

Perceived Loneliness and Anxiety During Covid-19: A Moderated Mediation Model of Hope and Age

Min-Rui Zhu ^{1,2}, Cheuk-Hang Lam ^{1,2}, Charlene L.M. Lam ^{1,2*}

1 The State Key Laboratory of Brain and Cognitive Sciences, The University of Hong Kong, Hong Kong, China.

2 Laboratory of Clinical Psychology and Affective Neuroscience, The University of Hong Kong, Hong Kong, China.

***Corresponding Author:** Charlene L.M. Lam, Laboratory of Clinical Psychology and Affective Neuroscience, The University of Hong Kong, Hong Kong, China.

Received date: March 29, 2023; **Accepted date:** June 12, 2023; **Published date:** June 18, 2023

Citation: Min-rui Zhu., Cheuk-Hang Lam., Charlene L.M. Lam., (2023), Perceived Loneliness and Anxiety During Covid-19: A Moderated Mediation Model of Hope and Age, *Psychology and Mental Health Care*, 7(4): DOI:10.31579/2637-8892/221

Copyright: © 2023, Charlene L.M. Lam. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Background: Hope has been identified as a psychological factor protecting against the negative impacts of anxiety and perceived loneliness. However, little is known about how the two factors of hope, namely agency thinking and pathway thinking, mitigate the negative psychological impacts of COVID-19 and how age might impact the relationship between perceived loneliness and anxiety. The current study aimed to examine the mediating effect of agency and pathway thinking between perceived loneliness and anxiety among young and older adults.

Methods: 154 participants (77 young adults; 77 old adults) were recruited during the fourth wave of COVID-19 in Hong Kong. They completed questionnaires on hope, perceived loneliness, anxiety and COVID-peritraumatic stress.

Results: Hope agency modulated the negative influence of perceived loneliness in younger adults compared to the older adults ($b = -0.14$, $SE = 0.06$, 95% CI [-0.28, -0.03]). Moreover, hope pathways modulated the COVID-19 peritraumatic distress in the younger adults compared with the older adults ($b = -0.09$, $SE = 0.04$, 95% CI [-0.19, -0.02]).

Conclusions: Different mental health strategies might be employed to reduce the negative impacts of perceived loneliness and anxiety related to COVID-19 in the younger and older populations.

Keywords: perceived loneliness; hope, anxiety, age; covid-19 peritraumatic distress

Introduction

The World Health Organization (WHO) declared the novel coronavirus outbreak (COVID-19) a global pandemic in March 2020 (WHO, 2020). Since its outbreak, numerous regions and countries have adopted strict social distancing policies in order to mitigate the spread and the negative impacts of the disease. Such policies and regulations, however, often undermined social interactions and led to social isolation to various degrees. Previous studies showed that levels of perceived loneliness have considerably increased among the general public during the outbreak (Cohn-Schwartz et al., 2022; Rogers et al., 2021).

Perceived loneliness and anxiety

Perceived loneliness refers to the distressing feelings that one's social needs are unsatisfied, despite the actual time spent alone (Hawkey & Cacioppo, 2010; Peplau & Perlman, 1982). There is compelling evidence that perceived loneliness is a risk factor for developing depression and anxiety, as well as physical illnesses (e.g., Beutel et al., 2017). During the COVID-19 pandemic, loneliness and mental health problems became a

particular concern due to physical distancing and quarantine restrictions. A body of literature has shown that perceived loneliness significantly accounts for an increase in anxiety symptoms among both young and older adults (McDonald et al., 2022; Okruszek et al., 2020). Individuals with higher levels of loneliness have more maladaptive thoughts, poor emotion regulation, and rumination (Preece et al., 2021; Zawadzki et al., 2013).

Perceived loneliness in younger and older adults

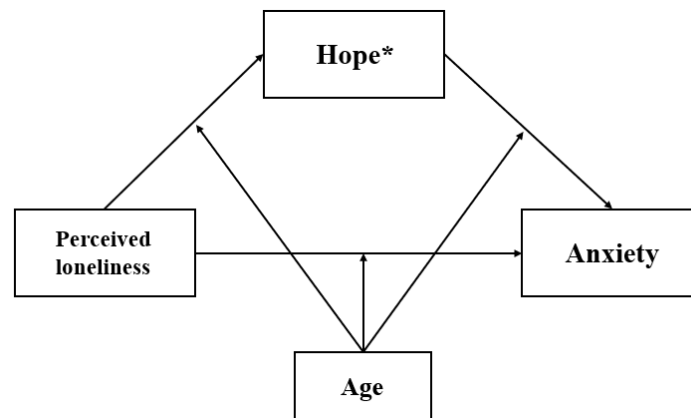
Previous studies suggest that perceived loneliness has a bimodal distribution: younger and older adults reported higher levels of perceived loneliness (e.g., Hawkey & Cacioppo, 2010). Social distancing might have impacted the young and the old to various degrees. On the one hand, older adults might place more significance on the quality, rather than quantity, of their relationships and social engagements (Luong et al., 2011). On the other hand, social distancing made it harder for older adults to access family, friends, and social services on which they are often

functionally dependent, specifically for those living in nursing homes (Hwang et al., 2020). Older adults may not be proficient in using virtual technology (e.g., video calls) for social connection (Armitage & Nellums, 2020; Hwang et al., 2020), making them more vulnerable to higher levels of perceived loneliness and mental distress during the pandemic. For younger adults, previous studies report that they are vulnerable to perceived loneliness and anxiety/depression during the pandemic (Loades et al., 2020). Younger adults might evaluate their social enjoyment and success based on the size of their social network and the number of social contacts (Wicken et al., 2021), both of which are directly impacted by social distancing.

