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Are Women Less Psychologically Resilient Than Men? Background Stressors Underlying Gender Differences in Reports of Stress-Related Psychological Sequelae

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Women are often reported to be more likely than men to develop stress-related psychological sequelae (SRPS), such as symptoms of major depressive disorder (MDD), generalized anxiety disorder (GAD), and posttraumatic stress disorder (PTSD), in response to an index stressor.[1] While such trends may contribute to notions of women being "more vulnerable" and "less psychologically resilient" than men, prior work has rarely considered the role of co-occurring gender disparities in social position (eg, occupational status) and psychosocial responsibilities (eg, caretaking) that may shape gender differences in SRPS. The combination of such disparities and a traumatic event may result in women having an apparent heightened response to the index stressor relative to men and thus appearing less resilient.[2] Although resilience is most commonly defined as a trajectory of stable mental health following a severe stressor,[3] the present study examines the current level of SRPS in response to an ongoing index stressor and operationalizes resilience as having low SRPS.

In the current study, we examined how a broad range of gender disparities may account for gender differences in SRPS in a highly stressed population—frontline health care workers (FHCWs) directly responding to the COVID-19 pandemic.

Methods

A survey was emailed to a purposively selected sample of 6,026 FHCWs at Mount Sinai Hospital in New York City during the initial SARS-CoV-2 pandemic surge between April 14–May 11, 2020. Of those invited, 3,360 (55.8%) completed an anonymous survey. Participants were given response options of "female," "male," and "other identity." Given that only 8 participants responded "other identity," we were unable to meaningfully include these participants in the analyses. Of the remaining 3,352 participants, 2,579 (76.9%) reported providing direct care for patients with COVID-19 and were included in the analyses. Because the survey was introduced to participants as exploring socially constructed roles and variables, the current study elected to consider participant reports as gender identification and use the terms *women* and *men* rather than *female* and *male*.[4] The local institutional review board approved the study, and American Association for Public Opinion Research Reporting Guidelines[5] were employed.

Validated cutoff scores on the Patient Health Questionnaire-8,[6] Generalized Anxiety Disorder-7,[7] and a brief version of the PTSD Checklist for *DSM-5*[8] were used to screen for SRPS. Supplementary Table 1 describes all study measures.

χ^2 and independent-samples *t* tests compared women and men FHCWs for potential mediators in the relation between gender and probable SRPS. Path analysis then examined indirect mediators of the relationship between gender and probable SRPS.

Results

The sample consisted of relatively equal proportions of FHCWs aged < 35 years (54.6%) and ≥ 35 years (45.4%), and the majority were women (73.6%). The sample had a median 6.0 years of experience (interquartile range [IQR] = 8.0) and

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Table 1. Characteristics of Women and Men Frontline COVID-19 Health Care Workers and Indirect Mediators of Association Between Gender and Positive Screen for SRPS During the Pandemic Surge (Total Model $R^2 = 0.43$)[a]

	Descriptive Statistics			Indirect Effect[b]
	Women (n = 1,897)	Men (n = 682)	Difference Test	Estimate (SE)
Pre-pandemic factors, n (%)				
Profession (RN or APRN/PA vs other[c])	1,261 (66.5)	215 (31.5)	319.96***	0.025 (0.015)
Burnout	837 (44.3)	242 (35.6)	15.61***	0.028 (0.009)**
Mental disorder	389 (20.5)	123 (18.0)	1.92	0.009 (0.006)
Pandemic-related factors, mean (SE)				
COVID-related stressors	−0.04 (1.0)	0.11 (1.0)	3.25**	−0.004 (0.002)
Family-related concerns	0.05 (1.0)	−0.13 (1.0)	3.94***	0.024 (0.008)**
Infection-related concerns	0.04 (1.0)	−0.13 (1.0)	3.68***	0.016 (0.006)**
Work-related concerns	0.05 (1.0)	−0.13 (1.0)	3.82***	0.027 (0.007)***
Work pride and meaning	0.02 (1.0)	−0.06 (1.1)	1.77	−0.005 (0.003)
Team camaraderie	2.4 (0.7)	2.5 (0.6)	2.45*	0.002 (0.002)
Leadership support	2.0 (0.7)	2.2 (0.7)	4.72***	0.008 (0.004)

