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Dual Pillars of Resilience: Community and Individual factors in Young Adults' Mental Health During the Coronavirus Disease 2019

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This study examined how resilience and community resilience moderate and mediate the relationship between perceived stress and mental health (depression, anxiety, and anger) among adults in their 20s during the COVID-19 pandemic. An online survey of 229 participants was analyzed using SPSS Windows software version 23.0 for descriptive and correlation statistics, while PROCESS Macro (version 3.3) was employed to assess the moderated mediation effects. The results indicated significant correlations among all variables, with resilience mediating the relationship between perceived stress and mental health. Community resilience significantly moderated the relationship between resilience and mental health. The moderated mediation effect was also significant, suggesting that community resilience influences how resilience mediates the effect of perceived stress on mental health. These findings highlight the importance of strengthening community resilience to enhance mental health outcomes. Based on the results, the study`s strengths, limitations, and suggestions were discussed.

Keywords: perceived stress, community resilience, resilience, mental health, coronavirus disease 2019

Introduction

It is no exaggeration to say that Coronavirus Disease 19 (COVID-19), which broke out at the start of 2020, is not just a disease but has changed the lives of people around the world. It has been found that the disasters such as COVID-19 or extreme external stressor events have negative effects on individual lives (Boon et al., 2012; Kimhi & Shamai, 2004). According to previous studies on past epidemic situations (Ebola, SARS, MERS, H1N1, etc.), individuals experience fear not only for their own health but also for infecting their family or neighbors (Cava et al., 2005; Desclaux et al., 2017). In addition, they also experience job loss and economic damage (Pellecchia et al., 2015), and such experiences have been reported to be related to psychopathologies such as depression (Hawryluck et al., 2004), anxiety (Bai et al., 2004), and anger (Marjanovic et al., 2007).

All the studies conducted in China (Huang & Zhao, 2020; Wang et al., 2020), Italy (Cellini et al., 2020; Gualano et al., 2020), and Spain (Gonzàlez et al., 2020) reported increases in anxiety, depression, and stress after isolation, and some of them reported complaints of sleep disturbance (Cellini et al., 2020; Gualano et al., 2020; Huang & Zhao, 2020), and even the experience of PTSD (Gonzàlez et al., 2020). These results show that the mental health of many citizens is threatened in the COVID-19 era.

Considering that the COVID-19 pandemic, which adversely affects mental health, is expected to last for a long time, it is urgent to

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identify factors that have a protective effect on individual mental health. Protective factors in a disaster refer to factors that protect individuals by preventing threats, minimizing risks, improving their ability to adapt after experiencing a disaster, and giving them the ability to control stress (Halpern & Tramontin, 2007).

Previous studies on the relationship between disasters and mental health have reported that resilience is an effective protective factor. This study focused on psychological resilience, the ability of individuals to cope with perceived stress during the COVID-19 pandemic, and social structural resilience, the ability of the community to cope with the COVID-19 pandemic. The term used to indicate psychological resilience is 'Resilience,' commonly defined in psychology as 'an ability to effectively utilize internal and external resources' (Waters & Sroufe, 1983) or 'the ability to lower stress by being affected less by stressful situations and to cope effectively in stressful situations' (Luthar & Cicchetti, 2000). The term used to indicate social structural resilience is 'Community Resilience' defined as 'the ability of an individual's community to return to normal and recover from disasters and adversity.'

Recently, the importance of not only individual resilience but also the resilience of the community to which individuals belong in disaster situations has attracted increasingly more attention (Leykin et al., 2013; Masten & Narayan, 2012). Previous studies have shown that community resilience affects individual adaptation after a disaster (Braun-Lewensohn & Sagy, 2014; Comfort et al., 2010), and have reported that, depending on the circumstances, community aid or supportive relationships are more effective than individual approaches (Allen et al., 2010; Shalev & Freedman, 2005).

Allen et al. (2010) and Shalev & Freedman (2005) emphasized the formation of a supportive relationship that ensure safety and address needs between individual and community. In particular, the assertion that environmental intervention is more effective than psychotherapeutic intervention in the early stages of a disaster (Bonanno, 2004; Gist & Woodall, 2000) shows the importance of proper implementation of personal and environmental intervention according to the stage of disaster and specific circumstances.

