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RESEARCH ARTICLE

Effects of Race, Workplace Racism, and COVID Worry on the Emotional Well-Being of Hospital-Based Nurses: A Dual Pandemic

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ABSTRACT

Persons of color in the US experience the worst COVID-related outcomes and account for the majority of COVID-19 cases and hospitalizations among healthcare workers. In a pandemic where minority populations and healthcare workers are among the hardest hit, nurses of color are undoubtedly taxed. Moreover, their workplace racism experiences represent a dual pandemic in that the effects of COVID-19 worries and workplace racism may synergize to the detriment of their emotional well-being. The purpose of this study was to examine the direct, indirect, and interactive effects of individual (race, COVID worry), interpersonal (workplace racial microaggressions), and institutional (racial climate) factors on hospital-based nurses' emotional well-being. A sample of 788 registered nurses who worked in New Jersey hospitals completed an electronic survey. Compared to White nurses, nonwhite nurses reported higher emotional distress, more negative racial climates, more racial microaggressions, and higher levels of COVID worry. Nurses' worry about getting sick from COVID and multiple racial microaggression experiences had the largest effects on the likelihood of high emotional distress. Racism variables and worry about COVID mediated indirect effects of nonwhite race on emotional distress. Racial microaggressions mediated an indirect effect of racial climate on this outcome. Nurses who were worried about getting sick from COVID and experienced multiple microaggressions and/or the most negative racial climates had severe emotional distress. There is a need for sustained investment in a racially diverse nursing workforce. Mitigating workplace racism in hospitals is crucial, particularly during public health crises that disproportionately threaten minority populations and healthcare workers.

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Introduction

Nursing is the nation's largest healthcare profession,[1] and the COVID-19 pandemic has confronted nurses with unprecedented stress and emotional strains.[2–4] Many nurses are essential, frontline healthcare providers and have been at high risk for workplace exposure to COVID-19 patients. Because the virus is highly contagious, nurses have faced constant worry for themselves and their families.[5] This concern is emphasized by data revealing that, among all healthcare workers infected with COVID-19, nurses have the highest rates of infections and hospitalizations.[6–8]

Moreover, COVID-19 and race in both the US general population and the healthcare workforce are inextricably linked. Black, Hispanic, and Asian persons in the US have experienced the highest rates of COVID-19 cases, deaths, and hospitalizations compared to Whites.[9,10] Similarly, the COVID-19 pandemic has disproportionately harmed healthcare workers of color in the US.[8] Nearly one-half of all confirmed healthcare worker cases of COVID-19 and COVID-related hospitalizations and deaths have occurred among workers of color.[6,8] Even though nurses of color comprise only 28% of the US nursing workforce,[1] in a pandemic where minority populations and healthcare workers are among the hardest hit, nonwhite nurses are undoubtedly taxed and are highly vulnerable to negative effects on their mental health from trying to balance workplace COVID-19 exposure with ensuring safety for themselves and their families.[11]

The COVID-19 pandemic has occurred against the backdrop of increased global attention on experiences of racism within and outside the workplace. Racism, which encompasses organized systems within societies that cause unfair and discriminatory inequalities in power, resources, capacities, and opportunities across racial or ethnic groups, is common in the workplace.[12–20] Compared to White workers, persons of color

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are often disproportionately disadvantaged in the workplace because of pernicious types of mistreatment and racism that are manifested in the form of limited occupational opportunities and organizational climates that are intentionally or unintentionally unwelcoming to persons of color.[13–15] Research has shown that persons of color also frequently experience other types of workplace racism such as microaggressions and bias,[16–18] stereotype threat,[19] disregards for positions,[20] and institutional neglect.[20] Nurses, particularly nurses of color, are no exception to these racial biases in the workplace, yet little is known of their negative racialized experiences in acute care hospitals, a setting in which nurses are the largest occupation.[21]

The combined experiences of COVID-19-related worries and racism at institutional and interpersonal levels within acute care hospitals undoubtedly exert the greatest emotional toll on nurses of color. Workplace racism experienced by frontline nurses of color combined with their COVID worries for themselves and their families may result in a level of emotional strain that may lead to psychological withdrawal, work disengagement, and job exit.[22] Since the pandemic, there is a growing concern about an increasing exodus of nurses from the workforce. A racially diverse nursing workforce is crucial to the care of racially diverse patient populations, and understanding the potentially harmful effects of exposure to COVID-19 and racialized experiences in the workplace on nurses' emotional distress is a priority.[1,23]

Theoretical framework

Socioecological perspectives about work and health provide a basis for understanding the complex interrelationships among nurses' experiences of racism in hospital workplaces, their worries about COVID-19 exposures, and their emotional distress. Social ecology frameworks postulate that workplaces are complex systems comprised of multiple social and environmental conditions that jointly influence the physical, emotional, and social well-being of their employees.[24–29] In short, ecological perspectives focused on work and health propose multilevel, interdependent, and interactional views of the etiology of workers' health, and they illustrate multiple underlying mechanisms for the impact of multilevel systems and conditions in the workplace on employees' well-being, suggesting direct effects, indirect effects of distal levels (i.e., institutional-level factors) through more proximal levels (i.e., interpersonal-level), and interactive or moderating effects between levels and within-level conditions.[27–29]

Thus, hospitals are theorized socioecological environments disaggregated into a set of nested, interacting individual-level, interpersonal-level, and institutional-level attributes that serve as important mediators and moderators of employee health and well-being[27–31] As hospital employees, nurses are at the center of these hospital socioecological environments and are influenced by their work environments and conditions.[27–31] The theorized institutional-, interpersonal-, and individual-level socioecological determinants of nurses' emotional distress and the between- and within-level linkages examined in this study are depicted in Figure 1.

