



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Suffering, Mental Health, and Psychological Well-being During the COVID-19 Pandemic: A Longitudinal Study of U.S. Adults With Chronic Health Conditions

Richard G. Cowden^{1,*}, Edward B. Davis², Victor Counted³, Ying Chen¹, Sandra Y. Rueger², Tyler J. VanderWeele^{1,4}, Austin W. Lemke², Kevin J. Glowiak², Everett L. Worthington Jr.⁵

¹ Harvard University, Human Flourishing Program, Institute for Quantitative Social Science

² Wheaton College, School of Psychology, Counseling, and Family Therapy

³ Western Sydney University, School of Psychology

⁴ Harvard T. H. Chan School of Public Health, Department of Epidemiology

⁵ Virginia Commonwealth University, Department of Psychology

ARTICLE INFO

Keywords:

anxiety
depression
mental health
psychological distress
suffering
well-being

ABSTRACT

Suffering has been a topic of considerable discussion in the fields of medicine and palliative care, yet few studies have reported causal evidence linking the experience of suffering to health and well-being. In this three-wave prospective cohort study, we explore the potential psychological implications of suffering during the COVID-19 pandemic by examining relations among suffering, mental health, and psychological well-being in a sample of U.S. adults living with chronic health conditions. We analyzed data from $n = 184$ participants who completed assessments one month before the SARS-CoV-2 outbreak was declared a pandemic by the World Health Organization (February 2020) and then two months (April 2020) and four months later (May/June 2020). Analyses controlled for a range of factors, including sociodemographic characteristics, physical health, religious/spiritual factors, psychological characteristics, and prior values of the predictor and each of the outcomes assessed one month before the COVID-19 pandemic. Results of the primary analysis indicated that greater overall suffering assessed one month into the COVID-19 pandemic was associated with lower psychological well-being ($\beta = -.17$, 95% CI: $-.29, -.05$) and higher levels of anxiety ($\beta = .27$, 95% CI: $.13, .41$) and depression ($\beta = .16$, 95% CI: $.03, .29$) two months later. In a secondary analysis that explored anxiety, depression, and psychological well-being as candidate antecedents of suffering, depression assessed one month into the COVID-19 pandemic was most strongly associated with worse overall suffering two months later. We highlight the implications of the findings for high-risk populations who are suffering amidst the challenges of the COVID-19 pandemic. Potential benefits of both integrating assessments of suffering into screening procedures and addressing experiences of suffering in mental health service settings are discussed.

1. Introduction

When the outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in late 2019, few countries were prepared for the public health and economic challenges that ensued. The U.S. confirmed its first case of coronavirus disease 2019 (COVID-19) – the illness caused by SARS-CoV-2 – on January 20, 2020 (Holshue et al., 2020). Within weeks, community transmission of the virus escalated rapidly in many parts of the country (Shultz et al., 2020). Compelled by a lack of evidence-based prevention strategies and antiviral options to

treat COVID-19, the U.S. federal government declared a national state of emergency on March 13, 2020 (Gostin et al., 2020).

In the weeks and months that followed, many parts of the U.S. enacted unprecedented community mitigation strategies (e.g., physical distancing recommendations, stay-at-home orders) to control the transmission of SARS-CoV-2 (Moreland et al., 2020). Those strategies attempted to limit or prevent close physical contact between people by imposing constraints on in-person business operations, suspending traditional classroom learning, and placing restrictions on physical social gatherings and events (e.g., religious service attendance). Specific

* Corresponding author. 129 Mount Auburn St., Cambridge, MA 02138

E-mail address: rcowden@fas.harvard.edu (R.G. Cowden).

<https://doi.org/10.1016/j.wss.2021.100048>

Received 29 December 2020; Received in revised form 10 June 2021; Accepted 13 July 2021

Available online 15 July 2021

2666-5581/© 2021 The Authors.

Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

groups of people (e.g., older adults, people living with chronic health conditions) who were soon identified as being at increased risk of severe illness from SARS-CoV-2 infection were instructed to take extra precautions (e.g., limit contact with nonfamily members, maintain social distancing) to protect their health (Centers for Disease Control and Prevention, 2020). However, the benefits of these protective measures materialized alongside unintended consequences that have impacted all aspects of human life.

Existing research involving samples of U.S. adults has revealed that the implications of the COVID-19 pandemic have been disruptive to economic, psychological, physical, and interpersonal resources. For example, the public health crisis has caused financial instability, negatively impacted mental health, restricted access to places of significance, and led to feelings of social isolation (Counted et al., 2021; Daly & Robinson, 2021; Twenge & Joiner, 2020; VanderWeele et al., 2021; Xiong et al., 2020). The cumulative effect of widespread stressors arising from the public health crisis may have precipitated or exacerbated subjective experiences of suffering, particularly for those with underlying medical conditions who are predisposed to added distress because of their risk of health complications from SARS-CoV-2 infection. In this study, we examine the effects of suffering experienced during the COVID-19 pandemic on mental health and psychological well-being in a sample of U.S. adults living with chronic health conditions.

1.1. Overview of suffering

For centuries, scholars in the humanities (e.g., philosophers, theologians) have pondered the nature of suffering, including its meaning and implications for well-being. Historical accounts suggest that the experience of suffering can undermine well-being, even among the most virtuous and fully flourishing of people (Aristotle, trans. 1999). In other descriptions, suffering is considered an inseparable feature of human existence that can be redeemed in a way that facilitates self-transcendence (Aquinas, trans. 2018). Only recently has empirical research on suffering begun to emerge, stimulated in part by seminal works published in the latter part of the 20th century (e.g., Cassell, 1982, 1991).

Suffering can be characterized as an undesired experience that involves enduring under loss or privation of some perceived good (VanderWeele, 2019a). It is a negatively valenced subjective experience that threatens a person's sense of self (Cassell, 2004; Fitzpatrick et al., 2016) by, amongst others, thwarting progress towards meaningful goal-oriented pursuits, disrupting the continuity of valued social connections, or challenging well-established views, beliefs, and assumptions about the world (Tate & Pearlman, 2019). Some features of suffering (e.g., its intensity or duration) resemble those that may also accompany physical symptoms, pain, or illness (VanderWeele, 2019a). However, suffering can originate from a broader range of causes than just one's physical health (Cowden et al., in press), such as psychological causes (e.g., mental health difficulties, reduced hope), social causes (e.g., a romantic break-up, the loss of a loved one), or systemic causes (e.g., poverty, social inequalities). Suffering is usually pervasive and extends beyond the boundaries of any single domain of functioning to permeate all aspects of a person's life (Cassell, 2004). Perceived lack of control is a key component of suffering. Uncertainty and inability to control the cause of suffering can heighten distress that is associated with suffering (VanderWeele, 2019a).

There are conceptual and empirical differences between suffering and clinical forms of psychological distress (e.g., anxiety, depression). Suffering characteristically involves the loss of some perceived good, which is not a prerequisite for a diagnosis of a clinical mental health condition (Cassell, 1999). Whereas mental health conditions are identified by screening against a standard set of symptoms, suffering is a subjective state that is complex, dynamic, and highly personal (Cowden et al., in press). Even when suffering arises out of problems with mental health, the object of suffering may be quite distinct (VanderWeele,

2019a). For example, the onset of depression during the COVID-19 pandemic may evoke a subjective state of suffering, but the object of a person's suffering may be their diminished sense of self. Some empirical research has shown that suffering may degrade well-being even when mental health symptoms are below the threshold for clinical diagnosis (see Wilson et al., 2007), indicating that the experience of suffering is distressing and can be problematic outside of clinically diagnosable mental health conditions. Hence, suffering is worthy of consideration in both research and clinical practice.

