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Quality of Life in Adult Obsessive-Compulsive Disorder:

The Role of Moderating and Mediating Variables

By

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Abstract

Background: This study examined the contribution of various aspects of obsessive-compulsive disorder (OCD) on quality of life (QoL) in 102 adults with a principal diagnosis of OCD from an archival database. **Method:** Participants were assessed for DSM-IV diagnoses by trained clinicians using the Anxiety Disorders Interview Schedule, 4th Edition (ADIS-IV), the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), and an unstructured interview. Further information was attained using the Beck Depression Inventory II (BDI-II), the Obsessive Compulsive Inventory Revised (OCI-R) and the Medical Outcome Study-36 (MOS-36). **Results:** Results indicated that obsessive-compulsive symptom severity was positively correlated with diminished emotional health, social functioning and general health QoL, but not physical health QoL. Main effects were found for depression severity, the presence or absence of comorbid major depressive disorder and obsessive-compulsive symptom severity and QoL. Mediational analyses indicated that interference of obsessive-compulsive symptoms on the Y-BOCS mediated the relationship between obsessive-compulsive symptom severity and social functioning, emotional health and general health QoL. Mediational analyses further revealed that resistance to obsessive-compulsive symptoms on the Y-BOCS was a mediator between obsessive-compulsive symptom severity and social functioning QoL. Further analyses explained the role of each mediator in the relationship between obsessive-compulsive symptom severity and social functioning QoL. Across symptom dimensions, persons with OCD had a largely impacted QoL within multiple domains. **Conclusions**: Diminished QoL is common in persons with OCD and is essential in

understanding the complete clinical picture of OCD. Results are discussed in terms of

implications for assessment, treatment and future research.

Introduction

Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by the presence of intrusive thoughts, impulses or images (obsessions) and/or repetitive behaviors, rituals or mental acts (compulsions) that cause significant distress or interference with daily functioning (American Psychiatric Association, 2000). Clinical rates of OCD in adults are estimated between 1-2% (Crino et al., 2005). When left untreated, OCD runs a chronic and debilitating course often contributing to interpersonal and psychological difficulties throughout adulthood (Norberg, Calamari, Cohen, & Riemann, 2008). Comorbidity is common in those with OCD with approximately 70% overall comorbidity, 38% comorbidity with generalized anxiety disorder, 31% with major depressive disorder, 17% with panic disorder, and lower frequency comorbidity rates with PTSD, specific phobias and tic disorders (Storch et al., 2010).

Several etiological theories have been proposed to explain OCD including neurochemistry, neuropsychological, genetic, and cognitive-behavioral theories. The neurochemistry theory points to the serotonergic and dopaminergic neurotransmitter systems in the pathogenesis of OCD (Markarian et al., 2010). This theory has contributed to the development of psychopharmacological treatment protocols for OCD. The neuropsychological theory of OCD points to the impairment in fronto-striatal executive functioning, including the use of organizational strategies and the organization of memories (Aouizerate et al., 2004; Chamberlain, Blackwell, Fineberg, Robbins, & Sahakian, 2005; Markarian, et al., 2010). The genetic etiological model focuses on the role of genetic features of OCD. To date, no specific gene has been determined to explain the disorder, yet family and twin studies reveal that there is a genetic component

in the transmission and expression of OCD (Nicolini, Arnold, Nestadt, Lanzagorta, & Kennedy, 2009). The cognitive-behavioral etiological theory posits that dysfunctional beliefs and misappraisals of intrusive thoughts lead to the development of behaviors that attempt to neutralize and diminish obsessions. This theory has led to the development of cognitive-behavioral focused treatments for OCD (Doron & Kyrios, 2005).

The World Health Organization has reported that OCD accounts for 2.5% of global years lost due to disability (YLDs) (Ayuso-Mateos, 2000). Given the high rates of disability and impairment associated with OCD and comorbid conditions, it is not surprising that quality of life (QoL) will be negatively affected by the presence of OCD. The construct of QoL is defined by two primary components which include an individual's functional status and an individual's subjective determination of how their health impacts their life (Rapaport, Clary, Fayyad, & Endicott, 2005). Measures of QoL generally depend on self-report and therefore indicate an individual's subjective experience of impairment. When investigating QoL it is important to consider the various areas of one's life that may be affected by psychopathological conditions. Quality of life can be looked at as one overall blanket measure or can be broken down into various domains. For the purposes of the current study, QoL will be defined as having four domains including physical health, emotional well-being, social functioning and general QoL. The physical health domain will include measures of role limitation due to physical health problems (role-physical) and bodily pain. The emotional well-being domain will include measures of role limitation due to emotional problems (role-emotional) and mental health. The social domain will include a measure of social functioning as it is affected by overall physical and mental health. The general QoL domain will include measures of general health and vitality (Ware, Snow, Kosinski, & Gandek, 1993). Quality of life across varying psychopathological disorders will be discussed next.

Quality of life and psychopathology

Studies have investigated QoL across many psychiatric conditions including anxiety disorders, mood disorders, and schizophrenia (Goossens, Hartong, Knoppert-van der Klein, & van Achterberg, 2008; Masthoff, Trompenaars, Van Heck, Hodiamont, & De Vries, 2006; Piccinni et al., 2007; Tomida et al., 2010; Yen et al., 2007). A broad range of anxiety and mood disorders are associated with significant QoL impairment relative to community norms. Specifically, a meta-analysis addressing QoL impairment across psychiatric conditions showed proportions of persons with impaired QoL as follows: major depressive disorder (63%), dysthymia (56%), panic disorder (20%), OCD (26%), social phobia (21%), and posttraumatic stress disorder (56%) (Rapaport, et al., 2005). It is important to consider that physical health QoL is generally less impaired in adults with anxiety disorders as compared to adults with major depressive disorder or posttraumatic stress disorder (Rapaport, et al., 2005). The physical health QoL domain is incorporated into overall QoL ratings yielding lower percentages of QoL impairment in adults with various anxiety disorders as compared with mood disorders and posttraumatic stress disorder. However, results have varied throughout studies comparing QoL in OCD to QoL in other psychiatric disorders. Studies have shown QoL in those with OCD to be comparable to QoL in adults with schizophrenia (Bobes et al., 2001), significantly worse than QoL in adults with schizophrenia (Stengler-Wenzke, Kroll, Riedel-Heller, Matschinger, & Angermeyer, 2007) and significantly worse than QoL in depressed patients (Bobes, et al., 2001). Specific studies of QoL in anxiety disorders, affective disorders and schizophrenia are reviewed next.

Anxiety disorders. Diminished QoL has been well documented across a broad range of anxiety disorders including panic disorder, social phobia, generalized anxiety disorder, and posttraumatic stress disorder (Barrera & Norton, 2009; Lunney & Schnurr, 2007; Mendlowicz & Stein, 2000). Poor QoL in panic disorder is predicted by the

severity of panic symptoms, side effects from panic disorder medications, perception of low level of social support, comorbid depression severity and an early onset of panic disorder (Yen, et al., 2007). Individuals with panic disorder, social phobia and generalized anxiety disorder tend to have comparably diminished QoL across disorders as compared to non-anxious individuals in the community. Additionally, QoL impairment among these three anxiety diagnoses does not differ across specific domains of QoL (Barrera & Norton, 2009). Comorbidity of anxiety disorders with depression yields significantly greater QoL impairment relative to individuals with an anxiety disorder and no depression comorbidity. However, having comorbid anxiety disorders does not predict greater impairment relative to the presence of one anxiety disorder alone (Barrera & Norton, 2009). Studies addressing QoL outcome in posttraumatic stress disorder have found similar results as compared to other anxiety disorders and QoL impairment, with numbing symptoms of posttraumatic stress disorder uniquely predicting QoL impairment across all QoL domains (Lunney & Schnurr, 2007).

Affective Disorders. Impaired quality of life in major depression has been well documented given that depression is highly comorbid with other psychopathological and physiological conditions (Barrera & Norton, 2009; Bobes, et al., 2001; Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009). Longitudinal data show that individuals with major depressive disorder (MDD) have significantly impaired quality of well-being over time as compared to non-depressed controls. Physical health QoL in persons with MDD is significantly lower than physical health QoL in healthy controls as well as persons with dysthymic disorder (Goldney, Fisher, Wilson, & Cheok, 2000; Saarijarvi, Salminen, Toikka, & Raitasalo, 2002). The severity of MDD symptoms as well as the presence of comorbid psychopathological conditions contribute to diminished QoL (Rapaport, et al., 2005). The relationship between poor QoL and affective disorders has also been demonstrated in bipolar I patients, with individuals who have persistent depressive

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symptoms fairing worse in QoL than those with persistent manic symptoms; both those with persistent depressive symptoms and those with persistent manic symptoms have significantly more impaired QoL when compared to community norms (Goossens, et al., 2008; Piccinni, et al., 2007).

