

Health-related quality of life among US young adults during the COVID-19 pandemic: Psychiatric symptoms and emotional experiences to target within clinical practice

Cindy H. Liu, PhD
Emily Zhang, MA
Sunah Hyun, PhD
Ga Tin Finneas Wong, BA
Hyeouk "Chris" Hahm, PhD, LCSW

BACKGROUND: The current study aimed to determine the role of psychological experiences during the COVID-19 pandemic (depression, anxiety, loneliness, and COVID-19-related grief and worry) on young adult physical and mental health functioning as measured by health-related quality of life (HRQoL).

METHODS: Using hierarchical multiple regression analyses, this cross-sectional study examined psychological predictors of physical and mental health functioning among young adults (age 18 to 30 years) from April 13 to September 5, 2020.

RESULTS: Pre-existing depression diagnoses ($\beta = -0.124$, $P < .001$), current depression symptoms ($\beta = -0.298$, $P < .001$), and COVID-19-related worry ($\beta = -0.142$, $P < .001$) significantly predicted poorer physical health functioning. Current depression and anxiety symptoms ($\beta = -0.342$ and $\beta = -0.268$), loneliness ($\beta = -0.135$), and COVID-19-related grief ($\beta = -0.180$) predicted lower self-reported mental health functioning ($P < .001$). Black ($\beta = -0.072$) and Hispanic/Latinx participants ($\beta = -0.082$) were more likely to indicate poorer physical health functioning ($P < .01$) relative to White participants, whereas women reported poorer mental health relative to men ($\beta = -0.047$, $P < .05$).

CONCLUSIONS: This study identifies potential negative impacts of pandemic-related psychological experiences for young adults' health during the COVID-19 pandemic. There is a need to consider mental health symptomatology, COVID-19-related experiences, race, and gender when designing efforts to address long-term implications on health.

CORRESPONDENCE

Cindy H. Liu, PhD
Department of Newborn Medicine
Department of Psychiatry
Brigham and Women's Hospital
221 Longwood Ave BLI 341
Boston, MA 02115 USA

EMAIL

chliu@bwh.harvard.edu



INTRODUCTION

The wide-scale efforts in managing the COVID-19 pandemic, including stay-at-home or shelter-in-place orders, have dramatically changed the lives of millions of individuals worldwide. In the United States, young adults between age 18 to 30 years (often referred to as Millennials or Generation Z) will comprise the majority of the US workforce in the next decade.¹ A major concern is the impact of current psychological experiences on the quality of life among young adults, as it may have consequences for their later functioning.

Quality of life (QoL), as defined by the World Health Organization, pertains to one's subjective appraisal of their present life situation,² with health-related quality of life (HRQoL) referring to their assessment of physical and mental functioning. In contrast to biological markers of health (eg, blood pressure or glucose levels), HRQoL is characterized by one's perception of their ability to function and can serve as a metric for individual well-being; at a population level, HRQoL can represent the burden of preventable health concerns. Although there is little doubt that the COVID-19 pandemic has produced psychological distress in many Americans, it is critical to determine the extent to which psychological experiences that occur during the pandemic are associated with HRQoL.

The adverse effects of mental health symptoms on HRQoL are well established, as such symptoms can affect one's perceived ability to function mentally.³⁻⁷ Depression has been associated with decreased HRQoL among the general population³ and among primary care patients.⁴ Anxiety has also been shown to be related to lower HRQoL.⁵ Likewise, loneliness, or undesired feelings and thoughts involved in social isolation or disconnection,^{8,9} is without a doubt an issue given the need to engage in physical distancing during the pandemic. Loneliness is a well-established predictor of physical health problems, such as high systolic blood pressure and cardiovascular conditions,^{10,11} as well as of mental health problems such as depression and anxiety.¹²⁻¹⁴ It is therefore no surprise that higher loneliness has been shown to be related to low levels of self-reported HRQoL.^{6,7} The symptoms that characterize depression and anxiety and the experience of loneliness are prominent features in the psychological experiences among individuals during a pandemic^{15,16} and may likely inform reported HRQoL.

Moreover, HRQoL may be impacted by worries and grief that pertain specifically to the COVID-19 pandemic.

