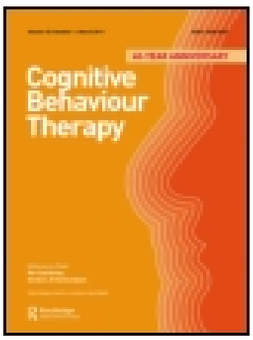

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Examining the longitudinal effects and potential mechanisms of hope on COVID-19 stress, anxiety, and well-being

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ABSTRACTSBEH_A_1877341
Hope is a cognitive trait that predicts both resilience to and recovery from anxiety and stress-related disorders. The present study examines the prospective associations of hope with subsequent anxiety, stress, and well-being during the COVID-19 pandemic. Perceived emotional control, a transdiagnostic vulnerability factor, was also examined as a potential mediator of these relationships. American adults (N = 822) were recruited during the COVID-19 pandemic using Amazon mTURK and structural equation modeling was used to examine how trait hope predicted outcomes approximately one month later. Higher hope was associated with greater well-being and perceived emotional control, as well as lower levels of anxiety and COVID-19 perceived stress. Results also indicated an indirect effect of hope with all outcomes via perceived emotional control. These findings suggest that hope may associated with resilience to the chronic stressors associated with the COVID-19 pandemic.

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Hope; anxiety; well-being; resilience; COVID-19

Introduction

The novel coronavirus (COVID-19) outbreak was declared a pandemic on 11 March 2020 by the World Health Organization (Adhanom, 2020). In addition to the potential for contracting COVID-19 and the associated physical consequences, the daily lives of individuals across the globe were impacted as government and public health officials sought to control community spread of the virus. Indeed, as aspects of daily life such as employment, child care, and social activities were adapted to fit recommendations by public health officials, mental health experts across the globe raised concerns regarding the impact of the COVID-19 pandemic on psychological distress (e.g., Cao et al., 2020; Xiang et al., 2020).

While the COVID-19 pandemic has impacted daily life in substantial ways, the psychological effects of the resulting stressors may not be uniform across individuals. Racial/Ethnic minorities are at an elevated risk for severe outcomes due to COVID-19 and healthcare workers and parents with children at home have been experiencing novel stressors during the pandemic. Not surprisingly, research has demonstrated that

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symptoms of anxiety and depression are elevated overall, but are not universal across individuals (e.g., Barzilay et al., 2020; Gallagher, Zvolensky, et al., 2020; Xiong et al., 2020). There is increasing evidence regarding psychological factors that may confer risk to elevated distress during the pandemic, but limited research on sources of psychological resilience that may promote greater wellbeing or allow individuals to flourish even during stressful events such as the COVID-19 pandemic. The identification of resiliency factors during the COVID-19 pandemic may help efforts to facilitate mental health during the global pandemic.

Hope is one resiliency factor that may promote well-being during a global health crisis (Gallagher & Lopez, 2018). The most widely studied model of hope defines hope as a cognitive trait that represents the perceived capacity to identify pathways or strategies to achieve one's goals and the agency or motivation to pursue desired goals (Snyder, 2002). Hope is conceptualized as a resource that provides a means of coping with seemingly uncontrollable circumstances (Lee & Gallagher, 2018). Research has demonstrated that individuals high in hope (versus those low in hope) are more likely to make adaptive adjustments to life's challenges and utilize effective coping strategies in the face of hardship (Lee & Gallagher, 2018). In this way, hope may promote increased positive affect, life satisfaction, and success while pursuing goals, particularly during times of stress.

Importantly, hope may protect against the development of anxiety- and stress-related disorders. As described by Barlow (2000), anxiety, when conceptualized as "a state of helplessness, because of a perceived inability to predict, control, or obtain desired results" (p. 1249), is an emotional experience that hope should help modulate to some degree. Therefore, we may think of hope as a potentially relevant resiliency factor in the context of the COVID-19 pandemic as it may facilitate continued goal pursuit despite difficult circumstances. Indeed, extant research has demonstrated negative relations between hope and anxiety across samples (e.g., Arnau et al., 2007; Gana et al., 2013), including prospective effects on symptoms of PTSD in meta-analytic reviews (Gallagher, Long, & Phillips, 2020).