Schizophrenia. Deficits in QoL have been seen in persons with schizophrenia and are exhibited by impairments in social functioning, diminished physical health and complex emotional issues. In schizophrenia, the presence of depressive and anxiety symptoms, low self-esteem and impairment in cognitive functioning contribute to diminished QoL (Meijer, Koeter, Sprangers, & Schene, 2009; Tomida, et al., 2010). Global functioning and social integration have a less significant role in predicting QoL impairment as compared to the presence of depression and anxiety (Meijer, et al., 2009). Remission from schizophrenia has been associated with improved QoL outcomes (Helldin, Kane, Karilampi, Norlander, & Archer, 2008). Next the relationship between QoL impairment and OCD symptom severity, number of symptoms, symptom dimensions and comorbidity will be discussed.

Quality of life and obsessive-compulsive disorder

Obsessive-compulsive symptom severity and number of symptoms.
Research addressing the predictors of diminished QoL in OCD is currently characterized by mixed results. Studies looking specifically at QoL in OCD have shown that increases in OCD symptom severity and number of symptoms correlate with greater QoL impairment across all domains (Eisen et al., 2006; Masellis, Rector, & Richter, 2003; Moritz et al., 2005). Interestingly, some studies have found that QoL impairment is more highly associated with the severity or number of obsessions (Eisen, et al., 2006), whereas others have found QOL impairment to be more highly associated with the severity or number of compulsions (Moritz, et al., 2005). Study results have shown that the Y-BOCS compulsion subscale has no relationship to QoL impairment whereas the Y-

BOCS obsession subscale contributes significantly to the relationship between QoL impairment in social and occupational functioning and OCD (Eisen, et al., 2006) . However, others have found that the number and severity of obsessions is most strongly related to the role-emotional and mental health subscales of QoL, whereas number of compulsions has a strong significant relationship with QoL across all domains (Moritz, et al., 2005). Often there is no relationship found between bodily pain (Fontenelle et al., 2010; Moritz, et al., 2005), role-physical health and general health QoL and OCD even when other areas of QoL are highly associated (Moritz, et al., 2005). Obsessions and compulsions have also contributed equally to impairment in QoL (Huppert, et al., 2009). The role of obsessions versus compulsions on QoL in OCD is not fully established at this time. Symptom dimensions of OCD and their relationship with diminished QoL will be reviewed next.

   OCD symptom dimensions and QoL. Symptom dimensions in OCD may also be related to QoL. Common symptoms of OCD that are related to diminished QoL in the OCD population as compared with other symptom dimensions include hoarding, ordering and washing symptoms. Hoarding may be defined as the collection and inability to get rid of items despite their apparent lack of value to others (Saxena et al., 2011). Ordering symptoms include obsessions about having items in a particular order and compulsive behavior to maintain the order of objects and prevent distress. Washing symptoms include obsessions related to contamination and cleanliness and compulsive washing/cleaning behaviors to prevent distress related to being contaminated (American Psychiatric Association, 2000). Persons with hoarding symptoms generally show a diminished QoL in the domains of safety/victimization, socialization and living situation (Fontenelle, et al., 2010; Huppert, et al., 2009; Saxena, et al., 2011). Persons with washing symptoms as compared to non-washers show more impairment in physical health QoL (Fontenelle, et al., 2010) and social functioning QoL (Huppert, et al., 2009).

Persons with ordering symptoms as compared with those with non-ordering symptoms may exhibit higher rates of impairment in social functioning QOL (Huppert, et al., 2009).

Importantly, studies addressing symptom dimensions often suggest that it is actually the presence of depressive and anxiety symptoms that account for the strength of the relationship between hoarding, ordering and washing symptom dimensions and QoL (Fontenelle, et al., 2010; Huppert, et al., 2009). After controlling for depression and anxiety symptoms, only the correlation between washing symptoms and social functioning, and ordering symptoms and work-related functioning remain significant (Huppert, et al., 2009). Contrarily, one study looking specifically at hoarding symptoms and QOL found that depressive and anxiety disorders did not moderate the relationship between the hoarding symptom dimension and diminished QoL. Rather, depressive and anxiety symptoms were equivalent across symptom dimension groups. (Saxena, et al., 2011). The relationship between impaired QoL and OCD comorbidity is discussed next.

Comorbidity. Comorbid affective and anxiety disorders contribute significantly to the diminished QoL experienced by those with OCD (Abramowitz, Storch, Keeley, & Cordell, 2007; Besiroglu, Uguz, Saglam, Agargun, & Cilli, 2007; Fontenelle, et al., 2010). However, the mechanism predicting the role of comorbidity on OCD QoL is unclear at this time. Comorbidity of OCD and MDD is related to a significantly diminished QoL and higher functional impairment as compared with individuals with non-comorbid OCD. Further, individuals with comorbid OCD-MDD and individuals with OCD alone have significantly worse QoL outcomes and greater functional impairment when compared to non-OCD controls. This is suggestive of the role of depression in accounting for the strength of the relationship between obsessions, compulsions and QoL (Huppert, et al., 2009).

The psychopathological processes mediated by OCD symptoms may predispose individuals to the development of depressive symptoms (Besiroglu, et al., 2007).

Specifically, individuals with comorbid OCD-MDD have significantly more severe obsessions and compulsions and are significantly more impaired in physical health, emotional well-being and social functioning QoL (Besiroglu, et al., 2007). Obsession severity, the presence of generalized anxiety disorder and aggressive obsessions are all associated with the development of MDD after OCD onset (Besiroglu, et al., 2007). Individuals with comorbid OCD-MDD tend to have more severe obsessions and compulsions, a greater tendency to misinterpret the significance of intrusive thoughts and poorer insight into symptoms. Functional impairment and the misinterpretation of intrusive thoughts are possible unique predictors of depression in individuals with OCD (Abramowitz, et al., 2007). The role of OCD symptom interference and resistance symptoms in QoL impairment are discussed next.

Yale-Brown Obsessive-Compulsive Scale dimensions. Utilizing the dimensional structure of the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), it is possible to address OCD as a compilation of severity of obsessions, severity of compulsions, symptom interference, and resistance to symptoms (Moritz et al., 2002; Storch et al., 2005). Resistance symptoms as well as perceived control over symptoms has uniquely predicted functional impairment in adults with OCD (Storch, Abramowitz, & Keeley, 2009). Symptom interference, or the combination of severity of obsessions and compulsions, includes time occupied by obsessions/compulsions, interference of obsessions/compulsions with activities, and distress over obsessions/compulsions. Resistance symptoms includes ability to resist obsessions/compulsions and degree of perceived control over obsessions/compulsions. The role of symptom interference versus the role of resistance to symptoms has yet to be addressed as possible mediating variables in the relationship between OCD and QoL.

Present Study

The present study seeks to expand the literature by clarifying the predictive components of diminished QoL in adults with OCD. First, this study will compare QoL in adults with OCD relative to historical controls of QoL in other psychiatric conditions, including major depressive disorder, panic disorder and schizophrenia. It is predicted that QoL in adults with OCD will be comparable to QoL in adults with major depressive disorder, panic disorder (Rapaport, et al., 2005) or schizophrenia (Bystritsky et al., 2001). Second, this study will investigate the relationship between obsessive-compulsive symptom severity as well as obsessive-compulsive symptom dimensions with the four domains of QoL: physical health, emotional well-being, social functioning and general quality of life. It is predicted that obsessive-compulsive severity scores on the Y-BOCS will correlate inversely with QoL for emotional well-being, social functioning and general domains, yet will not be associated with physical health QoL (Eisen, et al., 2006; Masellis, et al., 2003; Moritz, et al., 2005; Rapaport, et al., 2005). It is expected that symptom dimensions of hoarding, washing and ordering measured by the Obsessive-Compulsive Inventory Revised (OCI-R) will be associated with greater impairment in emotional well-being QoL, social functioning and general QoL as compared with other OCD symptom dimensions (Huppert, et al., 2009). It is possible that washing symptoms will be associated with diminished physical health QoL as the mere act of obsessive washing may impact role-physical functioning and bodily pain (Fontenelle, et al., 2010). This analysis will clarify the mixed results found in previously conducted research concerning the role of symptom severity and symptom dimensions on the relationship between OCD and diminished QoL.

Third, it is predicted that depression symptom severity on the BDI-II will moderate the relationship between OCD and QoL. This hypothesis will help expand on the literature that posits that depression plays a large role in moderating QoL in OCD by

differentiating whether the role of comorbid depressive symptoms (and their severity) or MDD diagnosis contributes to the relationship between OCD and QoL (Besiroglu, et al., 2007; Huppert, et al., 2009). Similarly, this study will address the moderating role of OCD comorbidity with a compiled anxiety disorder variable (generalized anxiety disorder, posttraumatic stress disorder, agoraphobia, social phobia and panic disorder). It is predicted that anxiety disorder comorbidity will moderate the relationship between OCD and QoL because of the increased impairment related to the presence of two or more psychopathological conditions. Lastly, this study will investigate the mediating role of symptom interference on the Y-BOCS versus the mediating role of resistance symptoms on the Y-BOCS in the relationship between OCD and QoL impairment. This novel aim will illuminate the roles of these categorical symptom clusters on the relationship between OCD and QoL.

