Functional Interventions as Augmentation Strategies for Obsessive-Compulsive Disorder (OCD): Scoping Review and Expert Survey from the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS)

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Abstract

Background. Patients with obsessive-compulsive disorder (OCD) commonly exhibit a range of functional difficulties, presumed linked to neurocognitive changes. Evidence-based first-line treatments have limited effect on improving these cognitive-functional problems. Candidate interventions could be used to augment evidence-based treatments by the multi-professional mental health team.

Methods. A scoping review was performed to identify any intervention with at least one peer-reviewed report of clinical improvement in any of the 13 functional domains of the Cognitive Assessment Instrument of Obsessions and Compulsions (CAIOC-13). Next, an online survey of experts of the International College of Obsessive-Compulsive Spectrum Disorders was conducted.

Results. Forty-four studies were identified reporting a positive outcome for 27 different kinds of intervention. Twenty-six experts from 12 different countries, including at least one expert from each continent, completed the opinion survey. Five interventions were identified as 'highly promising', none of which was moderated by rater-related factors, suggesting global applicability.

Conclusion. Patients with OCD may benefit from a detailed functional assessment, to identify areas of unmet need. A variety of interventions show theoretical promise for treating the complex functional difficulties in OCD as adjuncts to first-line treatments, but the published evidence is weak. Randomised controlled trials are needed to determine the clinical effectiveness of these interventions.

Keywords

Obsessive-Compulsive Disorder; Functional-cognitive problems; Functional interventions; Augmentation strategies; International College of Obsessive-Compulsive Spectrum Disorders; ICOCS

Introduction

Obsessive-compulsive disorder (OCD) is a psychiatric disorder accompanied by high levels of distress, disability and disruption of social and occupational functioning (Crino et al., 2005; Veale & Roberts, 2014). The World Health Organization has ranked OCD as one of the ten most disabling mental disorders by lost income and decreased quality of life, with a lifetime prevalence in community surveys ranging from 1.3-2.3% (Veale & Roberts, 2014; Fawcett et al., 2020) and a remission rate that ranges widely from 32% to 70% (Burchi et al., 2018).

OCD is characterized by obsessions, defined as recurrent, unwanted intrusive thoughts, urges or images and compulsions, defined as repetitive behaviours or mental acts that an individual feels driven to perform according to rigid rules, to reduce or prevent the anxiety and distress caused by obsessions or prevent harm (APA 2013). OCD has also been found to have a profound impact on mood, and depressive symptoms secondary to OCD are common (Marcks et al., 2011; Veale & Roberts, 2014).

Additionally, less well recognised cognitive-behavioural symptoms are also frequently present, such as tic-symptoms or tic-disorder (Conelea et al., 2014; American Psychiatry Association, 2013), attention-deficit symptoms (Brem et al., 2014), sleep-phase shift (Turner et al., 2007, Drummond et al., 2012), neurological soft signs (Hollander et al., 2005), slowness, and perfectionism (Abramovitch et al., 2019) suggesting a neurodevelopmental component to its aetiology. Comorbidity is common, with a substantial minority meeting criteria for attention deficit hyperactivity disorder (ADHD), especially in childhood-onset cases (Geller et al., 2002) and autism spectrum disorder (ASD) (Wikramanayake et al., 2017). Some cognitive-behavioural symptoms, such as attention-deficit problems, overlap across these different disorders, and even if difficulties in concentrating in OCD are thought to result, at least in part, from obsessions interfering with the ability to focus attention, the clinical impact of shared neuropsychological mechanisms (e.g. Norman et al., 2016; Carlisi et al., 2017) on attentional difficulties cannot be ruled out. Indeed, the functional impairment associated with OCD (e.g. poor psychosocial adjustment integration/development in the long-term outcome (Wewetzer et al., 2001), difficulties in family relationships and occupational performance (Velloso et al., 2018)) is not thought to be due exclusively to the presence of obsessions and compulsions, but also to deficiencies in other areas such as social communication skills (Gadelkarim et al., 2019) and neurocognitive functioning (Abramovitch et al., 2019; Burchi et al., 2018).