The purpose of this study was, accordingly, to examine whether the resilience, as an individual factors and community resilience, as a social factor, mitigate the effects of subjectively perceived stress on mental health in the disaster situation of COVID-19. Community resilience was used as a moderating variable in this study, based on its characteristics that it is influenced by community policies, responses, and practical support rather than individual experiences, and it is formed over a long period of time rather than a short period of time. The effect on individual mental health was measured by dividing it into depression, anxiety, and anger. Figure 1 shows theoretical models.

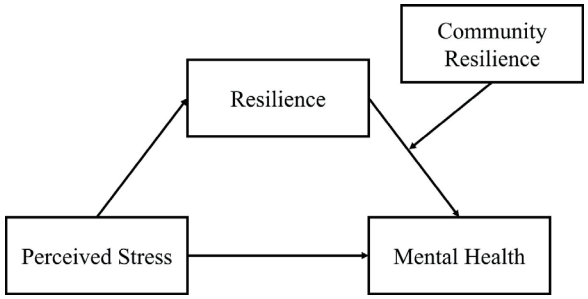


Figure 1. *Theoretical model of the prospective study.*

Methods

Ethics Statement

The project (KYU-2020-040-04) was approved by Konyang University Institutional Review Board ethics committee.

Study Design

The study employed a cross-sectional design, utilizing an online survey to collect data. Participants were 229 adults in their 20s residing in The Republic of Korea, and the survey was conducted online due to COVID-19. After excluding 55 subjects, including those under the age of 19, those over the age of 30, overseas residents, and insincere respondents.

Participants

229 subjects' (male: $n=52$, 22.7%; female: $n=170$, 74.2%; unknown: $n=7$, 3.1%) data were used for analysis. Except for one subject (0.4%), all ($n=228$, 99.6%) had no confirmed COVID-19 experience. Four subjects (1.7%) had experience of self-isolation by medical staff, and the remaining ($n=225$, 98.3%) had not. 14 subjects ($n=6.1\%$) had someone who has been infected with COV-

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Table 1. *Demographic Characteristics (n = 229)*

	Percentage (*n*)
Gender	
Male	22.7 (52)
Female	74.2 (170)
Unspecified	3.1 (7)
Self-quarantine experience	
Yes	1.7 (4)
No	98.3 (225)
Confirmed diagnosis experience	
Yes	0.4 (1)
No	99.6 (228)
Confirmed diagnosis experience of someone	
Yes	6.1 (14)
No	93.9 (215)

ID-19 (family, friends, and acquaintances) and the remaining (n = 215, 93.9%) had not. Table 1 presents participant demographic characteristics.

Measures

Perceived Stress Scale (PSS)

The perceived stress in the COVID-19 situation was measured by the PSS developed by Cohen et al. (1983) and translated by Park and Seo (2010). It consists of a total of ten items and is responded using a five-point Likert scale. "How often have you felt that way during the COVID-19 crisis" was added to the instructions to measure stress in the context of COVID-19. Cronbach's α of this scale was .87 in Park and Seo (2010) and .84 in this study.

Center for Epidemiological Studies–Depression Scale (CES–D)

Depression was measured using the Korean-version CES-D integrated and validated by Chon et al. (2001) from the CES-D developed by Radloff (1977). It consists of a total of 20 items and is responded using a four-point Likert scale. Cronbach's α of this scale was .91 in Chon et al. (2001) and .92 in this study.

Beck Anxiety Inventory (BAI)

Anxiety was measured using the Korean-version BAI modified by Yook and Kim (1997) from the BAI developed by Beck et al. (1988) and translated by Kwon (1992). It consists of a total of 21 items and is responded using a four-point Likert scale. Cronbach's α of this scale was .91 in Yook and Kim (1997) and .93 in this study.

State–Trait Anger Expression Inventory (STAXI)

Anger was measured using Korean-version STAXI (STAXI-K) developed by Chon et al. (1997) based on the STAXI developed by Spielberger et al. (1988). Anger was measured using STAXI-K developed by Chon et al. (1997) based on the STAXI developed by Spielberger et al. (1988). It is responded using a four-point likert scale and Cronbach's α of this scale was .93 in Chon et al. (1988) and .93 in this study.

Korean–Connor–Davison–Resilience Scale (K–CD–RISC)

Resilience was measured using K-CD-RISC developed by Connor & Davidson (2003) and translated and validated by Baek et al. (2010). It consists of a total of 25 items and is responded using a five-point Likert scale. Cronbach's α of this scale was .89 in Connor & Davidson (2003), .93 in Baek et al. (2010), and .91 in this study.