Overall, past research addressing the relationship between OCD and QoL is limited. Comparisons of QoL in adults with OCD and other psychopathological conditions have yielded inconsistent findings. Studies examining the predictors of diminished QoL in OCD have shown that symptom severity and number of symptoms generally correlate with more impaired QoL. It is unclear at this time if this relationship is due to the number and severity of obsessive symptoms, compulsive symptoms or overall combined symptoms (Eisen, et al., 2006; Masellis, et al., 2003; Moritz, et al., 2005). Investigations of the role of symptom dimensions in the relationship between OCD and QoL have shown that persons with hoarding (Saxena, et al., 2011), washing and ordering symptoms have significantly more diminished QoL than adults with other symptom dimensions (Fontenelle, et al., 2010; Huppert, et al., 2009). Additionally, comorbidity of OCD and MDD has been shown to be significantly related to diminished QoL (Besiroglu, et al., 2007), yet it is unclear whether depression symptom severity or the presence of diagnosed MDD moderates this relationship. Lastly, the relationship between QoL and

the bidimensional components of resistance and interference on the Y-BOCS has yet to

be investigated.

Method

Participants

Participants included 102 adults from an archival database with a principal diagnosis of OCD according to the *Diagnostic and Statistical Manual of Mental Disorder – Fourth Edition – Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000) criteria. Participants were referred to a university based specialty clinic for cognitive-behavioral treatment of OCD. Participants were given information about the study and presented with the option of taking part. Written consent was received by all persons choosing to participate in the study. Participants ranged in age from 18 to 79 years old (M = 29.4 ± 10.9 years) with 48% female (N = 49) and 52% male (N = 53). The ethnic distribution was Caucasian (96.3%), African American (1.9%), Asian (.9%), and other (.9%). Unfortunately, further demographic information concerning socioeconomic class, education, and marital status was not available for these participants.

Obsessive-compulsive disorder diagnoses as well as comorbid diagnoses were made by experienced clinical psychologists through an unstructured interview and verified with the Anxiety Disorder Interview Schedule- 4th edition (ADIS-IV) and the Y-BOCS. Clinicians were trained by first observing five or more administrations of the ADIS-IV and the Y-BOCS and then administering the measures under direct supervision. Lifetime best estimate diagnoses were made with the unstructured interview, ADIS-IV and Y-BOCS (Leckman, Sholomskas, Thompson, Belanger, & Weissman, 1982). No rater integrity measures were used. Comorbid diagnoses among participants with OCD consisted of Panic Disorder (n = 15), Social Phobia (n = 32), Agoraphobia (n = 10), Generalized Anxiety Disorder (n = 39), Specific Phobia (n= 13), Post Traumatic Stress

Disorder (*n* = 1), Major Depressive Disorder (*n* = 37), Dysthymia (*n* = 14), Alcohol Abuse

(*n* = 2), Substance Abuse (*n* = 1), Hypochondria (n = 1), and Psychotic Disorder Not

Otherwise Specified (*n* = 4).

Measures

      Anxiety Disorders Interview Schedule for DSM-IV (ADIS; Appendix A). The ADIS-

IV is a semi-structured clinical interview based on DSM-IV diagnostic criteria that

assesses the presence of anxiety disorders and allows for functional analysis of the

anxiety disorders. The ADIS-IV also provides sections that allow for the assessment of

commonly comorbid disorders including mood, somatoform and substance use

disorders. The ADIS-IV may be used to screen for psychotic symptoms and briefly

addresses family psychiatric history. The ADIS-IV adheres to the multiaxial system of the

DSM-IV and therefore is commonly used in research addressing anxiety and related

disorders (Brown, DiNardo, & Barlow, 1994).

      Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Appendix B). The Y-BOCS

(Goodman et al., 1989 a; Goodman, Price, Rasmussen, & Mazure, 1989b) is a 10-item

semi-structured clinician administered measure of obsession and compulsion severity.

Each item addresses self-reported experiences in the last week. Questions are rated on

a five-point Likert scale ranging from 0-4, with higher scores representing greater

symptom severity. Items 1-10 (excluding items 1b and 6b) are used to determine a total

severity score. Interference is defined as the sum of items one, two, three and six,

seven, eight on the Y-BOCS (Goodman et al., 1989a; Goodman, Price, Rasmussen, &

Mazure, 1989b). These items address time occupied by obsessions/compulsions,

interference of obsessions/compulsions with activities, and distress over

obsessions/compulsions. Resistance is defined as items four, five and nine, ten, which

address efforts made to resist obsessions/compulsions and degree of perceived control

over obsessions/compulsions (Goodman et al., 1989 a; Goodman, Price, Rasmussen, &

Mazure, 1989b). Satisfactory psychometric properties for the Y-BOCS have been found, including internal consistency, convergent validity, and treatment sensitivity (Deacon & Abramowitz, 2005; Goodman et al., 1989a,b; Storch et al., 2004). The factor structure of the Y-BOCS, comprised of obsession and compulsion factors is psychometrically supported with satisfactory reliability and good convergent validity. Divergent validity of the factor structure of the Y-BOCS is not entirely supported at this time (Deacon & Abramowitz, 2005; Storch, et al., 2005).

Obsessive-Compulsive Inventory-Revised (OCI-R; Appendix C). The OCI-R is an 18-item self-report measure that assesses the distress associated with obsessions and compulsions using six symptom dimension subscales which include: washing, checking, ordering, neutralizing, obsessing, and hoarding. Each subscale contains three-items that are rated on a five-point Likert scale measuring distress with values 0-4. Total scores for each symptom dimension may be determined by adding the three items for each individual subscale (Hunsley & Mash, 2008). Finding a total score on the OCI-R is misrepresentative of OCD severity as a person may have extremely high scores in one symptom dimension (e.g. hoarding) but very low scores in all other dimensions. It is therefore inaccurate to determine OCD severity based on an overall score as this score may not properly depict the severity of independent symptom dimensions. For the purposes of this study, factor scores will be used. Good psychometric properties have been found for use of the OCI-R in anxious patients (Foa et al., 2002; Huppert et al., 2006). The OCI-R is both highly sensitive and highly specific (Foa et al., 2002). Additionally, the OCI-R shows good convergent validity and performs well in discriminating OCD from other anxiety disorders (Abramowitz & Deacon, 2006).

Beck Depression Inventory-Second Edition (BDI-II; Appendix D). Based on the original Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a

21-question, self-report inventory of depressive symptoms experienced during the past week. Questions are rated on a four-point Likert scale ranging from 0-3, with higher scores representing greater symptom severity. A total score is calculated from the sum of all questions and is compared to a key to determine depression severity with a score of 0-9 indicating no depression, 10-18 mild to moderate depression, 19-29 moderate to severe depression and 30-63 indicating severe depression. Extensive reliability and validity data have been reported in clinical and non-clinical samples (Beck et al., 1996; Whisman, Perez, & Ramel, 2000). Psychometric analyses reveal that the second edition of the BDI is internally consistent and consists of two underlying factors addressing 1) cognitive-affective symptoms of depression and, 2) somatic symptoms of depression. Additionally, the high internal consistency supports the reliability of both the total score as well as the individual factor scores. The psychometric properties of the BDI-II support its use in evaluating the presence and severity of depressive symptomology (Whisman et al., 2000).

RAND MOS 36-Item Short Form Health Survey (Appendix E). The RAND MOS 36-Item Short Form Health Survey (SF-36; Ware et al., 1993) consists of 36 items that assess domains of physical, emotional, social and general quality of life. The scale is comprised of measures assessing eight different components of health including: physical functioning, physical role functioning, emotional role functioning, perceptions of general health, emotional health, energy/lethargy, bodily pain, and social functioning (Hays & Morales, 2001; Hays, Sherbourne, & Mazel, 1993). The SF-36 has shown good reliability and validity over diverse populations (McHorney, Ware, & Raczek, 1993; Ware et al., 1993). The three more specific domains assessed by the SF-36 have shown good psychometric properties with the physical health domain most accurately differentiating individuals on severity of chronic medical conditions, the emotional well-being domain most accurately distinguishing presence and severity of mental health disorders and the

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social functioning domain covering both physical and mental health components (McHorney et al., 1993).

