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To cite this article: Kenneth E. Vail, Madhwa Galgali, David E. Reed, Peter J. Helm, Megan E. Edwards, Tyler Jimenez, Jamie Arndt, Elizabeth Lehinger, Lauren Sedivy, Donald D. McGeary, Paul Nabity & Briana Cobos (2023): COVID-19-related threat, existential isolation, and well-being, *Clinical Psychologist*, DOI: [10.1080/13284207.2022.2155510](https://doi.org/10.1080/13284207.2022.2155510)

To link to this article: <https://doi.org/10.1080/13284207.2022.2155510>

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COVID-19-related threat, existential isolation, and well-being

Kenneth E. Vail^a, Madhwa Galgali^b, David E. Reed^c, Peter J. Helm^b, Megan E. Edwards^b, Tyler Jimenez^d, Jamie Arndt^b, Elizabeth Lehinger^e, Lauren Sedivy^a, Donald D. McGeary^{f,g}, Paul Nability^f  and Briana Cobos^f

^aDepartment of Psychology, Cleveland State University, Cleveland, OH, USA; ^bDepartment of Psychological Sciences, University of Missouri, Columbia, MO, USA; ^cCenter for Innovation for Veteran-Centered and Value-Driven Care, VA Puget Sound Health Care, Seattle, WA, USA; ^dDepartment of Psychology, University of Washington, Seattle, WA, USA; ^eDepartment of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA, USA; ^fDepartment of Psychiatry and Behavioral Sciences, Texas Health Center at San Antonio, San Antonio, TX, USA; ^gDepartment of Rehabilitation Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

ABSTRACT

Objective: Prior work suggests perceived COVID-19-related threat and existential isolation (EI) would be associated with greater anxiety and depression, worse subjective health and well-being, and lower hope. However, it was unclear whether such concerns might have additive effects (no interaction, two independent main effects) or interact (one effect modifies the other).

Method: Two studies collected data via MTurk during the COVID-19 pandemic. Study 1 (N = 110) measured perceived COVID-19-related threat, EI, anxiety and depression, subjective well-being, and hope. Study 2 (N = 2,673) measured perceived COVID-19-related threat, EI, anxiety, subjective health, and hope.

Results: In general, perceived COVID-19-related threat and EI were associated with anxiety and depression, worse subjective health and well-being, and reduced hope. On one outcome (hope, Study 2), an interaction was observed: perceived threat was associated with lower hope among those with high EI, but higher hope among those with low EI. However, on most outcomes (6 of 7), across both studies, additive effects were observed: greater cumulative existential stress (perceived COVID-19-related threat, EI) was associated with worse anxiety and depression, subjective health and well-being, and hope.

Conclusion: Discussion highlights theoretical considerations, practical implications, and the therapeutic value of addressing existential concerns in mental health.

KEY POINTS

What is already known about this topic:

- (1) Prior work found perceived COVID-19-related threat and other death-related existential concerns were related to anxiety, depression, and undermined well-being and hopeful engagement.
- (2) Prior work found existential isolation was related to anxiety, depression, and undermined well-being.
- (3) COVID-19-related threat was associated with worse anxiety, depression, and well-being, but not subjective health or hope.

What this topic adds:

- (1) EI was consistently associated with worse anxiety and depression, subjective health and well-being, and reduced hope.
- (2) In one outcome (hope, Study 2), an interaction found that perceived COVID-19-related threat decreased hope when people felt existentially isolated, but increased hope when people felt a sense of existential connection (e.g., “we’re all in this together”).
- (3) However, on six of seven outcomes, across two studies, additive effects were observed such that the more existential stress (COVID-19-related threat, existential isolation) experienced the worse the outcome.

ARTICLE HISTORY

Received 21 December 2021
Accepted 29 November 2022

KEYWORDS

COVID-19; existential threat; existential isolation; anxiety; hope; well-being

In December 2019, a novel coronavirus began spreading (Taylor, 2021). In January 2020, deaths were reported throughout multiple nations and the WHO declared a global health emergency; in February, the disease caused by the virus was

named COVID-19; in March, nations around the world – including the USA – began to lock down (e.g., stay-at-home orders for all non-essential personnel) and recommended or mandated wearing facemasks, vigilant sanitization of surfaces, and

social distancing. By March 2021, the coronavirus had reached every country around the world, sickening over 76 million and killing over 1.6 million (Taylor, 2021).

Many viewed COVID-19 as a threat, though many others considered it more trivial (no worse than the flu) and/or considered themselves resilient and were not terribly worried (Jimenez et al., 2020; Menzies & Menzies, 2020). Likewise, many felt despairingly alone in the experience, whereas many others felt as though “we’re all going through this together” (Helm et al., 2021). In other words, there appeared to be variation in the degree to which people viewed the pandemic as a serious threat and variation in the degree to which they felt isolated during the experience. Thus, the initial months of the pandemic presented a unique opportunity to study whether individual differences in perceived COVID-19-related threat and existential isolation (i.e., feeling as if one is *alone* in their experiences and no one else understands them, Helm, Greenberg, et al., 2019) impacted critical outcomes such as well-being, subjective health, and hope. Further, whereas prior research has explored the impacts of COVID-19-related threat and existential isolation – separately—on various aspects of well-being and optimism, the present work sought to better understand the potential combined effects of these existential experiences.