Converging evidence from translational neuroscience suggests that patients with OCD differ from healthy controls across a range of different cognitive-functional domains (Fineberg et al 2018).

Meta-analyses have found that patients with OCD show significantly impaired performance, with a medium effect size, on tasks measuring many aspects of executive function, including goal-directed planning, response inhibition, cognitive flexibility and working memory (Abramowitch et al., 2013; Shin, et al., 2014; Snyder et al., 2015). Other reported domains of cognitive impairment or alteration in patients with OCD include processing speed, visuospatial memory, decision making and error monitoring processing (Kuelz et al., 2004; Chamberlain et al., 2007; Abramovitch & Cooperman, 2015; Benzina et al., 2016; Hauser et al., 2017; Geller et al., 2018; Rector et al., 2019; Zartaloudi et al., 2019). Interestingly, some of these cognitive impairments have been found also in patients' unaffected parents and siblings suggesting heritable psychopathological mechanisms as candidate endophenotypes in OCD (Abramovitch et al., 2020). These cognitive problems are thought to adversely affect psychosocial and occupational functioning. In the light of these findings, Burchi et al. (2018) recommended that a routine assessment of cognitive functioning should be part of the determination of recovery in OCD.

In this emerging context, Dittrich et al. (2011) investigated the dysfunctions due to classical OCD symptoms (obsessions and compulsions) and neurocognitive deficits in a cohort of treatment-seeking patients with OCD and identified 13 cognitive-functional domains that appeared to be specifically linked to the psychosocial impairment of OCD. These include 1. Difficulty reading, 2. Doubt, 3. Lassitude, 4. Slowness, 5. Indecisiveness, 6. Perfectionism, 7. Circadian rhythms, 8. Anxiety, 9. Procrastination, 10. Flexibility, 11. Executive function, 12. Worrying about the future and 13. Compulsions. The authors used these domains to develop the 13-item Cognitive Assessment Instrument of Obsessions and Compulsions (CAIOC-13) (Dittrich et al., 2011), which appears a valid and reliable instrument for comprehensively measuring the impact of OCD on everyday function. Of note, the study by Dittrich et al (2011) did not explore the heterogeneity of functional impairment within the OCD sample to detect the extent to which certain domains of functional impairment might be explained by specific moderators such as symptom-types, so no inference about this can be drawn.

Many other psychiatric conditions including depression, ADHD and ASD have been demonstrated to have similar deficits. A concern could be that these cognitive impairments may not be exclusive to OCD itself, as not all the studies investigating this area excluded comorbidity, which could account for at least some of the cognitive deficits reported in OCD. However, in the study by Dittrich et al., (2011), compared to healthy controls, significant differences were found in patients with OCD across all 13 domains, whereas compared to patients with major depression, significantly greater

impairment scores were found in individuals with OCD in the following six domains: doubt, lassitude, perfectionism, anxiety, procrastination, and compulsions, as well as a trend for difficulty reading and slowness, indicating that these particular impairments are specific for OCD. Moreover, in the study by Dittrich et al., the majority of patients with OCD were affected across most domains.

A poorly investigated issue is whether these cognitive-functional deficits represent the product of years of untreated illness; one might hypothesize that a longer duration of untreated illness is associated with greater cognitive-functional deficits, just as a longer duration of untreated illness is associated with poorer response rates (Albert et al., 2019, Dell'0sso et al., 2010), suggesting a neurological progressive mechanism underlying this phenomenon. Furthermore, the extent to which these cognitive-functional changes may represent state- or trait-markers, and are therefore amenable to therapeutic intervention, remains controversial. Although some evidence (as described above) suggests that the cognitive deficits found in OCD are directly linked to the core psychiatric symptoms, and might respond as obsessions and compulsions improve, other evidence suggests they are underpinned by separate brain-based mechanisms and therefore may require alternative therapeutic approaches.