Data Analysis

In order to investigate the hypothesis concerning the comparability of QoL across conditions, one-sample *t*-tests were used to compare the eight different components of health including: physical functioning, physical role functioning, emotional role functioning, perceptions of general health, emotional health, energy/lethargy, bodily pain, and social functioning in OCD to historical means for QoL in panic disorder, major depressive disorder and schizophrenia. Historical data from adults with panic disorder was taken from a study addressing QoL scores on the MOS-36 (N = 62) (Simon et al., 2002). Data from adults with major depressive disorder was taken from a study addressing QoL on the MOS-36 (N = 54) (Schonfeld et al., 1997). Lastly data from adults with schizophrenia (N = 137) was taken from Sciolla, Patterson, Wetherell, McAdams, and Jeste (2003) looking at QoL on the MOS-36. Correlations were used to investigate the hypothesis that symptom severity on the Y-BOCS is inversely related to QoL scores on the MOS-36. Correlation matrices were then used to examine the hypothesis that hoarding, washing and ordering symptoms on the OCI-R were more significantly related to diminished QoL scores than other symptom dimensions on the OCI-R. For all analyses a *p* value of less than 0.05 was used for significance testing.

An a priori power analysis was conducted to determine the needed strength of interactions to show significant effects. Hierarchical linear regression analyses were again used to assess the unique contribution of depression severity scores on the BDI-II in predicting MOS-36 QoL scores after accounting for the variance explained by the Y-BOCS severity score. In each analysis, the Y-BOCS severity score was entered in step one, BDI-II severity score in step two, and the interaction of Y-BOCS severity scores and BDI-II severity scores in step three. Similarly, hierarchical linear regression analyses

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were used to assess the unique contribution of the presence of psychiatric diagnoses of major depressive disorder and, separately, the presence of any anxiety disorder on MOS-36 QoL total score after accounting for the variance explained by the Y-BOCS severity score. Anxiety disorder was a grouped and dummy coded variable combining DSM-IV diagnoses of generalized anxiety disorder, posttraumatic stress disorder, agoraphobia, social phobia and panic disorder. In the first of the two analyses, the Y-BOCS severity score was entered in step one, presence of major depressive disorder in step two, and the interaction of Y-BOCS severity scores and the presence of major depressive disorder in step three. In the second of the two analyses, the Y-BOCS severity score was entered in step one, presence of dummy coded anxiety disorder in step two, and the interaction of Y-BOCS severity scores and the presence of dummy coded anxiety disorder in step three.

Mediational analyses addressed whether symptom interference or resistance symptoms mediated the relationship between OCD and QoL across the four domains of physical health, emotional well-being, social functioning and general QoL. Using the bootstrapping mediation method, the provided sample was resampled $k=5,000$ times generating a 95% confidence interval. The criterion for mediation was the exclusion of zero between the lower and upper bound of the confidence interval. If zero was not present it indicated that the indirect effect of the mediator on the outcome was not zero with 95% confidence (Hayes, 2009).

Results

Sample Characteristics

Means and standard deviations for various study measures are presented in Table 1. Zero-order correlations highlighted a significant negative relationship between age and both emotional (r = -0.34) and social functioning (r = -0.35) QoL. Independent group t-tests indicated a significant gender difference on emotional health QoL ($t(100)$ = -2.07, $p < 0.05$) with females experiencing significantly more diminished emotional health QoL than males. No further differences were noted on any other domain of QoL, Y-BOCS total score or OCI-R total score for age, gender or ethnicity.

One sample t-tests were used to compare scores on the eight components of QoL on the MOS-36 (physical functioning, physical role functioning, emotional role functioning, perceptions of general health, mental health, energy/lethargy, bodily pain, and social functioning) in persons with OCD relative to historical means for QoL in persons with panic disorder, major depressive disorder (MDD) and schizophrenia as represented in Table 2. Social functioning QoL was significantly worse and physical health QoL (including role-physical, physical functioning and bodily pain) was significantly better in those with OCD as compared to patients with schizophrenia, panic disorder or MDD. Additionally, role emotional QoL and vitality/energy was worse for those with OCD relative to those with either schizophrenia or panic disorder. Persons with OCD had significantly worse general health than those with panic disorder, but significantly better general health than those with MDD. Mental health did not differ across OCD, panic disorder and MDD; persons with schizophrenia fared better in this domain.

Associations Between QoL, Symptom Severity and Symptom Dimensions

As predicted, symptom severity on both the Y-BOCS and the CGI-Severity was negatively correlated with emotional health (r = -.24, $p < 0.05$), social functioning (r = -0.32, $p < 0.01$) and general health (r = -0.30, $p < 0.01$) QoL domains (Table 3). There was no significant relationship between obsessive-compulsive symptom severity and physical health QoL. With respect to the OCI-R subscales and QoL domains, only hoarding was negatively correlated with general health QoL (r = -0.24, $p < 0.05$), and neutralizing was positively correlated with both emotional health (r = 0.36, $p < .01$) and social functioning (r = 0.21, $p < 0.05$) QoL (Table 4).

OCD Comorbidity

Table 5 displays the t- and significance values for independent t- tests comparing the OCD only and comorbid OCD groups across study variables. Comorbidity with OCD was related to increased OCD symptom severity as indicated by both the Y-BOCS total score and the CGI-Severity, higher endorsement of interference of and distress from obsessive-compulsive symptoms, and significantly more diminished emotional health, social functioning and general health QoL when compared to an OCD only group.

Moderation Analyses

An a priori power analysis utilizing a power of 0.80 and an alpha of 0.05 revealed an effect size of 0.07 indicating that interactions would need to account for 7% of the variance in order for an interaction to be significant. Three moderation analyses were conducted to examine the role of depressive symptom severity as indicated by the BDI-II, major depressive disorder diagnosis and anxiety diagnosis in the relationship between obsessive-compulsive symptom severity and QoL. When looking at depressive symptom severity, step 1 of the hierarchical regression revealed obsessive-compulsive symptom severity to be a predictor of diminished QoL across all domains excluding physical health (emotional health QoL, β = -0.21, R^2 = 0.04, $p < 0.05$; social functioning QoL, β = -0.32,

$R^2 = 0.11$, $p < 0.01$; general health QoL, $\beta = -0.28$, $R^2 = 0.08$, $p < 0.01$). Step 2 indicated that depressive symptom severity predicted diminished QoL across all domains above and beyond obsessive-compulsive symptom severity (physical health, $\beta = -0.24$, $R^2 = 0.06$, $p < 0.05$; emotional health QoL, $\beta = -0.68$, $R^2 = 0.44$, $p < 0.001$; social functioning QoL, $\beta = -0.47$, $R^2 = 0.30$, $p < 0.001$; general health QoL, $\beta = -0.53$, $R^2 = 0.31$, $p < 0.001$). Step 3 revealed a non-significant interaction between obsessive-compulsive symptom severity and depressive symptom severity.

When utilizing a diagnosis of MDD as a moderating variable, step 1 indicated a significant relationship between obsessive-compulsive symptom severity and QoL. Step 2 indicated that an MDD diagnosis was related to diminished QoL across all domains, excluding physical health, above and beyond obsessive-compulsive symptom severity (emotional health QoL, $\beta = -0.46$, $R^2 = 0.25$, $p < 0.001$; social functioning QoL, $\beta = -0.49$, $R^2 = 0.32$, $p < 0.001$; general health QoL, $\beta = -0.32$, $R^2 = 0.18$, $p < 0.01$). Step 3 revealed a non-significant interaction between obsessive-compulsive symptom severity and depression diagnosis.

Lastly, an anxiety disorder variable was examined as a possible moderating variable. Step 1 again indicated the predictive role of obsessive-compulsive symptom severity on diminished QoL. However, both steps 2 and 3 were non-significant indicating that comorbid anxiety does not affect QoL in a meaningful way. This set of analyses revealed that the relationship between obsessive-compulsive symptom severity and diminished QoL is not moderated by comorbid depression or anxiety. However, it is interesting to note the significant predictive role of depression in diminished QoL. Had significant moderators been revealed, a simple slope analysis would have been conducted to further explore these interactions.

Mediational Analyses

The Y-BOCS was examined to investigate the possible mediating roles of interference of obsessive-compulsive symptoms and/or resistance to obsessive-compulsive symptoms on QoL. In order to investigate this aim, first a moderational analysis was run to determine the significance of the interaction between interference of symptoms and resistance to symptoms. In this analysis, the dependent variable was CGI-Severity, interference of symptoms was entered into step 1, resistance to symptoms in step two and the interaction of interference and resistance in step 3. No significant interaction was noted for interference of obsessive-compulsive symptoms and resistance to obsessive-compulsive symptoms (t (3) = 1.04, p = 0.30). In order to ensure that the CGI-Severity appropriately reflected obsessive-compulsive symptom severity and was a reasonable independent variable for the subsequent mediational analyses, a correlation was run between the Y-BOCS and the CGI-Severity, showing a statistically significant correlation between the two measures (r = .663, p < 0.001). Next, two sets of four bootstrapping mediational analyses were run with k = 5,000, generating 95% confidence intervals to estimate the indirect path (Table 6).