Much of the existing research on suffering has focused on older patient populations in clinical settings, primarily people with physical pain or illness, those who have been diagnosed with a terminal illness (e.g., cancer, AIDS), and patients receiving palliative or end-of-life care (Cowden et al., in press). This has led to much empirical evidence on the associations of suffering with aspects of physical health. Less is known about the relations of suffering with mental health symptoms and psychological well-being (i.e., positive psychological functioning) in a broader range of populations and settings, including people who have endured natural and human-made disasters.

1.2. Suffering and psychological outcomes during the COVID-19 pandemic

The COVID-19 pandemic has led to hardships and losses that might evoke a state of distress that is consistent with suffering. First, many people have had to endure the loss of key economic (e.g., employment income), interpersonal (e.g., social integration), physical (e.g., freedom of mobility), and psychological (e.g., self-determination) resources that would normally satisfy needs (Counted et al., 2020; Meagher & Chandle, 2020; VanderWeele et al., 2021; Wakam et al., 2020). Second, numerous potential losses experienced during the public health crisis (e.g., unemployment, inability to attend religious services) have the capacity to threaten different aspects of one's personhood (e.g., career identity, religious/spiritual life) and disrupt valued purposes in life (e.g., career-oriented goal pursuits, life balance), particularly losses associated with features of the COVID-19 pandemic that have been outside of one's control (e.g., stringent community mitigation strategies). Third, several factors (e.g., inconsistent public health messaging, evolving SARS-CoV-2 transmission dynamics) have contributed to ongoing uncertainty surrounding the COVID-19 pandemic (Rettie & Daniels, 2021). If reasonable opportunities to regain or compensate for some perceived loss seem improbable in the near future, the length of time a person may expect to suffer could feel intolerable. In addition, experiences of suffering within the context of the COVID-19 pandemic could be challenging for people to resolve or overcome because they may not be able to enact their typical coping strategies during the public health crisis.

Although there is little research concerning the impact of self-reported suffering on psychological health amid the COVID-19 pandemic, evidence from the broader literature suggests that those who are suffering during the public health crisis might experience higher levels of psychological distress. In one cross-sectional study involving 98 advanced cancer patients, Wilson et al. (2007) found that 53.1% of those who reported moderate to extreme levels of suffering also met criteria for an anxiety or depressive disorder. By contrast, only 14.5% of those who reported lower levels of suffering met diagnostic criteria for either mental health condition. Other studies have examined relations between suffering and more positive aspects of psychological health. For example, Lehmann et al. (2011) found that suffering was associated with moderately lower levels of psychological well-being in a cross-sectional sample of 1,299 long-term cancer survivors. These aforementioned findings are consistent with a number of studies (mostly cross-sectional) that have reported evidence linking suffering with worse mental health or psychological well-being (e.g., Abraham et al., 2006; Al-Shahri et al., 2012; Samelius et al., 2010). However, few studies on the subjective experience of suffering have employed longitudinal designs that enable causal inferences to be drawn about

associations between suffering and aspects of well-being (VanderWeele, 2019a). More research is needed to develop an improved understanding of the causal relationship between suffering and psychological health, particularly indices of psychological distress (e.g., anxiety, depression) that are most common to people with chronic health conditions and others who are vulnerable to suffering. Such evidence may be of practical value to mental health professionals as they support the psychological needs of people both during and in the aftermath of the COVID-19 pandemic.

1.3. The present study

This study represents a direct response to recent calls that have emphasized the need to prioritize research on the implications of the COVID-19 pandemic for mental health (Holmes et al., 2020). It also addresses some of the broader gaps in knowledge on suffering and extends the body of evidence in this area by examining whether increases in overall and specific aspects of suffering from before to during the early part of the COVID-19 pandemic are associated with worse mental health and psychological well-being two months later. To this end, we use a longitudinal design to estimate potential causal effects of suffering on several indices of psychological health. We follow the analytic template of an outcome-wide longitudinal design (VanderWeele et al., 2020), which is a useful method for building a broad picture of relations between suffering and psychological health. The analytic approach also controls for an array of covariates and prior values of all outcomes simultaneously. This helps to reduce potential confounding and reverse causation. In the current study, we control for prior values of the exposure (or predictor) variable (i.e., suffering) to assess the effects of *incident exposure* (i.e., change in level of suffering from T1 to T2) on the outcomes at T3. This can strengthen the causal inferences that are drawn from the analysis (VanderWeele et al., 2020). We also performed a secondary analysis to explore anxiety, depression, and psychological well-being as potential antecedents of overall suffering and specific aspects of suffering. Such evidence can provide an indication of bidirectional associations among variables and reveal potentially modifiable factors that could be targeted to address suffering, which can facilitate future research and inform clinical practice.

2. Material and methods

2.1. Study sample

We used the final three waves of data from a five-wave longitudinal research project involving a community sample of U.S. adults living with chronic health conditions. Further information, including details about eligibility criteria and recruitment, can be found in Rueger et al. (2021) (see also Davis et al., 2021). Ethical approval to conduct this study was granted by the Institutional Review Board at Wheaton College (IL). Quotas were applied to ensure the distributions in the sample were approximately representative of the U.S. adult population on the basis of region, gender, racial/ethnic status, and religious affiliation. Beginning in August 2019, participants self-completed a web-based survey up to five times over a 10-month period. The first wave of data that formed part of this study was collected one month before COVID-19 was declared a pandemic by the World Health Organization (T1: February 6 to 16, 2020). Subsequent waves were completed approximately two and four months after T1, respectively (T2: April 3 to 12, 2020; T3: May 27 to June 6, 2020). Suffering, anxiety, depression, and psychological well-being were repeatedly measured in all waves. In the primary analysis, the exposure variables (i.e., overall suffering and specific aspects of suffering) were taken from T2. Outcomes of anxiety, depression, and psychological well-being were taken from T3. Covariate data (including prior values of suffering and all outcome variables) were taken from T1 (see Figure S1).

2.2. Measures

Participants completed the following measures. Internal consistency estimates for all psychometrically validated instruments are reported in Table S1.

2.2.1. Personal Suffering Assessment (PSA; VanderWeele, 2019a)

The PSA comprises seven items that capture the subjective experience of suffering. One item is a global question that assesses the extent of suffering experienced currently (i.e., “To what extent are you suffering?”). The remaining items assess salient characteristics of suffering: intensity, duration, uncontrollability, pervasiveness, disruption to purposes, and threats to personhood (e.g., “The intensity of what I have been experiencing feels intolerable”). Participants rate each item using an 11-point response format, although the anchor points for the global question (0 = *Not suffering at all*; 10 = *Suffering terribly*) differ from those provided for the other six items (0 = *Strongly disagree*; 10 = *Strongly agree*). We averaged responses to each item for an overall suffering score. The items may also be used individually to obtain a more nuanced understanding of how different aspects of suffering relate to outcomes of interest.

2.2.2. Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006)

The GAD-7 consists of seven items that measure the frequency of generalized anxiety symptoms experienced in the preceding two weeks. The items (e.g., “Feeling nervous, anxious or on edge”) are rated on a four-point scale (0 = *Not at all*; 3 = *Nearly every day*), and responses are summed for a total severity score.