As indicated by international evidence-based guidelines for OCD treatment, selective serotonin reuptake inhibitors (SSRIs) and cognitive behaviour therapy (CBT) with exposure and response prevention are considered first-line interventions for OCD (Fineberg et al., 2020; Hirschtritt et al., 2017). There is, however, mixed evidence as to whether these first line treatments are effective for OCD-related cognitive deficits. Some studies have found that executive deficits are improved in patients with OCD who respond to standard treatments (Bolton, et al., 2000; Kahn et al., 1984, Diefenbach et al., 2007) though others have not (Nielen & Den Boer, 2003; Bannon et al., 2006; Rao, et al., 2008; Sharma et al., 2014, Samuels et al., 2017). One study comparing neuropsychological performance (including general intelligence, attention, verbal and non-verbal working memory, declarative and procedural learning, visuo-constructive skills, and executive functions) in adults with OCD found that there were no significant differences between the group of patients treated with SSRI on any of the cognitive domains that were studied compared to the untreated group, suggesting that deficits persisted following chronic SSRI treatment (Mataix-Cols et al., 2002). However, psychiatric comorbidity was allowed in this study and as there is no mention of a developmental assessment, it is possible that these findings were confounded by the presence of comorbid neurodevelopmental disorder. In another study investigating adult patients with OCD, in whom other Axis I disorders and cognitive impairment diagnoses were excluded, it was found that

treatment with SSRI was associated with poorer cognitive performance in the acute phase (first 8 weeks) of treatment (Sayyah et al., 2016). However, another study of children and adolescents with OCD showed that, at least in the early phase of the disease, cognitive deficits like memory, speed of information processing and executive functions may normalize with SSRI treatment (Andres et al., 2008). There is some evidence that CBT may also improve cognitive function (e.g. planning) in patients with OCD (Van der Straten et al., 2018).

There is also evidence that patients with OCD with poorer cognitive and executive abilities respond less well to either SSRI or CBT (D'Alcante et al., 2012), suggesting additional treatment strategies may be needed for those with prominent functional impairment. Recent studies have underlined that successful treatment with Deep Brain Stimulation (DBS), an invasive neurosurgical procedure reserved for severely impaired treatment resistant cases, not only improved psychosocial disability (Tyagi et al 2019; Menchon et al 2019), but also improved laboratory-based measures of cognitive flexibility (Tyagi et al 2019). Indeed, a new unpublished analysis of the data of Tyagi et al., 2019 found that DBS also produced improvement across the cognitive-functional domains of the CAOIC-13 (Tyagi et al., unpublished data). Yet another study found that anterior capsulotomy attenuated moderate cognitive deficits alongside OCD symptoms (Gong et al., 2018). Efforts are therefore being made to find new, more accessible ways of targeting cognitive functions to improve OCD outcomes, such as training patients in cognitive control (McTeague et al., 2017), or by attempting to enhance the functioning of the underpinning brain networks using experimental non-invasive forms of neurostimulation, such as repetitive transcranial magnetic stimulation (rTMS) (Chalah & Avache, 2019) or deep TMS (Carmi et al., 2019).

Taken together, these findings suggest that SSRI and CBT may not be sufficient to adequately address the functional problems associated with OCD, and that although there is scope for improving cognitive-functional deficiencies in OCD, there is considerable uncertainty as to how best to achieve this. As standard treatment with CBT or SSRI may not be reliably associated with improved cognitive functioning and DBS or capsulotomy are only currently available for the most severely refractory cases, new heuristics are needed to identify interventions that, applied alongside conventional treatments, may produce a more holistic improvement and enhance the functional capabilities of patients with OCD.

With this in mind, our aim was to identify and evaluate the most promising non-pharmacological, non-surgical forms of therapeutic intervention with the potential to address functional impairment in patients with OCD and augment standard treatment with SSRI and CBT via a scoping review.