Both race and COVID worry are individual-level factors that can affect nurses' well-being and increase emotional distress.[5,27–33] Nurses, as employees, are also nested within the hospital's interpersonal system, defined as the environment in which patterns of activities, roles, and interpersonal relationships are experienced by individuals in a given setting.[30] Interpersonal racism, in the form of racial microaggressions, is an environmental condition that occurs at this level.[27,34] Nurses engage with coworkers and patients within the hospital interpersonal system, and negative, racialized nurse-coworker, and nurse-patient interpersonal exchanges, in the form of racial microaggressions, can occur within this space.[34] Microaggressions include events such as insults, slights, and discriminatory behaviors that employees, particularly persons of color, experience in their interpersonal interactions in daily life and the workplace.[34,35] These interpersonal, racialized experiences in the workplace are likely to decrease the well-being and increase the emotional distress of nurses who are targets of the offenses.[26–28,34–36]

Nurses are also nested within a larger hospital institutional-level system, described as the setting that does not involve the employee as an active participant but in which events occur that affect the employee.[30] In hospitals, institutional-level racism can manifest itself through governance, policy implementation, service delivery, recruitment, employment, and reporting that operates to privilege members of certain racial groups while unfairly subordinating members of minority racial groups.[15,35,36] Moreover, institutional racism represents the overarching, organizational-level umbrella that validates, supports, and enforces the manifestation of interpersonal racism among and between employees.[34]

Current study

There is comparatively little evidence about the direct effects of interpersonal- and institutional-level racism on the well-being of nurses in hospital settings, and there

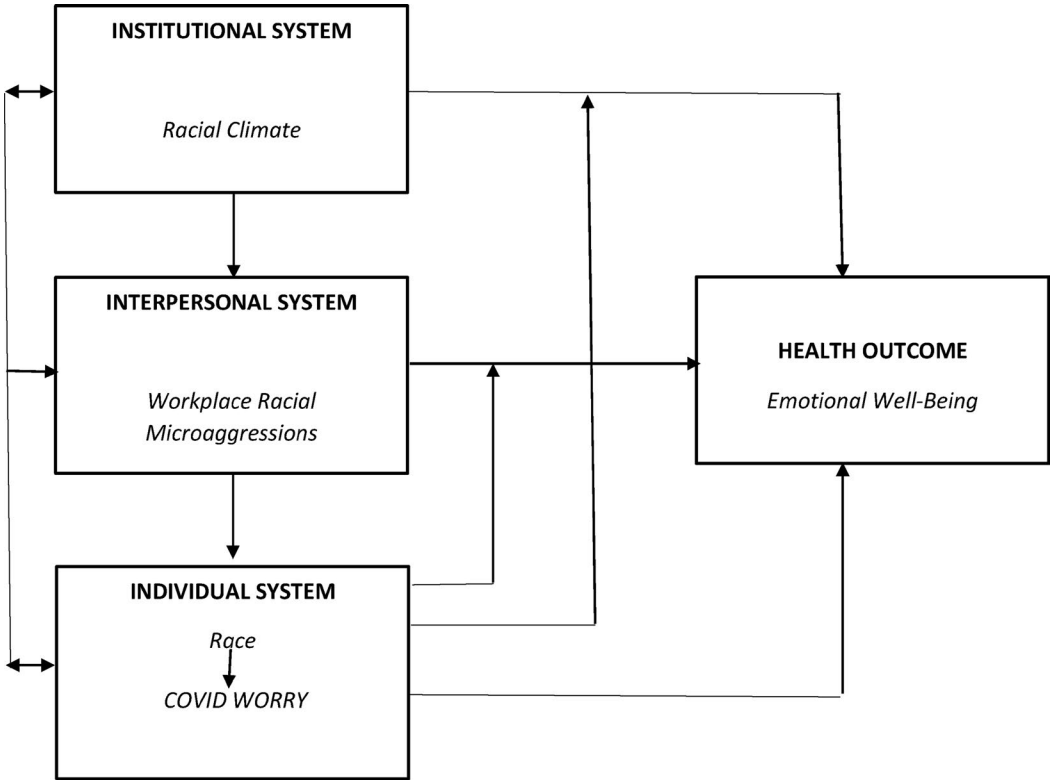

Figure 1. Simple slope analysis for moderating effects of worry about getting sick from COVID on relationship between two racism variables and likelihood of emotional distress.

has been no quantification of theorized indirect and interactive effects of racism and COVID-related affective experiences on nurses' emotional distress during the COVID pandemic. To fill this gap, hospital socioecological factors postulated to influence nurses' emotional well-being were examined, including race and COVID worry at the individual level, racial microaggression experiences at the interpersonal level, and racial climate at the institutional level. The purposes of this study were to examine (1) racial differences in nurses' level of COVID worry, perceptions of workplace racial climate, and workplace racial microaggression experiences, (2) direct effects of racial climate, racial microaggressions, race, and COVID-19 worry on nurses' emotional distress, and (3) operant pathways for indirect and interactive effects of race, workplace racial climate, workplace racial microaggression experiences, and COVID worry on nurses' emotional distress.

Methods

Design and sample

This study employed a cross-sectional, correlational survey design. Data collection was conducted between November 11, 2020, and December 2, 2020, a period of decline of COVID-related hospitalizations and deaths in New Jersey (NJ) after the initial surge in cases that began in March 2020. The targeted completion time for the survey was 15 to 20 minutes. The study was approved by the Rutgers University Institutional Review Board, Protocol # Pro2020002259, before data collection.