One potential mechanism by which hope may influence well-being is perceived emotional control. Within the triple vulnerabilities model, a lack of perceived control over potentially negative events represents a generalized psychological vulnerability for developing an anxiety disorder (Barlow, 2000). In a recent meta-analytic review (Gallagher et al., 2014), large negative associations were found between perceived control and anxiety. Importantly, negative associations with perceived control were found across measures of trait and disorder-specific measures of anxiety, underscoring the importance of perceived control as a transdiagnostic vulnerability factor across anxiety-related disorders.

While previous research has provided evidence for the relationship between hope and multiple components of well-being, anxiety, and stress (Anderson, 1988; Arnau et al., 2007; Ciarrochi et al., 2015; Snyder, Irving et al., 1991), limitations are present in the examination of the specificity of and mechanisms underlying these relationships. As with other research, many of these studies have been conducted using student samples. The COVID-19 pandemic presents a unique combination of life stressors experienced by a wide range of the population that will most likely have a lasting impact for years to come. We have empirical support for the premise that hope has robust effects on positive aspects of mental health (Gallagher & Lopez, 2009) as well as emotional distress (Arnau et al., 2007). However, there is yet to be research demonstrating the magnitude of these relationships

in the context of a modern pandemic. Additionally, there has been little examination of how hope is associated with one's mental health and stress using longitudinal data.

The present study therefore examined the prospective associations of hope with subsequent well-being, anxiety, and COVID-19 related stress. Our aim was to demonstrate that hope is a prospective predictor of well-being, anxiety, and COVID-19 related stress in a community sample using latent variable modeling techniques. Specifically, we predicted that hope measured at Time 1 would be associated with greater well-being, as well as lower COVID-19 related stress and anxiety measured at Time 2. We also aimed to examine whether hope is associated with positive outcomes (reduced COVID-19 stress and improved mental health) through increased perceived emotional control. We predicted that hope measured at Time 1 would indirectly predict outcomes through emotional control measured at Time 2.

Methods

Participants and procedure

The final sample included 822 American adults (41.4% female, Mage = 37.76 years, SD = 11.74) that were recruited using Amazon Mechanical Turk (mTURK), which has been shown to be an effective online platform for obtaining valid survey data (Thomas & Clifford, 2017). The study was advertised as a longitudinal study on mental health during the COVID-19 pandemic. The first wave of data collection occurred from 27 March 2020 to 28 May 2020, and the second wave occurred from 7 May 2020 to 28 June 2020. Participants were invited to complete the second wave on a rolling basis approximately three to six weeks after completing the first wave, and the average time between the two waves was 21.58 (SD = 6.77) days. Participants could receive up to three emails reminding them to complete each HIT, which were sent approximately 1 week apart through the mTURK platform. Participants in the mTURK system were eligible to participate if they were American adults 18 years or older and had completed at least 100 previous mTURK tasks with an approval rate of at least 95%. A total of 858 participants completed the survey, however, participants were excluded from the final sample and were not included in subsequent waves if they failed to complete at least 3 out of 4 validity check items (e.g., "Select 'true' for this question"). The average time taken to complete the survey was 79 minutes at timepoint 1 and 81 minutes at timepoint 2. The majority of participants identified as Caucasian (69.1%), with the remaining identifying as African American/Black (13.7%), Hispanic/Latino (5.8%), Asian/Pacific Islander (4.4%), Native American (3.2%), or multiracial/other (3.7%).

Measures

Demographics the demographics questionnaire assessed factors such as age, gender, ethnicity, sexual orientation, relationship status, level of education, occupation, place of birth, and household characteristics.

Hope was measured at Time 1 with the Adult Hope Scale (Snyder, Harris et al., 1991), which is the most empirically supported measure of trait hope in adults (Rose & Sieben, 2017). Participants used an 8-point Likert scale to rate themselves on 12 items, including

four items measuring agency thinking, four measuring pathways thinking, and four distractor items. There is extensive research support for the convergent and divergent validity of this scale and one meta-analysis reported the internal consistency as α = .82 (Hellman et al., 2013; Snyder, 2002). The internal consistency of this scale in the present study was α = .90.

