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Though much is known about obsessive-compulsive disorder and depression individually, not much research has been done to look at the comorbidity of the two mental illnesses. This study seeks to review the comorbidity of obsessive-compulsive disorder (OCD) and depression in a college sample. Comorbidity between mental illnesses like OCD and depression is important to study because results will implicate what symptoms should be of concern, and these symptoms should be used to consider treatment. Understanding symptoms of both illnesses, and how they relate, can drive future research on what the best treatment options are for individuals diagnosed with these illnesses. This study measured depression with various subtypes of OCD through an online SONA survey. Data was collected from a sample of l 05 college students. Furthermore, results showed an overall correlation between depression and OCD rates overall. Obsessive subtypes had higher correlations within those with depressive symptoms than did compulsive subtypes. This study indicates that further research needs to be done to understand treatment outcomes of those with comorbid OCD and depression. More studies should take into account for the complexity of OCD subtypes when measuring comorbidity.

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THE RELATIONSHIP BETWEEN OBSESSIVE-COMPULSIVE DISORDER AND DEPRESSION IN THE GENERAL POPULATION

By

Krystal Moroney

A Senior Thesis Submitted to the

Eastern Michigan University

Honors College

in Partial Fulfillment of the Requirements for Graduation

with Honors in ______Psychology__________

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Abstract

Though much is known about obsessive-compulsive disorder and depression individually, not much research has been done to look at the comorbidity of the two mental illnesses. This study seeks to review the comorbidity of obsessive-compulsive disorder (OCD) and depression in a college sample. Comorbidity between mental illnesses like OCD and depression is important to study because results will implicate what symptoms should be of concern, and these symptoms should be used to consider treatment. Understanding symptoms of both illnesses, and how they relate, can drive future research on what the best treatment options are for individuals diagnosed with these illnesses. This study measured depression with various subtypes of OCD through an online SONA survey. Data was collected from a sample of 105 college students. Furthermore, results showed an overall correlation between depression and OCD rates overall. Obsessive subtypes had higher correlations within those with depressive symptoms than did compulsive subtypes. This study indicates that further research needs to be done to understand treatment outcomes of those with comorbid OCD and depression. More studies should take into account for the complexity of OCD subtypes when measuring comorbidity.

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Literature Review

Obsessive-compulsive disorder (OCD) and depression are mental disorders with the potential to seriously negatively affect both the people experiencing them and the people around them. Depression is the more common of the two disorders in the United States. According to the National Institute of Mental Health, ("Major Depression Among Adults," n.d.), 6.7% of adults in the U.S. have lived with major depressive episode in the past year. According to Bebbington (1998a), obsessive-compulsive disorder occurs in about ".7 to 2.1% of the population." Typically, depression and OCD occur separately, but they can occur together. That is, they can be "comorbid." Given that the combination of depression and OCD is likely to be worse, perhaps much worse, than either individually, it is important to understand how they might correlate with one another when they are and are not comorbid. That is, a person with either OCD or depression might have compensatory skills that someone with both could lack. But this is less likely when the two occur together. Because these conditions exist in the general population as well as among people who are formally diagnosed, looking at the general population is a good place to start looking at these correlations.

Depression

Basic characteristics and demographics of depression. Depression is one of the most extensively researched mental disorders. According to the Diagnostic Statistic Manual 5 (DSM) (American Psychiatric Association, 2013), depression is characterized by emptiness, sadness and hopelessness for long periods of time every day. Social and occupational distress are also major factors that distinguish depression from other mental illnesses. Symptoms of depression often include, The National Institutes of Mental Health ("Depression," 2008) states depression is

caused by "genetic, biochemical, environmental, and psychological factors" and can present differently in men, women, children, and adults. Studies indicate that depression occurs more often within female population. Women are 1.7 to 2.1 times more likely to have depression due to possible joint effect of sex hormones and environmental experiences due to gender (Bebbington, 1998b; Kessler, McGonagle, Swartz, Blazer, &Nelson, 1993; Kessler, 2003). Depression is obviously relevant in everyday life. Globally, depression is a huge problem because it can be a factor in other illnesses, such as heart disease (Cuijpers, Beekman & Reynolds, 2012). Depression can also negatively affect the economy, increasing the costs of healthcare and reducing productivity (Cuijpers et al., 2012). Depression also shows up in the language and writing of college students. Students are more likely to use negative language and first person constructions when depressed, showing distress through "negative thoughts and heightened self-awareness" (Rude, Gortner, & Pennebaker., 2004).

