



# Viral Anxiety, Reassurance-Seeking Behavior, and Depression Mediate the Influence of Dysfunctional Self-Focus on Preoccupation With COVID-19 Among Infected Cases

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**Objective** Amid the coronavirus disease 2019 (COVID-19) pandemic, the pervasive threat of infection has heightened public and individual health concerns. In the context of instability, although the dysfunctional aspect of self-focus was prominent, preoccupation with viral infection was greater. This study explored the applicability of a cognitive-behavioral model of hypochondriasis to individuals infected with COVID-19 and assessed whether dysfunctional self-focus were associated with the development of preoccupation.

**Methods** An anonymous online survey was conducted via a professional survey platform in December 2022. Participants' clinical characteristics and responses to rating scales were collected, including Obsession with COVID-19 Scale (OCS), Coronavirus Reassurance-Seeking Behaviors Scale (CRBS), Stress and Anxiety to Viral Epidemic-6 items (SAVE-6), Patient Health Questionnaire-2 items (PHQ-2), and Dysfunctional Self-focus Attributes Scale (DSAS).

**Results** Among the 265 participants, preoccupation with COVID-19 was predicted using CRBS ( $\beta=0.60$ ,  $p<0.001$ ), SAVE-6 ( $\beta=0.20$ ,  $p=0.007$ ), and PHQ-2 ( $\beta=0.13$ ,  $p<0.001$ ) scores. Mediation analysis revealed that viral anxiety influenced this COVID-19 preoccupation, with the relationship mediated by coronavirus reassurance-seeking behavior. Another analysis indicated that dysfunctional self-focus had a significant total effect on preoccupation with COVID-19. However, its direct impact was statistically insignificant, with the association primarily influenced by three mediating factors: viral anxiety, depression, and reassurance-seeking behavior.

**Conclusion** Preoccupation with coronavirus is influenced by viral anxiety, depression, and reassurance-seeking behavior. Two mediation analyses showed that the application of the cognitive-behavioral model of hypochondriasis is feasible among COVID-19-infected cases and the association of dysfunctional self-focus with mediating factors. This finding highlights the need for personalized psychological support in managing COVID-19 cases.

Psychiatry Investig

**Keywords** COVID-19; Anxiety; Preoccupation; Stress.

## INTRODUCTION

On May 5, 2023, following a three-year-long pandemic, the World Health Organization officially announced an end to the global emergency caused by coronavirus disease 2019 (COVID-19). From early 2023, the newly reported severe acute respiratory syndrome-coronavirus-2 cases started exhibiting a

sustained and relatively stable pattern,<sup>1</sup> and the South Korean government downgraded the COVID-19 crisis alert level from “serious” to “warning” on June 1, 2023. Despite the reduced medical threat of COVID-19, the long-lasting repercussions of this viral outbreak persist. Over 770 million COVID-19 cases have been confirmed, with nearly 7 million fatalities as of September 2023.<sup>2</sup> The extensive spread of disease and the consequential imposition of restrictions on various activities have had adverse effects, particularly on the mental health of individuals. Globally, the prevalence of depression and anxiety symptoms in the normal population increased significantly.<sup>3</sup> More than 23% of healthcare workers presented with anxiety and depression,<sup>4</sup> and children and adolescents experienced psychological problems due to the activity restrictions.<sup>5</sup>

Illness anxiety disorder (previously referred to as hypochon-

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driasis) is defined as being preoccupied with health status and fearful about acquiring a disease. The development of illness anxiety disorder can be explained by a model of a cognitive-behavioral vicious cycle, starting with the fear of being sick inducing anxiety. Consequently, one may either start to avoid problems or seek reassurance.<sup>6</sup> Reassurance-seeking can provide temporary relief, but it eventually ends up with stronger feelings of fear and preoccupation with the illness.<sup>7</sup> Therefore, reassurance-seeking behavior can be a good indicator of illness preoccupation.

