Anxiety, Depression and Cognitive Emotion Regulation Strategies in Psychiatric Patients during the COVID-19 Pandemic

Woraphat Ratta-apha, M.D., Ph.D.*, Nichkamol Kittipavara, M.D.*, Varaporn Sripirom, M.N.S., Chia-Chun Hung, M.D., Ph.D.***,****, Tony Szu-Hsien Lee, Ph.D. ***,****,*****, Pornjira Pariwatcharakul, M.D.*, Kamonporn Wannarit, M.D.*, Panate Pukrittayakamee, M.D.*, Netnapa Promsuwong, B.N.S.**, Jingswat Sirikunchoat, M.D.*, Sirirat Kooptiwoot, M.D.***

Department of Psychiatry, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand, **Psychiatric Outpatient Department Unit, Siriraj Hospital, Bangkok, Thailand, * Center for Addiction Prevention and Policy Research, National Taiwan Normal University, Taipei, Taiwan, **** Continuing Education Master's Program of Addiction Prevention and Treatment, National Taiwan Normal University, Taipei, Taiwan, *****Department of Health Promotion and Health Education, National Taiwan Normal University, Taipei, Taiwan.*

ABSTRACT

Objective: The coronavirus disease 2019 (COVID-19) pandemic likely impacted emotional regulation and mood states. The present study aimed to investigate the perceived risk, stigma, and emotional regulation strategies of psychiatric patients, as well as the association between these characteristics, cognitive emotion regulation strategies (emotional suppression and cognitive reappraisal), and anxiety and depressive symptoms during the COVID-19 pandemic.

Materials and Methods: The present cross-sectional study of 282 patients with anxiety and mood disorders was conducted during the COVID-19 pandemic in 2020. Participants completed questionnaires that investigated anxiety (hospital anxiety and depression scale [HADS]), depression (patient health questionnaire [PHQ-9]), and cognitive emotion regulation strategies (emotion regulation questionnaire [ERQ]). Descriptive statistics were used to assess the data. The t-test, chi-square test, and Mann-Whitney U test were used to compare the differences between the two groups, with cut-off scores of 11 in the HADS and nine in the PHQ-9.

Results: Most participants were female (78.4%), and the median age was 31 years. A total of 23.8% of participants reported having anxiety symptoms, and 24.8% and 54.3% of participants reported having depression on the HADS-D and PHQ-9, respectively. HADS-A, HADS-D, and PHQ-9 were found to be significantly associated with emotional regulation style (P=0.002, P=0.005, P=0.006) but not with perceived risk and stigma. Patients with anxiety or depression tended to use expressive suppression more often than cognitive reappraisal.

Conclusion: This study found that mood states were associated with cognitive emotional regulation strategies during the COVID-19 pandemic. Patients with anxiety or depression tended to use expressive suppression more often than cognitive reappraisal.

Keywords: COVID-19; coronavirus; cognitive emotional regulation; anxiety; depression (Siriraj Med J 2022; 74: 857-864)

Corresponding author: Sirirat Kooptiwoot
E-mail: skooptiwoot@gmail.com
Received 13 October 2022 Revised 7 November 2022 Accepted 9 November 2022
ORCID ID:http://orcid.org/0000-0001-6427-4738
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INTRODUCTION

Coronavirus disease 2019 (COVID-19) spread rapidly following its emergence in 2019 in Wuhan, Hubei, China.[1] The World Health Organization (WHO) designated the coronavirus disease a public health emergency after only a few months, and the number of verified cases and associated fatalities continues to increase.[2] The present pandemic presents a serious worldwide problem. Thailand was the first country outside of China to diagnose a case of COVID-19 on January 17, 2020.[3]

