

ORIGINAL CONTRIBUTION

Factors Influencing the Relationship Between Work-Related Stress and Posttraumatic Stress Disorder Among Working Black Adults in the United States

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Introduction: Work-related stress (WRS) and posttraumatic disorder (PTSD) is higher among Black adults relative to their White counterparts. Trauma exposure is not the only connection to increased risk for PTSD as WRS is highly associated with risk for PTSD. However, the factors that link WRS and PTSD among working Black adults is not well understood. **Materials and Methods:** Cross-sectional data from the National Survey of American Life was used to examine the relationship between WRS and PTSD among 2,139 working Black adults and to determine whether there are influencing factors. **Results:** Logistic regression analyses revealed that working Black adults who reported experiencing WRS was associated with higher odds of PTSD than those who reported no WRS (OR: 1.24, 95% CI: 1.04-1.48). The relationship was attenuated when depression, alcohol abuse, and major discrimination were added to the model (OR: 1.09, 95% CI: 0.87-1.36). Mediation analyses show that the average indirect effect of WRS on PTSD were 0.09 ± 0.04 for alcohol abuse, 0.14 ± 0.06 for depression, and 0.35 ± 0.10 for major discrimination. **Conclusion:** The results underscore the need for culturally responsive trauma-informed public health interventions for working Black adults. Public health practitioners should be alerted to the relationship between WRS and PTSD among working Black adults and the potential contributing factors (alcohol abuse, depression, and major discrimination). Special attention should be given to working Black females with their worse PTSD status and major discrimination experiences which demonstrated greater effect on the relationship between WRS and PTSD.

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Abbreviations: PTSD, posttraumatic stress disorder; DSM-5, Diagnostic and Statistical Manual of Disorders, 5th Edition; WRS, Work-related stress; ACEs, Adverse Childhood Experiences; ABC Model of Racism, affect, behavior, cognition; triple ACEs effect, adverse childhood experiences, adverse community experiences, and adverse cultural experience; JHAC, John Henryism active coping; NSAL, National Survey of American Life; WHO-CIDI, World Health Organization Composite International Diagnostic Interview; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders-IV; MEDS, Major Experiences of Discrimination Scale; OR, odds ratios; CI, 95% confidence intervals; SES, socioeconomic status.

Keywords: Work related stress (WRS), Posttraumatic stress disorder (PTSD), Black adults, discrimination

INTRODUCTION

Black adults have a higher risk of posttraumatic stress disorder (PTSD) than White adults and PTSD's relationship with work stress has become an area of inquiry [1-3]. PTSD is a mental illness included as one of the trauma- and stressor-related disorders in the Diagnostic and Statistical Manual of Disorders, 5th Edition (DSM-5) [4]. PTSD is characterized by symptoms of intrusion, avoidance, negative alterations in cognition and mood, and changes in arousal and reactivity after direct or indirect exposure to a traumatic event. However, exposure to a traumatic event is not the only connection to increased risk for PTSD as previous research suggests. A recent systematic review uncovered that work stressors were highly associated with risk for PTSD [3]. The work stressors identified included, "working hours, layoffs, workplace stress, the severity of the injury, frequency of exposure, marital status, history of mental disorder or occurrence of psychiatric symptoms at the time of the event, personality, negative interpersonal relationship, etc." (p. 4-5) [3].

The lifetime prevalence of PTSD in the US was 6.1% with higher rates among women (8.1%) than men (4.1%) [5]. Although Goldstein and colleagues [5] found that Black adults (6.2%) had similar rates of PTSD as White adults (6.3%), an earlier study by Alegria and colleagues found that Black adults were more likely to experience higher rates of PTSD (7.8%) in comparison to Whites (6.9%) [1]. These researchers also revealed that Black adults had higher prevalence across six DSM-5 diagnostic criteria for PTSD than White adults. Another study by Roberts and colleagues found that Black adults (8.7%) had a lifetime prevalence of PTSD greater than White adults (7.4%) and were less likely to seek treatment for their PTSD than White adults [6]. These findings demonstrate that there are mixed results when comparing rates of PTSD between Black and White adults — with most findings showing PTSD rates higher among Black adults relative to White adults.

