The purpose of the article was to provide an overview of patient-reported outcomes (PROs) and related measures that have been examined in the context of obsessive-compulsive disorder (OCD). The current review focused on patient-reported outcome measures (PROMs) that evaluated three broad outcome domains: functioning, health-related quality of life (HRQoL), and OCD-related symptoms. The present review ultimately included a total of 155 unique articles and 22 PROMs. An examination of the PROs revealed that OCD patients tend to suffer from significant functional disability, and report lower HRQoL than controls. OCD patients report greater symptom severity than patients with other mental disorders and evidence indicates that PROMs are sensitive to change and may be even better than clinician-rated measures at predicting treatment outcomes. Nonetheless, it should be noted that the measures reviewed lacked patient input in their development. Future research on PROMs must involve patient perspectives and include rigorous psychometric evaluation of these measures.
Clinical research

Epidemiological studies have estimated the lifetime prevalence of OCD as ranging from 2.3% to 3.8% in the general population, with the average age of onset of the disorder to be around 20 years and a treatment gap of about 60%. Although symptoms typically wax and wane, a chronic course is the norm in the absence of adequate treatment. Comorbidity with OCD is common and associated conditions include affective disorders and anxiety disorders.

OCD also causes considerable disability. While the 1990 and 2000 Global Burden of Disease (GBD) studies included three specific anxiety disorders: post-traumatic stress disorder (PTSD), panic disorder (PD), and OCD, due to the high degree of comorbidity across anxiety disorders, the 2010 GBD assessed the burden of all anxiety disorders but chose not to provide estimates for specific anxiety disorders. In the GBD 2010 study, anxiety disorders were a major global cause of years lost to disability (YLD), contributing 3.5% of all YLD. The World Health Organization estimated OCD to be the 11th leading cause of nonfatal burden in the world in 1990, accounting for 2.2% of total YLD.

A patient-reported outcome (PRO) is any report of the status of a patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else. The outcome can be measured in absolute terms (e.g., severity of a symptom, sign, or state of a disease) or as a change from a previous state. A patient-reported outcome measure (PROM), eg, a questionnaire, log, or diary is a means to capture PRO data and can be used to measure symptom severity, functioning, treatment benefits, or side effects.

PROMs are important because objective measures of disease outcome are not always available, and they reflect what is most salient to patients about their condition and its treatment. PROMs are unique indicators of the impact of disease on patients, and can empower patients by giving them a voice and decision-making capacity in evaluating the efficacy of treatment, its side effects, and affordability. PROMs are especially important in the context of mental illnesses such as OCD because their symptoms may not always be perceptible to others. Indeed, the time taken up by obsessions or compulsions as well as the extent of distress experienced can only be reported by patients themselves. Similarly, treatment effectiveness is best reported by patients as improvements on clinician-rated measures may not correspond to how the patient functions or feels. Clinicians may overlook the negative side effects of treatment, which are often the reason for noncompliance.

A number of PROs have been reported among OCD patients. While some of the PROMs are generic and include questions designed to summarize perceived health in relation to broad life domains, others are condition-specific. Examples of generic instruments include the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) and the World Health Organization Quality of Life BREF (WHOQOL-BREF). On the other hand, condition-specific instruments such as the Obsessive-Compulsive Inventory (OCI) mainly evaluate symptom domains directly associated with OCD.

The aim of this systematic review was to present an overview of PROs in the context of OCD. It includes the constructs, corresponding scales, and key findings related to PROs in OCD patients.

Methodology

Index terms for PROs differ between the major bibliographic databases. It has been suggested that review authors should not rely on a single index or subheading search term to identify studies addressing PROs. Multiple search terms are usually necessary. Furthermore, the search needs to combine index terms and free-text terms, and is likely to require several iterations. The present review was guided by the PRISMA statement and conducted in two phases. In the first phase, the authors (MS, CO, PS, and ES) identified various PROMs that were used in patients with OCD. They then conducted a systematic review using a search strategy using two keywords: (i) obsessive-compulsive disorder; AND (ii) specific instrument, and limited the search to abstract, title, and keywords. The databases used for the systematic review were PubMed, Science Direct, Medline, and PsycInfo. In addition, reference lists of all included studies were hand searched. To ensure recency of articles, the search was restricted to the period between and inclusive of January 1995 to October 2013. Potentially relevant papers were examined by at least two authors who worked independently, with discrepancies of opinion resolved by meeting together as a group. Inclusion criteria included: (i) the study cohort comprised OCD patients where OCD was the primary diagnosis, diagnosed clinically or using DSM criteria;
(ii) the study described outcomes among OCD patients using PROMs; (iii) the study was among adult populations; and (iv) the study focused on at least one of the three broad groups of outcomes—symptoms primarily related to OCD, functioning, and health-related quality of life (HRQoL). Exclusion criteria included studies not reported in English, studies in the general population (ie, not a patient population), case reports, case series, studies conducted only for validation purposes and studies that did not report on outcomes per se.

Results

Search results

The searches returned a total of 1368 articles. This included 945 unique articles after the removal of 423 duplicates. Screening by abstracts removed a further 725 articles. Full texts of the remaining 220 manuscripts were then retrieved and a further 65 studies were excluded. A total of 155 studies met all criteria and were included in the paper.

A total of 22 PROMs were used across the included studies. An overview of each instrument’s measurement properties and how it assesses and scores outcomes is shown in Table I. Details of the sample and the outcome measures used in each of the 155 studies are outlined in Table II (available in the online version of this article).

Patient-reported outcomes related to functioning

Patients with OCD suffer from considerable disability as obsessive-compulsive (OC) symptoms can disrupt social relationships and impair occupational functioning. Knowing the predictors of functional impairment in OCD can facilitate treatment of the disorder by directing clinicians to those aspects of the problem. Storch et al14 suggested that patients who do not respond to first-line interventions could instead be offered therapies aimed at reducing factors associated with disability, thereby reducing burden of illness. There is also an increasing focus on patient-reported functional outcomes in clinical trials where they are often used to supplement traditional clinician-assessed outcomes. Scales that have been used to assess functioning in OCD include Sheehan Disability Scale (SDS),15 Social Adjustment Scale–Self Report (SAS-SR)16 and the Work and Social Adjustment Scale (WSAS).17 Table I.

Social functioning in OCD patients was found to be worse than community norms/controls.18,20 Comparing across mental illnesses, Kennedy et al20 reported that those with OCD had the highest work disability scores among six common mental disorders. Social functioning of OCD patients was comparable to that of patients with depression and alcoholism.19 Those with OCD were less impaired in terms of social functioning compared to those with social anxiety disorder (SAD).21 but were significantly more impaired in extended family functioning than patients with PD. Starcevic et al22 found no difference in disability scores between OCD patients with and without obsessive-compulsive personality disorder.

A younger age of onset of OCD was found to have a negative impact on social functioning in the domains of work and family unit role.19 This could be because an early onset of illness is specifically burdensome for patients’ academic and professional development.19 Depressive and anxiety symptoms have also been found to be significantly related to disability14,19,22 and depression was found to mediate the relationship between OCD-related distress and functional disability.14

Functional disability has been associated with OCD symptom severity.14,19,25-27 Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) compulsion scores were significantly related to social functioning.23 Storch et al14 found that the extent to which an individual attempts to resist and is able to control his or her OCD symptoms mediates the relationship between OC symptoms and functional disability. Severity of sexual/religious obsessions and hoarding symptoms were associated with overall social adjustment.19 Disability was correlated with insight with regards to OCD,28 as was the degree of avoidance and pathological doubting.29 Occupational disability was also associated with poorer social functioning.30 The Social Adjustment Scale (SAS)-non family score (excludes marital and family functioning score) was significantly associated with hostility expressed by patient’s relatives.31

Fontenelle et al32 found that among OCD patients, brain-derived neurotropic factor plasma levels correlated negatively on a trend level with total score on the SDS. The severity of disability was associated with the use of psychotropic agents33 as well as refusal of pharmacotherapy among OCD patients.34

Studies have found improved patient-reported functioning following treatment of OCD with pharmacoo-
therapy and/or psychotherapy. Statistically significant improvements in the SDS subscales were reported in the active treatment arm compared with the placebo arm in two studies. A prospective observational study conducted in a naturalistic primary care setting reported significant improvement in all three dimen-

| Name of instrument (ref) | Main domain of assessment/ Number of subscales | Number of items | Time for administration | Scoring |
|--------------------------|-----------------------------------------------|-----------------|--------------------------|---------|
| Sheehan’s Disability Scale (SDS)\(^{15}\) | Measure of functional impairment in three domains – work, social life, and family/home responsibilities. | 3-item | 1-2 minutes | A 0-10 visual analogue scale for each item. The three items may be summed into a single measure of global functional impairment that ranges from 0 (unimpaired) to 30 (highly impaired). |
| Social Adjustment Scale –Self Report (SAS-SR)\(^{16}\) | Measures role performance in 6 major areas of functioning – work, social/leisure activities, relationships with extended family, marital role as a spouse, parental role and role within the family unit. | 54-item | 15-20 minutes | 0-5 for each domain and for the total score (all items are summed and divided by the number of items completed). Higher scores indicate poorer social functioning. |
| Work and Social Adjustment Scale (WSAS)\(^{17}\) | Assesses level of functional impairment due to an identified problem across 5 domains: 1) ability to work, 2) home management, 3) social leisure activities, 4) private leisure activities and 5) ability to form and maintain close relationships with others. | 5-item | 1.5 minutes | A 9-point Likert scale from 0 = no impairment at all to 8 = very severe impairment. Item scores are summed to calculate total score. Higher scores indicate greater functional impairment. |

### Health-related quality of life

| Instrument (ref) | Main domain of assessment | Number of items | Time for administration | Scoring |
|-----------------|---------------------------|-----------------|--------------------------|---------|
| Illness Intrusiveness Rating Scale (IIRS)\(^{46}\) | Measures three domains “Relationship and Personal Development,” “Intimacy,” and “Instrumental Life” | 13-item | 10 minutes | Each domain is rated for level of intrusiveness on a scale ranging from 1 (not very much) to 7 (very much). |
| Medical Outcomes Study 36-Item Short Form (SF-36)\(^{18}\) | Measures well-being across 8 summary scales: general activities, physical functioning, limitations due to physical health problem, bodily pain, general health, vitality, social functioning, limitations due to emotional problems and mental health. | 36-item | 5-10 minutes | The number of response choices per item ranges from two to six. The SF-36 yields an eight-dimensional profile, with each scale having a range from 0 to 100. Higher scores indicate better quality of life status. |
| Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q)\(^{44}\) | Measures quality of life across 8 domains: general activities, physical health, emotional well-being, household duties, leisure time activities, social relations, work, and school/course work. | 93-item | 40-45 minutes | Each domain is assessed on a 5-point scale from very poor to very good, and the domains are aggregated to produce an overall score. |
| Quality of Life Inventory (QOLI)\(^{20}\) | Measures overall life satisfaction and importance within 16 domains: health, self-esteem, goals and values, money, work, play, learning, creativity, helping, love, friends, children, relatives, home, neighbourhood, and community. | 32-item | 5 minutes | Each domain is rated in terms of its importance to overall happiness (0–2) and in terms of respondent’s satisfaction with the area (-3 to 3). Importance ratings are multiplied by their satisfaction ratings to produce a weighted satisfaction score for each area of life. |

Table I. Patient-reported outcome measures: assessing functioning, health-related quality of life, and symptoms.
sions of SDS compared with baseline scores. Tükel et al found that baseline Y-BOCS and SDS subscale scores of nonresponders were significantly higher than those of responders, and baseline SDS-work scores were found to be significant predictors of nonresponse to selective serotonin reuptake inhibitors (SSRIs).

