

Mental health status among chronic disease patients in Bangladesh during the COVID-19 Pandemic: Findings from a cross-sectional study

Yasmin Jahan¹, Zara Khair², Michiko Moriyama²,
Md Robed Amin³, Mohammad Delwer Hossain Hawlader⁴,
Taiyaba Tabassum Ananta⁵, Asma Binte Aziz⁶, Mohiuddin Sharif³,
Monirul Hasan⁷, Md Forhadul Islam Chowdhury⁸, Nusrat Benta Nizam⁹,
Syed Mohammad Ariful Islam¹⁰, Mohammad Habibur Rahman¹¹,
Mohammad Habibur Rahman Sarker^{2,12}, Md Moshir Rahman²

¹Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, United Kingdom, ²Department of Health Science, Graduate School of Biomedical and Health Sciences, Hiroshima University, Hiroshima, Japan, ³Department of Medicine, Dhaka Medical College, Dhaka, Bangladesh, ⁴Department of Public Health, North South University, Dhaka, Bangladesh, ⁵Department of Food and Nutrition, Government College of Applied Human Science, Dhaka, Bangladesh, ⁶International Vaccine Institute, Seoul, Korea, ⁷Department of Gastroenterology, Sir Salimullah Medical College, Mitford Hospital, Dhaka, Bangladesh, ⁸Department of Gastroenterology and Hepatology, Ship International Hospital, Dhaka, Bangladesh, ⁹Department of Ophthalmology, Bangladesh Institute of Health Sciences (BIHS) General Hospital, Dhaka, Bangladesh, ¹⁰Department of Oncology, Kurmitola General Hospital, Dhaka, Bangladesh, ¹¹Department of Medical Oncology, Ahsania Mission Cancer and General Hospital, Dhaka, Bangladesh, ¹²Department of Technical Training Unit, icddr, b, Dhaka, Bangladesh

ABSTRACT

Context: The COVID-19 epidemic has had a substantial influence on the mental health of chronic disease patients. However, there is a scarcity of research on them in Bangladesh. **Aims:** This study aims to explore the prevalence of and identify the risk factors for depression, anxiety, and stress symptoms during the COVID-19 pandemic among people with chronic diseases in Bangladesh. **Materials and Methods:** This cross-sectional study involving face-to-face and telephone interviews was carried out among Bangladeshi people diagnosed with chronic diseases between September and November 2020. The total sample size was 878, and a convenient sampling technique was used. Logistic regression analysis was performed to investigate potential influencing factors for depression, anxiety, and stress. **Results:** The mean age of respondents was 50.10 years. Among them, 35.0%, 36.0%, and 29.0% suffered from depression, anxiety, and stress symptoms, respectively. In multivariable logistic regression, depression had a significant positive association with higher age (≥ 60 years), lower income, rural residency, and loss of close family members due to COVID-19. Anxiety had a significant positive association with higher age (≥ 40 years), lower education, lower income, rural residency, and loss of close family members due to COVID-19. Stress had a significant positive association with higher age (≥ 40 years), no income, rural residency, and loss of close family members due to COVID-19. **Conclusion:** It is urgent to consider the risk of developing mental health distress among chronic disease patients, especially aged people, by health service providers and generate effective programs for emergency situations.

Keywords: Anxiety, chronic disease, COVID-19, depression, stress

Address for correspondence: Dr. Md Moshir Rahman,
1-2-3, Kasumi, Minami-ku, Hiroshima - 734-8553, Japan.
E-mail: moshir@hiroshima-u.ac.jp

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Introduction

The outbreak of coronavirus disease 2019 (COVID-19) has been substantially influencing the lifestyle of people globally.^[1,2] There have been 222,812,592 confirmed cases up to September 8, 2021, and 4,601,142 have succumbed to this disease or complications resulting from COVID-19.^[3] Particularly, older individuals and those with chronic diseases, such as diabetes mellitus (DM), hypertension, chronic respiratory disease, malignancy, and cardiovascular disease, seem to be most vulnerable.^[4-6] Evidence from China and Italy also indicates that the presence of comorbid chronic illnesses may increase the risk of death from COVID-19.^[4-6] The COVID-19 pandemic triggered a combination of both physical and mental suffering and unwell-being since its first outbreak.^[7] Extreme quarantine measures and fear have made it difficult for individuals to access routine medical care, especially in low- and middle-income countries (LMICs).^[8] Thus, it is reasonable to anticipate that patients with chronic diseases will face mental health issues like anxiety, depression, and stress.^[9]