Interference of obsessive-compulsive symptoms as a mediator. In the first set of four analyses, the independent variable was CGI-Severity, the mediating variable was Y-BOCS interference of obsessive-compulsive symptoms and the dependent variable was MOS QoL domain (physical health, emotional health, social functioning, general health). Bootstrapping confidence intervals revealed that interference of obsessive-compulsive symptoms mediated the relationship between CGI-Severity and emotional health (-11.79; 95% CI -21.24 to -1.79), social functioning (-9.10; 95% CI -13.50 to -5.18) and general health (-9.04; 95% CI -14.99 to -2.89) QoL but not physical health QoL (-1.88; 95% CI -17.65 to 11.37). These findings suggest that the interference of obsessive-compulsive symptoms in daily living, as well as the distress related to these

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symptoms accounts for the relationship between obsessive-compulsive symptom severity and diminished QoL across three domains.

Resistance to obsessive-compulsive symptoms as a mediator. In the second set of four analyses, the independent variable was CGI-Severity, the mediating variable was Y-BOCS resistance to symptoms and the dependent variable was MOS QoL domain. Bootstrapping confidence intervals revealed that resistance to obsessive-compulsive symptoms only mediated the relationship between obsessive-compulsive symptoms and social functioning QoL (2.16; 95% CI 0.35 to 5.25). Resistance to obsessive-compulsive symptoms was a nonsignificant mediator of physical health (3.27; 95% CI -0.97 to 11.48), emotional health (1.77; 95% CI -1.53 to 6.97) and general health QoL (-0.12; 95% CI -2.73 to 2.67).

Further investigation into the mediating factors for social functioning QoL. Due to the mediating role of both interference of and resistance to obsessive-compulsive symptoms on social functioning QoL, a third set of analyses was run to further investigate this outcome (Table 7). In this analysis, both interference and resistance were entered at the same time as mediating variables, with CGI-Severity as the independent variable and social functioning QoL as the dependent variable. Both interference of symptoms (-11.00; 95% CI -15.72 to -7.02) and resistance to symptoms (3.16; 95% CI 1.09 to 6.85) retained their significance when evaluated at the same time. Lastly, because of the original role of these variables as dimensions of the Y-BOCS, a bootstrapping mediation analysis was run looking at Y-BOCS total score as the mediator, CGI-Severity as the independent variable and social functioning QoL as the dependent variable. Y-BOCS total score was not a significant mediator of the relationship between obsessive-compulsive severity and social functioning QoL (-2.57; 95% CI -7.02 to 2.12).

Discussion

The current study reported on various contributing factors to diminished QoL in adults with OCD. Associations between obsessive-compulsive symptom severity, obsessive-compulsive symptom dimensions, comorbidity and symptom clusters were explored. Consistent with previous research, obsessive-compulsive symptom severity was positively correlated with diminished emotional health, social functioning and general health QoL, but not physical health QoL (Eisen et al., 2006; Masellis, Rector, & Richter, 2003; Moritz et al., 2005). A comparison of QoL across four psychiatric conditions including OCD, MDD, panic disorder and schizophrenia revealed many group differences. Interestingly, persons with OCD had significantly worse social functioning QoL than persons with any of the three other disorders explored. This finding highlights the conspicuous and social nature of OCD. Social functioning is deeply impacted by the time, interference and distress related to intrusive obsessions and reflexive compulsions (Markarian, et al., 2010; Storch et al., 2006). Additionally, symptoms may be time consuming and interfere with employment/academic success as well as time spent with family or friends, thereby limiting a person's opportunities to experience functional and positive social interactions(Yaryura-Tobias et al., 2000). This decrease in routine social interactions may be associated with the decrease in social functioning QoL in those with OCD.

In addition to the decrease in social functioning QoL, those with OCD had significantly more diminished role emotional health and vitality/energy QoL as compared to those with panic disorder or schizophrenia and significantly worse mental health QoL relative to those with schizophrenia. It is possible that those with schizophrenia do not

have as clear insight into their emotional well-being and mental health, which may be reflected in this finding (i.e., those with OCD recognize the extent of their illness and impairment in a different way from someone with schizophrenia). However, a person's insight into their OCD, as well as symptom chronicity (Rasmussen & Eisen, 1994) may contribute to this detriment in emotional health and vitality/energy QoL. Additionally, those with OCD had significantly worse general health QoL than those with panic disorder, again indicating the severity of obsessive-compulsive symptoms and their impact on daily functioning. This finding reflects on the lack of general well-being felt by those with a chronic disease such as OCD. Unfortunately, obsessive-compulsive symptoms may interfere with activities of daily living and may limit contact with friends and family members (Bobes, et al., 2001). Functional and social impairment, in addition to the possibility of comorbid depression and other anxiety disorders may impact feelings of overall well-being, thereby diminishing general health QoL (Abramowitz, et al., 2007; Huppert, et al., 2009). Contrastingly, comparisons across disorders revealed that persons with OCD fared better in general health QoL than did those with MDD and had better physical health QoL than persons with MDD, panic disorder or schizophrenia. This finding is consistent with others that have shown that physical health QoL is not generally impacted by OCD (Hollander, 2010; Rapaport, et al., 2005).

Significant negative correlations between age and both emotional health and social functioning QoL were found. The negative relationship between age and social functioning QoL may be explained by the possible withdrawal from interpersonal relationships experienced by older adults with OCD in attempts to cope with their symptoms. The negative correlation between age and emotional health QoL may be explained by helplessness and hopelessness related to sustained illness. More specifically, persons of older age may have a greater understanding of the chronicity of their illness and may thereby have a better recognition of their level of impairment. After

years of being ill, one might feel that they have exhausted all options for reducing

symptoms and may feel that the disorder is interminable. It is also possible that those

who become symptomatic at a later age have an awareness of how significantly their

QoL has declined; those who develop the disorder earlier may not have as strong a

basis for comparison. Regarding gender, being female was negatively related to

emotional health QoL, but not social functioning, general health or physical health QoL.

It is possible that gender differences in comorbidity or depressive symptomology (e.g.,

self-worth, anhedonia) may contribute to the relationship between gender and emotional

health QoL, as aversive feelings may be related to more negative emotionality (Huppert,

et al., 2009; Rapaport, et al., 2005). Additionally, women may perceive significant role

strain, which may increase negative feelings thereby decreasing emotional health QoL

(Camporese, Freguja, & Sabbadini, 1998)

Obsessive-compulsive symptom severity, depression symptom severity and the

presence of comorbid MDD were associated with a decline in functioning. Anxiety

disorder comorbidity was not related to a decline in functioning, suggesting that

comorbid anxiety disorders do not affect QoL in adults with OCD (Barrera & Norton,

2009). The main effects of obsessive-compulsive symptom severity and depression

symptom severity draw evidence to the unique contribution of each symptom domain on

QoL, with depression exerting effects over and above obsessive-compulsive severity on

QoL outcomes. No interactions were found between obsessive-compulsive severity and

the depression or anxiety disorder variables in predicting a decline in functioning in those

with OCD. Nonsignificant interactions indicate that the strengths of the relationships

between two disorders do not outweigh the significance of the main effects for each

disorder. However, consistent with others (Cassin, Richter, Zhang, & Rector, 2009;

Fontenelle, et al., 2010; Huppert, et al., 2009), group comparisons between those with

comorbid OCD (anxiety or depressive disorders) and those with OCD only revealed that

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those with comorbid conditions had significantly more diminished emotional health, social functioning and general health QoL. These results reflect a general pathology model indicating that the addition of a comorbid condition plays a role in the severity of obsessive-compulsive symptoms and decreased QoL (Schonfeld, et al., 1997). The combination of having more than one disorder is associated with more impaired functioning, higher rates of generalized anxiety and significantly more debilitating obsessions and compulsions (Abramowitz, et al., 2007; Cassin, et al., 2009).

Unique to this study was the exploration of the mediating role of obsessive-compulsive symptom interference and resistance. Interference of obsessive-compulsive symptoms mediated the relationship between obsessive-compulsive severity and diminished emotional health, social functioning and general health QoL. The degree of interference of symptoms directly impacted the diminished QoL experienced by adults with OCD suggesting that interference of obsessive-compulsive symptoms is the underlying mechanism explaining the relationship between obsessive-compulsive severity and diminished emotional health, social functioning and general health QoL. Interference of symptoms may reduce engagement in routine (e.g. going to work) or pleasurable (e.g. seeing friends) activities, as activities are interrupted and time is occupied by obsessive-compulsive symptoms. A higher degree of distress related to these symptoms may also prevent time spent in more productive activities. The inability to participate in multiple aspects of daily functioning, including maintaining employment or academic success impedes on chronic illness coping and decreases QoL across multiple domains.

