

Not just right experiences and incompleteness as a predictor of Obsessive Compulsive symptoms in clinical and community samples: A meta-analysis

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ABSTRACT

Sensory phenomena (SP) are uncomfortable feelings, including bodily sensations, “just-right” perceptions and feelings of incompleteness, which have been shown to be predictors of symptom severity in individuals with obsessive-compulsive disorder (OCD). These sensory phenomena have also been related to obsessive compulsive (OC) traits within the general population. This meta-analysis aimed to quantify a possible relationship between sensory phenomena (incompleteness and Not Just in Right Experiences; NJRE), with OC symptoms in clinical and non-clinical samples. Methods: A systematic search was conducted for studies in children and adult populations of patients with OCD and in general populations displaying symptoms of OCD. Results: Effect sizes of incompleteness and NJRE were correlated to OCD symptoms. The effects sizes in the clinical and non-clinical groups did not differ significantly. Discussion: Robust effect sizes of incompleteness and NJRE in relation to OC symptomatology confirm sensory phenomena as marker of OC symptoms in both groups. The findings suggest that sensory phenomena could be targeted as an intervention in those showing both clinical and sub-clinical levels of OC traits.

1. Introduction

Obsessive Compulsive Disorder (OCD) is characterized by the recurrent and persistence presence of obsessions (unwanted thoughts, urges or images), and compulsions, defined as repetitive behaviors that individuals feel compelled to do to ameliorate such obsessions (Abramowitz, McKay, & Storch, 2017; American Psychiatric Association, 2013). The most common presentations of OCD are in the form of symptoms related to contamination and washing, doubts, checking, symmetry and ordering. The frequency, intrusiveness, and negativity of these symptoms are debilitating and long lasting. Not only is OCD among the leading causes of disability due to mental health conditions but having OCD has been associated with substantial decreases in quality of life (Coluccia et al., 2016; Meier et al., 2016).

The causes and symptoms of OCD are heterogeneous, associated with diverse phenomenological manifestations (Torres, 2016), with its effects varying between individuals (Chik, Calamari, Rector, & Riemann, 2010; Fornés-Romero & Belloch, 2017). This heterogeneity has limited the ability to reliably identify symptoms and treatment. In addition, traits associated to OCD are found to be widely distributed in the general population, with an estimated prevalence of 13% in Europe (Fullana

et al., 2010). While research has suggested those presenting Obsessive Compulsive (OC) symptoms to experience milder effects compared to those reaching a clinical diagnosis of OCD (Skapinakis, Politis, Karampas, Petrikis, & Mavreas, 2019; Subramaniam, Soh, Vaingankar, Picco, & Chong, 2013), these milder symptoms may have the potential to inform processes driving OC symptoms before they progress to clinical levels (Thompson, Brierley, Desr  e, Albertella, & Fontenelle, 2022).

1.1. Sensory phenomena and OCD

Individuals with OCD are frequently reported to show heightened sensitivity to sensory stimuli, limiting their ability to filter stimuli that they find bothersome (Grimaldi & Stern, 2017, pp. 113–118). Many of these experienced sensations, referred to as sensory phenomena are “internally generated,” and encompass the feelings or sensations along with the motivations for undertaking behaviors in order to ameliorate the distress caused by these initial sensations (Coles, Frost, Heimberg, & Rh  aume, 2003). This need or urge to perform behaviours is based on the desire to have things “just right” or “complete”, so that the uncomfortable sensation can be reduced. For example, individuals with

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OCD commonly rearrange, clean and correct things until they are made the way they had wanted, which consequently leads to the reduction of these uncomfortable sensations. An association between ritualistic behaviours and sensory over-responsivity may then follow (Houghton, Stein, & Cortese, 2020).

Research addressing sensory phenomena has largely focused around two specific types of urges, incompleteness and Not Just Right Experiences (NJREs, Melli et al., 2020). Incompleteness is the sense that an individual's actions or intentions have not been completely achieved, and behaviours must be done to accomplish a feeling of completeness (Taylor et al., 2014). Whereas NJREs describe the sensations in which an individual feels tense due to something not feeling right, with the sensations relieved through repetitive behaviours (e.g., counting rituals, checking, ordering, arranging and symmetry behaviours), either preceding or accompany the sensation (Ravid, Collins, & Coles, 2020). Although incompleteness and NJRE are recognized as similar concepts, incompleteness may relate more to a stable trait, whereas NJRE is seen more closely related to momentary appraisals (Summers, Wilver, Garratt, & Cogle, 2020). Apa, Tumkaya, Yucens, and Kashyap (2022) addressed this idea further by assessing whether NJREs should be considered a trait marker and thus would be present in unaffected first-degree relatives of OCD, and/or a state marker associated with obsessive-compulsive symptoms. While severity of NJREs were found to be associated with the severity of obsessive-compulsive symptoms for all participants, the total and severity of NJREs were significantly greater for those individuals with OCD.