| Name of instrument (ref) | Main domain of assessment/Number of subscales | Number of items | Time for administration | Scoring |
|--------------------------|-----------------------------------------------|-----------------|-------------------------|---------|
| Quality of Life Scale (QOLS) \(^{47}\) | Measures five conceptual domains of quality of life: material and physical well-being, relationships with other people, social, community and civic activities, personal development and fulfillment, and recreation. The instrument was later expanded to include independence. | 16-item | 5 minutes | Seven-point scale anchored by "delighted," "pleased," "mostly satisfied," "mixed," "mostly dissatisfied," "unhappy," "terrible." Scores can range from 16 to 112. |
| The Lancashire Quality of Life Profile (LQoLP) \(^{48}\) | For the subjective aspect, LQoLP focusses on 9 specific domains – work and education, leisure and participation, religion, finance, living situation, legal and safety, family relations, social relations and health. | 105-item | 30 minutes | All items are rated on a 7-point scale (can't be worse to can't be better). The sum of the nine dimension scores is the 'perceived QoL score.' |
| World Health Organization Quality of Life Assessment (WHOQOL-BREF) | Measures quality of life across four domains- physical health, psychological, social relationships and environment. | 26-item | 10-15 minutes | 1-5 point Likert scale for each item. Higher overall scores indicate higher quality of life. |
| Symptoms | | | | |
| Clark-Beck Obsessive Compulsive Inventory (CBOCI) \(^{38}\) | 11 items that assess obsessive behaviors and 14 items that assess compulsive behaviors. | 25-item | 10-20 minutes | Items scored on 4 point Likert scale ranging from 0 (absence of symptoms) to 3 (high difficulty with symptoms). Items are summed for a total score. |
| Dimensional Obsessive-Compulsive Scale (DOCS) \(^{39}\) | Measures the severity of the four most empirically supported OCD symptom dimensions: contamination, responsibility for harm and mistakes, symmetry/ordering, and unacceptable thoughts. | 20-item | 5-10 minutes | The responder first reads a description of the symptom dimension and following each description are five items (rated 0 to 4) that measure (a) time occupied by obsessions and rituals, (b) avoidance behavior, (c) distress, (d) functional interference, and (e) difficulty disregarding the obsessions and refraining from doing compulsions. |
| Hamburg Obsessive-Compulsive Inventory (HZI/HOCI) \(^{30}\) | Measures obsessions and compulsions on six different subscales: checking behavior; washing and cleaning behavior; symmetry and ordering behavior; counting, touching, repetitive speaking; thoughts of words and pictures; aggressive impulses and fantasies towards oneself or others. | 72-item | Approximately 23 minutes | Each subscale has 12 items and each item can be answered with “true” or “false.” The “true” answers are summed for the subscale scores. |
| Maudsley Obsessive-Compulsive Inventory (MOCI) \(^{22}\) | Measures overt rituals and their related obsessions within 4 subscales: checking, washing/ cleaning, slowness, and doubting. | 30-item | Approximately 15 minutes | A dichotomous correct/incorrect format; “yes” answered are scored 1 point and “no” answers 0 point. |

Table 1. Continued
have also found significant improvements in functioning following cognitive behavioral therapy (CBT), group behavior therapy, and Internet-administered CBT, as well as marginal improvement following multi-family behavior therapy. Improved functioning was also reported following computer-guided behavior

| Name of instrument (ref) | Main domain of assessment/ Number of subscales | Number of items | Time for administration | Scoring |
|-------------------------|-----------------------------------------------|----------------|-------------------------|---------|
| Obsessional Beliefs Questionnaire-44 (OBQ-44) | OBQ-44, a shortened version of the original 87-item OBQ, consists of 3 factor- analytically derived subscales assessing domains of cognition in: responsibility/threat estimation (16 items); perfectionism/certainty (12 items) and importance/control of thoughts (16 items). | 44-item | 10-20 minutes | Obsessional beliefs are rated on a 7-point scale from 1 (disagree very much) to 7 (agree very much). Higher scores indicate stronger beliefs. |
| Obsessive Compulsive Inventory, Revised (OCI-R) | OCI-R or OCI-Short Version, a revised version to address the limitations of OCI, measures the frequency and distress experiences across 6 domains: washing, obses- sing, hoarding, ordering, checking, and neutralizing. | 18-item | Approximately 10 minutes | This instrument uses a 5-point Likert scale (from 0= not at all, to 4= extremely). The maximum score on the OCI-R is 72, with a score of 21 reflecting clinically significant levels of symptoms. |
| Padua Inventory, Revised (PI-R) | Several revisions of the original PI have been published. Derived from a factor-analytic study, the most widely used PI-R is a 5- factor structure scale that assesses impulses, washing, checking, ruminating and precision. | 41-item | 10-20 minutes | This instrument uses a 5-point Likert scale (from 0 = not at all, to 4 = very much). The maximum score is 164 and higher scores represent greater interference in routine daily functioning. |
| Structured Clinical Interview for Obsessive-Compulsive Spectrum Self-Report - Lifetime (SCI-OBS-SR) | Measures seven domains: childhood/adolescence experiences, doubt, hyper-control, attitude toward time, perfectionism, repetition and automation, and specific themes—contamination, cleaning, sexuality, existential attitudes toward religion, aggressiveness, impulsiveness, and somatic themes. | 183-item | 40 minutes | Subjects answer either Yes or No to each item on the questionnaire according to the lifetime presence/absence of the described manifestation. |
| Symptom Checklist-90-Revised (SCL-90-R) | 9 primary symptom dimensions are measured: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and a category of additional items. | 90-item | 12-15 minutes | Symptoms are rated on a 5-point scale ranging from 0 ’not at all’ to 4 ‘extremely.’ Items are summed for a total score. |
| Vancouver Obsessional-Compulsive Inventory (VOCI) | Measures a range of obsessions, compulsions, avoidance behavior, and personality characteristics of known or theoretical importance in OCD: contamination, checking, obsessions, hoarding, just right experiences, and indecisiveness. | 55-item | 10-20 minutes | This instrument uses a 5-point Likert-type scale, with ratings being summed to provide scores on the six separate subscales. |

Table I. Continued
therapy (BT STEPS). Those randomized to BT STEPS and clinician-guided behavior therapy improved significantly more than patients assigned to relaxation therapy.40 Another study on patients using BT STEPS found that improvement, as measured by the Work and Social Adjustment Scale (WSAS), was significantly greater in patients who received additional scheduled help-line support from a clinician than patients who were asked to request support when they needed it.41 Increased baseline work and social adjustment was found to be a positive predictor of intensive residential treatment (IRT) response.41 The authors hypothesized that this could be because those with better social skills established stronger peer support during treatment, benefitted more from peer modeling, and engaged more in the treatment process than those with poorer social functioning.41 Alternatively, poorer social functioning may indicate more treatment-resistant, debilitating OCD.41 (See Table IIa, available in the online version of this article, for summary of included studies).

**Patient-reported outcomes related to health-related quality of life**

HRQoL is a patient-based concept that focuses on the impact of a perceived health state on the ability to live a fulfilling life.42 HRQoL is defined as optimum levels of mental, physical, role (eg, work), and social functioning, including relationships, and perceptions of health, fitness, life satisfaction, and well-being.43 A number of scales have been used in various studies as PROMs pertaining to HRQoL among patients with OCD. These include SF-36, WHOQOL instruments, Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q),44 Quality of Life Inventory (QOLI),45 Illness Intrusiveness Rating Scale (IIRS),46 Quality of Life Scale (QOLS)47 and The Lancashire Quality of Life Profile (LqoLP, Subjective component).48 Table I.

OCD patients have lower HRQoL compared with community samples or matched controls.18,23,49-66 Comparisons of HRQoL between patients with OCD and patients with other disorders have shown mixed results; some studies found that OCD patients tend to report higher HRQoL than patients with depression across all or some domains,56,59,67,68 though others report otherwise.50,55 Similarly, some studies have reported that HRQoL was similar in OCD and schizophrenia patients,55,69 whereas others reported lower scores in OCD patients in the domains of psychological well-being and social relationships,57,68,70 as well as in overall HRQoL.57 Patients with OCD have been reported to have lower HRQoL (in the mental health domain) than patients with diabetes59 as well as end-stage renal failure patients (who were on hemodialysis or kidney transplant recipients).55 Socio-demographic factors including age,51,52,57 gender,52,71 marital status,49 employment,51,53,57 education,51 low social status,65 and perceived lack of social support64 are associated with self-reported HRQoL in OCD patients. Illness-specific severity has been shown to impair HRQoL. While some studies have shown that Y-BOCS scores predicted or were correlated with HRQoL in some or all domains,23,24,49,50,52,53,60,65,66,67,68 others found that obsessive symptoms49,52,71 or compulsions alone72 specifically contributed to lowered HRQoL in patients with OCD. Presence of hoarding,51 checking65 and washing symptoms51,54 as well as the scores on the contamination/washing dimension of YBOCS have been reported to affect HRQoL.52 In addition, HRQoL scores

| Name of instrument (ref) | Main domain of assessment/Number of subscales | Number of items | Time for administration | Scoring |
|--------------------------|-----------------------------------------------|----------------|------------------------|---------|
| Yale-Brown Obsessive-Compulsive Scale, Self-Report Version (Y-BOCS-SR)<sup>60</sup> | Measures the severity of OCD symptoms independently of the type of clinical obsessions and compulsions the individual experiences. | 10-item (5 on obsessions and 5 on compulsions) | Approximately 10 minutes | Respondent indicates the presence or absence of obsessions/compulsions from a checklist of 58 symptoms and answers 10 questions indicating: time spent, interference, distress, resistance, and control. These responses are rated on a 5-point Likert type scale (0 = ‘none,’ 4 = ‘extreme’). The cutoff point for clinically significant symptoms is 16 or more. |

Table I. Continued
were impacted by the degree of symptom interference and resistance against symptoms, and correlated negatively with cognitive appraisals of thought control and inflated personal responsibility. Adverse effects of medications have also been shown to be associated with poorer HRQoL.

Studies have consistently shown that comorbid depression or depressive symptoms predict decreased HRQoL among those with OCD, with associations across multiple domains of HRQoL. Comorbidity with other medical and mental illnesses also results in further decline in HRQoL.

A lower HRQoL in the psychological health and level of independence domain was found to predict help-seeking behavior. Besiroglu et al also found that Y-BOCS scores were significantly correlated with social relationships and level of independence domain in the help-seeking group. The authors postulated that individuals whose HRQoL is minimally impaired by OCD are less likely to seek help than significantly affected patients.

HRQoL has also been used as an outcome measure in clinical trials. Statistically significant improvements have been reported in patients in the active treatment arm in pharmacotherapeutic trials. Hollander et al reported that compared with nonresponders, responders had a higher baseline HRQoL. Although baseline HRQoL did not predict future relapse, HRQoL continued to be correlated with symptom severity at end point. HRQoL was thus sensitive to both symptom improvement (treatment response) and symptom deterioration (relapse). However, Tenney et al reported that improvements in HRQoL seemed to occur independently of symptoms and responders and nonresponders did not differ in their improvement in HRQoL. Patients on clinical treatment, followed up longitudinally, have similarly shown improvements in HRQoL with only a few studies failing to find any significant difference between pre- and post-treatment HRQoL. CBT as well as cognitive-behavioral group therapy (CBGT) were shown to improve HRQoL significantly among responders in clinical samples, though Internet-based CBT (ICBT) with therapist support was not shown to improve HRQoL. A randomized controlled trial (RCT) examining the effects of augmenting serotonin reuptake inhibitors (SRIs) with exposure and ritual prevention (ERP) versus stress management training did not find any significant difference in the rate of change in quality of life between the two groups, post-hoc analyses however revealed modest but significantly superior quality of life at study completion (post-test).

A few studies have reported improvements in HRQoL among patients undergoing other forms of health behaviours and treatments. Patients showed improvement following acceptance and commitment therapy (ACT) and progressive relaxation techniques (PRT). A preliminary study examining the impact of aerobic exercise as an adjunctive intervention to CBT and pharmacological treatment of OCD reported a significant improvement in overall sense of well-being after intervention. Ooms et al observed significant improvement in HRQoL in their study exploring the long-term effects of deep brain stimulation in patients with therapy-resistant OCD.

**Patient-reported outcomes related to OCD-specific symptoms**

OCD is a heterogeneous condition and patients often present with multiple symptoms comprising both obsessional concerns and compulsive behaviors. There have been many attempts to subtype OCD based on symptoms. While early symptom subtyping approaches characterized OCD patients by their principal compulsive behavior, these were later extended to factor analysis of symptom measures. Patients differ not only in the type of symptoms experienced but also in terms of the severity of the symptoms and the distress and interference caused by them. A number of scales have been used to report different aspects of symptoms in OCD such as symptom dimensions, severity, and distress caused by them. These include Clark-Beck Obsessive Compulsive Inventory (CBOCI), Dimensional Obsessive-Compulsive Scale (DOCS), Hamburg Obsessive-Compulsive Inventory (HZI/HOCI), Leyton Obsessional Inventory (LOI), Maudsley Obsessive-Compulsive Inventory (MOCI), Obsessional Beliefs Questionnaire-44 (OBO-44), Obsessive Compulsive Inventory Revised (OCI-R), Padua Inventory Revised (PI-R), Structured Clinical Interview for Obsessive-Compulsive Spectrum Self-Report - Lifetime (SCI-OBS-SR), Symptom Checklist-90-Revised (SCL-90-R), Vancouver Obsessional-Compulsive Inventory (VOCI) and Yale-Brown Obsessive-Compulsive Scale, Self-Report Version (Y-BOCS-SR). These have been used in studies to report the
differences between patient and control groups, to investigate neuropsychological features across symptom-based OCD subtypes, association with imaging parameters and as treatment outcomes.