The current global crisis has affected healthcare systems, global economic outlooks, and the delivery of education, as well as people's daily lives, habits, and physical and mental health, whereby psychological distress due to a fear of infection, depression, anxiety, and stigma have been reported.[4,5] Anxiety and fear may have a negative impact on one's mental health, particularly those with psychological vulnerability. Furthermore, other pre-existing social, cultural, and economic vulnerabilities can also play a part.[6] When a stressful event occurs, certain groups, such as women, children and the elderly, are at greater risk of complications.[7]

Patients with psychiatric disorders are also vulnerable. When a large stressor or unexpected event occurs, psychiatric symptoms may be worsened or prolonged.[8] Previous research in Thailand found that outpatients with a mental health condition had a strong understanding of COVID-19, good preventive practices, and a low level of anxiety about COVID-19.[9]

An individual's emotional regulation, which can be defined as "the process that individuals influence which emotions they have, and how they experience and express these emotions", appears to contribute to a stress reaction.[10] The current study concentrated on the two most important emotion management strategies: cognitive reappraisal and emotional suppression. Cognitive reappraisal necessitates the adaptive application of cognitive effort to modify a situation's evaluation, which alters the emotional response before it fully occurs. Conversely, expressive suppression is a response-focused technique that involves a behavioral attempt to inhibit the display of an already occurring emotional response.[11,12] During the COVID-19 pandemic, previous studies revealed that emotional suppression was associated with poorer psychological well-being, such as increased depressive symptoms, psychological distress, and reduced emotional well-being.[13-15]

To the best of our knowledge, concerns regarding mood symptoms and emotional regulation in patients with psychiatric disorders during the pandemic have not been thoroughly studied in Thailand. Most research has focused on the overall population or a specific community during the pandemic. The current study has two goals: 1) to investigate the psychological impact, perceived risk, stigma, and emotional regulation strategies of patients with psychiatric problems during the COVID-19 pandemic, and 2) to investigate the relationship between the characteristics, emotion regulation strategies, anxiety, and depressive symptoms. The authors expect that those psychiatric patients who employ emotion regulation techniques that favor emotional suppression over cognitive reappraisal will have higher PHQ-9 and HADS scores.

MATERIALS AND METHODS

Participants

The current study included psychiatric patients who visited the outpatient unit of the psychiatric clinic at Siriraj Hospital in April and May 2020. Participants had to be at least 18 years old, diagnosed with a mood or anxiety disorder, have a good comprehension of the Thai language, and be willing to participate in the study. Individuals with severe or emergency medical or psychiatric disorders, such as unstable vital signs, psychotic symptoms, or suicidal behavior, were excluded.

The study was approved by the Siriraj Research Affairs and Siriraj Institutional Review Board (SIRB), Faculty of Medicine Siriraj Hospital, Mahidol University (COA no. Si 659/2020). The study was performed in accordance with the principles of the Declaration of Helsinki. Some parts of the questionnaire obtained for the present study were translated and conducted under the approval of the "Preventive measure and psychology stress on COVID-19" across Japan, Korea, Taiwan, and Thailand" (REC Number: 202003HS002).

Procedure and measurement

The study team recruited 282 patients with mental disorders according to the inclusion criteria listed above. The participants completed a questionnaire that assessed their demographic data and questionnaire sets. To comply with the COVID-19 pandemic policy, the authors offered a paper-based questionnaire with a set of envelopes to be returned by post and a paper with a quick response code for an online questionnaire. Participants were free to answer in any way that they saw fit. The questionnaires were completed anonymously.

Instruments

The questionnaire consisted of three sections. The first section collected demographic information about the respondents, including sex, age, occupational status, and educational status. The second section consisted

of questions about perceived risk and stigma that applied the questions from the questionnaire of the project "Preventive measure and psychology stress on COVID-19 by medical staff and students across Japan, Korea, Taiwan, and Thailand". The third section included three structured scales: the Thai version of the patient health questionnaire (PHQ-9), the hospital anxiety and depression scale (HADS), and the emotion regulation questionnaire (ERQ).

