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# The relationship of perceived social support to feelings of hopelessness under COVID-19 pandemic: The effects of epidemic risk and meaning in life

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## ARTICLE INFO

### Keywords:

Hopelessness  
Perceived social support  
Meaning in life  
Epidemic risk level  
Marginal zone effect  
COVID-19

## ABSTRACT

Lockdown orders were issued on January 23, 2020 in Wuhan, China, for the purpose of preventing and controlling COVID-19, which led to severe psychological problems for residents. The present study aimed to investigate the recovery model of hopelessness through interpersonal pathways during the COVID-19 epidemic. An online survey was conducted in 34 provinces (those in autonomous regions and municipalities) of China. This survey investigated residents' hopelessness and the impact of three factors on it, including their perceived social support, meaning in life, and epidemic risk levels. Results showed that both perceived social support and meaning in life negatively predicted hopelessness, while meaning in life played a partial mediating role between perceived social support and hopelessness. Further, epidemic risk level played a moderating role between perceived social support and meaning in life, indicating a "marginal zone effect." Specifically, when comparing other province, perceived social support showed a stronger positive relationship with meaning in life among residents living in other regions of Hubei province. In sum, this study extends the recovery model of hopelessness through interpersonal pathways, and has important implications for public health emergency management.

## 1. Introduction

Corona Virus Disease 2019 (COVID-19), named by World Health Organization (WHO, 2020), was caused by a novel coronavirus, and was first reported in Wuhan. The disease rapidly spread to other provinces of China (Ma et al., 2020). During the early developmental stage of COVID-19, the virus was unknown, infectious, and fatal. The situation was uncontrollable and unpredictable (Karataş & Tagay, 2021), which increased citizens' insecurity, fear of contracting the disease, and social isolation resulting from the lockdown (Bacon & Corr, 2020; Garfin, Silver, & Holman, 2020; Velavan & Meyer, 2020). Facing such a prolonged, unpredictable, and stressful event, may produce in people pessimistic life expectations of the future, along with the belief that they cannot do anything to change the scenario, which is called hopelessness (Abramson et al., 1989).

According to the hopelessness theory (Abramson et al., 1989), when people repeatedly experience stressful events and cannot cope with the associated problems, those with a negative cognitive style might attribute negative events to stability, globality, and consequences and characteristics of the self, causing negative future expectation and

helplessness (Alloy et al., 2000). This triggers depressive symptoms, suicidal tendencies, or other such serious mental problems (Bondade et al., 2019; Xiang et al., 2020). To address this, past research developed a recovery model on the basis of the hopelessness theory to promote recovery from depression (Needles & Abramson, 1990). This model assumed that those with a similar attributional style for positive life events will produce positive emotion and psychological resources, leading to restoration of hopefulness. Many studies have explored the recovery effects of positive life experiences and cognitive protective factors on hopelessness (Czekierda et al., 2019; Vines & Nixon, 2009). However, past literature has not clearly explained how people change the way they appraise events and recover from hopeless situations using interpersonal pathways, however, close relationships were important when residents were on lockdown (Nair & Appu, 2021).

### 1.1. The role of perceived social support on hopelessness

Social support is important for individual social development and mental health, and can be divided into objective and subjective components. The objective component refers to actual received social

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<https://doi.org/10.1016/j.paid.2021.111110>

Received 14 December 2020; Received in revised form 17 June 2021; Accepted 29 June 2021

Available online 3 July 2021

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support, while the subjective component refers to perceived social support (i.e., the expectation and perception of obtainable social support, [Barrera, 1986](#)). Compared to actual received social support, support where recipients feel understood and perceive it as being responsive to their needs was more effective ([Feeney & Collins, 2015](#); [Maisel & Gable, 2009](#)). The thriving through the relationships model pointed out that, under adversity, support from close relationships would encourage individuals to take positive action instead of dwelling on negative circumstances that cannot be changed ([Feeney & Collins, 2015](#)). Furthermore, this support would assist individuals in redefining the situation, and even help people attribute positive life events to global, stable factors that could make people turn hopeful, as suggested in the recovery model ([Needles & Abramson, 1990](#)). People with higher levels of perceived social support might be more likely to believe that they would always receive necessary resources to solve problems, thus avoiding a negative attribution style or maladaptive inferences about negative life events, and generating positive expectation for the future ([Mo et al., 2014](#)). Therefore, as a positive belief factor, some studies find that perceived social support is important for mental health and contributes to recovery from hopelessness ([Li et al., 2015](#); [Seyyedmoharrami et al., 2018](#)). As a consequence, we assume that perceived social support will negatively predict hopelessness.

