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The associations of obsessive–compulsive symptom dimensions and general severity with suicidal ideation in patients with obsessive–compulsive disorder: The role of specific stress responses to COVID-19

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Abstract

Suicidal ideation is prevalent in patients with obsessive–compulsive disorder (OCD); but, during COVID-19, it may be increased. The present study aimed to examine the effects of obsessive–compulsive (OC) symptom dimensions and OCD severity on suicidal ideation by considering the role of stress responses in reaction to COVID-19 in a clinical sample of patients with OCD. In a cross-sectional study, 304 patients with OCD completed measures of OC symptom dimensions, OCD severity, general mental health (depression and anxiety), and COVID-19-related stress. Results showed that after controlling for depression, anxiety, comorbidity, and lifetime suicide attempts, the OC symptom dimensions of responsibility for harm and unacceptable obsessional thoughts as well as general severity had indirect effects on suicidal ideation through the specific stress responses to COVID-19, including traumatic stress and compulsive checking. The study shows that OCD patients with specific OC symptom dimensions and severe OCD are more likely to have suicidal ideation during the pandemic. Further, the specific stress responses to COVID-19 may be an underlying mechanism. Clinicians should carefully assess suicidal ideation in patients with OCD who experience responsibility for harm and unacceptable thoughts, particularly during the pandemic.

KEYWORDS
COVID-19 stress, obsessive–compulsive disorder, obsessive–compulsive symptom dimensions, OCD severity, suicidal ideation

1 | INTRODUCTION

Research has shown that suicidal ideation and associated behaviours are prevalent in obsessive–compulsive disorder (OCD; Aguglia et al., 2017; Benatti, Ferrari, et al., 2020; Brakoulias et al., 2017; De Berardis et al., 2014; Khosravani, Kamali, et al., 2017; Pellegrini et al., 2020; Storch et al., 2017; Velloso et al., 2016). In a systematic review of 64 studies, Angelakis et al. (2015) reported a moderate to high association between OCD and suicidality, including suicide attempts and suicidal ideation. Further, it appears that OCD severity increases suicidal ideation (Albert et al., 2019; Angelakis & Gooding, 2020; Pellegrini et al., 2020).

OCD comprises several obsessive–compulsive (OC) symptom dimensions (Abramowitz et al., 2010), including contamination (e.g., obsessions related to pollution and compulsive rituals of washing and cleaning), responsibility for harm (e.g., obsessions regarding the

threat, checking, reassurances, and compulsive behaviours in response to these obsessions), unacceptable obsessional thoughts (e.g., taboo, forbidden obsessive thoughts containing violent, sexual, and religious themes and compulsive and neutralizing behaviours to deal with these obsessions), and symmetry (e.g., obsessions about accuracy and completeness and compulsive and repetitive behaviours to maintain order). Among these dimensions, responsibility for harm and unacceptable thoughts play an important role in the maintenance of OCD (Abramowitz et al., 2006; Arntz et al., 2007; Neal et al., 2017) and are associated with poor treatment outcomes (Jacoby, Abramowitz, et al., 2019; Mataix-Cols et al., 2002; Shetti et al., 2005; Steketee et al., 2019; Williams et al., 2014). In addition, the responsibility for harm and unacceptable thoughts dimensions are more strongly related to suicidality than other OC symptom dimensions above and beyond depression and OCD severity (Albert et al., 2019; Balci & Sevincok, 2010; De Berardis et al., 2015; DeVylder et al., 2012; Khosravani, Bastan, et al., 2017; Khosravani, Kamali, et al., 2017; Kim et al., 2016; Krebs et al., 2020; Rajabi Khamesi et al., in press; Torres et al., 2011; Velloso et al., 2016).

Over the past year, the coronavirus disease-19 (COVID-19) pandemic has affected virtually everyone in society and has had particularly significant impacts on patients with psychiatric disorders, including those with OCD (Benatti, Albert, et al., 2020; Davide et al., 2020; Jelinek et al., 2021; Khosravani, Asmundson, et al., 2021; Tanir et al., 2020). COVID-19 has been shown to increase anxiety, health anxiety, depression, stress (Nikčević et al., 2020; Taylor, Landry, Paluszek, & Asmundson, 2020; Taylor, Landry, Paluszek, Fergus, et al., 2020a, 2020b; Taylor, Landry, Paluszek, Rachor, & Asmundson, 2020) and suicidal ideation in the general population (Gunnell et al., 2020; Leaune et al., 2020; Mamun et al., 2020), especially among patients with pre-existing psychiatric disorders (Hao et al., 2020; Jefsen et al., 2020) such as OCD (Benatti, Albert, et al., 2020).