Anxiety was measured at Time 2 with the Overall Anxiety Severity and Impairment Scale (OASIS; Norman et al., 2006). Participants used a 4-point Likert scale to rate themselves on five items measuring general, not disorder-specific, anxiety although high scores on the OASIS indicate a likely anxiety disorder. The scores were summed so that higher values meant higher anxiety. The OASIS has been found to have high convergent and divergent validity with measures of mental illness and mental well-being as well as a reliability of α = .80. The internal consistency of this scale in the present study was .92.

COVID-19 perceived stress was measured at Time 2 with a version of the Perceived Stress Scale that was modified to focus on COVID-19 associated stress (PSS-COVID; Cohen et al., 1983). Participants used a 5-point Likert scale to rate themselves on 10 items measuring the extent to which life situations are appraised as stressful (e.g., "In the last week, how often have you felt nervous and 'stressed' due to the Coronavirus?"). The scores were summed so that higher values meant higher perceived stress. The reliability of the original measure in the validation study ranged from α = .84 to α = .86, and previous studies have found support for the unidimensionality of the COVID-19 version of the scale. The internal consistency of this scale in the present study was .87.

Well-being was measured at Time 2 with the Mental Health Continuum-Short Form (MHC-SF; Lamers et al., 2011). Participants used a 6-point frequency scale to rate themselves on 14 items measuring three domains of well-being: emotional, social, and psychological. Emotional well-being (3 items) refers to positive emotions and life satisfaction, social well-being (5 items) includes social acceptance, actualization, contribution, coherence and integration (Keyes, 1998), and psychological well-being (6 items) includes autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff, 1989). The scores were summed so that higher values meant higher well-being. The scale has good convergent and divergent validity and the reliability of the scale was originally reported as α = .89 with high reliability for each of the subscales as well (Lamers et al., 2011). The internal consistency of this scale in the present study was .94.

Perceived control was measured at Time 2 with the Anxiety Control Questionnaire-Revised (ACQ-R; Brown et al., 2004). Participants used a 6-point Likert scale to rate themselves on 15 items measuring three domains of emotion control, threat control, and stress control. The scores were summed so that higher values meant higher perceived stress. The validity of the scale has been supported in clinical and non-clinical samples and the scale has a reliability of ρ = .85. The internal consistency of this scale in the present study was .91.

Analyses

Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were used to quantify the prospective associations between hope and outcomes and the direct and indirect

effects of hope on the outcomes. SEM analyses were conducted using Mplus 8.0 (Muthén & Muthén, 1998–2017). Missing data at time 2 (24%) was accounted for using robust maximum likelihood estimation so that all eligible participants were included in all analyses. The latent variable of hope was identified using four parcels that each contained one pathways item and one agency item. The COVID-19 perceived stress latent variable was identified using three parcels that were created by randomly assigning items from the PSS-COVID. The anxiety latent variable was identified using the five OASIS items as indicators. The well-being and perceived emotional control latent variables were identified using the three subscales of the respective scales as indicators. The indirect effects of hope on outcomes at time 2 via perceived emotional control at time 2 were estimated using the MODEL INDIRECT command in Mplus based on the 95% bias-corrected bootstrapped confidence interval of the indirect effects. Model fit for the CFA/SEM analyses was evaluated using common model fit indices: root-mean-square error of approximation (RMSEA; Steiger, 1990), the Tucker–Lewis index (TLI; Tucker & Lewis, 1973), and the comparative fit index (CFI; Bentler, 1990). Acceptable model fit was evaluated using standard model fit criteria: RMSEA values below 0.10 for adequate fit and .06 for good fit, and CFI and TLI values above .90 for adequate fit and .95 for good fit (Hu & Bentler, 1998).

Results

Means, standard deviations, and correlations among hope at time 1, the hypothesized mediator of perceived emotional control at time 2, and the three outcomes at time 2 are presented in Table 1. As expected, hope was positively correlated with subsequent levels of perceived emotional control and well-being and negatively correlated with anxiety and COVID-19 stress. All correlations were statistically significant, but the magnitude of the associations between hope and outcomes were greater for positive outcomes than for anxiety/stress.

Latent associations

We first specified a CFA to examine model fit, measurement, and the latent associations between hope at wave 1 and outcomes at wave 2, including the hypothesized mediator of perceived emotional control. The model fit for the CFA was adequate (χ^2 (df = 125) = 757.72, p > .05, RMSEA = .08, TLI = .90, CFI = .92).