A number of studies have reported that patients with OCD score higher on symptom and/or dysfunctional belief measures as compared with controls. Studies comparing OCD with other psychiatric disorders found that symptom severity was similar among OCD and generalized anxiety disorder patients. One study reported similar scores in OCD and depressive patients while others reported higher severity scores in OCD patients. Symptom scores and/or scores on dysfunctional beliefs of OCD patients were higher than those among patients with compulsive buying. Tourette’s syndrome, anorexia nervosa, bulimia nervosa, binge eating disorder, trichotillomania, clozapine-treated schizophrenia, schizophrenia, bipolar disorder-I, other anxiety disorders, alcohol dependence, and borderline personality disorder. Individuals with OCD and obsessive-compulsive personality disorder (OCPD) reported higher severity scores as compared with patients with OCD alone and symptom dimensions were also differentially related to OCD and OCPD. Patients with OCD reported higher symptom severity than pathological gamblers but dysfunctional belief scores were found to be similar in the two groups. Those with chronic medical conditions scored higher on dysfunctional beliefs than those with OCD; non-affected first-degree relatives scored higher on dysfunctional beliefs than controls but scored lower than OCD patients.

Vulink et al reported an exacerbation of OCD symptoms among female outpatients during the premenstrual period with a significant difference between the premenstrual and midmenstrual phase. Depression was positively correlated with symptom severity as was neuroticism, responsibility, perfectionism and intolerance of uncertainty, worry, alexithymia, magical ideation, dissociation, pessimistic attitudes, and poor insight.

Factor analyses of PROMs of symptoms have yielded symptom dimensions that are largely consistent with clinical observations. Associations with OCD symptom dimensions include that of cognitive attentional impulsiveness with aggressive obsessions and checking but not washing; responsibility with checking and rumination and obsessions; perfectionism/certainty with ordering, symmetry symptoms and checking and precision, responsibility/threat estimation with obsessions, checking, contamination, rumination, and washing and mental neutralizing; importance/control of thoughts with obsessions, unacceptable/taboo thoughts, punishment, and impulse phobia; amnesic dissociation with checking and dissociative symptomatology with checking and symmetry and ordering; magical ideation with washing, fantasy with hoarding, fear of contamination with low beliefs subgroup and being sexually nonsensical. Perfectionism and intolerance of uncertainty were related to trait anger and anger expression in the checker group, obsessions with higher rates of antipsychotic use. OCD dimensions of controlling behavior and specific obsessions in females were associated with core symptoms of eating disorders like bulimia and drive for thinness, while obsessional impulses to harm self/others was predictive of depression severity. Childhood experiences of sociotropy and perception of threat were found to be closely related to belief domains in OCD and it has also been suggested that the relationship between obsessive beliefs and obsessive-compulsive symptoms are accounted for by inferential confusion.

Investigations of the association between symptom dimensions and neuropsychological profiles have been characterized by inconsistent findings. While some have found associations between symptom dimensions and deficits in memory, others could only demonstrate a trend and some did not show any association. Kyrios and Iob failed to demonstrate any association of symptom dimensions with Stroop interference test, while Okada et al showed a negative correlation between Stroop color-word task correct scores and symptom severity in OCD patients. Rectification of preattentive inhibition was far less evident in checkers as compared with noncheckers and attentional bias to personally salient stimuli was correlated with symptom severity. Tumkaya et al found significant correlations between situation awareness scores and symptom severity as well as slowness and doubt dimensions of OCD patients.

No association was established between severity scores and gray matter volumes among OCD patients although dysfunctional belief (over importance and thought control) was negatively correlated...
Clinical research

with gray matter volume and a significant correlation was found between OC-related dysfunctional beliefs and morphometric variability in the anterior temporal lobe. While a study found that washing symptoms were positively related to tumor necrosis factor receptor 1 (TNFR1) and chemokine (C-C motif) ligand 24 (CCL-24) another reported that plasma levels of nerve growth factor (NGF) and glial cell-derived neurotrophic factor (BDNF) correlated significantly with severity of washing symptoms. Significant interaction effects of catechol-O-methyltransferase and brain derived neurotrophic factor (BDNF) genotype were found with dysfunctional beliefs—responsibility and overestimation of threat and over importance/need to control thoughts.

Studies have reported significant improvement in symptom severity and/or dysfunctional beliefs in OCD patients treated with behavioral therapy, group behavioral treatment, interoceptive exposure therapy, danger ideation reduction therapy, self-directed treatment, SSRIs, and combination of SSRIs and behavioral therapy. No evidence was found to suggest that response prevention alone or gradual exposure in vivo alone had a differential effect on OCD symptoms although the patients showed significant overall improvement following treatment; ritualistic behavior was significantly more affected by response prevention than by exposure alone. Antipsychotics (risperidone and haloperidol) were both found to be effective in reducing severity of obsessions in patients with treatment resistant OCD. However, no improvement in symptom severity was found after an open-label trial of fluoxetine for OCD.

A study comparing differential efficacy of CBT and exposure and response prevention (ERP) versus their sequential combination with fluvoxamine found a significant decrease in symptom measures in patients randomized to all four arms but the four treatments did not differ among each other. Low-frequency repetitive transcranial magnetic stimulation (rTMS) for 4 weeks was associated with significant decrease in symptom severity and furthermore, cortical excitatory measures correlated with effective treatment response. A residential program using a multimodal approach for patients with OCD and coexisting eating disorder resulted in significant decreases in OCD severity however another study found that comitant OCD did not indicate a significantly poorer prognosis for patients with anorexia or bulimia nervosa. Patients also reported improvement after a computer-based treatment program that provided vicarious ERP for OCD.

Discussion

The objective of this review was to present an overview of PROs and their related measures in the context of OCD. A total of 155 publications fulfilled our inclusion criteria. The most common PROM used in OCD patients was the PI. The PI was used in 27 of the 155 included studies. Other commonly used instruments included MOCI, and OBQ. While a number of measures have been used in OCD patients to examine functioning, HRQoL and OCD-specific symptoms from the patient’s perspective, the term “patient-reported outcome” is rarely used. These measures are instead referred to as “self-reported measure” and other than symptom measures, these are generic self-report instruments that capture functioning and HRQoL. Patient input into the construction of the measures which are currently being used is lacking. It is evident that OCD affects specific domains and these effects may vary across cultures. Thus, it is imperative that patients’ input be included in the development of PROMs. In addition, the validity and responsiveness of these measures must be established using stringent study designs.

A number of studies have compared PROs to those of clinician-reported measures, and findings suggest that overall there is significant correlation between the two. However, some studies have found that clinician-based assessments do not correlate well with patient reports with others discovering significant differences between clinician and patient reported outcomes. Eisen et al reported that HRQoL became significantly more impaired after a certain cut-off point for symptom severity, suggesting that functioning and HRQoL may be preserved in individuals with OCD until a particular threshold of severity is crossed. However, the finding was not replicated with the clinician-administered Social and Occupational Functioning Assessment Scale (SOFAS), suggesting that the self-reported measure Q-LES-Q may be a more specific measure or that a self-report measure may be more sensitive than a rater-administered scale in detecting changes in HRQoL relative to OCD. Stengler Wenzke et al reported that HRQoL in patients with OCD was unexpectedly lower in the domains of ‘psychological...
well-being' and 'social relationships' compared with patients with schizophrenia—a finding that re-emphasises the point that patients' perception of their HRQoL tends to be different from that assessed by clinicians. Other studies have reported low correlations between the PI-R and Y-BOCS severity scale. However, the authors felt that the two scales measured relatively unrelated features of OCD and suggested that research should focus on patients for whom there is a high discrepancy between measures to clarify understanding of differences in the "measurement between measures."

PROMs can serve as screening instruments to identify the presence or absence of an OCD diagnosis as well as help focus attention on comorbidities which might otherwise be overlooked during busy clinical consultations. While these measures are not diagnostic in nature they can help highlight important areas of follow up during the clinical interview. PROMs have been shown to be as good as, and at times even better than, clinician-reported measures at predicting outcome. While Mantovani et al reported correlations between neurophysiological measures of outcome and both patient- and clinician-administered scales, another study reported that there was no significant difference in the clinician-administered Y-BOCS score between responders and nonresponders, though responders reported less severe psychopathology at baseline on self-reported scales. Of particular importance are studies that have established a correlation between self-reported measures and putative biological markers. These studies lend further credibility to the use of self-report measures as patient-reported functioning and symptoms have been linked to plausible pathways and neural mechanisms, which may in turn affect treatment response, leading to the differences observed in outcome trials.

Overall, our review suggests that multiple measures must be used in the assessment of OCD, given the heterogeneity of the disorder. It would be ideal to have a single multidimensional patient-reported instrument that not only assesses the different domains affected in OCD but also serves other purposes, such as diagnosis and outcome monitoring. Unfortunately, no such instrument currently exists. Future research must focus on the development of such a multidimensional instrument while ensuring that patients are involved in all the stages of its development.

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Resultados percibidos por el paciente en el trastorno obsesivo compulsivo

El propósito de este artículo fue proporcionar una panorámica de los resultados percibidos por el paciente (PROs) y las mediciones relacionadas que se han efectuado en el trastorno obsesivo compulsivo (TOC). La revisión se centró en las mediciones de los resultados percibidos por el paciente (PROMs) que evaluaron tres grandes áreas de resultados: funcionamiento, calidad de vida relacionada con la salud (CdVRS) y síntomas relacionados con el TOC. La presente revisión incluyó un total de 155 artículos individuales y 22 PROMs. Un análisis de los PROs reveló que los pacientes con TOC tienden a sufrir de una marcada incapacidad funcional y refieren una CdVRS menor que los controles. Los pacientes con TOC muestran una mayor gravedad sintomática que los pacientes con otros trastornos mentales y la evidencia indica que las PROMs son sensibles a los cambios y en la predicción de los resultados terapéuticos pueden ser incluso mejores que las mediciones realizadas por los clínicos. Sin embargo, hay que tener en cuenta que las mediciones revisadas carecen del aporte del paciente en su desarrollo. A futuro la investigación de las PROMs debe incluir las perspectivas del paciente e incorporar rigurosas evaluaciones psicométricas de estas mediciones.