This reassurance-preoccupation behavior includes repeated checks on bodily sensations, hand hygiene, and extensive online health-related searches during the COVID-19 pandemic. As the fear of being infected develops, an individual moves on to reassurance-seeking behaviors, which paradoxically worsen the anxiety. During the pandemic, a reassurance-seeking behavior among medical students mediated an effect of viral anxiety and depression on obsession with COVID-19.<sup>8</sup> This phenomenon is more prominent in this era of information overload, as cyberchondria involves using the internet owing to increased levels of health distress.<sup>9</sup> An analysis of the spread of information on five of the biggest online platforms revealed that the infodemic was caused in regions where the news media was less regulated, and the news from unreliable sources spread quickly.<sup>10</sup> Research showed that social media exposure was positively correlated with mental disorders.<sup>11,12</sup> This interferes with the social measures taken against the spread of infection and affects individual's preoccupation with well-being.

For patients who were infected with COVID-19, this mechanism was more apparent. Approximately 8 to 10 months after acute infection, 10.4% of the COVID-19 infected patients met the criteria for somatic symptom disorder, characterized by extreme anxiety about physical symptoms.<sup>13</sup> Predictably, psychological symptoms, including anxiety and depression, were more common in patients infected with COVID-19.<sup>14</sup> According to a survey in China, 96.2% of the quarantined patients suffered from posttraumatic stress symptoms.<sup>15</sup> Meta-analysis of the online biomedical databases showed that mental health problems were common, especially in infected cases during a pandemic. Of the COVID-19 patients, 41.7% reported depression, and 42.3% reported anxiety.<sup>16</sup> It is plausible that this unstable status initiates the cycle of illness anxiety disorder, placing considerable mental stress on the affected individuals.

In such stressful situations, the concept of dysfunctional self-focus has been reported. Self-focus refers to a phenomenon or state in which an individual's attention turns to oneself. The role of self-focus can be largely divided into functional and dysfunctional aspects.<sup>17</sup> The dysfunctional aspect of self-focus is distinct from rumination. Rumination is a response style

that continues to recall the cause of negative emotions or unresolved past problems, whereas self-focus starts from self-consciousness and is a cognitive process necessary for inner perception and reflection. However, in some instances, dysfunctional self-focus and rumination can be similar.<sup>18</sup> Dysfunctional self-focus can worsen the psychological stress associated with stressful situations.<sup>19</sup> Thus, dysfunctional self-focus can increase depression<sup>20</sup> because self-focus can be maladaptive in depression.<sup>21</sup>

In this study, we explored the feasibility of applying a cognitive-behavioral model of hypochondriasis in COVID-19-related infected cases. In addition, we examined whether the dysfunctional self-focus contributes to the COVID-related model of hypochondriasis. We hypothesized that 1) coronavirus reassurance-seeking behaviors in infected individuals were positively correlated with their preoccupation with coronavirus, 2) viral anxiety of infected cases was positively associated with their preoccupation with coronavirus, 3) dysfunctional self-focus of infected cases was positively related to their preoccupation with coronavirus, 4) dysfunctional self-focus influenced the cognitive-behavioral model of COVID-related hypochondriasis.

## METHODS

### Participants and procedure

We conducted an anonymous e-survey among the general population via a survey platform of the professional survey company ([www.embrain.com](http://www.embrain.com)) from December 19 to 27, 2022. We collected responses from participants infected with COVID-19 to explore their COVID-related hypochondriacal responses. We developed an online e-survey form that recorded information on participants' age, sex, or marital status. Individuals' past psychiatric history and current psychiatric distress were enquired. It also included questions on individuals' experience of being infected with COVID-19 or getting vaccinated. The survey form was developed in accordance with the Checklist for Reporting Results of Internet e-Surveys guidelines.<sup>22</sup> We estimated the sample size based on 30 samples for 10 cells<sup>23</sup> (sex×5 age groups), targeting to collect 300 responses from infected individuals from 1,640,000 registered panels in the survey platform. Enrolment emails were sent to 5,949 individuals, and all 706 accessed the survey. Overall, 265 who completed the survey were enrolled after excluding 151 uninfected participants. The study protocol was approved by the Institutional Review Boards of Asan Medical Center (IRB, 2022-1256). The requirement for written informed consent was waived by the IRB.