Table 1. Descriptive statistics and correlations between observed outcomes.

Outcome	Hope (T1)	ACQ-R (T2)	OASIS (T2)	PSS-COVID (T2)	MHC-SF
Hope (T1)	1				
ACQ-R (T2)	.412	1			
OASIS (T2)	−.149	−.637	1		
PSS-COVID (T2)	−.289	−.705	.672	1	
MHC-SF	.596	.374	−.317	−.408	1
Mean	46.84	44.69	5.06	14.61	44.10
SD	10.03	15.60	4.61	8.30	15.39

Note. All correlations statistically significant at p < .001. Hope = Adult Hope Scale (Snyder, Harris et al., 1991); ACQ-R = Anxiety Control Questionnaire-Revised (Brown et al., 2004); OASIS = Overall Anxiety Severity and Impairment Scale (Norman et al., 2006); PSS-COVID = Perceived Stress Scale modified for COVID-19 associated stress (Cohen et al., 1983); MHC-SF = Mental Health Continuum-Short Form (MHC-SF; Lamers et al., 2011).

Consistent with the observed correlations, the latent construct of hope was associated with greater levels of perceived emotional control (r = .33; 95% CI .24: .41) and well-being (r = .68; 95% CI .62: .74), as well as lower levels of anxiety (r = −.16; 95% CI −.07: −.25) and COVID-19 perceived stress (r = −.28; 95% CI −.20: −.36). Based on the confidence intervals of the associations, all associations were statistically significant. In addition, hope had more robust associations with well-being and the hypothesized mediator of perceived emotional control than the negative outcomes of anxiety and COVID-19 perceived stress.

Prospective associations of hope with outcomes

The prospective relationships between hope at wave 1 and the hypothesized mediator and three outcomes at time 2 was then examined using SEM (Figure 1). The model fit for the SEM was adequate (χ^2 (df = 125) = 757.72, p > .05, RMSEA = .08, TLI = .90, CFI = .92). As expected, latent effects of hope were statistically significant for all four outcomes. The unstandardized and completely standardized effects (with 95% CI) of hope and the variance explained (R^2) are presented in Table 2. The magnitude of the effect sizes ranged from small to large, with the greatest effects being found for the prospective effects of hope on perceived emotional control.