Although conducted with different objectives compared to systematic reviews, scoping reviews still require rigorous and transparent methods in their conduct to ensure that the results are trustworthy (Munn et al. 2018). We were particularly interested in therapies that could feasibly be applied by a wide range of members of the multi-professional mental health team, including occupational therapists, social workers, psychological therapies support workers, across most countries worldwide, including low and middle income countries, in order to maximise availability.

We first performed a scientific literature review to identify candidate interventions. We then sought expert opinion on the viability of these candidate therapies as effective interventions for OCD, obtained via a survey of the full membership of the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS). The ICOCS is an international organisation with a multidisciplinary membership, largely drawn from the fields of medicine, psychology and neuroscience. The ICOCS aims to advance, promote and facilitate research into OCD and related disorders, supports mental health professionals and others to develop research projects in this field, and helps coordinate research efforts amongst members (ICOCS, www.ICOCS.org).

Methodology

Ethical approval

Ethical approval for the present study was obtained on the 6/2/2020 from the *University of Hertfordshire Health, Sciences, Engineering & Technology ECDA* (UH reference protocol number: HSK/SF/UH/04080). All participants in the expert survey gave written consent for the responses to be used for the purposes of this study.

Scoping Review

Considering the scarcity of evidence on how best to address the cognitive-functional impairments in OCD, as a first step we performed a scoping review of the existing literature, identifying knowledge gaps and clarifying concepts, in order to identify a preliminary set of candidate treatments in addition to evidence-based standard treatments that may be suitable for further systematic investigation.

Search

We searched PubMed/Medline and PsycINFO databases from the date of the first available article (March 1973) to March 31, 2020. The following search terms were used:

(OCD OR "obsessive compulsive disorder" OR "obsessive compulsive spectrum disorder" OR "trichotillomania" OR "skin picking disorder" OR "hoarding disorder" OR "body dysmorphic disorder" OR autism OR "developmental disorder" OR "autism spectrum disorder" OR "psychiatric disorder" OR "difficulty reading" OR doubt OR lassitude OR slowness OR indecisiveness OR perfectionism OR "circadian rhythms" OR "executive function" OR anxiety OR "worry about the future" OR procrastination OR flexibility OR compulsions) AND ("alternative intervention" OR "alternative treatment" OR "functional treatment" OR "functional intervention" OR "psychosocial intervention" OR “psychosocial treatment”)

Article selection and review strategy

Articles were identified and assessed for eligibility by three independent reviewers (AV, VC and LP), who independently decided which identified articles to include according to eligibility criteria (see below). Duplicate studies were excluded. Cross-references from the chosen articles were also examined to refine the results of the search. Unpublished studies, conference abstracts or poster presentations were not included. Articles without an abstract or with scarce information (e.g. missing reference list) were excluded. The database search was restricted to English language papers.

Eligibility criteria

The inclusion criteria for the studies were the following:

1. Articles published in a peer-reviewed journal
2. Original articles or reviews investigating particular interventions in humans
3. Interventions with at least one positive report of improvement in any of the thirteen functional domains associated with OCD, as defined by the CAOIC-13 scale (Dittrich et al., 2011)

Exclusion criteria were

1. Articles without an abstract or with scarce information (e.g. missing reference list)
2. Papers published in languages other than English
3. Articles regarding:
    - aetiology of the disorder
    - epidemiological studies
    - psychopharmacological and nutraceutical trials

- neurosurgical and neuromodulation studies

4. Articles exclusively describing any of the evidence-based interventions already recognised as effective in OCD (CBT with or without ERP focussed on core OCD symptoms, SSRI, clomipramine).

We selected all those interventions with at least one positive report of improved outcomes in any of the CAOIC-13 domains.