Resistance to obsessive-compulsive symptoms (i.e., effort to resist symptoms and perceived degree of control over symptoms) mediated the relationship between obsessive-compulsive symptom severity and social functioning QoL. However, further investigation into the unique role of each mediator revealed that interference of

symptoms and resistance to symptoms mediated the relationship between obsessive-compulsive severity and social functioning QoL in opposite ways. Specifically, interference of symptoms (i.e., time spent on symptoms, distress over symptoms, and interference of symptoms in daily activities) was related to diminished social functioning QoL, whereas resistance to symptoms (i.e., effort to resist symptoms and perceived degree of control over symptoms) was related to increased social functioning QoL. Resistance to obsessive-compulsive symptoms may serve as a protective factor in maintaining healthy social functioning. The ability to resist symptoms may allow for more participation in social or occupational activities which may be associated with increased social functioning QoL. When little effort is made to resist symptoms, engagement in daily activities may be lessened and functional disability greater (Storch, et al., 2009). Ultimately, when utilizing the Y-BOCS total score as a single mediator in social functioning, it was non-significant further highlighting the unique role of the bi-dimensional structure of this measure in explaining the mediational relationship. It is suspected that this non-significant result is due to the positive and negative mediational effects of the two dimensions canceling each other out.

Obsessive-compulsive symptom dimensions did not play a significant role in the relationship between OCD and QoL with only hoarding negatively related to general health QoL, and neutralizing positively related to emotional health and social functioning QoL. It is interesting to note the possibility that neutralizing symptoms may be modestly 'protective' of both emotional health and social functioning QoL; this finding may indicate that neutralizing behaviors diminish resulting distress thereby increasing QoL. However, despite being protective of QoL, neutralizing symptoms are problematic as they feed into the obsessive-compulsive cycle of responding to excessive ruminations with anxiety-reducing behaviors, subsequently further perpetuating illness (Salkovskis, Thorpe, Wahl, Wroe, & Forrester, 2003). Ultimately, nearly null findings regarding symptom dimensions

highlight the fact that OCD is unilaterally related to diminished QoL despite the specific symptom presentation. Across dimensions, persons with OCD seem to have a largely impacted QoL within multiple domains.

Limitations and Implications

This study has several limitations worth noting. First, the study did not have the high power needed to detect moderational effects (McClelland & Judd, 1993). Having a larger sample may help clarify if non-significant interaction effects are a function of power or lack of presence, and elucidate why comorbid OCD versus OCD alone showed mean differences at the group level. Second, the demographic homogeneity of the sample limits its generalizability to a more diverse population. On balance, the sample was well divided between genders and covered a wide range of ages. Unfortunately, many demographic variables were not reportable as the data was taken from an archival database and were not available. Third, these results do not imply causality and should not be interpreted as such. Most notably, although it is assumed that OCD symptomology leads to decreased QoL, it may be that individuals with lower QoL are at a greater risk for the development of OCD. Despite this, mediational effects do show a direct pathway between variables and may be reflective of a causative agent in the relationship between obsessive-compulsive symptom severity and QoL (Hayes, 2009). Future research may attempt to investigate quality of life longitudinally in order to properly display the causative effects of OCD symptoms and severity on QoL. A prospective study of QoL would benefit from identifying persons prior to symptom expression or early in the disease course.

In lieu of these limitations, this study sheds light onto the contributing factors associated with diminished QoL in adults with OCD. Several past findings were replicated, validating their consistency over time and within various samples. Ultimately, this study points to the fact that QoL is important in gaining a complete understanding

into the complex picture of OCD. This research is consistent with the idea that the severity of symptoms (specifically interference of symptoms), rather than the symptom dimension, is highly related to QoL impairment.

This study has important clinical and scientific implications since QoL is significantly reduced in adults with OCD as compared to those without psychopathology. Most measures and treatments for OCD focus on symptom reduction, however, it is important to address the diminished QoL related to the presence of OCD. Without addressing QoL, clinicians may not be addressing individual's perceived impairment and the daily interference of OCD with areas of physical, emotional, social and general functioning. Understanding the roles of the factors that contribute to diminished QoL in adults with OCD will help guide clinicians to focus on the aspects of OCD that will yield the greatest improvement across QoL domains. This study also sheds light on the other supports needed to improve QoL in OCD such as symptom reduction, treatments for comorbid conditions, and social supports. For example, treatments may begin with the preliminary aim of reducing symptoms and follow symptom reduction with life and social skills training to address areas of diminished QoL. Clarity concerning the specific features of OCD that contribute to diminished QoL will help researchers target future investigations and ultimately allow for greater specificity in the development of treatments aimed at improving QoL in adults with OCD.

It is essential to consider the role of QoL when working clinically with persons with OCD. In order to gain complete clinical remission, not only do obsessive-compulsive symptoms need to be eradicated, but QoL needs to be targeted for improvement. Psychopharmacological therapy with various SRIs and psychotherapeutic treatments utilizing CBT are widely used for the treatment of OCD (Abramowitz, 2006; Foa, 2010). Attenuation of obsessive-compulsive symptoms with these treatments is often directly related to improvements in varying domains of QoL (Diefenbach,

Abramowitz, Norberg, & Tolin, 2007; Hollander, 2010; Koran et al., 2010; Tenney, Denys, van Megen, Glas, & Westenberg, 2003). However, despite the efficacy of both psychopharmacology and CBT attenuating obsessive-compulsive symptoms and improving QoL, there is more work that needs to be done to attain a more complete QoL. Treatments specifically aimed at improving daily functioning for the long-term must be incorporated into psychotherapy with the goal of significantly enhancing QoL (Bystritsky, et al., 2001). A two-tiered approach, outlined by Bystritsky et al. (2001) suggests that initial treatments must aim to reduce obsessive-compulsive symptoms as they impede QoL and hinder the person's ability to excel in psychosocial functioning. Subsequently, this treatment must be followed by psychosocial rehabilitation which strives to increase QoL by improving social functioning, enhancing coping techniques and aiding with practical goals such as finding appropriate employment.

The mediating role of interference of symptoms and resistance to symptoms helps better our understanding of what exactly impacts QoL in persons with OCD. In addition to including psychosocial rehabilitation, psychotherapeutic practice for the treatment of OCD must carefully incorporate CBT techniques (including psychoeducation, cognitive restructuring and exposure and response prevention) that target the reduction of interference and increase efforts to resist symptoms. Knowing that resistance to symptoms plays a protective role in social functioning QoL is important to clinical practice; CBT can be tailored to improve social functioning QoL by incorporating homeworks involving increased social interactions. Motivational interviewing may be useful in enhancing exposure and response prevention techniques by encouraging resistance to symptoms during anxiety-provoking situations (Simpson, Huppert, Petkova, Foa, & Liebowitz, 2006; Storch, et al., 2009). Ultimately, treatment for OCD must focus on both symptom reduction through the use of psychotherapeutic techniques and/or psychopharmacology (in severe cases; Foa, 2010) and on the

improvement of QoL and daily functioning through psychosocial rehabilitation and the maintenance of symptom attenuation or eradication.

Overall, this study shed new light on the mediating role of interference of and resistance to symptoms in the QoL of persons with OCD. This study highlights the necessity of including techniques in clinical practice that aim to both reduce OCD symptoms and improve QoL. Ultimately, the attenuation of problematic functioning in OCD is related to both the interference of OCD symptoms and the association of these symptoms to diminished QoL.

List of References

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.-TR). Washington, DC: Author.

Abramowitz, J. S. (2006). The psychological treatment of obsessive-compulsive disorder. *Canadian Journal of Psychiatry, 51*(7), 407-416.

Abramowitz, J. S., & Deacon, B. J. (2006). Psychometric properties and construct validity of the Obsessive-Compulsive Inventory--Revised: Replication and extension with a clinical sample. *Journal of Anxiety Disorders, 20*(8), 1016-1035.

Abramowitz, J. S., Storch, E. A., Keeley, M., & Cordell, E. (2007). Obsessive-compulsive disorder with comorbid major depression: what is the role of cognitive factors? *Behavioral Research and Therapy, 45*(10), 2257-2267.

Aouizerate, B., Guehl, D., Cuny, E., Rougier, A., Bioulac, B., Tignol, J., & Burbaud, P. (2004). Pathophysiology of obsessive-compulsive disorder: a necessary link between phenomenology, neuropsychology, imagery and physiology. *Progress in Neurobiology, 72*(3), 195-221.

Barrera, T. L., & Norton, P. J. (2009). Quality of life impairment in generalized anxiety disorder, social phobia, and panic disorder. *Journal of Anxiety Disorders, 23*(8), 1086-1090.

Besiroglu, L., Uguz, F., Saglam, M., Agargun, M. Y., & Cilli, A. S. (2007). Factors associated with major depressive disorder occurring after the onset of obsessive-compulsive disorder. *Journal of Affective Disorders, 102*(1-3), 73-79.

Bobes, J., Gonzalez, M. P., Bascaran, M. T., Arango, C., Saiz, P. A., & Bousono, M. (2001). Quality of life and disability in patients with obsessive-compulsive disorder. *European Psychiatry, 16*(4), 239-245.

Bystritsky, A., Liberman, R. P., Hwang, S., Wallace, C. J., Vapnik, T., Maindment, K., & Saxena, S. (2001). Social functioning and quality of life comparisons between obsessive-compulsive and schizophrenic disorders. *Depression and Anxiety, 14*(4), 214-218.

Camporese, R., Freguja, C., & Sabbadini, L. L. (1998). Time use by gender and quality of life. *Social Indicators Research, 44*(1), 119-144.