During the pandemic, most individuals likely experienced major changes in their daily routines, leading to worries about fulfilling basic needs, such as obtaining groceries and preventive supplies (eg, face masks, hand sanitizer) during lockdowns, receiving treatment or testing for COVID-19, or maintaining employment during the subsequent economic downturn.¹⁷ There may be greater uncertainty about how to connect with others or how to maintain current school or work responsibilities. Many young adults have had to transition to remote school or work, and many have lost employment.¹⁸ Not only have routines been changed, but major life milestones have been either canceled, postponed, or drastically altered (eg, graduations, weddings, funerals).¹⁹ Worry and grief due to uncertainty, instability, and loss of routine during the COVID-19 pandemic lockdowns are likely burdens that impact one's ability to function optimally.²⁰

The purpose of the current study is to examine the extent to which these psychological experiences, which took place during the first several months of the COVID-19 pandemic, may have played a role in functioning. The data used for this study are drawn from the CARES Project (COVID-19 Adult Resilience Experiences Study) which assesses the health and well-being of young adults. For this present cross-sectional analysis, we focus on the impact of the psychological experiences, specifically depression and anxiety symptoms, loneliness, and COVID-19-related grief and worry, and their association on HRQoL among young adults in the United States. The age between 18 and 30 years is a conventional period for the study of young adulthood within medicine,²¹⁻²³ and encompasses individuals within the "emerging adulthood" (age 18 to 25 years), an important developmental time point for understanding independence.²⁴ Specifically, young adults between age 18 and 30 years may be transitioning into independence from their immediate families; they may be entering or leaving college or graduate school, developing new relationships, or starting families. The major life milestones that take place during this period, and the disruption of such milestones due to the pandemic, are believed to have implications for their HRQoL.

METHODS

Procedure

Using data from Wave 1 of the CARES Project (April 13 to September 5, 2020), this cross-sectional study examined

depression and anxiety symptoms during the pandemic, as well as loneliness and COVID-19-related grief and worry, in relation to perceived physical and mental health functioning. Wave 1 data collection started approximately 1 month after the United States declared a state of emergency due to the COVID-19 pandemic. This wave included young adults age 18 to 30 years living in the United States or receiving education from a US institution. Participants, who were recruited through social media, email listservs, and word of mouth, were asked to use an anonymous link to complete a 30-minute online survey regarding COVID-19 experiences, psychosocial factors, and physical and mental health outcomes. Before the commencement of any survey data collection, potential participants were provided an opportunity to review the informed consent of the study, which covered the study's overview, procedures, risks, benefits, participant rights, and study team contact information. Consent was obtained by participants selecting the statement "I agree to participate in the study" at the end of the informed consent.

One of every 10 participants received a \$25 gift card. To ensure data quality, the online survey embedded various attention checks and human verification. This study was approved by the Institutional Review Board at Boston University.

Participants

In the current analysis, 1,310 young adults ranging from age 18 to 30 years (mean: 24.08 years) were included. The current sample included 14.6% men, 81.5% women, and 4.0% self-identified gender. The sample was 60.5% White, 21.1% Asian, 4.7% Black, 6.0% Hispanic/Latinx, 6.1% mixed race, and 1.5% of another race (including American Indian/Native American participants). Approximately 13.1% were non-US-born, 68.5% were students, and 64.0% were employed. Of the 85.4% of participants who reported receiving income in the past year, 70.0% of the participants reported a yearly income <\$50,000.

Measures

Risk and protective factors

Diagnosed depression and anxiety. Participants were asked to indicate previous depression and anxiety diagnoses with responses including "No"; "Suspected, but not diagnosed"; "Yes, diagnosed but not treated"; and "Yes, diagnosed and treated." Two binary variables, one for a pre-existing depression diagnosis and another for a pre-existing anxiety diagnosis, were created by collapsing "Suspected,

but not diagnosed" with "No," and other options into "Diagnosed" for each respective diagnosis. These 2 measures are not mutually exclusive; those who were diagnosed with depression could also be diagnosed with anxiety.

Current depression symptoms. The Patient Health Questionnaire depression scale (PHQ-8) was administered to assess the frequency of depressive symptoms in the past 2 weeks.²⁵ Participants were asked to rate their depressive symptoms on a scale of 0 to 3, with 0 = not at all to 3 = nearly every day.

Loneliness. The adapted 3-item version of the UCLA Loneliness Scale Short Form was administered to assess the frequency of loneliness in the past 2 weeks.²⁶ Participants rated lack of companionship, feelings of being left out, and isolation from others on a scale of 1 to 3, with 1 = hardly ever, 2 = some of the time, and 3 = often.