Theories of depression. As reported by Nyedegger (2008), being more specific in theoretical orientation, Beck's cognitive tryad of thinking about depression is negative feelings about experiences, themselves, and the future (Beck 1967; 1987). The cognitive-mediation theory of depression suggests treatment through cognitive-behavioral therapy focusing on a maladaptive belief system and has proven to be reasonably effective (Young, Rygh, Weinberger, & Beck, 2014). That is, the cognitive theory changes the way the patient reasons to life issues, reducing reactivity, and sometimes providing better strategies. Not all depression experts follow Beck's approach, however. Some others subscribe to Freud's psychodynamic approach, and look at history of a patient, particularly early social interactions. Treatment by psychodynamic psychotherapy then involves exploring insight on emotions, relationships, via a close patient-client interaction (Driessen et al., 2013; Jonghe et al., 2013). The biological approach to

depression posits that there are anomalies in neurotransmitter production and metabolism of the patient, probably genetically based, that interacts with family history (Nydegger,2008). The biological approach of depressions suggests drug-based treatment, anti-depressants being the main approach (Cornell, 1985). Learned helplessness has also been invoked to explain depression. According to Lobel and Hirshchfeld (1984), the intensity, severity, and duration of the clinical depression are huge factors in determining if the depression is clinical. Life events can both cause depression and depression can cause life events. One reason negative life events may occur is because depression effects ordinary cognitions and behavior through "learned helplessness," where the depressed believe they cannot control their life and more visible reactions such as memory loss or poor problem solving strategies.

History of depression. According to McCann and Endler (1990), depression has been highly stigmatized throughout history. Socio-political factors influenced how depression was treated and in extreme cases, such as Nazi extermination of victims of mental illness (Strous, 2009). There remains a negative attitude and stigma attached to the mentally illnesses generally, which includes depression. This may be changing as the wider recognition of depression as a serious illness occurs. Labelling of depression shows a significantly lower stigma than other illnesses like schizophrenia (Angermeyer &Matschinger, 2003). Even so, stigma remains (Brown et al, 2010).

Because of this historical stigma and current stigma, depression may go untreated. Brown et al. (2010) found that stigma against treatment is often internalized and treatment may lead to negative stereotypes in the community of the person. This is especially true for the African American community. People with depression may not face strong stereotypes, but it causes self-

stigma through decrements in self-esteem and self-efficacy (Corrigan, Watson, & Barr, 2006). This self and community stigmatization is important to note because it may affect treatment outcomes for those with depression and other mental illnesses. Lack of treatment for the depression may cause physical illness and make the depression more salient (Rawson, Bloomer, & Kendall, 1994).

Obsessive-Compulsive Disorder

Basic characteristics and demographics of OCD. Anxiety disorders are often intrusive, relating to fear and arousal in those experiencing them. This includes,obsessive-compulsive disorder. According to the Diagnostic Statistical Manual 5, OCD is compromised by a combination of obsessions and compulsions that impact daily life. Obsessions are "intrusive and persistent," thoughts often about anxiety provoking situations such as leaving an iron turned on. Compulsions are "excessive and repetitive" actions, such as cleaning or counting which reduce the anxiety created by the obsessions (American Psychiatric Association, 2013). Obsessive-compulsive disorder causes primary distress, which means distress to the person themselves. Most psychologists agree that OCD is a heterogeneous disorder, meaning there are many subtypes. Some symptom subtypes may include fear of contamination, self-harming, hoarding, excessive desire for symmetry, and certainty (Calamari et al., 2004). Obsessive-compulsive disorder is also important to study because it strongly impacts the quality of life of those who suffer from it. For both those with sub-clinical and clinical population, OCD show quality of life impairment greater than that of the general population

Obsessions relevant to this study are aggressive obsessions, contamination obsessions, sexual obsessions, hoarding obsessions, religious obsessions, obsessions of symmetry, and

somatic obsessions. Aggressive obsessions include fear of harming someone that is weak or harmless (Moulding, Aardema,& O'Connor, 2014). This subtype may also include fear of self-harm that does not actually occur. Sexual obsessions vary and can range from fear of homosexuality, intrusive sexual thoughts, and fear of those with STDs. These fears can be fear of self, others, or relationships when it comes to sexuality (Gordon, 2002). Hoarding obsessions are sometimes ascribed to poor "decision making, attachment to possessions, and poor insight" (Tolin et al., 2012), but manifest in the retention of excessive amounts of items, whether needed or not. Those with hoarding symptoms of OCD may also be perfectionists and indecisive, believing that the retention of the items will improve preparation (Frost & Gross, 1993). Religious obsessions come in forms of religious rituals, religious rites, and distress caused by the religion. Religious obsessions sometimes appear with sex obsessions and contamination obsessions (Tek & Ulug, 2001). Obsessions of symmetry involve having something be "just right." Those with this obsession often become uncomfortable with real or perceived incompleteness (Coles & Pietefesa, 2008). Lastly, somatic obsessions involve unnecessary attention and awareness of normal bodily functions, like blinking. These may be automatic functioning or small occurrences such as breathing pattern (Hershfield, Corboy, & Claiborn, 2013). In a sample of 109 adult male participants in the clinically diagnosed population, a study Besiroglu et al. (2007) showed that about 30% of the subjects had aggressive obsessions, 67% contamination, 27.5% symmetry, 27.5% religious, 14.3% sexual, 13% hoarding, and 18% somatic obsessions.