## Measures

### Dysfunctional Self-focus Attributes Scale (DSAS)

The DSAS is a self-reported scale measuring individual levels of dysfunctional self-focus.<sup>18</sup> The 15 items of the DSAS are rated on a 5-point Likert-type scale. These items are clustered into three parts: 1) negatively biased focus (items 2, 5, 7, 12, and 15), 2) low clear awareness (reverse scoring, items 1, 3, 6, 8, and 9), and 3) low focus control (items 4, 10, 11, 13, and 14). A higher total score indicates greater dysfunction of increased self-focus. In this study, we applied the original Korean version of the scale and the Cronbach's alpha among this sample was 0.896.

### Obsession with COVID-19 Scale (OCS)

The OCS is a self-reported scale that measures disturbed thinking related to COVID-19.<sup>24</sup> It is also a useful tool to detect functional impairments caused by viruses. The OCS has four items, rated on a 5-point scale from 0 (not at all) to 4 (nearly every day) over the last 2 weeks, and total scores  $\geq 7$  indicate dysfunctional thinking related to the virus. In this study, we applied the Korean version of the scale<sup>25</sup> and the Cronbach's alpha among this sample was 0.822.

### Coronavirus Reassurance-Seeking Behaviors Scale (CRBS)

The CRBS is a self-reported scale that measures reassurance-seeking behaviors,<sup>26</sup> which lead to a cycle of anxiety and reassurance seeking. The scale includes 5 items, and each of them is rated on a 5-point scale from 0 (not at all) to 4 (nearly every day). Total scores  $\geq 12$  meant that the reassurance-seeking activity was above average. We applied the Korean version CRBS in this study,<sup>27</sup> and Cronbach's alpha among the sample was 0.910.

### Stress and Anxiety to Viral Epidemic-6 items (SAVE-6)

The SAVE-6 scale is a self-reported scale that measures anxiety response to viral epidemics.<sup>28</sup> It is a sub-category of the SAVE-9 scale, developed to measure stress and anxiety responses in healthcare workers.<sup>29</sup> The 6 items are rated from 0 (never) to 4 (always), and a total score of 15 was considered an ideal cut-off score for mild anxiety. In this study, we applied the original Korean version of the SAVE-6, and Cronbach's alpha among the sample was 0.834.

### Patient Health Questionnaire-2 items (PHQ-2)

The PHQ-2 is a brief self-reported scale that measures any depression experienced<sup>30</sup> during the past 2 weeks. It is derived from the first two questions of the PHQ-9 scale<sup>31</sup> and is frequently used for the initial assessment of depression. The two items of this scale are rated from 0 (not at all) to 3 (nearly ev-

ery day). In this study, we applied the Korean version of the PHQ-2,<sup>32</sup> and the Split-half coefficient among the sample was 0.869.

## Statistical analysis

A summary of the demographic profile and measuring scale scores were calculated as mean $\pm$ standard deviation. Significance was defined as two-tailed at  $p < 0.05$ . Pearson's correlation analysis was performed to explore the association between age and scores from measuring scales. Linear regression analysis was conducted to identify the variables that could predict preoccupation with COVID-19. A bootstrap method with 2,000 resamples was implemented, and mediating effects of reassurance-seeking behavior, viral anxiety, and depression on the association between dysfunctional self-focus and obsession with COVID-19 were measured to examine the validity of the hypochondriasis model in COVID-19 infected cases. The JASP Version 0.17.3 (JASP team, Amsterdam, Netherlands) was used to conduct the statistical analysis.