Prior theory and research point to the importance of existential isolation (Helm, Greenberg, et al., 2019; Pinel et al., 2004), beyond socio-emotional loneliness. Social loneliness involves the perceived absence of an engaged social network and emotional loneliness involves the perceived lack of intimacy or attachment bonds (Gierveld & Tilburg, 2006; Weiss, 1973). *Existential isolation* (EI), however, involves the ontological problem of being alone in one’s subjective consciousness – the “unbridgeable gap” that renders each of us alone in our experience, uncertain about whether we are perceiving and interpreting “reality” in valid ways (Yalom, 1980). Although EI is a “given” for all humans, there are individual differences in the degree to which people *feel* isolated in their experiences (high EI) compared to feeling consensual validation and belonging with others who appear to perceive and interpret reality the same way (low EI) (Pinel et al., 2017). Thus, one might feel high or low EI regardless of whether one has been spending the pandemic in interpersonal isolation (e.g., living alone during lockdown, or on quarantine due to sickness) or is surrounded by other people (e.g., on lock-down with family, or leaving home to work with others as “essential” personnel).

Prior research has found EI is distinct from loneliness, with unique influences on social functioning and well-being (Helm, Greenberg, et al., 2019, 2021; Pinel et al., 2017). EI is also related to clinical outcomes, such as anxiety, depression, and clinical distress; and it can undermine intentions to seek therapy, increase pessimistic beliefs about therapist expertness, and among those undergoing therapy it can reduce satisfaction with mental health treatment (Constantino et al., 2019). However, experts suggest that resolving EI – by restoring a sense of epistemic validation and belonging – can improve the therapeutic alliance, extra-therapeutic relationships, and treatment outcomes (Pinel et al., 2015).

Thus, during the pandemic, we might expect EI to be associated with well-being, subjective health, and hope. Feeling as though few or no other people share one’s experience and interpretation of things (high EI) should be associated with anxiety and depression, impaired subjective health and well-being, and reduced hope for effectively navigating the future. In contrast, maintaining a sense of existential connection with others (low EI)—feeling that we’re all “on the same page” and going through it together – may be associated with reduced worry and depression, buoyed subjective health and well-being, and a more hopeful outlook for the future.

Likewise, prior theory and research point to the importance of perceived COVID-19-related threat as it might pertain to anxiety and depression, subjective health and well-being, and a sense of hope. COVID-19 elicited death-related anxiety (Barnes, 2021), which clinical research has found is a transdiagnostic factor underlying a variety of mental health conditions (Iverach et al., 2014)—including depressive disorders and anxiety disorders (Finch et al., 2016; Menzies & Dar-Nimrod, 2017; Menzies et al., 2019, 2021). Other work, with non-clinical samples, has similarly found that when people lack psychological buffers (e.g., self-esteem, meaning in life) existential threat increases anxiety and reduces subjective well-being (Juhl, 2019), and precipitates withdrawal, depression, and hopelessness (Hayes et al., 2016).

During the pandemic, Australians’ perceived existential threat was correlated with anxious beliefs and behaviours (e.g., self-estimated likelihood of contracting COVID-19 and willingness to mask up) as well as self-reported health anxiety and reduced subjective well-being (Newton-John et al., 2021). In Poland, COVID-19-related stress was associated with anxiety, lower well-being, and reduced hope (Trzebiński et al., 2020); and perceived COVID-19-related threat was related to anxiety, which in turn

mediated coping responses such as support for spread prevention (e.g., social distancing) and economic sacrifice (e.g., lock-downs) (Cypryńska et al., 2020). In Italy, perceived COVID-19-related threat was associated with lower well-being, worse subjective health, and undermined hope (Paleari et al., 2021).

Thus, during the pandemic, we might expect perceived COVID-19-related threat to be associated with well-being, subjective health, and hope. Greater perceived COVID-19-related threat should be associated with greater anxiety and depression, worse subjective health and well-being, and lower sense of hope. In contrast, lower COVID-19-related threat may be associated with lower anxiety and depression, better subjective health and well-being, and a more hopeful outlook for the future.

Whereas prior research has studied EI and COVID-19-related threat on their own, the present work examined both predictor variables together in the same study. This is an important contribution given that prior theory and research are ambiguous about how the effects of these two constructs might relate to each other.

On one hand, classic theoretical work (e.g., Yalom, 1980) presents concerns about life/death and isolation as distinct existential stressors, which might suggest additive effects: two independent main effects that simply add up. With an additive effect, anxiety (for example) would be lowest during zero existential stressors (low-threat/low-EI), medium when one existential stressor is present (either low-threat/high-EI or high-threat/low-EI), and high when both existential stressors are present (high-threat/high-EI).

On the other hand, one prior study found experimentally increasing EI led to increased death-related cognitions (though the finding did not replicate) (Helm, Lifshin, et al., 2019), raising the possibility that reduced EI might also be associated with reduced life/death concern. In other words, it is possible that EI may moderate death-related concerns. If so, it is possible that threat and EI might interact such that the effect of perceived COVID-19 threat may be moderated by the degree to which people believe they are alone in their experiences (variation in EI) during the pandemic. With an interactive effect, greater perceived COVID-19 threat would be associated with greater anxiety (for example) among those with greater EI, but that effect should be mitigated or eliminated among those with reduced EI.