The number of people affected by these symptoms tends to be higher than those affected by the infection.^[10] Limited knowledge about COVID-19, duration of home confinement, lack of access to healthcare systems, lack of physical activity, social isolation, and uncertainty regarding the economic scenario can be significant psychological stressors^[11-13] and cause adverse lifestyle changes.^[14] Existing literature points to a significant association between mental health conditions and chronic diseases like DM, cardiovascular diseases, and pneumonia.^[15,16] The presence of depressive comorbidity with DM in Bangladesh varies from 34% to 60%, depending on age, gender, and diabetes type.^[17-19] Amid the uncertainty and disruption of the COVID-19 pandemic in Bangladesh, mental health and chronic disease comorbidity may increase.

Apart from physical health, it is common that mental health remains neglected and explored later during a pandemic, especially for LMICs like Bangladesh. In Bangladesh, due to a lack of awareness and indifferent attitude, mental health is considered a stigma; people generally ignore its importance and adverse health impacts.^[20] The sudden outbreak of the COVID-19 pandemic and related uncertainty and fear may push the majority of the Bangladeshi population into a higher mental health risk.

Family doctors or primary care physicians play a vital role in reducing the risk of mental health issues in Bangladesh. This is especially crucial considering the country's inadequate mental health care services availability. Hence, considering their close proximity to the community and their understanding of cultural variables, primary care physicians can play a significant role in treating psychiatric issues triggered by COVID-19.^[21]

To the best of our knowledge, few studies have been conducted in Bangladesh exploring the mental health status of people with chronic diseases during COVID-19. Exploratory studies of mental health conditions and associated factors during this time

are essential to mitigate future negative mental health outcomes. We hypothesized that the prevalence of mental health distress is high among Bangladeshi residents with chronic diseases during this pandemic. Therefore, this study aims to explore the prevalence of and identify the risk factors for depression, anxiety, and stress symptoms during the COVID-19 pandemic among chronically diseased people in Bangladesh.

Materials and Methods

Study design and study participants

We performed a descriptive cross-sectional study from September and November 2020. Most of the data for this study were collected through face-to-face interviews at public tertiary hospitals in Bangladesh using convenient sampling.^[22] However, a small proportion of study participants were interviewed over the phone using snowball sampling procedures.

The inclusion criteria were: (i) Bangladeshi adults (aged ≥ 18 years) of either sex, (ii) Diagnosed with chronic diseases like DM, hypertension, chronic respiratory cases, malignancy, and cardiovascular disease (diagnosed by registered doctors' prescription and identified from different tertiary level hospitals in Bangladesh), (iii) understanding the study purpose, and (iv) voluntary participation in our study.

Sample size calculation and technique

Convenient and snowball techniques were used for data collection, and the sample size was calculated by using the following formula:

$$z^2 \times p \times (1 - p) / d^2$$

Here, we considered $z = 1.96$ and $d = 0.05$ confidence interval as 95%; the sample proportion was assumed to be 0.5 since this value provided the maximum sample size.^[23] Hence, the required sample size was 384. However, using design effect 2.3, the sample size was calculated to be 878. We considered the design effect for this study to increase the sample size and minimize the errors.

Study procedure

The Bangla questionnaire's validity was verified according to Sousa and Rojjanasrirat's (2011) guidelines.^[24] Two translators, one an expert in the subject matter and the other familiar with Bangla and English, translated the questionnaire. The two translations were reviewed by a four-person committee, who completed the initial Bangla version. Then, the committee finalized the initial draft of the Bangla version. A pre-test was conducted with 10-15 members of the participants to assess the questionnaire's acceptability and clarity. Following the pre-test, a few minor adjustments were made, but these surveys were not included in the final analysis.

Further, two bilingual translators, who had not seen the English version of the DASS-21, translated the questionnaire backward.

The reverse translation was approved by the same panel of experts. A pre-test was then conducted with this pre-final version with 10-15 chronic disease patients to check the item's suitability, meaning, and difficulty. No item was, however, required to be modified after the pre-testing.

Regarding face-to-face data collection, it took approximately 10-15 minutes to complete the survey, and for telephone interviews, the survey took approximately 15-20 minutes to complete.

