

COVID-19 and mental health: Anxiety disorders among immigrants due to COVID-19 outbreak in South Korea

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Abstract

Background: The COVID-19 pandemic has affected various facets of health. While mental health became a major concern during the COVID-19 outbreak, the impact on the migrants' mental health has still been neglected. The purpose of this study was to examine the COVID-19 outbreak's impact on the mental health of immigrants in South Korea.

Methods: A total number of 386 immigrants in South Korea participated in this quantitative cross-sectional study. The standardized e-questionnaire, including the General Anxiety Disorder (GAD-7) scale, was used to measure the anxiety level. Logistic regression analysis was performed to find out the determinants of anxiety disorders among immigrants.

Results: The prevalence of severe anxiety among immigrants was found to be 47.2%. Female immigrants (28.6%) had a lower anxiety disorder than males (71.4%). Immigrants who were married, living alone, had a low income, had a history of health problems were suffered from moderate to severe anxiety. Immigrants who

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were unemployed (OR 2.302, 95% CI = 1.353–3.917) and lost their jobs due to the COVID-19 outbreak (OR 2.197, 95% CI = 1.312–3.678) have a higher anxiety disorder. Immigrants aged over 30 years were found to suffer from a high level of anxiety (OR 2.285, 95% CI = 1.184–4.410). Relief support from the government was significantly associated with anxiety disorder among immigrants ($p < 0.01$, OR = 3.151, 95% CI = 1.962–5.061).

Conclusion: With very limited studies on immigrants' mental health during the COVID-19 pandemic, this paper provides scientific research evidence of the COVID-19 outbreak's impact on the mental health of migrants. Our study has consequences for implementing integrated psychological interventions and health promotion strategies for the well-being of immigrants' mental health.

Keywords

COVID-19, mental health, migrant health, anxiety disorder

Introduction

The COVID-19 pandemic has led to a series of adverse cognitive reactions and perceptions among people in all sectors. As a result, a novel coronavirus, SARS-CoV-2, which was first identified in Wuhan City, China in December 2019, has the potential to cause chronic cognitive impairments such as stress, anxiety and psychosocial effects.^{1,2} COVID-19 outbreak has had a major impact on the lives of individuals around the world, especially since the declaration of a global pandemic by the World Health Organization in March 2020.³ South Korea confirmed its first case of COVID-19 on 20 January. As of 19 February 2021, 86,128 cases of COVID-19 in South Korea have been confirmed, with a large number of cases in the Seoul area (27,101 cases).⁴ A series of stringent measures have been introduced in many countries, such as banning transport, locking down to contain the spread of extremely infectious diseases and ensuring that people remain safe at home.^{2,5–8} Almost all individuals affected by or during global emergencies are reported to have some level of psychological distress over time. Psychological and behavioral approaches to pandemic outbreaks have been discussed in many published reports.^{6,9–16}

With over 2.6 million immigrants currently living in South Korea with some undocumented immigrants,¹⁷ a socioeconomic perspective on the current COVID-19 pandemic within the immigrant population is essential. During the COVID-19 pandemic among immigrant communities, worsening socioeconomic conditions and employment losses among low-income households are especially at a high risk of psychiatric disorders.^{10,18,19} In addition, existing research shows that the burden and seriousness of COVID-19 is already at risk for immigrants

and minority groups.^{8,12,14,15,18,20–23} Employment and financial problems are significant documented factors that contribute to negative psychological consequences in immigrant communities, and mental anxiety and depression have been linked with economic stress. The magnitude of the impact on migrant workers should not be understated. Like past outbreaks, social and economic factors will greatly affect the health consequences of COVID-19.^{18,19,24} However, it is predictable that a vulnerable population, particularly the immigrant population, will be severely impacted.