### 1.2. The mediating role of meaning in life between perceived social support and hopelessness

Meaning in life refers to the degree to which individuals perceive, know, and understand the meaning of their own lives and how they perceive their purpose, mission, and primary goal ([Steger et al., 2009](#)). Some studies have asserted that meaning in life is an individually-based psychological construction that provides people with motivation and behavioral direction for the future, and reduces negative emotions while improving psychological resilience, happiness, and life satisfaction ([Cho, Lee, Lee, Bae, & Jeong, 2014](#); [Yek et al., 2017](#)). In contrast, lacking meaning in life is associated with negative impacts such as anxiety, antisocial behavior, hopelessness, depression, and even suicide ([Bryan et al., 2013](#); [García-Alandete et al., 2019](#)). Specifically, recovery model proposes that positive experiences help people acquire positive emotion and self-worth, which lead to restoration of hopefulness ([Needles & Abramson, 1990](#)), people with high meaning in life might be equipped to handle threats; their higher levels of personal significance may act as a source of comfort to deal with situations that challenge their personal value ([Fischer et al., 2020](#); [George & Park, 2016](#)). Besides, a high sense of meaning in life would encourage people to look toward to the future and search for positive meaning, rather than dwelling on the current negative events, an attribute leading to recovery from the negative experience and hopelessness ([Blackburn & Owens, 2015](#); [George & Park, 2017](#)). Therefore, meaning in life could also be a cognitive protective factor to promote recovery from hopelessness.

Although no previous studies have directly tested the mediating role of meaning in life between perceived social support and hopelessness, there is evidence indicating that without social connection, people would lack life meaning and harbor suicidal thoughts ([Chen et al., 2020](#)). Specifically, the thriving through relationships model proposes that perceived social support not only changes the way people make inferences about stress, but it can also activate recipients' participation in life, broadening and constructing individual resources, and help individuals find purpose and meaning in life ([Feeney & Collins, 2015](#)). Self-determination theory also described that satisfying the need for social relations will bring a sense of meaning to individuals. Individuals with high perceived social support will benefit from the social roles and acquire a sense of identity and belonging ([Haslam et al., 2015](#)). They would experience self-worth and search for their direction of future life ([Stillman et al., 2009](#)). Therefore, as perceived social support could directly predict meaning in life ([Dunn & O'Brien, 2009](#)), we assume that meaning in life could mediate the relationship between perceived social

support and hopelessness.

### 1.3. The moderating role of risk level between perceived social support and meaning in life

The epidemic was first reported in Wuhan and gradually spread to other areas of China as a result of interpersonal mobility. Therefore, in the early stages of COVID-19, the risk level of the epidemic increased with the decreasing distance from Wuhan. Some studies have shown that impact of a crisis spreads out in a circle and declines gradually over geographical distance, which is called the "ripple effect" ([Burns & Slovic, 2012](#); [Slovic, 1987](#)). Some studies also found there might be a marginal zone effect, which implied that the risk cognition of residents in the middle-risk area was lower than that of residents in other areas ([Wen et al., 2020](#)). This might be explained by the endowment effect and contrast effect. People in the middle-risk area, nearer to the center of disaster, could make comparisons of severity with the center of disaster, and feel relieved that their life was not so bad ([Tversky & Griffin, 1991](#)). Epidemic risk was a significant indicator of feelings of threat and anxiety, which would lead to the lack of meaning in life ([Norenzayan & Heine, 2005](#); [Wen et al., 2020](#)), in order to understand the interpersonal pathway of recovery model, this study also investigated the moderating role of epidemic risk levels on the relationship between perceived social support and meaning in life.