Conjoint Community Resiliency Assessment Measure (CCRAM)

Community resilience was measured using the Community Resilience Scale developed by An and Kang (2018) based on the short form of Conjoint Community Resiliency Assessment Measure-28 (CCRAM-28) developed by Leykin et al. (2013). It consists of a total of ten items. Cronbach's α of this scale was .75–.91 in Leykin et al. (2013), .89 in An and Kang (2018) and .86 in this study.

Data Analysis

Analysis in this study was performed using IBM Statistics version 23.0 program and PROCESS Macro v3.3. After checking the descriptive statistics of each variable and correlation, bootstrapping was used to verify whether the mediating effect of Resilience was statistically significant in the relationship between perceived stress and mental health. The moderating effect of community resilience in the relationship between Resilience and mental health was verified using hierarchical regression analysis. After verifying the mediation model and the moderation model, the moderated mediating effect of resilience and community resilience in the relationship between perceived stress and mental health was verified using PROCESS Macro Model 14 and significance was verified using bootstrap verification.

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Table 2. *Means, Standard Deviations, and Correlations among Study Variables*

Measure	1	2	3	4	5	6
1. Perceived Stress	-					
2. Resilience	-.39***	-				
3. Community Resilience	-.17**	.51***	-			
4. Depression	.72***	-.62***	-.36***	-		
5. Anxiety	.55***	-.37***	-.30***	.72***	-	
6. Anger	.51***	-.38***	-.34***	.64***	.60***	-
M	21.59	58.97	31.40	23.21	13.40	14.96
SD	6.08	14.25	6.25	11.69	10.87	6.37

M = mean, SD = standard deviation.
**$p < .01$, ***$p < .001$.

Results

Correlation

Correlation analysis and descriptive statistics of perceived stress, depression, anxiety, anger, resilience, and community resilience were performed, and Table 2 shows the results. The results of the correlation analysis are as follows: perceived stress showed a significantly negative correlation with resilience ($r = -.39, p < .001$) and community resilience ($r = -.17, p < .01$), and significantly positive correlation with depression ($r = .72, p < .001$), anxiety ($r = .55, p < .001$), and anger ($r = .51, p < .001$). Resilience showed significantly positive correlation with community resilience ($r = .51, p < .001$) and significantly negative correlation with depression ($r = -.72, p < .001$), anxiety ($r = -.56, p < .001$), and anger ($r = -.51, p < .001$). Community resilience showed significantly negative correlation with depression ($r = -.36, p < .001$), anxiety ($r = -.30, p < .001$), and anger ($r = -.34, p < .001$).

Mediating Effect of Resilience in Relationship between Perceived Stress and Mental Health in COVID–19 Situation

This study used the PROCESS macro to verify whether Resilience mediates the relationship between perceived stress and mental health in the COVID-19 situation. 5,000 samples were re-sampled and confidence intervals were set at 95%. The bootstrapping of Resilience in the relationship between perceived stress and mental health showed the mediating effect was significant in all depression ($\beta = .16$, *CI95* = .10 to .22), anxiety ($\beta = .07$, *CI95* = .02 to .14), and anger ($\beta = .08$, *CI95* = .02 to .14).

Moderated Mediating Effect of Resilience and Community Resilience in Relationship between Perceived Stress and Mental Health in COVID–19 Situation

The moderated mediating effect was verified using the SPSS Process Macro Model 14 to verify the effect of perceived stress on mental health through Resilience varies according to the level of community resilience.

First, the effect of interaction term of resilience and community resilience on depression in the process where perceived stress affects depression through resilience was significant ($\beta = .12, t = 2.94, p < .01$). In addition, the amount of change in R according to the addition of the interaction term was also statistically significant ($\Delta R^2 = .01, p < .001$). This means that the effect of perceived stress on depression through resilience may vary depending on the level of community resilience. Bootstrap verification was performed to estimate the conditional indirect effect following the proposal of Preacher et al. (2007), and the result showed that an increase in community resilience reduces the indirect effect, In addition, it was found that the indirect effect was significant in all the level of community resilience (*-1SD B* = -.35 *CI95* = -44 to -.27, *Mean B* = -.29 *CI95* = -.36 to -.21, *+1SD B* = -.22 *CI95* = -.31 to -.13).