2.2.3. Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001)

The PHQ-9 contains nine items that measure the frequency of depressive symptoms experienced over the last two weeks. The items (e.g., “Feeling down, depressed, or hopeless”) are rated on a four-point scale (0 = *Not at all*; 3 = *Nearly every day*). Item responses are summed for a total severity score.

2.2.4. Psychological Well-Being Scale (PWB; Diener et al., 2010)

The PWB consists of eight items designed to provide a broad assessment of desirable states that reflect optimal human functioning. A seven-point response format (1 = *Strongly disagree*; 7 = *Strongly agree*) is used to rate the items (e.g., “I lead a purposeful and meaningful life”). Responses to each item are averaged for a measure of psychological well-being.

2.2.5. Covariates

We controlled for a number of covariates. To reduce concerns that we were controlling for potential mediators, all covariates were controlled for at T1 prior to the primary exposure variable of suffering assessed at T2 (VanderWeele, 2019b). Covariates included age (continuous), gender (female or nonbinary, male), racial/ethnic status (racial/ethnic minority, White/Caucasian), sexual orientation (sexual minority, heterosexual), religious status (nonreligious, religious), marital status (unmarried or separated, married or in a domestic partnership), educational attainment (up to high school equivalency, college degree or better), annual household income (< \$50,000, \$50,000 to \$99,999, ≥ \$100,000), number of people living in household (≤ 2, > 2), geographic region (Midwest, Northeast, South, West), and number of chronic health conditions (continuous). We also controlled for several psychospiritual characteristics (all continuous variables) that were assessed using validated measures, including lifetime trauma exposure (Traumatic Life Events Questionnaire; Kubany et al., 2000), trait hope (Adult Hope Scale; Snyder et al., 1991), trait resilience (Brief Resilience Scale; Smith et al., 2008), trait grit (Grit Scale-Short; Duckworth & Quinn, 2009), trait optimism (Life Orientation

Test-Revised; Scheier et al., 1994), spiritual fortitude (Spiritual Fortitude Scale-9; Van Tongeren et al., 2019), and religious commitment (Religious Commitment Inventory-10; Worthington et al., 2003).

2.3. Statistical processing

Of the 302 participants who completed T1, $n = 237$ (78.48%) completed T2 and $n = 184$ (60.93%) completed T3. Separate logistic regression analyses were used to examine T1 study variables as potential predictors of nonresponse to the survey at T3. Younger age ($p = .013$), sexual majority status ($p = .033$), annual household income of $< \$50,000$ versus $\$50,000$ to $\$99,999$ ($p = .044$), and lower trait hope ($p = .030$) were each associated with a higher likelihood of nonresponse. No other variables were predictive of nonresponse at T3 ($ps \geq .067$). We proceeded with an available-case analytic approach.

We performed initial descriptive analyses using the full analytic sample. Analysis of variance and Chi-square tests were used to examine bivariate associations between covariates and tertiles of overall suffering. Logistic regression was used to regress the upper tertile of overall suffering (versus middle and bottom tertiles combined) on all sociodemographic covariates simultaneously.

We applied the outcome-wide longitudinal design in the primary analysis, which is an analytic template for estimating the causal effects of an exposure variable assessed at a single point in time on numerous subsequent outcomes (VanderWeele et al., 2020). This approach involved running a series of linear regressions to model continuous scores of each outcome assessed at T3 as dependent variables (one outcome at a time). Continuous scores of overall suffering and each suffering item (standardized at $M = 0$, $SD = 1$) assessed at T2 were used as the independent variables in eight separate models for each outcome variable. All outcomes were standardized ($M = 0$, $SD = 1$) to allow for effect sizes to be compared across outcomes. Each model fully adjusted for all covariates assessed at T1. Prior values of all outcome variables (i.e., anxiety, depression, psychological well-being) assessed at T1 were included in each model to minimize the possibility of reverse causation. To facilitate interpretations of change in degree of suffering, models also controlled for suffering at T1. This approach is also beneficial for reducing reverse causation and potential unmeasured confounding (VanderWeele et al., 2020).

We used the analytic template for an outcome-wide approach to explore anxiety, depression, and psychological well-being as potential antecedents (independent predictors) of overall suffering and each individual suffering item to allow for exploration of bidirectional effects. In eight separate models for each candidate antecedent, we regressed continuous outcomes of suffering at T3 on each candidate antecedent assessed at T2, controlling for prior values of respective suffering outcomes assessed at T1 and all the T1 covariates that were used in the primary analysis. Models with individual suffering items as outcomes also controlled for prior values of all other individual suffering items assessed at T1.

We assessed the robustness of the estimated effects in the primary analysis to potential unmeasured confounding by performing a sensitivity analysis using E -values (VanderWeele & Ding, 2017). E -values provide an estimate of the minimum strength that an unmeasured confounder would need to be related to both the exposure variable (e.g., overall suffering) and the outcome (e.g., anxiety) to explain away an exposure-outcome association, above and beyond the measured covariates. All analyses were performed in R (R Core Team, 2020).

3. Results

3.1. Descriptive analyses

The distribution of participant characteristics in the full analytic sample ($n = 184$) is reported in Table S1. Participants were between 29 and 82 years of age ($M_{age} = 63.92$, $SD = 10.86$). A majority of the sample

was male (54.35%), White/Caucasian (75.00%), and heterosexual (91.85%). Most participants were married or in a domestic partnership (61.96%), had graduated with a college degree or better (71.20%), and affiliated with a religious tradition (77.17%). The mean number of chronic health conditions was 1.93 ($SD = 1.14$, range = 1 to 6); the most frequently endorsed conditions were hypertension (47.83%), arthritis (32.61%), diabetes (29.89%), and mood disorder (10.87%).

The distribution of sociodemographic, physical health, psychological, and religious/spiritual covariates by tertiles of overall suffering are described in Table 1. When the upper tertile of overall suffering was regressed on all sociodemographic covariates simultaneously, participants who were not married or in a domestic partnership and those living in a household with more than two people had a higher probability of being in the upper tertile of suffering (Table S2).

3.2. Suffering and psychological outcomes

Associations between suffering and all subsequent outcomes are presented in Table 2. Overall suffering was associated with lower subsequent psychological well-being and higher subsequent anxiety and depression. A comparably larger (but still modest) effect size was found for anxiety ($\beta = .27$, $p < .001$) than for depression ($\beta = .16$, $p = .016$) or psychological well-being ($\beta = -.17$, $p = .008$). A similar pattern was found for each aspect of suffering, such that effect size estimates were consistently stronger for anxiety than for depression or psychological well-being. More associations emerged between the specific aspects of suffering and anxiety (six out of seven items) than depression (four out of seven items) or psychological well-being (three out of seven items). Length of suffering, powerlessness over suffering, and pervasiveness of suffering were the only three aspects of suffering that evidenced associations with all three outcomes (anxiety: $\beta s = .20$ to $.25$, $ps \leq .003$; depression: $\beta s = .14$ to $.18$, $ps \leq .024$; psychological well-being: $\beta s = -.20$ to $-.13$, $ps \leq .024$). Compared to other aspects of suffering, powerlessness over suffering evidenced the largest associations with subsequently worse functioning on all three outcomes (anxiety: $\beta = .25$, $p < .001$; depression: $\beta = .18$, $p = .005$; psychological well-being: $\beta = -.20$, $p = .001$). Extent of suffering was the only aspect of suffering for which there was little evidence of association with each outcome ($ps > .05$).