Hope as a psychological buffer

Hope has been considered a psychological buffer against loneliness and anxiety (Muyan et al., 2016; Chang et al., 2019). Hope refers to an individual's goal-oriented belief induced by *agency thinking* (i.e., the motivation to initiate and pursue goals) and *pathway thinking* (i.e., the perceived capacity to reach goals) (Snyder, 1994). Agency thinking, or *hope agency*, represents the willpower to achieve the expected outcome and reward, while pathway thinking, or *hope pathways*, involves concrete approaches and plans for the achievement of outcomes (Snyder, 2002). Previous research indicates that hope acts as a protective factor against anxiety and other mental outcomes (Carretta et al., 2014; Chang et al., 2016). Individuals with higher levels of hope demonstrated more adaptive emotional control and reported fewer anxious and depressive symptoms (Gallagher et al., 2021). Several studies have reported a negative association between perceived loneliness and hope during the pandemic (Bareket-Bojmel et al., 2021; Chang et al., 2019). For instance, perceived loneliness correlated negatively with hopeful thinking and acted as a mediator between social support and hope in a large sample of healthy adults from the U.K., the U.S., and Israel (Bareket-Bojmel et al., 2021). Lonely individuals reported higher scores in social inhibition and lower scores on hope and social network size compared to their non-lonely counterparts (Ypsilanti & Lazuras, 2022). However, findings of specific hope components (i.e., agency and pathways) on perceived loneliness and

anxiety were limited and mixed. Most studies did not distinguish the two components when investigating hope as a construct and its relationship with other factors. Few studies reported that both hope agency and hope pathways were negatively associated with perceived loneliness (Chang et al., 2019; Ekas et al., 2016). Likewise, several studies suggested that hope agency, but not hope pathways, was a significant predictor of anxiety symptoms (Germann et al., 2018; May et al., 2015). On the contrary, only hope pathways effectively protected against anxiety in a group of high school students (Wang et al., 2017). As suggested by Chang et al. (2019), clarifying the contribution of each component of hope is important because it could avoid theoretical and empirical confusion compared to a single composite score. Such clarification not only refines the hope theory but also points to appropriate interventions that bolster hope through strategically facilitating agency thinking, pathway thinking, or both, when designing mental health programs for combatting the negative impacts of public health outbreaks such as COVID-19 in the future. To our knowledge, the findings about the effect of age on the relationship between hope, perceived loneliness and anxiety have not been fully investigated. Previous studies reported that hope is associated with emotion regulation and resilience that tend to increase with age (Losada-Baltar et al., 2021; Wickens et al., 2021). The current study aimed to elucidate the impact of hope and age on the relationship between perceived loneliness and anxiety during COVID-19 with the following objectives: 1) to examine the three relationships among hope (agency thinking and pathway thinking), perceived loneliness and anxiety; 2) to test whether hope mediated the relationship between perceived loneliness and anxiety, 3) to test the moderating effect of age, in which relationships vary across young adults and old adults (Figure 1). Based on the existing literature, we hypothesized that agency thinking and pathway thinking were negatively associated with anxiety and perceived loneliness; both agency thinking and pathway thinking mediated the relationship between perceived loneliness and anxiety; and 3) young adults with low hope were more likely to report high levels of anxiety compared to older adults.



Note. *Hope will be analyzed by agency and pathways subscales separately.

Figure 1: The proposed moderated mediation model.

Methods

Participants

One hundred and fifty-four healthy Chinese were recruited from local universities, communities, and elderly centers from March 2021 to May 2021. The inclusion criteria were: [1] either aged 18 to 25 or aged 65 to 85; [2] able to read Chinese. The exclusion criteria were: [1] with a present or history of Covid-19 diagnosis; [2] with a present or history of psychiatric or neurological illnesses. Studies have found that the infection and long COVID-19 symptoms are highly associated with an increase in

mental health problems (Magnúsdóttir et al., 2022; Robinson et al., 2022). The infection rate in Hong Kong was low during the data collection. Therefore, people with the infection were excluded to avoid the confounding effect. The sample comprised 77 young adults ($Age = 45.18$, $SD = 25.83$, 50.6% female), and 77 old adults ($Age = 45.18$, $SD = 25.83$, 45.5% female). The study was approved the research ethics committee at the University of Hong Kong and was conducted according to the Declaration of Helsinki. All participants provided informed consent before participation.

Measures

Perceived loneliness

Perceived loneliness was measured by the UCLA-Loneliness scale (UCLA-LS) (Version 3) (Russell, 1996). It consists of 20 items, a 4-point Likert scale from 1 (*Never*) to 4 (*Often*), to assess the subjective feelings of loneliness and isolation. The Chinese version of UCLA-LS was reported to be reliable and valid among the samples and in Hong Kong (Cronbach's alpha = 0.91; Ng & Lee, 2020). Cronbach's alpha in the current study was 0.89.

Hope

Hope was examined by the Adult Dispositional Hope Scale (ADHS) (Snyder et al., 1991). ADHS contains 12 items, divided into two 4-item subscales: [1] Agency (i.e., goal-directed energy) and [2] Pathways (i.e., planning to accomplish goals). The remaining four items are distractors. Each item is answered using an 8-point Likert scale ranging from 1 = *Definitely false* to 8 = *Definitely true*. The Chinese version was tested with good reliability and validity with 0.80 and 0.83 Cronbach's alpha of agency and pathways subscales respectively (Chen & Shen, 2009). Cronbach's alpha of agency and pathways subscales in the current study were 0.67 and 0.80.