Expert Opinion Survey

A prototype paper survey, which listed all the selected interventions alongside the functional domains of interest listed in the CAOIC-13, was drafted. We added a consent section, glossary of terms for the interventions and a questionnaire to determine various demographic features of the rater. A rating score was allocated to each intervention, ranging from 1 (unlikely to be effective), 2 (possibly effective) or 3 (probably effective). Prior to implementation, we presented the prototype scale to the ICOCS Expert Survey Workgroup and gauged their opinion about the acceptability and feasibility of the survey at a face to face meeting in Orlando (US) in December 2019. The workgroup broadly approved the aims and objective of the project, recognising similar issues in their practice of treating cognitive-functional impairment in patients with OCD. They did not suggest any modifications to the original version of the survey, and recommended conversion of the questionnaire into an e-survey to be sent to all the ICOCS members as experts in the research and treatment of OCD, including those who were not physically present at the meeting.

We then converted the prototype survey to the definitive online survey using Qualtrics software and sent it out to all ICOCS members (total N=35) giving them one month for completion (see Appendix for the complete e-survey form). The respondents were defined as the 'ICOCS Expert Group', consisting of both psychologists and psychiatrists with expertise on psychological and pharmacological treatments for OCD.

We established two different empirical a-priori threshold values, based on the expert group's scoring, to determine the likely effectiveness of each intervention for treating functional impairment in OCD:

- The criterion for a *minimum* level of perceived effectiveness for a candidate treatment (promising) was defined as >= 66.6% of the total number of participants endorsing the treatment as either possibly effective or probably effective.

- The criterion for a *convincing* level of perceived effectiveness for a candidate treatment (highly promising) was defined as >=50 % of participants endorsing this treatment as probably effective.

Analysis

We used descriptive statistics to analyse the survey scores. We also applied a simple exploratory analysis of moderating factors we judged likely to affect outcomes (gender, duration of expertise, geographical location of practice) to all those interventions that were judged "promising" or "highly promising" to determine the extent to which rater-related factors affected the survey outcomes. We defined 10 years of experience as a cut-off between less experienced and more experienced clinicians and divided the participants into three groups according to the country of origin (Europe = group 1; North America, Australia, UK = group 2; South America, Asia, Africa = group 3). Group 3 represented low- and middle-income countries. The Chi-squared statistic was used to detect significant differences between groups.

Results

Forty-four studies fulfilling the selection criteria from a total of 783 were identified.

Figure 1 about here

The papers reported a positive outcome for 27 different categories of candidate intervention. All 13 functional domains of interest were covered. As several interventions had been successfully applied across more than one domain, 57 different forms of functional intervention were identified (see survey in appendix for a list of the interventions). There was a mean number of 4 candidate interventions per functional domain.

Twenty-six experts out of 35 ICOCS members contacted (response rate 74%) consented and completed the survey. Seventeen participants were male (65%); seven were from Europe, two from North America, two from Australia, eight from UK, three from South America, two from India and two from Africa. The average age of participants was 53.0 years (SD: 8.9 y) with 23.6 years of experience (SD: 8.5 y) in treating patients with OCD. The results of the expert opinion survey are presented in table 1.

Table 1 about here

Twenty-seven functional interventions were identified as being 'promising', of which five were identified as 'highly promising': activity scheduling for doubt, lassitude, circadian rhythm disturbance; specific forms of CBT for perfectionism, insomnia, worry about the future; lifestyle intervention for circadian rhythm disturbance; mindfulness for anxiety; habit reversal therapy for compulsions. None of these highly promising treatments were moderated by rater-related factors (i.e. gender, duration of expertise, geographical location of practice), suggesting global applicability, including in low- and middle- income countries.

On our exploratory analysis, four of the 27 interventions that were identified as 'promising' (not 'highly promising') proved to be moderated by one of the following rater-related factors: gender, country of practice, and number of years of experience.