These results indicate that the mediating effects on the pathways from perceived stress through resilience to depression may be controlled by the level of community resilience suggests that the lower community resilience may lead to the experience of stronger mediating effect of resilience between perceived stress and depression. Figure 2 shows these relationships in schematic form.

Second, the effect of interaction term of resilience and community resilience on anxiety in the process where perceived stress af-

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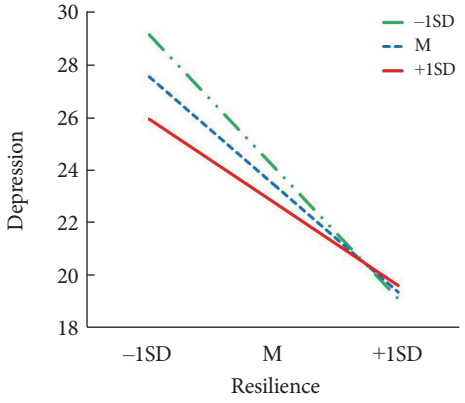


Figure 2. *Conditional indirect effect of resilience on depression by levels of community resilience.*

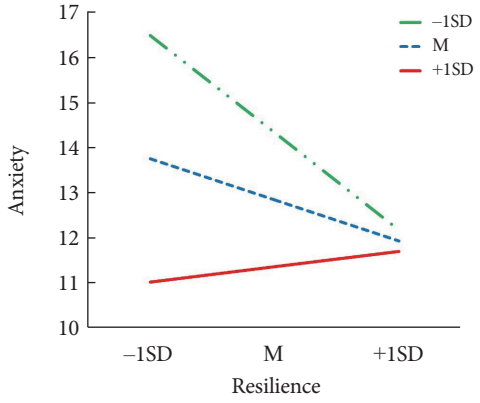


Figure 3. *Conditional indirect effect of resilience on anxiety by levels of community resilience.*

fects anxiety through resilience was significant ($\beta = .17$, $t = 3.10$, $p < .01$). In addition, the amount of change in R according to the addition of the interaction term was also statistically significant ($\Delta R^2 = .03$, $p < .001$). This means that the effect of perceived stress on anxiety through resilience may vary depending on the level of community resilience. Bootstrap verification was performed to estimate the conditional indirect effect, and the result showed that an increase in community resilience reduces the indirect effect. In addition, the indirect effect was found to be statistically significant under lower community resilience but not to be statistically significant under higher community resilience (*-1SD B* = -.15 *CI95* = -26 to -.04, *Mean B* = -.06 *CI95* = -.16 to .03, *+1SD B* = .02 *CI95* = -.09 to .14).

These results indicate that, while the mediating effects on the pathways from perceived stress through resilience to anxiety is significant under low community resilience and increase in community resilience leads to decrease in mediating effect, the mediating effect become insignificant when the community resilience increases above a certain level. Figure 3 shows these relationships in schematic form.

Third, the effect of interaction term of resilience and community resilience on anger in the process where perceived stress affects anger through resilience was significant ($\beta = .19$, $t = 3.35$, $p < .01$). In addition, the amount of change in R according to the addition of the interaction term was also statistically significant ($\Delta R^2 = .03$, $p < .001$). This means that the effect of perceived stress on anger through resilience may vary depending on the level of community

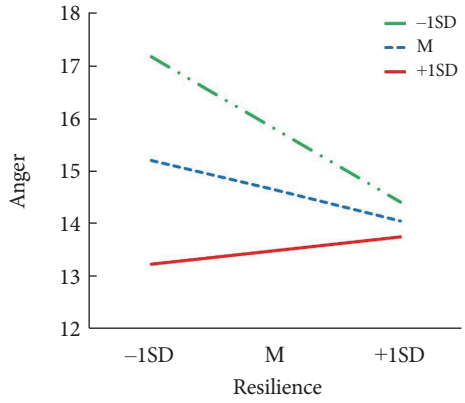


Figure 4. *Conditional indirect effect of resilience on anger by levels of community resilience.*

resilience. Bootstrap verification was performed to estimate the conditional indirect effect, and the result showed that an increase in community resilience reduces the indirect effect. In addition, the indirect effect was found to be statistically significant under lower community resilience but not to be statistically significant under higher community resilience (*-1SD B* = -.10 *CI95* = -16 to -.03, *Mean B* = -.04 *CI95* = -.10 to .02, *+1SD B* = .02 *CI95* = -.05 to .09).