The COVID-19 pandemic presents a scenario in which unprecedented numbers of people are at increased risk of psychological distress because of job loss and financial instability that are associated with adverse psychological impacts.^{5,6,11,14,25} In any epidemic or pandemic situation, there is an unmet need for a greater understanding of the management of anxiety and depression. The development of social media and social networking has made it easier to share the severity of the problem, but the higher levels of indirect exposure have increased, leading to stress, anxiety, and depression.^{6,14,15,25–27} Depression and anxiety are found to increase with age and are more common in an outbreak setting.^{5,14} Migrant groups are considered vulnerable as most of them are not included in the public policies of foreign countries, do hard work with low pay, operate in a dangerous working environment and have to work with substantial cultural and linguistic barriers. Immediate problems faced by migrant workers include food, accommodation, medical care, the risk of becoming sick or contracting the virus, lack of income, family worries, anxiety, and fear. Even in the broader culture, they also face harassment and adverse reactions.^{8,14–16,20,21,23,24,27–29}

Several studies can be found on anxiety, depression and stress assessment in various settings.^{5,9–11,13–15,19,21,23,25,30} However, there are limited studies that examine people's mental suffering during the course of an epidemic. To our best understanding, this paper is the first psychological distress analysis centered on the mental health of immigrants in South Korea amid the COVID-19 pandemic. This study highlighted the levels of anxiety in the immigrant population attributable to COVID-19 pandemic via the GAD-7 tool. With the implementation of anxiety measures, we have found evidence of severe anxiety disorder symptoms among immigrants.

Methodology

Study setting and sample

The study participants were 386 immigrants in South Korea. The cross-sectional quantitative study was conducted among immigrants in Korea to assess the prevalence of anxiety during the COVID-19 pandemic. Immigrants over 18 years old and who were able to provide their consent were included in the

study. Non-probability sampling methods (convenience and snowball sampling) were mainly performed for sampling purposes. The sample size was calculated by using this formula;

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

By taking the proportion to be 50%, at a confidence interval of 95% and a 5% margin of error, a sample size of 385 was calculated for the study. Altogether, 386 immigrants who completed the survey were included in this study.

Data collection and statistical analysis

The quantitative data was collected from 05–17 October, 2020, using a structured questionnaire that consists of informed consent, demographic data and the General Anxiety Disorder (GAD-7) scale. As the South Korean government implemented COVID-19 restrictive control measures, the online survey questionnaire was distributed to immigrants on various social media platforms through a Google form. The data was analyzed using IBM SPSS 23.0. Basic information about immigrants and their anxiety responses was analyzed using descriptive statistics. Logistic regression was used to investigate the factors influencing the anxiety level among immigrants categorized into low and high anxiety based on GAD-7 score. The level of statistical significance was defined as $p < 0.05$.

Variable measures

Basic Information: The age of the immigrant, marital status, education level, employment status, income, residency, living type, work situation during the COVID-19 pandemic, previous health conditions and the relief fund from the South Korean government were considered as the independent variables for the study.

Anxiety disorder: Anxiety was evaluated by using the Generalized Anxiety Disorder (GAD-7) tool. The GAD-7 scale consists of a 7-item questionnaire that asks participants how frequently they were bothered by each symptom in the previous two weeks. Response options were “not at all,” “several days,” “more than half the days,” and “nearly every day,” scored as 0, 1, 2, and 3 respectively. GAD-7 having a sensitivity of 89% and a specificity of 82% has been found very successful in identifying anxiety among different populations. A score of 0–4 was considered minimal anxiety; 5–9 was considered mild anxiety; 10–14 was considered moderate anxiety and 15–21 was considered severe anxiety.³¹ The anxiety score was further dichotomized for the logistic regression

analysis. Anxiety score of ≤ 10 was considered as immigrants with low anxiety and > 10 were considered as immigrants with high anxiety.

Ethical consideration

Ethical approval was taken from the ethical review board of Inje University, South Korea. Informed consent was taken from all participants, which was included in the online survey form. All immigrants were given information about the research purposes and the confidentiality of information.

Results

Table 1 shows the socio-demographic and work-related information of immigrants. More than half (56.7%) were living alone and 66.8% of the immigrants were employed. Nearly two-quarters of immigrants were living in the capital area. More than half of immigrants were working in the company during the COVID-19 pandemic, while 27.2% of the immigrants lost their jobs due to the COVID-19 outbreak. Immigrants were found to have a history of chronic diseases (10.1%) and psychiatric conditions (7.5%) in their past life span. Although the Korean government distributed various kinds of social relief funds during the COVID-19 pandemic to the people, more than half of the immigrants (60.9%) didn't receive the relief funds yet. None of the immigrant were found to be infected with COVID-19. Results show that 185 (47.9%) of immigrants were found to have severe anxiety, followed by moderate anxiety (26.2%), mild anxiety (21.8%) and minimal anxiety (4.1%), as depicted in Figure 1.

