Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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How much "Thinking" about COVID-19 is clinically dysfunctional?

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Several papers recently published in the journal '*Brain, Behavior, and Immunity*' highlighted some of the profound psychological impacts that the COVID-19 pandemic is having worldwide (Kim and Su, 2020; Thakur and Jain, 2020; Zhai and Du, 2020). As people are repeatedly exposed, through personal experiences and media consumption, to anxiety-provoking topics related to this growing health crisis, it is vital for health professionals, researchers, and policy makers to be able to recognize the clinical signs of dysfunctional thought processes related to the COVID-19 crisis. A reasonable level of attention and reflection on COVID-19 information can help people stay safe during the crisis, but too much disturbing thinking about this infectious disease can be debilitating and unhealthy (Taylor, 2019).

To answer the question of how much COVID-19 related thinking is "too much," I systematically examined the frequencies of people's thought processes about COVID-19 and analyzed how they related to measures of distress and functional impairment. This investigation drew upon two large samples of online survey data of MTurk workers from across the U.S. One sample consisted of 775 adults (median age of 30) who reported some level of anxiety about the coronavirus (collected on March 11 to 13, 2020), while the other sample consisted of 398 adults (median age of 32) who were not restricted to any level of anxiety (collected on March 23 to 24, 2020). To ensure that the results of this study were reliable, statistical analyses were applied independently to each sample.

First, I examined four patterns of persistent thinking regarding COVID-19, which make up the Obsession with COVID-19 Scale (OCS; see Table 1), to see if they cohered together into a reliable and factorially valid measure. Bootstrap ML confirmatory factor analyses on the OCS items revealed that this scale is highly reliable (αs = 0.84 to 0.85) and factorially valid with excellent fit indices [$\chi 2$/df ratios = 0.42 to 1.58; CFIs = 1.00; TLIs = 1.00; SRMRs = 0.01; RMSEAs = 0.00 to 0.03 (0.00, 0.08; 90% CIs)].

Second, I examined the correlations between the OCS and several indicators of psychological distress to determine if this measure of COVID-19 thinking is associated with mental anguish. The results of the bivariate correlation analyses support the construct validity of the OCS by demonstrating that elevated OCS scores were strongly associated with coronavirus anxiety (*r*s = 0.72–0.81), spiritual crisis (*r*s = 0.53–0.64), alcohol/drug coping (*r*s = 0.42–0.50), extreme hopelessness (*r*s = 0.66–0.70), and suicidal ideation (*r*s = 0.45–0.56).

Last, I examined the OCS for its diagnostic qualities and then identified how much COVID-19 thinking, within a two-week time frame, was indicative of dysfunction using a cut-score approach. ROC curve analyses with an established measure of functional impairment as a criterion variable (Mundt et al., 2002), revealed that the OCS has solid discrimination ability as a clinical scale (AUCs = 0.81 to 0.92). OCS total scores $\geq$ 7 optimally classified people as having (sensitivity values of 81% to 93%) or not having (specificity values of 73% to 76%) dys-

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Table 1
Obsession with COVID-19 Scale (OCS).

OCS						
How often have you experienced the following activities over the last 2 weeks?		*Not at all*	*Rare, less than a day or two*	*Several days*	*More than 7 days*	*Nearly every day over the last 2 weeks*
1.	I had disturbing thoughts that I may have caught the coronavirus.	0	1	2	3	4
2.	I had disturbing thoughts that certain people I saw may have the coronavirus.	0	1	2	3	4
3.	I could not stop thinking about the coronavirus.	0	1	2	3	4
4.	I dreamed about the coronavirus.	0	1	2	3	4
	Column Totals	___ +	___ +	___ +	___ +	___ +
		Total Score _____				

Note. The OCS is placed in the public domain to encourage its use in clinical assessment and research. No formal permission is therefore required for its reproduction and use by others, beyond appropriate citation of the present article

functional COVID-19 thinking patterns.

The results of this investigation answered the question of how much COVID-19 related thinking is too much. From a psychometric perspective, too much COVID-19 thinking means scores greater than or equal to 7 on the OCS. From a practical perspective, too much COVID-19 thinking roughly corresponds to spending at least three to seven days, dreaming about the coronavirus, repetitively thinking about the coronavirus, having disturbing thoughts that one has caught the coronavirus, and having disturbing thoughts that one saw particular people who may have the coronavirus. Although these cognitive processes are derived from a biologically evolved defense system designed to keep a person safe from harm (Ohman, 2000), these kinds of persistent and distressing thought patterns are common symptoms of clinical anxiety (American Psychiatric Association, 2013). Moreover, these thought patterns were shown to be maladaptive in this study, as they were not only tied to functional impairment, but were also found to be associated with a host of issues, ranging from drugs/alcohol coping to thoughts of suicide. Therefore, health professionals, researchers, and policy makers would be well advised to recognize this form of COVID-19 related thinking.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bbi.2020.04.067.

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