Compulsions relevant to the present study are washing, checking, repeating, ordering, hoarding, and neutralizing (counting). Washing compulsions are often attempts to reduce anxiety from fear of disease (contamination obsessions). Washing compulsions, clinically, could involve

repetition, extreme washing, and rituals associated with washing (Riggs & Foa, 2007). Checking compulsions occur when an individual checks or monitors something over and over, the anxiety is reduced when they check things. Checking can be caused by inflated responsibility and intolerance of uncertainty when checking (Radomsky, Ashbaugh, Gelfand, & Dugas 2008). Next, repeating compulsions can be seen in checking as well. Repeating can cause doubt, need for reassurance, and reduced confidence in memory (Radomsky, Dugas, Alcolado,& Lavoie, 2014). Goodman et al. (1989a) uses the example of having to rewrite or reread and having to repeat routine activities. Next, ordering compulsions can be driven by "fear of potential harm" or to preserve sameness (Summerfeldt, 2007).The sense of things not being right for those with ordering compulsions could cause distress in all factors of their being. Ordering compulsions could be caused by a symmetry obsession. These compulsions mostly are used to achieve a "just right" feeling, an example of this being having to organize everything in your house (Summerfeldt, 2007). Next, hoarding compulsions involve difficulty discarding clutter and acquisition of items. People with hoarding compulsions have positive emotions when gaining items and negative emotions when losing items, such as anxiety, which continues the compulsion (Frost & Steketee, 2008). Lastly, neutralizing compulsions (i.e. counting compulsions) are like repeating compulsions, as those who have this compulsion have to do things multiple times to alleviate the fear (Grabe et al., 2000). An example of this would be having to count steps or counting to a specific number before one can do what is needed.

Theories of OCD. Obsessive-compulsive disorder tends to be explained in two dominant ways — neurologically and cognitive-behaviorally. According to Rosenberg, Russell, & Fougere (2005), OCD patients have anomalous neuroanatomical structures, such as differences between grey and white matter and multiple neurochemical differences. Treatments for OCD based on the

neurological theory includes the administration of SSRIs (Selective Serotonin Reuptake Inhibiting) and tricyclic antidepressants (Pigott and Seay, 1998). In contrast, Shafran's (2005) explanation of cognitive behavioral etiology of OCD, OCD is caused by events that increase the person's responsibility, which in turn causes the obsession. The compulsive actions serve to reduce the anxiety caused by the increased responsibility. There is often a fear of a catastrophic event occurring if the action is not completed. Treatment for OCD based on this cognitive-behavioral theory includes exposure (exposing to fear without escaping physically or psychologically), ritual prevention, and rational emotive behavioral therapy (teaching the patient to think very rationally about the situation). These are just some examples of cognitive-behavioral therapies (Foa, Franklin,& Kozak, 1998). Another less commonly held theory of OCD involves Freud's concept of "obsessional neurosis" (Freud, 1909/1955). Freud claimed that OCD can be a result of hyper-morality and latent aggression. Treatment for OCD based on psychoanalytic theory includes clarifying relationship problems and finding the deeper meaning in their problems using transference and counter-transferrence (Gabbard, 2001). According to Starcevi, and Brakoulias (2008), the best working treatment for obsessions would be pure cognitive-behavioral therapy, while an exposure based and response prevention treatment would work better with compulsions.

History of OCD. OCD has been stigmatized as well within history and in the present. According to Davis (2008), obsessions, in the renaissance age until the 18th century, previously meant demonic possession. Until the mid-1970s, OCD was considered the rarest disorder and it was to be assumed that those who were diagnosed were completely crazy. For example, in a study by Coles, Heimberg, and Weiss (2013), 14% of the respondents said that someone with OCD shouldn't tell anyone except a doctor and only 33% of the people correctly labelled the

vignette shown as having OCD. This may be a result of misguided or non-existent media and movie representation of OCD. There is clearly still stigmatization within the OCD community and lack of knowledge of what OCD is. It is important to study OCD to bring awareness and decrease the stigma.

Comorbidity

Characteristics of comorbid depression and OCD. Comorbidity is an important focus of this project. Comorbidity is defined in psychology as "the co-occurrence of two or more psychiatric disorders" (Maj, 2005). Comorbidity is common, especially with anxiety disorders and depression (Hofmeijer-Sevink et al., 2012). In fact, 80% of those with anxiety disorders have a comorbid disorder, and 50% of those with anxiety disorders have comorbidity with depression (Brown et. al., 2001). Vulnerability to the disorders plays a key role in why comorbidity is common in mental illness, whether it be from family or social vulnerability (Hofmeijer-Sevink et al., 2012). The analysis of comorbidity is complex due to problems with assessing the disorder in combination, yet their prevalence of comorbidity makes it an essential area of study (Cheng Oladap, & Rascati, 2009).

One important reason to have a proper measure of comorbidity is that comorbidity can predict suicidal behaviors. In fact, 80% of those who attempt suicide have or have had a mental illness. Additionally, because of comorbidity there is a great deal of uncertainty which mental illnesses are associated with suicidal ideation (Nock, Hwang, Sampson, & Kessler, 2009). Thus, it is important to study both depression and anxiety disorders, such as OCD, together to see how they variously contribute to serious adjustment problems. According to "Co-occurring disorders" (n.d), on a more personal perspective, mental illness comorbidity prevents people from holding

down a job, relapse rates are high, and treatment is not easy to find. This shows a need to study comorbidity more because research is limited.