Thus, we did not make firm predictions one way or another but instead sought to more open-mindedly explore whether EI and COVID-19-related threat might

have additive effects (no interaction, two cumulative main effects) or interact with each other (one effect modifies the other). A better understanding of whether EI and COVID-19-related threat have additive or interactive effects offers important practical and therapeutic implications. If the variables have additive effects, interventions designed to alleviate the effects of one would not necessarily alleviate the effects of the other; instead, clinicians and policy advocates would need to address each of these existential concerns. But if the variables interact, it is possible an intervention designed to address one could also mitigate the other.

Study 1

Initially, prior to the COVID-19 outbreak in the USA, participants completed an eligibility screener (T1), followed by a survey (T2), both of which occurred via Amazon's Mechanical Turk (MTurk) between January 10-12 February 2020. Once the outbreak had been declared and public health measures implemented in the USA (e.g., stay-at-home orders), we developed a follow-up survey (T3) to address the present research question (among others beyond the scope of the present article, see Reed, Cobos, et al., 2021, Reed, Lehinger, et al., 2021). The T3 follow-up survey battery was administered between May 5–13, 2020. To address the present research question, we analysed the effects of perceived COVID-19-related threat and EI on anxiety and depression, subjective well-being, and hope. This study was approved by the IRB of the University of Texas Health Science Center at San Antonio (protocol: HSC2019085E).

Method

Recruitment and data collection

Participants were recruited using CloudResearch.com (Litman & Robinson, 2021), an internet-based platform that recruits participants through MTurk. MTurk is a marketplace for a crowdsourced workforce, where researchers can recruit from a large population of users to provide information or complete human interaction tasks (HITs), such as the present research study. The MTurk population can be used to study topics relevant to clinical psychology (Shapiro et al., 2013; Vail et al., 2018). Compared to other convenience populations (e.g., university or hospital research programs), the MTurk samples are more diverse (Robinson et al., 2021) and capable of obtaining high quality data (Chandler et al., 2021). Furthermore, previous research has also shown that, compared to general population samples, MTurk samples often have higher rates of

depression and anxiety (Arditte et al., 2016; Ophir et al., 2020), increasing the clinical relevance (Chandler & Shapiro, 2016).

In the present study, CloudResearch was used to post links to the present study on MTurk. Initial recruitment required participants to have a 95% approval rating and the following CloudResearch security features were enabled: Duplicate IP Block, Suspicious Geocode Block, and Verify Worker Country Location. Study 1 only included participants in the US. Qualifying MTurk users could voluntarily complete the pre-pandemic eligibility screener (T1) for \$0.30 and initial survey (T2) for \$2.00, and the during-pandemic follow-up survey (T3) for \$3.00. Some 897 possible respondents completed an initial eligibility screener (T1); of those, 587 were invited to complete the T2 survey¹ and 169 responded with valid data. Then, after the outbreak had been declared and public health measures implemented in the USA, the 169 T2 respondents were invited to complete the T3 follow-up survey. Of those, 121 responded and 110 provided valid data (e.g., passed attention checks). Missing data were excluded casewise.

Participants

The relevant sample ($n = 110$) was middle-aged ($M = 42.19$, $SD = 13.16$); it included mostly White (86%) Christians (50%), with nearly equal numbers of males (45%) and females (55%), who had attended some college (26%) or completed an undergraduate (49%) or Master's degree (12%). For full demographic details, see online supplement, Table S4.

Procedure

After agreeing to participate in the study, participants completed the online survey materials described below (for detailed materials, see online supplement) and then received a debriefing.

Materials

Perceived threat

Perceived COVID-19-related threat was assessed using a previously-established 6-item measure with sound psychometric properties (Conway et al., 2020), including items such as "Thinking about the coronavirus (COVID-19) makes me feel threatened" and "I am afraid of the coronavirus (COVID-19)". Participants responded using a 7-point Likert-type scale (1 = *Not True of Me At All*; 7 = *Very True of Me*). The measure showed strong internal reliability ($\alpha = .90$) and, after reverse-scoring relevant items, a

composite mean score was computed such that higher scores indicated greater perceived threat.

Existential isolation

Following previous research (Helm et al., 2019), participants used a 10-point Likert-type scale (0 = *Strongly disagree*; 9 = *Strongly agree*) to complete the previously-established six-item state EI measure (Pinel et al., 2017). An example item is: "Other people do not understand my experiences". The measure demonstrated strong internal reliability ($\alpha = .96$) and a composite mean score was computed such that higher scores indicated greater feelings of EI.

Subjective well-being

Two items, created for the present study, assessed subjective well-being: "The coronavirus (COVID-19) outbreak has impacted my psychological health negatively" (reverse-scored) and "The coronavirus (COVID-19) pandemic has *not* made me feel any worse than I did before". Participants used a 7-point response scale (1 = *Not True of Me At All*; 7 = *Very True of Me*). The items were strongly correlated ($r = .74$, $p < .001$) so a composite mean was computed such that higher scores indicated greater well-being.

Anxiety and depression

The previously-established Mental Health Inventory (Berwick et al., 1991) was used to assess anxiety and depression. Two items measured anxiety (e.g., "How much of the time, during the past month, have you been a very nervous person?" reverse-scored) using a 6-point Likert-type scale (1 = *All the time*; 6 = *None of the time*). The items were strongly correlated ($r = .69$, $p < .001$) so a composite mean was computed with higher scores indicating greater anxiety. Three items measured depression (e.g., "How much of the time, during the past month, have you felt downhearted and blue?") using a 6-point Likert-type scale (1 = *All the time*; 6 = *None of the time*) and demonstrated strong internal reliability ($\alpha = .91$) so a composite mean score was computed such that higher scores indicated greater depression. Importantly, prior work found this inventory to have good psychometric properties and good convergent validity – with high success at detecting anxiety disorders and depression identified through a diagnostic interview (Berwick et al., 1991) and has been found to perform remarkably well in comparison to other longer questionnaires such as Mental Health Component Summary (Kelly et al., 2008).