Measures

In this study, the structured questionnaire containing questions regarding sociodemographic data and COVID-19-related factors was used for data collection. Sociodemographic variables included age, gender, marital status, education level, occupation, family type, monthly income, and residence. COVID-19-related factors included lost earnings (yes/no) and recently lost close family members (yes/no).

Depression Anxiety Stress Scale 21 (DASS 21)

The Depression Anxiety Stress Scale 21 (DASS-21) is a validated screening instrument for evaluating mental health status and was also used in previous surveys to ascertain the psychological status of the COVID-19 pandemic.^[25-27] The DASS has a strong construct, concurrent validity, and internal consistency reliability. Therefore, DASS 21 was used to assess depression, anxiety, and stress in this study. The scale includes 21 items divided evenly into three sub-scales of stress, anxiety, and depression with seven items each, and scored on a four-point Likert scale ranging from 0 ("never") to 3 ("always"). The sub-scale of depression consists of questions 3, 5, 10, 13, 16, 17, and 21, and the cut-off scores were: normal (0-4), mild depression (5-6), moderate depression (7-10), severe depression (11-13), and extremely severe depression (14 and above). The sub-scale of anxiety consists of questions 2, 4, 7, 9, 15, 19, and 20, and the cut-off scores were: normal (0-3), mild anxiety (4-5), moderate anxiety (6-7), severe anxiety (8-9), and extremely severe anxiety (10 and above). The sub-scale of stress consists of questions 1, 6, 8, 11, 12, 14, and 18, and the cut-off scores were: normal (0-7), mild stress (8-9), moderate stress (10-12), severe stress (13-16), and extremely severe stress (17 and above). The validated Bangla version of the DASS 21^[28] was used in this study due to its strong psychometric properties and ability to quickly assess stress, anxiety, and depression in Bangladeshi individuals. Alim *et al.*^[28] mentioned Cronbach's alpha of the total score was 0.989, demonstrating the scale to be reliable. Cronbach's alpha for depression, anxiety, and stress subscales were 0.987, 0.957, and 0.964, respectively. The correlation was significant at the 0.01 level (2-tailed).

Ethical consideration

Ethics approval was obtained from the Institutional Review Board/Ethical Review Committee (IRB/ERC) of North South University (2020/OR-NSU/IRB-No. 0801), Bangladesh. For

face-to-face interviews, consent was obtained from the study participants before the interview. Participants were well briefed on the process, study intent, and data confidentiality. Data were collected anonymously, and their participation was completely voluntary. Participants could withdraw from the study at any time, and no incentives were offered to participate in this study. However, before conducting the telephone interview, all respondents were given proper information about the interview process, and they verbally agreed to participate. They were also informed that their participation was voluntary and that they could withdraw from the interview at any time. The information they provided was kept confidential to ensure their privacy. All instructions were given to them in Bengali. After listening to or reading about the study's purposes, its nature, and risks and benefits, participants gave their consent to participate in the survey. Those who did not provide their consent were not required to participate in the survey.

Data analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS), IBM Statistics version 25. Descriptive analyses (frequency and percentages) to describe the sociodemographic characteristics and factors related to COVID-19 were performed. Logistic regression analysis was performed to investigate potential influencing factors for depression, anxiety, and stress. The results of regression analyses were reported by the odds ratio (OR) with a 95% confidence interval (CI). The association of variables was deemed statistically significant if the *P* value was below 0.05.

Results

A total of 878 participants completed the survey, and the mean age was 50.10 years (SD: 13.73). Most of them were female (53.0%), aged 40-59 years (50.3%), and married (87.2%). More than half of the participants had completed secondary level education (52.6%), and 50.8% of the participants' monthly income was BDT 1,000-30,000. About one-third (35.4%) had a joint family, 46.2% were rural residents, 46.6% lost earnings during COVID-19, and 14.1% had lost close family members during COVID-19 [Table 1].

Among the study participants, 35.0%, 36.0%, and 29.0% suffered from depression, anxiety, and stress symptoms, respectively [Figure 1]. Depression was categorized as follows: normal 43.2%, mild 12.5%, moderate 21.9%, severe 8.3%, and extremely severe 14.1%. Anxiety was categorized as follows: normal 41.9%, mild 9.0%, moderate 11.7%, severe 9.8%, and extremely severe 27.6%, and stress was categorized as normal 53.3%, mild 12.2%, moderate 15.4%, severe 14.8%, and extremely severe 4.3% [Table 2].