Eligible participants were registered nurses (RN) licensed in NJ who were currently employed, whose primary workplaces were NJ hospital inpatient or outpatient settings, and whose primary role was staff nurse, charge nurse, unit-level nurse manager, case manager, director, or supervisor. A publicly available list of all RNs licensed to practice in NJ and their mailing addresses were downloaded from the NJ Division of Consumer Affairs website. Using a Dillman survey method[37] and Qualtrics software, an email invitation with a link to the consent form and electronic survey was sent to 108,733 licensed RNs for whom email addresses were available on the RN licensee list. Two follow-up reminders were sent to non-responders at scheduled intervals. A total of 3210 nurses started the survey, 2271 read the informed consent, and 2251 consented to proceed with the survey. Of these, 1016 met eligibility criteria. Two hundred twenty-eight nurses initiated but did not complete

the survey. The 788 eligible participants who completed the survey comprised the study sample.

Measures

Participants completed a battery of online questionnaires that inquired about indicators of emotional distress, COVID-19 worry and concerns, workplace racial climate, workplace racial microaggression experiences, and demographic information.

Outcome variable

Emotional distress

The Well-Being Index (WBI), used in this study, is a 9-item instrument that assesses multiple dimensions of stress, including depression, stress, anxiety, burnout, and fatigue.[38] Final scores are adjusted for two items measuring respondents' levels of satisfaction with work-life integration and meaning of work. The WBI has been well validated in national samples of physicians, nurses, and US workers across all occupations.[38–40] The WBI total score ranges from −2 to 9, and a higher score indicates a greater degree of distress. Moreover, a score of 2.0 or higher indicates more severe emotional distress associated with a greater risk for stress-related personal and professional adverse outcomes such as severe fatigue and poor quality of life.[38–42] Cronbach's alpha for the WBI in this study was 0.70.

Explanatory variables

Racial climate

The racial climate of participants' hospital workplace was assessed using the Racial Climate Scale (RCS) that consists of 18 items that measure respondents' perceptions of racism in organizational decision-making processes, reward systems, adverse impact, and interpersonal processes based on two racial identity groups (persons of color and Whites).[43] For example, one item states "In general, organization-wide racism is a problem here". Participants respond to each RCS item using a 5-point scale from 1 = strongly disagree to 5 = strongly agree. Several items were reverse coded so that higher scores would denote negative perceptions of racial climate and lower scores were more representative of positive perceptions. Item responses were summed for a total score. Cronbach's alpha for the RCS in this study was 0.93.

Racial microaggressions

The 5-item Workplace Racial and Ethnic Microaggressions Scale (REMS) of the larger 45-item REMS was used to assess participants' experience of racial microaggressions in the workplace.[44] The Workplace REMS lists five types of workplace microaggressions such as "an employer or coworker was unwelcoming or unfriendly because of my race" and "I was treated differently by employer or coworker than persons of other racial groups". The scale was modified for this study with the addition of a sixth item, "A patient or patient's family member treated me differently than my coworkers of other racial groups", based on previous research that revealed differential treatment of healthcare workers by patients based on race.[13,14,23] For each item, participants are presented with a checklist (0 = I did not experience this in the last six months; 1 = I did experience this in the last six months). The checklist item ratings (yes/no) are summed, and a higher score reflects a higher number of workplace racial microaggression types experienced. Cronbach's alpha for the modified Workplace REMS scale in this study was 0.93.

COVID worry

COVID worry was assessed with three worry/concern single-item measures that were used in previous research to assess one's knowledge, preparedness, and concerns during pandemic outbreaks.[45,46] The first item "How worried are you about getting COVID?" was rated on a 4-point scale from 1 = not at all worried to 4 = very worried. The second item "Do you think you will get sick from the coronavirus?" was rated on a 4-point scale from 1 = not at all to 4 = I definitely will. The last worry item "How likely do you think it is that someone you know may get sick from the coronavirus this year?" was rated on a 4-point scale from 1= not at all likely to 4 = very likely. Higher ratings on each of these items reflected a higher level of COVID worry.

Demographic information

The demographic questionnaire created for this study included questions about race/ethnicity, age, gender identity, unit type, among other characteristics.

Data analysis

All data analyses were conducted using the Statistical Package for the Social Sciences, Version 27.0. To examine mean differences in emotional distress, racial climate, racial microaggressions, and COVID worry by race (White/nonwhite), independent t-tests were conducted. To examine the individual and independent effects of racial climate, racial microaggression, and COVID worry on the odds of emotional distress,

binary logistic regressions models were estimated. Age, number of years in the current position, and unit type were controlled for as confounding variables. To prepare for logistic regression analyses, nurse emotional distress scores were dichotomized into two categories that represent (1) a level of emotional distress not associated with risks for personal or professional consequences (WBI scores less than 2.0), and (2) a level of emotional distress reflecting a risk for negative consequences (WBI scores ≥ 2.0). To compare the effects of different levels of predictors on the odds of emotional distress, scores for each predictor were dichotomized. Racial climate scores were split at the median into two categories: (1) less negative racial climate as indicated by a score of 49 or less, and (2) more negative racial climate as indicated by a score of 50 or more. Racial microaggression scores were dichotomized into (1) no microaggressions experienced and (2) one or more types of microaggressions experienced. Finally, the three COVID worry items were dichotomized into (1) not worried at all versus worried a little to a lot, (2) will not get sick from COVID versus will possibly to definitely get sick from COVID, and (3) not at all likely that someone close will get sick from COVID versus somewhat to very likely that someone close will get sick from COVID.