## RESULTS

Data from 265 participants who had COVID-19 infection were collected (Table 1). Their mean age was  $39.6 \pm 10.5$ , 158 (59.6%) were female, and 106 (40.0%) had a relationship status of being single. Among these participants, 13 (4.9%) had been infected twice, 250 (94.3%) were vaccinated, 38 (14.3%) had a past psychiatric history, and 33 (12.5%) had current psychiatric distress.

Pearson's correlation analysis is shown in Table 2, and the OCS score was significantly correlated with CRBS ( $r=0.75$ ,  $p < 0.01$ ), SAVE-6 ( $r=0.48$ ,  $p < 0.01$ ), PHQ-2 ( $r=0.52$ ,  $p < 0.01$ ), and DSAS ( $r=0.28$ ,  $p < 0.01$ ). The DSAS score was significantly correlated with the CRBS ( $r=0.28$ ,  $p < 0.01$ ), SAVE-6 ( $r=0.23$ ,  $p < 0.01$ ), and PHQ-2 ( $r=0.31$ ,  $p < 0.01$ ). Linear regression analysis revealed that the OCS score was associated with CRBS ( $\beta=0.60$ ,  $p < 0.001$ ), SAVE-6 ( $\beta=0.20$ ,  $p=0.007$ ), and PHQ-2 ( $\beta=0.13$ ,  $p < 0.001$ ),  $F=85.6$ ,  $p < 0.001$  (Table 3).

Mediation analysis showed that viral anxiety directly influenced COVID-19 preoccupation among infected cases, and coronavirus reassurance-seeking behavior mediated this relationship (Table 4). It fortified the feasibility of the application of cognitive-behavioral model hypochondriasis in individuals infected with COVID-19. We also observed that dysfunctional self-focus did not directly influence COVID-19 preoccupation. However, the relationship was mediated by viral anxiety, coronavirus-related reassurance-seeking behavior, and depression (Table 5 and Figure 1).

**Table 1.** Clinical characteristics of participants (N=265)

Variables	Value
Sex (female)	158 (59.6)
Age (yr)	39.6±10.5
Marital status	
Single	106 (40.0)
Married, without kids	20 (7.5)
Married, with kids	133 (50.2)
Others	6 (2.2)
Questions on COVID-19	
Did you experience being infected with COVID-19? (Yes)	265 (100)
Once	252 (95.1)
Two times	13 (4.9)
Did you get vaccinated? (Yes)	250 (94.3)
Psychiatric history	
Did you experience or get treated for depression, anxiety, or insomnia? (Yes)	38 (14.3)
Now, do you think you are depressed or anxious, or do you need help with your mood state? (Yes)	33 (12.5)
Rating scales scores	
Obsession with COVID-19	2.8±2.7
Coronavirus Reassurance-seeking Behavior Scale	3.6±4.0
Stress and Anxiety to Viral Epidemics-6 items	14.1±4.4
Patient Health Questionnaire-2 items	1.2±1.4
Dysfunctional Self-focus Attributes Scale	41.2±9.9

Data are presented as mean±standard deviation or N (%)

**Table 2.** Correlation coefficients of each variables among infected cases (N=265)

Variables	Age	OCS	CRBS	SAVE-6	PHQ-2
OCS	-0.01				
CRBS	-0.02	0.75**			
SAVE-6	0.03	0.48**	0.39**		
PHQ-2	-0.05	0.52**	0.53**	0.31**	
DSAS	-0.12	0.28**	0.28**	0.23**	0.31**

\*\*p<0.01. OCS, Obsession with COVID-19 Scale; CRBS, Coronavirus Reassurance-Seeking Behaviors Scale; SAVE-6, Stress and Anxiety to Viral Epidemic-6 items; PHQ-2, Patient Health Questionnaire-2 items; DSAS, Dysfunctional Self-focus Attributes Scale