These results indicate that, while the mediating effects on the pathways from perceived stress through resilience to anger is significant under low community resilience and increase in community resilience leads to decrease in mediating effect, the mediating effect become insignificant when the community resilience increases above a certain level. Figure 4 shows these relationships in schematic form.

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Discussion

This study explored how Resilience, an individual factor, and community resilience, an environmental factor, act as protective factors in the relationship between perceived stress and mental health (depression, anxiety, anger) in the COVID-19 pandemic era.

First, the effect of perceived stress on mental health in the COVID-19 pandemic era was found to be significant. This is consistent with the results of previous studies that perceived stress worsens individual mental health (Bai et al., 2004; Hawryluck et al., 2004; Marjanovic et al., 2007) and supports the result that the perceived stress worsens individual mental health in COVID-19 pandemic era (Cellini et al., 2020; González et al., 2020; Gualano et al., 2020; Wang et al., 2020).

Second, it was found that the partial mediating effect of resilience is significant in the relationship between perceived stress and mental health during the COVID-19 pandemic era, indicating that higher perceived stress leads to lower individual resilience and higher levels of depression, anxiety, and anger. This finding is supporting the results that the resilience act as a protective factor mitigating the negative effects of perceived stress on individual's psychological well-being (Abbas & Zhiqiang, 2020), distress (Kimhi et el., 2020) during the COVID-19 pandemic era.

Third, the moderated mediating effect of resilience and community resilience in the relationship between perceived stress and mental health during the COVID-19 pandemic era was found to be significant. The indirect effect was shown to decrease with an increase in the level of community resilience. Specifically, it was found that the effects on anxiety and anger were not significant when the level of community resilience was above medium. This indicates that when resilience is reduced due to heightened perceived stress in the COVID-19 pandemic era, there is no significant effect on anxiety and anger if the community resilience level is above medium. This suggests that the factors influencing individual depression, anxiety, and anger in the COVID-19 pandemic era differ, particularly regarding anxiety and anger which may be managed at the community level. Anxiety, stemming from uncertainty about the future and perceptions of COVID-19's threat to oneself, can be mitigated by community resilience.

The communities, therefore, should take measures such as provision of accurate information about the COVID-19 virus and accurate notification of policy changes so that individuals understand the COVID-19 pandemic era and respond appropriately. Other ways communities contribute to the alleviation individual anxiety include sufficient supply of medical supplies (masks, disinfectants, inspection tools, etc.) through prevention of hoarding and sudden price increases, establishment of prompt treatment environment and transparent infection management system, and mitigation of the infectivity and risk of COVID-19 through vaccination and treatment development.

Anger is caused by the degree of direct damage, the direction and response methods of community response, and injustice experienced by individuals. In the early stage of a disaster, in particular, individuals are greatly affected by the community since it is difficult for them to respond to sudden change. Communities are likely to choose to limit outdoor activities, such as banning gatherings and limiting the number of gathered people, to prevent the spread of COVID-19. Since, in this process, individuals are directly affected by breakdown of interpersonal relationships, reduced income, and job loss, the direction and specific details of the policy should be determined through sufficient communication between individuals and the community. In addition, fairness should be maintained in areas such as punishment for violations of quarantine rules, support of relief goods, and treatment opportunities during lockdown.

The results of this study support existing claims that protective factors for individuals' mental health in disaster situations such as COVID-19 include environmental as well as personal aspects (Boon et al., 2012). In particular, it shows that the response level of the community is important in the early stage when it is difficult for individuals to respond appropriately due to the enormous damage caused by disaster exceeding the individual's ability to respond, consistent with the results of previous studies that, in the early stages of a disaster, environmental intervention is more effective than psychotherapeutic intervention (Bonanno, 2004; Gist & Woodall, 2000). The influence of community resilience was found to be stronger in individuals with low resilience than in individuals with high resilience. These results suggest that a lower individual ability to overcome difficulties in the COVID-19 pandemic era leads to a stronger influence of external factors. For ex-

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ample, they are vulnerable to psychopathological problems caused by disaster situations such as COVID-19. Therefore, intervention for the vulnerable, such as the elderly living alone, basic livelihood security recipients, and those with underlying diseases, or those under economic difficulties such as the unemployed and self-employed should be prioritized. In the early stages of a disaster, the focus should be on minimizing the direct damage caused by the COVID-19 pandemic era by providing relief items such as clothes and food, supplying medical supplies such as hand sanitizer and masks, testing, and medical support, and afterwards, depending on the speed of spread of COVID-19, it should be dealt with flexibly.