Cassin, S. E., Richter, M. A., Zhang, K. A., & Rector, N. A. (2009). Quality of life in treatment-seeking patients with obsessive-compulsive disorder with and without major depressive disorder. *Canadian Journal of Psychiatry, 54*(7), 460-467.

Chamberlain, S. R., Blackwell, A. D., Fineberg, N. A., Robbins, T. W., & Sahakian, B. J. (2005). The neuropsychology of obsessive compulsive disorder: the importance of failures in cognitive and behavioural inhibition as candidate endophenotypic markers. *Neuroscience and Biobehavioral Review, 29*(3), 399-419.

Deacon, B. J., & Abramowitz, J. S. (2005). The Yale-Brown Obsessive Compulsive Scale: factor analysis, construct validity, and suggestions for refinement. . *Journal of Anxiety Disorders, 19*, 573-585.

Diefenbach, G. J., Abramowitz, J. S., Norberg, M. M., & Tolin, D. F. (2007). Changes in quality of life following cognitive-behavioral therapy for obsessive-compulsive disorder. *Behavioral Research and Therapy, 45*(12), 3060-3068.

Doron, G., & Kyrios, M. (2005). Obsessive compulsive disorder: A review of possible specific internal representations within a broader cognitive theory. *Clinical Psychology Review, 25*(4), 415-432.

Eisen, J. L., Mancebo, M. A., Pinto, A., Coles, M. E., Pagano, M. E., Stout, R., & Rasmussen, S. A. (2006). Impact of obsessive-compulsive disorder on quality of life. *Comprehensive Psychiatry, 47*(4), 270-275.

Foa, E. B. (2010). Cognitive behavioral therapy of obsessive-compulsive disorder. *Dialogues of Clinical Neuroscience, 12*(199-207).

Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., & Salkovskis, P. M. (2002). The Obsessive-Compulsive Inventory: development and validation of a short version. *Psychological Assessment, 14*(4), 485-496.

Fontenelle, I. S., Fontenelle, L. F., Borges, M. C., Prazeres, A. M., Range, B. P., Mendlowicz, M. V., & Versiani, M. (2010). Quality of life and symptom dimensions of patients with obsessive-compulsive disorder. *Psychiatry Research, 179*(2), 198-203.

Goldney, R. D., Fisher, L. J., Wilson, D. H., & Cheok, F. (2000). Major depression and its associated morbidity and quality of life in a random, representative Australian community sample. *Australian and New Zealand Journal of Psychiatry, 34*(6), 1022-1029.

Goossens, P. J., Hartong, E. G., Knoppert-van der Klein, E. A., & van Achterberg, T. (2008). Self-reported psychopathological symptoms and quality of life in outpatients with bipolar disorder. *Perspectives in Psychiatric Care, 44*(4), 275-284.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408-420.

Helldin, L., Kane, J., Karilampi, U., Norlander, T., & Archer, T. (2008). Experience of quality of life and attitude to care and treatment in patients with schizophrenia: Role of cross-sectional remission. *International Journal of Psychiatry in Clinical Practice, 12*(2), 97-104.

Hollander, E., Stein, D.J., Fineberg, N.A., Marteau, F., Legault, M. (2010). Quality of life outcomes in patients with obsessive-compulsive disorder: Relationship to treatment response and symptom relapse. *Journal of Clinical Psychiatry, 71*(6), 784-792.

Huppert, J. D., Simpson, H. B., Nissenson, K. J., Liebowitz, M. R., & Foa, E. B. (2009). Quality of life and functional impairment in obsessive-compulsive disorder: a comparison of patients with and without comorbidity, patients in remission, and healthy controls. *Depression and Anxiety, 26*(1), 39-45.

Koran, L. M., Bromberg, D., Hornfeldt, C. S., Shepski, J. C., Wang, S., & Hollander, E. (2010). Extended-release fluvoxamine and improvements in quality of life in patients with obsessive-compulsive disorder. *Comprehensive Psychiatry, 51*(4), 373-379.

Leckman, J. F., Sholomskas, D., Thompson, W. D., Belanger, A., & Weissman, M. M. (1982). Best estimate of lifetime psychiatric diagnosis: a methodological study. *Archives of General Psychiatry, 39*(8), 879-883.

Lunney, C. A., & Schnurr, P. P. (2007). Domains of quality of life and symptoms in male veterans treated for posttraumatic stress disorder. *Journal of Traumatic Stress, 20*(6), 955-964.

Markarian, Y., Larson, M. J., Aldea, M. A., Baldwin, S. A., Good, D., Berkeljon, A., . . . McKay, D. (2010). Multiple pathways to functional impairment in obsessive-compulsive disorder. *Clinical Psychology Review, 30*(1), 78-88.

Masellis, M., Rector, N. A., & Richter, M. A. (2003). Quality of life in OCD: differential impact of obsessions, compulsions, and depression comorbidity. *Canadian Journal of Psychiatry, 48*(2), 72-77.

Masthoff, E. D., Trompenaars, F. J., Van Heck, G. L., Hodiamont, P. P., & De Vries, J. (2006). Quality of life and psychopathology: Investigations into their relationship. *Australian and New Zealand Journal of Psychiatry, 40*(4), 333-340.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114*(2), 376-390.

Meijer, C. J., Koeter, M. W., Sprangers, M. A., & Schene, A. H. (2009). Predictors of general quality of life and the mediating role of health related quality of life in patients with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology, 44*(5), 361-368.

Mendlowicz, M. V., & Stein, M. B. (2000). Quality of life in individuals with anxiety disorders. *American Journal of Psychiatry, 157*(5), 669-682.

Moritz, S., Meier, B., Kloss, M., Jacobsen, D., Wein, C., Fricke, S., & Hand, I. (2002). Dimensional structure of the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS). *Psychiatry Research, 109*(2), 193-199.

Moritz, S., Rufer, M., Fricke, S., Karow, A., Morfeld, M., Jelinek, L., & Jacobsen, D. (2005). Quality of life in obsessive-compulsive disorder before and after treatment. *Comprehensive Psychiatry, 46*(6), 453-459.

Nicolini, H., Arnold, P., Nestadt, G., Lanzagorta, N., & Kennedy, J. L. (2009). Overview of genetics and obsessive-compulsive disorder. *Psychiatry Research, 170*(1), 7-14.

Norberg, M. M., Calamari, J. E., Cohen, R. J., & Riemann, B. C. (2008). Quality of life in obsessive-compulsive disorder: an evaluation of impairment and a preliminary analysis of the ameliorating effects of treatment. *Depression and Anxiety, 25*(3), 248-259.

Piccinni, A., Catena, M., Del Debbio, A., Marazziti, D., Monje, C., Schiavi, E., . . .
Dell'Osso, L. (2007). Health-related quality of life and functioning in remitted
bipolar I outpatients. *Comprehensive Psychiatry, 48*(4), 323-328.

Rapaport, M. H., Clary, C., Fayyad, R., & Endicott, J. (2005). Quality-of-life impairment in
depressive and anxiety disorders. *American Journal of Psychiatry, 162*(6), 1171-
1178.

Rasmussen, S. A., & Eisen, J. L. (1994). The epidemiology and differential diagnosis of
obsessive–compulsive disorder. *Journal of Clinical Psychiatry, 55*, 5-10.

Saarijarvi, S., Salminen, J. K., Toikka, T., & Raitasalo, R. (2002). Health-related quality
of life among patients with major depression. *Nordic Journal of Psychiatry, 56*(4),
261-264.

Salkovskis, P. M., Thorpe, S. J., Wahl, K., Wroe, A. L., & Forrester, E. (2003).
Neutralizing increases discomfort associated with obsessional thoughts: an
experimental study with obsessional patients. *Journal of Abnormal Psychology,
112*(4), 709-715.

Saxena, S., Ayers, C. R., Maidment, K. M., Vapnik, T., Wetherell, J. L., & Bystritsky, A.
(2011). Quality of life and functional impairment in compulsive hoarding. *Journal
of Psychiatric Research*.

Schonfeld, W. H., Verboncoeur, C. J., Fifer, S. K., Lipschutz, R. C., Lubeck, D. P., &
Buesching, D. P. (1997). The functioning and well-being of patients with
unrecognized anxiety disorders and major depressive disorder. *Journal of
Affective Disorders, 43*(2), 105-119.

Simon, N. M., Otto, M. W., Korbly, N. B., Peters, P. M., Nicolaou, D. C., & Pollack, M. H.
(2002). Quality of life in social anxiety disorder compared with panic disorder and
the general population. *Psychiatric Services, 53*(6), 714-718.

Simpson, H. B., Huppert, J., Petkova, E., Foa, E. B., & Liebowitz, M. R. (2006).

    Response versus remission in obsessive-compulsive disorder. *Journal of Clinical*

    Psychiatry, 67, 269-276.

