship between rumination and OCD. OCD patients who learn to stop ruminating show better prognosis<sup>[11]</sup>.

Recently, research on Obsessive Compulsive Disorder (OCD) has started to focus on the cycle of obsessive thoughts and various cognitive factors that underline it<sup>[19]</sup> and the cognitions that act as a catalyst in OC symptoms are being addressed<sup>[6]</sup>. The examination of these cognitive factors in OCD helps to shed light on many unanswered questions in OCD literature. One such question is the role of rumination in OCD. McFall and Wollersheim<sup>[6]</sup> were the first to focus on rumination as an important cognitive factor that influences OC symptomatology. Salkovskis



[16] also laid importance on the role of rumination on OCD, however the exact nature of influence is not known.

The present study attempted to understand this line of enquiry. It was hypothesized that rumination will mediate the role of OC symptoms and attention deficits. However, contrary to the prediction, result revealed insufficient statistical support for mediation hypothesis. No significant evidence was found indicative of the role of rumination in the relation of OC symptoms and Attention deficits.

Conceptually, this outcome is somewhat surprising however it could be due to a number of participants involved in the study. The sample size was small and included only non clinical participants which could account for the results. As the variance reduced when examining the mediating role, sample size could have played a major role, resulting in insignificant mediation. Debra [6] stated that the degree of mediation maybe such that in sample size of much poorer power it is undetectable.

Nonetheless, these findings remain interesting and add to the literature of OCD. The results disagree with past supposition that rumination, in general, is an adaptive problem solving strategy [19] thus opening a new line of enquiry for future research.

The study has some limitations and should be interpreted with appropriate caution. Data were collected in non clinical population; although, obsessive compulsive symptoms occur on a continuum of severity, it is unclear if results can be generalized to OCD patients. The correlation design for initial hypothesis does not allow causal conclusions. The positive relationship between OC symptoms and attention deficit and OC symptoms and rumination might be accounted for by either of them influencing the other or alternatively, it might be influenced by another unrelated variable. Finally, self report measure of all the variables were utilized rather than interview based assessment.

In summary, in a non clinical sample of 30 individuals the authors found deficits in identification task. These deficits seem to be indicative of attention dysfunction in individuals with OC symptoms. Also, positive correlation was found between rumination and OC symptoms; however rumination does not play the role of a mediating variable in neurocognitive obsessive compulsive phenomenology.

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