Anxiety

Generalized Anxiety Disorder-7 (GAD-7) is comprised of 7 items and aims to screen anxiety-related disorders among the general healthy population (Spitzer et al., 2006). It is rated on a 4-point Likert scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*) over the past two weeks. A higher score is associated with more severe anxiety symptoms. The present study adopted the Chinese version of GAD-7 developed by He et al. (2010), which had shown good validity and reliability in the Chinese population (Gong et al., 2021). Cronbach's alpha in the current study was 0.91.

COVID-19 peritraumatic distress (Revised)

The presence of negative moods and behavioral changes during the COVID-19 pandemic was termed COVID-19 peritraumatic distress (CPD; Qiu et al., 2020). Developed by Qiu et al. (2020), the COVID-19 Peritraumatic Distress Index (CPDI) is a self-report Chinese

questionnaire that quantifies adverse mental health outcomes including anxiety. The CPDI examines various psychological distress such as the frequency of anxiety, depression, and physical symptoms in the past week. The present study employed the revised CPDI with higher validity and reliability (Tao et al., 2021). It contains 15 items on a 5-point Likert scale, ranging from 0 (*Never*) to 4 (*Most of the time*). Cronbach's alpha in the current study was 0.90.

Procedure

Participants completed self-report questionnaires via either an online platform, Qualtrics, or a hard copy. In addition, participants reported demographic information such as education, marital status, and living arrangement.

Data analyses

Data were analyzed using Statistical Package for the Social Science (SPSS) version 28. We first investigated the descriptive statistics and correlations among variables. We compared variables between young and old adult groups with Welch's *t*-test because their values violated the assumption of equal variance. Then, we utilized the PROCESS macro in SPSS to test the mediation and moderation effects (Hayes, 2013). Specifically, we used Model 4 of PROCESS macro to test a simple mediation model, and Model 59 to test the moderated mediation. Age was dummy coded such that 0 = young adults and 1 = old adults. Model 1 was to test the moderating effect of age on the relationship between perceived loneliness and anxiety. Model 2 was to examine the moderating effect of age on the relationship between perceived loneliness and hope. Model 3 was to investigate the moderating effect of age on the relationship between hope and anxiety. A total bootstrap sample of 5,000 was applied to obtain a 95% bias-corrected confidence interval (Hayes, 2018). The mediating effect is significant if zero is excluded in the CI for the indirect effect. All continuous variables were standardized. Several studies found that females are susceptible to loneliness and anxiety (Beutel et al., 2017) while others indicated no difference (McDonald et al., 2022; Wicken et al., 2021). Given the mixed findings, we controlled for gender as a covariate in the present study.

Results

The information on demographic variables is shown in Table 1.

Demographic characteristics	Young adults (<i>n</i> = 77)	Old adults (<i>n</i> = 77)	Full sample (<i>N</i> = 154)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Gender			
Male	38 (49.4)	42 (54.5)	80 (51.9)
Female	39 (50.6)	35 (45.5)	74 (48.1)
Education			
No formal education	0 (0)	11 (14.3)	11 (7.1)
Primary school	0 (0)	35 (45.5)	35 (22.7)
Secondary school	5 (6.5)	31 (40.3)	36 (23.4)
Bachelor degree or above	72 (93.5)	0 (0)	72 (46.8)
Marital status			
Unmarried	77 (100)	2 (2.6)	79 (51.3)

Married	0 (0)	49 (63.6)	49 (31.8)
Divorced/widowed	0 (0)	26 (33.8)	26 (16.9)
Living arrangement			
Alone	5 (6.5)	16 (20.8)	21 (13.6)
Otherwise	72 (93.5)	61 (79.2)	133 (86.4)
Presence of children			
Yes	0 (0)	71 (92.2)	71 (46.1)
No	77 (100)	6 (7.8)	83 (53.9)
Employment			
Studying	66 (85.7)	0 (0)	66 (42.9)
Working	7 (9.1)	5 (6.5)	12 (7.8)
Unemployed	4 (5.2)	0 (0)	4 (2.6)
Retired	0 (0)	72 (93.5)	72 (46.8)

Table 1: Descriptive statistics.

The means, standard deviations and Pearson's correlation matrix of each variable are shown in Table 2.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Perceived loneliness	42.20	9.57				
2. Hope (Agency)	21.51	4.35	-0.26** [-0.40, -0.11]			
3. Hope (Pathway)	22.02	5.16	-0.27*** [-0.41, -0.12]	0.76*** [0.68, 0.82]		
4. Anxiety	4.90	4.56	0.54*** [0.41, 0.54]	-0.07 [-0.23, 0.09]	-0.13 [-0.28, 0.03]	
5. CPD	11.66	8.17	0.58*** [0.47, 0.68]	-0.14 [-0.30, 0.01]	-0.18* [-0.33, -0.02]	0.69*** [0.60, 0.77]