Tables 2 and 3 show the prevalence of anxiety disorders at various levels among immigrants. Among the immigrants, 370 (95.9%) exhibited anxiety disorders from mild to severe. Female immigrants (28.6%) had lower anxiety disorders as compared to male immigrants (71.4%). Immigrants over the age of 25 (80.7%) had a higher prevalence of mild to severe anxiety disorders than those under the age of 25 (15.3%). Married immigrants were found to have higher mild to severe anxiety levels than single immigrants. Immigrants living alone (54.6%) were more prone to mild to severe anxiety disorders than those living with their family members (41.2%). Immigrants with a monthly income of less than \$2000 have a high level of anxiety. Immigrants working in the company during the COVID-19 pandemic (39.8%) were found to be suffer from a moderate to severe level of anxiety than those who lost their jobs due to the COVID-19 outbreak (24.1%) and working from home (5.9%). Among immigrants who have a history of chronic disease, the severe anxiety level was found to be 46.1% followed by a moderate anxiety level (25.6%). Immigrants with a history of psychiatric conditions were found to have moderate (24.1%) to severe anxiety disorders (44.9%). Immigrants who received relief funds and support (13.5%) from the Korean government due to the COVID-19 outbreak had lower severe anxiety disorders than immigrants who didn't

Table 1. Information of the immigrants for selected variables.

Variable	Frequency	Percent
Age		
18–25 years	64	16.6
26–30 years	174	45.1
>30 years	148	38.3
Gender		
Male	274	71.0
Female	112	29.0
Education status		
Primary	51	13.2
High school/college	178	46.1
Bachelor/MS/PhD	157	40.7
Marital status		
Single	143	37.0
Married	243	63.0
Living type		
Alone	219	56.7
With family	167	43.3
Employment		
Yes	258	66.8
No	128	33.2
Monthly income (USD)		
<2000\$	172	44.6
2000–3000\$	145	37.6
>3000\$	69	17.9
Residence		
Seoul	99	25.6
Gyeonggi	90	23.3
Gangwon	71	18.4
Chungcheong	50	13.0
Gyeongsang	52	13.5
Jeolla	24	6.2
Work situation during COVID-19 outbreak		
Work from home	32	8.3
Work in the company	224	58.0
Lost a job	105	27.2
Not working before and during the COVID-19 outbreak	25	6.5
Diagnosed with any psychiatric condition		
Yes	29	7.5
No	357	92.5
Diagnosed with any chronic medical disease		
Yes	39	10.1
No	347	89.9

(continued)

Table I. Continued.

Variable	Frequency	Percent
Relief fund		
Yes	151	39.1
No	235	60.9
COVID-19 Infection		
Yes	0	0
No	386	100

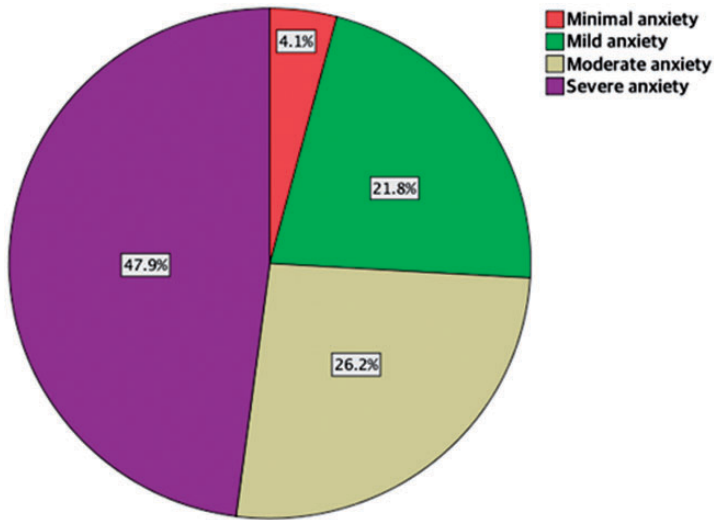


Figure 1. Anxiety level due to COVID-19 outbreak among immigrants.

receive any relief funds (34.5%). Immigrants were predominantly worried about the impact on social life (72%) and losing their jobs amid the COVID-19 pandemic (49.2%) as shown in Figure 2.