3.3. Psychological antecedents of suffering

Results for analyses involving anxiety, depression, and psychological well-being as candidate antecedents of suffering are reported in Table 3. Depression was more strongly associated with subsequently worse overall suffering ($\beta = .23$, $p < .001$) than anxiety ($\beta = .16$, $p = .010$) or psychological well-being ($\beta = -.14$, $p = .094$). More associations emerged between depression and specific aspects of suffering (four out of seven items) compared to anxiety (two out of seven items) and psychological well-being (two out of seven items). Effect size estimates for associations between candidate predictors and the aspects of suffering were generally larger for depression compared to anxiety and psychological well-being. Two aspects of suffering were predicted by more than one candidate antecedent; intensity of suffering was predicted by anxiety ($\beta = .22$, $p = .002$) and depression ($\beta = .26$, $p < .001$), whereas pervasiveness of suffering was predicted by depression ($\beta = .16$, $p = .021$) and psychological well-being ($\beta = -.18$, $p = .039$). Disruption to purposes was the only aspect of suffering for which there was little evidence of prediction by any of the candidate antecedents ($ps > .05$).

3.4. Sensitivity analysis

The E -values for the primary analysis involving associations of suffering with subsequent mental health and psychological well-being outcomes suggested that the results were at least somewhat robust to potential unmeasured confounding (see Table 4). For example, an unmeasured confounder that was associated with both overall suffering

Table 1

Distribution of Participant Characteristics Assessed One Month Before the COVID-19 Pandemic (T1) by Tertiles of Overall Suffering Assessed One Month Into the COVID-19 Pandemic (T2)

Participant characteristics	Overall suffering						p-value
	Bottom tertile (n = 62)		Middle tertile (n = 63)		Upper tertile (n = 59)		
	%	M (SD)	%	M (SD)	%	M (SD)	
Sociodemographic							
Age, years (range: 29–82)		64.90 (10.14)		63.94 (10.49)		62.88 (12.01)	p = .595
Gender							p = .511
Female or nonbinary	51.61		42.86		42.37		
Male	48.39		57.14		57.63		
Racial/ethnic status							p = .073
Racial/ethnic minority	19.35		20.63		35.59		
White/Caucasian	80.65		79.37		64.41		
Sexual orientation							p = .417
Sexual minority	4.84		11.11		8.47		
Heterosexual	95.16		88.89		91.53		
Religious status							p = .766
Nonreligious	25.81		22.22		20.34		
Religious	74.19		77.78		79.66		
Marital status							p = .020
Unmarried or separated	24.59		39.68		49.15		
Married or in a domestic partnership	75.41		60.32		50.85		
Educational attainment							p = .911
Up to high school equivalency	29.03		26.98		30.51		
College degree or better	70.97		73.02		69.49		
Annual household income							p = .294
< \$50,000	20.97		32.26		33.90		
\$50,000 to \$99,999	35.48		40.32		33.90		
≥ \$100,000	43.55		27.42		32.20		
Number of people living in household							p = .004
≤ 2	87.10		88.89		67.80		
> 2	12.90		11.11		32.20		
Geographic region							p = .534
Midwest	20.97		19.05		16.95		
Northeast	20.97		19.05		25.42		
South	22.58		38.10		32.20		
West	35.48		23.81		25.42		
Physical health							
Number of chronic health conditions (range: 1–6)		1.90 (1.10)		1.86 (1.09)		2.03 (1.23)	p = .677
Psychological							
Lifetime trauma exposure (range: 0–110)		6.82 (6.00)		13.54 (17.40)		10.63 (9.11)	p = .008
Trait hope (range: 1.75–8)		6.73 (0.91)		6.28 (0.85)		5.80 (1.14)	p < .001
Trait resilience (range: 1.33–5)		4.03 (0.68)		3.62 (0.67)		3.15 (0.95)	p < .001
Trait grit (range: 1.50–5)		4.06 (0.60)		3.79 (0.61)		3.58 (0.67)	p < .001
Trait optimism (range: 1–5)		4.25 (0.70)		3.86 (0.75)		3.15 (1.08)	p < .001
Anxiety (range: 0–21)		1.21 (2.37)		3.29 (4.38)		5.29 (5.06)	p < .001
Depression (range: 0–21)		1.74 (2.13)		3.30 (4.27)		6.31 (4.99)	p < .001
Psychological well-being (range: 1.88–7)		6.07 (0.88)		5.82 (0.72)		5.28 (1.06)	p < .001
Religious/spiritual							
Spiritual fortitude (range: 1.56–5)		3.54 (0.78)		3.71 (0.66)		3.39 (0.89)	p = .078
Religious commitment (range: 1–4.90)		1.85 (1.15)		2.35 (1.31)		2.08 (1.29)	p = .090

Note. M = mean, SD = standard deviation. All participant characteristics were used as covariates and were assessed in the wave prior (i.e., one month before the COVID-19 pandemic) to the wave in which the exposure variable (i.e., suffering) was assessed (i.e., one month into the COVID-19 pandemic). Analysis of variance tests, Chi-square tests of independence, and Fisher’s exact tests were used to examine the mean (SD) levels of the characteristic or the proportion of individuals within each overall suffering tertile with that characteristic.

and anxiety by risk ratios of 1.88, above and beyond all the adjusted covariates, could suffice to explain away the observed association, but weaker confounding could not; to shift the confidence interval (CI) to include the null, an unmeasured confounder associated with both overall suffering and anxiety by risk ratios of 1.51 each could do so, but weaker confounding could not. The corresponding E-values for associations of overall suffering with depression (1.58 for the estimate; 1.20 for the CI) and psychological well-being (1.61 for the estimate; 1.26 for the CI) were somewhat lower, but still suggested at least modest robustness to potential unmeasured confounding.

4. Discussion

In this longitudinal study of U.S. adults living with chronic health conditions, we found that the experience of suffering one month into the early part of the COVID-19 pandemic was positively associated with

mental health problems (i.e., anxiety and depression) and negatively associated with psychological well-being assessed two months later. Although these findings resonate with the broader body of empirical evidence on suffering and well-being (e.g., Best et al., 2015; Boston et al., 2011; Krikorian et al., 2012), the bulk of existing research on suffering has relied on cross-sectional data (VanderWeele, 2019a). By using data from a prospective cohort and applying a methodologically rigorous analytic approach that involved controlling for potential confounding and taking steps to reduce reverse causation, this study contributes to developing an improved understanding of the implications of suffering for mental health and psychological well-being. It also extends research on the mental health consequences of the COVID-19 pandemic by providing insight into the role of suffering in precipitating or exacerbating psychological problems during the public health crisis.