Résultats rapportés par les patients dans les troubles obsessionnels compulsifs

Cet article étudie les résultats rapportés par les patients (PRO, patient-reported outcome) et leurs mesures, analysés dans le contexte des TOC (troubles obsessionnels compulsifs). Les mesures des résultats rapportés par les patients (PROM, patient-reported outcome measures) évaluent ici trois grands domaines : le fonctionnement, la qualité de vie liée à la santé (QdVLS) et les symptômes liés aux TOC. La revue actuelle a finalement inclus un total de 155 articles originaux et 22 PROM. L’analyse des PRO montre que les patients atteints de TOC souffrent d’incapacité fonctionnelle significative et rapportent une moins bonne QdVLS que les témoin. Leurs symptômes rapportés sont plus sévères que ceux des patients atteints d’autres troubles mentaux et des données montrent que les PROM sont sensibles au changement et peuvent même mieux prédire les résultats thérapeutiques que les mesures faites par les médecins. Notons cependant que les mesures analysées ne disposent pas, dans leur évolution, de la contribution des patients. La recherche future sur les PROM doit faire intervenir le point de vue des patients et inclure une évaluation psychométrique rigoureuse de ces mesures.
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| Reference              | Study sample (N, number of sites, country)                                                                 | Study methodology | PROM(s) used | Major findings                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|----------------------------------------------------------------------------------------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brakoulias et al 2011 | 154 participants with a primary OCD diagnosis; several sites in NSW; Australia                             | Cross-sectional   | SDS          | The use of psychotropic agents for treating OCD symptoms was associated with higher SDS work and social subscale scores.                                                                                                                                                                                                                                                                              |
| Chambless & Steketee 2011 | 60 patients with a primary OCD diagnosis, 41 patients with a primary PD with agoraphobia (PDA) diagnosis and relatives living with the patients; Washington, DC and Massachusetts; USA | Longitudinal      | SAS-SR       | The effect of hostility at baseline on post-treatment functioning was moderated by relative type such that the negative relationship between hostility and functioning was only observed with non-spousal relatives.                                                                                                                                                   |
| Didie et al 2018      | 210 patients with a primary OCD diagnosis, 45 patients with a primary BDD diagnosis and 40 patients with comorbid BDD+OCD; USA | Cross-sectional   | SAS-SR       | All participants reported poorer overall social adjustment compared to community norms. BDD+OCD participants had significantly higher SAS-SR total scores than OCD participants. No difference in social functioning was found between OCD and BDD participants.                                                                                                                                       |
| Diefenbach et al 2021 | 70 patients with a primary OCD diagnosis; Connecticut and Minnesota; USA                                     | Longitudinal      | SDS          | SDS baseline scores were significantly and positively correlated with OC and depressive symptoms. Participants showed significant improvement in their SDS scores from pre- to post-treatment, with greater improvement observed in family functioning than work or social functioning. There was also a subset of patients who experienced clinically significant improvement in OC symptoms without showing a corresponding improvement in functioning. |
| Farris et al 2020     | 288 participants with a primary OCD diagnosis; 2 sites: Pennsylvania and New York; USA                       | Meta-analysis of 4 RCTs | SAS-SR       | Greater OCD symptom severity was moderately associated with poorer social functioning at post-treatment.                                                                                                                                                                                                                                                                               |
| Fontenelle et al 2020 | 40 patients with a primary OCD diagnosis and 40 community controls; Brazil                                  | Cross-sectional   | SDS          | BDNF plasma levels were marginally and positively correlated with overall functioning in the OCD group.                                                                                                                                                                                                                     |
| Fontenelle et al 2022 | 60 patients with a primary OCD diagnosis; Brazil                                                           | Cross-sectional   | SDS          | Composite insight was significantly and positively correlated with social disability.                                                                                                                                                                                                                                                                                                         |
| Gérard et al 2023     | 373 patients with OCD, 6270 patients with MDD, 2848 patients with GAD, 1213 patients with SAD and 656 patients with PD; France | Longitudinal      | SDS          | At baseline, even patients with low physician-rated illness severity reported significant disability. From pre-treatment to the 12-week follow-up visit, patients’ SDS subscale scores improved significantly. Mean improvement in SDS subscale scores for all participants was moderately and positively correlated with physician-rated improvement. |
| Greist et al 2023     | 218 patients with a primary OCD diagnosis; 8 sites: Utah, Colorado, Florida, Texas, Ontario, North Carolina, Massachusetts, and Georgia; USA | RCT               | WSAS,        | Patients who underwent computer-guided exposure sessions (BT STEPS) or clinician-guided behavior therapy improved significantly more from baseline to endpoint on WSAS total score than patients in the placebo condition. There was no significant difference between BT STEPS and clinician-guided therapy. |

Table IIa. Summary of the sample, interventions, and outcome measures used in included studies that measured functioning using patient-reported outcome measures (PROMs).
| Reference       | Study sample (N, number of sites, country)                                                                 | Study methodology | PROM(s) used | Major findings                                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------|-------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Hollander et al | 466 patients with a primary OCD diagnosis; 1) 58 sites in 7 countries and 2) 62 sites in 14 countries     | Retrospective     | SDS         | Patients with more severe OCD symptoms had significantly higher SDS subscale scores at baseline. Patients receiving active treatment showed a significant reduction in dysfunction compared to the placebo group. In addition, responders reported significantly less functional impairment than nonresponders, and relapsed patients had significantly higher SDS scores than non-relapsed patients. |
| Huppert et al   | 66 patients with OCD, 36 healthy controls (HCs); USA                                                   | Cross-sectional   | SAS-SR, SDS | SDS scores for HCs and patients in remission did not significantly differ, though both groups reported less disability than current OCD patients who, in turn, experienced less disability than comorbid OCD patients. |
| Kennedy et al   | 14 participants with OCD, 77 participants with major depression, 21 participants with PD, 30 participants with social phobia, 21 participants with mixed anxiety disorder and 29 controls; USA | Cross-sectional   | SDS         | OCD participants had significantly greater work, social, and family disability than controls, but did not differ from the other clinical groups in work or social disability. |
| Kenwright et al | 44 patients with a primary OCD diagnosis; UK                                                            | RCT               | WSAS        | Improvement in WSAS total score was significantly greater among patients provided with scheduled help-line support than patients who were asked to request support when needed. However, all patients’ WSAS scores improved significantly from pre- to post-treatment. |
| Lochner et al   | 220 patients with OCD, 53 patients with PD and 64 patients with SAD; South Africa                      | Cross-sectional   | SDS         | OCD patients reported greater current impairment in friendship, activities of daily living and extended family functioning than PD patients. However, they reported significantly less current impairment in social life and social functioning than SAD patients. |
| Mancebo et al   | 238 participants with a primary OCD diagnosis; USA                                                    | Cross-sectional   | SAS-SR      | Participants with occupational disability reported greater impairment in their social and leisure, extended family and family unit functioning than those without occupational disability. |
| Montgomery et al| 401 patients with OCD; 53 sites in 12 countries                                                          | RCT               | SDS         | Improvement on SDS subscale scores was significantly greater in at least one treatment condition (the three treatment groups received varying doses of citalopram) compared to the placebo condition. |
| Rosa et al      | 815 patients with a primary OCD diagnosis; 7 specialized outpatient clinics comprising the Brazilian Research Consortium on Obsessive-Compulsive Spectrum Disorders; Brazil | Cross-sectional   | SAS-SR      | Greater OC symptom severity, poorer quality of life as well as current comorbidity with depression, PTSD or eating disorders predicted greater overall social dysfunction. The SAS work, social/leisure, family unit, marital role and economic situation subscale scores were related to poorer quality of life. |

Table IIa. Continued
| Reference                | Study sample (N, number of sites, country)                      | Study methodology | PROM(s) used | Major findings                                                                                                                                                                                                 |
|--------------------------|----------------------------------------------------------------|-------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Santana et al14          | 60 patients with OCD diagnosis; Brazil                         | Cross-sectional   | SDS          | Patients who reported at least one refusal of pharmacotherapy had higher levels of family disability.                                                                                                        |
| Starcevic et al14        | 148 patients with OCD diagnosis; several sites in NSW, Australia | Cross-sectional   | SDS          | No significant difference in SDS scores was found between participants with and without OCPD.                                                                                                              |
| Stewart et al41          | 476 patients with OCD; USA                                     | Cross-sectional   | WSAS         | The responder group had higher psychosocial functioning at baseline than the non-responder group, and better initial psychosocial adjustment was found to be a predictor of IRT response. |
| Storch et al14           | 87 treatment-seeking participants with a primary OCD diagnosis; 2 sites: Minnesota and Florida; USA                 | Cross-sectional   | SDS          | SDS total score was significantly and positively related to OCD symptom severity, anxiety, depression, and maladaptive interpretation of intrusions. Analyses revealed that the Y-BOCS Resistance/Control factor and depression fully mediated the relationship between OC symptoms and functional disability. |
| Tükel et al20            | 59 patients with a primary OCD diagnosis; Turkey               | Randomised trial  | SDS          | Non-responders to the administered SSRI treatment scored significantly higher on the 3 SDS subscales than responders, even after adjusting for OCD symptom severity. The 3 subscales were positively correlated with OCD symptom severity. Greater work disability significantly predicted non-response to treatment. |
| Van Noppen et al17       | 36 patients with OCD; USA                                      | Longitudinal      | SDS          | Patients who received group behavior therapy (GBT) improved significantly in overall functioning from pre- to post-test as well as from pre-test to 1-year follow-up. However, patients who received multi-family behavior therapy (MFBT) did not show significant improvement in functioning from baseline to either post-test or follow-up. |

**List of Abbreviations used in Table IIa**

- BDD: Body dysmorphic disorder
- BDNF: Brain-derived neurotrophic factor
- GAD: Generalized anxiety disorder
- GBT: Group behavior therapy
- HC: Healthy control
- IRT: Intensive residential treatment
- MDD: Major depressive disorder
- MFBT: Multi-family behavior therapy
- OC: Obsessive-compulsive
- OCD: Obsessive-compulsive disorder
- OCPD: Obsessive-compulsive personality disorder
- PD: Panic disorder
- PDA: Panic disorder with agoraphobia
- PTSD: Post-traumatic stress disorder
- RCT: Randomised controlled trial
- SAS-SR: Social Adjustment Scale-Self Report
- SAD: Social anxiety disorder
- SDS: Sheehan Disability Scale
- SSRI: Selective serotonin reuptake inhibitor
- WSAS: Work and Social Adjustment Scale
- Y-BOCS: Yale-Brown Obsessive-Compulsive Scale
## Table Iib. Summary of the sample, intervention, and outcome measures used in included studies that measured health-related quality of life using patient-reported outcome measures (PROMS).

| Reference      | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                                                                                 |
|----------------|-------------------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Albert et al²  | 151 patients with OCD; Italy              | Cross-sectional   | SF-36        | Patients with OCD showed greater impairment in all domains of mental health-related quality of life, especially social functioning.                                                                        |
| Andersson et al³ | 23 patients with OCD; Sweden              | RCT               | QOLI         | At post-treatment, results indicated a non-significant trend on the EQ-5D with a small effect size of 0.24. The result for QOLI was non-significant.                                                               |
| Besiroglu et al⁷⁷ | 25 health care-seekers with OCD and 23 non-health care-seekers with OCD; Turkey | Cross-sectional   | WHO-QOL-103 TR | Individuals whose QOL is minimally impaired by OCD are less likely to seek health care compared to significantly affected patients.                                                                           |
| Besiroglu et al⁷⁵ | 43 patients with comorbid OCD and MDD and 67 patients with OCD only; Turkey | Cross-sectional   | WHO-QOL-BREF-TR | The OCD-MDD group reported significantly lower physical and psychological health and social relationship domain scores compared with patients with OCD only.                                             |
| Besiroglu et al⁸⁰ | 53 patients with OCD; Turkey               | RCT               | WHO-QOL-BREF-TR | There was no significant difference between the pre and post-treatment quality of life domain scores. Social relationship scores at follow-up were associated with baseline compulsion severity. |
| Bobes et al⁵⁵  | 36 patients with OCD; Spain               | Cross-sectional   | SF-36        | OCD patients reported significantly lower mean scores on all SF-36 scales as compared to Spanish norms, especially in social functioning, role, emotional and mental health. |
| Brown et al⁶⁶   | 15 patients with OCD; USA                 | RCT               | Q-LES-Q      | Results showed a significant improvement in overall sense of well-being following participation in a 12-week moderate-intensity exercise intervention.                                                        |
| Cordioli et al⁸¹ | 47 patients with OCD; Brazil              | RCT               | WHO-QOL-BREF  | Significant improvement in the quality of life in the four domains of QOL after 12 weekly cognitive behavioral group therapy sessions.                                                                   |
| Dehlin et al⁸⁵  | 5 patients with scrupulosity-based OCD; USA | Multiple baseline across participants design | QOLS         | Patients showed a 26% increase in QOLS scores after undergoing ACT.                                                                                                                                           |
| Cassin et al⁷²  | 28 outpatients with OCD and 28 outpatients with comorbid OCD and MDD; Canada | Cross-sectional   | Q-LES-Q      | Patients with comorbid OCD and MDD scored significantly lower on Q-LES-Q subjective feelings, overall well-being, social relations and general activities.                                                          |
| Didie et al¹⁸   | 210 patients with OCD, 45 patients with BDD and 40 patients with comorbid BDD and OCD; USA | Longitudinal      | SF-36, Q-LES-Q | OCD subjects and BDD subjects had poorer quality of life as compared with the US population norms.                                                                                                            |
| Dougherty et al⁷⁹ | 30 patients with OCD (only 23 completers); USA | Longitudinal      | Q-LES-Q      | Pre-treatment and post-treatment analyses showed significant improvements in quality of life.                                                                                                           |
| Reference | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings |
|-----------|------------------------------------------|-------------------|-------------|----------------|
| Eisen et al<sup>69</sup> | 197 patients with OCD; USA | Cross-sectional | Q-LES-Q | Marital status and symptom severity of obsessions and depression contributed to the degree of impairment in QOL. OCD patients showed marked impairment in domains such as the ability to work and perform household duties, subjective sense of well-being, social relationships and ability to enjoy leisure activities compared to community norms. |
| Farooqi & Rasul<sup>71</sup> | 60 patients with OCD; Pakistan | Cross-sectional | WHO-QOL-BREF | Female patients reported better overall QOL, especially in social and environmental domains as compared with male patients. |
| Fontenelle et al<sup>71</sup> | 53 patients with OCD and 53 community members; Brazil | Cross-sectional | SF-36 | Patients with OCD reported significantly lower levels of QOL in all domains except bodily pain. Hoarding and washing symptoms contributed significantly for the decline in the social quality of life in OCD hoarders. |
| Gezginc et al<sup>63</sup> | 25 pregnant outpatients with OCD and 25 pregnant healthy controls; Turkey | Cross-sectional | WHO-QOL-BREF | OCD pregnant women scored lower subscores in all 4 domains as compared to healthy controls. Also, OCD duration was negatively correlated to the psychological health domain. |
| Gururaj et al<sup>70</sup> | 35 patients with OCD and 35 patients with schizophrenia; India | Cross-sectional | WHO-QOL-BREF | Patients with OCD reported better QOL in the physical and environmental domains as compared to patients with schizophrenia. However, in terms of psychological and social domains, both groups reported similar QOL. |
| Hertenstein et al<sup>65</sup> | 73 patients with OCD; Germany | Longitudinal | WHO-QOL-BREF | At baseline, participants reported a significantly diminished psychological, social, physical, and global QOL compared to the German general population. The QOL was significantly improved after 12 months of treatment. |
| Hollander et al<sup>24</sup> | 466 patients with OCD; USA | RCT | SF-36 | Patients receiving escitalopram or paroxetine reported significant improvements on most SF-36 dimensions, but patients taking 20 mg/d escitalopram were seen to improve earlier in work-related functioning. |
| Hou et al<sup>65</sup> | 57 outpatients with OCD and 106 healthy controls; Taiwan | Cross-sectional | WHO-QOL-BREF | OCD group reported lower QOL in the general, psychological and social relationship domains as compared to the control group. Also, severe obsession and compulsion symptoms and low social support were significantly correlated to poor QOL. |
| Huppert et al<sup>25</sup> | 66 patients with OCD and 36 healthy controls; USA | Cross-sectional | Q-LES-Q | Greater severity of OCD was correlated to worse QOL. Results suggested a linear relationship between the Q-LES-Q and OCD severity. Individuals with OCD and comorbid disorders were more impaired than individuals with only OCD. |
Clinical research