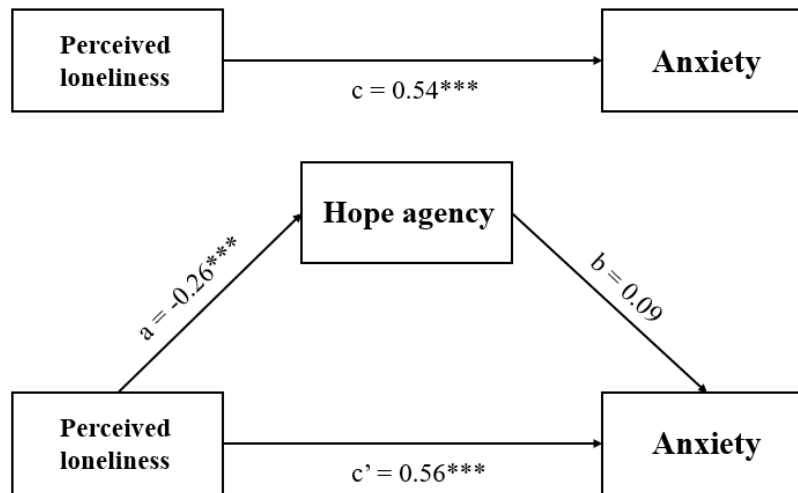
Note. *M* = mean, *SD* = standard deviation. CPD: covid peritraumatic distress. Values in brackets indicate the 95% confidence interval. * $p < .05$, ** $p < .01$, *** $p < .001$

Perceived loneliness was positively associated with anxiety and covid peritraumatic distress, and negatively correlated with hope agency and pathways. Hope pathways were negatively correlated with covid peritraumatic distress ($r = -0.18$, $p = .025$). However, hope agency and hope pathways were not significantly associated with levels of anxiety and covid peritraumatic distress in the overall sample. In addition, young adults reported significantly higher levels of loneliness, anxiety and

peritraumatic distress compared to the older adults (perceived loneliness: $t(152) = 6.40$, $p < .001$, $d = 1.03$, 95% CI [0.67, 1.38]; anxiety: $t[146] = 8.24$, $p < .001$, $d = 1.33$, 95% CI [-0.21, 0.42]; CPD: $t[136] = 8.31$, $p < .001$, $d = 1.34$, 95% CI [0.96, 1.72]), while they reported similar levels of agency and pathway thinkings (hope agency: $t(146) = 1.51$, $p = .134$, $d = 0.24$, 95% CI [-0.08, 0.56]; hope pathways: $t[145] = 0.64$, $p > .05$, $d = 0.10$, 95% CI [-0.21, 0.42]).

Mediation effect analysis

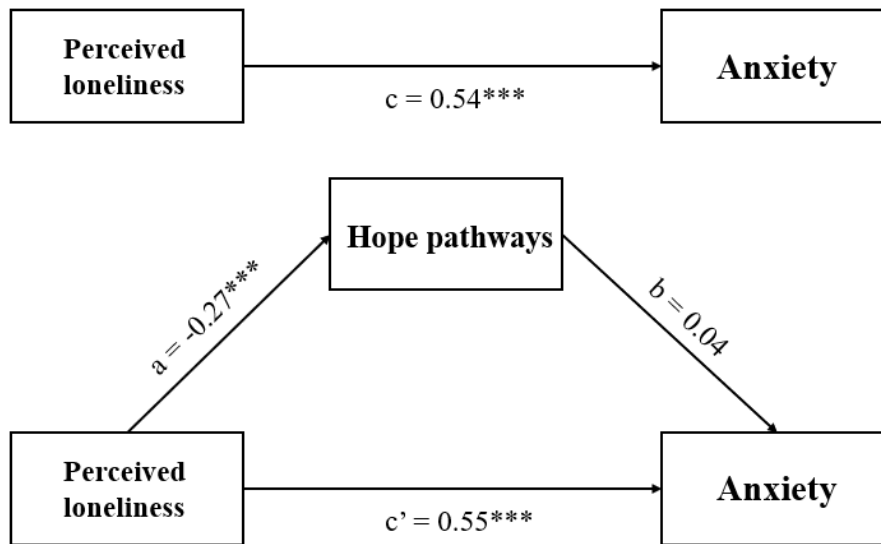
The mediating effect of hope on the relationship between perceived loneliness and anxiety is shown in Figure 2



Note. *** $p < .001$.

Figure 2: The mediation effect of hope agency on perceived loneliness and anxiety.

(hope agency) and Figure 3



Note. *** $p < .001$.

Figure 3: The mediation effect of hope pathways on perceived loneliness and anxiety.

(hope pathways). Concerning the model involving hope agency, perceived loneliness was positively associated with anxiety ($\beta = 0.56, t = 7.95, p < .001$), and had a significant negative effect on hope agency ($\beta = -0.26, t = -3.35, p < .001$). However, agency thinking was not significantly associated with the levels of anxiety ($\beta = 0.09, t = 1.21, p > .05$). There was no evidence for a mediating effect of hope agency on the relationship between perceived loneliness and anxiety (indirect effect = $-0.02, SE = 0.02, 95\% CI [-0.07, 0.02]$). Similarly, there was no evidence for a mediating effect of hope pathways on the relationship between perceived loneliness and anxiety (indirect effect = $-0.01, SE = 0.02, 95\% CI [-0.06, 0.03]$) in the whole sample.