Table 2

Associations of Suffering One Month Into the COVID-19 Pandemic (T2) With Anxiety, Depression, and Psychological Well-being Three Months Into the COVID-19 Pandemic (T3)

Exposure	Outcome		
	Anxiety	Depression	Psychological well-being
	β [95% CI]	β [95% CI]	β [95% CI]
Overall suffering	.27 [.13, .41]***	.16 [.03, .29]*	-.17 [-.29, -.05]*
Extent of suffering	.13 [-.01, .27]	.07 [-.05, .19]	-.08 [-.20, .04]
Intensity of suffering	.23 [.11, .35]***	.08 [-.03, .19]	-.10 [-.21, .00]
Length of suffering	.22 [.09, .35]***	.14 [.02, .26]*	-.16 [-.27, -.04]*
Powerlessness over suffering	.25 [.11, .39]***	.18 [.05, .31]***	-.20 [-.32, -.08]***
Pervasiveness of suffering	.20 [.07, .33]***	.14 [.02, .25]*	-.13 [-.24, -.02]*
Disruption to purposes	.14 [.02, .26]*	.10 [-.00, .21]	-.10 [-.20, .01]
Threats to personhood	.23 [.11, .36]***	.13 [.02, .24]*	-.07 [-.18, .03]

Note. β = standardized effect size, CI = confidence interval. $n = 182$ for all analyses. An outcome-wide analytic approach was used to estimate effects, which involved regressing each outcome on overall suffering and each of the individual suffering items in separate models. Ordinary least squares regressions were used to estimate the mean change (β) in the standardized scores of anxiety, depression, and psychological well-being with the change in suffering. Exposure and outcome variables were continuous and standardized ($M = 0, SD = 1$) to facilitate comparison of effect estimates across outcomes. All models adjusted for prior values of age, gender, racial/ethnic status, sexual orientation, religious status, marital status, educational attainment, annual household income, number of household members, geographic region, number of chronic health conditions, lifetime trauma exposure, trait hope, trait resilience, trait grit, trait optimism, spiritual fortitude, and religious commitment assessed at T1, the prior value of the exposure variable (i.e., suffering) assessed at T1, and prior values of all outcomes (i.e., anxiety, depression and psychological well-being) assessed at T1. We applied Bonferroni corrections by adjusting for the number of tests involving each outcome variable (i.e., $\alpha = .05/8$). * $p < .05$ before but not after Bonferroni correction, *** $p < .05$ after Bonferroni correction (the p -value cutoff for Bonferroni correction was .006 for each outcome).

Table 3

Associations of Anxiety, Depression, and Psychological Well-being One Month Into the COVID-19 Pandemic (T2) With Suffering Three Months Into the COVID-19 Pandemic (T3)

Outcome	Candidate antecedents		
	Anxiety	Depression	Psychological well-being
	β [95% CI]	β [95% CI]	β [95% CI]
Overall suffering	.16 [.04, .28]*	.23 [.10, .36]***	-.14 [-.31, .02]
Extent of suffering	.08 [-.06, .21]	.19 [.05, .34]*	-.00 [-.19, .18]
Intensity of suffering	.22 [.08, .35]***	.26 [.11, .41]***	-.16 [-.35, .04]
Length of suffering	.09 [-.05, .23]	.14 [-.01, .29]	-.19 [-.38, -.00]*
Powerlessness over suffering	.16 [.02, .29]*	.11 [-.04, .26]	-.08 [-.27, .10]
Pervasiveness of suffering	.09 [-.03, .21]	.16 [.02, .29]*	-.18 [-.35, -.01]*
Disruption to purposes	.12 [-.03, .28]	.16 [-.01, .33]	-.08 [-.29, .14]
Threats to personhood	.10 [-.04, .24]	.21 [.06, .36]*	-.15 [-.34, .04]

Note. β = standardized effect size, CI = confidence interval. $n = 181$ for all analyses. An outcome-wide analytic approach was used to estimate effects, which involved regressing the outcomes of overall suffering and each of the individual suffering items on candidate antecedents of anxiety, depression, and psychological well-being in separate models. Ordinary least squares regressions were used to estimate the mean change (β) in the standardized scores of suffering with the change in anxiety, depression, and psychological well-being. Exposure and outcome variables were continuous and standardized ($M = 0, SD = 1$) to facilitate comparison of effect estimates across outcomes. All models adjusted for prior values of age, gender, racial/ethnic status, sexual orientation, religious status, marital status, educational attainment, annual household income, number of household members, geographic region, number of chronic health conditions, lifetime trauma exposure, trait hope, trait resilience, trait grit, trait optimism, spiritual fortitude, and religious commitment assessed at T1, the prior value of each exposure variable (i.e., anxiety, depression, and psychological well-being) assessed at T1, and the prior value of respective outcomes assessed at T1. Models with individual suffering items as outcomes also controlled for prior values of all other individual suffering items assessed at T1. We applied Bonferroni corrections by adjusting for the number of tests involving each candidate antecedent variable (i.e., $\alpha = .05/8$). * $p < .05$ before but not after Bonferroni correction, *** $p < .05$ after Bonferroni correction (the p -value cutoff for Bonferroni correction was .006 for each outcome).

4.1. Suffering and psychological outcomes

The associations that were observed between overall suffering and changes in each outcome align with prior studies that have pointed to the negative impact of suffering on anxiety, depression, and psychological well-being (Abraham et al., 2006; Al-Shahri et al., 2012; Sameilus et al., 2010; Wilson et al., 2007). We also found evidence of a larger effect of overall suffering on anxiety compared to depression and psychological well-being, a trend that was consistent across specific aspects of suffering. More aspects of suffering were associated with anxiety than each of the other two outcomes, suggesting that symptoms of anxiety may have been particularly sensitive to increases in suffering during the initial period of the COVID-19 pandemic. Overall, these findings resonate with numerous studies (mostly cross-sectional) that have reported on the implications of this public health crisis for mental health (Daly & Robinson, 2021; Twenge & Joiner, 2020; Xiong et al., 2020).

Powerlessness over suffering evidenced the largest effect of any

aspect of suffering on all three outcomes. Within the context of the COVID-19 pandemic, which has challenged society’s core assumptions about human control over the environment and the extent to which the future is predictable (Menzies et al., 2020), this finding may be indicative of the negative impact that the public health crisis has had on individual agency. Amidst the range of unforeseen losses that people have had to endure during the COVID-19 pandemic (e.g., income, employment, social support), a thwarted sense of autonomy and limits to self-determination may induce a sense of powerlessness over being able to stop or change one’s situation (Ishikawa, 2020). That experience of suffering may lead to psychological distress, particularly when opportunities or resources to overcome one’s circumstance are lacking (Harber et al., 2011).

Aside from powerlessness over suffering, the aspect of suffering that was most strongly associated with worse functioning on all three outcomes was length of suffering. This finding might be explained by the existential threat posed by SARS-CoV-2. Specifically, the COVID-19

Table 4

Robustness to Unmeasured Confounding (E-values^a) for the Associations of Suffering One Month Into the COVID-19 Pandemic (T2) With Anxiety, Depression, and Psychological Well-being Three Months Into the COVID-19 Pandemic (T3)

Exposure	Outcome					
	Anxiety		Depression		Psychological well-being	
	Effect estimate ^b	CI limit ^c	Effect estimate ^b	CI limit ^c	Effect estimate ^b	CI limit ^c
Overall suffering	1.88	1.51	1.58	1.20	1.61	1.26
Extent of suffering	1.50	1.00	1.33	1.00	1.35	1.00
Intensity of suffering	1.77	1.44	1.35	1.00	1.43	1.00
Length of suffering	1.75	1.39	1.52	1.15	1.57	1.24
Powerlessness over suffering	1.82	1.45	1.63	1.28	1.69	1.37
Pervasiveness of suffering	1.68	1.32	1.52	1.16	1.50	1.15
Disruption to purposes	1.53	1.16	1.43	1.00	1.41	1.00
Threats to personhood	1.78	1.46	1.50	1.15	1.34	1.00

Note. CI = confidence interval. ^aThe formula for calculating E-values can be found in VanderWeele and Ding (2017). ^bE-values for effect estimates are the minimum strength of association that an unmeasured confounder would need to have with both the exposure and the outcome variable to explain away the observed effect, after accounting for the measured covariates. ^cE-values for the limit of the 95% CI closest to the null denote the minimum strength of association that an unmeasured confounder would need to have with both the exposure and the outcome variable to shift the confidence interval to include the null value, after accounting for the measured covariates.

pandemic has created an unusual scenario in which people have been reminded of their mortality on a near constant basis (Menzies & Menzies, 2020). This priming effect might be especially salient among vulnerable populations who are at increased risk of severe illness from SARS-CoV-2 infection, including those with underlying medical conditions. The lingering threat of the virus to one's existence may evoke an undesired subjective experience that constitutes a loss of some perceived good (e.g., peace of mind). Given the ambiguous timeline of the COVID-19 pandemic and uncertainties about when evidence-based prevention and antiviral options are likely to become available, mental well-being may have been undermined when people expected to endure such loss for a length of time that felt unbearable.