The effects of the current pandemic on OCD have been shown to worsen OC symptom severity (Benatti, Albert, et al., 2020; Davide et al., 2020; Fontenelle & Miguel, 2020; Khosravani, Aardema, et al., 2021; Matsunaga et al., 2020; Tanir et al., 2020) and to change the manifestation of OC symptoms, leading to the development of new obsessions and compulsions in the context of the pandemic (Benatti, Albert, et al., 2020). It is probable that the OC dimensions of responsibility for harm and unacceptable obsessional thoughts, along with general OCD severity, increase suicidal ideation during the pandemic. Accordingly, the purpose of the present research was to evaluate the extent that the aforementioned symptom dimensions have been exacerbated during the COVID-19 pandemic, and the extent to which these dimensions are associated with greater suicidal ideation. What is also less clear is whether the specific stress of COVID-19 increases suicidal ideation in OCD and, if so, for which symptom dimensions.

As stress generally is a mechanism that worsens symptoms in OCD (Keeley et al., 2008; Khosravani, Aardema, et al., 2021), it is reasonable to hypothesize that COVID-19 may be a stress-related mechanism of symptom exacerbation. Research has shown that approximately 86% of individuals experience COVID-19-related stress during the pandemic (Islam et al., 2020). Worry about the dangerousness of COVID-19 evokes stress responses in individuals and intensifies distress and avoidance (Taylor, Landry, Paluszek, & Asmundson, 2020; Taylor, Landry, Paluszek, Rachor, & Asmundson, 2020). Further, research during the COVID-19 pandemic has shown several specific stress responses. COVID Stress Syndrome, as measured by the COVID Stress Scales (CSS; Taylor, Landry, Paluszek, Fergus, et al., 2020a), is a reaction to COVID-19 (Taylor, Landry, Paluszek, Fergus, et al., 2020b) that includes danger and contamination fears, fears of socio-economic consequences, xenophobia, compulsive checking and reassurance-seeking, and traumatic stress symptoms (Taylor, Landry, Paluszek, Fergus, et al., 2020a). COVID Stress Syndrome is associated with pre-existing psychopathology, avoidance behaviours related to COVID19, and difficulty in coping (Taylor, Landry, Paluszek, Fergus, et al., 2020b). Thus, COVID-19 stress may increase suicidal ideation in community individuals (Rahman et al., 2021; Shi et al., 2021) and clinical samples, including OCD patients with the OC dimensions of unacceptable obsessional thoughts and responsibility for harm who experience difficulty in emotion regulation and coping (Berman et al., 2020; Cludius et al., 2020; Khosravani, Ardestani, et al., 2017, 2020). Given that individuals with OCD frequently report inflated responsibility and overestimation of threat, the COVID-19 pandemic presents a unique and highly intense relevant set of stressors that would be expected to exacerbate symptoms (Ferreira et al., 2020; Rosa-Alcázar et al., 2021).

Individuals with pre-existing anxiety disorders, including OCD, may be more vulnerable to COVID-19-related stress responses than healthy individuals and those with mood disorders (Ardestani et al., in press; Asmundson et al., 2020; Khosravani, Asmundson, et al., 2021), such that stress reactions to COVID-19 have been found to intensify OC symptoms and their severity (Khosravani, Aardema, et al., 2021). Further, the use of maladaptive strategies and reactions to cope with COVID-19 may be associated with suicidal ideation (Pruitt et al., 2020). Therefore, stress responses related to COVID-19 may underlie the associations of specific OC symptom dimensions and OCD severity with suicidal ideation during the pandemic in patients with OCD. Accordingly, the present study aimed to investigate the effects of OC symptom dimensions on suicidal ideation in patients with OCD in the context of COVD-19 stress responses. We expected the OC dimensions of responsibility for harm and unacceptable thoughts, as well as overall OCD severity, to be associated with

Key Practitioner Message

- Responsibility and unacceptable thoughts increase suicidal ideation during the pandemic in OCD.
- COVID-19 stress responses intensify the effects of specific OC dimensions on suicidal ideation.
- COVID-19 stress reactions should be considered in clinical settings to prevent suicide in OCD patients.

suicidal ideation through the role of specific COVID-19 stress responses. Depression, anxiety, psychiatric comorbidity, and past suicide attempts were controlled in the analyses given the independent associations of these factors with suicidal ideation (Albert et al., 2019; Angelakis et al., 2015; Brown et al., 2019; Pellegrini et al., 2020; Storch et al., 2017).