Moderated mediation effect analysis

Our results showed that the indirect effect of perceived loneliness on anxiety via hope agency was moderated by age ($b = -0.14, SE = 0.06, 95\% CI [-0.28, -0.03]$). Specifically, the hope agency acted as a mediator in the young adults ($b = 0.10, SE = 0.05, 95\% CI [0.01, 0.22]$), but not in the older adults ($b = -0.04, SE = 0.04, 95\% CI [-0.12, 0.01]$). For young adults, higher levels of hope agency were associated with lower levels of anxiety ($b = -0.41, p < .001$), whereas for old adults, such a relationship was not significant ($b = 0.06, p > .05$) (Figure 4).

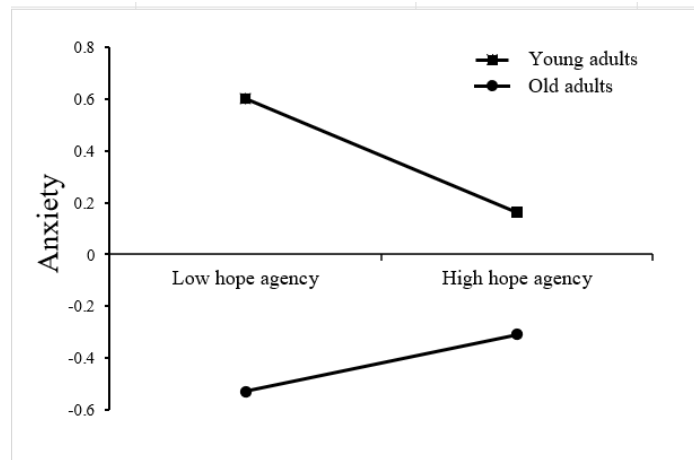


Figure 4: Anxiety at low vs. high hope agency for young and old adults.

Regarding the model involving hope pathways, both perceived loneliness \times age and hope pathways \times age was not significantly associated with anxiety. In other words, age did not buffer the mediating effect of hope pathways on the relationship between perceived loneliness and anxiety in the two age groups (young adults: $b = 0.08$, $SE = 0.06$, 95% CI [-0.04, 0.19]); old adults ($b = -0.01$, $SE = 0.03$, 95% CI [-0.08, 0.03]).

Hope agency did not mediate the relationship between perceived loneliness and CPD (young adults: $b = 0.05$, $SE = 0.04$, 95% CI [-0.01,

0.15]; old adults: $b = 0.00$, $SE = 0.02$, 95% CI [-0.03, 0.04]) in the whole sample. Interestingly, we found that hope pathways \times age were significantly associated with covid peritraumatic distress, ($b = -0.09$, $SE = 0.04$, 95% CI [-0.19, -0.02]). Moreover, such mediation was only detected in young adults ($b = 0.08$, $SE = 0.04$, 95% CI [0.02, 0.17]), but not in the older adults ($b = -0.01$, $SE = 0.02$, 95% CI [-0.05, 0.02]). Further, the simple slope diagram (Figure 5)

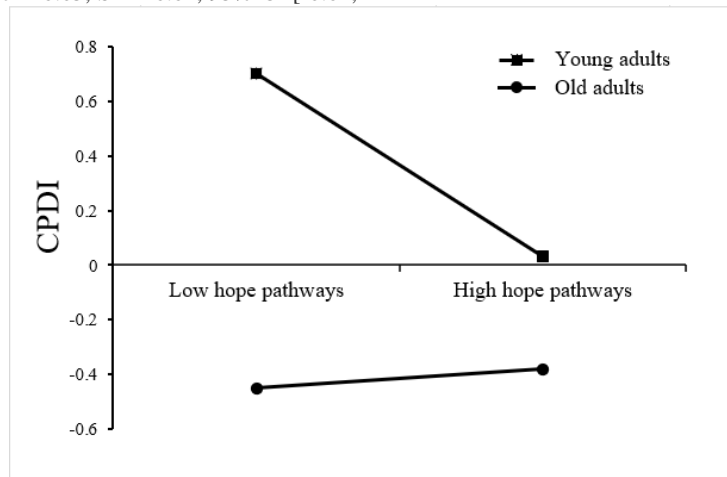


Figure 5: CPD at low vs. high hope pathways for young and old adults.

illustrated that higher levels of hope pathways were associated with lower levels of CPD for young adults ($b = -0.45$, $p < .001$), whereas such a relationship was not significant for old adults ($b = 0.04$, $p > .05$).

Discussion

The current study aimed to examine the mediating effect of agency thinking and pathway thinking between perceived loneliness and anxiety among young and older adults. Our results revealed that hope agency modulated the negative influence of perceived loneliness in younger adults compared to the older adults. Moreover, hope pathways modulated the reported covid-19 peritraumatic distress in the younger adults compared with the older adults. First of all, we found positive associations between loneliness and anxiety, and a negative association between loneliness and hope, which were in line with previous findings (e.g., Beutel et al., 2017; Okruszek et al., 2020). Consistent with other studies reporting young people were more negatively affected by the COVID-19 (e.g., Varma et al., 2021), young adults in our study reported higher levels

of perceived loneliness and anxiety than older adults. Despite the reports of higher general distress, younger adults reported similar levels of hope agency and pathways as the older adults. To our knowledge, no previous studies examined the age difference in hope during COVID-19; our study suggested that hope might be a stable construct in young and old adult groups.