Work-related stress (WRS) — defined as the maladaptive physical and emotional responses that occur "when the requirements of the job do not match the capabilities, resources, or needs of the worker," (p. 1) [7] was greater among Black adults in the lowest educational stratum, representing those with less than a high school education (18.5%), relative to their White counterparts (12.5%) [8]. The most identified work elements that contributed to the differential stressors were low job control and social support. This reflects the chronic negative work experiences that Black adults have endured historically and continue to encounter [9,10]. When the life expectancy loss due to WRS was examined by gender and race it was found that Black adult males in the lowest educational stratum had a life expectancy loss of 2.77 years compared to 1.72 years

for White males. Black adult females in the lowest educational stratum had a life expectancy loss of 1.92 years compared to 1.40 years for White females [8].

Skogstad and colleagues identified that there is an emotional trauma response that occurs after WRS, which has been shown to be a major source of PTSD symptoms for adult workers across various occupations [2]. This becomes important for PTSD prevention efforts since approximately 64% of workers in the United States reported their work as significantly stressful, making work stress one among two of the most mentioned personal stressors [11]. The identification of traumatic stress in the work environment warrant further investigation due to the relationship found between WRS and PTSD [2,3]. In addition, the reportedly high WRS and PTSD among Black adults and reported association with the social costs of *living-while-black*, underscores the need to expand our understanding of the correlation between WRS and PTSD in this population [8,12,13].

Work-Related Stress and PTSD

Work-related stressors, including areas concerning role conflict, shift work, work-discrimination, supervisors, management and administration, co-workers, etc., have been found to greatly impact PTSD symptoms [14]. The trauma- and stress-related stimuli at work seem to be triggered by what the National Institute for Occupational Safety and Health has termed *psychosocial occupational hazards* [15]. The work environment has been identified as a veritable petri dish for such psychosocial occupational hazards as "work overload, lack of control over one's work, non-supportive supervisors or co-workers, limited job opportunities, role ambiguity or conflict, rotating shiftwork, and machine-paced work." (p. 619) [15]. These psychosocial occupational hazards tend to lead to stressful work environments resulting in absenteeism and presenteeism — defined as no engagement or productivity while being present at work, job dissatisfaction, low productivity and engagement, disability, workplace disloyalty, work-family conflict, and health issues [16].

Trauma and Working Black Adults

The trauma exposure that impacts PTSD symptoms occurs throughout the life course for Black adults include their working years [17]. The PTSD in the working Black population may be understood through the lens of exposure to trauma in childhood (eg, incarcerated family member), community (eg, crime-ridden neighborhood), and culture (eg, racism) which have been shown to contribute to the higher prevalence and poor outcomes of PTSD in Black adults [18-23]. The unique historical and contemporary context of Black adults in the US underscores the need to go beyond adverse childhood experiences (ACEs) [23] to

include adverse community and cultural experiences [20-22]. Building on this premise and for the purposes of this paper, a framework coined the *triple-ACEs-effect* was developed and proposes that the stressors associated with the cumulative and interactive traumatic stress exposures in the working Black population extend beyond *adverse childhood experiences* to include *adverse community experiences* and *adverse cultural experiences* linked to PTSD [18,24,25].

Work-Related Stress and Behavioral Health Factors

The association between WRS and behavioral health factors — encompassing mental health and substance use disorders has been found to be influenced by an individual's ability to cope with work demands [26-33]. In fact, job strain has been shown to influence the onset of depression among an estimated 6% to 16.9% of US workers relative to 10.45% among the general population [27-30]. A recent study found a 67.5 to 90.6 prevalence rate of depressive symptoms among working Black adults who reported experiencing WRS which was associated with 1.70 higher odds of depressive symptoms than working Black adults who reported no WRS [31]. In addition, researchers reported results that showed that job strain increased the alcohol abuse severity of individuals experiencing severe alcohol abuse and the tobacco use severity of individuals experiencing mild tobacco use [32]. Another more recent study found that stressful work exposure to the public (eg, physical or phone contact in work capacity with people, other than colleagues, every day or almost every day) was associated with higher risk for increased alcohol, tobacco, and cannabis use for men and higher risk for increased tobacco and cannabis use for women [33]. Workplace environments that interact positively with human factors lead to improved mental health outcomes, however, when there is a negative interaction, poor biopsychosocial consequences occur leading to mental health issues such as PTSD [2,15].