In multivariable logistic regression, depression had significant positive association with aged ≥ 60 years [adjusted OR (95% CI); 1.65 (1.04-2.59)], monthly income (1,000-30,000 BDT) [2.16 (1.30-3.57)], no monthly income [3.13 (1.79-5.47)],

rural resident [1.78 (1.27-2.47)] and participant recently lost their close family member due to COVID-19 [5.17 (3.07-8.70)]; however, significant negative association was observed with participants from joint family [0.71 (0.52-9.98)] [Table 3]. Anxiety had significant positive association with aged 40-59 years [adjusted OR (95% CI); 1.76 (1.20-2.59)], aged ≥60 years [2.28 (1.44-3.60)], education (primary level) [1.75 (1.05-2.93)], monthly income (1,000-30,000 BDT) [1.91 (1.16-3.14)], no monthly income [2.43 (1.40-4.22)], rural resident [1.83 (1.31-2.56)] and participant recently lost close family member due to COVID-19 [4.66 (2.81-7.75)] [Table 3]. Stress had a significant positive association with those aged 40-59 years [adjusted OR (95%

CI); 1.59 (1.08-2.33)], aged ≥60 years [2.20 (1.40-3.47)], no monthly income [2.25 (1.28-3.94)], rural resident [1.75 (1.26-2.43)] and participant recently lost a close family member due to COVID-19 [4.61 (2.89-7.34)] [Table 3].

Discussion

This study investigated the mental health status of people with chronic diseases in Bangladesh during the COVID-19 pandemic. In the present study, more than one-third of the patients suffered from depression (35.0%) and anxiety (36.0%), and one-fourth from stress (29.0%). The prevalence of anxiety in this study was higher than that of depression and stress; this is in keeping with current literature in which anxiety rates are frequently higher than depression and stress.^[29-31] A study carried out by Kaur *et al.*^[32] showed that the prevalence of depression, anxiety, and stress symptoms were 11.5%, 30.5%, and 12.5%, respectively, in patients with chronic diseases, which was consistent with our study findings. Conversely, several studies among patients with chronic diseases had found higher rates than our study.^[30,31] People with chronic diseases present higher levels of psychological symptoms due to the sudden occurrence, lack of good prognosis, and definitive treatment during pandemic situations.^[33,34]

Chronic disease occurs mostly in the age range between 35 years or more.^[35,36] In the present study, older age (≥60 years) was significantly associated with depression, anxiety, and stress, whereas participants aged 40-59 years had only anxiety and stress. Depression, anxiety, and stress are the most common psychological impacts of chronic diseases within these age

Table 1: Sociodemographic characteristics of the study participants (n=878)

Characteristics	Number	Percentage
Age		
18-39 years	188	21.4
40-59 years	442	50.3
60 and above years	248	28.2
Mean (SD)	50.10 (13.73) years	
Gender		
Male	413	47.0
Female	465	53.0
Education		
Class 11 and above completed	171	19.5
Class 6-10 completed	462	52.6
Class 5 and below (0-5)	245	27.9
Marital status		
Unmarried	37	4.2
Divorced	4	0.5
Widowed	71	8.1
Married	766	87.2
Family type		
Nuclear	567	64.6
Joint	311	35.4
Monthly income (in BDT)		
>30,000	102	11.6
1000-30000	446	50.8
No income	330	37.6
Residence		
Urban	472	53.8
Rural	406	46.2
Lost your earning COVID-19		
No	469	53.4
Yes	409	46.6
Lost close family members COVID-19		
No	754	85.9
Yes	124	14.1

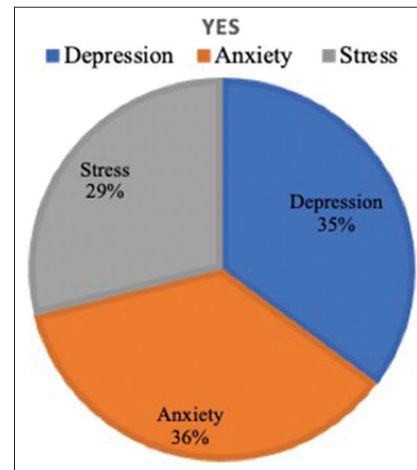


Figure 1: Mental health status among the study participants

Table 2: Frequency distribution of depression, anxiety, and stress in participants