OCD and depression are commonly comorbid, but the reported rate of comorbidity varies widely across most studies because of varying sample sizes (Crino& Andrews, 1996). It is important to study OCD in relation to depression because those with depression and OCD comorbid suffer more from cognitive impairment. They may also be at higher risk for other anxiety disorders (Abramowitz, Storch, Keeley,& Cordell, 2007). Though those with Depression have higher obsessive-compulsive symptoms, often when admitted into a treatment, some studies claim there is hope, in that, treatment outcomes of those with OCD and depression show little difference from treatment outcomes with only OCD in both youth and adults (Anholt et al.,2011; Leonard, Jacobi, Riemann, Lake, & Luhn, 2014; Stewart, Yen, Stack, & Jenike, 2006). Other studies, however, claim that comorbid depression negatively impacts treatment outcome of comorbid OCD patients (Abramowitz& Foa, 2000; Overbeek, Schruers, Vermetten,& Griez, 2002; Steketee, Eisen, Dyck, Warshaw, & Rasmussen, 1999). Pozza and Dèttore (2014) discovered, similarly to OCD, depression patients also have an inflated sense of responsibility (obsessional symptoms). It has been found that both people with past and current mood disorders have higher obsessional symptoms than compulsion symptoms in a clinical population (Ricciardi& Mcnally,1995). According to Watson (2009), people with depression are significantly more likely to focus more on obsessions and obsessive checking rather than obsessive cleanliness (2009). Though obsessive behavior is more common, compulsive behavior still exists within those that are depressed. According to Parrish and Radomsky (2010), those who have more OCD symptoms and depression symptoms seek excessive reassurance, but those with OCD may search to get rid of general harm, while those with depression symptoms look

more to alleviate social harm. Though OCD and depression are comorbid, it should be noted that in the general population it appears that other anxiety related disorders are more strongly comorbid with depression, however it is important to still look at their relation (Wu& Carter, 2008).

Quality of life is also decreased due to OCD and depression comorbidity. According to Mascltis, Rector, and Richter (2003), when depression is present in someone with OCD, their illness was much more intrusive and quality of life was decreased significantly. It is also important to note that relapse in cases of comorbidity is higher. In this study obsessions are said to impact quality of life greatly and they correlate with depression (Stengler-Wenzke, Kroll, Matschinger, & Angermeyer, 2007). Compulsions, however, showed more effect on physical well-being than obsessional symptoms (Stengler-Wenzke et al., 2007). In another study by Eisen et al. (2006), physical health, emotional well-being, school life, social life, and work life were all severely impaired in comparison to the general population in the comorbid population.

Non-Clinical Population

This study examines depression in a non-clinical population. According to Roberta Roesch(1991), non-clinical versions of depression are quite common. In fact, many (or all) of us feel depressed at some point in our life. Sometimes people experience one depressive episode and others have many. In addition, normal depression comes with life's events that may trigger such feelings like "anger, conflict, disappointment, discouragement and sadness." Clinical depression must be for a longer period of time (more than 2 weeks) and be more severe than non-clinical (Parker& Paterson, 2015). Often people in the non-clinical range of depression have

higher rates of negative view of self, especially in student samples, which is the population in this study (Gould,1982; Lips&Ng,1986).

This study is also aimed at those with OCD in the non-clinical population. According to Fullana et al. (2009), OCD symptoms (OCS) appear in 21-25% of the general population and most of the people who have them do not seek help. In a study of the non-clinical population, those with symptoms also are more likely to have other mental illness. Additionally, Adam, Meinlschmidt, Gloster, and Lieb (2011), showed that those with obsessive-compulsive symptoms and sub-threshold OCD were more likely to have another mental disorder than those with no symptoms. In 65.9% of sub-threshold OCD and 61.2% of OCS there was one or more mental disorders. Though research with the general population is used often for obsessive-compulsive disorder, it is useful because OCD is dimensional, meaning there is a spectrum of symptom prevalence. (Abramowitz et al., 2014). Studying dimensional OCD in the general population will show more prevalence than studying "categorical," meaning there is either no symptoms or all symptoms.

Purpose

The purpose of this study is to examine the co-occurrence of the symptoms of OCD and depression in a non-clinical population. Just as symptomology occurs in one person in the clinical population, the same factors may appear within the general population in a less obvious way. That is, people in the general population may be less affected, have better coping skills, may be unaware that assistance is available, or unable to access treatment. Tully, Zajac, and Venning (2009) claimed that negative emotions interrelate, thus showing within the non-clinical population as well. It is also interesting to note that mental illness in the general population

should be viewed through a "dimensional," and not so much a "categorical," perspective. Diversity is important in the sample, in order to get a broad view of the results, but confounding variables are also relevant within the general population (Crawford & Henry, 2003). According to Ferraro and Trottier-Wolter (2010), the general population is not studied nearly as much as it should be, and cultures are often left out (such as the Native American community). If general population studies are not done of specific cultures, there can be an overestimation or underestimation of the diagnosis. Considering the college age population in this study will provide normative data for the college population and provide more data in order for future experiments and treatments for comorbid OCD and depression to not be over or underestimated. Therefore, it is important to study the general population in this study because it will give more information about comorbidity within the clinical population as well as provide important details for treatment solutions to the less known and studied populations of mental illness. Hypothesis one is that OCD and depression are significantly correlated . Hypothesis two is that obsessional symptoms will be stronger than compulsions in those with depressive symptoms in the general population.

