

## Brief-Report COVID-19

# Longitudinal associations of meaning in life and psychosocial adjustment to the COVID-19 outbreak in China

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**Objective.** Literature suggests that ‘meaning in life’ may be a mental strength that enables individuals to function healthily and adaptively in the face of stress events. Therefore, this study aims to examine the longitudinal associations between meaning in life and psychosocial adjustment to the COVID-19 outbreak among Chinese people.

**Methods.** A prospective design was adopted. 154 Chinese college students (Mean age =  $20.41 \pm 1.45$  years) completed two waves of the assessment. Participants reported their meaning in life before the outbreak (Time 1) and their psychosocial adjustment 7 weeks later after the outbreak had occurred (Time 2).

**Results.** Participants’ meaning in life at Time 1 was positively related to life satisfaction and negatively related to depression, anxiety, stress, and negative emotions at Time 2. Additionally, levels of meaning in life at Time 1 were positively associated to COVID-19-related behavioural engagement – prosocial behaviour and information addiction at Time 2. Individuals’ perceptions of the outbreak and status of self-quarantine did not moderate these relationships.

**Conclusion.** Findings suggest that individuals’ prior level of meaning in life may help them maintain a healthy psychosocial adjustment during disease outbreak, though cautions regarding the possibility to render an addiction to information about the outbreak are warranted.

### Statement of contribution

#### *What is already known on this subject?*

- Meaning in life is related to better level of mental health.
- The novel coronavirus disease (COVID-19) outbreak evokes individuals’ psychosocial distress.
- Little is known about the relationship between meaning in life and psychosocial adjustment to disease outbreak.

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***What does this study add?***

- A higher level of meaning in life before the COVID-19 outbreak predicts better life satisfaction, less psychological distress and negative emotions, more prosocial behavior and information addiction related to COVID-19 during the outbreak.
- The longitudinal associations between meaning in life and psychosocial adjustment to the COVID-19 outbreak are not moderated by individuals' perceptions of the outbreak and status of self-quarantine.

In January 2020, the novel coronavirus disease (COVID-19) outbreak took place in China and later evolved into a global pandemic. This unforeseen crisis and the unprecedentedly stringent precaution measures have changed people's lives remarkably, as well as put their mental health and psychosocial functioning at risk. On top of documenting the heightened psychological distress in response to the outbreak (Qiu et al., 2020; Wang, Pan, et al., 2020; Wang, Xia, et al., 2020), it is imperative to understand what kind of mental strength would confer resilience to the mental hardships of the outbreak and enable people to stay healthy and adaptive during this disease outbreak and any other future health crises that may come. The present study sheds light on this issue by investigating the relationship between the presence of meaning in life (measured before the outbreak) and psychosocial outcomes during the COVID-19 outbreak.

Meaning in life refers to the subjective feeling and experience that life is meaningful (King, Hicks, Krull, & Del Gaiso, 2006). It enables people to feel that their lives make sense and matter beyond mundanity, and that they have a clear purpose, mission, or overarching goal. Overall, meaning in life has been found relevant to physical and mental health (Czekierda, Banik, Park, & Luszczynska, 2017; Steger, 2012). Substantial research has indicated that the presence of meaning in life relates to a better state of well-being, such as greater life satisfaction and positive affects (e.g., Lin & Shek, 2019; Steger, Frazier, Oishi, & Kaler, 2006), as well as less psychological maladjustment, such as depression and daily distress (e.g., Kiang & Fuligni, 2010; Steger, Oishi, & Kashdan, 2009). Several studies have also found that people with higher levels of meaning in life show better behavioural adjustment, such as engaging in more prosocial behaviour (e.g., Shek, Ma, & Cheung, 1994) and less addictive behaviour (e.g., Zhang et al., 2015).