Patient health questionnaire (PHQ-9)

The PHQ-9 is a self-report of depressive symptoms comprised of nine items based on the DSM-IV diagnostic criteria for major depressive episodes.[16] Lotrakul et al. translated the original version to Thai and used it as a screening tool for depression. With a cut-off score of nine or higher, the Thai version of the PHQ-9 exhibited acceptable internal consistency (Cronbach's alpha=0.79).[17]

Hospital anxiety and depression scale (HADS)

The HADS is a questionnaire used for screening anxiety and depressive disorders.[18] The HADS consists of 14 items, including the HADS-Anxiety Subscale (HADS-A) and the HADS-Depressive Subscale (HADS-D). A score equal or greater than 11 indicated anxiety or depression. The Thai version of the HADS-A has a sensitivity and specificity of 100% and 86%, respectively, and the HADS-D has a sensitivity and specificity of 85.7% and 91.3%, respectively.[19]

Emotion regulation questionnaire (ERQ)

Gross and John developed the ERQ, a 10-item self-reported questionnaire intended to examine respondents' inclination to manage their emotions in two styles: cognitive reappraisal (six items) and expressive suppression (four items).[11] Higher subscale mean scores suggest greater use of a specific emotion control style. Khumrod and Soonthornchaiya translated and then evaluated the Thai version of the ERQ to assess its validity and reliability (2017). In the Thai version, the content validity index of the ERQ was 0.80, and its reliability was 0.82.[20]

Statistical analysis

The data were analyzed using SPSS (version 21.0; IBM SPSS, Armonk, NY, USA). Descriptive statistics were used to characterize the demographic data, agreement of perceived risk, and stigma among all participants. Descriptive analyses included the means, standard deviations, medians, and interquartile ranges (for non-normally distributed data). Using the HADS cut-off score of 11 and the PHQ-9 cut-off score of nine, the data were classified into two groups: the participants who had anxiety or depression (HADS-A ≥ 11, HADS-D ≥ 11, or PHQ-9 ≥ 9) and those who did not. The t-test, chi-square test, and Mann-Whitney U test were conducted to compare the differences in characteristics, ERQ, perceived risk, and stigma between the two groups. Pearson's correlation was used to investigate the correlation between HADS-A, HADS-D, and PHQ-9. A probability level of $p < 0.05$ was considered to be statistically significant.

RESULTS

Basic characteristics

This cross-sectional study included 282 participants. Of these, 221 (78.4%) were females, and 61 (21.6%) were males. The median age was 31 years (median [(Q1-Q3) = (25-41)]). the employment rate was 251 (89.0%), and the majority of participants (229; 81.2%) had graduated from college or university (Table 1). The primary diagnoses were depressive disorders, bipolar disorder, and anxiety disorder or insomnia disorder in 45.7%, 14.9%, and 39.4%, respectively. Overall, 23.8% of participants reported having anxiety symptoms (HADS-A positive; HADS-A ≥ 11), while 24.8% and 54.3% of participants reported having depression according to the HADS-D (HADS-D ≥ 11) and PHQ-9 (PHQ-9 ≥ 9), respectively. The median age of the participants with anxiety and depression was significantly different between the two groups (HADS-A, p<0.001; HADS-D, p=0.002; PHQ-9, p<0.001). Participants who were HADS-A, HADS-D, or PHQ-9 positive were younger than those who were negative. No other differences were observed between the two groups (Table 1).