Methods

Measures

There are multiple measures used to provide an accurate representation of OCD and obsessive-compulsive symptoms. It is important to look at studies similar to this one when finding the most accurate measure for the non-clinical population. A valid and reliable method of measuring is important when doing proper research. One common test of obsessive-compulsive symptoms is the OCI-R (Foa et al., 2002) (Obsessive-Compulsive Inventory- Revised). The

OCI-R is considered reliable and valid, and can be used in both general and clinical population (Foa et al., 2002; Fullana et al., 2005; Hajcak,, Huppert, Simons, & Foa, 2004; Huppert et al., 2007). The OCI-R is an 18-item self-report on a Likert scale of 5, and measures washing, checking, ordering, obsessing, and hoarding. However, a flaw in the OCI-R may be that more weight is given to compulsions than obsessions (Foa et al., 2002). Another common obsessive-compulsive inventory is the Yale-Brown Obsessive-Compulsive Scale-Symptom Checklist or Y-BOCS (Goodman et al., 1989a&b). Though this is not a self-report scale, the Y-BOCS is important because it provides measures of severity of OCD symptoms and is highly reliable and valid. The Y-BOCS has 58 items on the checklist (Goodman et al., 1989a). A version of the Y-BOCS is the Y-BOCS Self report or Y-BOCS-SR which was originally used by Baer (1991). Though the Y-BOCS-SR is normally a checklist, the Y-BOCS-SR has been edited to make it on a Likert scale of 5 (see Appendix 1). This will create a more dimensional views of OCD symptoms. In this study, there will be use of the Y-BOCS-SR and the OCI-R. The Y-BOCS-SR has been used and seen as a valid source of information, highly correlates with the OCI-R and is of good use in the student population and general population (Ólafsson., Snorrason,& Smári, 2009; Warren, Zgourides, & Monto, 1993).

The most commonly used depression inventory is the Beck Depression Inventory or BDI. The most recent version is the BDI-II. This inventory has 21 items on a Likert scale from 0 to 3 (Beck, Steer, Ball, & Ranieri, 1996). Both BDI and BDI-II show high validity and reliability, however the BDI-II is "stronger in its factor structure" (Dozois, Dobson, & Ahnberg, 1998). Results are often similar because there is a "non-specific distress factor" in depression (Steer, Clark, Beck, & Ranieri, 1999). The BDI-II version has been used within non-clinical

populations, specifically college students (Steer& Clark.,1997; O'hara, 1998). This study will use the BDI-II to measure depression.

Participants

A total of 140 people took the online survey. Out of the 140 people, 115 people completed the demographics survey, and 105 people passed the check and completed all the diagnostic surveys. Female participants were more common in this study, 19.5% (n=22) participants identified as male, 78.8% (n=89) identified as female, and 1.8% (n=2) did not respond. Within the racial demographic, 83.2% (n=94) identified as white, 8.0% (n=9) identified as black, 2.7% (n=3) identified as mixed race, 1.8% (n=2) identified as Asian, 1.8% (n=2) identified as middle eastern or Arab, and 2.7% (n=3) did not respond. Each participant was asked to complete the BDI-II, OCI-R, and Y-BOCS-SR checklist in Likert scale format.

Procedure

A survey was delivered on the Eastern Michigan University SONA survey system. This system is available for students to get credit for their psychology lab class. After agreeing to the informed consent, the survey was given. The survey included the BDI-II, OCI-R, Y-BOCS-SR checklist formatted into a Likert scale, and questions on demographics (race, gender, and age). A check was made in the middle of the survey "put 2 if you are reading this" to make sure the participant was reading the survey. After completing the survey, the student was given the option to press a link to be directed to a separate, un-affiliated survey. Here, they would put their names to achieve credit for taking the survey.

Results

Using R-studio analysis programs, a frequency table was created to see if there is an overall difference in rates of OCD and depression, using the OCI-R and the BDI-II (table 1). The results of the frequency table were used in the second table to have relevant statistics. In table 2, an r value was found to see if certain symptoms would be correlated with overall depression. A t-test is used to see if there is a difference between the depressed and non-depressed in the respective symptom subtype. A scatter plot was then made to see an overall correlation between OCI-R scores and BDI-II scores (figure 1).

Table 1

Frequency depression/OCD

	Clinical OCI-R (>21)	Non-Clinical OCI-R (<21)
Clinical Depression (>21)	7	17
Subclinical Depression (20-11)	10	25
Non-depressed (<10)	4	42

Note. Values represent the number of participants who fall into each level of pathology. Eight participants did complete all items of diagnostic inventory. *Chi squared is significant*. Significance was found between subclinical and non-depressed and clinical and non-depressed, but not subclinical and clinical.