2 | METHOD

2.1 | Participants

This study was supported by the Behavioral Sciences Research Center and approved by the Medical Ethics Committee of Shahid Beheshti University of Medical Sciences. All participants completed informed consent, and standards based on the 1989 Helsinki Declaration were adhered to. In a cross-sectional design from 5 June to 30 October 2020, a total of 390 patients referred for treatment of a primary OCD diagnosis based on the Structured Clinical Interview for DSM-5, Research Version (SCID-5-RV; First et al., 2014) were recruited for the current study. These patients were being treated using medication and/or psychopathology. Exclusion criteria were personality and psychotic disorders, intellectual disability, and any general medical condition. To check the exclusion criteria, we referred to the psychiatric files of these patients in which the information related to the exclusion criteria was available.

Of the 390 recruited participants, 86 were excluded from the study due to meeting exclusion criteria, unwillingness to participate, or providing incomplete responses on self-report questionnaires. Ultimately, 304 patients (females = 58.6%, mean age = 35.8 years, age range = 17–67 years) were included in the present study. Some participants had comorbid psychiatric disorders ($n = 129$; 42.4%) and a history of lifetime suicide attempts ($n = 69$; 22.7%). Common comorbid disorders were major depressive disorder (MDD), bipolar disorder (BD), various anxiety disorders, and substance use disorders (SUDs). Some participants had a history of being infected by COVID-19 ($n = 60$, 19.7%). During the sampling period (i.e., June to October 2020), the threat of viral infection was moderate to high, and as such, the levels of stress and fear related to the pandemic were expected to be generally elevated.

2.2 | Measures

2.2.1 | The Dimensional Obsessive–Compulsive Scale (DOCS)

The DOCS (Abramowitz et al., 2010) is a self-report scale to evaluate the OC dimensions of responsibility for harm, unacceptable thoughts, contamination, and symmetry using 20 items scored from 0 (never) to 4 (very much). The DOCS has been found to have good psychometric features in Iranian patients with OCD (Khosravani, Abramowitz, et al., 2020). In the present study, Cronbach's alphas of the total scale ($\alpha = 0.98$) and its dimensions of responsibility for harm ($\alpha = 0.94$), unacceptable thoughts ($\alpha = 0.95$), contamination ($\alpha = 0.94$), and symmetry ($\alpha = 0.98$) were good.

2.2.2 | The Yale-Brown Obsessive–Compulsive Scale (Y-BOCS)

OCD severity was evaluated by the self-report Y-BOCS (Goodman et al., 1989), which measures obsessions (five items) and compulsions (five items). Each item is scored from 0 (without symptoms) to 4 (very severe). The Y-BOCS has been validated for the Iranian community (Esfahani et al., 2012), with a Cronbach's alpha of 0.95 in patients with OCD (Khosravani, Bastan, et al., 2020). Cronbach's alpha for the Y-BOCS was 0.98 in the present study.

2.2.3 | The COVID Stress Scales (CSS)

The self-report CSS (Taylor, Landry, Paluszek, Fergus, et al., 2020a) has 36 items to measure stress responses in reaction to COVID-19, including danger and contamination fears, fears of socio-economic consequences, xenophobia, compulsive checking, and traumatic stress symptoms. Each item of the CSS is rated on a 5-point Likert scale scoring from 0 (never) to 4 (always or extremely). The Persian version of the scale has been validated for Iranian patients with OCD (Khosravani, Asmundson, et al., 2021). Cronbach's alpha for the CSS was 0.97 in the present study.

2.2.4 | The Patient Health Questionnaire-4 (PHQ-4)

This self-report scale (Kroenke et al., 2009) has four items to evaluate anxiety (two items) and depressive symptoms (two items) over the previous week. Participants respond to items based on a 4-point Likert scale ranging from 0 (not at all) to 3 (almost every day). The Persian version of the PHQ-4 has good psychometric properties (Ahmadi et al., 2020). Cronbach's alpha of the PHQ-4 was 0.71 in the current study.

2.2.5 | The Beck Scale for Suicidal Ideation (BSSI)

The BSSI (Beck et al., 1979) is a self-report scale containing 19 items evaluating levels of suicidal ideation during the past week. Each item of the scale is scored from 0 (without suicidal ideation) to 2 (high suicidal ideation). The Persian version of the BSSI has been standardized for the Iranian community (Esfahani et al., 2015). Cronbach's alpha for the BSSI was 0.99 in the current study.