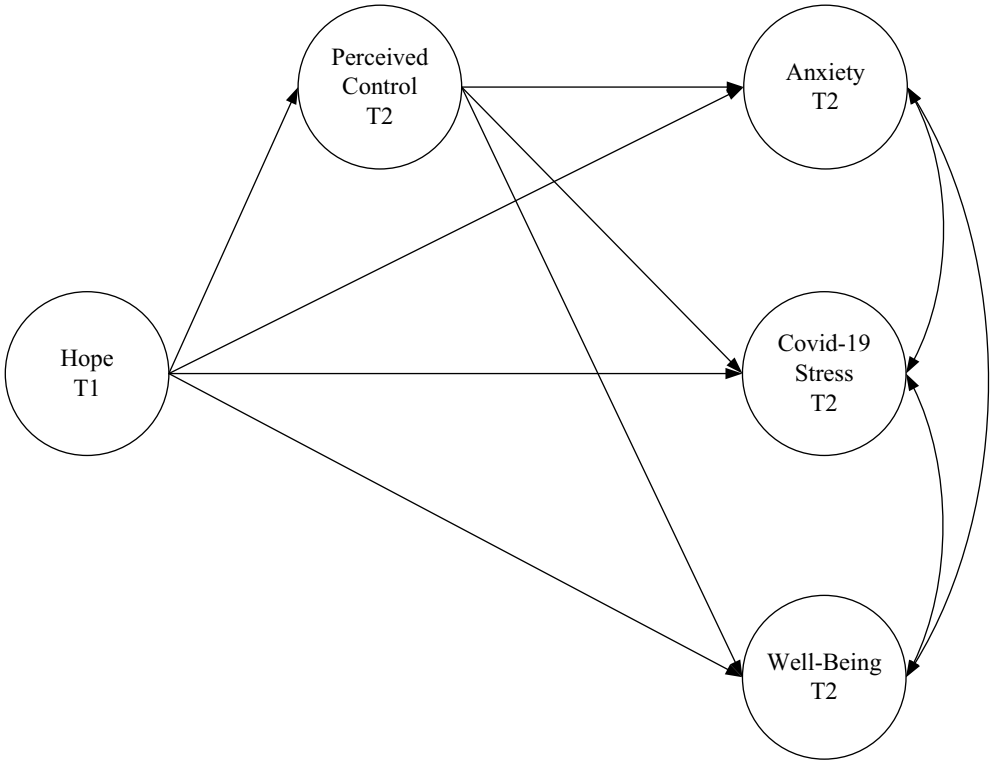

Figure 1. Prospective associations and indirect effects of hope with anxiety, stress and well-being via perceived emotional control. *Note*. Structural equation model examining the prospective direct and indirect effects of hope on anxiety, stress and well-being via perceived emotional control.

Table 2. latent effects of hope at wave 1 on outcomes at wave 2 in SEM analysis.

Outcome	b	*se*	*p*	*B*	95% CI *B*	R^2
Anxiety (OASIS)	−0.062	0.017	<.001	−0.160	−.072: −.247	.025
COVID-19 Stress (PSS-COVID)	−0.420	0.067	<.001	−0.278	−.196: −.360	.077
Well-being (MHC-SF)	0.299	0.018	<.001	0.677	.618: .735	.105
Perceived Emotional Control (ACQ-R)	0.080	0.016	<.001	0.325	.237: .412	.458

Note. b represents unstandardized beta coefficient; *B* represents completely standardized beta coefficient. OASIS = Overall Anxiety Severity and Impairment Scale (Norman et al., 2006); PSS-COVID = Perceived Stress Scale modified for COVID-19 associated stress (Cohen et al., 1983); MHC-SF = Mental Health Continuum-Short Form (MHC-SF; Lamers et al., 2011).
ACQ-R = Anxiety Control Questionnaire-Revised (Brown et al., 2004).

Indirect effects of hope via perceived emotional control

Our final model was specified to examine the indirect effects of hope on outcomes as time 2 via perceived emotional control. The model fit for the SEM was adequate (χ^2 (*df* = 125) = 887.24, $p > .05$, RMSEA = .09, TLI = .90, CFI = .92). Hope at wave 1 was a moderate predictor of perceived emotional control at wave 2 (b = 0.08, se = .016, $p < .001$; *B* = .325; 95% CI *B* .237: .412). Perceived emotional control was a strong predictor of anxiety (b = −1.11, se = .10, $p < .001$; *B* = −.709; 95% CI *B* − .647: −.771) and COVID-19 stress (b = −4.51, se = .39, $p < .001$; *B* = −.733; 95% CI *B* − .682: −.785), and a weak predictor of well-being (b = 0.19, se = .07, $p < .001$; *B* = .104; 95% CI *B* .030: .177). The indirect effects of hope via perceived emotional control on anxiety (ab = −.089; 95% CI −.062: −.116), COVID-19 stress (ab = −.360; 95% −.258: −.470), and well-being (ab = .015; 95% .004: .029) were all statistically significant based on the confidence intervals of the indirect effects. Hope was no longer a statistically significant correlate of anxiety or COVID-19 stress after accounting for perceived emotional control, but remained a strong correlated of well-being (b = .28, se = .019, $p < .001$; *B* = .643; 95% CI *B* .578: .708). The total amount of variance predicted in anxiety (R^2 = .475), COVID-19 stress (R^2 = .558) and well-being (R^2 = .468) was consistently large.

Discussion

The COVID-19 pandemic has profoundly impacted the day to day lives of individuals worldwide. Unlike a natural disaster, this pandemic has impacted individuals across the globe and can be felt in most life domains. The present findings provide preliminary evidence that hope could be associated with resilience against stress related to COVID-19, an enduring stressor that has a low probability of relenting until vaccines are widely distributed. Hope demonstrated a prospective, robust association with anxiety, COVID-19 stress, well-being, and perceived emotional control, with the strongest relationship being between hope and well-being. Furthermore, the current study provides increased understanding with regard to how hope impacts mental health and stress. Hope was indirectly associated with reductions in anxiety and COVID-19 stress and increases in well-being via more adaptive perceived emotional control.