Current anxiety symptoms. Anxiety was assessed through the widely-used Generalized Anxiety Disorder-7 Scale (GAD-7).²⁷ Participants indicated frequency of anxiety symptoms in the past 2 weeks on a 4-point scale, with 0 = not at all and 3 = nearly every day.

COVID-19-related worry. A 6-item measure was used to assess the severity of COVID-19 pandemic-related worry. This measure was designed for this particular study, given the emergence of new concerns specific to the COVID-19 pandemic. Participants indicated their level of worry on a scale of 1 to 5, with 1 = not worried at all and 5 = very worried, for items such as being able to obtain groceries, obtaining a test or treatment for COVID-19, keeping in touch with loved ones under social distancing guidelines, and maintaining employment and financial stability. Cronbach's alpha for measure items was .70, indicating good reliability. Previous published work has demonstrated an association between higher levels of worry and greater severity of mental health symptoms.¹⁵

COVID-19-related grief. We also developed a new 6-item measure to assess feelings of grief and loss during the COVID-19 pandemic, such as missing out on significant life events, losing touch with loved ones, losing tangible resources, and sentiments such as feeling stunned or dazed, or feeling bitter over loss in daily routines and activities.²⁸ As with the COVID-19-related worry scale, this scale was developed to understand the losses due to the COVID-19 pandemic that could be overlooked by other measures that were not specifically developed for the pandemic. We also included several items adapted from the Inventory of Complicated Grief²⁹ to assess emotional experiences that reflect grief (eg, "I feel stunned or dazed over what

happened,” “I feel that life is empty”). Participants indicated the extent to which they agreed with the following statements on a scale of 1 to 5, with 1 = strongly disagree and 5 = strongly agree. Cronbach’s alpha for measure items was 0.76, indicating good reliability.

Outcomes

Physical and mental health functioning. Health-related quality of life was assessed using the 12-item Short Form Health Survey (SF-12).³⁰ The SF-12 is one of the most widely used self-report measures for assessing quality of life for the general and patient population. Summary scores for physical health and mental health functioning are provided through the SF-12 with a mean set at 50 and a standard deviation (SD) set at 10. Higher scores reflect better HRQoL. The internal consistency is difficult to obtain for the SF-12 because of varying answer formats and complicated scoring; however, internal consistency of the Medical Outcomes Study SF-36 from which the SF-12 is drawn has been demonstrated to be high (Cronbach’s alpha $\geq .80$).

Data analytic plan

Two hierarchical multiple regression analyses were performed using SPSS 26.0 to identify potential risk factors for physical and mental health functioning. Covariates included respondent age, race, gender, and income. Additionally, the pandemic length, as defined by the number of days between the date when COVID-19 was declared as a pandemic (March 13, 2020) and the survey administration, was included as a covariate given the possible correlation between the date of the survey administration and the outcome measures. For each regression model, the following details were entered:

Step 1: covariates (age, race, gender, income, pandemic length),

Step 2: depression and anxiety diagnoses, and

Step 3: current depression and anxiety symptoms, COVID-19-related grief, COVID-19-related worry, and loneliness.

29.8% indicated a pre-existing depression diagnosis and 27.3% indicated a pre-existing anxiety diagnosis. On average, participants scored a mean of 8.94 (SD = 5.63) on current depression symptoms as measured by the PHQ-8 and a score of 9.19 (SD = 5.57) on current anxiety symptoms as measured by the GAD-7. COVID-19-related worry and grief symptoms ranged from total possible scores of 6 to 30 with a mean of 15.49 (SD = 5.30) and 19.28 (SD = 4.65), respectively. Participants also indicated feelings of loneliness, with a mean score of 6.10 (SD = 1.87).

TABLE 2 and **TABLE 3** present results from a series of hierarchical regression models to determine the effect of depression, anxiety, COVID-19-related grief and worry, and loneliness on physical and mental health functioning using the SF-12. **TABLE 2** presents results for physical health functioning. The overall model was significant ($F [20, 1,289] = 17.42, P < .001$), accounting for 21.3% of the variance in physical health functioning when controlling for pre-existing depression and anxiety diagnoses (R^2). Black (beta = -0.072) and Hispanic/Latinx participants (beta = -0.082) were more likely to indicate poorer physical health functioning ($P < .01$) relative to White participants. After controlling for sociodemographic characteristics, pre-existing depression was significant in the overall model (beta = $-0.124, P < .001$), whereas pre-existing anxiety was marginally significant (beta = $-0.063, P < .1$), predicting poorer physical health functioning. Current depression symptoms (beta = $-0.298, P < .001$) and COVID-19-related worry (beta = $-0.142, P < .001$) significantly predicted poorer physical health functioning above and beyond pre-existing depression and anxiety diagnoses.