Table 2

OCD symptoms in comparison to depression

OCD	r	Total Sample *M* (*SD*) n = 105	Non-Depressed *M (SD)* n=46	Depressive Symptoms *M (SD)* n=59	t-value
Total	0.33*	13.67 *(10.39)*	9.02 *(7.25)*	17.10 *(11.12)*	4.27*
Checking (OCI-R)	0.11	2.39 *(2.56)*	1.81 *(2.46)*	2.83 *(2.64)*	2.05*
Hoarding (OCI-R)	0.22*	1.95 *(1.84)*	1.26 *(1.36)*	2.51 *(2.05)*	3.60*
Neutralizing (OCI-R)	0.15	1.19 *(1.79)*	0.81 *(1.06)*	1.38 *(2.04)*	1.75
Ordering (OCI-R)	0.26*	4.06 *(3.38)*	3.11 *(2.88)*	4.85 *(3.61)*	2.71*
Obsessing (OCI-R)	0.44*	2.15 *(2.43)*	0.92 *(1.40)*	2.97 *(2.56)*	4.94*
Washing (OCI-R)	0.22*	1.98 *(2.59)*	1.15 *(1.56)*	2.65 *(3.08)*	3.01*
Aggressive Obsessions (YBOCS)	0.53*	4.85 *(4.50)*	2.72 *(3.57)*	6.30 *(4.44)*	4.46*
Contamination Obsessions (YBOCS)	0.20*	6.17 *(5.67)*	5.35 *(5.92)*	7.02 *(5.49)*	1.48
Sexual Obsessions (YBOCS)	0.20*	0.81 *(1.73)*	0.45 *(1.02)*	1.00 *(2.00)*	1.73
Hoarding/Saving Obsessions (YBOCS)	0.15	0.46 *(0.76)*	0.28 *(0.65)*	0.60 *(0.81)*	2.24*
Religious Obsessions (YBOCS)	-0.02	0.85 *(1.21)*	0.87 *(1.41)*	0.88 *(1.08)*	0.03
Obsessions of Symmetry (YBOCS)	0.22*	0.90 (1.21)	0.85 *(1.16)*	1.00 *(1.29)*	0.62
Somatic Obsessions (YBOCS)	0.31*	2.33 *(2.03)*	1.72 *(1.90)*	2.86 *(2.07)*	2.92*
Cleaning/Washing Compulsions (YBOCS)	0.14	1.37 *(1.99)*	1.02 *(1.76)*	1.68 *(2.13)*	1.69
Checking Compulsions (YBOCS)	0.11	5.14 *(5.29)*	4.64 *(6.12)*	5.38 *(4.76)*	0.69
Repeating Rituals (YBOCS)	0.08	2.91 *(2.18)*	2.79 *(2.55)*	2.98 *(1.89)*	0.45
Hoarding/Collecting Compulsions	0.16	0.41 *(0.68)*	0.17 *(0.38)*	0.58 *(0.77)*	3.31*

(YBOCS)

Note: $p<.05$. *signifies significance. Non-depressed reflects scores <10 on the BDI-II. Depressive symptoms reflects scores >11.

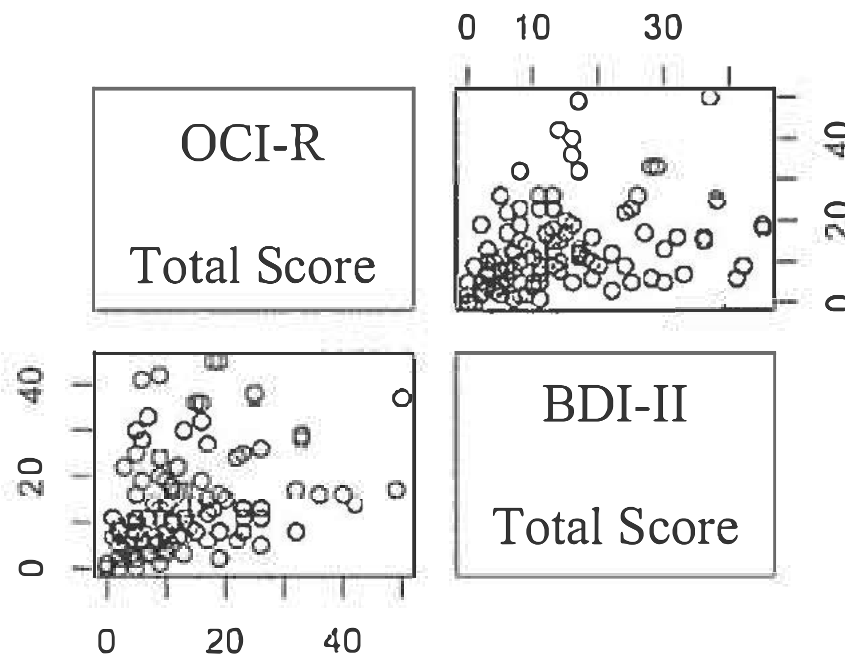

Figure 1. Scatter plot showing the relationship between the OCI-R total score and BDI-II. There is a moderate positive correlation between the OCI-R score and BDI-II.

Discussion

The purpose of this study was to understand the correlation of obsessive-compulsive disorder and depression in a non-clinical sample. The hypothesis that OCD and depression are positively correlated was supported. In addition, the hypothesis that obsessions are stronger than

compulsions was seen through the Y-BOCS and the OCI-R where obsessions often had a higher r value, therefore this hypothesis was supported. This study also had the major contribution of looking at specific symptoms and subtypes of OCD that are often overlooked. Symptoms that showed positive correlation with depression overall were hoarding, ordering, obsessing, washing, aggressive obsessions, contamination obsessions, sexual obsessions, obsessions of symmetry, and somatic obsessions. There was a significant difference between non-depressed individuals and those who showed some symptoms of depression in checking, hoarding, ordering, obsessing, washing, aggressive obsession, hoarding/saving obsessions, somatic obsessions, and hoarding/saving compulsions.