## DISCUSSION

In this study, we showed that individuals with COVID-19 who had preoccupied thoughts about the infection had viral anxiety, depression, and coronavirus-related reassurance-seeking behavior. We found that a hypochondriasis cognitive-behavioral model is feasible for applying in individuals infected with COVID-19. Furthermore, viral anxiety, coronavirus-related reassurance-seeking behavior, and depression mediated the influence of dysfunctional self-focus on preoccupation

**Table 3.** Linear regression analysis results among infected cases (N=265)

Dependent variables	Included parameters	β	p	Adjusted R <sup>2</sup>	F, p
OCS	Age	0.001	0.992	0.62	F=85.6 p<0.001
	CRBS	0.60	<0.001		
	SAVE-6	0.20	0.007		
	PHQ-2	0.13	<0.001		
	DSAS	0.03	0.432		

OCS, Obsession with COVID-19 Scale; CRBS, Coronavirus Reassurance-Seeking Behaviors Scale; SAVE-6, Stress and Anxiety to Viral Epidemic-6 items; PHQ-2, Patient Health Questionnaire-2 items; DSAS, Dysfunctional Self-focus Attributes Scale

with COVID-19.

Previously, we demonstrated that the cognitive-behavioral model of COVID-19-related hypochondriasis can be implemented across diverse groups. A study involving medical students revealed a noteworthy association between viral anxiety and preoccupation with COVID-19, and reassurance-seeking behavior was identified as a mediating factor.<sup>8</sup> This association was prominent among healthcare workers who had encountered a high number of patient deaths, leading to subsequent rumination.<sup>33</sup> Furthermore, previous studies have

**Table 4.** Feasibility of the cognitive-behavioral model for hypochondriasis among infected cases

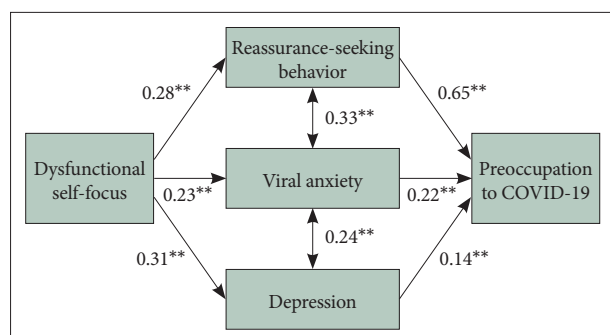
Effect	Standardized estimator	SE	Z-value	p	95% CI
Direct effect: SAVE-6 → OCS	0.22	0.04	5.24	<0.001	0.14–0.30
Indirect effect: SAVE-6 → CRBS → OCS	0.26	0.04	6.37	<0.001	0.18–0.34
Total effect: SAVE-6 → OCS	0.48	0.05	8.94	<0.001	0.38–0.59

SE, standard error; CI, confidence interval; OCS, Obsession with COVID-19 Scale; CRBS, Coronavirus Reassurance-Seeking Behaviors Scale; SAVE-6, Stress and Anxiety to Viral Epidemic-6 items

**Table 5.** The results of direct, indirect, and total effects on mediation analysis

Effect	Standardized estimator	SE	Z-value	p	95% CI
Direct effect:					
DSAS → OCS	0.03	0.03	0.80	0.423	-0.05–0.11
Indirect effect:					
DSAS → CRBS → OCS	0.17	0.04	4.37	<0.001	0.09–0.24
DSAS → PHQ-2 → OCS	0.04	0.02	2.45	0.003	0.02–0.08
DSAS → SAVE-6 → OCS	0.05	0.02	3.00	0.014	0.01–0.07
Path coefficients					
DSAS → CRBS	0.28	0.06	4.65	<0.001	0.16–0.39
CRBS → OCS	0.60	0.05	12.85	<0.001	0.51–0.69
DSAS → PHQ-2	0.31	0.06	5.38	<0.001	0.20–0.43
PHQ-2 → OCS	0.13	0.05	2.75	0.006	0.04–0.22
DSAS → SAVE-6	0.23	0.06	3.77	<0.001	0.11–0.34
SAVE-6 → OCS	0.20	0.04	4.79	<0.001	0.12–0.28
Residual covariances					
CRBS ↔ SAVE-6	0.33	0.06	5.42	<0.001	0.21–0.45
CRBS ↔ PHQ-2	0.44	0.06	7.09	<0.001	0.32–0.56
SAVE-6 ↔ PHQ-2	0.24	0.06	4.04	<0.001	0.12–0.35
Total effect:					
DSAS → OCS	0.28	0.06	4.78	<0.001	0.17–0.40