The presence of these sensory phenomena have been found in the majority of those with a clinical diagnosis. For example, incompleteness occurs in over 80% of people suffering from OCD (Leckman et al., 1994), whereas NJREs occurs in around 70–80% of OCD patients (Ferrão et al., 2012). In addition, incompleteness and NJRE have been associated with OC symptoms in non-clinical populations (Belloch et al., 2016; Ghisi, Chiri, Marchetti, Sanavio, & Sica, 2010; Ecker & Gönner, 2008; Sica et al., 2019; Taylor et al., 2014). For example, incompleteness has been identified as a good predictor of OC symptoms (Lee & Wu, 2019), and individuals in the general population will commonly have at least one NJRE (Ravid et al., 2020). NJREs have also been found to relate to both, ordering behavior and the need for symmetry in clinical and non-clinical samples (Coles et al., 2003; Ecker & Gönner, 2008; Pietrefesa & Coles, 2009).

The role of incompleteness/NJRE as predictors of OC symptoms have been considered previously (e.g., Coles & Ravid, 2016), and it has even been proposed that NJRE could be a marker of OCD severity (Pascual-Vera, Belloch, Ghisi, Sica, & Bottesi, 2021). For example, Taylor et al. (2014) reported results of a meta-analysis investigating the relationship between OC symptoms, incompleteness and harm avoidance in non-clinical samples. Their results showed that incompleteness could be differentiated from harm avoidance and predicted all types of OC symptoms even after controlling for harm avoidance.

The present meta-analysis expands upon the findings of Taylor and colleagues with the inclusion of NJRE in conjunction with incompleteness, to provide the first systematic analysis comparing clinical and non-clinical samples to identify incompleteness/NJRE as predictors of OC symptoms. It is important to investigate potential differences in sensory phenomena in clinical and non-clinical populations due to the widespread presence of NJRE in both groups, as well as the consideration that NJRE lie on a continuum, varying from those with mild experiences to those classed as severely distressing (Ghisi et al., 2010). The comparison with non-clinical populations is important given the large variation that exists in the severity of sensory phenomena experienced among OCD patients (Brown et al., 2019).

Therefore, despite previous research evidence suggesting sensory phenomena to be reliable predictors of OC symptoms in clinical and non-clinical samples, this is the first meta-analysis investigating the relationship between OC symptoms and reported levels of sensory phenomena, namely incompleteness and Not Just Right Experiences

(NJRE), comparing clinical and non-clinical groups.

2. Method

2.1. Identification and selection of studies

A preliminary literature review was conducted following PRISMA guidelines to identify studies relevant to the occurrence of sensory phenomena in OCD (Moher, Liberati, Tetzlaff, & Altman, 2009). This initial search and identification of studies was performed by one member of the team. Those studies relevant were identified in a systematic search of online databases SCOPUS and PubMed, between May and July 2021. The searches were filtered to focus on journals from 2000 to 2021, using the terms 'OCD' AND 'sensory sensitivity', OR 'sensory processing', OR 'sensory behavior', OR 'incompleteness', OR 'sensory phenomena', OR 'Not Just Right Experiences', OR 'NJRE' AND 'incompleteness' AND 'OCD'.

A second search was performed by a different member of the team in order to check for missing studies in the initial search. The studies identified as relevant for the inclusion in the meta-analysis were confirmed by two members of the team, discussing any disagreement regarding the final inclusion of studies. A total of 591 studies were initially identified and examined, 85 of which were found to be relevant. When filtering further to include incompleteness and NJREs, 22 studies were reviewed and included in a PRISMA guided literature review. A third member of the team was involved checking all the studies included in the meta-analysis and the criteria to retain the articles. At least two members of the team reviewed and agreed the studies included.

For inclusion in the current meta-analysis, articles considered from either of the databases had to be (1) written in English and published, (2) reference sensory phenomena in OCD, namely incompleteness or NJREs, (3) be of either clinical or non-clinical populations, (4) include either children or adult populations, (5) focus on measures of OCD symptoms, and features of incompleteness and NJREs, and finally (6) include correlational data exploring the relationship between incompleteness/NJREs and OCD symptoms (Fig. 1).

