Supplementary Material

List of Supplementary Material for the article

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Supplementary Table 1. Prevalence of COVID-19 exposures and their association with composite psychological distress scores

	Mean (SD) or n (%)	Multivariable association with psychological distress R^2=0.16	
		β	p
Number of hours worked on site per week	37.1 (17.9)	0.00	0.85
Number of COVID-19 patients assessed/treated	55.2 (83.9)	0.02	0.22
Redeployed to different unit during COVID-19 pandemic	948 (36.8)	0.00	0.85
Personal medical risk for COVID-19-related complications		0.14	<.001
Low	1,559 (60.4)		
Medium	734 (28.5)		
High	286 (11.1)		
Made difficult decision prioritizing COVID-19 patients	733 (28.5)	0.10	<.001
Number of coworkers infected with COVID-19	8.5 (10.4)	0.01	0.73
Know a coworker hospitalized or in ICU to treat COVID-19	792 (30.7)	0.02	0.30
Know a coworker who died from COVID-19	215 (8.3)	0.04	0.048
Not enough personal protective equipment	780 (30.3)	0.13	<.001
Not enough COVID-19 testing for staff	1,905 (74.0)	0.02	0.28
Not enough COVID-19 testing for patients	803 (31.2)	0.00	0.87
Occupational COVID-19 exposures			
Cared for patients in person who have gotten sick from the virus	2,016 (78.2)	-0.04	0.056
Cared for patients in person who have died from the virus	1,341 (52.0)	0.04	0.072
Cared for patients via telemedicine who have gotten sick from the virus	415 (16.1)	-0.07	0.004
Cared for patients via telemedicine who have died from the virus	180 (7.0)	0.03	0.23
Personal COVID-19 exposures			
Know a friend or colleague who has gotten sick from COVID-19 and required hospitalization	1,840 (71.3)	0.04	0.037
Know a friend or colleague who has died from the virus	898 (34.8)	0.01	0.69
Have a family member not living with me who has gotten sick but not required hospitalization	726 (28.2)	0.02	0.20
Have a family member not living with me who has gotten sick but required hospitalization	308 (11.9)	0.03	0.17

Have a family member who did not live with me who has died from the virus	186 (7.2)	0.00	0.88
Have a family member living with me who has gotten sick but not required hospitalization	296 (11.5)	-0.02	0.35
Have a family member living with me who has gotten sick but required hospitalization	22 (0.9)	0.01	0.61
Have a family member who lived with me who has died from the virus	6 (0.2)	0.06	<.001
I have gotten sick but did not require hospitalization	605 (23.5)	0.05	0.008
I have gotten sick and required hospitalization	7 (0.3)	0.00	0.70
I have gotten sick and required an ICU stay	1 (0)	0.03	0.081
Feel torn between desire/duty to help patients vs. loved ones	1,655 (64.2)	0.15	<.001
People with whom you reside are fearful to be near you due to possible COVID-19 exposure	1,365 (52.9)	0.12	<.001

Note. Of the 2,579 FHCWs, 1,408 (54.6%) were 18 to 34 years old, 581 (22.5%) 35 to 44, 330 (12.8%) 45 to 54, and 260 (10.1%) 55 and older; n=1,897 were female (73.6%) and 1,821 were married/partnered (70.6%). With regard to profession, n=1,082 (42.0%) were registered nurses, 541 (21.0%) house staff, 398 (15.4%) attending physicians, 394 (15.3%) physician assistants or advanced practice registered nurses, and 164 (6.4%) other (i.e., social workers, psychologists, chaplains). The median number of years in practice was 6.0 (interquartile range [IQR]=8.0); median number of hours working onsite was 37.5 (IQR=10.3); and median number of COVID-19 patients treated was 30.0 (IQR=48.0).

COVID-19-related posttraumatic stress disorder (PTSD) symptoms were assessed using a 4-item version of the PTSD Checklist for DSM-5 (α=0.85); major depressive disorder (MDD) symptoms using the Patient Health Questionnaire-8 (α=0.89), and generalized anxiety disorder (GAD) symptoms using the Generalized Anxiety Disorder-7 (α=0.91). Psychological distress scores were derived using an exploratory factor analysis with promax rotation of COVID-19-related PTSD, MDD, and GAD symptoms (eigenvalue=2.47, 82.3% cumulative variance explained; factor loadings=0.862 for COVID-19-related PTSD symptoms, 0.923 for MDD symptoms, and 0.934 for GAD symptoms).

Supplementary Table 2. Assessment of resilience-related factors

Perceived preparedness	Sum of affirmative responses to the following questions (assessed using No vs. Yes response options): 1. My work and activities before the coronavirus pandemic provided me with helpful training to perform my current clinical work 2. In my current clinical setting, I am adequately informed about my clinical duties and the role I am expected to play 3. At present, I have a good idea of how long my current level/volume of work will last. 4. I am adequate trained to perform the professional tasks required of me during this pandemic.
Work pride and meaning	Sum of responses to the following questions (Assessed on 3-point scale: Disagree, Neutral, Agree) 1. I have felt more pride than usual to be a healthcare worker 2. I have derived more meaning from my clinical work than during life as usual. 3. I have been inspired by colleagues who I consider to be role models.
Feel valued and supported at work	Sum of standardized scores on the following questions (Assessed on 4-point scale: Not at all valued, Slightly valued, Moderately valued, Very much valued): In your opinion, to what extent do you feel valued by: 1. Your immediate supervisors (team leader, service chief, etc.) 2. Hospital leadership In your opinion, what is the current level of: (Assessed on 3-point scale: Low, Medium, High): 1. Camaraderie/team spirit among your group of co-workers in your own clinical practice team or setting. 2. Support from your hospital leadership.
Positive emotions	Score on the positive affect subscale of the Positive and Negative Affect Schedule-Short Form (PANAS-SF[1]), which assesses 10 positive emotions: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active.
Perceived social support	Score on abbreviated 3-item version of the Medical Outcomes Study Social Support Scale[2] (Assessed on 5-point scale: None of the time, A little of the time, Some of the time, Most of the time, All of the time). How often is each of the following kinds of support available to you if you need it? 1. Someone to love you and make you feel wanted (i.e., emotional support) 2. Someone to help you if you were confined to bed (i.e., instrumental support) 3. Someone to give you good advice in a crisis (i.e., appraisal support)