TABLE 3 presents the results for mental health functioning. The overall model was significant ($F [20, 1,289] = 107.44, P < .001$), accounting for 62.5% of the model variance. Older individuals and women (relative to men) reported lower mental health functioning (age: beta = $-0.049, P < .05$; women: $-0.047, P < .05$). A pre-existing depression diagnosis (beta = $-0.043, P = .1$) was marginally significant in predicting poorer mental health functioning. While controlling for all other factors including pre-existing depression and anxiety diagnoses, current depression symptoms (beta = -0.342), current anxiety symptoms (beta = -0.268), COVID-19-related grief (beta = -0.180), and loneliness (beta = -0.135) significantly predicted poorer mental health functioning at the $P < .001$ level.

RESULTS

The demographic characteristics and descriptive data of key variables are presented in **TABLE 1**. Of the sample,

TABLE 1
Demographic characteristics and variables
from Wave I of CARES Project (N = 1,310)

Characteristic/variable	Mean (range) or %
Age (years)	24.08 (18.02 to 30.08)
Gender	
Men	14.6%
Women	81.5%
Other	4.0%
Race	
Asian	21.1%
Black	4.7%
Hispanic or Latinx	6.0%
White	60.5%
Mixed	6.1%
Other race	1.5%
US-born	
Yes	86.9%
No	13.1%
Employed	
Yes	64.0%
No	36.0%
Individual income (USD/year)	
No income	14.6%
≤\$25,000	48.9%
\$25,000-\$49,999	21.1%
\$50,000-\$74,999	9.2%
≥\$75,000	6.3%
Student	
Yes	31.5%
No	68.5%
Depression diagnosis	29.8%
Anxiety diagnosis	27.3%
Current depression symptoms (PHQ-8)	8.94 (0 to 24.00)
Current anxiety symptoms (GAD-7)	9.19 (0 to 21.00)
COVID-19–related worry	15.49 (6.00 to 30.00)
COVID-19–related grief	19.28 (6.00 to 30.00)
Loneliness	6.10 (3.00 to 9.00)
SF-12 physical health	87.2 (30 to 100)
SF-12 mental health	57.5 (22 to 96)

GAD-7: Generalized Anxiety Disorder-7 scale; PHQ-8: Patient Health Questionnaire depression scale; SF-12: 12-item Short Form Health Survey.

the first 2 months following the designation of COVID-19 as a pandemic. Considering that SF-12 scores are standardized to population norms with the mean set at 50, the young adults in our sample were above average in their health, with summary scores of 87.2 for physical and 57.5 for mental health, with the difference in scores indicating poorer mental health relative to physical health.

As expected, those who reported having pre-existing diagnoses of depression and anxiety had lower perceived functioning, and this was statistically significant ($P < .05$) only for physical functioning. Research examining young adults has demonstrated that those with depression tended to endorse poorer cognitive and physical functioning.³¹⁻³⁴ It is also possible that those in our sample with a pre-existing mental health condition rely on physical activity to cope; the need to quarantine or shelter-in-place during the pandemic may have also interfered with normal routines for exercise, thus affecting their physical functioning.

We found that the depressive symptoms taking place during the pandemic were associated with both poorer physical and mental health functioning, above and beyond any effects due to pre-existing depression and anxiety diagnoses. This is consistent with prior literature showing depressive symptoms to be a robust major predictor for health outcomes, such as cardiovascular disease,³⁵ obesity,³⁶ and physical health functioning.³¹⁻³⁴ Our work contributes to the literature by showing that individuals who experienced depressive symptoms occurring during the pandemic—regardless of having a pre-existing diagnosis of depression or anxiety—reported more difficulty with both their physical and mental health functioning.

However, in addition to depressive symptoms, COVID-19–related worry emerged as a significant predictor of poorer physical functioning. In addition to depressive symptoms, COVID-19–related worry appeared to be associated with poorer physical health functioning. This may be because the worries that were assessed focused on concerns related to physical survival. Items such as being able to obtain enough groceries, getting treatment for COVID-19, and having enough money to pay rent and basic necessities suggest that the concern about survival may be debilitating physically. This finding, coupled with the reliability of items within this measure, provides additional evidence of the utility of this 6-item COVID-19–related worry scale in determining health related outcomes.