| Reference      | Study sample (N, number of sites, country) | Study methodology | PROM(s) used          | Major findings                                                                                                                                 |
|----------------|--------------------------------------------|-------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Akdede et al   | 23 patients with OCD and 22 healthy controls; Turkey | Cross-sectional   | WHO-QOL-BREF-TR       | OCD patients reported worse QOL in the psychological and social domains. There were significant correlations between attention, visual tracking and working memory and the psychological, social and environmental domains of QOL. |
| Koran et al    | 60 outpatients with OCD and U.S. population published norms (2474); USA | Cross-sectional   | SF-36                 | Patients with OCD perceived the mental health domains of their quality of life as more impaired than the physical health domains. Severity of OCD was related to lower scores on the social functioning domain. |
| Koran et al    | 147 patients with OCD, U.S. population published norms (2474); USA | RCT               | SF-36                 | Both the active drug and placebo groups reported significant improvements in psychosocial domains of HRQOL. For subjects who went through 40 weeks of treatment with extended-release fluvoxamine, there were increased improvements in the psychosocial domains. |
| Kugler et al   | 102 patients with OCD; USA                 | Cross-sectional   | MOS-36                | Social functioning QOL was significantly worse and physical health QOL was significantly better in OCD patients as compared to persons with PD, MDD and schizophrenia. Resistance against obsessive-compulsive symptoms mediated the relationship between obsessive-compulsive symptom severity and social functioning QOL. |
| Kugler et al   | 31 patients with OCD and 30 healthy controls; India | Cross-sectional   | WHO-QOL-BREF          | OCD patients reported worse QOL as compared with healthy controls. Also, there was a negative correlation between cognitive appraisals (thought control, importance of thoughts and inflated responsibility) and psychological domains. |
| Masellis et al | 43 patients with OCD; Canada               | Cross-sectional   | IIRS                  | QOL was particularly affected by obsessional severity compared to compulsion severity. Comorbid depression severity greatly predicted poor QOL, accounting for 54% of the variance. |
| Meritz et al   | 79 patients with OCD and 32 healthy controls; Germany | Longitudinal      | SF-36                 | OCD patients reported significantly decreased mean QOL scores for every domain as compared to healthy controls. Correlations with QOL were most evident for depression severity and number of OCD symptoms. |
| Norberg et al  | 188 patients with OCD; USA                 | Cross-sectional   | QOLI                  | OCD patient sample's total QOL scores were at the 11th percentile in comparison to clinical norms. |
| Ooms et al     | 16 patients with OCD; Netherlands          | Longitudinal      | WHO-QOL-BREF          | Baseline QOL scores of OCD patients were significantly lower in all domains as compared to a Dutch normative population. There were distinct improvements in the general score and in the physical, psychological and environmental domains following deep brain stimulation. |

Table IIb. Continued
| Reference              | Study sample (N, number of sites, country)                                                                                                                                                                                                 | Study methodology | PROM(s) used         | Major findings                                                                                                                                                                                                 |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rapaport et al        | 521 patients with OCD, non-psychiatric community sample (67), MDD (366), chronic/double depression (576), PD (302), PTSD (139), dysthymia (315), SP (358), premenstrual dysphoric disorder (437); 11 multicenter trials; USA | Cross-sectional   | Q-LES-Q              | OCD subjects showed greater impairment on the social relationship, family relationships, leisure, ability to function and vision items. Depression and anxiety comorbidity significantly predicted Q-LES-Q scores for OCD subjects. |
| Rodriguez-Salgado et al | 64 outpatients with OCD and 9151 respondents from the general population; Spain                                                                                                                                         | Cross-sectional   | SF-36                | OCD patients had significantly decreased mean QOL scores for all SF-36 subscales except those related to physical health and pain in comparison to the general population. |
| Simpson et al         | 108 patients with OCD. Study conducted at two academic outpatient Clinics; USA                                                                                                                                                           | RCT               | Q-LES-Q              | No significant difference in the rate of change in quality of life between the two groups (augmentation of SRIs with ERP versus stress management training), post-hoc analyses however revealed modest but significantly superior quality of life at study completion (post-test). |
| Solanki et al         | 50 outpatients with OCD and 50 patients with schizophrenia; India                                                                                                                                                                        | Cross-sectional   | WHO-QOL-BREF         | There was no statistically significant difference in the QOL between the OCD and schizophrenia group. Both groups scored the lowest on the social relationship domain. |
| Srivastava et al       | 45 outpatients with OCD, 50 patients with MDD and 150 healthy controls; India                                                                                                                                                              | Cross-sectional   | WHO-QOL-BREF         | Compared with healthy controls, OCD patients reported a lower QOL in the physical well-being, psychological well-being, social and environmental domains. Compared to MDD patients, the QOL of patients with OCD was significantly higher in psychological well-being, social and environmental domains. |
| Stengler-Wenzke et al | 75 outpatients with OCD, 243 patients with schizophrenia and 315 respondents from the general population; Germany                                                                                                                        | Cross-sectional   | WHO-QOL-BREF         | Compared with general population, QOL of patients with OCD and schizophrenia was lower in all domains. OCD patients scored lower scores in the domains of psychological well-being and social relationship and overall QOL than patients with schizophrenia. |
| Stengler-Wenzke et al | 75 outpatients with OCD; Germany                                                                                                                                                                                                            | Cross-sectional   | WHO-QOL-BREF         | Compulsions were found to be negatively associated with QOL. Depressive symptoms were also negatively associated with QOL.                                                                                       |
| Twohig et al          | 79 patients with OCD; USA                                                                                                                                                                                                                   | RCT               | QOLS                 | QOL improved in both conditions (ACT and progressive relaxation training) but was marginally in favor of ACT at post treatment.                                                                                  |
| Vikas et al           | 32 patients with OCD and 30 patients with depression; India                                                                                                                                                                                 | Cross-sectional   | WHO-QOL-BREF         | OCD patients had the lowest scores in the psychological health domain whereas they had relatively high scores in the social relationship domains. OCD patients in comparison to depressed patients had significantly higher scores in QOL domains of physical and psychological health. |

Table IIb. Continued
**List of Abbreviations used in Table IIb**

| Abbreviation | Description                        |
|--------------|------------------------------------|
| ACT          | Acceptance and Commitment Therapy   |
| BDD          | Body dysmorphic disorder            |
| ERP          | Exposure and Response Prevention    |
| IIRS         | Illness Intrusiveness Rating Scale  |
| MDD          | Major Depressive Disorder           |
| MOS-36       | Medical Outcomes Study SF-36 Health Survey |
| OCD          | Obsessive-compulsive disorder       |
| PD           | Panic Disorder                      |
| PTSD         | Post-traumatic stress disorder      |
| Q-LES-Q      | Quality of Life Enjoyment and Satisfaction Questionnaire |
| QOL          | Quality of life                     |
| QOLI         | Quality of Life Inventory           |
| QOLS         | Quality of Life Scale               |
| RCT          | Randomised controlled trial         |
| SF-36        | Short Form (36) Health Survey       |
| SP           | Social phobia                       |
| SRI          | Serotonin reuptake inhibitors       |
| WHOQOL-BREF  | The World Health Organization Quality of Life-BREF |
| WHOQOL-BREF-TR | WHO Quality of Life-BREF-Turkish Version |

**Reference**

| Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings |
|-------------------------------------------|-------------------|--------------|----------------|
| 85 OCD patients; Canada                   | Cross-sectional   | OBQ, PI-R    | The relationship between obsessive beliefs and OC symptoms decreased significantly when inferential confusion was controlled. Conversely, the relationship between inferential confusion and OC symptoms was not substantially affected when obsessive belief was controlled. |
| 77 OCD patients; 2 sites; Minnesota & Connecticut, USA | Cross-sequential | OCI-R        | Analyses suggest that OCI-R is sensitive to treatment effects and that pre- to post-test change on this instrument reflects improvement in OCD and other symptoms following CBT. |
| 50 OCD patients, 3 healthy controls; Spain | Cross-sectional | OBQ          | A correlation between OBQ-44 domains and regional grey matter was not observed in OCD patients. Study also suggests a significant correlation between OC-related dysfunctional beliefs and morphometric variability in the anterior temporal lobe. |
| 141 OCD patients; Spain                   | Cross-sectional   | OBQ          | Change in dysfunctional beliefs was not affected by the COMT and BDNF genotype in isolation. Their interaction, however, had an effect on the responsibility/overestimation of threat and over importance/need to control thoughts scores. |
| 23 OCD female & 26 GAD female patients; Turkey | Cross-sectional | MOCI         | Women with OCD were more sexually nonsensual avoidant and anorgasmic than the women with GAD. The patients with fear of contamination obsessions on MOCI were more sexually nonsensual, and avoidant than obsessive compulsive with other types of fears. |
| 8 OCD patients; USA                        | Longitudinal      | MOCI         | Subjects reported no significant improvements in OC symptoms on MOCI or Y-BOCS following 8 weeks open trial of flutamide. However, feelings of aggressiveness did fail. |
| 23 OCD patients; Sweden                    | Longitudinal      | Y-BOCS-SR, OCI-R | Participants reported statistically significant improvements in self-rated OCD symptoms (Y-BOCS & OCI-R) following a 15-weeks of internet-based CBT. |