Protective psychosocial characteristics	Factor score of the following measures:
	
	  1. Items assessing self-efficacy from the Connor-Davidson Resilience Scale-2 (CD-RISC2[3]; Responses on 5-point scale ranging from Not true at all to True nearly all the time): I am able to adapt when changes occur; I tend to bounce back after illness, injury, or other hardships.
	
	Items assessing dispositional gratitude, optimism, curiosity/exploration, purpose in life, and religiosity/spirituality (Responses on 7-point scale ranging from Strongly Disagree to Strongly Agree):
	
	  2. I have so much in life to be thankful for.[4]
	  3. In uncertain times, I usually expect the best.[5]
	  4. I frequently find myself looking for new opportunities to grow as a person (e.g., information, people, resources).[6]
	  5. I have discovered clear-cut goals and purpose in my life.[7]
	  6. In my life, I experience the presence of the Divine (i.e., God).[8]

Self-sufficient coping strategies	Count of engaging in the following coping strategies to help cope with COVID-19-related experiences (adapted from the Brief COPE[9]): planning (e.g., coming up with a strategy for what to do), active coping (e.g., taking action to make the situation better), positive reframing (e.g., looking for something positive in what happened), acceptance (e.g., accepting the reality that it happened), humor (e.g., trying to find humor in the situation), religion (e.g., praying, meditating, or finding comfort in spiritual beliefs).
Socially-oriented coping strategies	Count of engaging in the following coping strategies to help cope with COVID-19-related experiences (adapted from the Brief COPE[9]: use of emotional support (e.g., getting comfort or understanding from others), use of instrumental support (e.g., getting advice from others), venting (e.g., expressing negative feelings).
Non-engagement in avoidance coping strategies	Count of non-engaging in the following coping strategies to help cope with COVID-19-related experiences (from the Brief COPE[9]): self-distraction (e.g., turning to work or other activities to get mind off things), denial (e.g., refusing to believe that it happened), substance use (e.g., using alcohol, nicotine, or drugs to help get through it), behavioral disengagement (e.g., giving up in trying to deal with it), self-blame (e.g., blaming or criticizing myself for what happened).

References

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Supplementary Table 3. Bivariate and Multivariable Correlates of Psychological Resilience in Frontline Healthcare Workers Responding to the Spring 2020 Pandemic Surge in New York City.

	Bivariate analyses (r)	Multivariable regression model $R^2=0.23$	
		β	p
Age	0.14***	0.01	0.69
Male gender	0.13***	**0.08**	**<.001**
Married/partnered	0.12***	**0.04**	**0.049**
Attending physician vs. other professions	0.14***	**0.09**	**<.001**
Years in practice	0.14***	0.03	0.14
History of mental illness	-0.14***	-0.03	0.13
Perceived preparedness	0.16***	**0.05**	**0.009**
Work pride and meaning	0.11***	-0.04	0.067
Feel valued and supported at work	0.22***	**0.09**	**<.001**
Positive emotions	0.30***	**0.12**	**<.001**
Perceived social support	0.20***	**0.08**	**<.001**
Protective psychosocial characteristics	0.30***	**0.12**	**<.001**
Self-sufficient coping	0.26***	**0.08**	**0.047**
Socially-oriented coping	-0.09***	-0.01	0.79
Non-engagement in avoidance coping	0.23***	**0.12**	**<.001**
Currently receiving mental health treatment	-0.11***	**-0.05**	**0.024**

Note. Bolded values indicate significant correlates of psychological resilience scores in the multivariable model.

Psychological resilience scores were computed by regressing composite psychological distress scores onto measures of COVID-19-related stressors; residual scores from this model were then inverted such that higher scores reflected lower actual vs. predicted distress scores given higher levels of exposure to COVID-19-related stressors. Details regarding this approach to operationalizing psychological resilience are provided in: Amstadter AB, Myers JM, Kendler KS. Psychiatric resilience: longitudinal twin study. *Br J Psychiatry.* 2014;205(4):275-280.

Post-hoc analyses revealed that: Perceived preparedness: having a sense of how long work volume would last (β=0.05, p=0.015); Feel valued and supported at work: hospital leadership support (β=0.07, p=0.007); Positive emotions: feeling interested (β=0.14, p<.001) and enthusiastic (β=0.07, p=0.001); Perceived social support: emotional support (β=0.09, p<.001); Protective psychosocial characteristics: self-efficacy (β=0.13, p<.001), purpose in life (β=0.09, p<.001), and dispositional gratitude (β=0.05, p=0.023); Self-sufficient coping: acceptance coping (β=0.04, p=0.016); and Non-engagement in avoidance coping: non-engagement in substance use (β= 0.13, p<.001), denial (β= 0.08, p<.001), behavioral disengagement (β= 0.07, p<.001), self-distraction (β=0.05, p=0.011), and self-blame (β= 0.04, p=0.016) coping were associated with greater psychological resilience scores. See Supplemental Table 2 for full list of factors assessed.