2.3 | Statistical analysis

Data were analysed using SPSS-22 software (IBM Corp., 2013) and AMOS 21.0 software (Chicago, USA). Pearson correlations were conducted to determine the relationships among variables. To examine the effects of OC symptom dimensions and OCD severity on suicidal ideation via specific stress responses to COVID-19, structural equation modelling (SEM) with maximum likelihood estimation (MLE) was performed. In the SEM model, the PHQ-4 (depression and anxiety), comorbidity, and lifetime suicide attempts were controlled as covariates. An appropriate model fit was tested through chi-square (χ^2) divided by degrees of freedom (CMIN/*df* < 2), the root mean square error of approximation (RMSEA < 0.05), the Tucker–Lewis index (TLI > 0.95), the comparative fit index (CFI > 0.95), and the goodness-of-fit index (GFI > 0.95) (Kline, 2015; MacCallum et al., 1996; Schermelleh-Engel et al., 2003). Indirect effects were examined via bootstrapping ($n = 5000$) using SPSS PROCESS macro (Hayes, 2018).

3 | RESULTS

3.1 | Demographic and clinical characteristics

Demographic and clinical characteristics of patients with OCD are reported in Table 1. The ranges of skewness and kurtosis were between −1 and +1, suggesting that the data were normally distributed (Byrne, 2010; Kline, 2015).

3.2 | Correlation coefficients

The results showed that OC symptom dimensions and OCD severity were significantly associated with all specific COVID-19 stress responses and suicidal ideation (all *p*s < 0.01). COVID-19 stress responses had significant associations with suicidal ideation (all *p*s < 0.01). The covariates of depression, anxiety, comorbidity, and suicide attempts showed significant associations with suicidal ideation (all *p*s < 0.01) (see Table 2).

3.3 | Direct and indirect effects

The direct associations between the OC symptom dimensions and suicidal ideation were evaluated in SEM analyses. The findings showed that the OC symptom dimensions of contamination ($\beta = 0.25$), responsibility for harm ($\beta = 0.26$), unacceptable thoughts ($\beta = 0.24$), and symmetry ($\beta = 0.28$), as well as OCD severity ($\beta = 0.24$), were significantly related to suicidal ideation (all *p*s < 0.001) with a good fit ($\chi^2 = 4.47$, $df = 4$, CMIN/DF = 1.1, $p < 0.001$, GFI = 0.99, TLI = 0.99; CFI = 0.99, RMSEA = 0.020).

The results of the SEM model (Table 3) showed that the model had a good fit ($\chi^2 = 102.01$, $df = 55$, CMIN/DF = 1.9, $p < 0.001$, GFI = 0.94, TLI = 0.95; CFI = 0.96, RMSEA = 0.049). The covariates (i.e., PHQ-4 depression and anxiety, comorbidity, and suicide attempts) were significantly associated with suicidal ideation ($p < 0.001$). OC symptom dimensions had no significant direct effects on suicidal ideation ($p > 0.05$), but they were significantly associated with all stress responses to COVID-19, except for socio-economic consequences (all *p*s < 0.05). Among COVID-19 stress responses,

TABLE 1 Demographic and clinical characteristics of patients with OCD

Demographic and clinical features	Mean ± SD or *n* (%)
Age (years)	35.8 ± 11.80
Education (years)	13.7 ± 3.11
Gender	
Male	126 (41.4%)
Female	178 (58.6%)
Marital status	
Single	128 (42.1%)
Married	157 (51.6%)
Divorced	19 (6.3%)
Age of onset (years)	26.5 ± 8.45
Illness duration (years)	9.5 ± 6.8
Comorbidity	129 (42.4%)
Anxiety disorders	60 (19.7%)
Major depressive disorder	49 (16.1%)
Bipolar disorder and substance use disorders	20 (6.6%)
A history of suicide attempts	69 (22.7%)

Clinical variables	Mean ± SD	Skewness/kurtosis
Suicidal ideation	18.3 ± 13.6	0.12/−0.34
Total Y-BOCS	27.7 ± 8.5	−0.49/−0.53
Total DOCS	53.6 ± 14.5	−0.16/−0.69
DOCS contamination	14.1 ± 3.6	−0.19/−0.58
DOCS responsibility for harm	13.7 ± 3.7	−0.13/−0.54
DOCD unacceptable obsessional thoughts	14.0 ± 3.8	−0.46/−0.24
DOCS symmetry	11.9 ± 5.0	−0.12/−0.90
PHQ-4	7.51 ± 1.77	0.13/0.20
Total CSS	100.5 ± 23.05	−0.62/0.23
DAN	34.4 ± 7.8	−0.53/0.36
SEC	14.3 ± 5.3	−0.37/−0.02
XEN	17.1 ± 4.4	−0.48/0.17
TSS	16.2 ± 4.7	−0.65/0.28
CHE	18.5 ± 4.4	−0.67/0.03