Table IIc. Summary of the sample, interventions, and outcome measures used in included studies that measured symptoms using PROMs.
| Reference         | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                 |
|-------------------|--------------------------------------------|-------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Anholt et al      | 66 OCD, 20 panic &/or agoraphobia, 20 PG patients, 30 controls; Netherlands | Cross-sectional   | OBQ, PI-R    | OCD patients reported higher OBQ-87 scores than both panic patients and normal controls, but did not differ from the pathological gambling patients. Pathological gamblers however, reported no increase in OCD symptoms. The OC spectrum theory for pathological gambling is questionable. |
| Anholt et al      | 50 tic-free OCD, 19 OCD+tic, 18 TS w/o OCD patients, 30 controls; Netherlands | Cross-sectional   | OBQ, PI      | Tic-free OCD patients scored higher OBQ-87 than TS patients while no differences were found between OCD with or without tic patients. Thus, dysfunctional beliefs have no discriminative power with respect to OCD with or without tic patients. |
| Anholt et al      | 120 OCD patients; Netherlands              | Cross-sectional   | PI-R         | Differences in neither the measurement between self- and clinician-administered measures nor the way severity is being calculated can account for the differences between the PI-R and the Y-BOCS Severity scale. Findings suggest that the two scales measure unrelated features of OCD. |
| Anholt et al      | 104 OCD patients; Netherlands              | Cross-sectional   | OBQ, PI-R    | OBQ-44 and OBQ-87 were compared for sensitivity to treatment change and other OCD measures. Results revealed identical medium effect size, the limitation of OBQ as a primary measure of treatment change and a lack of symptom dimension association to OBQ pre-post-treatment changes. |
| Arntz et al       | 27 OCD, 37 non-OCD anxiety patients, 28 non patients; Netherlands | Cross-sectional   | PI           | Subjective OCD-like experience and checking behaviors were higher in OCD patients being exposed to a high responsibility classification task than in all other groups. Although the PI checking subscale correlated with their subjective ratings, it was not correlated with their checking behaviors, suggesting the causal role of responsibility in OCD. |
| Baptista et al    | 24 OCD and 24 Medical Clinic(MC) patients for chronic diseases; 2 sites; Brazil | Cross-sectional   | OBQ          | MC group scored higher than the OCD group in domains of OBQ-Tolerance for Uncertainty, Threat estimation, Responsibility and Perfectionism. The same findings occurred with DAS, which was significantly correlated with the OBQ. |
| Black et al       | 38 non-depressed OCD patients; USA         | RCT               | MOCl, SCL-90-R | Respondents were less symptomatic on their MOCI doubting/conscientious and checking scores and marginally better on the SCL-90-R positive symptom distress index, given 12 weeks of treatment with paroxetine, placebo or CBT. |
| Bortoncello et al | 104 OCD patients; Brazil                   | Longitudinal      | OBQ          | OBQ-44’s sensitivity to treatment change following CBGT was good and all 3 belief domains declined significantly, hence proving the quality of this measure. |
| Brakoulias et al  | 154 OCD patients; Australia                | Cross-sectional   | OBQ          | The relationship between 5 Y-BOCS-derived OC symptom dimensions and the 3 OC cognitive Domains (OBQ) was examined. The symmetry/ordering dimension was associated with increased perfectionism/intolerance of uncertainty, the unacceptable/taboo thoughts dimension was associated with increased importance/control of thoughts and the doubt/checking dimension was associated with increased responsibility/threat estimation. |

Table IIc. Continued
| Reference          | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                 |
|--------------------|--------------------------------------------|-------------------|-------------|---------------------------------------------------------------------------------|
| Brakoulias et al148 | 154 OCD patients; Australia                | Cross-sectional   | VOCI, SDS   | VOCI obsessions were found to be correlated with higher usage rates of both psychotropic agent and antipsychotic agent. |
| Calamari et al151   | 367 OCD patients; USA & Canada             | Cross-sectional   | OBQ, Y-BOCS-SR | Relations between belief and symptom-based subgroups were examined. Symmetry symptom subgroup membership was modestly associated with membership in the Perfectionism/Certainty beliefs subgroup. |
| Careau et al152     | 83 OCD patients, 213 student controls; Canada | Cross-sectional   | OBQ         | The relationship between 5 different childhood experiences to 5 conceptually matched OBQ belief domains was examined. Beliefs related to responsibility, threat perception, and perfectionism showed association to their theoretically related early experiences. Threat perception and sociotropy experiences were closely related to most OBQ belief domains. |
| Chik et al153       | 88 OCD, 44 OAD patients, 48 student controls; USA | Cross-sectional   | OBQ, OCI-R | OCD patients with high, OCD-H or low, OCD-L dysfunctional beliefs differed in their 1) metacognitive beliefs which correlated with the OC symptom measures in the OCD-H and 2) monitoring tendencies which correlated with the OC symptom measures in the OCD-L. |
| Choi et al156       | 22 OCD patients and 22 matched healthy controls; South Korea | Cross-sectional   | MOCI        | Regional brain gray matter volumes were not correlated with the MOCI scores in patients with OCD despite significant volume reduction in bilateral planum polare. |
| Clark et al158      | 56 OCD patients, 38 non-obsessional psychiatric outpatients, 35 community adults and 403 undergraduate students; Canada, Australia, USA | Cross-sectional   | CBOCI, PI-WSUR | A validation study of CBOCI. The OCD group scored significantly higher on the CBOCI total score than all other groups. |
| Dastgiri & Nateghian152 | 25 OCD, 25 GAD patients and 25 normal subjects; Iran | Cross-sectional   | PI          | Results revealed a significant correlation between PI scores and worry. While PI is able to differentiate OCD and GAD from normal subjects, PI is unable to differentiate OCD from GAD subjects unless worry score is being controlled. |
| de Berardis et al146 | 112 OCD patients; Italy                  | Cross-sectional   | MOCI        | TAS-20 (measure for Alexithymia) total score and sub factors positively correlated with score for item #11 on the Y-BOCS, severity of OCD (as measured by MOCI) and MADRS scores (depression measure). |
| Dehlin et al145     | 5 scrupulosity-based OCD patients; USA    | Longitudinal      | OCI-R       | Treatment outcomes in 5 scrupulosity-based OCD patients following 8 sessions of ACT were assessed. Average daily compulsions and avoided valued activities decreased significantly. |
| Doyle et al135      | 62 patients with schizophrenia treated with clozapine, 35 OCD patients; Ireland | Cross-sectional   | OCI         | The OCD group reported significantly more symptoms for all OCI subscales compared to the clozapine group. In terms of profile, the clozapine group scored highest on the Doubting scale, a cognitive symptom whereas the OCD group scored highest on Washing, a behavioral symptom. Both groups reported greater distress with cognitive rather than behavioral symptoms. |
| Reference            | Study sample (N, number of sites, country) | Study methodology | PROM(s) used       | Major findings                                                                                                                                                                                                 |
|----------------------|------------------------------------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Einstein & Menzies   | 60 OCD patients; Australia               | Cross-sectional   | PI, OCI-SV         | Magical ideation (MI) was found to correlate highly with impaired control over mental activities, and urges and worries about losing control over motor behaviors in PI. It also attained positive correlations with the checking sub-scales on the PI and on the neutralising, obsessing, and hoarding scales of the OCI-SV. Neither the PI nor the OCI-SV contamination/washing scales were significantly correlated with MI. |
| Einstein & Menzies   | 11 cleaning & 20 checking OCD patients, 19 PD patients, 21 controls; Australia | Cross-sectional   | MOCI, OCI-SV       | OCD group reported magical ideation scores higher than both the PD group and normal subjects. OCD washers obtained higher MI scores than OCD checkers but they did not differ on scores on MOCI and OCI-SV.                                            |
| Einstein & Menzies   | 34 OCD outpatients; Australia            | Cross-sequential  | MOCI, OCI-SV, PI   | OC symptoms decreased significantly following CBT. MI improvement was significantly correlated with improvement on both the PI and the OCI-SV.                                                                    |
| Emmelkamp et al      | 89 OCD, 45 neurotic patients & 79 normal subjects; Netherlands | Longitudinal      | MOCI, LOI          | The MOCI may be used to evaluate effects of treatment, but it is less sensitive than target ratings of obsessional problems. It reliably discriminates between obsessional patients and normal, patients with anorexia nervosa and anxiety disorders; however, it failed to discriminate the obsessional from depressives. |
| Enander et al        | 48 OCD patients; Sweden                  | RCT               | DOCS, OCI-R        | DOCS found to show fair sensitivity treatment effects following Internet-delivered CBT with main intervention being exposure with response prevention.                                                |
| Enright et al        | 32 OCD patients and 32 with OAD; UK      | Cross-sectional   | MOCI               | A distinction between checkers and non-checkers in the OCD group was made using MOCI. Non-checkers displayed greater negative priming across all presentation speeds compared to checkers.                      |
| Ettelt et al         | 70 OCD patients & their 139 relatives, 70 control & their 134 relatives; 4 sites; Germany | Cross-sectional   | PI                 | Significant correlations of cognitive impulsiveness (BIS-11 subscale) were found with PI sub-scales of aggressive thoughts concerning self/others, aggressive impulses concerning self/ others, checking and symmetry separately. No other sub-scale of impulsiveness was significantly associated with OCD symptoms. |
| Exner et al          | 19 OCD patients, 19 matched controls; Germany | Cross-sectional   | PI-R               | Study revealed that episodic and semantic memory performance, but not working memory, reduced significantly in OCD subjects compared to controls. Episodic memory performance in both samples was significantly related to the Padua Ruminating and Checking, even after controlled for depression and OC symptom severity. Linear regression revealed that Rumination was most closely related to episodic memory performance in both samples above Checking. |
| Filomensky et al     | 35 OCD, 21 BP patients, 24 compulsive buyers; Brazil | Cross-sectional   | PI-WSUR            | OCD patients scored higher on OC symptoms than those with CB and BD; particularly higher on the PI contamination/washing and checking dimensions; however, they did not score higher on any hoarding dimension.             |
| Fontenelle et al     | 23 OCD patients and 40 obese individuals; Brazil | Cross-sectional   | SCL-90             | Patients with OCD had significantly higher obsessive-compulsive scores than obese non-binge and obese binge eaters.                                                                                   |