OCD and Depression

Obsessive-compulsive disorder and depression were significantly correlated with an r of 0.33. This study compared overall depression using the BDI-II and OCI-R. The Y-BOCS was not used to measure overall OCD because this measure did not have an overall scoring method, but was used based on individual items. The t-value was also significant when comparing symptomatic depression with no symptoms. Interestingly enough, 33% of all the patients within the clinical realm of OCD also were in the clinical realm of depression. Though numbers are varied in many studies, a compilation of studies by Altıntaş and Taşkıntuna (2015) found anywhere from 14% to 64% of an OCD sample also had clinical depression.

Obsession subtypes and depression. Only one symptom subtype of the OCI-R measures obsessions. With an r of 0.44, it had the highest correlation with depression than any compulsion measured within the OCI-R. Obsessions also had the highest t-value difference between showing no symptoms and showing symptoms. This higher correlation was expected

based on previous studies by Ricciardi and Mcnally (1995). The obsession subtypes that were significantly correlated with depression were aggressive obsessions, contamination obsessions, sexual obsessions, obsessions of symmetry, and somatic obsessions. The obsessions where there was a significant difference between showing clinical symptoms and no clinical symptoms of depression were aggressive obsessions, hoarding/ saving obsessions, and somatic obsessions. At 0.53, the highest correlation with depression was aggressive obsessions. This could be due to many reasons, for example in a study by Praag (1986) there was a discovery that the hormone 5-hydroxyindoleacetic acid was linked with both depressive and aggression disorders. A common occurrence within depression is self-harming, and agitation is another common symptom of depression, both of which could be considered a part of diagnosing aggressive obsessions. There was an overall correlation in contamination obsessions, but no difference between showing symptoms of depression and no depression. Correlation might have occurred because, as previously stated, contamination obsessions occur in 67% of OCD patients, and therefore is the most commonly occurring (Besiroglu et al., 2007). Power and Tarsia (2007) showed that disgust emotion is more common in both anxiety and depressive disorders than the general population, and this "disgust" aspect may be an explanation for contamination fears. Sexual obsessions, like "hidden or perverse sexual impulses," are measured in the Y-BOCS. In various studies, it has been found that depression has been correlated with sexually risky behaviors and dysfunction (Atlantis & Sullivan, 2012; Jackson, 2004; Lennon, Huedo-Medina, Gerwien, & Johnson, 2012). Hoarding obsessions show a difference within the depressed and non-depressed population, but not in the overall correlation. This difference may be due to the fact that there is only one item measuring hoarding or there was a broader range of scores between the levels of depression. Other studies, such as the one by Raines et al. (2016), have found that depression and hoarding

are significantly correlated, and correlation may be due to perceived feeling of burdensomeness and negative affect of those who are hoarders and depressed. An obsession with hoarding in OCD would more than likely create a similar result in those with depression. Obsessions of symmetry may occur in the depressed out of fear of judgement and not being perfect due to the heightened self-awareness described earlier (Rude et al., 2004). Somatic obsessions understandably occur at higher rates and higher correlations in depressed individuals because of the higher rates of illness in the depressed (Cuijpers et al., 2012). Poor body image is also common in the depressed, even if they are perceived as attractive to others (Noles, Cash, & Winstead, 1985). Lastly, religious obsessions showed no correlation overall. This lack of correlation could be due to many factors: lack of overall religiosity in a liberal college, lack of items to correlate, or an overall low rate of extreme feelings towards religion. It could be interesting to note that religiosity often reduces depression (Mosqueiro, Rocha, & Fleck, 2015). Obsessions have an increased correlation with depression, but these factors may reduce the correlation significantly. Overall, obsessions have a high rate of correlation with depression. Each obsession can relate to the heightened self-awareness and heightened judgement that depression is known for. However, these obsessions may not always translate into compulsions.

Compulsion Subtypes and Depression. As previously stated, compulsions are less common in depressed patients than obsessions are. In this study, the Y-BOCs checklist Likert scale format found that there was a significant difference between hoarding compulsions between the depressed and non-depressed. The OCI-R, which mainly has measures for compulsions, found significance overall and for depressed vs. non- depressed in hoarding, ordering, and washing. There was a significant difference between depressed and non-depressed in the OCI-R for checking. No correlation was found for cleaning/washing and checking for the