Abbreviations: CHE, compulsive checking; CSS, COVID Stress Scales; DAN, danger and contamination fears; DOCS, dimensional Obsessive–Compulsive Scale; OCD, obsessive–compulsive disorder; PHQ-4, Patient Health Questionnaire-4; SEC, socio-economic consequences fears; TSS, traumatic stress symptoms; XEN, xenophobic fears; Y-BOCS, Yale-Brown Obsessive–Compulsive Scale.

TABLE 2 Correlations among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Contamination	-													
2. Responsibility for harm	0.79	-												
3. Unacceptable thoughts	0.80	0.86	-											
4. Symmetry	0.66	0.71	0.74	-										
5. CSS DAN	0.73	0.73	0.70	0.52	-									
6. CSS SEC	0.52	0.59	0.56	0.46	0.67	-								
7. CSS XEN	0.63	0.66	0.63	0.44	0.88	0.67	-							
8. CSS TSS	0.68	0.72	0.70	0.46	0.84	0.60	0.80	-						
9. CSS CHE	0.62	0.59	0.59	0.42	0.74	0.53	0.70	0.78	-					
10. PHQ-4	0.57	0.55	0.52	0.46	0.51	0.39	0.41	0.48	0.41	-				
11. OCD severity	0.80	0.79	0.77	0.63	0.68	0.54	0.61	0.67	0.59	0.62	-			
12. Suicide attempts	0.40	0.34	0.33	0.37	0.29	0.22	0.25	0.25	0.26	0.30	0.37	-		
13. Comorbidity	0.35	0.30	0.29	0.27	0.33	0.26	0.33	0.32	0.34	0.28	0.34	0.55	-	
14. Suicidal ideation	0.39	0.64	0.62	0.32	0.53	0.43	0.47	0.48	0.49	0.46	0.62	0.44	0.37	-

Note: All correlations are significant ($p < 0.01$).
Abbreviations: CHE, compulsive checking; CSS, COVID Stress Scales; DAN, danger and contamination fears; OCD, obsessive–compulsive disorder; PHQ-4, Patient Health Questionnaire-4; SEC, socio-economic consequences fears; TSS, traumatic stress symptoms; XEN, xenophobic fears.

compulsive checking and traumatic stress symptoms had significant relations to suicidal ideation ($p < 0.01$). The full model predicted 48% of the total variance of suicidal ideation.

3.4 | Indirect effects by bootstrapping with 5,000 re-samples

The 95% CI controlling for covariates showed that, among OC symptoms dimensions, only responsibility for harm and unacceptable thoughts had significant indirect effects on suicidal ideation through COVID-19 stress responses, specifically compulsive checking and traumatic stress symptoms. Also, OCD severity significantly and indirectly affected suicidal ideation through the COVID-19 stress response of compulsive checking (see Table 4). According to these findings, the study hypothesis regarding the effects of responsibility for harm, unacceptable thoughts, and general severity on suicidal ideation via specific stress responses to COVID-19 was supported.

4 | DISCUSSION

The present study aimed to evaluate the effects of OC symptom dimensions and OCD symptom severity on suicidal ideation through the role of specific stress responses to COVID-19 in a clinical group of patients with OCD. The prevalence of suicide attempts in patients was 22.7%, consistent with rates reported in the previous studies (i.e., 1 to 52%; Albert et al., 2019; De La Vega et al., 2018; Dell'Osso et al., 2018; Kim et al., 2016; Rajabi Khamesi et al., in press; Pellegrini et al., 2020). Discrepancies in reporting the prevalence of suicide attempts in these studies may be due to the study samples differing in the prevalence of comorbid psychiatric disorders, especially BD, MDD, and SUDs (Albert et al., 2018) as well as heterogeneity regarding age ranges, sample size, study design, gender distribution, and various tools assessing suicide attempts (see Angelakis et al., 2015; Pellegrini et al., 2020). Regardless of these discrepancies, these studies and the present findings emphasize the importance of assessing suicide risk in patients with OCD. Past suicide attempts are a risk factor for future suicide attempts and ideation (Angelakis et al., 2015). Thus, in this study, prior suicide attempts were controlled, along with other potential risk factors for suicidality, including depression, anxiety, and comorbid psychiatric disorders (Angelakis et al., 2015).