Table IIc. Continued
| Reference          | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                                                                                 |
|--------------------|------------------------------------------|-------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fontenelle et al137 | 34 OCD, 30 SAD patients; Brazil          | Cross-sectional   | OCI          | Patients with OCD reported significantly lower rates of exposure to traumatic events. Statistical analyses revealed that the OCI scores better predicted the variance on Dissociative Experience Scale scores in the OCD sample, while the Liebowitz Social Anxiety Scale did so better in the social anxiety group. |
| Fontenelle et al156 | 53 OCD patients, 53 matched individuals; 3 sites; Brazil | Cross-sectional   | OCI-R        | Patients with OCD displayed greater levels of affective sympathy and personal discomfort than controls. Analyses revealed that severity of hoarding symptoms in OCD correlated with empathic concern, fantasy, and personal discomfort. |
| Fontenelle et al111 | 53 OCD patients, 53 matched controls; 2 sites; Brazil | Cross-sectional   | OCI-R        | Washing symptoms explained 31% of the variance of limitation due to physical health problems. Other analyses however concluded that depressive, but not obsessive–compulsive symptoms, explained the remaining SF-36 dimensions. |
| Fontenelle et al132 | 40 OCD patients, 40 healthy controls; Brazil | Cross-sectional   | OCI-R        | Patients with OCD displayed higher plasma levels of CCL3, CXCL8, sTNFR1, and sTNFR2 than controls. The levels of sTNFR1 correlated positively with washing symptoms while CCL24 levels correlated negatively with hoarding. |
| Fontenelle et al168 | 40 OCD patients, 40 healthy controls; Brazil | Cross-sectional   | OCI-R        | Patients with OCD displayed lower levels of BDNF and significantly increased levels of NGF as compared to healthy controls. A positive correlation between both NGF and GDNF and severity of washing symptoms was also found. |
| Fritzler et al179   | 9 OCD patients; USA                      | Cross-sectional   | MOCI, Y-BOCS-SR | Subjects in the Delayed treatment condition following self-directed ERP showed no significant improvements. However, as a combined group with those in the Immediate treatment condition, improvements were observed in outcome measures of Y-BOCS and MOCI. |
| Fullana et al124    | 56 OCD patients, 40 healthy controls; Spain | Cross-sectional   | PI           | OCD patients scored higher in all PI subscales and were also more anxious and depressed than controls. Results showed that patients scored higher on Neuroticism, Sensitivity to Punishment and Psychoticism than normal controls; scored lower on Extraversion. No differences in Sensitivity to Reward found. |
| Grabe et al155      | 70 OCD patients; Germany                 | Cross-sectional   | HZI/ HOCI    | The dimensions ‘Checking’ and ‘Symmetry and Ordering’ were significantly related to dissociative symptomatology. A clear-cut lack of association was found in ‘Washing and Cleaning’, ‘Counting and Touching’ and ‘Aggressive Impulses and Fantasies’. HZI dimensions significantly discriminated patients with high from patients with low dissociative symptomatology. |
| Grabe et al158      | 61 OCD patients; Germany                 | Cross-sectional   | HZI/ HOCI    | In female patients, controlling behavior and obsessions and compulsions associated with counting, touching and talking were associated with bulimia whereas obsessions associated with words, pictures or thought-chains were related to drive for thinness, thus pointing to a differential gender and symptom-specific relationship between OCD and ED. |
| Reference            | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                                                                                 |
|----------------------|------------------------------------------|-------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Greist et al\(^{140}\) | 325 non-depressive OCD patients; USA     | RCT               | MOCI         | Analysis of the MOCI administered at baseline and endpoint revealed significant improvement in pooled sertraline group compared to placebo group.                                                         |
| Hashimoto et al\(^{122}\) | 63 OCD patients, 50 healthy controls; Japan | Cross-sectional   | PI           | For the logical memory tasks, a positive association was observed with PI's washing scale but a negative association was observed with PI's precision scale. Positive correlation between interference scores and PI’s precision scale was also observed. Results support the hypothesis that different symptoms may represent distinct and partially overlapping neurocognitive networks in OCD. |
| Hermans et al\(^{120}\) | 17 OCD patients, 17 non-anxious control; Belgium | Cross-sectional   | MOCI, PI     | General reality monitoring ability, and selective reality monitoring ability for anxiety relevant actions in was examined. There was no difference observed for patients that reported low or high frequencies of checking behavior.                              |
| Hunter et al\(^{123}\) | 198 OCD patients, 1457 adult psychiatric outpatients in all; USA | Cross-sectional   | SCL-90       | SCL diagnostic scales were shown to differentiate patients positive for each of the eight psychiatric disorders from other psychiatric patients who did not have that disorder.                                                        |
| Huppert et al\(^{121}\) | 128 OCD, 109 PTSD, 63 OAD patients, 40 students; USA | Cross-sectional   | OCI          | Study revealed presence of relationship between symptoms of OCD and PTSD in all samples, largely accounted for by a combination of symptom overlap and depression.                                                      |
| Jiménez-Murcia et al\(^{122}\) | 90 female patients (30 OCD, 30 anorexia nervosa, 30 bulimia nervosa); Spain | Cross-sectional   | MOCI         | Higher MOCI scores and Eating Disorder Inventory (EDI)-Perfectionism scores predicted higher EDI score. Thus, severity of ED symptomatology increases as OC symptomatology increases.                                           |
| Jones & Menzies\(^{110}\) | 21 OCD patients, 10 controls; Australia | RCT               | MOCI, LOI    | 11 patients who received the Danger Ideation Reduction Therapy (DIRT) observed significantly greater improvements from pre-treatment to after-treatment on all measures including MOCI and LOI.                                                      |
| Julien et al\(^{153}\) | 126 OCD patients; Canada                | Cross-sectional   | OBQ, PI-R    | Specificity of belief domains in OCD symptom subtype was investigated. Analyses revealed that participants in the rumination subtype scored higher on Importance/Control of Thoughts than those in the washing subtype when anxiety was controlled. Responsibility/Threat Estimation predicted rumination scores, Perfectionism/Certainty predicted checking and precision scores, and Importance/Control of Thoughts predicted impulse phobia scores when negative mood states were controlled. |
| Karadag et al\(^{143}\) | 32 OCD patients and 31 healthy controls; Turkey | Cross-sectional   | MOCQ         | MOCQ was used to define checkers from non-checkers using cut-off score of 5 and above. The OCD patients with checking compulsions were no different from the non-checking group for memory of OC relevant material and confidence.                                      |
| Kearns et al\(^{176}\) | 24 OCD patients; Ireland                | Longitudinal      | MOCI         | Significant reduction in clinical symptom ratings on completion of group based CBT for OCD patients was observed in measures including MOCI.                                                                     |

Table IIc. Continued
### Clinical research

| Reference          | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                 |
|--------------------|-------------------------------------------|-------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Keijser et al.     | 40 OCD patients; Netherlands              | Cross-sectional   | MOCI        | No differential treatment effects between exposure in vivo alone and response prevention alone could be found, although ritualistic behavior was less strongly affected by exposure in vivo following response prevention. |
| Kennedy et al.     | 280 patients with 6 diagnoses: 33 with OCD, others with major depression, panic disorder, GAD, social phobia and mixed anxiety and depression. 31 graduate students as comparison group | Cross-sectional   | SCL-90      | Each diagnostic group had a significantly high score on its corresponding subscale. The OCD group had only 2 high subscale scores – obsessive-compulsive and phobic anxiety subscale scores. OCD subjects had the lowest general anxiety and depression scores among the 6 diagnostic groups. Those with GAD endorsed many OCD symptoms. |
| Kirkby et al.      | 13 OCD patients; Australia                | Longitudinal      | PI-R        | Across three computer treatment sessions that provided vicarious exposure and response prevention for OCD, all subjects increased their vicarious exposure behaviors that predicted symptom reduction on PI. |
| Krochmalik et al.  | 5 OCD patients; Australia                 | Longitudinal      | MOCI, PI    | On the MOCI, 4 of the 5 subjects (unchanged by ERP) met recovery criteria following DIRT. Changes were maintained at follow-up. |
| Kyrios & Iob.      | 15 OCD patients, 15 normal controls; Australia | Cross-sectional   | PI          | Significant associations were found between interference scores of OCD threat words (masked only) with both the depression and anxiety symptom measures, but not with OC symptom severity (measured on PI). |
| Li et al.          | 16 OCD patients; USA                      | Double-blind, placebo-controlled, crossover study | SCL-90      | Significant reduction in the SCL-90R obsession and anxiety scale was observed with both risperidone and haloperidol compared to placebo augmentation of serotonin reuptake inhibitors in the treatment of OCD patients. On the depression scale, scores of those on risperidone but not haloperidol treatment separated out from placebo. |
| López-Solà et al.  | 110 OCD patients, 237 non-clinical sample; Spain | Cross-sectional   | DOCS, OBQ   | The association between OC symptom dimensions in DOCS and obsessive beliefs was examined. In OCD patients, Contamination, Responsibility for Harm, and Unacceptable Thoughts were predicted by OBQ-Responsibility. For the Symmetry dimension the OBQ-Perfectionism domain emerged as the only significant predictor. |
| Mantovani et al.   | 18 OCD subjects through stringent recruitment; USA | RCT (Sham)         | Y-BOCS-SR   | Correlation between changes in Y-BOCS-SR and cortical excitability measures was examined and results suggested that low-frequency repetitive transcranial magnetic stimulation are supportive of the role of SMA in the modulation of OCD symptoms. |
| Mass et al.        | 15 OCD, 50 schizophrenia (25 with severe negative symptoms) and 25 alcohol dependence patients; Germany | Cross-sectional   | HZI-K/HOCI  | OCD subjects had the highest compulsion scores but the obsessions scores on HZI-K did not differ among the groups. |

Table IIc. Continued
| Reference      | Study sample (N, number of sites, country)                                                                 | Study methodology | PROM(s) used                  | Major findings                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------|-------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Muller et al  | 31 OCD, 18 with TS, 13 with Parkinson’s Disease & 46 controls; Germany                                   | Cross-sectional   | MOCI, HZI-K                   | On most subscales -Checking, Ordering, and Counting/touching, TS patients scored higher than controls but reported fewer symptoms than OCD patients, particularly on the MOCI subscales ‘Checking’ and ‘Slowness/Repetition’ as well as on the HZI subscales ‘Cleaning’ and ‘Obsessive Thoughts’. |
| Murayama et al| 22 OCD, 19 controls; Japan                                                                               | Cross-sectional   | MOCI                          | Both checkers and washers were compared with the controls on a symptom provocation task on fMRI. The checkers showed slightly higher activation in the left caudate and left AC which saw a positive correlation between activation and symptom severity. The washers showed higher activation in several bilateral cortico-cerebellar regions which saw a position correlation between symptom severity and the bilateral frontotemporal gyrus. |
| Nakamae et al | 23 non-medicated OCD patients, 23 healthy controls; Japan                                               | Cross-sectional   | OBQ                           | The relationship between gray matter volume and each dimension of OBQ was explored. Only a significant negative correlation was found between gray matter volume and OBQ-over-importance and over-control of thoughts) scores in the left amygdala. |
| Niemeyer et al| 34 OCD, 34 healthy controls; Germany                                                                     | Cross-sectional   | OBQ, Y-BOCS-SR, OCI-R         | Metacognition (measured on OBQ) contributed significantly but modestly to OC symptoms (measured on the OC scales) after responsibility was controlled for, and conversely responsibility made a significant contribution after controlling for metacognition. |
| O’Connor et al| 44 OCD patients; Canada                                                                                  | Cross-sequential  | PI, OBQ                       | After 20 weeks of treatment s (cognitive appraisal model, exposure and response prevention or inference-based approach), all groups showed a significant reduction in scores including PI. Participants with high levels of obsessional conviction showed greater benefit from IBA than CAM. |
| Okada et al   | 12 OCD subjects and 12 matched controls; Japan                                                          | Cross-sectional   | MOCI                          | The study found that oxy-Hb changes in the OCD group during the Stroop color-word task (SCWC) were significantly smaller than those in the control group, especially in the frontopolar cortex. No significant correlations between the SCWC score and age, FIQ, and MOCI score. |
| Olantunji et al| 30 OCD and 30 non-clinical controls; USA                                                                   | Cross-sectional   | DOCS                          | DOCS score was found to correlate inversely with the disengagement efficiency score when erotic images served as the distractor, indicating that OCD subjects showed a weakened ability to disengage their attention. |
| Overbeek et al| 120 OCD patients for baseline ratings and 72 for post-treatment ratings; Netherlands                     | Longitudinal      | MOCI                          | Severity of OCD symptoms on the 120 patients following a combined psychopharmacologic and behavioral therapy differed for depressed and nondepressed on the anxiety and depression measures, but not OCD measures. Post-treatment scores on YBOCS and MOCI were also found to be worse for depressed OCD patients despite the lack of difference at baseline. |