A series of simple mediation analyses using Hayes' PROCESS method[47] with 10,000 bootstrap samples were conducted to examine the (1) role of racial microaggressions as a mediator of an indirect effect of racial climate on emotional distress, (2) roles of racial microaggressions and negative racial climates as mediators of indirect effects of race on emotional distress, and (3) role of COVID worry variables as mediators of indirect effects of race, negative racial climate, and racial microaggressions on emotional distress. A dichotomous race variable (White/nonwhite), and continuous emotional distress, racial climate, racial macroaggression, and COVID worry variables were used for these analyses. Unit type, years of experience in the current position, and age were entered into each mediation model as covariates.

To examine the role of COVID worry as a moderator of the relationships between *race,* the two racism variables, and emotional distress, a series of simple moderation analyses were conducted using the PROCESS method with 10,000 bootstrap samples to examine the effects of interactions between (1) COVID worry variables and racial climate, (2) COVID worry variables and racial macroaggressions, and (3) COVID worry variables and White/nonwhite race on high levels of emotional distress. For these analyses, the continuous well-being, racial climate scores, and racial microaggression variables were entered into the moderation models. The dichotomous COVID worry variables were entered as moderators in the models to assess significant interactions of explanatory variables at two levels of COVID worry (no-worry vs. worry). Unit type, years of experience in the current position, and age were entered into each moderation model as covariates. For each simple moderation model, two-way interactions between the COVID worry, race, and racism variables were examined. Any significant interactions were further probed by examining the estimates of the conditional effects of race, racial climate, and racial microaggressions on emotional distress as a function of the two levels of the COVID worry variable moderators.[47,48]

Results

Sample characteristics are presented in Table 1. Overall, the mean well-being score for the sample reflected a moderate level of distress among study participants. Notably, a striking percentage of nurses reported feeling burned out from work (67.9%) and felt that work was hardening them emotionally (55.8%). Nearly one-half (42.8%) of the sample reported feeling depressed, and one out of three nurses (32.6%) reported dissatisfaction with their work-life balance. Moreover, 44.1% of participants had emotional distress scores of 2.0 or greater, reflecting high levels of stress. Nurses reported a relatively high level of worry about COVID in general and worry about someone close to them getting sick from COVID, while their mean level of worry about getting COVID themselves was moderate. The mean racial climate score reflected a moderately negative perception among participants about the racial climates in their hospitals. A majority of participants reported experiencing, on average, one to two workplace racial microaggression types in the past six months. Additionally, 27.7% reported experiencing three to six types of microaggressions during this period. The most frequently experienced racial microaggression types were (1) being treated differently by employer or coworker than persons of other racial groups and (2) being treated differently by patients or patients' family members than coworkers of other racial groups.

Differences in study variables by race

Mean differences in well-being, racial microaggression experiences, racial climate, and COVID worry scores by race are presented in Table 2. Compared to White

nurses, nonwhite nurses reported significantly higher mean levels of emotional distress and overall worry about COVD. Additionally, a higher percentage of nonwhite nurses (61%) were very worried about COVID compared to the percentage of White nurses (41%) who were very worried. Compared to White nurses, nonwhite nurses' perceived more negative racial climates. Specifically, 74% of nonwhite nurses rated their hospital's racial climate above the median RCS score compared to only 36% of White nurses, and Black nurses reported the most negative racial climates. Furthermore, nonwhite nurses experienced more racial microaggression types compared to White nurses, and Black nurses experienced the highest number of racial microaggression types compared to all other racial groups.

Independent effects of study variables on emotional distress

The unadjusted and adjusted logistic regression findings are presented in Table 3. The unadjusted effects of all predictors and covariates on the odds of emotional distress were significant, and nurses' worry about getting sick from COVID and their worry about someone close to them getting COVID had the largest individual effects on the odds of emotional distress. The second model, adjusted for the effects of the other explanatory variables and covariates, was significant ($\chi^2 = 78$, $p < .001$) and was a good fit with the data as evidenced by an insignificant Hosmer and Lemeshow test ($\chi^2 = 5.0$, p = .76). A Nagelkerke R^2 indicated that the predictors and covariates accounted

Table 1. Sample characteristics (n = 788).

Demographic variables		
	Mean (*SD*)	Range
Age in years	48.6 (12.2)	22–76
Number of years in current position	12.1 (10.9)	1–48
	N	**%**
Race		
Black	135	17.13
White/Caucasian	475	60.28
Hispanic/Latinx	57	7.23
Asian/Pacific Islander	60	7.61
Multiple-racial	23	2.92
Other	12	1.52
Gender		
Female	715	90.74
Male	65	8.25
Employment status		
Full time	599	76.02
Part time	107	13.58
Per diem	69	8.76
Staffing agency/temp nurse	13	1.65
Primary nursing role		
Advanced practice registered nurse	103	13.07
Staff nurse	545	69.16
Assistant nurse manager	16	2.03
Clinical manager	27	3.43
Unit manager/department manager	30	3.80
Case manager	25	3.17
Charge nurse	34	4.31
Patient care coordinator	8	1.02
Unit type		
Hospital inpatient unit	566	71.83
Hospital outpatient unit	222	28.17
Highest nursing degree		
Diploma	34	4.31
Associate degree	127	16.12
Bachelor degree	410	52.03
Master's degree	178	22.59
Doctorate of nursing practice (DN	26	3.30
PhD	12	1.52
Cared for COVID patients	652	82.74
Cared for COVID patients who died	382	48.50
Study variables		
	Mean (*SD*)	Range
Emotional distress	1.34 (2.47)	−2 to 9
I am worried about COVID	3.17 (.97)	1 to 4
I think I will get sick from COVID	2.19 (.62)	1 to 4
Someone close to me will get sick from COVID	3.07 (.74)	1 to 4
Racial climate	43.95 (14.01)	18 to 88
Racial microaggressions	1.73 (2.20)	0 to 6

Note: Percentages may not sum to 100 due to missing data and rounding.

for 14% of the variance in emotional distress in the sample. Nurses' worry about getting sick from COVID had the largest independent effect of all predictors in the adjusted model. The effect of nurses' worry that someone close to them was likely to get sick from COVID on the odds of emotional distress remained significant in the adjusted model. On the other hand, nurses' overall worry about COVID was no longer significant after controlling for the effects of the other variables in the model. Nurses' experiences of workplace racial microaggressions had the second largest independent effect on the odds of emotional distress, and the effect of negative racial climate on the odds of emotional distress remained significant in the adjusted model.