Emotional regulation style: Comparison between styles by HADS and PHQ-9

Participants preferred cognitive reappraisal over expressive suppression (72.3% vs 27.7%) (Table 2). When anxiety symptoms were used to compare emotional regulation styles, the HADS-A was found to be significantly associated with emotional regulation style (P=0.002; OR [95% CI] = 2.51 [1.39-4.52]). Participants who were anxious (HADS-A positive) preferred expressive suppression (42.4%), whereas those who were not anxious (HADS-A negative) preferred cognitive reappraisal (72.3%). HADS-D was significantly associated with emotional regulation style in participants with depression (P=0.005; OR [95% CI] = 2.29 [1.27-4.13]). Participants with depression (HADS-D positive) preferred expressive suppression (40.9%), whereas those without depression (HADS-D negative) preferred cognitive reappraisal (76.8%). The PHQ-9 was also significantly associated with emotional

TABLE 1. Characteristics of psychiatric patients grouped by the hospital anxiety and depression scale-anxiety subscale (HADS-A), depression subscale (HADS-D), and patient health questionnaire-9 (PHQ-9)

Characteristics	Total n=282	HADS-A Negative n = 215 (76.2%)	HADS-A Positive n = 67 (23.8%)	HADS-A P-value	HADS-A OR (95%CI)	HADS-D Negative n = 212 (75.2%)	HADS-D Positive n = 70 (24.8%)	HADS-D P-value	HADS-D OR (95%CI)	PHQ-9 Negative n = 129 (45.7%)	PHQ-9 Positive n = 153 (54.3%)	PHQ-9 P-value	PHQ-9 OR (95%CI)
Sex				0.397	0.74 (0.37-1.49)			0.702	0.88 (0.45-1.71)			0.234	0.71 (0.40-1.25)
Male	61 (21.6)	49 (22.8)	12 (17.9)			47 (22.2)	14 (20.0)			32 (24.8)	29 (19.0)		
Fetamale	221 (78.4)	166 (77.2)	55 (82.1)			165 (77.8)	56 (80.0)			97 (75.2)	124 (81.0)		
Age (years);	31.0	33.0	26.0			33.0	27.5			35.0	28.0		
Median (Q1-Q3)	(25-41)	(26-43)	(22-35)	<0.001*		(26-43)	(23-35.25)	0.002*		(28-44.75)	(23-36)	<0.001*	
Occupation				0.465	1.36 (0.59-3.12)			0.145	1.79 (0.81-3.95)			0.224	1.61 (0.74-3.51)
Employed	251 (89.0)	193 (89.8)	58 (86.6)			192 (90.6)	59 (84.3)			118 (91.5)	133 (86.9)		
Unemployed	31 (11.0)	22 (10.2)	9 (13.4)			20 (9.4)	11 (15.7)			11 (8.5)	20 (13.1)		
Educational status				0.774				0.977				0.622	
Primary school	10 (3.5)	9 (4.2)	1 (2.4)			7 (3.3)	3 (4.3)			6 (4.7)	4 (2.6)		
Middle school	17 (6.0)	13 (6.0)	4 (6.0)			13 (6.1)	4 (5.7)			8 (6.2)	9 (5.9)		
High school	26 (9.2)	20 (9.3)	6 (9.0)			20 (9.4)	6 (8.6)			14 (10.9)	12 (7.8)		
College or University	229 (81.2)	173 (80.5)	56 (83.6)			172 (81.1)	57 (81.4)			101 (78.3)	128 (83.7)		

* Mann-Whitney U test

TABLE 2. Emotional regulation style in psychiatric patients grouped by the hospital anxiety and depression scale-anxiety subscale (HADS-A), depression subscale (HADS-D), and patient health questionnaire-9 (PHQ-9)

Emotional regulation style	Total n=264	HADS-A Negative n = 198 (75.0%)	HADS-A Positive n = 66 (25.0%)	HADS-A P-value	HADS-A OR (95%CI)	HADS-D Negative n = 198 (75.0%)	HADS-D Positive n = 66 (25.0%)	HADS-D P-value	HADS-D OR (95%CI)	PHQ-9 Negative n = 119 (45.1%)	PHQ-9 Positive n = 145 (54.9%)	PHQ-9 P-value	PHQ-9 OR (95%CI)
Emotional regulation style				0.002	2.51 (1.39-4.52)			0.005	2.29 (1.27-4.13)			0.006	2.20 (1.24-3.88)
Cognitive reappraisal	191 (72.3)	153 (77.3)	38 (57.6)			152 (76.8)	39 (59.1)			96 (80.7)	95 (65.5)		
Expressive suppression	73 (27.7)	45 (22.7)	28 (42.4)			46 (23.2)	27 (40.9)			23 (19.3)	50 (34.5)		