Despite the fact that neither pathway thinking nor agency thinking mediated the relationships between perceived loneliness and anxiety in the overall sample, our findings revealed specific roles of agency and pathway thinking in mitigating the negative impacts of COVID-19. Specifically, hope agency mediated the relationship between perceived loneliness and anxiety in young adults, and hope pathways mediated the relationship between perceived loneliness and peritraumatic distress in the young adults. In the original theory of Hope, Synder et al. (1991) proposed that both components of hope facilitate psychological adjustment. Our results showed that hope agency and pathways may have unequal contributions to anxiety and distress during COVID-19. Only

hope agency mediated the effect of perceived loneliness on anxiety in our young adult samples. It might imply that despite feeling lonely, younger adults with higher motivation to initiate or achieve a goal would result in lower anxiety. In fact, lacking motivation might be an important source of anxiety symptoms in young adults. Consistently, several studies have suggested the stronger involvement of hope agency on anxiety over hope pathways (Chang et al., 2016; Muyan & Chang, 2019). In contrast, the effect of perceived loneliness on COVID-19 peritraumatic distress, an index aimed to quantify pandemic-related acute stress reactions involving additional mental health factors, was mediated only by hope pathways. We conjecture that high pathway thinking, the perceived ability that a specific and concrete goal can be attained, might enable young adults to cope with stress more effectively. The null findings in old adults might be understood by their low requirements for social connections. In other words, the quarantine policies did not significantly undermine the fulfillment of their needs for social network nor changed their daily routine (Luong et al., 2011). Another possible explanation is the widespread adoption of digital technology for Hong Kong elderly. Although being inexperienced in using virtual technology could increase the vulnerability of feeling loneliness, such situation may not have applied to Hong Kong old adults. Yang et al. (2022) reported that around 70 percent of old adults have taken advantage of smartphones for social connections in 2021 (e.g., video calls with family members), which countered the negative impact caused by quarantine policies. Moreover, Philip et al. (2020) proposed a potential explanation that older adults generally have greater resilience, emotion regulation and coping strategies which provided better psychological responses during the pandemic.

Practical implications

Our study provides insight that hope could buffer the relationship between perceived loneliness and anxiety in young adults during COVID-19. The findings underscored the importance of hope, both agency and pathways thinking, in young adults to enhance their resilience in combatting COVID-related distress. Several hope-focused interventions suggested by previous studies could improve the hopeful thinking for young adults. Berg et al. (2020) developed an 8-week app-based program, focused on psychoeducation on hope-related skills (e.g., how to maintain motivations towards life goals) and addressed the enhanced mental well-being. Another brief single-session hope intervention conducted by Feldman and Dreher (2012) showed the greater hope of college students and facilitated their goal progress. In addition to specific hope intervention, problem-focused coping, aiming to resolve stressful situations with strategies such as reason identification, new skills learning, and implementation of alternative plans and approaches could also ameliorate the hope pathways (Folkman & Lazarus, 1985). What is worth mentioning, due to the interactive nature of the relationship between agency and pathways, the enhancement of either agency or pathways thinking should be another effective method to boost each other. For instance, distressed young adults who engage in such coping training should have more pathways to achieve goals and, as a result, gain more confidence and self-esteem (i.e., agency promotion). Lindsay et al. (2019) conducted a study about a 2-week smartphone-based mindfulness training, which reduced loneliness significantly and improved the feeling of social connectedness. Such training should be appropriate under the pandemic circumstance. Hope is also a crucial determinant of mental health for older adults although our study did not discover its mediation effect of hope among this group. Maintenance of a healthy hope level could prevent or lower the risk of other mental health problems. Two psychological interventions based on cognitive behavioral therapy (CBT) and life review are recommended to improve hope in older adults after a systematic review (Hernandez & Overholse, 2021). CBT facilitates goal-setting (e.g., breaking goals down into several manageable steps) and life review therapy enables one to recollect previously fulfilled particularized hopes to strengthen generalized hope.

Limitations and future directions

The findings should be considered in light of several important limitations upon which future research can build. First, we conducted a cross-sectional study so inferences of any causality should be cautioned. Second, it is unclear if the present model is useful across other age groups (e.g., middle age group). We emphasized on young adults and older adults in our study because they are the two group psychologically more susceptible to the impact of the pandemic (Birditt et al., 2021). Future studies could consider including more age groups, so as to paint a more complete picture of the moderating effect of age. Third, the participants were recruited by the convenience sampling procedure, therefore the generalizability of our findings to other groups (e.g., old adults who live at home) might be limited. Given the null findings in the older adults group, further studies should attempt to use random sampling, particularly in the older population to unveil the relationships among hope, perceived loneliness and mental distress.

Conclusions

The COVID-19 pandemic will not be the last in our lifetime. Despite the current pandemic is nearly over, it is important to learn from the past such that we can be better prepared for the next pandemic. The present study highlights the importance of hope as an important psychological resource that we can enhance to help us manage through challenging situations. This internal psychological resource seems to play a more important role in younger adults compared to their older counterparts. Future work should focus on strategies to enhance hope in younger adults while further exploring other psychological resources that might help older adults to combat the next pandemic.

Disclosure statement

No potential conflict of interest was reported by the author(s).


Acknowledgement


The authors thank Ms. Tiffany Li for contributing her time and effort in the data collection of this project.

Funding

This project is supported by the State Key Laboratory of Brain and Cognitive Sciences Research Fund.