Stengler-Wenzke, K., Kroll, M., Riedel-Heller, S., Matschinger, H., & Angermeyer, M. C.

    (2007). Quality of life in obsessive-compulsive disorder: the different impact of

    obsessions and compulsions. *Psychopathology, 40*(5), 282-289.

Storch, E. A., Abramowitz, J. S., & Keeley, M. (2009). Correlates and mediators of

    functional disability in obsessive-compulsive disorder. *Depression and Anxiety,*

    26(9), 806-813.

Storch, E. A., Ledley, D. R., Lewin, A. B., Murphy, T. K., Johns, N. B., Goodman, W. K.,

    & Geffken, G. R. (2006). Peer victimization in children with obsessive-compulsive

    disorder: relations with symptoms of psychopathology. *Journal of Clinical Child*

    and Adolescent Psychology, 35, 446-455.

Storch, E. A., Lewin, A. B., Farrell, L., Aldea, M. A., Reid, J., Geffken, G. R., & Murphy,

    T. K. (2010). Does cognitive-behavioral therapy response among adults with

    obsessive-compulsive disorder differ as a function of certain comorbidities?

    Journal of Anxiety Disorders, 24(6), 547-552.

Storch, E. A., Shapira, N. A., Dimoulas, E., Geffken, G. R., Murphy, T. K., & Goodman,

    W. K. (2005). Yale-Brown Obsessive Compulsive Scale: the dimensional

    structure revisited. *Depression and Anxiety, 22*(1), 28-35.

Tenney, N. H., Denys, D. A., van Megen, H. J., Glas, G., & Westenberg, H. G. (2003).

    Effect of a pharmacological intervention on quality of life in patients with

    obsessive-compulsive disorder. *International Clinical Psychopharmacology,*

    18(1), 29-33.

Tomida, K., Takahashi, N., Saito, S., Maeno, N., Iwamoto, K., Yoshida, K., . . . Ozaki, N.

    (2010). Relationship of psychopathological symptoms and cognitive function to

subjective quality of life in patients with chronic schizophrenia. *Psychiatry and Clinical Neurosciences, 64*(1), 62-69.

Yaryura-Tobias, J., Grunes, M., Todaro, J., McKay, D., Neziroglu, F., & Stockman, R. (2000). Nosological insertion of Axis I disorders in the etiology of obsessive–compulsive disorder. *Journal of Anxiety Disorders, 14*, 19-30.

Yen, C.-F., Kuo, C.-Y., Tsai, P.-T., Ko, C.-H., Yen, J.-Y., & Chen, T.-T. (2007). Correlations of quality of life with adverse effects of medication, social support, course of illness, psychopathology, and demographic characteristics in patients with panic disorder. *Depression and Anxiety, 24*(8), 563-570.

Appendix 1

Tables

Table 1. Means (standard deviations) on study variables

Variable	M (SD) for this study	M (SD) from other OCD Studies
Y-BOCS Total Score	27.90 (5.50)	24.52 (5.50)[a]
Interference	16.91 (3.89)	14.48 (4.17)[a]
Resistance	10.99 (2.63)	10.03 (2.94)[a]
OCI-R Total Score	23.95 (11.73)	27.02 (13.22)[b]
Washing	4.08 (4.25)	5.04 (4.32)[b]
Checking	4.51 (4.15)	4.98 (3.74)[b]
Obsessing	6.37 (3.54)	6.40 (4.05)[b]
Neutralizing	2.47 (3.27)	2.62 (3.42)[b]
Ordering	4.21 (3.78)	4.88 (4.04)[b]
Hoarding	2.17 (2.83)	3.19 (3.70)[b]
BDI-II	16.84 (10.44)	17.11 (10.35)[a]

Note: Y-BOCS, Yale-Brown Obsessive-Compulsive Scale; OCI-R, Obsessive-Compulsive Inventory-Revised; BDI-II, Beck Depression Inventory-II; OCD, Obsessive-compulsive disorder.
[a] Storch et al. (2009)
[b] Abramowitz and Deacon, (2006)

Table 2. Quality of life means (MOS-36) across conditions

Group/effect	MOS-36 Quality of Life Domains							
	Physical Functioning	Role-Physical	Role-Emotional	Vitality/Energy	Mental Health	Social Functioning	Bodily Pain	General Health
Reference Group: OCD (N = 102)	88.43	77.21	33.33	38.77	47.1	48.41	82.6	64.46
Schizophrenia (N = 137)	65.0**	54.44**	62.5**	54.8**	66.1**	68.7**	68.9**	62.8
Panic disorder (N = 62)	79.6**	54.9**	55.5**	51.5**	47.7	61.0**	68.1**	71.1*
MDD (N = 54)	82.5*	55.6**	37.4	35.5	48.6	60.3**	61.6**	54.9**

Note: One sample *t*-tests co mpare current OCD reference group with other diagnostic groups.
**$p<.001$, *$p<.05$

Table 3. Correlations of OCD symptom severity and quality of life domains (MOS-36)

Group/effect	Mos-36 Quality of Life Domains			
	Physical	Emotional	Social	General
Y-BOCS Severity	-0.07	-0.24*	-0.32**	-0.30*
CGI- Severity	-0.17	-0.25*	-0.37**	-0.25*

**$p<.001$, *$p<.05$

Table 4. Correlations of OCD symptom dimensions (OCI-R) and quality of life domains (MOS-36)

Group/effect	Quality of Life Domains			
	Physical	Emotional	Social	General
Washing	-0.02	0.03	-0.11	-0.05
Obsessing	-0.09	-0.17	-0.05	-0.12
Hoarding	-0.11	-0.05	-0.19	-0.26*
Ordering	0.14	0.14	0.01	0.00
Checking	0.06	0.17	-0.04	-0.16
Neutralizing	0.03	0.36**	0.21*	0.05

**$p<.001$, *$p<.05$

Table 5. "Pure" OCD (No Comorbidity) (N = 28) Versus Comorbidity (N = 71)

Variable	"Pure" OCD Means (*SD*)	Comorbid Means (*SD*)	*t*-value
Y-BOCS Total	25.56 (6.22)	28.78 (4.97)	2.76*
Y-BOCS Interference	15.04 (4.13)	17.62 (3.57)	3.13*
Y-BOCS Resistance	10.52 (2.85)	11.16 (2.54)	1.15
CGI-Severity	4.64 (0.91)	5.31 (0.86)	3.59*
MOS- Physical Health	266.96 (53.24)	241.15 (72.21)	-1.62
MOS- Emotional Health	103.71 (56.24)	71.62 (47.30)	-3.00*
MOS- Social Functioning	60.71 (24.93)	43.75 (26.11)	-3.02*
MOS- General Health	122.32 (30.84)	96.01 (31.88)	-3.88**

*p< 0.01, **p<0.001

Table 6. Mediators in the relationship between illness severity and QoL. Data include coefficient(SE).

Mediators entered independently	a path	b path	c path	c' path	Indirect effects (coefficient)	95% CI
Interference of Symptoms						
Physical Health QoL	2.95(0.30)**	-0.64(2.43)	-12.44(7.32)	-10.56(10.28)	-1.88	-17.65 to 11.37
Emotional Health QoL	2.95(0.30)**	-3.99(1.76)*	-14.03(5.43)*	-2.25(7.45)	-11.79	-21.24 to 1.79*
Social Functioning QoL	2.95(0.30)**	-3.08(0.84)**	-10.89(2.70)**	-1.79(3.56)	-9.10	-13.50 to -5.18*
General Health QoL	2.95(0.30)**	-3.06(1.14)*	-9.05(3.54)*	-0.01(4.80)	-9.04	-15.00 to -2.89*
Resistance to Symptoms						
Physical Health QoL	1.01(0.27)**	3.22(2.73)	-12.44(7.32)	-15.71(7.82)*	3.27	-0.97 to 11.48
Emotional Health QoL	1.01(0.27)**	1.74(2.04)	-14.03(5.43)*	-15.80(5.83)*	1.77	-1.53 to 6.97
Social Functioning QoL	1.01(0.27)**	2.13(0.99)*	-10.89(2.70)**	-13.05(2.84)**	2.16	0.35 to 5.25*
General Health QoL	1.01(0.27)**	-0.12(1.33)	-9.05(3.54)*	-8.93(3.81)*	-0.12	-2.73 to 2.67

*$p<0.05$ $p<0.001$

Table 7. Further evaluation of mediation for social functioning QoL. Data include coefficient(SE) unless otherwise specified.

Mediators entered together	a path	b path	c path	c' path	Indirect effects (coefficient)	95% CI
Interference of Symptoms	2.95(.30)**	-3.72(.83)**	-10.89(2.70)**	-3.05(3.41)	-11.00	-15.72 to -7.02*
Resistance to Symptoms	1.01(.27)**	3.12(.93)*	-10.89(2.70)**	-3.05(3.41)	3.16	1.09 to 6.85*
Total	------	------	------	------	-7.84	-12.60 to -3.81*

*p<0.05 **p< 0.001