Table 2 about here

In particular, male experts were generally more optimistic than females about the effectiveness of cognitive remediation training as a treatment for doubt (X^2 = 6.812, p = 0.033); experts with fewer years of experience were more optimistic than those with more years of experience for video-assisted exercises as a treatment for indecisiveness (X^2 = 9.152, p = 0.010); Experts from South America-Asia-Africa (i.e. low- and middle- income countries) and Europe were more optimistic than experts from North America-Australia-UK about the use of a personal digital assistant as a treatment for procrastination (X^2 = 9.896, p = 0.042) and for cognitive remediation training as a treatment for flexibility (X^2 = 11.366, p = 0.023). There were no significant moderators for the 'highly promising' interventions. The results of the analysis of moderators are available as supplementary materials.

Discussion

Our scoping review identified 27 different kinds of functional interventions with at least some documented evidence of effectiveness in remediating OCD-related dysfunction. However, the validating studies tended to be underpowered, with around 20% not being randomised controlled trials. The candidate interventions were diverse, ranging from more cognitive ones such as cognitive remediation therapy to behavioural ones such as behavioural skills training. Four of the interventions involved the use of digital tools: Video-assisted exercises, internet-based CBT for perfectionism, personal digital assistant to increase completion of novel tasks and independent transitioning, and computerized home-based treatments. Experts with fewer years of experience and those from low- and middle-income countries relatively favoured digital technologies and it is

likely that technology will play an increasing role in the treatment of mental illness; new heuristics using this approach are growing in the field of OCD (Lind et al., 2013). However, none of these digital interventions were endorsed as highly promising by our ICOCS expert group.

Five broad intervention categories were identified as 'highly promising': activity scheduling for doubt, lassitude, circadian rhythm disturbance; specific forms of CBT for perfectionism, insomnia, worry about the future; lifestyle intervention for circadian rhythm disturbance; mindfulness for anxiety; habit reversal therapy for compulsions. All of these forms of therapy may prove to be useful when augmenting evidence-based treatments for OCD (i.e. SSRI or CBT with ERP). As these interventions have not been specifically investigated in the OCD patient population (though studies of habit reversal therapy in OCD are underway), randomised controlled trials are now needed to determine the clinical efficacy of these interventions to address the cognitive-functional disabilities associated with OCD with greater certainty.

Some of these interventions (e.g. activity scheduling for doubt, lassitude, circadian rhythm disturbance, CBT in various forms for perfectionism, insomnia, worry about the future) were judged by the ICOCS Expert Group as highly promising for more than one functional domain and therefore there is an argument that research into these interventions should be prioritized. On the other hand, considering that all the items in the CAIOC-13 were found to be inter-correlated (Dittrich et al., 2011) and therefore assuming that many of these functional domains are likely to be closely - or even casually inter-related (e.g. circadian rhythm disturbance and lassitude), it could be expected that a single intervention might effect change across multiple domains. Indeed, as we work to develop interventions across the broad range of OCD-related functional problems, a greater understanding of their inter-relatedness is likely to emerge.

As long as efficacy is confirmed, these interventions could potentially be delivered alongside SSRI or CBT by a range of health professionals working as members of the multidisciplinary mental health team, such as an occupational therapist, nurse or support worker. For some of the interventions, e.g. activity scheduling and lifestyle intervention, the therapist would need to provide mental coaching and help the patient organize his or her daily activities. For other interventions, e.g. CBT for insomnia, perfectionism or worrying about the future and habit reversal therapy, some degree of training and expertise in CBT would be needed. The optimal timing of these interventions should also be investigated, to determine the stage of illness at which they would be most beneficial (e.g. close to disorder onset or later after years of untreated OCD), and thus guide the timing of

introduction into the treatment plan (e.g. after three months of SSRI or after a CBT trial or starting altogether with the evidence based treatment) as well as for how long they should be implemented. However, some cognitive-functional domains remained for which no highly promising interventions could yet be identified. These included procrastination, executive function, flexibility, indecisiveness, and reading difficulties. These domains count among those that are judged to be most highly disabling (Dittrich et al., 2011) and for which intervention ideally should be prioritised. It is possible however that these domains are more neurobiologically based and therefore less amenable to generic psychosocial interventions.