ORCID

Min-rui Zhu  <https://orcid.org/0000-0002-1316-7649>

Cheuk-hang Lam  <https://orcid.org/0009-0000-1267-4326>

Charlene Lok-man Lam  <https://orcid.org/0000-0003-4024-3800>

References

1. Armitage, R., & Nellums, L. B. (2020). COVID-19 and the consequences of isolating the elderly. *The Lancet Public Health*, 5(5), e256
2. Bareket-Bojmel, L., Shahar, G., Abu-Kaf, S., & Margalit, M. (2021). Perceived social support, loneliness, and hope during the COVID-19 Pandemic: Testing a mediating model in the UK, USA, and Israel. *British Journal of Clinical Psychology*, 60(2), 133-148.
3. Berg, C. J., Vanderpool, R. C., Getachew, B., Payne, J. B., Johnson, M. F., (2020). A hope-based intervention to address disrupted goal pursuits and quality of life among young adult cancer survivors. *Journal of Cancer Education*, 35, 1158-1169.
4. Beutel, M. E., Klein, E. M., Brähler, E., Reiner, I., Jünger, C., Michal, M., Wiltink, J., Wild, S. P., Münzel, T., Lackner, J. K., & Tibubos, A. N. (2017). Loneliness in the general population:

- prevalence, determinants and relations to mental health. *BMC psychiatry*, 17(1), 1-7.
5. Birditt, K. S., Turkelson, A., Fingerman, K. L., Polenick, C. A., & Oya, A. (2021). Age differences in stress, life changes, and social ties during the COVID-19 pandemic: Implications for psychological well-being. *The Gerontologist*, 61(2), 205-216.
 6. Carretta, C., Ridner, S. H., & Dietrich, M. S. (2014). Hope, hopelessness, and anxiety: A pilot instrument comparison study. *Archives of Psychiatric Nursing*, 28, 230-234.
 7. Chang, E. C., Chang, O. D., Li, M., Xi, Z., Liu, Y. (2019). Positive emotions, hope, and life satisfaction in Chinese adults: A test of the broaden-and-build model in accounting for subjective well-being in Chinese college students. *The Journal of Positive Psychology*, 14(6), 829-835.
 8. Chang, E. C., Yu, T., Chang, O. D., & Hirsch, J. K. (2016). Hope and trauma: Examining a diathesis-stress model in predicting depressive and anxious symptoms in college students. *Personality and Individual Differences*, 96, 52-54.
 9. Chen, C. R., & Shen, H. Y. (2009). "Reliability and validity of adult dispositional hope scale," *Chinese Journal of Clinical Psychology*, 17, 24-26.
 10. Cohn-Schwartz, E., Vitman-Schorr, A., & Khalaila, R. (2022). Physical distancing is related to fewer electronic and in-person contacts and to increased loneliness during the COVID-19 pandemic among older Europeans. *Quality of Life Research*, 31(4), 1033-1042.
 11. Ekas, N. V., Pruitt, M. M., & McKay, E. (2016). Hope, social relations, and depressive symptoms in mothers of children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 29, 8-18.
 12. Feldman, D. B., & Dreher, D. E. (2012). Can hope be changed in 90 minutes? Testing the efficacy of a single-session goal-pursuit intervention for college students. *Journal of happiness studies*, 13, 745-759.
 13. Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48(1), 150-170.
 14. Gallagher, M. W., Smith, L. J., Richardson, A. L., D'Souza, J. M., & Long, L. J. (2021). Examining the longitudinal effects and potential mechanisms of hope on COVID-19 stress, anxiety, and well-being. *Cognitive Behaviour Therapy*, 50(3), 234-245.
 15. Germann, J. N., Leonard, D., Heath, C. L., Stewart, S. M., & Leavey, P. J. (2018). Hope as a predictor of anxiety and depressive symptoms following pediatric cancer diagnosis. *Journal of pediatric psychology*, 43(2), 152-161.
 16. Gong, Y., Zhou, H., Zhang, Y., Zhu, X., Wang, X. et al. (2021). Validation of the 7-item Generalized Anxiety Disorder scale (GAD-7) as a screening tool for anxiety among pregnant Chinese women. *Journal of Affective Disorders*, 282, 98-103.
 17. Hawkey, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of behavioral medicine*, 40(2), 218-227.
 18. Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
 19. Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Communication monographs*, 85(1), 4-40.
 20. He, X.Y., Li, C.B., Qian, J., Cui, H.S., Wu, W.Y. (2010). Reliability and validity of a generalized anxiety disorder scale in general hospital outpatient. *Shanghai Arch. Psychiatry*, 22, 200-203.
 21. Hernandez, S. C., & Overholser, J. C. (2021). A systematic review of interventions for hope/hopelessness in older adults. *Clinical gerontologist*, 44(2), 97-111.
 22. Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. *International psychogeriatrics*, 32(10), 1217-1220.
 23. Lindsay, E. K., Young, S., Brown, K. W., Smyth, J. M., & Creswell, J. D. (2019). Mindfulness training reduces loneliness and increases social contact in a randomized controlled trial. *Proceedings of the National Academy of Sciences*, 116(9), 3488-3493.
 24. Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., et al. (2020). Rapid systematic review: the impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(11), 1218-1239.
 25. Losada-Baltar, A., Jiménez-Gonzalo, L., Gallego-Alberto, L., Pedroso-Chaparro, M. D. S., Fernandes-Pires, J., et al. (2021). "We are staying at home." Association of self-perceptions of aging, personal and family resources, and loneliness with psychological distress during the lock-down period of COVID-19. *The Journals of Gerontology: Series B*, 76(2), e10-e16.
 26. Luong, G., Charles, S. T., & Fingerman, K. L. (2011). Better with age: Social relationships across adulthood. *Journal of social and personal relationships*, 28(1), 9-23.
 27. Magnúsdóttir, I., Lovik, A., Unnarsdóttir, A. B., McCartney, D., Ask, H., Kõiv, K., et al. COVIDMENT Collaboration (2022). Acute COVID-19 severity and mental health morbidity trajectories in patient populations of six nations: an observational study. *The Lancet Public Health*, 7(5), e406-e416.
 28. May, E. M., Hunter, B. A., Ferrari, J., Noel, N., & Jason, L. A. (2015). Hope and abstinence self-efficacy: Positive predictors of negative affect in substance abuse recovery. *Community Mental Health Journal*, 51(6), 695-700.
 29. McDonald, A. J., Wickens, C. M., Bondy, S. J., Elton-Marshall, T., Wells, S., et al. (2022). Age differences in the association between loneliness and anxiety symptoms during the COVID-19 pandemic. *Psychiatry Research*, 310, 114446.
 30. Muyan, M., & Chang, E. C. (2019). Hope as a mediator of the link between intimate partner violence and suicidal risk in Turkish women: Further evidence for the role of hope agency. *Journal of interpersonal violence*, 34(21-22), 4620-4637.
 31. Muyan, M., Chang, E. C., Jilani, Z., Yu, T., Lin, J., & Hirsch, J. K. (2016). Loneliness and negative affective conditions in adults: are there any room for hope in predicting anxiety and depressive symptoms? *The Journal of psychology*, 150(3), 333-341.
 32. Ng, S. M., & Lee, T. M. (2020). The mediating role of hardiness in the relationship between perceived loneliness and depressive symptoms among older. *Aging & mental health*, 24(5), 805-810.
 33. Okruszek, Ł., Aniszewska-Stańczuk, A., Piejka, A., Wiśniewska, M., & Żurek, K. (2020). Safe but lonely? Loneliness, anxiety, and depression symptoms and COVID-19. *Frontiers in psychology*, 11, 3222. a
 34. Peplau L, & Perlman D. Perspectives on loneliness. In: Peplau L, Perlman D, editors. Loneliness: A sourcebook of current theory, research, and therapy. New York: Wiley; 1982.
 35. Philip, K., Cumella, A., Farrington-Douglas, J., Laffan, M., & Hopkinson, N. (2020). Respiratory patient experience of measures to reduce risk of COVID-19: findings from a descriptive cross-sectional UK wide survey. *BMJ open*, 10(9), e040951.