Table IIc. Continued
| Reference           | Study sample (N, number of sites, country)                                                                 | Study methodology | PROM(s) used        | Major findings                                                                                                                                 |
|---------------------|----------------------------------------------------------------------------------------------------------------|-------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Peng et al<sup>122</sup> | 100 OCD, 38 OCD + other psychosis patients, 101 controls, 47 healthy OCD’s relatives; China                  | Cross-sectional   | OCI-R               | OCD patients with or without comorbid psychosis scored higher in motor coordination and total neurological soft signs (NSS) than controls, with no significant difference between them in general. |
| Radomksy et al<sup>128</sup> | 33 OCD patients, 143 students; Canada                                                                       | Cross-sectional   | OBQ, VOCI          | The compulsive checking group reported greater trait anger, but not greater anger expression, than the control group. Beliefs concerning perfectionism and intolerance of uncertainty were positively correlated with anger expression and trait anger among compulsive checkers but not among the control group. |
| Rector et al<sup>142</sup> | 14 OCD probands, their 14 lst degree relatives, 87 normal controls;                                        | Cross-sectional   | OBQ                 | 1st degree relatives scored significantly higher than controls on the OBQ domains- inflated responsibility and overestimation of threat. In addition, relatives of early onset OCD probands scored significantly higher than controls on both the inflated responsibility and overestimation of threat domain and the domain tapping perfectionism and intolerance of uncertainty. |
| Rubenstei et al<sup>115</sup> | 50 OCD, 69 normal weight bulimia nervosa patients & 28 controls (all females); USA                           | Cross-sectional   | MOCI, SCL-90-R (OC) | Study confirmed that OCD patients scored higher than both normal volunteers and bulimics, and bulimics scored higher than normal volunteers on the OC subsection of the SCL-90-R and on the MOCI. |
| Rufer et al<sup>154</sup>     | 50 OCD patients; Germany                                                                                     | Cross-sectional study | HZI/ HOCI          | The checking dimension was most strongly related to dissociation, followed by the symmetry/ordering and obsessive thoughts dimensions. Multiple regression analyses revealed that: (1) only the checking dimension showed an independent positive correlation with dissociation, and (2) only higher scores on the DES subscale "amnestic dissociation" were associated with higher scores for checking compulsions. |
| Salkovskis et al<sup>121</sup> | 83 OCD, 48 anxiety & 218 non-clinical participants; UK                                                       | Cross-sectional   | MOCI, OCI          | Responsibility Attitude Scale (RAS) & Responsibility Interpretations Questionnaire (RIQ) were significantly correlated to both MOCI & OCI, indicating that the two responsibility scales are strong predictors of obsessions. |
| Scarrabelotti et al<sup>101</sup> | 20 OCD patients and 151 controls; Australia                                                                   | Cross-sectional   | PI                  | After controlling for depression, neuroticism and responsibility were significant predictors of discomfort from obsessions and compulsions (PI) in both the OCD and normal sample, while extraversion and psychoticism were not important. |
| Selvi et al<sup>187</sup>     | 57 OCD patients; Turkey                                                                                      | Longitudinal      | OBQ                 | Patients had reduced scores on OBQ-44 following 12 weeks of SSRI treatment. Mean changes in OBQ-44 Importance & Control of Intrusive Thoughts subscale of responders were significantly higher than those of SSRI-resistant patients. |
| Shin et al<sup>111</sup>      | 30 OCD patients and 30 healthy controls; South Korea                                                       | Cross-sectional   | MOCI                | The MOCI score was found to be negatively correlated with Immediate Presence and Accuracy, Delayed Presence and Accuracy, Immediate Retention, and Organization scores on the ROCF. This study indicates that people with OCD have poor memory function and organizational deficits. |
| Reference            | Study sample (N, number of sites, country) | Study methodology | PROM(s) used       | Major findings                                                                                                                                                                                                 |
|----------------------|-------------------------------------------|-------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Simpson et al196     | 56 OCD + eating disorder patients; USA    | Longitudinal      | Y-BOCS-SR          | Significant decrease in OCD severity, measured by Y-BOCS was observed in patients following a residential treatment program                                                                                     |
| Solem et al173       | 83 OCD patients; Norway                   | Longitudinal      | OBQ                | Y-BOCS & OBQ were administered at pre-, post- treatment and follow ups to OCD patients undergoing ERP and results showed significant improvements in symptoms, metacognition score, responsibility and perfectionism. |
| Souza et al121       | 64 OCD, 33 social phobia, 33 panic disorder, 130 controls; Brazil | Longitudinal      | OCI-R              | OCD's sensitivity to change was evaluated by comparing changes in its total score administered before and after CBGT and by comparing these to changes in Y-BOCS scores. Analyses revealed that OCI-R showed a good ability to assess the effects of treatment in OCD patients. |
| Starcevic et al22     | 148 OCD participants, of which 70 had OCPD and 78 without; Australia | Cross-sectional   | VOCI, SCL-90-R     | Results on VOCI showed that all OCD symptom dimensions except for contamination and checking were significantly more prominent in participants with OCPD. OCPD participants also scored significantly higher on all dimensions of psychopathology based on SCL-90-R. |
| Stein et al134       | 17 OCD, 12 trichotillomania and 14 borderline personality disorder patients | Cross-sectional   | LOI                | Trichotillomania and borderline personality disorder patients had significantly lower scores of obsessive-compulsive symptoms than OCD patients.                                                                 |
| Storch et al14       | 87 OCD patients; 2 sites; Minnesota & Florida; USA | Cross-sectional   | OCI-R              | Factors associated with OCD related functional disability were examined. Depressive symptoms and the extent to which a patient attempts to resist and is able to control OCD symptoms predict functional disability strongly. |
| Taylor et al145      | 248 OCD patients; 12; USA, Canada & Australia | Cross-sectional   | PI, OBQ            | Given PI subscales and OBQ (inflated responsibility, perfectionism and controlling one’s thought), analyses revealed significant main effects. There was no evidence that beliefs interact in their effects on OC symptoms. |
| Thiel et al188       | 75 female inpatients with anorexia or bulimia nervosa; 29 met criteria for concomitant OCD; Germany | Longitudinal      | HZI/ HOCI          | Clinically significant change, as reflected by improvement in scores on the Eating Disorder Inventory, was seen more often in patients without concomitant OCD, but this trend was not statistically significant. The patients whose eating disorders were most improved at follow-up also showed the highest reduction of obsessions and compulsions. |
| Tumkaya et al114      | 42 OCD patients and 42 healthy controls; Turkey | Cross-sectional   | MOCI               | There were significant correlations between situational awareness scores and slowness and doubt scores of MOCI in OCD patients. Results indicated that (I) OCD patients have problems of perception, integration, and comprehension of complex visual perceptions; (II) situation awareness deficits associated with severity and prevalence of obsessions and compulsions. |
| Tynes & Winsstead.144 | 41 OCD patients; USA                      | Retrospective      | MOCI               | Total BDI score was found to be significantly correlated with total MOCI score in the 41 participants. Checking was correlated with Retarded depression while doubting correlated with both Guilty depression and Retarded depression. |

Table IIC. Continued
| Reference                  | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                 |
|----------------------------|-------------------------------------------|-------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Tolin et al\(^{138}\)      | 77 OCD patients, 35 anxious control; USA   | Cross-sectional   | OBQ, OCI-R   | Thought Control Questionnaire-Punishment scale correlated significantly with the OBQ-44 Importance/Control of Thoughts scale. Regression revealed that beliefs about the Importance/Control of Thoughts accounted for the relations between OCD and the use of Punishment as a thought control strategy. |
| Tolin et al\(^{135}\)      | 99 OCD patients; USA                       | Cross-sectional   | OCI          | Relationship between OCD symptoms and obsessional beliefs was explored. Washing was predicted by responsibility/threat estimation beliefs. Checking/doubting was not predicted by any obsessional beliefs. Hoarding was predicted by perfectionism/certainty beliefs. Neutralizing was predicted by responsibility/threat estimation beliefs. Obsessing was predicted by importance/control of thoughts and perfectionism/certainty beliefs. Ordering was predicted by perfectionism/certainty beliefs. |
| van Balkom et al\(^{186}\) | 117 OCD patients; Netherlands              | RCT                | PI-R, SCL-90 | Study aimed to investigate the differential efficacy of cognitive therapy or exposure in vivo with response prevention for OCD versus the sequential combination with fluvoxamine. Results revealed decreases in OC symptom scales (including PI-R and SCL-90) across all 4 treatments, but they did not differ among each other. |
| van Noppen et al\(^{175}\) | 90 OCD patients; USA                       | Longitudinal      | Y-BOCS-SR    | A significant decrease was observed in the 90 OCD subjects on the Y-BOCS-SR scores; (mean ± SD) 21.8 ± 5.6 at baseline and 16.6 ± 6.4 after the 10-week treatment of behavioral group therapy. |
| van Oppen et al\(^{191}\)  | 63 OCD patients; Netherlands               | Longitudinal      | PI-R          | PI-R demonstrated not only significant treatment effects, but also large effect sizes, thereby providing evidence of its sensitivity to change. The PI-R and the Y-BOCS were comparable in terms of reliable change and clinical significance. |
| Victoria et al\(^{185}\)   | 48 OCD patients, 24 controls; Brazil       | Cross-sectional   | OCI-R        | Positive correlations between reaction time to content-specific stimuli and OC symptom severity was found, suggesting that OCD patients experience difficulty in disengaging attention from personally salient stimuli. |
| Vulink et al\(^{143}\)     | 101 female OCD outpatients; Netherlands    | Cross-sectional   | Y-BOCS-SR    | 59 patients reported an exacerbation of OCD symptoms during premenstrual period, 9 during menopause and 17 patients during pregnancy, whereas 11 patients mentioned improvement of OCD symptoms during pregnancy. |
| Wahl et al\(^{140}\)       | 34 OCD, 34 MDD; Brazil                     | Cross-sectional   | OCI-R        | OCI-R scores were significantly higher in OCD patients as compared to patients with major depressive disorder. |
| Wellen et al\(^{140}\)     | 92 OCD and 376 non-OCD subjects; USA       | Cross-sectional   | LOI          | The relationship between the factors, OCD and OCPD was evaluated using logistic regression. Five factors underlying the LOI were identified. Obsessional ruminations and compulsions, organizing activities, and contamination fears may indicate OCD, and ordering and arranging symptoms indicate OCPD. |

Table IIc. Continued
| Reference     | Study sample (N, number of sites, country) | Study methodology | PROM(s) used | Major findings                                                                                                                                 |
|---------------|-------------------------------------------|-------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Wheaton et al | 152 OCD patients; 3 sites; USA            | Cross-sectional   | DOCS, OBQ    | Using DOCS and OBQ, contamination symptoms were predicted by responsibility/threat estimation beliefs, symmetry symptoms were predicted by perfectionism/ certainty beliefs, unacceptable thoughts were predicted by Importance /control of thoughts beliefs and symptoms related to being responsible for harm were predicted by responsibility/threat estimation beliefs. |
| Woo et al     | 91 OCD patients, 702 students; Korea      | Cross-sectional   | OCI-R, PI-WSUR | The receiver operating characteristic analyses showed that the OCI-R is an effective screening tool for OCD.                                                                                     |
| Wootton et al | 22 OCD patients; Australia                | Longitudinal      | OCI-R        | Following an 8-week online CBT course, OCD participants improved significantly on outcome measures including OCI-R, hence providing support for the efficacy of Internet administered treatment program. |
| Yap et al     | 56 OCD, 46 OCD+ depression patients; Australia | Cross-sectional | OBQ, Y-BOCS-SR, PI-R | The study examined differences between depressed and non-depressed OCD cohorts on OCD-related and non-specific factors. The two tested groups did not differ on these variables although depression severity was correlated with obsessional impulses to harm self/others. |

**Table IIC. Continued**

**List of Abbreviations used in Table IIC**

| Abbreviation | Description                    | Abbreviation | Description                    |
|--------------|--------------------------------|--------------|--------------------------------|
| BD           | Bipolar disorder               | MOCI         | Maudsley Obsessive Compulsive Inventory |
| BDNF         | Brain derived neurotropic factor | MOCQ        | Maudsley Obsessive Compulsive Questionnaire |
| CAM          | Cognitive Appraisal Model      | NGF          | Nerve growth factor            |
| BIS          | Barratt Impulsiveness Scale    | OAD          | Other anxiety disorder         |
| CB           | Compulsive buyers              | OBQ          | Obsessional Beliefs Questionnaire |
| CBGT         | Cognitive behavioral group therapy | OCD         | Obsessive-compulsive disorder |
| CBT          | Cognitive behavioral therapy   | OCPD         | Obsessive compulsive personality disorder |
| COMT         | Catechol-O-methyltransferase   | OCI-R        | Obsessive Compulsive Inventory-Revised |
| DAS          | Dysfunctional attitude scale   | OCI-SV       | Obsessive Compulsive Inventory-Short Version |
| DIRT         | Danger Ideation Reduction Therapy | PI-R       | Padua Inventory-Revised         |
| DOCS         | Dimensional Obsessive Compulsive Scale | PI-WSUR      | PI-Washington State University revised form) |
| ED           | Eating disorder                | PTSD         | Post-traumatic stress disorder |
| ERP          | Exposure and Response Prevention | RAS         | Responsibility Attitude Scale |
| fMRI         | Functional magnetic resonance imaging | RIQ          | Responsibility Interpretations Questionnaire |
| GAD          | Generalised anxiety disorder   | SAD          | Social anxiety disorder        |
| GDNF         | Glial cell-derived neurotrophic factor | ROCF       | Rey-Osterrieth Complex Figure |
| HZI/HOCI     | Hamburg Obsessive Compulsive Disorder | SCL-90-R    | Symptom Checklist-90-Revised |
| IBA          | Interference-Based Approach    | SCWC         | Stroop Color-Word Task         |
| LOI          | Leyton Obsessional Inventory   |              |                                |
| MADRS        | Montgomery Åsberg Depression Rating Scale |              |                                |
| MDD          | Major Depressive Disorder      |              |                                |
| MI           | Magical ideation               |              |                                |

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| SSRI          | Selective serotonin reuptake inhibitor | VOCI             | Vancouver Obsessional Compulsive Scale |
|---------------|----------------------------------------|------------------|---------------------------------------|
| TAS           | Toronto Alexithymia Scale              | Y-BOCS-SR        | Yale-Brown Obsessive Compulsive Scale-Self Report |
| TS            | Tourette syndrome                      |                  |                                       |

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