This study serves as an addition to the literature on COVID-19 and mental health, especially through the identification of prospective effects. Research with regard to COVID-19 has primarily examined vulnerability factors that may contribute to mental

health problems (e.g., distress tolerance and loneliness; Liu et al., 2020) and has begun to preliminarily examine the relationship between mental health and coping (Fullana et al., 2020). Few studies published thus far have examined resiliency factors, with initial findings indicating a negative association between resiliency and stress, anxiety and depression (Barzilay et al., 2020). There has yet to be a longitudinal examination using validated measures of a future-oriented protective trait, such as hope, and its relationship to COVID-19 stress.

Hope has shown to predict higher levels of positive mental health and lower levels of mental illness, including anxiety and depression (Alarcon et al., 2013; Arnau et al., 2007). The current study adds to this literature by providing evidence that hope is prospectively associated with lower levels of anxiety and COVID-19 stress. This temporal relationship is consistent with past studies examining the relationship between hope and anxiety (Arnau et al., 2007). While the present findings demonstrate that hope predicts subsequent well-being, anxiety, and COVID-19 stress, the relationship between hope and well-being appeared to be the most robust.

Our findings regarding the direct and indirect effects of hope on mental health outcomes are consistent with previous research examining hope as a mechanism for recovery from distress. Findings from a recent clinical trial found that hope predicted lower levels of anxiety across time during CBT (Gallagher, Long, et al., 2020). Hope may promote resilience by both directly and indirectly reducing anxiety and stress. Therefore, while hope is still an important source of resilience and recovery, there is now evidence that hope may influence anxiety by facilitating perceived emotional control, which has a more robust impact on indicators of languishing such as stress and anxiety.

Perceived emotional control is a transdiagnostic factor associated with greater physical and mental health (Barlow, 2000). While individuals may objectively lack direct control over many aspects of the coronavirus pandemic, the present findings indicate that a sense of emotional control is associated with less COVID-19 stress. Moreover, perceived emotional control was not only a predictor of anxiety, stress, and well-being, but it appeared to be a mechanism through which hope is able to impact the three outcomes. If an individual believes they are generally capable of planning how they will achieve their goals and possess the motivation to reach their goals, they may also have a greater capacity to maintain positive evaluations of perceived emotional control even during situations in which an individual may lack direct control such as the coronavirus pandemic. Based on our findings, if the individual finds that they can control their internal emotional state, they may feel a reduction in anxiety and stress related to more external factors such as the possibility of contracting the virus. Previous research has demonstrated that both hope and perceived emotional control can be reliably promoted during CBT interventions, so these factors could be important treatment targets in individuals seeking treatment for COVID-19 associated stress as they may both be useful in promoting adaptive coping that could lessen COVID-19 associated stress.

Strengths of the present study include the use of longitudinal data that permits more robust conclusions regarding the potential protective effects of hope on outcomes during the COVID-19 pandemic. Future studies examining longer periods of time and more waves of data will allow for an even better understanding of sources of recovery and resilience during the pandemic. The use of SEM to model outcomes as latent variables also helped to

reduce the potential impact of measurement error, but future work using independent evaluations of clinical outcomes will also allow for stronger conclusions. Extending our findings to examine other outcomes that may be impacted by the COVID-19 pandemic such as substance abuse (Liu et al., 2020), and examining the unique contributions of hope relative to other positive psychological traits will also be important for clarifying what factors promote resilience and well-being in this context.

Limitations

The present research was limited by the racial and ethnic homogeneity of the sample, the exclusive use of self-report measurements, and the nature of data analysis and collection. The present study sampled from the general US population, but was not a representative sample of the US population so our findings may not be fully generalizable to subpopulations that appear to be more severely impacted by COVID-19 (e.g., marginalized populations, healthcare providers). While past studies have supported the validity of MTurk for survey research, certain qualifications are required for Mturk Prime account, such as a US bank account, that limit the representativeness of the sample. Future research may therefore attempt to replicate the present findings with a more diverse sample and to examine how race, gender, and other demographic factors may influence sources of resilience. In addition, all measures were completed electronically via self-report, so potential effects due to method variance and reporting bias cannot be ruled out. Finally, the current study examined the relationship between study variables across two waves of data. Future research using data collected at three or more timepoints would allow for the use of other longitudinal methods of analyses such as cross-lagged panel models or latent growth curve modeling that allow for more precise quantification of intraindividual changes processes.