Hope (general)

The state hope scale (Snyder et al., 1996) presented six previously-established items (e.g., "If I should find

myself in a jam, I could think of many ways to get out of it" and "I can think of many ways to reach my current goals") using an 8-point Likert-type scale (1 = *Definitely False*; 8 = *Definitely True*). The measure demonstrated strong internal reliability ($\alpha = .95$), and a composite mean score was computed such that higher scores indicated greater hope.

Data analytic strategy

Multiple regressions were conducted, using SPSS (*IBM SPSS Statistics for Windows (Version 25.0) (25.0) (2017)*), to examine the Threat x EI interactions on each of the target outcomes in both Studies 1 and 2. For each analysis, Threat and EI scores were each centred about their means and the interaction term was computed by multiplying them. Threat and EI were entered in Step 1 and the interaction term in Step 2. Thus, the interaction term statistics (ΔF test, ΔR^2 effect size) in Step 2 will indicate the presence of an interaction relationship; if an interaction is detected, the directional patterns will be further analysed by examining the Threat slope (t -tests, β effect sizes) when adjusting the EI scores $\pm 1SD$, and examining EI slope when adjusting the Threat scores $\pm 1SD$. In the absence of a significant interaction, the presence of additive effects will be examined by analysing the Threat and EI terms in Step 1 of the multiple regression (t -tests, β effect sizes); thus, we will be able to assess the additive impact of each predictor while controlling for the other.

Results

Subjective well-being

In Step 1, both perceived threat ($\beta = -.52$, $t = -6.53$, $p < .001$) and EI ($\beta = -.20$, $t = -2.53$, $p = .013$) were negatively associated with subjective well-being. In Step 2,

the Threat x EI interaction was not significant, $\Delta F(1, 106) = 2.47$, $\Delta R^2 = .015$, $p = .119$ (Figure 1).

Anxiety

In Step 1, both perceived threat ($\beta = .26$, $t = 3.16$, $p = .002$) and EI ($\beta = .42$, $t = 4.97$, $p < .001$) were positively associated with anxiety. In Step 2, the Threat x EI interaction was not significant, $\Delta F(1, 106) = 3.61$, $\Delta R^2 = .025$, $p = .060$ (Figure 2).

Depression

In Step 1, both perceived threat ($\beta = .20$, $t = 2.39$, $p = .019$) and EI ($\beta = .45$, $t = 5.42$, $p < .001$) were positively associated with depression. In Step 2, the Threat x EI interaction was not significant, $\Delta F(1, 106) = 1.39$, $\Delta R^2 = .01$, $p = .241$ (Figure 3).

Hope

In Step 1, both perceived threat ($\beta = -.21$, $t = -2.65$, $p = .009$) and EI ($\beta = -.51$, $t = -6.31$, $p < .001$) were negatively associated with hope. In Step 2, the Threat x EI interaction was not significant, $\Delta F(1, 106) = .21$, $\Delta R^2 = .001$, $p = .656$ (Figure 4).

Study 2

Study 2 was developed independently of Study 1 but addressed the same research question (among others beyond the scope of the present article) with the following differences in design. First, it was developed after the outbreak reached the USA. Second, it included a large non-clinical sample recruited over an 11-week period (March 18 – 1 June 2020). Third, whereas Study

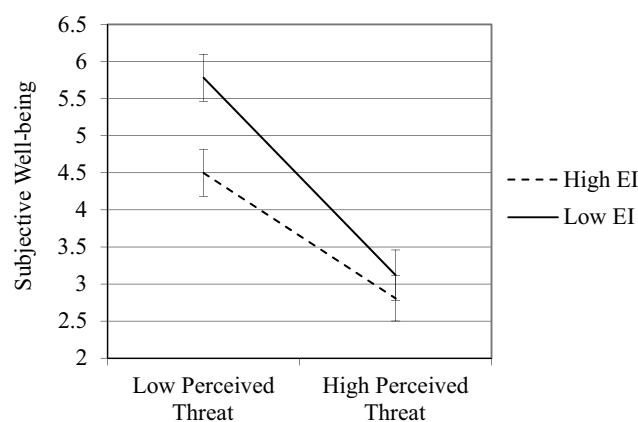


Figure 1. Existential isolation (EI) and perceived threat were each associated with worse subjective well-being. Error bars represent standard error.

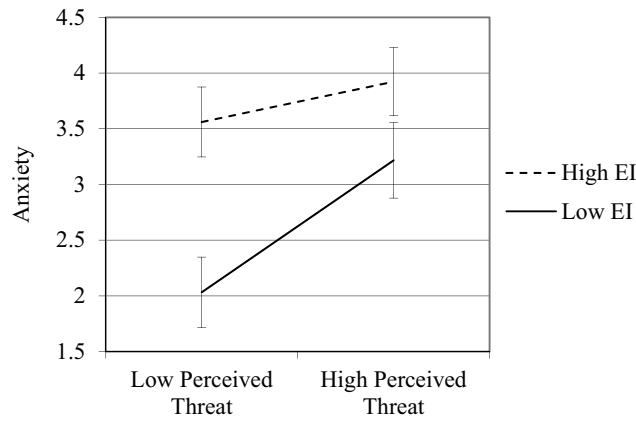


Figure 2. Existential isolation (EI) and perceived threat were each associated with greater anxiety. Error bars represent standard error.