In sum, based on the recovery model, thriving through relationship model, and self-determination model, we aimed to extend the hopelessness recovery model through interpersonal pathways. We hypothesized that perceived social support would negatively predict hopelessness, while meaning in life would mediate the relationship between perceived social support and hopelessness. Next, we assumed that the epidemic risk level would moderate the relationship between perceived social support and meaning in life. In the context of COVID-19, this study conducted a questionnaire survey to explore the influencing mechanism in the recovery model of hopelessness.

## 2. Methods

### 2.1. Participants

In this study, G.Power 3.1 ([Faul et al., 2007](#)) was used to calculate the sample size, and the effect size was set to 0.25,  $\alpha$  set to 0.05, so the minimal sample size was 159. However, in this study, in order to collect the data from all regions in China, a total of 2608 Chinese participants were randomly recruited online from January 28th to February 8th, 2020 on the Wenjuanxing platform (a platform similar to MTurk), all questionnaires we received were completely finished (that is to say, the response rate is 100%); then a total of 107 data that excluded three standard deviations of each scale were deleted. Finally, 2501 valid data were obtained, including 774 males (31.1%) and 1727 females, aged 11–82 years, with an average age of 32.65 ( $\pm 11.57$ ) years. According to the degree of epidemic risk, we divided China into areas covering the Wuhan region (the capital of Hubei province), other regions of Hubei province, and other provinces or regions. There were 455 participants in Wuhan, with an average age of 35.92 ( $\pm 12.23$ ) years, including 128 males (28.1%) and 327 females. There were 825 participants in other regions in Hubei, with an average age of 33.17 ( $\pm 11.77$ ) years, among which 302 were males (36.6%) and 523 were females. There were 1221 participants in other provinces or regions of China, with an average age of 31.08 ( $\pm 10.88$ ) years, 344 males (31.1%) and 877 females.

### 2.2. Measures

#### 2.2.1. Perceived social support scale

The Perceived Social Support Scale (PSSS) was used to measure the degree of perceived social support. The scale was compiled by [Zimet et al. \(1988\)](#). In order to explore the effect of close relationships, we

selected four items about family support and friend support from the scale: “My family can give me concrete help”; “Family members are willing to help me”; “Friends will comfort me when I am in trouble”; “We discuss our difficulties with friends.” Participants answered these using a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree), which was deemed reliable through a Cronbach’s  $\alpha$  of 0.81.

2.2.2. *Meaning in life questionnaire*

The Meaning in Life Questionnaire (MLQ) was compiled by Steger et al. (2006), and translated into Chinese by Liu and Gan (2010). It contains the two subscales of search and presence. Search measures the degree to which individuals search for meaning in their lives, while presence measures the degree to which individuals feel meaning in their lives. Two items from each subscale were chosen: “I am searching for my purpose in life” and “I’m always trying to find a purpose in my life” were chosen from the search subscale, and “I know what my life is about” and “I have a clear direction in my life” were chosen from the presence subscale. Participants answered these using a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). The Cronbach’s  $\alpha$  of the two subscales were 0.76 and 0.83, respectively, and the Cronbach’s  $\alpha$  of the total scale was 0.70.

2.2.3. *Hopelessness scale*

Hopelessness was assessed using the brief Hopelessness Scale developed by Bolland et al. (2001). The following scale items were translated into Chinese and adapted for the context: “There is no need to strive for what I think, because it is futile to do so”; “The future may be dark for me”; “I give up because I can’t develop things in a good direction”; “I do not have good luck now, so there is no reason to expect I will have it later”; “I never get what I want, so it is silly to look forward to anything”; “My longing for the future is more bad than good.” Participants answered these items using a 6-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree), which was deemed reliable through a Cronbach’s  $\alpha$  of 0.90.

2.3. *Ethical suitability*

All experiments were carried out in accordance with the Ethics Committee of the Center for Studies of Social Psychology at Central China Normal university (CSSP-2020026), and all participants enrolled in the study voluntarily, with informed consent prior to its initiation.