Mediating effects of interpersonal and institutional racism

To test theorized indirect pathways for the effects of distal ecological levels on nurses' emotional distress through more proximal levels, a series of simple mediation analyses were conducted (Table 4). In the first mediation model, racial microaggressions were examined as a mediator of the relationship between racial climate and emotional distress. The bias-corrected 95% bootstrap confidence interval for an indirect effect of negative racial climates on emotional distress was entirely above zero, indicating a significant mediating effect of racial microaggression experiences on the relationship between negative racial climates and high levels of emotional distress, controlling for covariate effects.[47]

Since nonwhite race was not significantly related to emotional well-being in bivariate analysis, we also examined the roles of racial microaggressions and negative racial climates as mediators of the indirect effects of nonwhite race on emotional distress. As listed in Table 4, controlling for the effects of covariates, both racial microaggression and negative racial climates were mediators of significant indirect effects of nonwhite race on high levels of emotional distress, as evidenced by bias-corrected 95% confidence intervals entirely above zero (Table 4).[47]

Lastly, we examined the role of each of the three COVID worry variables as a mediator of the indirect effects of race, racial microaggressions, and negative racial climate on emotional distress, controlling for covariate effects. The 95% bias-corrected intervals for all COVID worry variables revealed that overall worry about COVID, worry about getting sick from COVID, and worry about someone close getting sick from COVID were significant mediators of indirect effects of negative racial climate on high levels of emotional well-being (Table 4). Additionally, overall worry about COVID mediated a significant indirect effect of nonwhite race on high emotional distress. On the other hand, as evidenced by 95% bias-corrected confidence intervals that were not entirely above or below zero (Table 4), worry about getting sick from COVD and worry about someone close getting sick from COVID were not mediators of indirect effects of race on emotional well-being. Similarly, the three COVID variables were not mediators of indirect effects of racial microaggression on emotional well-being.

Moderating effects of COVID worry

To test theorized effects of two-way between-level or within-level interactions on emotional distress, the three COVID worry variables were examined as moderators of the relationship between race, the two racism variables, and emotional distress. Controlling for covariate effects, two-way interactions between each COVID worry variable and racial microaggressions, negative racial climate, and White/

Table 2. Mean differences in emotional distress, racial microaggressions, racial climate, and COVID worry by race.

	Mean differences *p value*		Mean scores				
	Nonwhite	White	Asian/PI	Black	Hispanic	Mixed	Other
Emotional distress	1.62	1.16	1.41	1.61	2.28	2.14	0.70
	p = .01						
Racial microaggressions	2.76	1.06	2.38	3.39	2.10	2.83	2.17
	p <.001						
Racial climate	51.7	38.8	44.8	58.4	47.8	52.0	44.7
	p <.001						
I am worried about COVID	3.39	3.03	3.76	3.43	3.30	3.00	3.36
	p <.001						
I think I will get sick from COVID	2.25	2.16	2.44	2.12	2.33	2.09	2.18
	p = .05						
It is likely that someone close to me will get COVID	3.05	3.08	3.00	2.98	3.16	3.09	3.27
	p = .65						

Table 3. Unadjusted and adjusted effects of predictor variables on the odds of emotional distress.

	Unadjusted odds ratio (95% CI)	*p*	Adjusted odds ratio (95% CI)	*p*
Predictor variables				
COVID worry variables				
Very worried about COVID (vs. not at all worried)	2.10 (1.19, 3.70)	.01	.873 (.44, 1.72)	.76
I will likely get sick (vs. not at all)	6.09 (2.26, 16.4)	<.001	3.70 (1.47, 9.32)	.005
Very likely that someone close will get sick (vs. not likely at all)	3.17 (1.38, 7.29)	.006	1.73 (1.06, 2.84)	.03
Racism variables				
Negative racial climate (vs. less negative racial climate)	1.76 (1.30, 2.38)	<.001	1.41 (1.02, 1.96)	.04
One or more racial microaggression types experienced (vs. no racial microaggression experienced)	2.14 (1.59, 2.88)	<.001	1.90 (1.37, 2.61)	< .001
Covariates				
>50 years of age (vs. <49 years of age)	.433 (.32, .58)	<.001	.572 (.37, .75)	.001
Inpatient unit (vs. outpatient unit)	1.45 (1.05, 2.02)	.02	1.28 (.89, 1.83)	.18
≥9 years of experience in current position (vs. ≤8 years)	1.72 (1.28, 2.30)	<.001	1.50 (1.08, 2.07)	.01

nonwhite race were examined. As listed in Table 4, only the models that tested the moderating effects of nurses' worry about getting sick from COVID on the relationships between the two racism variables and emotional distress were significant as evidenced by 95% bias-corrected bootstrap confidence intervals that were entirely above zero. The significant interactions indicate that the effects of negative racial climate and racial microaggressions on emotional well-being are contingent on the level of nurses' worry about getting sick from COVID. To further probe these significant interactions, we estimated the simple slopes for both levels of the moderator by three levels of racial microaggressions (none experienced, 1 microaggression type experienced, 5 microaggression types experienced) and three negative racial climate scores representing less negative, moderate, and highly negative institutional climates generated by PROCESS[47,48] As shown in Figure 2, nurses who worried about getting sick from COVID and who experienced 5 types of racial microaggressions had the highest level of emotional distress. Similarly, nurses who worried about getting sick from COVID and who also experienced the most negative racial climates had the highest level of emotional distress.