regulation style (P=0.006; OR [95% CI] = 2.20 [1.24-3.88]). Participants with depression (PHQ-9 positive) used expressive suppression (34.5%), whereas participants without depression (PHQ-9 negative) used cognitive reappraisal (80.7%).

Perceived risk and stigma

Regarding perceived risk, 58.2% (n=163) participants agreed with the statement "It is possible that I might be infected by COVID-19," 63.0% (n=177) agreed with the statement "It is possible that my neighbors, colleagues, and friends might be infected by COVID-19," and 87.5% (n=246) agreed with the statement "It is possible that others might be infected by COVID-19".

Regarding stigma, 11.0% (n=31) of participants agreed that they felt fear/afraid, 25.3% (n=71) avoidance, 3.2% (n=9) kept their diagnosis a secret, 9.6% (n=27) felt embarrassed, and 10.3% (n=29) stigma.

The HADS-A, HAD-D, and PHQ-9 scores were not associated with the agreement of all perceived risk and stigma items (all P>0.05; Table 3).

TABLE 3. Perceived risk and stigma

	Agree n (%)	Disagree n (%)	HADS-A P-value	HADS-A OR (95%CI)	HADS-D P-value	HADS-D OR (95%CI)	PHQ-9 P-value	PHQ-9 OR (95%CI)
Perceived risk								
It is possible that I might be infected by COVID-19	163 (58.2)	117 (41.8)	0.999	1.00 (0.57-1.75)	0.834	1.06 (0.61-1.83)	0.085	0.66 (0.41-1.06)
It is possible that my neighbors/colleagues/friends might be infected by COVID-19	177 (63.0)	104 (37.0)	0.953	1.02 (0.58-1.79)	0.242	1.39 (0.80-2.41)	0.576	0.87 (0.54-1.42)
It is possible that others might be infected by COVID-19	246 (87.5)	35 (12.5)	0.568	0.78 (0.32-1.86)	0.907	1.05 (0.47-2.36)	0.154	0.60 (0.29-1.22)
Stigma								
Fear/Afraid: I will be afraid to let people know if I may have been infected with COVID-19	31 (11.0)	250 (89.0)	0.786	0.89 (0.38-2.09)	0.448	1.43 (0.56-3.65)	0.963	0.98 (0.46-2.08)
Avoidance: If I suspect I may have been infected with COVID-19, I will not think about it until I become unwell/sick	71 (25.3)	210 (74.7)	0.534	1.23 (0.64-2.35)	0.677	0.88 (0.48-1.62)	0.925	0.97 (0.57-1.67)
Keeping a secret: If I suspect I may have been infected with COVID-19, I will keep it a secret	9 (3.2)	272 (96.8)	1.000	1.10 (0.22-5.42)	0.695	0.65 (0.16-2.69)	1.000	0.96 (0.25-3.63)
Embarrassment: I will feel embarrassed if others know that I may have been infected with COVID-19	27 (9.6)	254 (90.4)	0.835	1.11 (0.43-2.87)	0.419	1.51 (0.55-4.16)	0.598	0.81 (0.36-1.80)
Stigma: I will lose friends if I tell them I may have been infected with COVID-19	29 (10.3)	252 (89.7)	0.156	0.56 (0.24-1.26)	0.919	1.05 (0.43-2.57)	0.097	0.50 (0.22-1.15)

DISCUSSION

The present study investigated the psychological impact, perceived risk, stigma, and emotional regulation strategies of patients with psychiatric problems during the COVID-19 pandemic and the association between the characteristics, emotion regulation strategies, and psychiatric symptoms.