2.4. *Data analysis*

The statistical analyses were performed using IBM SPSS v. 21.0. Firstly, Cronbach’s alpha was used to measure the reliability of the scale. Next, analysis of variance was used to estimate the impact of epidemic risk level on perceived social support, meaning in life, and hopelessness. Pearson’s correlation was used to analyze the correlation between key variables. A multiple mediation analysis was conducted via the PROCESS 3.3 macro in SPSS (Hayes, 2013), while the bootstrap method (sampling was repeated 5000 times) was adopted to construct a confidence interval for significance testing the mediating effects. Following Wen and Ye (2014), we controlled for gender and age while testing the mediation effect for meaning in life in regard to perceived support and hopelessness, as well as the moderation effect of the epidemic area.

3. Results

3.1. *Common-method variance*

As all variables were measured via questionnaires, we assessed results for common-method variance. According to the Harman single factor test (Zhou & Long, 2004), four factors were extracted, with variance contribution rates of 70.87%. The variance contribution rate of

the first factor was 37.05%, <40%, so common variance caused by the self-reported questionnaire could be eliminated.

3.2. *Means, standard deviations, and correlation matrices for each variable*

A Pearson correlation analysis of all variables resulted in the correlation matrix shown in Table 1. It showed that perceived social support was positively correlated with the sense of meaning of life, and negatively correlated with the sense of hopelessness; there was a negative correlation between sense of meaning in life and hopelessness.

3.3. *Results of perceived social support, meaning in life, and sense of hopelessness among participants living in different regions*

A one-way ANOVA was conducted with “region” set as the independent variable, while “perceived social support,” “meaning in life,” and “hopelessness” were set as dependent variables.

Average perceived social support scores were analyzed via one-way ANOVA, thus revealing significant differences  $F(2, 2498) = 7.05, p = .001, \eta_p^2 = 0.006$ . The perceived social support level of participants living in other regions of Hubei province ( $M = 6.04, SD = 0.93$ ) was significantly higher than that of residents living in other provinces ( $M = 5.89, SD = 0.89$ ). However, difference between Wuhan and other provinces was not significant.

A one-way ANOVA on the average scores for sense of meaning in life also revealed significant differences,  $F(2, 2498) = 5.03, p < .01, \eta_p^2 = 0.004$ . This factor was significantly lower among Wuhan residents ( $M = 4.91, SD = 0.97$ ) when compared to residents of other regions of Hubei province ( $M = 5.10, SD = 1.11$ ) and those in other provinces ( $M = 5.05, SD = 0.99$ ).

Finally, a one-way ANOVA on the average score for hopelessness revealed significant differences,  $F(2, 2498) = 15.43, p < .001, \eta_p^2 = 0.012$ . The hopelessness scores of residents in other regions of Hubei province ( $M = 1.91, SD = 0.99$ ) were significantly lower than those of residents in Wuhan ( $M = 2.20, SD = 0.99$ ) and other provinces ( $M = 2.10, SD = 0.98$ ).

To avoid confusion and unobvious trends related to smaller numerical variables, the scores for perceived social support, meaning in life, and hopelessness were submitted to standardized processing (Fig. 1).

3.4. *Relationship between perceived social support and hopelessness: The roles of “meaning in life” and epidemic risk level*

Since the degree of epidemic risk was a categorical variable, dummy variables were set. Using the SPSS macro-program process compiled by Hayes (2013) and following methods recommended by Wen and Ye (2014), we tested the intermediary effect of meaning in life in regard to social support and hopelessness as well as the epidemic situation while controlling for gender and age. The adjustment effect of the region was tested using the bootstrap method, repeating sampling 5000 times, and setting a 95% confidence interval was set.

Perceived social support significantly and negatively predicted hopelessness (Table 2). This effect remained significant after adding the mediating and moderating variables. Perceived social support also significantly and positively predicted meaning in life, which had a significant and negative effect on hopelessness, thus indicating that

**Table 1**  
The correlation coefficient between each variable.

	1	2	3	<i>M</i>	<i>SD</i>
1. Perceived social support	–			5.96	0.91
2. Meaning in life	0.33***	–		5.04	1.03
3. Hopelessness	–0.36***	–0.31***	–	2.06	0.99