2.2. Data extraction and analysis procedure

The meta-analysis was based on measures of sensory phenomena, namely incompleteness and NJREs scales; as well as OCD global symptom severity and frequency scores. The meta-analysis of correlations was performed in R (R Core Team, 2021) using the metafor package (Viechtbauer, 2010). The effect analysed was the correlation between reported OCD levels and sensory phenomena. In those cases in which one article reported results of more than one group (e.g., clinical and non-clinical groups), each correlation was considered independent.

Measures of NJREs present in the selected studies included the Not Just Right Experiences-Questionnaire (NJRE-Q) and a revised version (Coles et al., 2003; Coles, Heimberg, Frost, & Steketee, 2005), with a youth version included in one study (Ravid et al., 2020). The NJRE-Q-R is a 19-item questionnaire assessing severity and frequency of past month NJREs in individuals. The youth version (NJRE-YV) is adapted to suit a younger demographic.

Measures of incompleteness were commonly the Obsessive-Compulsive Trait Core Dimensions Questionnaire (OCTCDQ), the Obsessive-Compulsive Core Dimensions Questionnaire (OCCDQ) and the Obsessive-Compulsive Core Dimensions Interview (Summerfeldt, Kloosterman, Antony, & Swinson, 2014). Both the OCCDQ and OCTCDQ are 20-item self-report scales assessing incompleteness symptoms, as well as harm avoidance, but for the purpose of the current meta-analysis only incompleteness was considered. Measures of OCD global or specific symptoms were commonly the Obsessive Compulsive Inventory (OCI, Foa, Kozak, Salkovskis, Coles, & Amir, 1998), and the Obsessive Compulsive Inventory Revised (OCI-R, Foa et al., 2002). Other scales were used on one occasion each to measure OCD symptoms and include

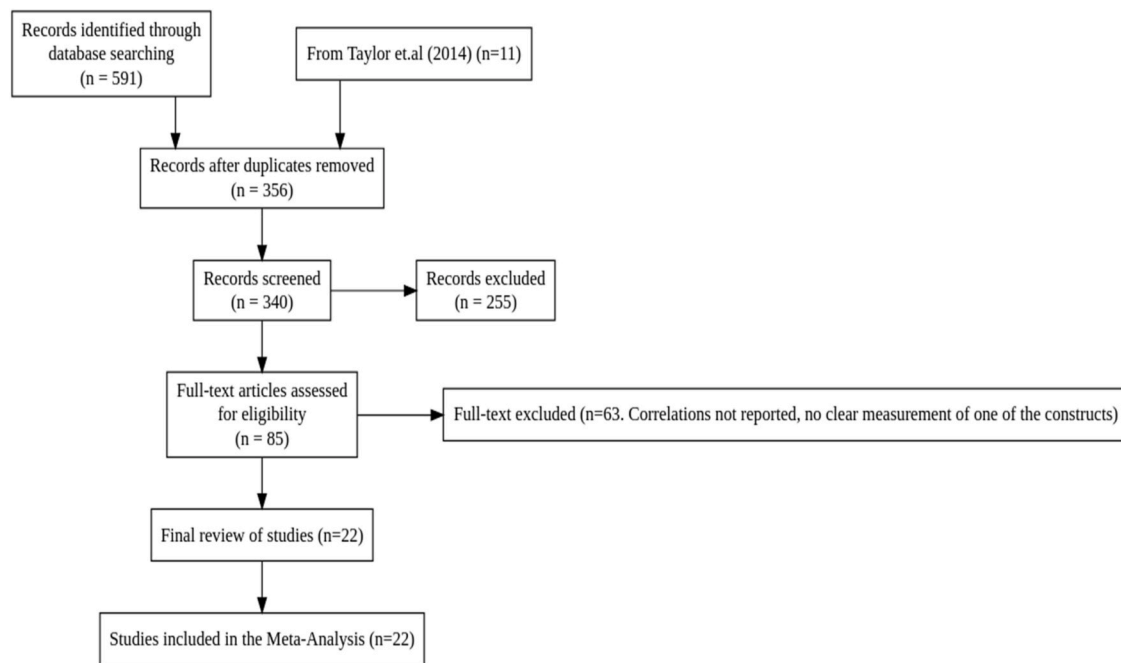


Fig. 1. Flow diagram showing the identification and selection of studies.

the Schedule of Compulsions, Obsessions, and Pathological Impulses (SCOPI; Watson & Wu, 2005), used by Lee and Wu (2019). The Dimensional Yale-Brown Obsessive-Compulsive Scale (DY-BOCS, Rosario-Campos et al., 2006), was used by Cervin and Perrin (2019). The Child Yale-Brown Obsessive-Compulsive Scale (Scahill et al., 1997), was used by Cervin, Perrin, Olsson, Claesdotter-Knutsson, and Lindvall (2020). Finally, the Padua Inventory (Sanavio, 1988), was used by Coles et al. (2003).