According to the stress-resilience perspective (Glazer, Kozusznik, Meyers, & Ganai, 2014; Ryff & Singer, 1998), a sense of meaning in life may serve as building blocks of resilience, fostering positive adaptation and personal growth in the face of stress (Masten & Reed, 2002). The presence of meaning in life provides an interpretative framework to understand unexpected and uncertain life circumstances, which helps people restore a sense of control and thus enhance their adjustment to negative life changes (Park & Baumeister, 2017; Steger, 2012). Additionally, studies have documented the health benefits to possessing meaning in life (for a meta-analysis, see Czekierda et al., 2017). Prior meaning in life helps people tackle the risk and uncertainty associated with stress, which in turn increases the likelihood of individuals remaining healthy and adaptive. Disease outbreak represents a stress event usually accompanied by much uncertainty and unforeseeable threat. It thus poses a challenge to individuals' views of themselves and of the world. Accordingly, possession of meaning in life presumably serves as a resilience factor that helps individuals tackle the unexpected changes and risks in life. Research has

found that meaning in life relates to a better adjustment to traumatic events and diseases (e.g., Kállay & Miclea, 2007; Owens, Steger, Whitesell, & Herrera, 2009). A meta-analysis has also revealed that helping adult patients with serious diseases identify their meaning in life enhances their self-efficacy and reduces psychopathology (Vos, Craig, & Cooper, 2015).

However, little research has linked meaning in life to individuals' adjustment to disease outbreaks specifically. The existing literature on the COVID-19 outbreak mainly documents psychological responses of the general public and analyses the demographic correlations (e.g., Qiu et al., 2020; Wang, Xia, et al., 2020), with only a few exceptions attempting to identify the predictors of individuals' psychological responses from the perspective of personality, media exposure, and perception of the outbreak (e.g., Mertens, Gerritsen, Duijndam, Saleminck, & Engelhard, 2020). Moreover, the documented psychological responses primarily pertain to emotional responses, with cognitive and behavioural responses remaining largely under-examined. Finally, the majority of the studies assessed meaning in life during or after negative life events; therefore, it is unclear whether the prior level of meaning in life conveys resilience to later life stressors.

Against this backdrop, the present study uses a prospective design to examine the effects of meaning in life on individuals' cognitive, emotional, and behavioural aspects of adjustment to the COVID-19 outbreak. Participants' overall cognitive appraisal of life was indexed by life satisfaction, emotional adjustment was indexed by emotional distress (i.e., stress, depression and anxiety) and negative emotions, behavioural engagement in the outbreak was indexed by COVID-19 information addiction (i.e., problematically and compulsively seeking and checking COVID-19 information) and prosocial behaviour that help combat the outbreak (i.e., sharing and helping behaviour related to the outbreak). This study measured participants' meaning in life before the outbreak occurred, and the outcome variables during the outbreak. Such a prospective design enhances our understanding about whether prior mental strengths helps individuals demonstrate healthy psychosocial adjustment during a disease outbreak. It is hypothesized that greater perceptions of meaning in life would be related to higher levels of life satisfaction and lower levels of stress, depression, anxiety, and negative emotions. Additionally, it is expected that greater meaning in life would be associated with less COVID-19 information addiction and more prosocial behaviour.

## **Methods**

### ***Participants and procedure***

Participants were recruited by the Sojump platform (sojump.com). Similar to Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011), Sojump provides an all-in-one solution for participant recruitment for online surveys in China. The first wave of assessment was administered from December 27, 2019 to January 1, 2020 (Time 1), when only a small cluster of pneumonia cases of unknown cause were reported in Wuhan city of China, and precautionary measures had not been taken. 319 college students (165 females; mean age =  $20.30 \pm 1.46$  years) participated in this online survey. The second wave of assessment was administered from February 15 to March 14, 2020 (Time 2), during which confirmed cases of COVID-19 infection in China increased from 66,581 to 81,021. 165 participants completed the second wave of the survey, which resulted in an attrition rate of 48.3%. We removed 11 participants who failed to pass one of the two attention checking questions (see Oppenheimer, Meyvis, & Davidenko, 2009), which

resulted in 154 valid cases (107 females; mean age =  $20.41 \pm 1.45$  years). Participants' average subjective perception of socioeconomic status (SES) was 4.49 ( $SD = 1.44$ ), indexed by perceived position at a 10 rung SES ladder (Adler, Epel, Castellazzo, & Ickovics, 2000). Attrition analyses using independent *t*-test analyses revealed no significant differences in meaning in life, age and subjective SES between participants who completed the second wave of assessment and those who had quit. However, more males quit the study than females ( $\chi^2(1) = 31.85, p < .001$ ).