The age of the immigrants was found to be significantly associated with anxiety level ($p = 0.045$). Table 3 reveals that immigrants aged 26–30 years tend to have 1.6 times more high anxiety disorders (95% CI: 0.849–2.949) and immigrants aged >30 years were 2.3 times more likely to show high anxiety disorders (95% CI: 1.184–4.410) than immigrants aged 18–25 years. The immigrants who weren't employed were found to suffer 2.3 times more from anxiety (95% CI: 1.353–3.917) compared with the immigrants who were employed during the COVID-19 pandemic. The immigrants who lost their jobs due to the COVID-19 outbreak were 2.2 times (95% CI: 1.312–3.678) more likely to

Table 2. Anxiety level among immigrants during COVID-19 outbreak.

Variable	Anxiety level (GAD-7 scale)			
	Minimal	Mild	Moderate	Severe
Age				
18–25 years	5 (1.3)	18 (4.7)	21 (5.4)	20 (5.2)
26–30 years	5 (1.3)	40 (10.4)	45 (11.7)	84 (21.8)
>30 years	6 (1.6)	26 (6.7)	35 (9.1)	81 (21.0)
Gender				
Male	10 (2.6)	61 (15.8)	77 (19.9)	126 (32.6)
Female	6 (1.6)	23 (6.0)	24 (6.2)	59 (15.3)
Education status				
Primary	5 (1.3)	11 (2.8)	16 (4.1)	19 (4.9)
High school/college	7 (1.8)	44 (11.4)	40 (10.4)	87 (22.5)
Bachelor/MS/PhD	4 (1.0)	29 (7.5)	45 (11.7)	79 (20.5)
Marital status				
Single	8 (2.1)	30 (7.8)	40 (10.4)	65 (16.8)
Married	8 (2.1)	54 (14.0)	61 (15.8)	120 (31.1)
Employment				
Yes	12 (3.1)	69 (17.9)	63 (16.3)	114 (29.5)
No	4 (1.0)	15 (3.9)	38 (9.8)	71 (18.4)
Living type				
Alone	8 (2.1)	43 (11.1)	54 (14.0)	114 (29.5)
With family	8 (2.1)	41 (10.6)	47 (12.2)	71 (18.4)
Monthly income (USD)				
<2000\$	8 (2.1)	33 (8.5)	50 (13.0)	81 (21.0)
2000–3000\$	6 (1.6)	38 (9.8)	36 (9.3)	65 (16.8)
>3000\$	2 (0.5)	13 (3.4)	15 (3.9)	39 (10.1)
Work situation				
Work from home	1 (0.3)	8 (2.1)	7 (1.8)	16 (4.1)
Work in the company	10 (2.6)	60 (15.5)	55 (14.2)	99 (25.6)
Lost a job due to Covid-19	2 (0.5)	10 (2.6)	28 (7.3)	65 (16.8)
Not working before and during the Covid-19 outbreak	3 (0.8)	6 (1.6)	11 (2.8)	5 (1.3)
Residence				
Capital area	8 (2.1)	39 (10.1)	47 (12.2)	95 (24.6)
Non-capital area	8 (2.1)	45 (11.7)	54 (14.0)	90 (23.3)
Diagnosed with chronic medical disease (n = 39)	0 (0)	11 (28.3)	10 (25.6)	18 (46.1)
Diagnosed with psychiatric condition (n = 29)	1 (3.4)	8 (27.6)	7 (24.1)	13 (44.9)
Relief fund				
Yes	6 (1.6)	51 (13.2)	42 (10.9)	52 (13.5)
No	10 (2.6)	33 (8.5)	59 (15.3)	133 (34.5)

Table 3. Logistic regression analysis for anxiety disorders based on the GAD-7 scale.