Implication

The strength of this study lies in it identified predictive that deteriorate mental health and protective factors in the context of COVID-19. Under the circumstances that studies on the causal relationship between psychological factors is limited, whether the concept of resilience, which was considered an effective protective factor in previous disaster situations such as SARS and MERS, applies to the COVID-19 pandemic era was tested. This study, by verifying the interaction between internal and external factors, shows that both type of factors should be considered for mental health protection in the COVID-19 pandemic era, and it is important to consider that there are differences in effective intervention methods depending on the stage of the disaster. In disaster situations, psychological interventions and community involvement play complementary roles, and their effectiveness may vary depending on the stage of the disaster. During the initial phase, community engagement becomes increasingly crucial, as individuals often struggle to adapt to sudden changes and the ensuing trauma. Therefore, it is essential to leverage community resources and support to minimize individual suffering and facilitate rapid adaptation to the disaster context. In the early stage, measures such as accurate information dissemination regarding the disease, management of confirmed cases, and vaccine development are vital to preventing the spread of the disease. These actions can help mitigate misinformation and anxiety surrounding the infection, thereby fostering trust within the community.

As the disaster progresses to the dissemination stage, an increase in the number of confirmed cases and contacts necessitates interventions focused on prevention and treatment. It is imperative to prevent shortages of medical supplies and price hikes, ensuring that adequate medical services are provided to those affected. Additionally, policies such as social distancing and lockdowns may be required; however, it is crucial to minimize the adverse effects of prolonged policy implementation and ensure appropriate sanctions for non-compliance. Given the occupational and economic changes that arise from hospitalization and distancing measures, support mechanisms must be established to address these widespread changes.

Moreover, emotional challenges such as depression, anxiety, and anger are anticipated to rise due to disruptions in interpersonal relationships, leisure activities, shifts in social atmospheres, and experiences of illness or loss among close contacts. Thus, psychological interventions for individuals have become increasingly necessary. Considering the widespread psychological impact of COVID-19 on the entire population, there is a significant shortage of institutions and professionals capable of providing psychological services. Therefore, exploring safe and effective intervention methods through online platforms, smartphones, and telephone communications is imperative.

To enhance resilience, it is crucial to guide the public in accessing relevant programs and activities aimed at fostering resilience. Furthermore, individuals requiring psychological intervention should be systematically identified to receive initial psychological support. Following this, long-term interventions should be advocated through specialized community agencies or remote counseling services. The implementation of these strategies is anticipated to facilitate more effective delivery of psychological services.

This study presented theoretical data on the direction of intervention to protect mental health in the COVID-19 pandemic era by confirming the influence of resilience and community resilience. It is important for communities to develop the capacity to withstand disaster situations and have the resilience to adapt quickly and effectively to the changing COVID-19 pandemic era. In an epidemic disaster situation, the supply of medical supplies and daily necessities and medical support for isolation and recovery should be sufficient. In the process of responding, support to alleviate the economic difficulties of job seekers and those who

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have lost their jobs is needed, and through continuous and smooth communication between community members or between community deciders and members, specific needs should be identified, and realistic countermeasures should be presented.

The limitations of the study are as follows. First, there is a limitation in that the demographic characteristics were not evenly distributed. Due to the significant difference in the number of participants by gender (male = 52, female = 170), we analyzed the moderated mediation effects by separating the genders to examine gender differences. The results showed that anxiety was significant for both males and females, while depression and anger were not significant for either gender, indicating no gender differences. However, the results for depression and anger may be due to the small sample size, so future research should aim to recruit a enough participants to verify potential gender differences.

Author contributions statement

Jegeun Yu, Clinical Psychology Intern at Konyang University, collected and analyzed data, and led manuscript preparation.

Wonyoung Song, professor at Konyang University, served as the research grant and supervised the research process. All authors provided critical feedback, participated in revision of the manuscript, and approved the final submission.

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