Y-BOCS. Neutralizing and repeating rituals were not significant for either inventory. This difference in cross-test reliability may be due to the already weak correlation that was perceived in the OCI-R of less than 0.3 or different wording of questions because the Y-BOCS checklist is more often given to the clinical population than the OCI-R. Hoarding may appear to be more common in depressed people and appear significant in both the OCI-R and the Y-BOCS because of the high correlation of hoarding and depression. In a study by Hall, Tolin, Frost, and Steketee (2013), there was a 42% comorbidity rate with hoarding and depression. This study also found that those who had both hoarding and depression had poor self-control and emotion regulation, which could be caused by both the hoarding and depression. The ordering correlate could be due to the significance of the obsessions of symmetry, and possible depression while learning this compulsion. This subtype of OCD needs more research done to find if ordering and depression are correlated in most circumstances. Some literature explains why there may be a correlate between washing and depression, as found in this study. This and many other compulsions were created due to associated learning (Jones & Menzies, 1998). It was found that those with washing compulsions acquired the compulsion while they were depressed. It is understandable that others would develop compulsions in this way as well. Checking compulsions also had significance between depressed and non-depressed. In a study by Viswanath et al. (2012), they found checking compulsions were some of the more relevant compulsions of women with OCD and depression. Neutralizing and repeating rituals, which both involve repeated actions, both were not correlated with depression, and there was no difference between depressed and non-depressed. This could be due to lack of learned compulsions in the depressed population. Depression is often more about everlasting sadness, and most do not manage this sadness with

ritualized actions. The majority of depressed individuals obsess, rather than take actions about these obsessions.

Limitations and Future Directions

The validity of the current research is limited by its use of a convenience sample of college students at a large Midwest university. Different rates of depression and obsessive-compulsive disorder can occur in different populations, such as the Native American population, who show higher rates. Additionally, more study needs to be done on the validity of using the Y-BOCS checklist as a Likert scale to measure symptoms in the general population. Also, a few of the symptoms listed in the Y-BOCS only have one or two items: religious obsessions, somatic obsessions, repeating rituals, and hoarding compulsions. In future studies, more items should be made to measure these symptoms.

Future studies should look more into subtypes of obsessive-compulsive disorder. Very few studies, for example, have looked specifically at somatic subtypes of OCD. Exploring other comorbid disorders (e.g. eating disorders or other anxiety disorders), in relationship to OCD would be relevant in furthering knowledge about obsessive and compulsive subtypes. Other measures should be used to measure stigmatization of both OCD and depression, to understand how these diagnoses may affect the general population and the clinical population. This study should also be repeated with different, more diverse, and larger populations to see if there are any differences between race, gender, and overall culture.

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Appendix: Yale Brown Obsessive-Compulsive Scale Symptom Checklist

The following statements refer to experiences that many people have in their everyday lives. Circle the number that best describes HOW MUCH that experience has DISTRESSED or BOTHERED you during the PAST MONTH.

		Not at all			Extremely	
		0	1	2	3	4
1	I fear I might harm myself					
2	I fear I might harm other people					
3	I have violent or horrific images in my mind					
4	I fear I will blurt out obscenities in class					
5	I fear doing something embarrassing					
6	I fear I will act on unwanted impulse					
7	I fear I will steal things					
8	I fear that I'll harm others because I'm not careful enough					
9	I fear I'll be responsible for something else terrible happening					
10	I am concerned or disgusted with bodily waste or secretion					
11	I am concerned with dirt or germs					
12	I am excessively concerned with environmental contaminants					
13	I am excessively concerned with certain household cleansers					
14	I am excessively concerned with animals					
15	I am bothered by sticky substances or residues					
16	I am concerned that I will get ill because of contamination					

17	I am concerned that I will contaminate others					
18	I have forbidden or perverse sexual thoughts, images, or impulses					
19	I have sexual obsessions that involve children or incest					
20	I have obsessions about homosexuality					
21	I have obsessions about aggressive sexual behaviour toward other people					
22	I have obsessions about hoarding or saving things					
23	I am concerned with sacrilege or blasphemy					
24	I am excessively concerned with morality					
25	I have obsessions about symmetry or exactness					
26	I feel that I need to know or remember certain things					
27	I fear saying certain things					
28	I fear not saying just the right thing					
29	I fear losing things					
30	I am bothered by intrusive (neutral) mental images					
31	I am bothered by intrusive mental nonsense sounds, words, or music					
32	I am bothered by certain sounds or noises					
33	I have lucky and unlucky numbers					
34	Certain colors have special significance to me					
35	I have superstitious fears					

36	I am concerned with illness or disease					
37	I am excessively concerned with a part of my body or an aspect of my appearances					
38	I wash my hands excessively or in a ritualized way					
39	I have excessive or ritualized showering, bathing, tooth brushing, grooming, or toilet routines					
40	I have compulsions that involve cleaning household items or other inanimate objects					
41	I do other things to prevent or remove contact with contaminants					
42	I check that I did not harm others					
43	I check that I did not harm myself					
44	I check that nothing terrible happened					
45	I check that I did not make a mistake					
46	I check some aspect of my physical condition tied to my obsessions about my body					
47	I reread or rewrite things					
48	I need to repeat routine activities					
49	I have counting compulsions					
50	I have ordering or arranging compulsions					
51	I have compulsions to hoard or collect things					
52	I have mental rituals (other than checking/counting)					
53	I need to tell, ask, or confess					

54	I need to touch, tap, or rub things.					
55	I take measures (other than checking) to prevent harm or terrible consequences to myself or family.					
56	I have ritualized eating behaviors					
57	I have superstitious behaviors					
58	I pull my hair out (trichotillomania)					

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