Variables	Anxiety level		B	P-value	OR (95% CI)
	Low	High			
Age (ref: 18-25 years)				0.045*	
18-25 years	24 (6.2)	40 (10.4)			
26-30 years	54 (14)	120 (31.1)	0.459		1.582 (0.849-2.949)
>30 years	36 (9.3)	112 (29)	0.826		2.285 (1.184-4.410)
Gender (ref: male)				0.705	
Male	84 (21.8)	190 (49.2)			1.107 (0.655-1.871)
Female	30 (7.8)	82 (21.2)			
Education status (ref: primary)				0.355	
Primary	18 (4.7)	33 (8.5)			
High School/College	56 (14.5)	122 (31.6)	0.256		1.291 (0.658-2.534)
Bachelor/MS/PhD	40 (10.4)	117 (30.3)	0.488		1.629 (0.814-3.260)
Marital status (ref: single)				0.584	
Single	43 (11.1)	100 (25.9)			1.150 (0.698-1.896)
Married	71 (18.4)	172 (44.6)			
Living type (ref: alone)				0.944	
Alone	57 (14.8)	162 (42)	-0.017		0.983 (0.614-1.573)
With Family	57 (14.8)	110 (28.5)			
Employment (ref: yes)				0.002*	
Yes	88 (22.8)	170 (44)			2.302 (1.353-3.917)
No	26 (6.7)	102 (26.4)			
Monthly income (ref: >3000\$)				0.473	
<2000\$	48 (12.4)	124 (32.1)	-0.092		0.912 (0.485-1.716)
2000-3000\$	48 (12.4)	97 (25.1)	-0.338		0.713 (0.376-1.351)
>3000\$	18 (4.7)	51 (13.2)			

(continued)

Table 3. Continued.

Variables	Anxiety level		B	P-value	OR (95% CI)
	Low	High			
Residency (ref: capital area)					
Capital area	54 (14)	135 (35)	-0.009	0.970	0.991 (0.622-1.579)
Non-capital area	60 (15.5)	137 (35.5)			
Work situation during COVID-19 outbreak (ref: working)					
Working	87 (22.5)	169 (43.8)	0.787	0.003*	2.197 (1.312-3.678)
Lost a job	27 (7)	103 (26.7)			
Diagnosed with any psychiatric condition (ref: yes)					
Yes	11 (2.8)	18 (4.7)	0.034	0.941	1.035 (0.415-2.583)
No	103 (26.7)	254 (65.8)			
Diagnosed with any chronic medical disease (ref: yes)					
Yes	11 (2.8)	28 (7.3)	-0.243	0.575	0.784 (0.335-1.835)
No	103 (26.7)	244 (63.2)			
Relief fund (ref: yes)					
Yes	67 (17.4)	84 (21.8)	1.148	0.000*	3.151 (1.962-5.061)
No	47 (12.2)	188 (48.7)			

Ref: Reference group; OR: Odds ratio; CI: Confidence interval.

*Statistically significant at $p < 0.05$.

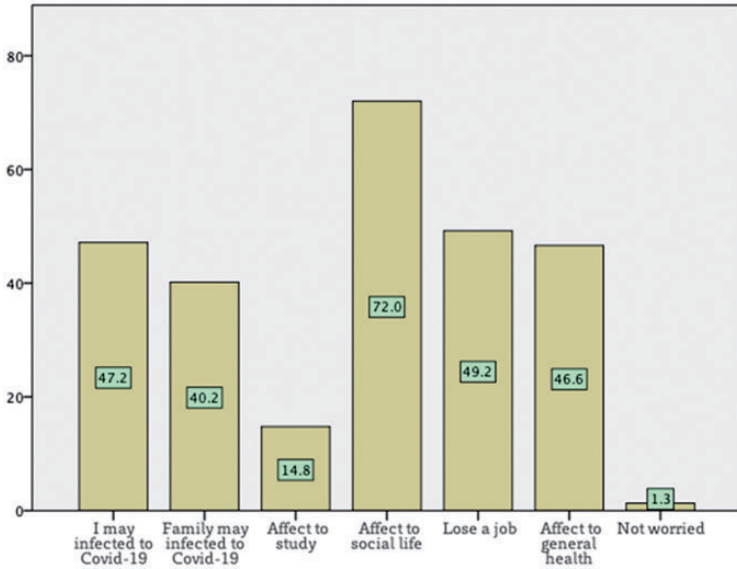


Figure 2. Main worries due to COVID-19 outbreak.

have high anxiety disorders than immigrants who were working during the COVID-19 pandemic. The immigrants who didn't receive any relief funds and support from the Korean government during the COVID-19 pandemic were 3.1 times (95% CI: 1.962–5.061) more likely to suffer from a high anxiety disorder than those who received the relief funds. However, gender, history of health conditions, residence, education, income and living type were not found to be statistically associated with anxiety disorders among immigrants.