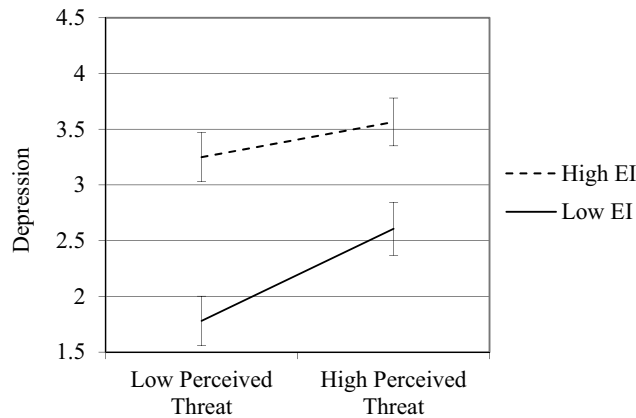


Figure 3. Existential isolation (EI) and perceived threat were each associated with greater depression. Error bars represent standard error.

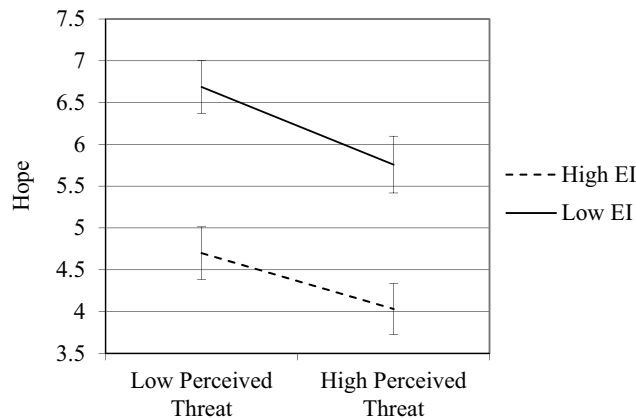


Figure 4. Existential isolation (EI) and perceived threat were each associated with reduced hope. Error bars represent standard error.

1 measured anxiety and depression, Study 2 only measured anxiety; whereas Study 1 measured subjective well-being, Study 2 measured subjective health; whereas Study 1 measured generalized hope, Study 2

measured hope related to the COVID-19 pandemic. Analysis plans were the same as in Study 1. This study was approved by the IRB of the University of Missouri (protocol: 2020741).

Method

Recruitment and data collection

Again, CloudResearch.com was used to post links on MTurk. We used the CloudResearch settings to require that MTurk respondents have completed at least 100 prior HITs, pass a reCAPTCHA test to screen out bots (Storozuk et al., 2020), and were not allowed to complete the survey more than once. The following CloudResearch security features were enabled: Duplicate IP Block, Suspicious Geocode Block, and Verify Worker Country Location. Study 1 only included participants in the US. Qualifying MTurk users could voluntarily complete the survey for \$0.75. Participant recruitment spanned an 11-week period from March 18th through June 1st, 2020, with the Qualtrics survey link (re)posted to MTurk each week (except weeks 8 and 10). The Qualtrics survey was comprised of about 100 items each week. About 60 items were included every week (thus, administered to every participant) whereas the remaining ~40 items were replaced at various times as the pandemic developed and new research questions emerged. For the present purposes, the attention check, perceived threat, EI, and subjective health items were administered each week; the anxiety measure was included beginning April 10th (weeks 4–11) and the hope measure beginning May 15th (weeks 9–11). Missing data were excluded casewise.

Participants

Over the full 11-week period, the survey was administered to a total of 3,011 participants, of which 338 failed the attention check for an acceptable sample of $N = 2,673$. The sample was middle-aged ($M = 37.86$, $SD = 12.63$); it included mostly White (70%) and Christians (67%), with nearly equal numbers of males (56%) and females (43%), who had attended some college (13%) or completed an undergraduate (58%) or Master's degree (19%). For full demographic details, see online supplement, Table S4.

Procedure

Participants gave informed consent, completed the online survey materials described below (for detailed materials, see online supplement) then received a debriefing.

Materials

Perceived threat

Perceived COVID-19-related threat was measured using a single face valid item, created for this study: "How much are you worried about dying from coronavirus (also known as COVID-19)?" Participants responded using a 7-point Likert-type scale (1 = *Not at all*; 7 = *Strongly*).

Existential isolation

The same EI scale was used as in Study 1, though here with responses on a 7-point Likert-type scale (1 = *Strongly disagree*; 7 = *Strongly agree*; $\alpha = .77$). A composite mean score was again computed such that higher scores indicated greater feelings of EI.

Subjective health

Participants responded to the item, "How is your health today?", created for this study, using a 5-point scale (1 = *Very bad*; 5 = *Very good*).

Anxiety

Five items from the previously-established State-Trait Anxiety Inventory (Spielberger et al., 1983) asked participants to indicate their anxiety (e.g., "I am worried") using a 4-point Likert-type scale (1 = *Note at all*; 4 = *Very much*). The measure demonstrated strong internal reliability ($\alpha = .80$); a composite mean was computed such that higher scores indicated greater anxiety.