**Note.** \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

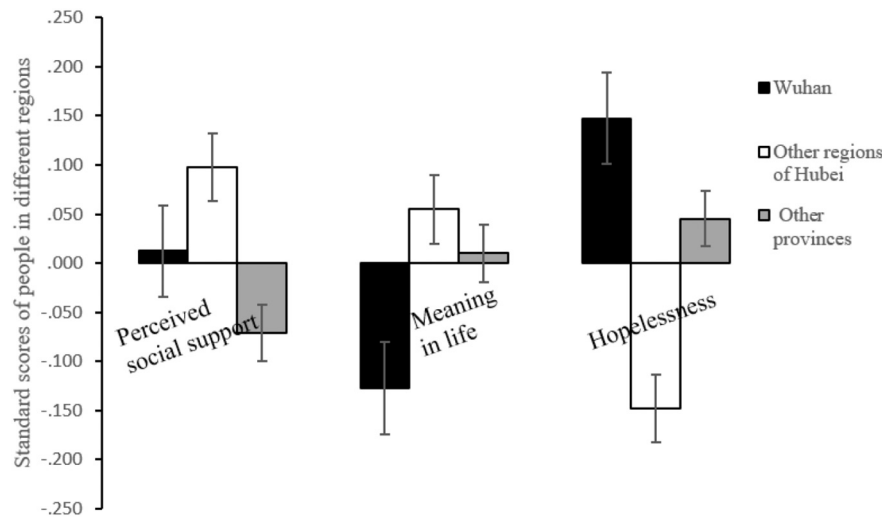


Fig. 1. Standard scores of people in different regions on various variables.

Table 2  
Test model of hopelessness.

Outcome variables	Predict variables	R	R <sup>2</sup>	F	β	t
Hopelessness		0.363	0.132	126.04***		
	Gender				-0.068	-1.69
	Age				-0.065	-3.47**
Meaning in life	Perceived social support	0.346	0.120	48.24***	-0.347	-18.46***
	Gender				-0.050	-1.22
	Age				0.088	4.60***
	W <sub>1</sub>				-0.040	-0.93
	W <sub>2</sub>				-0.199	-3.82***
	Perceived social support				0.269	9.78***
	Perceived social Support * epidemic risk level				0.003	4.39*
	Perceived social support * W <sub>1</sub>				0.123	2.91**
Hopelessness	Perceived social support * W <sub>2</sub>	0.024	0.46			
	Gender	-0.080	-2.02*			
	Age	-0.049	-2.64**			
	Perceived social support	-0.279	-14.41***			
	Meaning in life	-0.217	-11.18***			

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

W<sub>1</sub>, W<sub>2</sub> were dummy variables of epidemic areas. W<sub>1</sub>=0, W<sub>2</sub>=0 represented other provinces; W<sub>1</sub>=1, W<sub>2</sub>=0 represented other regions in Hubei Province; W<sub>1</sub>=0, W<sub>2</sub>=1 represented Wuhan.

meaning in life mediates the impact of perceived social support on hopelessness. Epidemic risk level played a significant moderating role on the impact of perceived social support on meaning in life. Table 3

Table 3  
The direct effect of perceived social support and the mediation effect in different epidemic areas.

Effect	Epidemic areas	Effect value	Boot SE	Bootstrap 95%CI		Effect ratio
				LC	UC	
Direct effect The mediation effect of the meaning in life		-0.279	0.019	-0.317	-0.241	57.41%
	Other provinces (except Hubei)	-0.058	0.008	-0.076	-0.043	11.93%
	Other regions in Hubei (except Wuhan)	-0.085	0.011	-0.107	-0.065	17.49%
	Wuhan	-0.064	0.011	-0.086	-0.043	13.17%

shows the direct and indirect effects within the model, which included the main variables of perceived social support, epidemic risk level, meaning in life, and hopelessness (Fig. 2).

A simple slope test was conducted to analyze the moderating effect in epidemic areas. Results showed the following: Perceived social support significantly and positively predicted meaning in life in the other provinces group ( $b = 0.269, t = 9.78, p < .001$ ), other regions of Hubei group ( $b = 0.392, t = 12.22, p < .001$ ), and Wuhan group ( $b = 0.293, t = 6.61, p < .001$ ; Fig. 3).