DISCUSSION

The objective of this cross-sectional study was to examine the psychological experiences among young adults in the United States and their associations with HRQoL during

TABLE 2

Multiple regression analyses predicting physical health functioning from the SF-12 based on mental health diagnoses, symptoms, COVID-19–related grief and worry, and loneliness (N = 1,310)

Blocks of variables entered in 3 steps	Change in physical health associated with each variable		Percent variance explained by each block
	Unstandardized coefficients	Standardized coefficients	
	Beta	SE	Beta
1. Sociodemographic characteristics			0.035^c
Age	–0.001	0.001	–0.021
Race (reference = White)			
Asian	0.00	0.008	0.001
Black	–0.040	0.014	–0.072 ^b
Hispanic or Latinx	–0.040	0.012	–0.082 ^b
Mixed	–0.007	0.012	–0.015
Other race	–0.003	0.024	–0.003
Gender (reference = man)			
Woman	0.010	0.008	0.034
Other	–0.007	0.017	–0.012
Income USD/year (reference = no income)			
≤\$25,000	–0.001	0.009	–0.004
\$25,000 to \$49,999	0.018	0.011	0.062
\$50,000 to \$74,999	0.014	0.014	0.033
≥\$75,000	0.003	0.015	0.007
Pandemic duration	0.000	0.000	–0.025
2. Pre-existing mental health diagnosis			0.071^c
Depression diagnosis	–0.032	0.008	–0.124 ^c
Anxiety diagnosis	–0.016	0.009	–0.063 ^a
3. Social and emotional factors during COVID-19 pandemic			0.107^c
Depression symptoms	–0.006	0.001	–0.298 ^c
Anxiety symptoms	0.001	0.001	0.035
COVID-19–related worry	–0.003	0.001	–0.142 ^c
COVID-19–related grief	0.000	0.001	0.008
Loneliness	–0.001	0.002	–0.012

^aP < .1^bP < .01^cP < .001

SF-12: 12-item Short Form Health Survey; SD: standard deviation.

Furthermore, depressive and anxiety symptoms, COVID-19–related grief, and loneliness were associated with poorer mental health functioning. Depressive and anxiety symptoms as well as loneliness during the pandemic are likely to affect one's mental functioning, such as concentration, attention, and executive functioning. Such symptoms impede one's ability to think or work as productively as they regularly would. Further, impaired sleep among those with higher levels of depression and

anxiety,^{37,38} or greater feelings of loneliness or grief,^{39,40} can affect one's ability to function optimally. Notably, we found that COVID-19–related grief was associated with one's perception of mental health functioning. Our measure assesses experiences related to loss of meaningful or important experiences due to the pandemic. Significant loss in these experiences, including routines and resources, likely reflect reduced capacity in achieving the ideal, which in turn may lead to lower levels of mental functioning.

TABLE 3

Multiple regression analyses predicting mental health functioning from the SF-12 based on mental health diagnoses, symptoms, COVID-19–related grief and worry, and loneliness (N = 1,310)

Blocks of variables entered in 3 steps	Change in mental health associated with each variable			Percent variance explained by each block
	Unstandardized coefficients		Standardized coefficients	
	Beta	SE	Beta	
1. Sociodemographic characteristics				0.068^c
Age	−0.002	0.001	−0.049 ^b	
Race (reference = White)				
Asian	−0.004	0.006	−0.012	
Black	−0.006	0.012	−0.009	
Hispanic or Latinx	−0.016	0.010	−0.027	
Mixed	0.006	0.010	0.011	
Other	−0.001	0.019	−0.001	
Gender (reference = man)				
Woman	−0.017	0.007	−0.047 ^b	
Other	−0.020	0.014	−0.028	
Income USD/year (reference = no income)				
≤\$25,000	−0.005	0.007	−0.018	
\$25,000 to \$49,999	−0.002	0.009	−0.005	
\$50,000 to \$74,999	0.008	0.011	0.017	
≥\$75,000	0.011	0.012	0.019	
Pandemic duration	0.000	0.000	0.011	
2. Mental health diagnosis				0.083^c
Depression diagnosis	−0.013	0.007	−0.043 ^a	
Anxiety diagnosis	−0.008	0.007	−0.025	
3. Social and emotional factors during COVID-19 pandemic				0.474^c
Depression symptoms	−0.008	0.001	−0.342 ^c	
Anxiety symptoms	−0.007	0.001	−0.268 ^c	
COVID-19–related worry	0.000	0.001	−0.019	
COVID-19–related grief	−0.005	0.001	−0.180 ^c	
Loneliness	−0.010	0.002	−0.135 ^c	

^aP < .1^bP < .05^cP < .001

SF-12: 12-item Short Form Health Survey; SD: standard deviation.