Anxiety and depression

Regarding the first objective, the results showed that about a quarter of participants reported having depressive or anxiety symptoms using the HADS-A or HADS-D, and about half reported having depression using the PHQ-9. There was a significant difference in the median age of patients with anxiety and depression. While the other features were similar, the participants with anxiety or depression were younger. Although the number of participants with anxiety differed between the two questionnaires, HADS-D and PHQ-9, we discovered a moderately significant correlation (r=0.767, P<0.01) between both questionnaires (Table 4). The results of the two questionnaires differ because the HADS-D concentrates on emotions and interests, whereas the PHQ-9 assesses neurovegetative symptoms. Other than age, we could not find an association between mood states (depression and anxiety), sex, and employment.

The current study's participants were comparable to that of a previous study, which enrolled outpatients with a mental health condition from university hospitals.[9] However, the objectives of this study were different. The earlier study concentrated on the participants' COVID-19 knowledge, preventive behaviors, and anxiety levels, whereas the current study included emotion control, perceived risk, and stigma.

Perceived risk and stigma

According to the perceived risk in the three statements, the majority of the participants (87.5%) agreed with the perceived risk of COVID-19 infection in others. Approximately half (58.2%) of the participants reported a risk of infection. This could imply that believing others are afflicted is simpler than believing oneself. Participants may have been confident in their preventive behaviors toward COVID-19, which is consistent with a recent study that found that almost half of the participants had a low-risk perception of COVID-19.

Regarding stigma, around a quarter of the participants agreed with the statement of avoidance, while "keeping a secret" received the least agreement. This could be because most participants did not see the illness as an issue that needed to be concealed. Avoidance is one of the defense mechanisms used by neurotic patients to deal with worry. We hypothesized that anxiety and sadness are related to perceived danger or stigma. However, no association was found between perceived risk and stigma in participants with high anxiety (HADS-A ≥ 11), depression (HADS-D ≥ 11), or PHQ-9 ≥ 9. There are several possible explanations for this, including 1) because the data were collected during the country's second wave of the pandemic (around April-May 2020), which did not have a high prevalence rate compared to Europe, most people felt they were not at a high risk of being infected; and 2) at that time, most people may have known about COVID-19 and how to deal with it. As a result, the perceived threat or stigma may have been lower.

TABLE 4. Correlation between HADS and PHQ-9

	HADS-A	HADS-D	PHQ-9
HADS-A		0.705**	0.797**
HADS-D	0.705**		0.767**
PHQ-9	0.797**	0.767**	

**. Correlation is significant at the 0.01 level (2-tailed).

Emotional regulation strategies

According to the results, participants preferred cognitive reappraisal over expressive suppression. Anxiety and depression were significantly related to emotional regulation style, and participants who were anxious or depressed preferred expressive suppression. Emotional regulation is a complex mental process controlled by various elements such as mental health, mood state, and life satisfaction.[21] Effective emotion regulation is crucial for effective functioning in a dynamic context. Previous studies have shown that greater use of cognitive reappraisal and less use of expressive suppression are associated with more positive outcomes in the domains of mood, well-being, and social functioning.[22] A previous meta-analysis showed a significant positive correlation between cognitive reappraisal and a positive indicator of mental health, while expressive suppression showed a negative correlation with a positive indicator of mental health. In addition, this meta-analysis found that cultural values may influence individual emotion regulation strategies.[23] A previous study revealed that regulating emotions using cognitive reappraisal was associated

with greater resilience (i.e., the ability to seek enjoyable activities and social support and feelings of hope and resourcefulness).[24] Cognitive reappraisal is a technique that may be learned and utilized to mitigate the impact of stress on an individual's well-being, including stress induced by a pandemic.