Discussion

Our study findings show that immigrants suffered from severe anxiety disorder (47.9%) amid the COVID-19 pandemic, which was found to be higher as compared with the studies from Korea; 29.7%,¹³ 29.5%,³² 24.8%,³³ 15.2%³⁴ and other nations.^{5,6,11,13} Due to a lack of quantitative studies focusing solely on immigrants' mental health during the COVID-19 outbreak, our findings suggest that immigrants are experiencing an unprecedented occurrence of anxiety disorders in the current global pandemic scenario.

Our study found no significant association between male and female immigrants with anxiety but immigrants above 25 years old were more likely to suffer from anxiety disorders.⁵ Yet other studies have found no association between age and gender with anxiety. In contrast, in the study from Korea, gender was found to be significantly associated with anxiety. Females can feel significant

stress as a result of job instability due to uncertainty about the future.^{13,32,35} This study has shown that the majority of the female participants were working during the COVID-19 pandemic.

Previous findings found that the employment condition, validated by our study, was strongly correlated with anxiety. The sudden unemployment and economic recession have placed immigrants in worse condition, impacting their mental well-being.^{5,21,36} No statistically significant association was observed between other socio-demographic variables, such as income, marital status, education with anxiety. On the contrary, only a few studies have established a substantial correlation with education, income and marital status.^{5,37} Our research showed that living areas had no effect on the level of anxiety, supported by a study carried out in Korea among migrant workers.²⁴

Anxiety was associated with living type, and people who were living with their family were more likely to suffer from anxiety than those who were living alone.⁶ There was also no statistical connection in our study.^{5,13} However, immigrants living alone were found to be suffer from moderate to extreme anxiety compared to immigrants living with their family.

Immigrants with a history of chronic disease and psychological illness have not been statistically linked with anxiety disorders found to be identical to prior research outcomes.^{5,14,24} In order to solve the challenges of mental wellbeing, mental health resources and a community-based support program are required urgently.^{11,18,19,21,24} The social relief support was a significant factor associated with anxiety disorders among immigrants. Our research also supports micro-level resources focused on this community to promote immigrants' mental health. The study from Korea also showed that social support was associated with depression and stress among migrant workers.²⁴ Certain local governments in Korea rendered social support to immigrants residing in some provinces or urban areas. Disparities in social support services should be avoided. During the COVID-19 pandemic, low-income immigrants were found to be more vulnerable to psychological disorders.^{11,14,26} Our study also discovered that low-income immigrants experienced moderate to severe anxiety.

The prevalence of mental disorders in the outbreak and conflict-affected population was estimated by WHO to be 17% for mild to moderate forms of depression, anxiety, and stress. In comparison, our results found 95.9% among the studied population for mild to severe forms of anxiety. Policies and initiatives relating to the health and wellbeing of immigrants relevant to outbreaks like COVID-19 are essential to provide assurances.^{8,14,15} Immigrant mental health has not yet been quantified, so further research is needed into this problem. In order to mitigate the health inequities and financial burdens during an outbreak, care of vulnerable populations, including immigrants, should be highlighted.

With limited study design due to the lack of resources and time mobilization during the COVID-19 pandemic, we performed snowball and convenience sampling. We investigated anxiety disorder levels among immigrants in South Korea

via an online questionnaire under strict social distancing measures during the COVID-19 pandemic. It wasn't possible to conduct this study during this global crisis situation without online methods. Face to face interaction or focus-group discussion may have supported the underlying evaluation of physiological impacts. Our study findings emphasize overall immigrants, which may not reflect the anxiety disorders among specific immigrant communities and ethnicities from each respective country. This calls for more research focusing on the specific immigrant community.

Conclusion

The COVID-19 pandemic has had a significant impact on the mental health of immigrants. Severe anxiety level was found to be highly prevalent among immigrants. Immigrants with a history of chronic and psychological events were shown to be more vulnerable to anxiety disorders. The primary contributors to the anxiety disorder were age, social relief funds, and working conditions. Our study provides the first empirical evidence of psychological effects on immigrants in South Korea during the COVID-19 outbreak. Furthermore, psychological intervention measures and the development of mental health assessment tools are critical, particularly in outbreak crises like COVID-19.

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Authors' contributions

SRA interpreted the study information, analysis and manuscript writing. YCS, DHM and JHC performed research concept and literature discussion.

Author's Note

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Ethics approval and consent

Ethical approval was taken from the Inje university. The informed consent was also taken from each participant.

Declaration of conflicting interests

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