3. Results

Data was extracted from 22 studies that included 33 samples of either non-clinical or OCD clinical populations ($N = 6267$). The clinical population included 14 samples ($N = 1151$), whereas the non-clinical population had 19 samples ($N = 5116$).

A meta-analysis of studies investigating the relationship between OC symptoms and sensory phenomena was found to have considerable heterogeneity $I^2 = 69.60\%$, (56.6%–78.70%), with a value of $\tau^2 = 0.013$ (0.01 - 0.29), reflecting substantial difference in effect size across studies $Q(32) = 105.10$, $p < .001$. Based on these levels of heterogeneity a random effects model was used, considering the effect of publication bias using the fill and trim technique (Duval & Tweedie, 2000). The inverse variance method was used in order to consider the size of the sample in each study. Results of the overall analysis (considering clinical and non-clinical samples together), revealed a pooled effect of $k = 33$, $r = 0.54$ (0.50 - 0.57), $Z = 22.78$, $p < .001$ (Fig. 2). The fill and trim analysis of the effects revealed that the addition of 4 studies would not change significantly the levels of heterogeneity $\tau^2 = 0.015$ (0.01 - 0.03; $I^2 = 69.4\%$, (57.2%–78.1%); or change the pooled effect ($k = 37$, $r = 0.55$ (0.51 - 0.59), $Z = 23.35$, $p < .001$). Results also revealed a considerable high fail-safe number ($N = 21296$; Oswald & Plonsky, 2010).

In order to further investigate the relationship between sensory phenomena and OC symptoms we conducted analyses on the correlations between OC symptoms and reported levels of anxiety and depression on the studies that reported these results. The analysis revealed that the relationship between sensory phenomena and OC symptoms was stronger than the relationship between sensory

phenomena and anxiety (clinical: $k = 4$, $r = 0.31$; non-clinical: $k = 12$, $r = 0.35$, common effect: $r = 0.35$); and sensory phenomena and depression (clinical: $k = 6$, $r = 0.24$; non-clinical: $k = 13$, $r = 0.30$, common effect: $r = 0.30$).

A moderation analysis considering each group separately (clinical and non-clinical), revealed that the pooled effects were not significantly different between the groups ($Q(1) = 2.47$, $p = .12$). The clinical group ($k = 14$) had a pooled effect of $r = 0.58$ (0.51 - 0.64), whereas the non-clinical group ($k = 19$) revealed a pooled effect of $r = 0.52$ (0.48 - 0.55). Analysis aimed at identifying outliers due to the substantial heterogeneity of the effects revealed 4 samples that potentially could alter the results. However, the pooled effects were similar for both groups when the studies were removed: clinical: $k = 11$, $r = 0.63$ (0.57 - 0.67); non-clinical: $k = 18$, $r = 0.52$ (0.48 - 0.55). The level of heterogeneity was similar, $I^2 = 69.9\%$, (56.1%–79.4%), with a value of $\tau^2 = 0.01$ (0.01 - 0.02). Because the effects were very similar, the studies were retained in the analysis (Fig. 3).

4. Discussion

The focus of the meta-analysis was to investigate the relationship between OC symptoms and reported levels of sensory phenomena, namely incompleteness and Not Just Right Experiences (NJRE) in clinical and non-clinical populations. Results confirmed the strong relationship between sensory phenomena and reported levels of OC symptoms, and this effect was not moderated by the groups of participants, such that the relationship between OC symptoms and reported levels of sensory phenomena was found to be similar in clinical and non-clinical groups. These results support further investigation into both incompleteness and NJRE in aiding our understanding of OCD (Coles & Ravid, 2016).