[a]Post hoc analyses revealed that the following concerns were independent indirect mediators of the association between gender and SRPS: not being able to visit/assist loved ones (estimate = 0.015, SE = 0.005, $P = .003$); effect of COVID-19 on personal relationships (estimate = 0.010, SE = 0.004, $P = .021$); effect of COVID-19 on ability to care for children/dependents (estimate = 0.009, SE = 0.004, $P = .017$); infecting patients with COVID-19 (estimate = 0.014, SE = 0.006, $P = .019$); not having enough knowledge/experience to take adequate care of COVID patients (estimate = 0.015, SE = 0.005, $P = .002$); and not being able to do enough for COVID-19 patients (estimate = 0.015, SE = 0.005, $P = .002$).
[b]Results are adjusted for age, marital status, parental status, years in practice, and supervisory role during pandemic.
[c]Includes resident/fellow, attending physician, clinical psychologists, social workers, chaplains, and clinical dietitians.
*$P < .05$ and ≥ .01.
**$P < .01$ and ≥ .001.
***$P < .001$.
Abbreviations: APRN = advanced practice registered nurse, COVID-19 = coronavirus disease 2019, PA = physician assistant, PPE = personal protective equipment, RN = registered nurse, SE = standard error, SRPS = stress-related psychological sequelae.

worked a median of 37.5 hours onsite during the pandemic surge (IQR = 10.3).

Women were more likely than men to screen positive for any SRPS (n = 802 [42.3%] vs n = 203 [29.8%], $\chi^2 = 33.02$, $P < .001$) and for all of the individual disorders that were screened: MDD (n = 553 [29.2%] vs n = 130 [19.1%]), GAD (n = 518 [27.4%] vs n = 124 [18.2%]), and PTSD (n = 467 [24.7%] vs n = 681 [19.4%]); all $\chi^2 > 7.83$, all P values < .006. Table 1 shows characteristics of FHCW women and men.

While identifying as a woman was associated with a significantly greater likelihood of SRPS (Wald $\chi^2 = 33.82$, $P = 6.0 \times 10^{-9}$; odds ratio = 1.73, 95% CI = 1.43–2.08), this direct effect of reported gender was nonsignificant after accounting for indirect effects of the presence of pre-pandemic burnout and family-, infection-, and work-related concerns during the pandemic (estimate = 0.038, SE = 0.038, $P = .31$; Table 1). Collectively, the indirect effect via these factors accounted for 77.1% of the total effect of gender in predicting probable SRPS.

Discussion

We found that gender differences in SRPS among FHCWs were explained by the presence of reported "background stressors" for women (most notably pre-pandemic burnout) as well as by the effects of the index stressor (eg, caring for children/dependents during the pandemic). These findings add to a limited body of predominantly theoretical literature calling for attention to contextual influences on gender differences in measuring stress and concepts of resilience.[2] Findings also align with socio-ecological models of health, which have deep historical roots dating back to the aftermath of World War I and burgeoning in the 1980s[9] but remain underutilized in the current stress, trauma, and resilience literature.

This study was limited by a cross-sectional design, which did not permit the usual longitudinal approach to assessing resilience or an examination of the trajectory of SRPS; use of screening instruments to assess mental health outcomes; use of sex indicators to assess gender identity; lack of insight into the experiences of gender non-binary FHCWs. Nevertheless, our findings underscore the importance of attending to gender disparities in the assessment of stress and resilience. Our results require replication examining the role of gender disparities in other stress-exposed populations and for other public health crises. The current findings are important in considering how gender disparities may affect the assessment of stress and resilience and for designing and evaluating prevention and treatment efforts that promote the mental health of FHCWs.

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important intellectual content: All authors. Statistical analysis: Pietrzak.

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Supplementary material: Available at PSYCHIATRIST.COM

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Supplementary Material

Article Title: Are Women Less Psychologically Resilient Than Men? Background Stressors Underlying Gender Differences in Reports of Stress-Related Psychological Sequelae

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List of Supplementary Material for the article

1. Table 1 Study Variables

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Supplementary Table 1. Study variables