Hope (about COVID-19)

Adapting items from prior work (Cohen-Chen et al., 2014) for the present study, four items measured COVID-19-related hope (e.g., "I feel hopeful about the COVID-19 situation") using an 8-point Likert-type scale (1 = *Not at all*; 8 = *Very much*). The measure demonstrated strong internal reliability ($\alpha = .83$) and a composite mean score was computed such that higher scores indicated greater hope.

Data analytic strategy

Analytic strategy was the same as Study 1. We used multiple regression to examine main effects and interaction patterns (ΔF test, ΔR^2 effect size) and further explored significant additive effects and directional patterns of interactions (t tests, β effect sizes).

Results

Subjective health

There were 2,615 participants who passed the attention check and completed the Threat, EI, and subjective health measure (weeks 1–11). In Step 1, both perceived threat ($\beta = -.04$, $t = -2.25$, $p = .025$) and EI ($\beta = -.16$, $t = -7.96$, $p < .001$) were negatively associated with subjective health. In Step 2, the Threat x EI interaction was not significant, $\Delta F(1, 2611) = 2.73$, $\Delta R^2 = .001$, $p = .098$ (Figure 5).

Anxiety

There were 1,758 participants who passed the attention check and completed the Threat, EI, and anxiety measure (weeks 4–11). In Step 1, both Threat ($\beta = .51$, $t = 24.76$, $p < .001$) and EI ($\beta = .12$, $t = 5.70$, $p < .001$) were positively associated with anxiety. In Step 2, the Threat x EI interaction was not significant, $\Delta F(1, 1754) = 3.60$, $\Delta R^2 = .002$, $p = .058$ (Figure 6).

Hope (about COVID-19)

There were 618 participants who passed the attention check and completed the Threat, EI, and hope measure (weeks 9–11). In Step 1, Threat was not associated with hope ($\beta = .07$, $t = 1.64$, $p = .102$) whereas EI was negatively associated with it ($\beta = -.25$, $t = -6.37$, $p < .001$). However, in Step 2 these associations were qualified by a significant Threat x EI interaction, $\Delta F(1, 614) = 18.95$, $\Delta R^2 = .03$, $p < .001$.

Among those with lower ($-1SD$) Threat scores, EI was negatively associated with hope ($\beta = -.19$, $t = -4.68$, $p < .001$). Among those with higher ($+1SD$) Threat scores, EI was strongly negatively associated with hope ($\beta = -.51$, $t = -7.15$, $p < .001$). Alternatively: among those with lower ($-1SD$) EI scores, Threat was positively related to hope, $\beta = .23$, $t = 4.22$, $p < .001$, whereas among those with higher ($+1SD$) EI scores the effect reversed and Threat was marginally negatively associated with hope, $\beta = -.09$, $t = -1.77$, $p = .078$ (Figure 7).

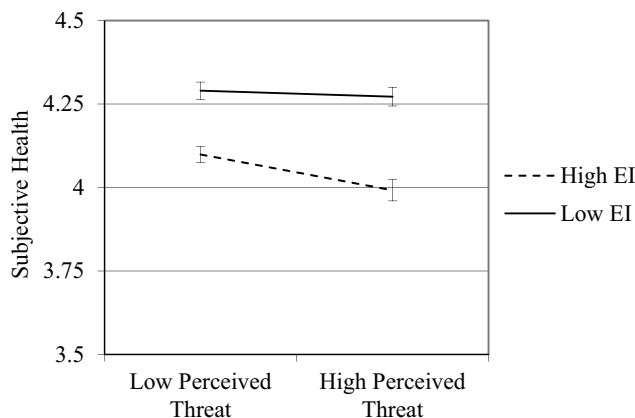


Figure 5. Existential isolation (EI) and perceived threat were associated with lower subjective health.

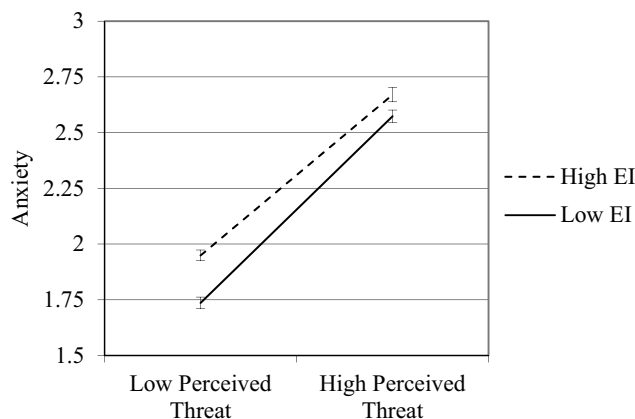


Figure 6. Existential isolation (EI) and perceived threat were each associated with higher anxiety.

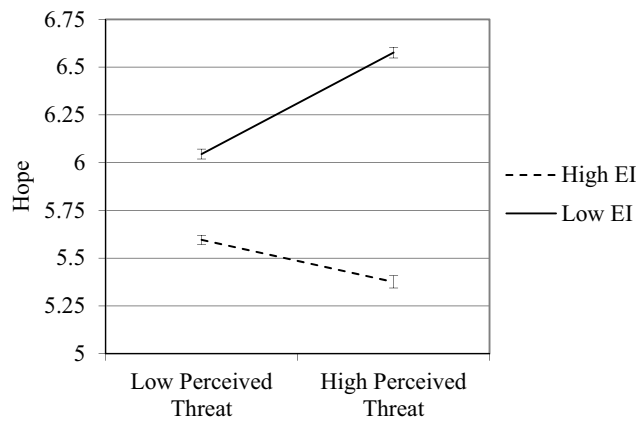


Figure 7. Existential isolation (EI) was associated with lower hope (about COVID-19) at both low and high levels of perceived threat. Perceived threat was associated with greater hope among those with lower EI but reduced hope among those with higher EI.