Table 4. Mediating effects of racism variables and moderating effects of COVID worry variables.

		Bias-corrected 95% bootstrap CI for b	
Mediator	*b*	*Lower*	*Upper*
Racial microaggressions			
Indirect effect of negative racial climate on well-being	.01	.01	.04
Indirect effect of nonwhite race on well-being	.49	.31	.68
Negative racial climate			
Indirect effect of nonwhite race on well-being	.66	.46	.89
Overall worry about COVID			
Indirect effect of negative racial climate on well-being	.01	.0004	.01
Indirect effect of racial microaggressions on well-being	.01	−.01	.03
Indirect effect of nonwhite race on well-being	.20	.11	.32
Worry about getting sick from COVID			
Indirect effect of negative racial climate on well-being	.003	.001	.01
Indirect effect of racial microaggressions on well-being	.008	−.01	.03
Indirect effect of nonwhite race on well-being	.06	−.02	.15
Worry about someone close getting sick from COVID			
Indirect effect of negative racial climate on well-being	.003	.0002	.003
Indirect effect of racial microaggressions on well-being	.001	−.02	.02
Indirect effect of nonwhite race on well-being	−.03	−.12	.04
		Bias-corrected 95% bootstrap CI for b	
Two-way interactions	b	Lower	Upper
COVID Worry			
Racial climate*Worry about COVID	.007	−.08	.06
Racial climate*Getting sick from COVID	.07	.02	.12
Racial climate*Someone close getting sick from COVID	−.0004	−.04	.04
Racial microaggression*Worry about COVID	.18	−.10	.46
Racial microaggression*Getting sick from COVID	46	.14	.81
Racial microaggressions*Someone close getting sick from COVID	.01	−.21	.23
White/nonwhite race*Worry about COVID	1.2	−.41	2.8
White/nonwhite race*Getting sick from COVID	1.39	−.21	3.0
White/nonwhite race*Someone close getting sick from COVID	.17	−.83	1.2