#### 4. Discussion

Results showed that perceived social support was negatively related to hopelessness, while meaning in life mediated the relationship between social support and hopelessness, and the level of epidemic risk also moderated the relationship between the two.

Perceived social support negatively predicted hopelessness, thus supporting previous research; that is, perceived social support was a protective factor for depression and, therefore, significantly and

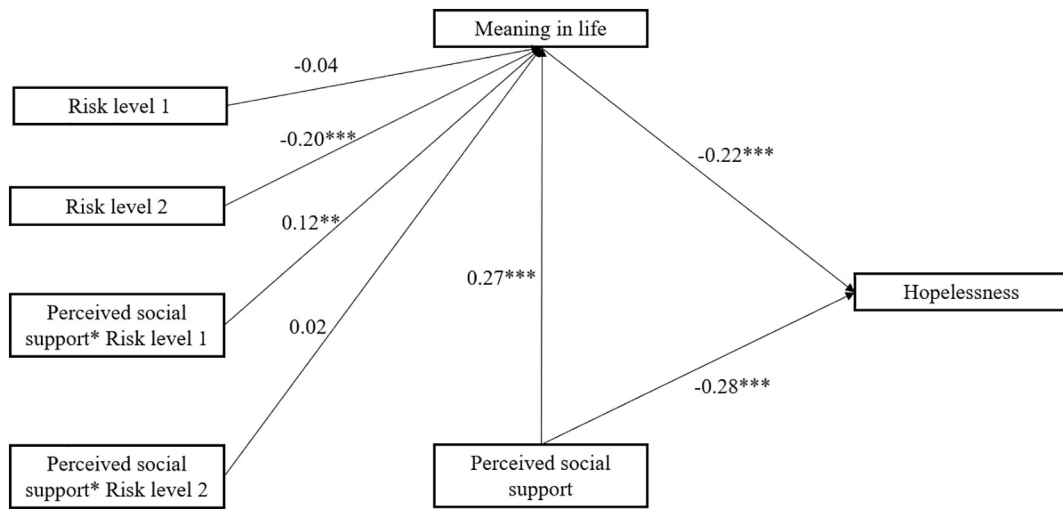


Fig. 2. Impact model of residents' hopelessness in the context of COVID-19.

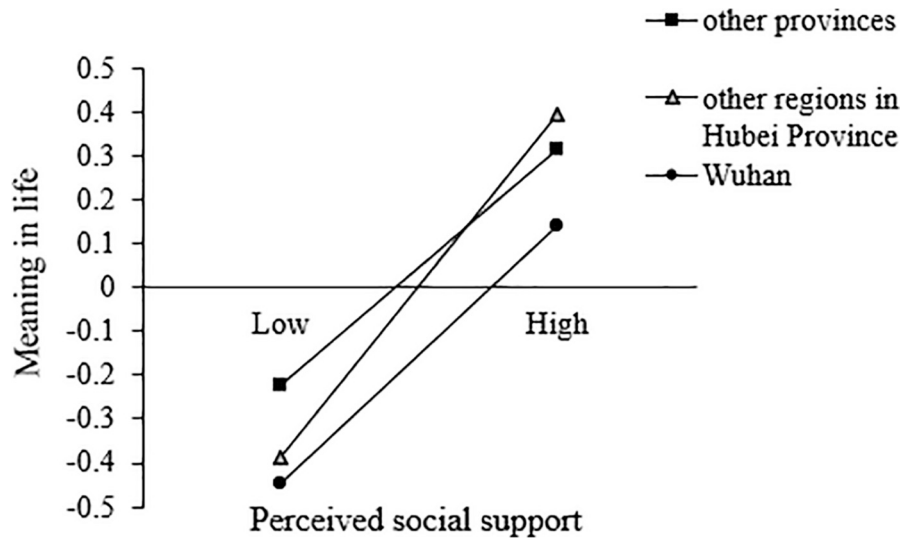


Fig. 3. The distribution of standard scores for each variable in different regions.