However, in most of the studies reviewed, functional domains such as these were simply not included, even as a secondary outcome measure, hence this review may not be entirely representative of the full range of functional effects that may come with the highly promising interventions contained herein.

It has been suggested that some functional problems, like reading difficulties, may simply represent an associated outcome of certain OCD symptom presentations. Indeed, in the case of reading difficulties, many patients explain the subjective experience as symptomatic of their OCD e.g. failure to take in information driven by the need to check every word to achieve a sense of completeness, or the urge to repeat whole sentences. On the other hand, other less well understood (and possibly overlooked) neuro-physiological aetiologies that are known to affect patients with OCD and related neurodevelopmental disorders such as Tourette's syndrome, such as convergence insufficiency (Pauc, 2008), may be a relevant source of functional disability in this patient group, and if confirmed, may open up yet more potential opportunites for intervention (Rucker & Phillips, 2018).

As certain medications have been able to improve some of these cognitive-functional deficits in other conditions (e.g. methylphenidate in ADHD (Tamminga et al., 2016), melatonin and related compounds for circadian rhythm disturbance (Sletten et al., 2018)), it is possible to think that there may be a role in future for medications such as these in ameliorating the cognitive-functional deficits that accompany this disorder. Research into novel experimental therapeutics for cognitive-functional deficits represents an area of active current research in other conditions such as schizophrenia and bipolar disorder. Alternatively, application of more specialised or intensive targeted treatments such as new non-invasive neurostimulation modalities that have already shown some success in improving laboratory-based markers of neurocognitive functions in OCD (D'Urso et al.,2016; Dinn et al., 2016) may be successfully developed for this purpose.

Some experts' opinions were moderated by country of origin or years of experience in treating OCD, but most were not. However, as the sample-size was small and the study had little power to detect an effect, the absence of a positive finding for many of our exploratory factors is not that persuasive. Even if these analyses do not allow statistically strong conclusions, we may nevertheless infer that clinicians from high income countries could be more sceptical toward new and alternative forms of functional treatments compared to the ones from low- and middle- income countries and that those who had fewer years of experience are more optimistic toward treatments delivered through digital forms, compared to clinicians with more years of experience.

Limitations

A key limitation of this work is that the interventions reviewed had not been specifically tested in patients with OCD and so it remains conjectural as to whether they would work in this clinical population. Another limitation is the fact that the experts were chosen for their expertise in OCD and not the interventions under review. So, for example, we only had one nurse among our group of respondents and no occupational therapists, which professional groups might be best placed to judge these treatments. However, we considered expertise in OCD was preferable for judging the applicability of the selected techniques as potential treatments for those with OCD. Owing to the small sample size, we did not include the experts' professional discipline in the moderator analysis. This difference might have been significant, though as medical treatments were specifically excluded from the analysis and several of the medical respondents were experienced in psychotherapy, we are not convinced it would have been.

Conclusions

Patients with OCD may benefit from a detailed cognitive and functional assessment, to identify areas of unmet need. A variety of augmentations to standard pharmacotherapy and CBT show theoretical promise for treating some of the cognitive-functional difficulties presented by patients with OCD. The published evidence seems relatively weak and not all domains are covered. Some interventions (e.g. activity scheduling, CBT in various forms, lifestyle interventions, mindfulness and habit reversal therapy) have been judged by experts as highly promising for addressing at least one functional domain. Randomised controlled trials are needed to determine the clinical effectiveness of these interventions.

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Declaration of competing interests:

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Prof. Bernardo Dell'Osso declares that in the past 3 years he has received lecture honoraria from Lundbeck, Angelini, Janssen, Neuraxpharma, Arcapharma and Livanova.

Prof. Umberto Albert declares that in the past 3 years he has been a consultant and/or a speaker for Angelini, Neuraxpharm, Janssen Cilag, Lundbeck, Innova Pharma.

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