The results of the current study showed that, among the OC symptom dimensions, responsibility for harm and unacceptable obsessional thoughts as well as OCD severity indirectly affected suicidal ideation through stress responses in reaction to the pandemic, specifically traumatic stress symptoms and compulsive checking, after controlling for covariates of general depression and anxiety, comorbidity, and lifetime suicide attempts. These results are consistent with prior findings showing the significant role of these same OC symptom dimensions and OCD severity in suicidality, including suicidal ideation (e.g., Albert et al., 2019; Balci & Sevincok, 2010; De Berardis et al., 2015; DeVylder et al., 2012; Khosravani, Bastan, et al., 2017; Khosravani, Kamali, et al., 2017; Kim et al., 2016; Krebs et al., 2020; Rajabi Khamesi et al., in press; Torres et al., 2011; Velloso et al., 2016). Further, the present findings are consistent with the results of previous studies reporting the relationships between COVID-19 and suicidal ideation in patients with OCD (Benatti, Albert, et al., 2020). However, and importantly, fear and stress related to COVID-19 may contribute to suicidal risk in individuals (Leaune et al., 2020; Mamun et al., 2020), including patients with OCD.

TABLE 3 Standardized coefficients for the direct effects between variables

Direct paths	Standardized β	p
Contamination → CSS DAN	0.29	0.001***
Contamination → CSS SEC	0.02	0.79
Contamination → CSS XEN	0.18	0.006**
Contamination → CSS TSS	0.16	0.009**
Contamination → CSS CHE	0.25	0.001***
Responsibility for harm → CSS DAN	0.28	0.001***
Responsibility for harm → CSS SEC	0.30	0.001***
Responsibility for harm → CSS XEN	0.33	0.001***
Responsibility for harm → CSS TSS	0.31	0.001***
Responsibility for harm → CSS CHE	0.29	0.001***
Unacceptable thoughts → CSS DAN	0.24	0.001***
Unacceptable thoughts → CSS SEC	0.07	0.49
Unacceptable thoughts → CSS XEN	0.24	0.001***
Unacceptable thoughts → CSS TSS	0.25	0.001***
Unacceptable thoughts → CSS CHE	0.28	0.001***
Symmetry → CSS DAN	0.25	0.001***
Symmetry → CSS SEC	0.03	0.63
Symmetry → CSS XEN	0.16	0.009**
Symmetry → CSS TSS	0.23	0.001***
Symmetry → CSS CHE	0.14	0.036*
OCD severity → CSS DAN	0.22	0.001***
OCD severity → CSS SEC	0.28	0.001***
OCD severity → CSS XEN	0.25	0.001***
OCD severity → CSS TSS	0.27	0.001***
OCD severity → CSS CHE	0.27	0.001***
Contamination → SSI	0.11	0.19
Responsibility for harm → SSI	0.19	0.09
Unacceptable thoughts → SSI	0.01	0.99
Symmetry → SSI	0.15	0.14
OCD severity → SSI	0.18	0.07
CSS DAN → SSI	0.01	0.91
CSS SEC → SSI	0.01	0.94
CSS XEN → SSI	0.01	0.92
CSS TSS → SSI	0.22	0.009**
CSS CHE → SSI	0.26	0.007**
A history of suicide attempts → SSI	0.15	0.001***
Comorbidity → SSI	0.17	0.001***
PHQ-4 → SSI	0.16	0.001***

Abbreviations: CHE, compulsive checking; CSS, COVID Stress Scales; DAN, danger and contamination fears; OCD, obsessive–compulsive disorder; PHQ-4, Patient Health Questionnaire-4; SEC, socio-economic consequences fears; SSI, Scale for Suicidal Ideation; XEN, xenophobic fears; TSS, traumatic stress symptoms.
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

The novelty of the present study was to address the role of COVID-19 stress responses on the associations of specific OC symptom dimensions and OCD symptom severity with suicidal ideation. This sets the stage for considering COVID-19 stress as an important mechanism in this relationship and further suggests a unique clinical target for the treatment of OCD during the current pandemic and future pandemics. COVID-19 frequently results in distressing outcomes, including fear, avoidance, anxiety, depression, and self-related anxiety in OCD (Aardema, 2020; Benatti, Albert, et al., 2020; Nissen et al., 2020; Seçer & Ulaş, 2020), increasing suicidal thoughts (Fountoulakis et al., 2021).