36. Preece, D. A., Goldenberg, A., Becerra, R., Boyes, M., Hasking, P., & Gross, J. J. (2021). Loneliness and emotion regulation. *Personality and Individual Differences, 180*, 110974.
37. Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General psychiatry, 33*(2).
38. Robinson, E., Sutin, A. R., Daly, M., & Jones, A. (2022). A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic in 2020. *Journal of affective disorders, 296*, 567-576.
39. Rogers, A. A., Ha, T., & Ockey, S. (2021). Adolescents' perceived socio-emotional impact of COVID-19 and implications for mental health: Results from a US-based mixed-methods study. *Journal of Adolescent Health, 68*(1), 43-52.
40. Snyder, C. R. (1994). The psychology of hope: You can get there from here. Simon and Schuster.
41. Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry, 13*, 249-275.
42. Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., et al. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology, 60*, 570-585.
43. Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine, 166*(10), 1092-1097.
44. Tao, J., Zeng, Q., Dang, J., & Qiu, J. (2021). Reliability and Validity of Corona Virus Disease 2019 (COVID-19) Peritraumatic Distress Index (CPDI). *Journal of Shanghai Jiao Tong University (Medical Science), 41*(10), 1-7.
45. Varma, P., Junge, M., Meaklim, H., & Jackson, M. L. (2021). Younger people are more vulnerable to stress, anxiety and depression during COVID-19 pandemic: A global cross-sectional survey. *Progress in Neuro-Psychopharmacology and Biological Psychiatry, 109*, 110236.
46. Wang, S., Xu, X., Zhou, M., Chen, T., Yang, X., Chen, G., & Gong, Q. (2017). Hope and the brain: trait hope mediates the protective role of medial orbitofrontal cortex spontaneous activity against anxiety. *Neuroimage, 157*, 439-447.
47. Wickens, C. M., McDonald, A. J., Elton-Marshall, T., Wells, S., Nigatu, Y. T., Jankowicz, D., & Hamilton, H. A. (2021). Loneliness in the COVID-19 pandemic: Associations with age, gender and their interaction. *Journal of Psychiatric Research, 136*, 103-108.
48. World Health Organization WHO timeline - COVID-19 Available at: <https://www.who.int/news-room/detail/27-04-2020-who-timeline---covid-19> (2020), Accessed 20th May 2020.
49. Yang, C., Lai, D. W., Sun, Y., Ma, C. Y., & Chau, A. K. C. (2022). Mobile Application Use and Loneliness among Older Adults in the Digital Age: Insights from a Survey in Hong Kong during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health, 19*(13), 7656.
50. Ypsilanti, A., & Lazuras, L. (2022). Loneliness is not a homogeneous experience: An empirical analysis of adaptive and maladaptive forms of loneliness in the UK. *Psychiatry Research, 312*, 114571.
51. Zawadzki, M. J., Graham, J. E., & Gerin, W. (2013). Rumination and anxiety mediate the effect of loneliness on depressed mood and sleep quality in college students. *Health Psychology, 32*(2), 212.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

Submit Manuscript

DOI:10.31579/2637-8892/221

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/psychology-and-mental-health-care>