Contrary to the research suggesting that incompleteness and NJRE can be differentiated by their severity in clinical and non-clinical populations (Pascual-Vera et al., 2021), the results of the meta-analysis suggest no differences in sensory phenomena between the two groups. The lack of differentiation in the sensory phenomena is important as there is presumed to be a 5–7-year window for which individuals with subthreshold OC symptoms progress to a diagnosable level of OCD

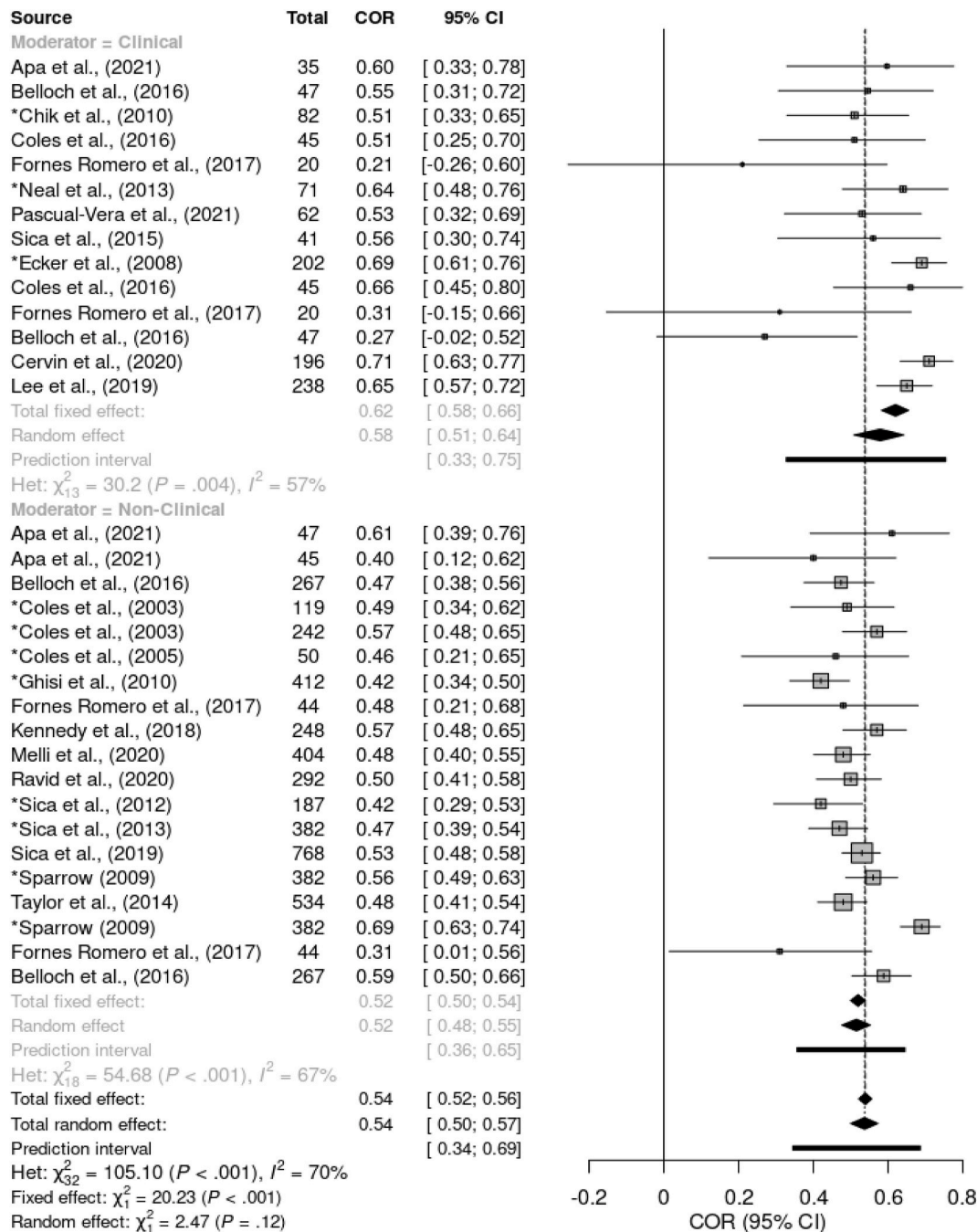


Fig. 2. Forest plot of NJRE on OC symptoms in clinical and non-clinical groups.
 Note: Studies with * appeared in Taylor et al. (2014).