Patients with OCD who experience unacceptable thoughts have challenges coping with unwanted emotions (Berman et al., 2018). COVID-19 increases intrusive thoughts (Lee, 2020). In addition, it has been reported that patients with OCD who overestimate threats and are concerned about the possibility of spreading COVID-19 to others, hold themselves responsible for possible harm to others, and that those who repeatedly check COVID-19-related news to seek assurance are more likely to be affected by COVID-19 (Shafran et al., 2020). Individuals with responsibility for harm and unacceptable thoughts are more likely to experience intolerance of uncertainty (Jacoby et al., 2013; Jacoby, Reuman, et al., 2019; Reuman et al., 2017; Tolin et al., 2003), which may be further increased by COVID-19 (Tull et al., 2020; Wheaton et al., 2021). In addition, patients with OCD frequently check for news related to COVID-19 during the pandemic that, in turn, can result in increased suicidal ideation (Benatti, Albert, et al., 2020). Therefore, OCD patients with the OC dimensions of unacceptable thoughts and responsibility for harm may be highly vulnerable to developing COVID Stress Syndrome, particularly traumatic stress symptoms and compulsive checking related to COVID-19 (Khosravani, Aardema, et al., 2021), and possibly elevated suicidal ideation.

In discussing the relationship of the OC dimensions of responsibility for harm and unacceptable thoughts with suicidal ideation through COVID-19-related stress, it is also important to consider suicidal obsessions. As an aspect of suicidal thoughts experienced in OCD patients, these obsessions may be associated with environmental stressors (Uvais, 2018) and easily confounded with suicidal ideation (Al-Zaben, 2012; Wetterneck et al., 2016; Wetzler et al., 2007). Therefore, therapists need to pay attention to suicidal obsessions and distinguish them from suicidal ideation in the diagnostic setting and appropriate treatment planning (Aukst-Margetić et al., 2011; Rachamallu et al., 2017), especially during environmental stressors such as pandemics.

4.1 | Implications

The findings of the present study have important theoretical and clinical implications. This study showed that specific OC symptom dimensions of responsibility for harm and unacceptable thoughts as well as OCD severity are more associated with suicidal ideation through the role of COVID-19 traumatic stress and checking behaviours tied directly to the pandemic. These findings suggest that therapists target COVID-19 traumatic stress symptoms to address suicidal ideation and increased suicidal risk, in addition to usual standards of care to manage suicidality. Since OC symptom dimensions

TABLE 4 Standardized indirect effects using bootstrapping with 5000 resamples[a]

			95% bias corrected CI	
	Effects	SE_{boot}	Lower bound	Upper bound
Contamination → CSS DAN → SSI	0.07	0.21	−0.32	0.53
Contamination → CSS SEC → SSI	0.06	0.05	−0.04	0.18
Contamination → CSS XEN → SSI	0.03	0.13	−0.32	0.23
Contamination → CSS TSS → SSI	0.14	0.14	−0.43	0.11
Contamination → CSS CHE → SSI	0.15	0.12	−0.04	0.40
Responsibility for harm → CSS DAN → SSI	0.13	0.19	−0.22	0.54
Responsibility for harm → CSS SEC → SSI	0.04	0.08	−0.12	0.22
Responsibility for harm → CSS XEN → SSI	0.07	0.16	−0.40	0.22
Responsibility for harm → CSS TSS → SSI	**0.29**[b]	**0.15**	**0.01**	**0.59**
Responsibility for harm → CSS CHE → SSI	**0.20**[b]	**0.10**	**0.04**	**0.44**
Unacceptable thoughts → CSS DAN → SSI	0.10	0.17	−0.21	0.44
Unacceptable thoughts → CSS SEC → SSI	0.04	0.07	−0.08	0.18
Unacceptable thoughts → CSS XEN → SSI	0.02	0.11	−0.25	0.22
Unacceptable thoughts → CSS TSS → SSI	**0.22**[b]	**0.12**	**0.01**	**0.46**
Unacceptable thoughts → CSS CHE → SSI	**0.17**[b]	**0.10**	**0.02**	**0.40**
Symmetry → CSS DAN → SSI	0.02	0.05	−0.06	0.13
Symmetry → CSS SEC → SSI	0.01	0.03	−0.06	0.07
Symmetry → CSS XEN → SSI	0.001	0.03	−0.06	0.06
Symmetry → CSS TSS → SSI	0.01	0.03	−0.06	0.03
Symmetry → CSS CHE → SSI	0.04	0.03	−0.01	0.10
OCD severity → CSS DAN → SSI	0.13	0.12	−0.10	0.35
OCD severity → CSS SEC → SSI	0.05	0.05	−0.04	0.14
OCD severity → CSS XEN → SSI	0.03	0.08	−0.19	0.14
OCD severity → CSS TSS → SSI	0.08	0.09	−0.26	0.08
OCD severity → CSS CHE → SSI	**0.28**[b]	**0.07**	**0.01**	**0.32**

Note: Significant indirect paths are bolded.