### Measures

Participants reported meaning in life and demographic information at Time 1 and other outcome variables at Time 2. Table 1 shows the descriptive information of these variables. First, meaning in life was measured by the 5-item presence of meaning subscale in the Meaning in Life Questionnaire (Steger et al., 2006) using a 7-point scale (1 = not true at all; 7 = totally true). Second, life satisfaction was measured by the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) using a 7-point scale (1 = not true at all; 7 = totally true). Third, a 21-item version of the Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995) was used to assess participants' symptoms of depression, anxiety, and stress in the past week (1 = Did not apply to me at all; 4 = Applied to me very much). Fourth, participants reported their experiences of eight negative affections related to the outbreak (i.e., bored, lonely, empty, dull, isolated, discriminated, threatened, and disgusted) in the past month (1 = never, 5 = always). Fifth, to assess participants' addiction to COVID-19 information, three items were created with reference to Wilson's, Fornasier, and White (2010) scale of addictive tendency of social networking media (1 = not true at all; 6 = totally true). Sixth, a 10-item checklist was created to measure

**Table 1.** Descriptive information of the study variables

	Mean (SD)	Cronbach's $\alpha$	Correlation with meaning in life
Time 1			
Meaning in life	4.33 (1.38)	.91	–
Time 2			
Life satisfaction	3.89 (1.14)	.86	.53***
Stress	2.01 (.53)	.70	–.29***
Depression	1.69 (.56)	.83	–.49***
Anxiety	2.01 (.53)	.68	–.39***
Negative emotions	2.38 (.67)	.77	–.35***
Information addiction	3.68 (1.15)	.66	.16***
Prosocial behaviour	.42 (.20)	.77	.32***
Perceived severity	4.14 (.72)	–	–.20
Perceived likelihood of infection	1.86 (.77)	–	.004
Self-quarantine	–	–	.116
Demographic variables (Time 1)			
Gender	–	–	.07
Age	20.41 (1.45)	–	.01
SES	4.49 (1.44)	–	.33

Notes. Prosocial behaviour: 1 = yes; 0 = no; Self-quarantine: 1 = yes, 0 = no; Gender: 1 = male, 0 = female; SES = subjective socioeconomic status.

prosocial behaviour that helps combat the outbreak. Regarding the multi-item scales, mean scores were taken with larger scores indicating higher levels of meaning in life, satisfaction with life, depression, anxiety, stress, negative emotions related to the outbreak, addiction to COVID-19 information, and prosocial behaviour related to the outbreak, respectively. Finally, participants reported their perception of the outbreak severity (1 = not severe at all, 5 = extremely severe) and the likelihood of infection (1 = very low, 5 = very high), and their current status of self-quarantine. More details of the measures and the zero-order correlations among the study variables were reported in the online Appendixes 1 and 2.

## Results

Hierarchical regression analyses were performed to examine the longitudinal associations of meaning in life with different aspects of adjustment to the COVID-19 outbreak. Demographic variables were entered in the first step as controlled variables; perceived severity of the outbreak, perceived likelihood of infection, and status of self-quarantine were entered in the second step; meaning in life at Time 1 was entered in the third step; and the interaction effects were entered in the last step. As shown in Table 2, meaning in life at Time 1 positively predicted life satisfaction ( $b = .43$ ;  $\Delta R^2 = .19$ ,  $ps < .001$ ) and negatively predicted stress ( $b = -.30$ ;  $\Delta R^2 = .06$ ,  $ps < .01$ ), depression ( $b = -.44$ ;  $\Delta R^2 = .19$ ,  $ps < .001$ ), anxiety ( $b = -.39$ ;  $\Delta R^2 = .13$ ,  $ps < .001$ ), and negative emotions related to the outbreak ( $b = -.32$ ;  $\Delta R^2 = .14$ ,  $ps < .001$ ) at Time 2. In addition, meaning in life at Time 1 positively predicted both COVID-19 information addiction ( $b = .26$ ,  $p < .01$ ;  $\Delta R^2 = .03$ ,  $p < .05$ ) and prosocial behaviour ( $b = .30$ ,  $p < .01$ ;  $\Delta R^2 = .07$ ,  $p < .001$ ) at Time 2. The non-significant interaction effects suggest that the longitudinal effects of meaning in life remained true regardless of one's perceptions of the outbreak and status of self-quarantine. The detailed results of each step of regression were presented in online Appendix 2.