negatively related to hopelessness and depression (Seyyedmoharrami et al., 2018). Specifically, under COVID-19, residents experienced the uncertainty of the epidemic and great changes in work, life, and social interaction, and might have had difficulties adapting to the new lifestyle under the threat of the virus (Garfin, Silver, & Holman, 2020; Velavan & Meyer, 2020). However, as the recovery model says that hopeless people with stable and global attribution would benefit from positive life events, those with high social support thought that they could still receive help from their friends and family during the lockdown, and had sufficient resources to deal with this high pressure situation (Feeney & Collins, 2015; Mo et al., 2014). Besides, they felt cared for and loved, and could experience self-worth through relationships and could encourage each other to overcome the emergency together and not lose confidence in the future (Stillman et al., 2009). In such cases, people would not use negative attributions to make inferences about the stressful event. Therefore, perceived social support was an important interpersonal factor that promoted recovery from hopelessness.

This study also showed that meaning in life partially mediated the relationship between perceived social support and hopelessness. In this intermediary path, perceived social support positively predicted meaning in life, while meaning in life negatively predicted hopelessness. This result was similar to those of past studies, and indicated that establishing

interpersonal networks helps residents feel a societal connection, thus creating a sense of meaning and a decrease in depression or suicidal thoughts (Chen et al., 2020; Deci & Ryan, 1985). The thriving through relationships model and self-determination model state that perceived social support increases residents' sense of belonging and self-worth, which are important for finding purpose and meaning in their lives and purpose for the future in unsafe environments (Feeney & Collins, 2015; Haslam et al., 2015; Stillman et al., 2009). Purpose comprises future-oriented goals and motivation that motivate residents to look forward to a positive future rather than the current adversity (Martela & Steger, 2016). Purpose also made people realize what they could do to master their own lives (Psarra & Kleftras, 2013; Volkert et al., 2014), thus decreasing the negative cognition that they could not change anything as the environment was uncontrollable (Abramson et al., 1989). Therefore, meaning in life could be regarded as an intermediary that transforms the effect of perceived social support into a psychological resource, motivation for future life, and finally, recovery from hopelessness under COVID-19.

This study found that there were significant differences in perceived social support, meaning in life, and hopelessness in different epidemic risk levels. Specifically, the perceived social support of people in other regions of Hubei was significantly higher than that in the Wuhan area or

other provinces, while the meaning in life of residents in Wuhan was significantly lower than that in the other two areas. The level of hopelessness in other regions of Hubei was significantly lower than that in the other two areas. Besides, epidemic risk level moderated the relationship between perceived social support and hopelessness, indicating a possible “marginal zone effect” related to mental health (Wen et al., 2020). Compared with residents in Wuhan and other provinces, perceived social support had a stronger predictive effect on residents’ meaning in life in other regions of Hubei province, and exhibited a stronger positive relationship between social support and meaning in life. On the one hand, residents in the center of the epidemic had more direct experiences involving serious life threats, which likely increased their focus on information related to the epidemic (Tversky & Griffin, 1991; Wen et al., 2020). This resulted in a higher risk perception of the event (Burns & Slovic, 2012). On the other hand, residents further away from the center of the epidemic gained vaguer information from social media, thus leading to psychological panic. Such ambiguity did not affect residents living relatively close to the epidemic center due to their direct objective experiences (Tversky & Griffin, 1991). However, though those in the middle-risk area were nearer to the center of epidemic than residents in the low-risk area, they perceived lesser risk than residents in Wuhan (Tversky & Griffin, 1991; Wen et al., 2020). This made them feel that they could survive the disaster and they felt relieved that they did not live in the most dangerous areas. When they perceived high levels of social support, they would cherish their life more than before, and struggled to find goals for the future. Therefore, those in the marginal zone would enlarge the effect of perceived social support experience on meaning in life.

The model of the present study holds important theoretical implications for recovery from the hopelessness during COVID-19. This study expands on the thriving through the relationships model, which ignores the extent of adversity (Feeney & Collins, 2015), and verifies and explains the process of the recovery model through interpersonal paths (Needles & Abramson, 1990). Specifically, it implies that perceived social support can buffer hopelessness through increasing meaning in life, showing that perceived social support was an important factor to overcome crises where residents were unsafe and isolated (Bacon & Corr, 2020; Garfin et al., 2020), and that meaning in life could be regarded as a psychological process that transforms the effect of perceived social support into the motivation for future life. Findings also indicate that different areas will have different perceptions and responses in a crisis; however, residents in marginal areas can enlarge the effect of perceived social support on meaning in life. Future studies about risk perception and mental health could take this phenomenon into consideration.