Conclusions

Given the duration and global nature of the COVID-19 pandemic, this ongoing event is likely to have a lasting effect on our society. While we are beginning to develop an understanding of how this crisis contributes to negative health outcomes, it is just as important to determine what sources of resilience may help promote well-being or protect against or reduce levels stress and anxiety. The present study establishes hope as a potential source of resilience that is associated with improved overall well-being during the coronavirus pandemic. In addition to the direct effects of hope, hope appears to indirectly influence COVID-19 related stress and anxiety by promoting more adaptive perceptions of emotional control. As the coronavirus pandemic becomes a fixture in our day-to-day lives for the foreseeable future, individuals are finding ways to protect both their emotional and physical health. It may be advantageous to boost resilience through fostering future-oriented traits that individuals already possess, such as hope. A trait-like, future-oriented protective factor such as hope may lead individuals struggling through the coronavirus pandemic to look towards the possibilities for the future, rather than the obstacles of the present.

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Disclosure statement

The authors have no conflicts of interest to report.

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References

Adhanom, T. (2020). *WHO director-General's opening remarks at the media briefing on COVID-19-11 March 2020*. World Health Organization. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020

Alarcon, G. M., Bowling, N. A., & Khazon, S. (2013). Great expectations: A meta-analytic examination of optimism and hope. *Personality and Individual Differences*, *54*(7), 821–827. https://doi.org/10.1016/j.paid.2012.12.004

Anderson, J. R. (1988). *The role of hope in appraisal, goal-setting, expectancy about future success, and coping* (Publication No. 8903077) [Doctoral dissertation, University of Kansas]. ProQuest Dissertations and Theses Global.

Arnau, R. C., Rosen, D. H., Finch, J. F., Rhudy, J. L., & Fortunato, V. J. (2007). Longitudinal effects of hope on depression and anxiety: A latent variable analysis. *Journal of Personality*, *75*(1), 43–64. https://doi.org/10.1111/j.1467-6494.2006.00432.x

Barlow, D. H. (2000). Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American Psychologist*, *55*(11), 1247–1263. https://doi.org/10.1037/0003-066X.55.11.1247

Barzilay, R., Moore, T. M., Greenberg, D. M., DiDomenico, G. E., Brown, L. A., White, L. K., Gur, R. C., & Gur, R. E. (2020). Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. *Translational Psychiatry*, *10*(1), 291. https://doi.org/10.1038/s41398-020-00982-4

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238

Brown, T. A., White, K. S., Forsyth, J. P., & Barlow, D. H. (2004). The structure of perceived emotional control: Psychometric properties of a revised anxiety control questionnaire. *Behavior Therapy*, *35*(1), 75–99. https://doi.org/10.1016/S0005-7894(04)80005-4

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, *287*, 112934. https://doi.org/10.1016/j.psychres.2020.112934

Ciarrochi, J., Parker, P., Kashdan, T. B., Heaven, P. C. L., & Barkus, E. (2015). Hope and emotional well-being: A six-year study to distinguish antecedents, correlates, and consequences. *The Journal of Positive Psychology*, *10*(6), 520–532. https://doi.org/10.1080/17439760.2015.1015154

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385–396. https://doi.org/10.2307/2136404

Fullana, M. A., Hidalgo-Mazzei, D., Vieta, E., & Radua, J. (2020). Coping behaviors associated with decreased anxiety and depressive symptoms during the COVID-19 pandemic and lockdown. *Journal of Affective Disorders*, *275*, 80–81. https://doi.org/10.1016/j.jad.2020.06.027

Gallagher, M. W., Bentley, K. H., & Barlow, D. H. (2014). Perceived control and vulnerability to anxiety disorders: A meta-analytic review. *Cognitive Therapy and Research*, *38*(6), 571–584. https://doi.org/10.1007/s10608-014-9624-x