Category	Score for depression	Depression n (%)	Score for anxiety	Anxiety n (%)	Score for stress	Stress n (%)
Normal	0-4	379 (43.2)	0-3	368 (41.9)	0-7	468 (53.3)
Mild	5-6	110 (12.5)	4-5	79 (9)	8-9	107 (12.2)
Moderate	7-10	192 (21.9)	6-7	103 (11.7)	10-12	135 (15.4)
Severe	11-13	73 (8.3)	8-9	86 (9.8)	13-16	130 (14.8)
Extremely severe	14+	124 (14.1)	10+	242 (27.6)	17+	38 (4.3)

Table 3: Association between the demographic characteristics and mental health status

Variables	Depression n (%)	ORs (95% CI)	Anxiety n (%)	ORs (95% CI)	Stress n (%)	ORs (95% CI)
Age group (in years)						
18-39 [®]	97 (19.4)		84 (16.5)		69 (16.8)	
40-59	245 (49.1)	1.25 (0.85-1.83)	260 (51.0)	1.76 (1.20-2.59)***	205 (50.0)	1.59 (1.08-2.33)***
≥60	157 (31.5)	1.65 (1.04-2.59)***	166 (32.5)	2.28 (1.44-3.60)***	136 (33.2)	2.20 (1.40-3.47)***
Gender						
Male [®]	236 (47.3)		244 (47.8)		201 (49.0)	1
Female	263 (52.7)	0.85 (0.54-1.34)	266 (52.2)	0.70 (0.44-1.11)	209 (51.0)	0.84 (0.54-1.32)
Education						
Secondary complete or higher (11 and above)	80 (16.0)	1	80 (15.7)		67 (16.3)	1
Secondary incomplete (6-10)	274 (54.9)	1.42 (0.94-2.16)	267 (52.4)	1.42 (0.94-2.15)	229 (55.9)	1.45 (0.95-2.20)
Primary complete or below (0-5)	145 (29.1)	1.25 (0.75-2.09)	163 (32.0)	1.75 (1.05-2.93)***	114 (27.8)	1.13 (0.67-1.88)
Marital status						
Unmarried [®]	72 (14.4)	1	66 (12.9)	1	56 (13.7)	1
Married	427 (85.6)	0.76 (0.47-1.20)	444 (87.1)	1.04 (0.65-1.66)	354 (87.2)	0.91 (0.58-1.43)
Family type						
Nuclear [®]	328 (65.7)	1	329 (64.5)	1	267 (65.1)	1
Joint	171 (34.3)	0.71 (0.52-9.98)***	181 (35.5)	0.79 (0.57-1.08)	143 (34.9)	0.78 (0.57-1.07)
Monthly income						
>30,000 [®]	35 (7.0)	1	39 (7.6)	1	33 (8.0)	1
1,000-30,000	253 (50.7)	2.16 (1.30-3.57)***	259 (50.8)	1.91 (1.16-3.14)***	198 (48.3)	1.50 (0.91-2.50)
No income	211 (42.3)	3.13 (1.79-5.47)***	212 (41.6)	2.43 (1.40-4.22)***	179 (43.7)	2.25 (1.28-3.94)***
Occupation						
Homemaker [®]	232 (46.5)	1	243 (47.6)	1	186 (45.4)	1
Service/business	188 (37.7)	1.00 (0.60-1.68)	188 (36.9)	0.80 (0.47-1.35)	157 (38.3)	1.02 (0.61-1.70)
Student/retired/other	79 (15.8)	0.69 (0.40-1.20)	79 (15.5)	0.63 (0.36-1.10)	67 (16.3)	0.71 (0.41-1.22)
Residence						
Urban [®]	242 (48.5)	1	241 (47.3)	1	199 (48.5)	1
Rural	257 (51.5)	1.78 (1.27-2.47)***	269 (52.7)	1.83 (1.31-2.56)***	211 (51.5)	1.75 (1.26-2.43)***
Lost your earning during COVID-19						
No [®]	262 (52.5)	1	270 (52.9)	1	222 (54.1)	1
Yes	237 (47.5)	0.95 (0.68-1.31)	240 (47.1)	0.81 (0.58-1.13)	188 (45.9)	0.84 (0.61-1.17)
Recently lost close family members during COVID-19						
No [®]	397 (79.6)	1	411 (80.6)	1	319 (77.8)	1
Yes	102 (20.4)	5.17 (3.07-8.70)	99 (19.4)	4.66 (2.81-7.75)	91 (22.2)	4.61 (2.89-7.34)***