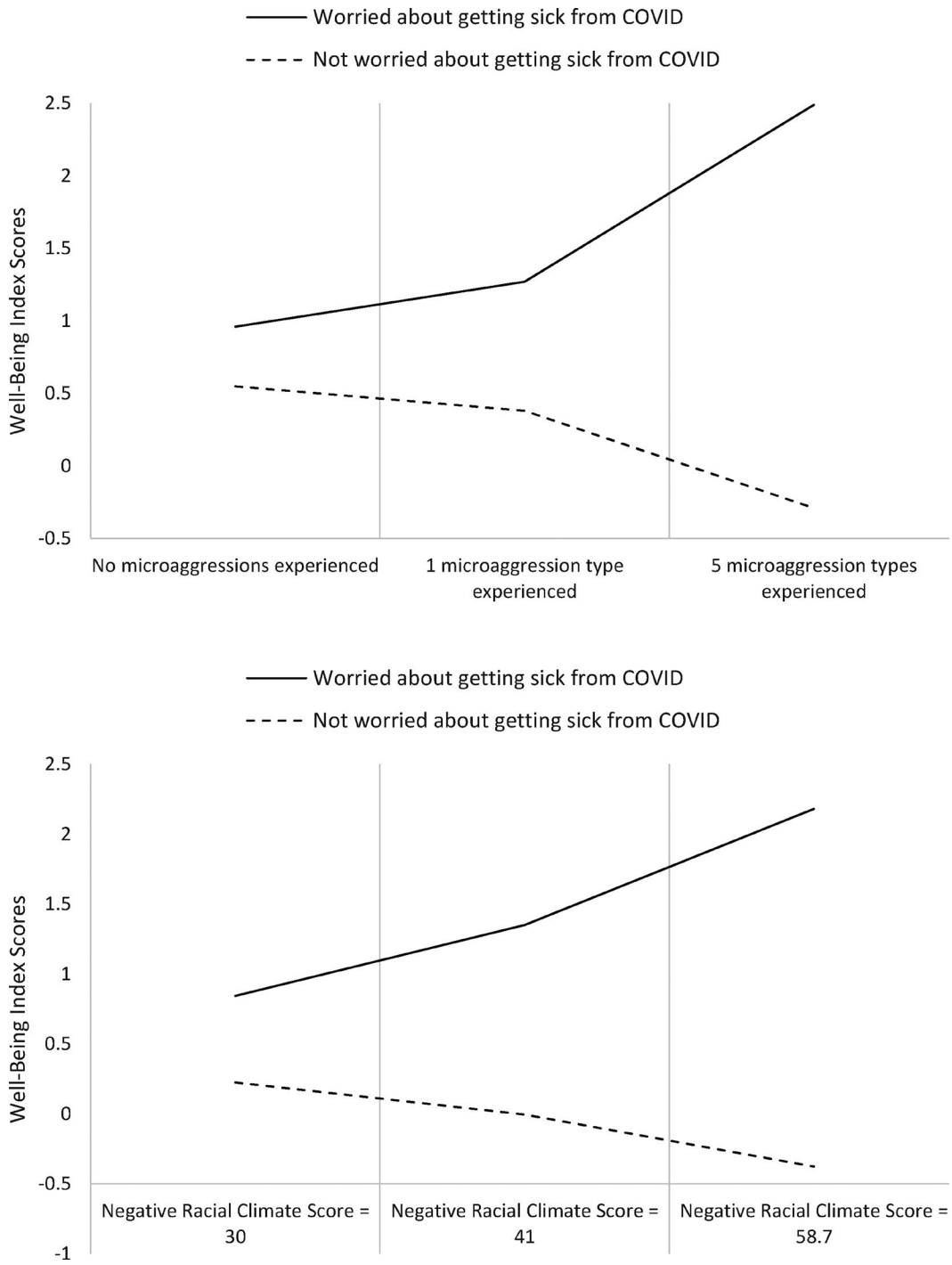

Figure 2. Work and health socioecological model and interrelationships examined.

Discussion

The overarching purpose of this study was to examine the complex interrelationships among emotional distress, COVID worry, race, and interpersonal and institutional racism in a diverse sample of nurses who worked in acute care hospitals in NJ. Emotional distress was widespread among nurse participants yet, as expected, nonwhite nurses' level of emotional distress, on average, was significantly higher compared to White nurses. Moreover, two-thirds of all nurses in the sample reported burnout, and nearly one-half had high levels of distress (WBI ≥ 2). This is disturbing since, in national samples, WBI scores ≥ 2 identified nurses with a twofold higher likelihood of extreme fatigue, patient care error, and an intent to leave the job.[38,41] Our findings of moderate to severe distress among nurse participants are also consistent with

previous reports of psychological distress experienced by health care workers during the COVID-19 pandemic.[5,32,33] However, we are unaware of any studies that have explored racial differences in the prevalence of emotional distress among nurses and other frontline health care workers, and future work is needed to corroborate these racial differences in diverse samples of nurses across clinical settings. Our findings also underscore a need for routine monitoring of nurses' emotional distress during high-stress conditions in hospitals so that stress-reducing individual-, interpersonal-, and institutional-level strategies can be developed and implemented to mitigate the distress.[27–29]

COVID worry was conceptualized as an individual-level socioecological determinant of emotional distress. This study was conducted during a time early in the pandemic when NJ had the third-highest number of COVID-19 cases in the US. Most nurses in our study reported caring for hospitalized persons who had COVID-19 and who died from it. Not surprisingly, nearly one-half of nurses reported they were very worried about COVID. Additionally, compared to White nurses, nonwhite nurses reported a higher mean level of overall COVID worry. Moreover, a higher percentage of nurses of color were very worried about COVID. These racial differences in COVID worry were recently corroborated in a national sample of nephrology nurses who worked in both inpatient and outpatient settings.[49] The disproportionate level of COVID worry between nonwhite and White nurses in our study likely represents a heightened level of vulnerability nurses of color feel for themselves and their families when faced with continuous workplace exposure to a highly infectious virus that disproportionately affects racial minority groups.[2–5] Notably, for each of the three COVID worry variables in this study, nurses with higher levels of worry also had severe levels of emotional distress (i.e., WBI scores ≥ 2). Furthermore, nurses' worry about getting sick from COVID had the largest effect on emotional distress among all explanatory variables we examined and was independently associated with a nearly four times higher likelihood of severe emotional distress compared to nurses who were not worried about getting sick. The significant effects of COVID worry on emotional distress found in this study mirror recent reports of the negative impact of COVID-19 on the mental health of healthcare workers.[3,32,50–52]

We hypothesized that racism, as hospital interpersonal and institutional level factors, was significantly associated with nurses' emotional distress. Not surprisingly, there were racial differences in nurses' perceptions of workplace racial climates and reports of racial microaggression experiences. Compared to White nurses, nurses of color reported more negative racial climates and they experienced multiple racial microaggression types at a rate that was nearly three times higher than their White counterparts. Moreover, compared to all other races, Black nurses experienced the most negative racial climates and the highest number of microaggression types. Within this context, it is important to note that racial microaggressions had the second-largest independent effect on the likelihood of severe emotional distress among all explanatory factors we examined. Furthermore, our findings explain the additional impact of interpersonal and institutional racism on nurses' emotional distress beyond that explained by COVID-19 concerns. To our knowledge, this is the first study that quantified the experiences and effects of interpersonal and institutional racism in a sample of hospital-based nurses. Yet these findings align with those from national samples of minority physicians and medical residents who reported similar workplace experiences of racism.[17,18,20,53,54]

The final aim of this study was to understand the complex indirect and interactive mechanisms for the effects of race, racial climate, racial microaggressions, and COVID worry on nurses' emotional distress. A surprising finding was that race was not significantly related to emotional distress in bivariate analysis, given the racial differences (White/nonwhite) in this outcome. Since evidence of a simple association between a predictor and outcome variable is not a precondition for mediation analysis,[55–57] we examined the roles of negative racial climates, racial microaggressions, and COVID worry as mediators of the effect of nonwhite race on nurses' emotional distress. Both negative racial climates and racial microaggressions mediated an indirect effect of nonwhite race on emotional distress. Additionally, overall worry about COVID also mediated this indirect effect.

We also tested the theorized premise that institutional racism is an organizational-level umbrella that validates, supports, and enforces the manifestation of interpersonal racism by examining the role of racial microaggression as a mediator of the indirect effect of negative racial climates on emotional distress. Mediation analysis revealed that negative racial climates contributed to nurses' emotional distress through its effects on the frequency of racial microaggression experiences. Though these are new findings for hospital-based nurses, they are consistent with findings in national samples that revealed injurious effects of race and racism on stress and mental health.[58–60] Unfortunately, the effects of nonwhite race

and workplace racism on severe levels of emotional distress in this study are sobering in that, added to the emotional and physical exhaustion of caring for hospitalized patients with COVID-19, many nurses of color also have to endure workplace racism that intensifies their level of distress.