Gallagher, M. W., Long, L. J., & Phillips, C. A. (2020). Hope, optimism, self-efficacy, and posttraumatic stress disorder: A meta-analytic review of the protective effects of positive expectancies. *Journal of Clinical Psychology*, *76*(3), 329–355. https://doi.org/10.1002/jclp.22882

Gallagher, M. W., Long, L. J., Richardson, A., D'Souza, J., Boswell, J. F., Farchione, T. J., & Barlow, D. H. (2020). Examining hope as a transdiagnostic mechanism of change across anxiety disorders and CBT treatment protocols. *Behavior Therapy*, *51*(1), 190–202. https://doi.org/10.1016/j.beth.2019.06.001

Gallagher, M. W., & Lopez, S. J. (2009). Positive expectancies and mental health: Identifying the unique contributions of hope and optimism. *The Journal of Positive Psychology*, *4*(6), 548–556. https://doi.org/10.1080/17439760903157166

Gallagher, M. W., & Lopez, S. J. (Eds.). (2018). *The Oxford handbook of hope*. Oxford University Press.

Gallagher, M. W., Zvolensky, M. J., Long, L. J., Rogers, A. H., & Garey, L. (2020). The impact of Covid-19 experiences and associated stress on anxiety, depression, and functional impairment in American adults. *Cognitive Therapy and Research, 44*(6), 1043–1051. https://doi.org/10.1007/s10608-020-10143-y

Gana, K., Daigre, S., & Ledrich, J. (2013). Psychometric properties of the French version of the adult dispositional hope scale. *Assessment*, *20*(1), 114–118. https://doi.org/10.1177/1073191112468315

Hellman, C. M., Pittman, M. K., & Munoz, R. T. (2013). The first twenty years of the will and the ways: An examination of score reliability distribution on Snyder's Dispositional Hope Scale. *Journal of Happiness Studies*, *14*(3), 723–729. https://doi.org/10.1007/s10902-012-9351-5

Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*(4), 424–453. https://doi.org/10.1037/1082-989X.3.4.424

Keyes, C. L. M. (1998). Social well-being. *Social Psychology Quarterly*, *61*(2), 121–140. https://doi.org/10.2307/2787065

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., Ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). *Journal of Clinical Psychology*, *67*(1), 99–110. https://doi.org/10.1002/jclp.20741

Lee, J. Y., & Gallagher, M. W. (2018). Hope and well-being. In M. W. Gallagher & S. J. Lopez (Eds.), *The oxford handbook of hope* (pp. 287–298). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199399314.013.20

Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., Hu, S., & Zhang, B. (2020). Online mental health services in China during the COVID-19 outbreak. *The Lancet Psychiatry*, *7*(4), e17–e18. https://doi.org/10.1016/s2215-0366(20)30077-8

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Norman, S. B., Cissell, S. H., Means-Christensen, A. J., & Stein, M. B. (2006). Development and validation of an Overall Anxiety Severity And Impairment Scale (OASIS). *Depression and Anxiety*, *23*(4), 245–249. https://doi.org/10.1002/da.20182

Rose, S., & Sieben, N. (2017). Hope measurement. In M. W. Gallagher & S. J. Lopez (Eds.), *The oxford handbook of hope* (pp. 83–94). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199399314.013.26

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081. https://doi.org/https://doi.org/10.1037/0022-3514.57.6.1069

Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, *13*(4), 249–275. https://doi.org/https://doi.org/10.1207/S15327965PLI1304_01

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, *60*(4), 570–585. https://doi.org/10.1037//0022-3514.60.4.570

Snyder, C. R., Irving, L. M., & Anderson, J. R. (1991). Hope and health. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective* (pp. 285–305). Pergamon Press.

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, *25*(2), 173–180. https://doi.org/10.1207/s15327906mbr2502_4

Thomas, K. A., & Clifford, S. (2017). Validity and mechanical turk: An assessment of exclusion methods and interactive experiments. *Computers in Human Behavior*, *77*, 184–197. https://doi.org/10.1016/j.chb.2017.08.038

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*(1), 1–10. https://doi.org/10.1007/BF02291170

Xiang, Y. T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry*, *7*(3), 228–229. https://doi.org/10.1016/s2215-0366(20)30046-8

Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, *277*, 55–64. https://doi.org/10.1016/j.jad.2020.08.001