## Discussion

This is the first study that linked meaning in life to the psychosocial adjustment of a disease outbreak. The results extend prior work on the health benefits of meaning in life (e.g., Kiang & Fuligni, 2010; Steger, Fitch-Martin, Donnelly, & Rickard, 2015) by identifying meaning in life as one mental strength that may confer resilience to disease outbreaks. Consistent with the hypotheses, the current study found that people who possessed higher levels of meaning in life before the outbreak demonstrated better life satisfaction, less depressive, anxiety, and stress symptoms, less negative emotions, and more prosocial behaviour during the outbreak. However, participants showed a stronger addictive tendency towards COVID-19 information.

Prior literature has documented the role of meaning in life in helping individuals adapt to chronic or life-threatening disease and traumatic events (e.g., Kállay & Miclea, 2007; Owens et al., 2009). The present findings suggest that establishing meaning in life can prepare people better for coping with subsequent unexpected disease outbreaks, and enhance their likelihood to show healthy adjustment in cognition, emotions, and behaviour during the disease outbreak. These findings thus indicate a need to promote meaning in life as a mental strength in health prevention programs and intervention therapy. Most experts believe that the COVID-19 disease will probably linger for an

**Table 2.** Statistics of regression analyses

	Life satisfaction		Stress		Depression		Anxiety		Negative emotions		Information addiction		Prosocial behaviour	
	$\beta$ (SE)	95%CI	$\beta$ (SE)	95% CI	$\beta$ (SE)	95% CI	$\beta$ (SE)	95%CI	$\beta$ (SE)	95%CI	$\beta$ (SE)	95%CI	$\beta$ (SE)	95%CI
Gender	-.08 (.17)	[-.42, .25]	.08 (.09)	[-.10, .26]	-.07 (.09)	[-.25, .11]	-.05 (.08)	[-.22, .11]	.18 (.11)	[-.04, .40]	-.26 (.20)	[-.66, .14]	.04 (.03)	[-.03, .10]
Age	.04 (.05)	[-.07, .14]	.04 (.03)	[-.02, .10]	.02 (.03)	[-.03, .08]	.03 (.03)	[-.02, .08]	.00 (.03)	[-.07, .07]	.05 (.06)	[-.08, .17]	.01 (.01)	[-.01, .03]
SES	.15* (.06)	[.04, .26]	-.05 (.03)	[-.11, .02]	-.02 (.03)	[-.08, .04]	-.02 (.03)	[-.07, .04]	.03 (.04)	[-.04, .11]	-.01 (.07)	[-.15, .12]	.01 (.01)	[-.01, .03]
Perceived severity	.13 (.11)	[-.08, .35]	-.07 (.06)	[-.18, .05]	-.13* (.06)	[-.24, -.01]	-.09 (.05)	[-.20, .01]	-.09 (.07)	[-.23, .05]	-.17 (.13)	[-.43, .09]	-.01 (.02)	[-.05, .03]
Perceived likelihood of infection	-.01 (.11)	[-.21, .20]	-.01 (.06)	[-.12, .11]	.12* (.06)	[.01, .23]	.05 (.05)	[-.05, .16]	.04 (.07)	[-.10, .17]	.24 (.13)	[.00, .49]	.04* (.02)	[.00, .09]
Self-quarantine	-.04 (.19)	[-.42, .34]	.07 (.10)	[-.13, .28]	.05 (.10)	[-.14, .25]	.02 (.09)	[-.16, .20]	.21 (.12)	[-.03, .46]	-.03 (.23)	[-.48, .42]	.02 (.04)	[-.05, .10]
<b>Meaning in life</b>	<b>.36*** (.07)</b>	<b>[.23, .48]</b>	<b>-.12** (.04)</b>	<b>[-.19, -.05]</b>	<b>-.18*** (.03)</b>	<b>[-.25, -.12]</b>	<b>-.14*** (.03)</b>	<b>[-.20, -.07]</b>	<b>-.15*** (.04)</b>	<b>[-.24, -.07]</b>	<b>.22*** (.08)</b>	<b>[.06, .37]</b>	<b>.04*** (.01)</b>	<b>[.02, .07]</b>
Meaning in life $\times$ Severity	.02 (.08)	[-.14, .17]	-.02 (.04)	[-.10, .06]	.01 (.04)	[-.08, .09]	.01 (.04)	[-.06, .09]	.07 (.05)	[-.03, .18]	.09 (.10)	[-.09, .28]	.03 (.02)	[.00, .06]
Meaning in life $\times$ likelihood of infection	.11 (.07)	[-.04, .25]	.00 (.04)	[-.08, .08]	-.07 (.04)	[-.14, .01]	-.04 (.04)	[-.11, .03]	-.06 (.05)	[-.15, .04]	-.03 (.09)	[-.20, .15]	.01 (.01)	[-.02, .03]
Meaning in life $\times$ Quarantine	.17 (.20)	[-.23, .56]	.08 (.11)	[-.13, .30]	-.05 (.11)	[-.26, .16]	.05 (.10)	[-.15, .24]	-.20 (.13)	[-.46, .06]	-.42 (.24)	[-.90, .05]	.00 (.04)	[-.08, .08]