4.2. Psychological antecedents of suffering

This study also explored anxiety, depression, and psychological well-being as potential antecedents of suffering, revealing several aspects of psychological functioning that could be targeted to attenuate suffering. By controlling for a wide range of covariates assessed at baseline, the secondary analysis provided a more robust indication of how a change in each exposure variable (i.e., anxiety, depression, and psychological well-being) affects each outcome (i.e., overall suffering and specific aspects of suffering). In that analysis, depression yielded the largest positive association with overall suffering. When specific aspects of suffering were considered as outcomes, effect sizes were generally larger for depression than for anxiety or psychological well-being. The aspect of suffering that evidenced the largest association with any potential antecedent was intensity of suffering, which was predicted by both anxiety and depression.

Taken together, the findings of both the primary and secondary analyses provide some evidence of bidirectional relationships between suffering and psychological functioning. Whereas the results of the primary analysis indicated that suffering was more strongly associated with subsequent anxiety, the secondary analysis provided evidence of depression associating more strongly with subsequent suffering. Further inquiry is needed to identify potential explanations for the pattern of associations observed in this study, including mechanisms and effect modifiers that may lead to an improved understanding of the relationship between suffering and psychological functioning.

4.3. Implications for research and practice

Although much discussion surrounding the COVID-19 pandemic has been dedicated to suffering as a broad concept (e.g., Radbruch et al., 2020), the current study offers more explicit insight into the experience

of suffering and its impact on well-being during this public health crisis. The results provide further evidence of the conceptual distinction between the subjective experience of suffering and symptoms of anxiety and depression. Many prior studies have operationalized suffering using measures which conflate suffering with symptoms of psychopathology (e.g., Schulz et al., 2009, 2008). That approach could capture some cause or consequence of suffering, but it tends to overlook the experience of suffering itself (VanderWeele, 2019a). Research that operationalizes suffering by drawing on conceptual frameworks that distinguish it from symptoms of mental illness will prove useful for advancing the empirical literature on suffering, the findings of which are likely to translate into benefits for clinical practice.

Mental health practitioners involved in treating clients during the COVID-19 pandemic may need to be sensitive to subjective experiences of suffering when exploring the etiology of their psychological distress. In approaching the subject of suffering, the findings of this study suggest that clinical interviews and assessment procedures may need to extend beyond clients' surface-level perceptions about whether they are suffering. By focusing on the *nature* of clients' subjective state of suffering (e.g., length of suffering, perceived powerlessness over suffering, pervasiveness of suffering) and exploring their suffering experiences more deeply, practitioners might be able to develop more personalized treatment approaches to address aspects of clients' phenomenological experiences that are impacting their psychological health.

Based on the findings of this study, clients who are experiencing psychological distress during this public health crisis may find relief from treatment approaches that attend to their subjective experience of suffering. Meaning-based interventions (e.g., Meaning and Purpose therapy; Lethborg et al., 2019) offer a potentially useful therapeutic framework for supporting people who are suffering. Those approaches tend to draw on meaning and purpose to assist clients with developing a meaning-based focus by shifting their preoccupation away from their suffering. In addition, much philosophical and theological literature suggests that virtues (e.g., patience) and character strengths (e.g., courage) may be useful psychological resources for addressing suffering in a way that promotes personal growth (VanderWeele, 2019a). To date, few studies have explored the clinical utility of such concepts in supporting people who are suffering.

More generally, the majority of existing research on the concept of suffering has focused on specific populations within clinical contexts (e.g., terminally ill patients, palliative care recipients). Our understanding of suffering and its implications for well-being could be enhanced by studying a broader range of clinical and nonclinical populations, particularly in contexts where social-structural

disadvantages (e.g., economic inequality, material hardship, weak health systems, gender inequality) heighten risk of loss or privation in a wide variety of life domains (Govender et al., 2020). An expanded scope of suffering research could contribute to the development and refinement of contextually informed interventions and treatment programs to support people who are suffering.

4.4. Strengths and limitations

A major strength of this study is the outcome-wide methodological design that was used to estimate causal effects (VanderWeele et al., 2020), which involved adjusting for prior values of covariates, exposures, and outcomes. Controlling for prior values of the exposure variable made it possible to evaluate the effects of incident suffering (i.e., the change in level of suffering) experienced during the early part of the COVID-19 pandemic on mental health and psychological well-being. This approach provides stronger evidence of causality than if we had estimated effects based on the prevalence of the exposure.

There are also several limitations of this study. First, the attrition rate was almost 40%, which could bias the results if participants in the analytic sample differed systematically from those who discontinued participation. Second, the analytic sample was composed of chronically ill U.S. adults who were primarily White/Caucasian and highly educated. Although statistically controlling for sociodemographic factors in the analyses provides a stronger basis for generalizing the findings more broadly, caution should be applied when generalizing the results of this study to the general U.S. population and to people living in non-Western contexts. Third, the results are based entirely on self-reported data. The findings of this study could be strengthened by integrating objective assessments of psychological functioning into longitudinal research on suffering. Fourth, the lag between each assessment was two months. A two-month period between the exposure and outcome variables may have been insufficient for estimating the impact of suffering during the COVID-19 pandemic on mental health and psychological well-being. Datasets that have longer lags between assessments may provide further insight into the cause-and-effect associations between the experience of suffering and aspects of psychological functioning, particularly in the midst of the ongoing challenges of this public health crisis. Fifth, the observed associations in this study may have been biased by unmeasured confounding (e.g., quality of physical health). To assess whether the observed effects may have been confounded by unmeasured factors, we performed a sensitivity analysis using *E*-values (VanderWeele & Ding, 2017). *E*-values corresponding with the observed effects indicated that the associations of suffering with each outcome were at least somewhat robust to potential unmeasured confounding; robustness was most substantial for associations with subsequent anxiety. A more modest set of *E*-values emerged for the confidence interval limits, particularly for some of the aspects of suffering. Thus, it is possible that the associations observed in this study could be explained away by a combination of unmeasured confounding and statistical uncertainty.

5. Conclusions

In summary, this study utilized prospective data to support causal inference about the implications of suffering for psychological functioning. Our findings provided evidence of associations between suffering during the early part of the COVID-19 pandemic and worse mental health (especially anxiety) and psychological well-being approximately two months later. Although the results of this study have particular relevance to U.S. adults living with chronic health conditions, these findings highlight areas that researchers and mental health practitioners may consider exploring to address mental health concerns and promote psychological well-being in a broader range of populations during the COVID-19 pandemic and beyond.

Ethics approval

This study was granted institutional ethical approval from Wheaton College (IL). All procedures involving human participants were performed in accordance with the 1964 Helsinki declaration and its later amendments.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Availability of data

All data related to this study are publicly available on the Open Science Framework (<https://osf.io/2anvx>).

Declarations of interest

None.

Funding

No funding was received to assist with the preparation of this manuscript.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.wss.2021.100048](https://doi.org/10.1016/j.wss.2021.100048).