Lastly, we examined the role of COVID worry as a moderator to determine any combined effects of nurses' worry about COVID, their race, and their racism experiences on nurses' emotional distress. We found significant two-way interaction effects between nurses' worry about getting sick from COVID and both multiple types of racial microaggression experiences and the most negative racial climates on severe emotional distress. The significant interactions reflected a synergistic effect of COVID worry and workplace racism on high levels of emotional distress. Specifically, nurses who were worried about getting sick from COVID and who experienced multiple types of racial microaggressions and/or the most negative racial climates were likely to experience severe levels of emotional distress. On the other hand, nurses who were worried about getting sick from COVID but who experienced no racial microaggressions and less negative racial climates were likely to experience less emotional distress. These new findings suggest that the effects of interpersonal- and institutional-level workplace racism experiences and nurses' worry about getting COVID overlap and their combined effect explains, in part, the high level of emotional distress that nurses, particularly nurses of color, are experiencing in COVID-19 environments in hospitals.

Our study findings point to the need for strategies targeted at individual, interpersonal, and institutional socioecological systems within hospitals to reduce COVID worry among nurses, mitigate racial microaggressions largely perpetrated by coworkers and patients, and improve the overall racial climate.[25–27] There have been ongoing efforts by hospitals to address the emotional distress that nurses are experiencing since the COVID-19 outbreak, and numerous mental health resources to assist nurses in coping with their stress such as support groups and confidential counseling have been implemented.[2,33,61–63] Evaluation of the effectiveness of these efforts is warranted. Our findings also call attention to the need to address workplace racism at both interpersonal and institutional levels in hospitals to provide equitable and inclusive work environments that cultivate positive emotional well-being among nurses of color. To that end, strategies to manage racism within organizations are becoming routine practice with various approaches, such as implicit bias training, adopted by human resource departments, managers, and diversity experts.[64] Unfortunately, despite the increasing popularity of these approaches, there is little empirical support for their overall effectiveness, although some interventions have found positive individual-level impacts on participants.[64–67] Furthermore, changes in individuals' attitudes and behavior may be short-lived if institutional-level policies and practices have not adapted to anti-racism norms.[34,64]

Our findings have important implications for future research. Longitudinal designs are needed to understand the long-term psychological effects of the COVID pandemic on frontline nurses. Moreover, there is a need to further understand the range of personal and professional consequences of severe emotional distress in nurses. Longitudinal designs are also needed to understand the enduring effects of workplace racism on nurses' well-being and other professional outcomes such as quality of care, leadership promotions or denials, and decisions to exit the job. Lastly, the effects of interpersonal- and institutional-level theory-informed and evidence-based interventions aimed at rigorously testing the effects of strategies designed to address and mitigate interpersonal racism and improve racial climates in hospitals are sorely needed.

This study had several limitations worth noting. First, the response to our survey was quite low. We distributed the survey to all actively licensed RNs in NJ who provided an email address at the time of licensure or re-licensure, regardless of their place of employment. Since the electronic survey invitation message indicated that the study focused on nurses' hospital-based experiences, nurses who did not work in hospitals may not have started the survey. In addition, the invitation for frontline, hospital-based nurses to respond to our electronic survey during the COVID pandemic was likely not a priority for them to complete. Second, the generalizability of our findings is limited due to a sample of hospital-based nurses in one state. Third, the cross-sectional design limits our ability to make inferential causal statements about the interrelationships among study variables. Fourth, our study was conducted during a downward trend in COVID cases in NJ that may have affected the level of impact of COVID worry on well-being. Fifth, the variation in nurses' emotional distress accounted for by the explanatory variables was small, and the extent to which nurses' COVID concerns and racism experiences explain other outcomes such as job satisfaction, job exodus, and quality of care should be explored. Lastly, we did not examine coping resources used by nurses that would inform an intervention to address their negative workplace experiences.

Conclusion

Nurses comprise the largest number of health professionals, and frontline nurses working during the intensity and pervasiveness of COVID-19 in acute care hospital settings have faced worry for themselves, their colleagues, and their families. Moreover, COVID-19 emerged in the US amid heightened attention to mistrust, systemic racism, and social injustice. We found that variations in nurses' emotional distress were determined, in part, by direct and complex interactions among COVID worry, race, and workplace racism experiences. For nurses of color in our study who experienced more negative racial climates and multiple racial microaggression types, workplace racism and COVID-19 represented a dual pandemic; that is, their experiences of racism and COVID-19 exposure and worries were synergized to the detriment of their emotional well-being. Even as national COVID-19 vaccination programs are ongoing and COVID cases, hospitalizations, and deaths decline, the psychological effects of nurses' workplace COVID exposure and worry will likely last far into the future. Moreover, the persistence of workplace racism will continue to inflict individual-level psychological harm among nurses of color unless it is effectively ameliorated. Concerns about nursing workforce shortages existed pre-COVID.[1] Since the pandemic, new concerns about nurse shortages have arisen based on reports of an increased global exodus of nurses from the profession.[68] Our findings point to the urgent need for a sustained investment in a racially diverse nursing workforce. Hospital executives and leaders should leverage and target efforts at the network of nested individual, interpersonal, and institutional systems within their organizations to protect the well-being of nurses, provide adequate psychosocial support in light of the COVID-related psychological traumas they face, and commit to short- and long-term strategies to effectively mitigate workplace racism.

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