In addition, the results of this study can provide theoretical and practical support for protecting public health and crisis management in the future. Firstly, in the early stage of a public health emergency, in order to decrease residents’ psychological panic, it is effective to encourage residents to promptly connect with their close relations, to obtain support that will give them psychological buffer resources when they are on lockdown. Secondly, the relationship between meaning in life and hopelessness also reflects the importance of life goals and self-worth for future expectations. Therefore, we recommend that residents set goals and achieve them to feel mastery of their own life through media. This research also suggests that education around meaning in life might give people positive belief in their self-value and future life. Finally, this research also suggests that the epidemic risk level may affect individuals’ mental health in the early stages of a public health emergency. This study not only finds that the residents in the center of the epidemic may have a lower mental health level but also finds a marginal zone effect. For those at the center of the epidemic, timely material and relationship support can alleviate their negative emotions and provide psychological resources to cope with the crisis; for those farther away from the center, social media might be an important source of event information. It is thus necessary to ensure informational

openness and accuracy, thus reducing ambiguity. This will help residents establish positive attitudes about the future.

This study also had some limitations. First, it was conducted during the early stages of COVID-19. Future studies should consider psychological changes of residents at different crisis stages, thus providing evidence on how and why people’s psychological state would change with the development of a crisis, thus further verifying the interpersonal pathway of recovery model. Second, the epidemic areas were simply divided into Wuhan City, other areas of Hubei province, and other provinces. This did not show the trend of psychological states among residents changing with the gradual increase of the epidemic or distance from the center of the epidemic. Finally, this study was only conducted in China. As COVID-19 has affected people globally, whether the epidemic in other countries spread the same way as it did in China, and whether the distance to the center of crisis or epidemic risk level would impact the mental health of residents in different cultures, could be tested.

## 5. Conclusion

This study explored the situation of hopelessness and its influence mechanism model under the COVID-19 epidemic, showing the effect of epidemic risk levels, perceived social support, and meaning in life. First, we found that residents’ perceived social support negatively predicted their sense of hopelessness but positively predicted meaning in life, and meaning in life negatively predicted their hopelessness. Second, meaning in life played a partial mediating role between perceived social support and hopelessness. Finally, the research results showed that the epidemic risk level played a moderating role between perceived social support and meaning in life, indicating a “marginal zone effect.” Our results suggest that timely mental health care and general guidance need to be implemented in the early stage of public health emergency. Specifically, interpersonal support has positive effect on residents’ meaning in life which gives them direction of future, and this finally decreases hopelessness. Besides, residents’ psychological states vary with different epidemic risk levels. Future studies should attach much weight to the impact of epidemic risk level on mental health in public health emergency and develop more appropriate measures to address public health emergency in different areas.

## Funding

The funding was provided by the Major Program of National Social Science Foundation of China (Grand No. 18ZDA331), National Post-funded Projects of Philosophy and Social Sciences (20FSHB003), and Self-determined Research Funds of CCNU from the Colleges’ Basic Research and Operation of MOE Grants (CCNU19ZNO21).

## Ethical approval

All experiments were carried out in accordance with the Ethics Committee of the Center for Studies of Social Psychology at Central China Normal University (CSSP-2020026), and all participants enrolled in the study voluntarily, with informed consent prior to its initiation.

## Availability of data and material

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

## Code availability

Not applicable.

## Author contributions

The study conception and design were performed by Bin Zuo and Fangfang Wen. Material preparation was performed by Ke Yang and Fangfang Wen. Data collection was performed by Yi Yao, Shi Han, Siyuan Nie. Analysis was performed by Ke Yang, Yi Yao, Shi Han, Siyuan Nie. The first draft of the manuscript was written by Bin Zuo, Ke Yang and Fangfang Wen, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

## Declaration of competing interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

## Acknowledgements

We would like to thank our colleagues and students at CSSP of CCNU for their kind support. We also thank the editor and reviewer for their comments and suggestions about our article.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2021.111110>.

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