References

- Abraham, A., Kutner, J.S., Beaty, B., 2006. Suffering at the end of life in the setting of low physical symptom distress. *Journal of Palliative Medicine* 9 (3), 658–665. <https://doi.org/10.1089/jpm.2006.9.658>.
- Al-Shahri, M.Z., Eldali, A.M., Al-Zahrani, O., 2012. Prevalence and severity of suffering among patients with advanced cancer. *Supportive Care in Cancer* 20 (12), 3137–3140. <https://doi.org/10.1007/s00520-012-1443-6>.
- Aristotle, 1999. *Nicomachean ethics*. Batoche Books. W. D. Ross, Trans.
- Aquinas, T., 2018. *Commentary on the letter of Saint Paul to the Romans*. Aquinas Institute. F. R. Larcher, Trans.
- Best, M., Aldridge, L., Butow, P., Olver, I., Webster, F., 2015. Conceptual analysis of suffering in cancer: A systematic review. *Psycho-Oncology* 24 (9), 977–986. <https://doi.org/10.1002/pon.3795>.
- Boston, P., Bruce, A., Schreiber, R., 2011. Existential suffering in the palliative care setting: An integrated literature review. *Journal of Pain & Symptom Management* 41 (3), 604–618. <https://doi.org/10.1016/j.jpainsymman.2010.05.010>.
- Cassell, E.J., 1982. The nature of suffering and the goals of medicine. *The New England Journal of Medicine* 306, 639–645. <https://doi.org/10.1056/NEJM198203183061104>.
- Cassell, E.J., 1991. *The nature of suffering and the goals of medicine*, 1st ed. Oxford University Press.
- Cassell, E.J., 1999. Diagnosing suffering: A perspective. *Annals of Internal Medicine* 131 (7), 531–534. <https://doi.org/10.7326/0003-4819-131-7-199910050-00009>.
- Cassell, E.J., 2004. *The nature of suffering and the goals of medicine*, 2nd ed. Oxford University Press.
- Centers for Disease Control and Prevention, 2020. Coronavirus disease 2019 (COVID-19): People at increased risk and other people who need to take extra precautions. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/index.html>.
- Counted, V., Neff, M.A., Captari, L.E., Cowden, R.G., 2021. Transcending place attachment disruptions during a public health crisis: Spiritual struggles, resilience, and transformation. *Journal of Psychology and Christianity* 39 (4), 276–286.
- Counted, V., Pargament, K.I., Bachera, A.O., Joynt, S., Cowden, R.G., 2020. Hope and well-being in vulnerable contexts during the COVID-19 pandemic: Does religious coping matter? *The Journal of Positive Psychology*. Advance online publication. <https://doi.org/10.1080/17439760.2020.1832247>.
- Cowden, R.G., Counted, V., Ramkissoon, H., in press. Place attachment and suffering during a pandemic. In V. Counted, R.G. Cowden, H. Ramkissoon, Place and post-pandemic flourishing: Disruption, adjustment, and healthy behaviors. Springer. <https://www.springer.com/us/book/9783030825799>.
- Daly, M., Robinson, E., 2021. Psychological distress and adaptation to the COVID-19 crisis in the United States. *Journal of Psychiatric Research* 136, 603–609. <https://doi.org/10.1016/j.jpsychires.2020.10.035>.
- Davis, E.B., McElroy-Heltzel, S.E., Lemke, A.W., Cowden, R.G., VanderWeele, T.J., Worthington Jr., E.L., Glowiak, K.J., Shannonhouse, L., Davis, D.E., Hook, J.N., Van