Taken together, it is notable that the experiences tied to the specific features of the pandemic, and not just the experience of depressive and anxiety symptoms during the pandemic, are associated with HRQoL. For instance, the items measuring COVID-19–related grief and worry capture areas of concern during this pandemic. That is, the content of one's worries, as well as the particular losses of lifestyle and routine due to the pandemic, appears to be associated with poorer HRQoL. As well, loneliness is both a relevant and prevalent experience among young adults during the pandemic with lockdowns or

stay-at-home directives.¹⁶ Loneliness—having a sense of isolation, loss of companionship, or feelings of being left out—due to the pandemic has been a sudden experience for many, and may be particularly challenging for young adults, including college students.⁴¹ Overall, these new experiences specifically tied to the pandemic seem to be uniquely associated with one's perceived mental health functioning, over and beyond symptoms of depression and anxiety.

Our study also yielded racial and gender differences, with Black and Hispanic/Latinx individuals reporting

poorer physical health (but not mental health) than White individuals and women reporting poorer mental health than men. This is consistent with past research on physical health disparities by race that demonstrates how Black and Hispanic/Latinx communities show poorer health outcomes due to a number of social determinants, such as neighborhood conditions, socioeconomic status, and early childhood education.⁴²⁻⁴⁴ In addition, past research has indicated higher rates of depression among women compared with men.⁴⁵ Our current findings continue to highlight similar disparities among racial/ethnic and gender minorities with respect to HRQoL as an outcome.

Limitations

This study has several limitations that need to be taken into consideration. First, the generalizability of the present study results is constrained because we utilized convenience sampling during the pandemic, with no pre-pandemic data for comparison. Our study design also lacks a comparison group; ideally, we would include a group unexposed to the pandemic conditions. Thus, it is possible that within our population, depression and anxiety levels may not have changed during the pandemic. In addition, although the current study yielded some racial and gender differences, a large portion of our sample was White, and our participants were predominantly women. We surmise that sampling bias occurred through our recruitment approach, with the social networks and listservs that were used to be predominantly comprised of women, and/or that women were more likely to be interested in taking part in this study. As such, these findings may not be valid beyond our sample characteristics. Future work is necessary to understand whether the associations that we observed with HRQoL outcomes are similarly found in individuals from racial/ethnic minority groups and men. Second, the data were obtained solely through young adults' self-report, which may cause our results to be biased. Third, the cross-sectional nature of this study limits the ability to establish cause-and-effect relationships among our predictor variables. A longitudinal design would strengthen our confidence in the direction of these associations. Any future

waves of data collection that can be added to this dataset will allow us to better approximate causality, as well as adjust for additional confounds.

CONCLUSIONS

Despite the limitations, our findings help to identify and prioritize intervention targets that may mitigate potential impairments to HRQoL. Based on our findings, there are several psychiatric symptoms and emotional experiences connected with the COVID-19 pandemic that may be suitable targets for clinical practice. Our study confirmed that individuals with pre-existing depression are at higher risk for poorer functioning overall, and thus considering one's psychiatric history when addressing HRQoL is imperative at this time. However, it should be noted that having depression or anxiety symptoms during the pandemic appears to be a risk for poorer functioning overall, even among those without a pre-existing mental health condition. As such, screening for current depression and anxiety symptomatology continues to be relevant during the pandemic. Finally, individuals who endorse higher levels of COVID-19-related worries may be at risk for poorer physical health, and those who endorse higher COVID-19-related grief and loneliness may be at risk for poorer mental health. Regardless of a patient's psychiatric history and current symptom experiences, clinicians might consider inquiring about feelings of grief and worry that have arisen specifically from the COVID-19 pandemic, because also addressing these experiences may be needed to improve HRQoL now and in the future. ■

ACKNOWLEDGMENTS: Support for this manuscript was provided through the National Science Foundation (2027553) award (to CHL and HCH), a Mary A. Tynan Faculty Fellowship and a NIMH K23 MH 107714-01 A1 award (to CHL), and a T32 MH 16259-39 award (to SH).