(Coles, Johnson, & Schubert, 2011; Thompson et al., 2022), yet many of these individuals with subthreshold OC symptoms will show significant difficulties in health and psychosocial functioning. They are also likely to seek and utilise health care services, in addition to showing higher rates of co-occurring diagnoses including anxiety, depression and substance abuse (Adam, Meinschmidt, Gloster, & Lieb, 2012; Barzilay et al., 2019; Blom et al., 2011; Ruscio et al., 2010). Therefore, understanding how incompleteness and NJREs drive OC symptoms in non-clinical populations may help to identify triggers for those individuals at the mild end of the continuum, and could inform early intervention (Thompson et al., 2022).

Our findings are important as they suggests that sensory phenomena to be a consistent predictor of OC symptoms regardless of whether these

symptoms reach the threshold to be considered for a clinical diagnosis. Moreover, this relationship has also been established in children, further suggesting that NJRE can be a clear and reliable predictor of clinical OCD (Ravid et al., 2020). Longitudinal research is now needed to address sensory phenomena and OC symptoms in children and adults, as it is important to understand these symptoms as risk and maintenance factors on OCD and their changes across the lifespan, as well as their changes in severity.

This meta-analysis is not without limitations. It is important to note that it included only published studies which may be over representative of specific findings (Spector & Thompson, 1991), although there is little indication of publication bias across all analyses. Also, while the results showed a similar effect for both groups, the analysis also revealed high

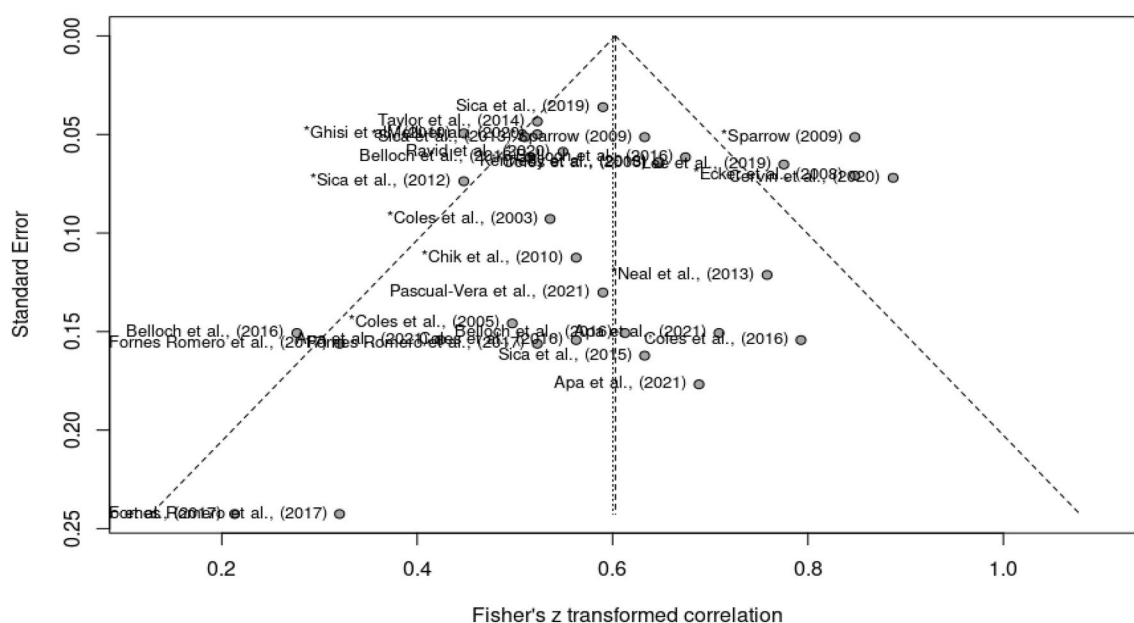


Fig. 3. Funnel plot of studies, including clinical and non-clinical groups.

levels of heterogeneity, with the clinical group having comparatively smaller sample sizes. The difficulty of obtaining equal sample sizes is also reflected in the literature. For example, Fornés-Romero and Belloch (2017), had a much larger non-clinical group than the clinical one.

In summary, given the prevalence and impact of OCD, there is a need for it to be conceptualized and treated as effectively and efficiently as possible. The present meta-analysis suggests that incompleteness and NJRE to be similar in clinical and non-clinical populations and could therefore be targeted as an intervention in those showing a clinical diagnosis and those with borderline clinical traits.

Author contribution

Author 1: Conceptualization, Investigation, Writing- Original draft preparation.

Author 2: Conceptualization, Writing- Reviewing and Editing.

Author 3: Conceptualization, Writing- Reviewing and Editing, Supervision, Software, Validation.

Declaration of competing interest

The authors declare no conflict of interest.

Data availability

No data was used for the research described in the article.

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