SE, standard error; CI, confidence interval; OCS, Obsession with COVID-19 Scale; CRBS, Coronavirus Reassurance-Seeking Behaviors Scale; SAVE-6, Stress and Anxiety to Viral Epidemic-6 items; PHQ-9, Patient Health Questionnaire-9 items; DSAS, Dysfunctional Self-focus Attributes Scale

**Figure 1.** Mediation model of the effect of dysfunctional self-focus (independent variables) on preoccupation with coronavirus (outcome) is mediated by reassurance-seeking behavior, depression, and viral anxiety (mediator variables). \*\* $p < 0.01$ .

affirmed the relevance of this model within the broader general population.<sup>34</sup> In this study, we examined the feasibility of the cognitive-behavioral model of COVID-related health anxiety among individuals from the general population infected with COVID-19. Using mediation analysis, we confirmed that

this model is applicable to infected individuals. We anticipate that this model will serve as a foundation for comprehending health anxiety related to the virus in the general population in the event of future pandemics.

We also found a significant association between dysfunctional self-focus and preoccupation with the virus. However, the mediation analysis results showed that dysfunctional self-focus did not exert a direct influence on preoccupation with COVID-19. Dysfunctional self-focus is characterized by a lack of ability to regulate attention, oscillating between past, present, and future events, with unclear focus targets. Additionally, the attention is diverted towards negative thought patterns. Despite hierarchical differences, dysfunctional states of self-focus and rumination are often considered analogous, leading to the term 'ruminative function of self-focus'.<sup>18</sup> Contrary to the misconception that ruminative thinking aids problem-solving,<sup>35</sup> it has been shown that ruminant thinking is a determinant of stress in response to negative events.<sup>19</sup> Rumination triggers negative emotional states, perpetuating a vicious cycle

of increased rumination.<sup>36</sup> Dysfunctional self-focus is known to exacerbate mood, depression, and anxiety,<sup>37</sup> particularly demonstrating associations with obsessive-compulsive disorder and somatization.<sup>38</sup>

Nonetheless, dysfunctional self-focus did not directly impact individuals who tested positive for the virus; several factors may contribute to this observation. A confirmed diagnosis of COVID-19 might lead to a reduction in anxiety and preoccupation related to the virus. The initial fear during the early stages of the pandemic, when COVID-19 diagnosis was considered potentially fatal, could have diminished over time. Post-infection, individuals may have developed a sense of reassurance, given the understanding that after experiencing an initial discomfort, they were likely to develop immunity and be less prone to re-infection. Several studies have indicated significantly lower levels of anxiety, depression and mental illness among individuals who had received the vaccine compared to non-vaccinated individuals.<sup>39</sup> Previous studies suggesting that groups with a history of COVID-19 infection were less inclined to adhere to preventative measures may stem from this underlying perception.<sup>40</sup>

Another possible explanation is that people may have become more accustomed to viral infections with time. Additionally, as virus variants emerged and fatality rates decreased, dysfunctional self-focus could reduce the attention on virus preoccupation. These observations indicate that dysfunctional self-focus may not directly influence virus preoccupation among COVID-19-infected individuals, highlighting the evolving perceptions and experiences that individuals experience over the pandemic.