- Tongeren, D.R., Aten, J.D., 2021. Psychological and spiritual outcomes during the COVID-19 pandemic: A prospective longitudinal study of U.S. adults with chronic disease. *Health Psychology*. Advance online publication. <https://doi.org/10.1037/hea0001079>.
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., Biswas-Diener, R., 2010. New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research* 97, 143–156. <https://doi.org/10.1007/s11205-009-9493-y>.
- Duckworth, A.L., Quinn, P.D., 2009. Development and validation of the Short Grit Scale (GRIT-S). *Journal of Personality Assessment* 91 (2), 166–174. <https://doi.org/10.1080/00223890802634290>.
- Fitzpatrick, S., Kerridge, I., Jordens, C., Zoloth, L., Tollefsen, C., Tsomo, K., Jensen, M., Sachedina, A., Sarma, D., 2016. Religious perspectives on human suffering: Implications for medicine and bioethics. *Journal of Religion & Health* 55 (1), 159–173. <https://doi.org/10.1007/s10943-015-0014-9>.
- Gostin, L.O., Hodge, J.G., Wiley, L.F., 2020. Presidential powers and response to COVID-19. *JAMA* 323 (16), 1547–1548. <https://doi.org/10.1001/jama.2020.4335>.
- Govender, K., Cowden, R.G., Nyamaruze, P., Armstrong, R.M., Hatane, L., 2020. Beyond the disease: Contextualized implications of the COVID-19 pandemic for children and young people living in Eastern and Southern Africa. *Frontiers in Public Health* 8, 504. <https://doi.org/10.3389/fpubh.2020.00504>.
- Harber, K.D., Yeung, D., Iacovelli, A., 2011. Psychosocial resources, threat, and the perception of distance and height: Support for the resources and perception model. *Emotion* 11 (5), 1080–1090. <https://doi.org/10.1037/a0023995>.
- Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Silver, Cohen, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A., K., Shafran, R., Sweeney, A., Worthman, C.M., Bullmore, E., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry* 7 (6), 547–560. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1).
- Holshue, M.L., DeBolt, C., Lindquist, S., Lofy, K.H., Wiesman, J., Bruce, H., Spitters, C., Ericson, K., Wilkerson, S., Tural, A., Diaz, G., Cohn, A., Fox, L., Patel, A., Gerber, S.I., Kim, L., Tong, S., Lu, X., Lindstrom, S., Pillai, S.K., 2020. First case of 2019 novel coronavirus in the United States. *The New England Journal of Medicine* 382, 929–936. <https://doi.org/10.1056/NEJMoa2001191>.
- Ishikawa, R.Z., 2020. I may never see the ocean again: Loss and grief among older adults during the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice, and Policy* 12 (S1), S85–S86. <http://doi.org/10.1037/tra0000695>.
- Krikorian, A., Limonero, J.T., Maté, J., 2012. Suffering and distress at the end-of-life. *Psycho-Oncology* 21 (8), 799–808. <https://doi.org/10.1002/pon.2087>.
- Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine* 16 (9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>.
- Kubany, E.S., Leisen, M.B., Kaplan, A.S., Watson, S.B., Haynes, S.N., Owens, J.A., Burns, K., 2000. Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: The Traumatic Life Events Questionnaire. *Psychological Assessment* 12 (2), 210–224. <https://doi.org/10.1037/1040-3590.12.2.210>.
- Lehmann, V., Oerlemans, S., van de Poll-Franse, L.V., Vingerhoets, A.J., Mols, F., 2011. Suffering in long-term cancer survivors: An evaluation of the PRISM-R2 in a population-based cohort. *Quality of Life Research* 20 (10), 1645–1654. <https://doi.org/10.1007/s11136-011-9911-x>.
- Lethborg, C., Kissane, D.W., Schofield, P., 2019. Meaning and Purpose (MaP) therapy I: Therapeutic processes and themes in advanced cancer. *Palliative & Supportive Care* 17 (1), 13–20. <https://doi.org/10.1017/S1478951518000871>.
- Meagher, B.R., Cheadle, A.D., 2020. Distant from others, but close to home: The relationship between home attachment and mental health during COVID-19. *Journal of Environmental Psychology* 72, 101516. <https://doi.org/10.1016/j.jenvp.2020.101516>.
- Menzies, R., Menzies, R., 2020. Death anxiety in the time of COVID-19: Theoretical explanations and clinical implications. *The Cognitive Behaviour Therapist* 13, e19. <https://doi.org/10.1017/S1754470X20000215>.
- Menzies, R., Neimeyer, R., Menzies, R., 2020. Death anxiety, loss, and grief in the time of COVID-19. *Behaviour Change* 37 (3), 111–115. <https://doi.org/10.1017/bec.2020.10>.
- Moreland, A., Herlihy, C., Tynan, M.A., Sunshine, G., McCord, R.F., Hilton, C., Poovey, J., Werner, A.K., Jones, C.D., Fulmer, E.B., Gundlapalli, A.V., Strosnider, H., Potvien, A., Garcia, M.C., Honeycutt, S., Baldwin, G., CDC Public Health Law Program, CDC COVID-19 Response Team, Mitigation Policy Analysis Unit, 2020. Timing of State and Territorial COVID-19 Stay-at-Home Orders and Changes in Population Movement — United States, March 1–May 31, 2020. *Morbidity and Mortality Weekly Report* 69 (35), 1198–1203. <http://doi.org/10.15585/mmwr.mm6935a2>.
- Radbruch, L., Knaut, F.M., de Lima, L., de Joncheere, C., Bhadelia, A., 2020. The key role of palliative care in response to the COVID-19 tsunami of suffering. *The Lancet* 395 (10235), 1467–1469. [https://doi.org/10.1016/S0140-6736\(20\)30964-8](https://doi.org/10.1016/S0140-6736(20)30964-8).
- R Core Team, 2020. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from. <https://www.R-project.org/>
- Rettie, H., Daniels, J., 2021. Coping and tolerance of uncertainty: Predictors and mediators of mental health during the COVID-19 pandemic. *American Psychologist* 76 (3), 427–437. <http://doi.org/10.1037/amp0000710>.
- Rueger, S.Y., Worthington Jr., E.L., Davis, E.B., Chen, Z.J., Maloney, J.M., Eveleigh, E., Cowden, R.G., Stone, L.B., Glowiak, K., Lemke, A.W., 2021. Development and initial validation of the Persevering Hope Scale: Measuring wait-power in four independent samples [Manuscript submitted for publication]. School of Psychology, Counseling, and Family Therapy, Wheaton College.
- Samelius, L., Wijma, B., Wingren, G., Wijma, K., 2010. Lifetime history of abuse, suffering and psychological health. *Nordic Journal of Psychiatry* 64 (4), 227–232. <https://doi.org/10.3109/08039480903478680>.
- Scheier, M.F., Carver, C.S., Bridges, M.W., 1994. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology* 67 (6), 1063–1078. <https://doi.org/10.1037/0022-3514.67.6.1063>.
- Schulz, R., Beach, S.R., Hebert, R.S., Martire, L.M., Monin, J.K., Tompkins, C.A., Albert, S.M., 2009. Spousal suffering and partner's depression and cardiovascular disease: The Cardiovascular Health Study. *The American Journal of Geriatric Psychiatry* 17 (3), 246–254. <https://doi.org/10.1097/JGP.0b013e318198775b>.
- Schulz, R., McGinnis, K.A., Zhang, S., Martire, L.M., Hebert, R.S., Beach, S.R., Zdaniuk, B., Czaja, S.J., Belle, S.H., 2008. Dementia patient suffering and caregiver depression. *Alzheimer Disease and Associated Disorders* 22 (2), 170–176. <https://doi.org/10.1097/WAD.0b013e318166553c>.
- Shultz, J.M., Perlin, A., Saltzman, R.G., Espinel, Z., Galea, S., 2020. Pandemic March: 2019 coronavirus disease's first wave circumnavigates the globe. *Disaster Medicine and Public Health Preparedness* 14 (5), e28–e32. <https://doi.org/10.1017/dmp.2020.103>.
- Smith, B.W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., Bernard, J., 2008. The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine* 15 (3), 194–200. <https://doi.org/10.1080/10705500802222972>.
- 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>.
- 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. <https://doi.org/10.1001/archinte.166.10.1092>.
- Tate, T., Pearlman, R., 2019. What we mean when we talk about suffering—and why Eric Cassell should not have the last word. *Perspectives in Biology and Medicine* 62 (1), 95–110. <https://doi.org/10.1353/pbm.2019.0005>.
- Twenge, J.M., Joiner, T.E., 2020. Mental distress among U.S. adults during the COVID-19 pandemic. *Journal of Clinical Psychology* 76 (12), 2170–2182. <https://doi.org/10.1002/jclp.23064>.
- Van Tongeren, D.R., Aten, J.D., McElroy, S., Davis, D.E., Shannonhouse, L., Davis, E.B., Hook, J.N., 2019. Development and validation of a measure of spiritual fortitude. *Psychological Trauma: Theory, Research, Practice, and Policy* 11 (6), 588–596. <https://doi.org/10.1037/tra0000449>.
- VanderWeele, T.J., 2019a. Suffering and response: Directions in empirical research. *Social Science & Medicine* 224, 58–66. <https://doi.org/10.1016/j.socscimed.2019.01.041>.
- VanderWeele, T.J., 2019b. Principles of confounder selection. *European Journal of Epidemiology* 34, 211–219. <https://doi.org/10.1007/s10654-019-00494-6>.
- VanderWeele, T.J., Ding, P., 2017. Sensitivity analysis in observational research: Introducing the E-Value. *Annals of Internal Medicine* 167 (4), 268–274. <https://doi.org/10.7326/M16-2607>.
- VanderWeele, T.J., Fulks, J., Plake, J.F., Lee, M.T., 2021. National well-being measures before and during the COVID-19 pandemic in online samples. *Journal of General Internal Medicine* 36 (1), 248–250. <https://doi.org/10.1007/s11606-020-06274-3>.
- VanderWeele, T.J., Mathur, M.B., Chen, Y., 2020. Outcome-wide longitudinal designs for causal inference: A new template for empirical studies. *Statistical Science* 35, 437–466. <https://doi.org/10.1214/19-STS728>.
- Wakam, G.K., Montgomery, J.R., Biesterveld, B.E., Brown, C.S., 2020. Not dying alone—modern compassionate care in the Covid-19 pandemic. *New England Journal of Medicine* 382 (24), e88. <https://doi.org/10.1056/NEJMp2007781>.
- Wilson, K.G., Chochinov, H.M., McPherson, C.J., LeMay, K., Allard, P., Chary, S., Gagnon, P.R., Macmillan, K., De Luca, M., O'Shea, F., Kuhl, D., Fainsinger, R.L., 2007. Suffering with advanced cancer. *Journal of Clinical Oncology* 25 (13), 1691–1697. <https://doi.org/10.1200/JCO.2006.08.6801>.
- Worthington Jr., E.L., Wade, N.G., Hight, T.L., Ripley, J.S., McCullough, M.E., Berry, J.W., Schmitt, M.M., Berry, J.T., Bursley, K.H., O'Connor, L., 2003. The Religious Commitment Inventory-10: Development, refinement, and validation of a brief scale for research and counseling. *Journal of Counseling Psychology* 50 (1), 84–96. <https://doi.org/10.1037/0022-0167.50.1.84>.
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L., 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>.