***P<0.001; [®]=Reference

groups^[37] and can negatively affect the patient's quality of life. Besides, it may be due to the fact that old age increases the risk of COVID-19-related infection and mortality.^[38]

Moreover, no significant relationship was observed between depression, anxiety, and stress, with variables sex, marital status, occupation, and loss of earnings.^[39] Additionally, we found the patients with primary education and below had a high level of anxiety. This is probably because of job insecurity, a low level of self-awareness or knowledge of their health.^[40]

Depression was negatively associated with joint family type, which is inconsistent with other studies.^[41,42] Joint families have been found to provide emotional and interpersonal support, which may have contributed to better experiences and lower levels of depression.^[43] In this study, no or lower level of income significantly predicted depression, anxiety, and stress. Studies found that lower family income may lead to more stress responses, anxiety, and depression.^[44,45] The reason behind that

could be household poverty,^[46] limited resources,^[47] health care expenditure,^[48] and so on.

Multivariate Logistic regression analysis suggested that persons living in urban areas were less likely to suffer from depression, anxiety, and stress than rural areas. This might be explained by the fact that urban areas have better economic, cultural, and educational resources and better access to health, hygiene, and sanitary conditions than rural areas.^[49] However, the death of a beloved leads to psychological problems, such as stress.^[50] Studies found that the death of a family member may psychologically affect the other family members because they cannot perform the last rites and attend the funeral, which turns into intense grief and stress.^[51]

Further, the emergence of the pandemic has hindered efforts to diagnose, treat, and monitor chronic illnesses, particularly in older adults and individuals with comorbidities that can be life-threatening. Additionally, people with multiple chronic

diseases need regular check-ups or hospital visits to manage their risk factors. But, due to the COVID-19 pandemic, these in-person interactions have become challenging. To reduce the risk of transmission, healthcare providers have adapted to new methods of providing care through telemedicine.^[52] People with chronic diseases and who have mental health issues often feel more secure knowing that their primary care physician is available via teleservice. Therefore, it is recommended that primary care physicians make use of this facility to consult with a mental health specialist via telemedicine and digital mode.

Nonetheless, this study has some limitations. Our data was generated by participants' subjective reports of their experiences and emotions and subjected to response bias. The self-reporting of depression, anxiety, or stress symptoms is not equivalent to a structured diagnostic interview^[53] and cannot be used to classify a mental health disorder as a depressive disorder. Besides, the present study does not provide any qualitative information regarding preventive measures and coping strategies for people with chronic diseases, which are warranted in future studies.

Despite these limitations, this study provides novel information regarding the psychological states of Bangladeshi people with chronic diseases in the context of COVID-19. This is among the first few studies in Bangladesh's context on the mental health impacts of the COVID-19 pandemic among people with chronic diseases. This study included people with chronic diseases from all divisions across Bangladesh, and the recruitment methods captured the diverse backgrounds of the study participants. The findings of this study might be helpful for concerned authorities to plan and adopt appropriate interventions to ensure sound mental health for people with chronic diseases in the context of COVID-19.

Conclusion

This study explores the psychological symptoms among people with chronic diseases during the COVID-19 pandemic. The results of this study could be valuable in detecting mental health problems and identifying individuals with chronic disease conditions who are at a higher risk and may benefit from interventions. Further, due to the insufficient mental health resources available in the country and the restricted community access during the COVID-19 pandemic, it has become necessary for family and primary care physicians to manage psychological issues along with physical illnesses. Further, primary care physicians may take appropriate measures to combat mental health issues among people with chronic diseases, possibly by reaching out via telemedicine sessions. Therefore, it is imperative for primary care physicians to possess sufficient knowledge and skill in addressing frequent mental health concerns that arise in the context of infectious disease outbreaks, such as COVID-19. Additionally, a longitudinal study is necessary to investigate the relationships between mental health issues and COVID-19-related factors in more detail, and the findings could be used to enhance the health of individuals with chronic diseases.

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Conflicts of interest

There are no conflicts of interest.

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