Abbreviations: CHE, compulsive checking; CI, confidence interval; CSS, COVID Stress Scales; DAN, danger and contamination fears; OCD, obsessive–compulsive disorder; PHQ-4, Patient Health Questionnaire-4; SEC, socio-economic consequences fears; SSI, Scale for Suicidal Ideation; TSS, traumatic stress symptoms; XEN, xenophobic fears.

[a]Indirect effects were analysed by controlling for PHQ-4 (depression and anxiety), comorbidity, and history of suicide attempts.

[b]Confidence intervals not including zero.

and their severity can be increased by the effects of COVID-19, especially stress responses in reaction to the pandemic (Khosravani, Aardema, et al., 2021; Khosravani, Asmundson, et al., 2021), it is likely that the effects of COVID-19 result in worsening OCD, developing new obsessions and compulsions, and altering the manifestation of the OC symptom dimensions (Benatti, Albert, et al., 2020). Therefore, in addition to considering the inherent nature of the OC dimensions of responsibility for harm and unacceptable thoughts, common treatments for these dimensions and OCD symptom severity should be adjusted to treat the pandemic-related stress responses, specifically traumatic stress and compulsive checking. This is particularly salient for patients with unacceptable thoughts, who may be at risk for recurring fear after exposure and response prevention therapy (ERP) (Jacoby, Abramowitz, et al., 2019) or patients with OCD experiencing doubt/uncertainty who may respond better to ERP during the COVID-19 pandemic (Storch et al., 2021). Thus, an exposure-based strategy designed to treat the OC symptoms of taboo or unacceptable thoughts (Berman, 2019), cognitive therapy for compulsive checking (Radomsky et al., 2020), and ERP (McKay et al., 2020; Sheu et al., 2020; Storch et al., 2020) may be adjustable to target these symptoms and general severity exacerbated by stress responses in reaction to COVID-19. In addition, the collaborative assessment and management of suicidality using telepsychotherapy may be useful to reduce suicidal ideation during COVID-19 (Jobes et al., 2020).

4.2 | Limitations and suggestions

This study has several limitations that highlight avenues for future research. First, the cross-sectional design does not address the

causality of the examined associations. Thus, the results should be further evaluated longitudinally. Second, the use of self-report scales may be biased, as participants may exaggerate their responses due to the impact of the threatening situation of the pandemic. Further research with clinical interviews may be a solution to this limitation. Third, the data were collected at the time of high prevalence of COVID-19 and findings may be different compared with times when the prevalence of COVID-19 is lower. Given that individuals experience more COVID-19 stress during the peak of the pandemic and at the height of restrictions (Asmundson & Taylor, 2020), so these results should be re-examined when the prevalence of COVID-19 is less. Finally, one of the factors that may be important concerning suicidality in OCD, but which has received little attention, is insight. Poor insight has been found to be associated with elevated severity of OC symptoms, chronicity, more comorbidity, and poor outcome in OCD patients (De Berardis et al., 2008; Visser et al., 2017); so poor insight may serve to increase suicidal ideation, and future studies should evaluate the effect of insight on the associations of the OC dimensions of unacceptable thoughts and responsibility for harm with suicidal ideation in OCD.

5 | CONCLUSION

The current study provides empirical evidence showing that the OC symptom dimensions of responsibility for harm and unacceptable thoughts, as well as general OCD severity, are associated with suicidal ideation, and that these relationships are increased by traumatic stress reactions and compulsive checking in reaction to COVID-19. The findings suggest that clinical interventions for OCD focus on assessing COVID-19 stress as a means of ameliorating suicidality as part of a comprehensive treatment plan during the current pandemic and possible future pandemics.

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CONTRIBUTORS

V. Khosravani: methodology, data curation, formal analysis, writing - original draft, writing -review and editing. S.M.S. Ardestani: supervision, clinical diagnosis, writing - review and editing. F.S. Bastan: data curation, formal analysis, clinical diagnosis. D. McKay and G.J.G. Asmundson: supervision writing - review and editing.

CONFLICT OF INTEREST

None declared.

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