However, this relationship between dysfunctional self-focus and virus preoccupation demonstrated meaningful associations when integrated with the cognitive-behavioral model. The model was significantly associated with the mediation of virus anxiety responses and reassurance-seeking behaviors. In other words, while dysfunctional self-focus may not directly influence the preoccupation itself, it could potentially lead to an obsessive preoccupation with the disease depending on the anxiety responses and reassurance-seeking behavior. When the infection risk is low, individuals exhibit higher psychological resilience scores,<sup>41</sup> and perceived epidemic risk and psychological symptoms are positively correlated.<sup>42</sup> Similar to these findings, a study conducted in the UK revealed a decrease in mental health problems after September 2021.

In the current study, depression mediated the relationship between dysfunctional self-focus and preoccupation with COVID-19. Dysfunctional self-focus (also known as ruminative self-focus) can trigger depression. Ruminative responses predict depressive disorders, the onset of new depressive episodes, and the prolonged duration of depressive symptoms.<sup>43</sup> More-

over, laboratory investigations have confirmed that induced rumination heightens ruminative self-focus, resulting in a detrimental impact on mood in depressed patients.<sup>44</sup> Several experimental ambulatory assessment studies have consistently reported that this effect extends into individuals' daily lives.<sup>37</sup> Furthermore, various studies have indicated an association between depression and preoccupation. The severity of depression is notably linked to elevated scores on delusion items, including hypochondriasis.<sup>45</sup> Additionally, there is an observed heightened vulnerability to hypochondriasis in older individuals with depression.<sup>46</sup> This association was observed even in relation to COVID-19.<sup>8</sup> Though no previous study has explored this relationship among infected individuals, we demonstrated that depression in infected individuals with COVID-19 might underlie dysfunctional self-focus and preoccupation when infected.

There are several limitations of this study. First, we collected responses from the general population who had been infected with coronavirus. However, they were not seriously ill or hospitalized. The results need to be interpreted with caution in severely infected patients who require medical attention. Second, this study was conducted in December 2022, three years after the first coronavirus outbreak in South Korea, making it possible that people could have adjusted to the viral pandemic situation and think they would be safe from re-infection. However, the worry of people in Korea over the big surge in infected cases in China in December 2022<sup>47</sup> needs to be considered when interpreting the results of this study. Third, this study was conducted via an online survey, and we could not conduct the polymerase chain reaction test. Hence, we cannot confirm whether all participants had really been infected with coronavirus. Finally, participants' psychological symptoms were assessed using subjective rating scales instead of objective measures or face-to-face interviews with psychiatrists. Responses to subjective measurement may lead to bias or inaccuracies. When interpreting participants' responses, it should be taken into account.

In conclusion, our study reveals that preoccupation with coronavirus is significantly influenced by viral anxiety, depression, and reassurance-seeking behavior among individuals who were infected with the COVID-19 infection. The cognitive-behavioral model of hypochondriasis was found to be applicable in this context, emphasizing the interconnectedness of dysfunctional self-focus. These findings underscore the importance of tailored psychological support for individuals recovering from COVID-19. Educational programs and comprehensive mental health screening are crucial components of public health efforts, which can be aimed at enhancing awareness and addressing emotional responses effectively. Integrating mental health considerations into a broader healthcare

system can lead to a more comprehensive approach to managing the unique psychological challenges associated with the pandemic.

### Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

### Conflicts of Interest

Seockhoon Chung, a contributing editor of the *Psychiatry Investigation*, was not involved in the editorial evaluation or decision to publish this article. All remaining authors have declared no conflicts of interest.

### Author Contributions

Conceptualization: Jihoon Hong, Seockhoon Chung. Data curation: Seockhoon Chung. Formal analysis: Byeongha Yoon, Seockhoon Chung. Methodology: Jihoon Hong, Seockhoon Chung. Supervision: Seockhoon Chung. Visualization: Byeongha Yoon. Writing—original draft: Byeongha Yoon, Jihoon Hong. Writing—review & editing: Seockhoon Chung.

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