Variables	Measurement tool	References
Major depressive disorder (MDD) symptoms	Symptoms of MDD were assessed using the *Patient Health Questionnaire-8*, an eight-item measure that assesses symptoms of MDD experienced over the previous 2 weeks. A positive screen for significant MDD symptoms was defined by a score ≥ 10, which yields comparable estimates of the prevalence of current major depressive or other depressive disorders relative to diagnostic interviews. Cronbach's α=0.89.	Shin C, Lee SH, Han KM, Yoon HK, Han C. Comparison of the Usefulness of the PHQ-8 and PHQ-9 for Screening for Major Depressive Disorder: Analysis of Psychiatric Outpatient Data. Psychiatry Investig. 2019;16(4):300-5.
Generalized anxiety (GAD) disorder symptoms	Symptoms of GAD were assessed using the *Generalized Anxiety Disorder-7*, a seven-item measure that assesses symptoms of GAD experienced over the past 2 weeks. A positive screen for significant GAD symptoms was defined by a score ≥10, which has a sensitivity of 0.89 and specificity of 0.82 in diagnosing GAD (24). Cronbach's α=0.91.	Spitzer RL, Kroenke K, Williams JB, Lowe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092-7.
COVID-19-related PTSD symptoms	Symptoms of PTSD were assessed using a 4-item PTSD-Checklist, an abbreviated version of the *PTSD-Checklist for DSM-5* (PCL-5*),* with questions modified to assess PTSD symptoms related to COVID-19 exposure (e.g., "Over the past two weeks, how often were you bothered by repeated, disturbing, and unwanted memories of your experiences related to the COVID-19 pandemic?") A positive screen for significant COVID-19-related PTSD symptoms was defined by a score ≥ 8, which showed the highest efficiency (90.4%; sensitivity=0.81, specificity=0.94) in diagnosing PTSD (21) Cronbach's α=0.85.	Geier TJ, Hunt JC, Hanson JL, Heyrman K, Larsen SE, Brasel KJ, et al. Validation of Abbreviated Four- and Eight-Item Versions of the PTSD Checklist for DSM-5 in a Traumatically Injured Sample. J Trauma Stress. 2020. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). 2013.
Demographic and occupational characteristics	Reported age, gender, relationship status, past history of mental health diagnosis (yes/no), level of perceived personal medical risk for COVID-19-related complications (high, medium, low) - Profession: Nurse Practitioner or Physician Assistant, Attending MD/DO, Resident/Fellow, Other (Social worker, chaplain, clinical dietitian, psychologist, other) - Number of years in practice: Report of number of years in clinical practice Burnout: Experience of Burnout based a rating of ≥ 4 (at least once a week) on either item of 2-item Maslach Burnout Inventory (MBI) specifically worded to ascertain the experience of burnout "before the onset of the	West CP, Dyrbye LN, Sloan JA, Shanafelt TD. Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. J Gen Intern Med. 2009;24(12):1318-1321. doi:10.1007/s11606-009-1129-z

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	COVID-19 pandemic." Together, questions measure emotional exhaustion and depersonalization with responses ranging from 0 ("Never") to 6 ("Every day").	
COVID-19-related stressors	Composite measure including the following measures: *Personal exposure sum score* Number of items endorsed on a question asking whether friends, family, colleagues, and self have been sick, required hospitalization, ICU stay, or died due to COVID-19. *COVID-19 Related Job Factors* - Number of coworkers infected: "How many of your direct co-workers would you estimate have gotten ill with suspected or confirmed COVID-19 (and been unable to work)?" - Coworker COVID-19 illness severity level: The following questions were asked and categorized. "How many of your direct co-workers have been hospitalized?" "How many of your direct co-workers have been admitted to the ICU?" "How many of your direct co-workers have passed way?" - *Patient exposure sum score:* Number of items endorsed on a question asking whether they have cared for patients who have been sick with COVID-19 or died either virtually or in person. - Number of patients with COVID-19 treated: "What is the estimated number of patients you have treated (or consulted on) with suspected or confirmed COVID-19?" - Access to enough Personal Protective Equipment (PPE) on your unit (yes/ no/ cannot assess) - Access to sufficient coronavirus testing for staff (yes/no/cannot assess) - Access to sufficient coronavirus testing for patients (yes/no/cannot assess) - Redeployed (yes/no) - Onsite hours worked (number) - Difficult decisions prioritizing patients: The following question was asked. "In the last week, have you or your team had to make a difficult decision (or decisions), involving prioritizing the health/survival of one patient over another, due to limited equipment/resources?" (yes/no)	

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Pandemic-related concerns	The following items queried worries/concerns about related to family-, infection-, and work during the pandemic surge (factor scores were computed to each domain): *Family-related concerns*: Feel torn between desire/duty to help patients vs. loved ones (family, friends, etc); Worry about how COVID-19 might affect ability to care for children/dependents; Feel that those with whom you live are fearful to be near you due to possible COVID-19 exposure at work; Worry about how COVID-19 will affect personal relationships; Worry about not being able to visit or assist loved ones who are ill or become ill with COVID-19. *Infection-related concerns*: Worry about infecting family with COVID-19; Worry about infecting patients with COVID-19; and Worry about infecting colleagues with COVID-19. *Work-related concerns*: Worry about not being able to do enough for COVID-19 patients; Worry about not having enough knowledge or experience to take adequate care of COVID-19 patients; Worry about having to make extremely difficult decisions involving prioritizing health/survival of one COVID-19 patient over another. Items beginning with "worry" were assessed using the stem: "How much do you worry about the following work-related concerns?" and a 5-point scale ranging from "Not worried at all" to "Worried nearly all of the time." The item "Feel torn between desire/duty to help patients vs. loved ones (family, friends, etc)" was assessed using the stem: "In the last week, how often have you felt torn between your desire/duty to help your patients and your desire/duty to loved ones (family, friends, etc.)?" and a 5-point scale ranging from "None of the time" to "All of the time." "Feel that those with whom you live are fearful to be near you due to possible COVID-19 exposure at work" was assessed using the stem: "In the last week, how often have you felt that those who live with you are fearful to be near you due to your possible COVID-19 exposure at work?" and a 5-point scale ranging from "None of the time" to "All of the time."	

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Work pride and meaning	Sum of standardized scores on 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.	
Work-related social support	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.	

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