The current study revealed that patients with psychological problems are especially susceptible and in need of care, particularly during the current COVID-19 pandemic. Psychological therapy focusing on emotional regulation skills could be used to support them cope with the COVID-19 pandemic. Even though face-to-face interventions are not possible during the pandemic, psychological support via the Internet and phone can ensure that patients with a psychiatric condition receive the care they require. It appears that people are now better equipped to deal with COVID-19. The current study sought to better understand the perceptions and emotional control styles of people suffering from psychiatric diseases. This increases preparedness to deal with mental health issues in the event of future pandemics.

Strengths and limitations

The present study has several strengths and limitations. To the best of our knowledge, this is the first study in Thailand to investigate emotion regulation styles and the relationship between these factors and anxiety and depression in people with mental health problems. This study also included a large number of patients with mood and anxiety disorders, which could be investigated using an emotional regulation lens. However, this study has significant drawbacks. First, this study was conducted at a single site and included only outpatients with mood and anxiety disorders, which may have resulted in a selection bias, and the representativeness of the population was limited. Inpatients may have more active symptoms, and their reactions may differ. Second, not all psychiatric disorders were included. Therefore, our findings may not be representative of other psychotic problems. Furthermore, the symptoms were established through self-report rather than face-to-face questioning, which may have resulted in a reporting bias. However, during the pandemic, these methods proved useful for data collection. Next, because the data were collected only once during the second wave of the pandemic, which was around April-May 2020, we could not examine the change or trend of the response during the pandemic. Therefore, the data should be carefully interpreted because it may only reflect the perception and behavior toward COVID-19 of the population at that specific point in time. Although we observed an increase in negative feelings and emotional regulation among mental patients, as noted previously in the introduction and results of the manuscript, it is difficult to regulate external factors that influence each participant's perception of COVID-19. Each participant has a unique viewpoint on COVID-19 based on how they feel about various aspects, such as health, costs, employment, etc. Furthermore, we could not conclude that patients with depression and anxiety disorders tended to use expressive suppression during the COVID-19 pandemic any more than normal because only one time point of data was collected.

Future recommendations and implications

In contrast to other examples, such as HIV infection, it can have a direct impact on specific groups of people, such as minorities or vulnerable groups, which may not be socially acceptable. COVID-19, on the other hand, can have an individual influence in cluster outbreaks like those in pubs and clubs, or on groups that can easily be identified as spreaders. The participants in this study were not infected with COVID-19 at the time of the study. As a result, this could assist to rule out strong thoughts about being infected, such as being labeled, feeling guilty, and so on. However, in the current study, external influences and one's own views about the individual perspective were difficult to control. In order to address this challenge and obtain a clearer answer to the study, there may be several ways to design for additional research, such as: 1) inquiring into psychosocial issues that directly affect individual subjects for a better understanding of individual details, or 2) incorporating psychosocial variables into the analysis.

Further research across different sites and over time is necessary to understand the impact of the emerging disease pandemic on psychiatric problems and emotional control. Further research should cover additional mental illnesses, particularly in psychotic patients and inpatients who are more prone to stress. Furthermore, comparing people with and without psychiatric diagnoses should be considered in future studies. Nevertheless, the authors believe that the findings of this study contribute significantly to the literature on the experience of patients with psychiatric illnesses during the emerging disease pandemic. Furthermore, the association between emotion regulation strategies and mental health was investigated, which provides a foundation for future research and may lead to the development of useful interventions.

CONCLUSION

The results of the current study revealed that about a quarter to a half of the participants reported depressive

or anxiety symptoms. There was a significant difference in the median age of patients with anxiety and depression; participants with anxiety or depression were younger. Anxiety and depression were found to be associated with emotion regulation strategies. Patients with anxiety or depression tended to use expressive suppression more often than cognitive reappraisal. Understanding mood states and cognitive emotion regulation strategies will aid the future promotion of psychosocial interventions during pandemics.

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Potential conflicts of interest

None.

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