Notes. This table shows the results of last step of hierarchical regressions. The results of major interest are highlighted.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

uncertain period of time, and its impacts on business and life have been, and will continue to be, tremendous (Lum, 2020; Paton, 2020). Helping people construct meaning in life is a possible way to help them cope with further life challenges and foster positive adaptation to other health crises.

The positive association between meaning in life and information addiction is inconsistent with previous studies that found a negative relationship between meaning in life and addictive behaviour (e.g., Internet addiction; Zhang et al., 2015). This unexpected finding, though considered to be small in magnitude (Funder & Ozer, 2019), warrants future replications. It is possible that people possessing meaning in life tend to be more behaviourally engaging in the battle against the outbreak; this includes prosocial involvement and heavy immersion into the related news. Future studies need to examine under what circumstances meaning in life would lead to different behaviours.

The findings should be interpreted with caution, as the current prospective design does not allow us to infer causal effects of meaning in life on psychosocial adjustment. As the two waves of assessments did not include the same variables, the current study could not inform the changes in meaning in life and outcome variables. Additionally, with only two waves of assessment, the current findings could not inform the process of how meaning in life builds up physical and psychological resources over time, which in turn contribute to better psychosocial adjustment to disease outbreak. Future work can address these limitations by adopting a multi-wave longitudinal panel design to examine how meaning in life helps people adapt to health crises. Furthermore, the current sample size was sufficient in statistic power to detect medium but not small moderation effect (Soper, 2020). Future research needs a larger sample to examine the individual differences in the effects of meaning in life on psychosocial adjustment. Lastly, the sample of college students renders the generalizability of results limited among those educated emerging adults possibly without children and job. Also, many male participants did not join the second wave of assessment, which resulted in a sample predominantly composed of females. Future studies would benefit from more heterogeneous samples and further exploration of gender differences.

## **Acknowledgements**

This study was supported the author's start-up fund at The Hong Kong Polytechnic University.

## **Conflicts of interest**

All authors declare no conflict of interest.

## **Author contribution**

Li Lin was involved in all the roles related to this study (Conceptualization, data curation, formal analysis, methodology, and writing).

## **Data availability statement**

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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### **Supporting Information**

The following supporting information may be found in the online edition of the article:

**Appendix 1.** Measures.

**Appendix 2.** Analysis Results.