General discussion

First, we examined whether greater perceived COVID-19-related threat and higher EI were each associated with greater anxiety and depression, worse subjective health and well-being, and lower hope. In Study 1 both COVID-19-related threat and EI were positively associated with anxiety and depression, and negatively associated with pandemic-related subjective well-being and general hope. Likewise, in Study 2, EI was positively associated with anxiety and negatively associated with subjective health and hope. Perceived COVID-19-related threat was negatively related to subjective health and positively associated with anxiety, as expected, but it was not related to hope. Thus, the observed main effects of COVID-19-related threat were nuanced: consistent with expectations about worse anxiety, depression, subjective health, and well-being in both Studies 1 and 2, but only consistent with expectations about hope in Study 1. In contrast, the observed main effects of EI, in both Studies 1 and 2, were consistent with expectations that it would be associated with worse anxiety and depression, subjective health and well-being, and reduced hope.

Second, we explored whether COVID-19-related threat and EI would interact or have additive effects. Study 1 found no significant interactions; instead, there were additive effects: Threat and EI each had unique effects while controlling for each other in multiple regression. Data patterns showed anxiety and depression were lowest during zero existential stressors (low-threat/low-EI), moderately increased when one existential stressor was present (either low-threat/high-EI or high-threat/low-EI), and highest when both existential stressors were present (high-threat/high-EI); likewise, subjective well-being and

generalized hope were highest during zero existential stressors (low-threat/low-EI), reduced when one existential stressor was present (either low-threat/high-EI or high-threat/low-EI), and lowest when both existential stressors were present (high-threat/high-EI). Study 2 found similar additive effects on anxiety and subjective health. However, Study 2 also found one interaction effect on hope about COVID-19, such that perceived COVID-19-related threat was associated with reduced hope about it when EI was high but with increased hope when EI was low.

Theoretical implications

The interaction on one of the seven outcomes (hope about COVID-19, Study 2) supports the view that COVID-19-related threat makes life, or perhaps the pandemic specifically, more hopeless when people feel alone in their experience (high EI) but more hopeful when people feel like “we’re all in this together” (low EI). However, this theoretical interpretation does not seem particularly trustworthy, as the interaction on hope did not replicate in Study 1 nor did we observe conceptually similar interactions on anxiety, depression, or subjective well-being in either Studies 1 or 2.

In contrast, the additive patterns observed on these outcomes were consistent with the view that existential threat and existential isolation are distinct existential concerns (e.g., Yalom, 1980). That is, these patterns suggest existential connection (low vs. high EI) does not necessarily mitigate the effects of perceived COVID-19-related threat, and vice versa – mitigating the perceived threat from the pandemic does not necessarily mitigate the effects of feelings of existential isolation. This may be the more trustworthy theoretical

interpretation, as additive effects were repeatedly observed 6 out of 7 times it was examined in the present two studies.

Neither of these two perspectives was supported by all the observed data patterns but each perspective received at least some support, which perhaps suggests some unknown factors that may determine whether additive or interaction effects emerge. Given that an additive effect was observed on generalized hope (Study 1) whereas an interaction was observed on hope about COVID-19 (Study 2), one such factor could be the relevance of the outcomes to specific situations vs. more generalized experiences. However, additive effects were also observed on both general subjective health (Study 2) and specifically COVID-19-related subjective well-being (Study 1), so other factors may also be at play. Thus, it would be useful for additional research to further explore the circumstances under which EI and death-related existential concerns might have additive vs. interaction effects on outcomes such as anxiety, well-being, and hope.

Practical implications

The present work contributes to recent work on the practical implications of perceived existential threat and EI during the pandemic. First, the main effects of perceived COVID-19-related threat clearly underscore the importance of government and NGO leadership, public health communications, and public policy designed to effectively (and quickly) control and mitigate the threat of diseases such as COVID-19. Second, the main effects of EI may help to further understand why some people seem to have coped well during the pandemic whereas others have seemed to languish. When people felt alone in their experiences (high EI) they also felt more worried (anxious) and depressed, were more likely to take a negative view of their own health and well-being, and began to lose hope for their ability to successfully navigate the world around them. One implication is that behaviours, digital tools, and perhaps even interventions designed to maintain connections with others during lockdowns could be helpful. For example, prior reports (Helm et al., 2021) found that, during the pandemic, low social media use (or merely passive use) was associated with greater EI which in turn was associated with reduced meaning in life, whereas active social media use was associated with reduced EI (greater existential connection) and buoyed sense of meaning in life.

Therapeutic implications

That the present data patterns showed additive effects of perceived COVID-19-related threat and EI is also potentially clinically meaningful, in that these appear to be unique existential concerns. Given that the significant interaction on hope in Study 2 did not replicate in Study 1, and that there were no conceptually similar interactions on anxiety, depression, or subjective well-being in either study, clinicians should be extremely cautious about attempting to rely upon that interaction pattern to inform their therapeutic approach to these existential concerns. The preponderance of data here suggests that interventions designed to alleviate the effects of one would not necessarily alleviate the effects of the other. Instead, the additive effects repeatedly observed in the present work probably suggest clinicians would need to address each of these existential concerns.