DISCLOSURES: The authors report no financial relationships with any companies whose products are mentioned in this article, or with manufacturers of competing products.

REFERENCES

1. Gilchrist K. How millennials and Gen Z are reshaping the future of the workforce. CNBC. Published March 5, 2019. Accessed June 8, 2021. <https://www.cnbc.com/2019/03/05/how-millennials-and-gen-z-are-reshaping-the-future-of-the-workforce.html>
2. WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med*. 1995;41:1403-1409.
3. ten Doesschate MC, Koeter MWJ, Bockting CLH, et al. Health related quality of life in recurrent depression: a comparison with a general population sample. *J Affect Disord*. 2010;120:126-132.
4. Riihimäki K, Sintonen H, Vuorilehto M, et al. Health-related quality of life of primary care patients with depressive disorders. *Eur Psychiatry*. 2016;37:28-34.

5. Saarni SI, Suvisaari J, Sintonen H, et al. Impact of psychiatric disorders on health-related quality of life: general population survey. *Br J Psychiatry*. 2007;190:326-332.
6. Richard A, Rohrmann S, Vandeleur CL, et al. Loneliness is adversely associated with physical and mental health and lifestyle factors: results from a Swiss national survey. *PLoS One*. 2017;12:e0181442. doi: 10.1371/journal.pone.0181442
7. Shankar A, McMunn A, Demakakos P, et al. Social isolation and loneliness: prospective associations with functional status in older adults. *Health Psychol*. 2017;36:179-187.
8. Perlman D, Peplau LA. Theoretical approaches to loneliness. *Loneliness: a sourcebook of current theory, research, and therapy*. Wiley;1982:123-134.
9. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *J Pers Soc Psychol*. 1980;39:472-480.
10. Hawkey LC, Cacioppo JT. Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Ann Behav Med*. 2010;40:218-227.
11. Hegeman A, Schutter N, Comijs H, et al. Loneliness and cardiovascular disease and the role of late-life depression. *Int J Geriatr Psychiatry*. 2018;33:e65-e72. doi: 10.1002/gps.4716
12. Alpass FM, Neville S. Loneliness, health and depression in older males. *Aging Ment Health*. 2003;7:212-216.
13. Hagerty BM, Williams A. The effects of sense of belonging, social support, conflict, and loneliness on depression. *Nurs Res*. 1999;48:215-219.
14. Lim MH, Rodebaugh TL, Zyphur MJ, et al. Loneliness over time: the crucial role of social anxiety. *J Abnorm Psychol*. 2016;125:620.
15. Liu CH, Zhang E, Wong GTF, et al. Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: clinical implications for U.S. young adult mental health. *Psychiatry Res*. 2020;113172. doi.org/10.1016/j.psychres.2020.113172
16. Li LZ, Wang S. Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Res*. 2020;291:113267. doi: 10.1016/j.psychres.2020.113267
17. Haleem A, Javaid M, Vaishya R. Effects of COVID 19 pandemic in daily life. *Curr Med Res Pract*. 2020;10:78-79.
18. Conrad R, Rayala H, Menon M, et al. Universities' response to supporting mental health of college students during the COVID-19 pandemic. *Psychiatr Times*. Published March 23, 2020. Accessed June 8, 2021. <https://www.psychiatristimes.com/view/universities-response-supporting-mental-health-college-students-during-covid-19-pandemic>
19. Hess A. How the class of 2020 became the class of COVID-19. *CNBC*. Published April 2, 2020. Accessed June 8, 2021. <https://www.cnn.com/2020/04/02/how-the-class-of-2020-became-the-class-of-covid-19.html>
20. Weir K. Grief and COVID-19: saying goodbye in the age of physical distancing. *American Psychological Association*. Published April 6, 2020. Accessed June 8, 2021. <https://www.apa.org/topics/covid-19/grief-distance>
21. Biener L, Albers AB. Young adults: vulnerable new targets of tobacco marketing. *Am J Public Health*. 2004;94:326-330.
22. Apostol GG, Jacobs DR Jr, Tsai AW, et al. Early life factors contribute to the decrease in lung function between ages 18 and 40: the Coronary Artery Risk Development in Young Adults study. *Am J Respir Crit Care Med*. 2002;166:166-172.
23. Larcombe I, Mott M, Hunt L. Lifestyle behaviours of young adult survivors of childhood cancer. *Br J Cancer*. 2002;87:1204-1209.
24. Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. *Am Psychol*. 2000;55:469.
25. Kroenke K, Strine TW, Spitzer RL, et al. The PHQ-8 as a measure of current depression in the general population. *J Affect Disord*. 2009;114:163-173.
26. Hughes ME, Waite LJ, Hawkey LC, et al. A short scale for measuring loneliness in large surveys. *Res Aging*. 2004;26:655-672.
27. Spitzer RL, Kroenke K, Williams JB, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166:1092-1097.
28. Liu CH, Stevens C, Conrad R, et al. Evidence for elevated psychiatric distress, poor sleep, and quality of life concerns during the COVID-19 pandemic among U.S. young adults with suspected and reported psychiatric diagnoses. *Psychiatry Res*. 2020;292:113345. doi: 10.1016/j.psychres.2020.113345
29. Prigerson HG, Maciejewski PK, Reynolds CF 3rd, et al. Inventory of complicated grief: a scale to measure maladaptive symptoms of loss. *Psychiatry Res*. 1995;59:65-79.
30. Ware JE, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34:220-233.
31. Ahern E, Semkova M. Cognitive functioning in the first-episode of major depressive disorder: a systematic review and meta-analysis. *Neuropsychology*. 2017;31:52.
32. Nyer M, Farabaugh A, Fehling K, et al. Relationship between sleep disturbance and depression, anxiety, and functioning in college students. *Depress Anxiety*. 2013;30:873-880.
33. Zayfert C, Dums AR, Ferguson RJ, et al. Health functioning impairments associated with posttraumatic stress disorder, anxiety disorders, and depression. *J Nerv Ment Dis*. 2002;190:233-240.
34. Gonsalvez I, Li JJ, Stevens C, et al. Preexisting depression and daytime sleepiness in women and men. *Behav Sleep Med*. 2021;1-13. doi: 10.1080/15402002.2021.1924720
35. Joynt KE, Whellan DJ, O'Connor CM. Depression and cardiovascular disease: mechanisms of interaction. *Biol Psychiatry*. 2003;54:248-261.
36. De Wit L, Luppino F, van Straten A, et al. Depression and obesity: a meta-analysis of community-based studies. *Psychiatry Res*. 2010;178:230-235.
37. Alvaro PK, Roberts RM, Harris JK. A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression. *Sleep*. 2013;36:1059-1068.
38. Hyun S, Hahn HC, Wong GTF, et al. Psychological correlates of poor sleep quality among US young adults during the COVID-19 pandemic. *Sleep Med*. 2021;78:51-56.
39. Hardison HG, Neimeyer RA, Lichstein KL. Insomnia and complicated grief symptoms in bereaved college students. *Behav Sleep Med*. 2005;3:99-111.
40. Matthews T, Danese A, Gregory AM, et al. Sleeping with one eye open: loneliness and sleep quality in young adults. *Psychol Med*. 2017;47:2177-2186.
41. Conrad RC, Koire A, Pinder-Amaker S, et al. College student mental health risks during the COVID-19 pandemic: implications of campus relocation. *J Psychiatr Res*. 2021;136:117-126.
42. Dressler WW, Oths KS, Gravlee CC. Race and ethnicity in public health research: models to explain health disparities. *Annu Rev Anthropology*. 2005;34:231-252.
43. National Center for Health Statistics. Health, United States, 2015: with special feature on racial and ethnic health disparities. Published May 2016. Accessed June 8, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK367640/>
44. Williams DR, Costa MV, Odunlami AO, et al. Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. *J Public Health Manag Pract*. 2008;14:S8-S17.
45. Kuehner C. Why is depression more common among women than among men? *Lancet Psychiatry*. 2017;4:146-158.

Cindy H. Liu, PhD

Department of Newborn Medicine
Brigham and Women's Hospital
Department of Psychiatry
Brigham and Women's Hospital
Boston, Massachusetts, USA

Emily Zhang, MA

Department of Newborn Medicine
Brigham and Women's Hospital
Boston, Massachusetts, USA

Sunah Hyun, PhD

Department of Newborn Medicine
Brigham and Women's Hospital
Boston, Massachusetts, USA

Ga Tin Finneas Wong, BA

Department of Newborn Medicine
Brigham and Women's Hospital
Boston, Massachusetts, USA

Hyeouk "Chris" Hahn, PhD, LCSW

School of Social Work
Boston University
Boston, Massachusetts, USA