First, the relationship between COVID-19-related threat and key mental health outcomes points to a broader transdiagnostic concern related to death anxiety. Death anxiety is related to the severity of mental illness and the number of lifetime diagnoses, hospitalizations, and medications (Menzies et al., 2019). A meta-analytic review of preliminary work suggests that psychosocial interventions (e.g., psychotherapy, death education/training programs) are effective in reducing death anxiety (Menzies et al., 2018). However, given the nascent nature of that literature ($k = 15$), additional research is clearly needed to inform how best to therapeutically intervene for death-related existential concerns.

Nevertheless, as COVID-19 continues to present as a unique stressor, clinicians should expect that if concerns about the pandemic are part of the patient's presenting issues, it is possible that anxiety, depression, or loss of hope are also present. COVID-19 poses a realistic threat to one's physical safety and should be taken seriously, and the threat of "long COVID" and its corresponding mental health concerns may add to patient concerns (Cutler, 2022). Clinicians should focus on helping patients manage emotions and thoughts related to the pandemic. For instance, clinicians could help patients see how specific automatic thoughts about the pandemic (e.g., "I am going to die if I get COVID-19") may contribute to anxiety, depression, and hopelessness. Clinicians and patients may then use thought replacement or cognitive restructuring, acceptance and commitment, or other methods, to adjust thoughts, emotions, and behaviours in a more functional direction. The link between

hopelessness and suicidality has been particularly well-studied (Bauer et al., 2022; Bryan et al., 2020), so pandemic-related concerns producing hopelessness may be particularly important to address.

Second, the present studies also highlight a growing body of research pointing to the effects of EI on clinical outcomes, such as anxiety and depression (Constantino et al., 2019). Experts have recently suggested that resolving EI may bolster the therapeutic alliance and improve treatment outcomes (Pinel et al., 2015). The present findings on anxiety and depression are consistent with such prior work, and further add that EI can also impact subjective health, well-being, and hope – each of which would be important therapeutic outcomes. Similar to therapeutic attempts to manage negative thoughts and emotions related to COVID-19-related threat, clinicians can work to address thoughts and emotions related to feeling existentially isolated. Moreover, some useful therapeutic interventions may seek to leverage the benefits of the “I-sharing” experience – which is when people believe they are having a similar subjective experience with others. I-sharing can foster a sense of connectedness, transcend group boundaries, and promote prosocial behaviours, and experts argue that it may improve the therapeutic alliance, extra-therapeutic relationships, and treatment outcomes (Pinel et al., 2015). Future work might attempt to develop and test therapeutic interventions to reduce EI, and bolster existential connection, both during broader crises (e.g., pandemic) as well as in clinical settings. Work could also be done to incorporate techniques to bolster existential connection within existing therapeutic modalities.

Limitations

The present studies of course entailed several limitations. The perspectives offered in this General Discussion section rely heavily on the inference that perceived COVID-19-related threat and EI were the factors causing worse mental health outcomes, but the data were correlational and cross-sectional so the reverse causal path could also be possible (that poor mental health outcomes were what caused participants to feel more threatened by COVID-19 and to feel more existentially isolated) or these could even be spurious associations caused by some unobserved confounding variable(s).

Additionally, the data came from studies conducted during a pandemic that caused major sociocultural disruptions unevenly distributed across race, class, and other demographic categories. Such inequity certainly impacted the present samples and thereby limits

the generalizability of the present findings – both studies involved samples that were primarily White Christians with undergraduate and graduate degrees. The studies were also limited to the U.S. context, which was unique in a multitude of ways, such as weakened administrative preparations and political resistance to public health measures (Ellerbeck, 2021).

Conclusion

Together, the present studies found evidence that greater EI and perceived COVID-19-related threat were each associated with greater anxiety and depression, worse subjective health and well-being, and reduced hope. They also found that EI and perceived threat did produce one interaction effect but most often produced additive effects, suggesting that each was a unique existential concern that warrant unique practical and therapeutic approaches.

Note

1. To address research questions beyond the scope of the present article, the researchers who conducted the T1 eligibility screener and T2 survey (Reed, Cobos, et al., 2021, Reed, Lehinger, et al., 2021) were interested in identifying participants who met the threshold for chronic pain, for PTSD, for both (comorbid), and for neither (a “healthy” group). See the online supplement for “Recruitment and Sample Flow Diagram”, which shows the numbers of respondents identified in each such category at the T1, T2, and T3 stages of data collection. Of the final sample of 110 participants who completed the T3 follow-up survey, 34 were those with chronic pain, 22 were those with PTSD, 22 were those with comorbid pain and PTSD, and 32 were from the healthy group. However, in the present study, these categorizations were not related to the present research question, and there was no theoretical basis to expect that these conditions would influence the data patterns. Indeed, chronic pain and PTSD symptoms were not even measured in Study 2. Therefore, they will not be further mentioned.

Disclosure statement

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

Data availability statement

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

Open scholarship



This article has earned the Center for Open Science badge for Open Data. The data are openly accessible at https://osf.io/pa37v/?view_only=7425bb4981174bdaade2f8a17afc4699

ORCID

Paul Nabity  <http://orcid.org/0000-0003-0040-7196>

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