Work-Related Stress and Discrimination

Black adults spend an average of 41.7 hours weekly in the workplace with Black men (85.6%) employed full time more often than Black women (78.5%). Black women (21.6%) tend to be employed part time more often than Black men (14.8%) [34,35]. Although there has been an increase in the share of Black adults in the labor force from 1972 (10%) to 2016 (12%), there also seem to have been a repeal of the workplace integration gains made by the civil rights movement as racial segregation in US workplaces has been increasing since the late 1980s [36-38]. Racial segregation in the workplace has been identified as a major source of WRS among Black adults

[39]. The location of a Black individual's job was found to be more predictive of employment racial segregation than the career or work choice; highly racially segregated neighborhoods seemingly parallel to highly racially segregated employment [37]. Black adult workers are seemingly more likely to be segregated to low complexity jobs compared to White workers; exposing them to increased WRS akin to poor working conditions, job strain, low wage earnings, lack of autonomy, and increased work instability [10,40]. In the workplace, Black adults experience chronic stressors associated with racial segregation, stereotypes, and prejudices exacerbated by the rates of discrimination along the employment continuum — from hiring to wage determination to promotion to termination [9].

Stress-Coping

Coping strategies that are employed by Black adults when faced with chronic stressors may also clarify the role of WRS in risk of PTSD. Researchers have shown that individuals utilize *health-related self-regulatory coping strategies* that are affordable, accessible, and acceptable in their communities [41,42]. For instance, Black adults tend to engage substance use to alleviate the deleterious effects of racial discrimination [43]. An extensive literature review found a large body of literature that supported the self-medication hypothesis, which proposes that individuals cope with their psychological distress by using substances [25]. These results are of particular importance because although Black adults (6.8%) were less likely to have a substance use disorder compared to White adults (7.4%), they were more likely to have a moderate to severe substance use disorder (3.3%) versus White adults (2.8%) [44,45]. In a sample of 1,098 Black adults, exposure to a traumatic event was associated with early onset of cannabis use, heroin use, alcohol abuse, and opioid use for men; and early onset of alcohol abuse for women [46].

Another coping strategy is the high-effort coping strategy of John Henryism active coping (JHAC). This type of coping strategy deployed by Black adults involves a sustained mental and physical effort to combat the stress stimuli associated with racial discrimination by adhering to an intense commitment to hard work and success [47]. Black adults tend to utilize the JHAC strategy as a means of dispelling the work-stereotype threat of “laziness” by intensely focusing and increasing occupational task performances. The high-effort strategies used to accomplish JHAC in the workplace have been found to be positively associated with a greater likelihood of depression and PTSD [48,49]. Interestingly, Kramer and colleagues found that JHAC moderated the relationship between race and PTSD. However, JHAC was found to be a protective factor in experiencing PTSD in White women but

not for Black women [49].

Rationale for Study

The number of hours spent at work in the lives of Black adults who are employed coupled with the compounded stress-exposures in the workplace that has been found to be associated with PTSD suggests that there are factors that link WRS and PTSD among Black adults, although it is not clearly understood [2,3,8]. This research focus is important for Black adults since the life expectancy loss due to WRS is higher among Black males and females compared to their White counterparts [8]. Additionally, WRS is related to depression and PTSD, and depression has been found to increase risk for mortality by 50% [50], while PTSD increases risk for mortality by 38% [51]. Leong and colleagues proposed that prevention methods developed for Black adults should consider the association of WRS with the trauma- and stressor-related disorders [52]. However, there exists a dearth of empirical research investigating the relationship between WRS and PTSD among Black adults. Lack of data on factors that may be contributing to prevalence of PTSD in the Black working population exposed to WRS undermines efforts to prevent PTSD within this population. Hence, the objective of the study was to examine the relationship between WRS and PTSD and to determine whether there are factors that influence how WRS is associated with PTSD among working Black adults.

MATERIALS AND METHODS

Sample

Cross-sectional data is extracted from the National Survey of American Life (NSAL), conducted by the Program for Research on Black Americans within the Institute for Social Research at the University of Michigan. The NSAL was designed to understand intra- and inter-group racial and ethnic differences in mental disorders, psychological distress, and informal and formal service use, as they are manifested in the context of a number of different stressors, risk and resilient factors, and coping resources, among African American and Caribbean Black populations of the United States compared to White respondents living in the same communities. The survey was conducted between February 2001 and March 2003 through face-to-face and some telephone interviews with an integrated national household probability sample of individuals aged 18 and over. Interviews were conducted with a randomly selected adult from each household. The overall response rate for the study was 71%. African Americans represented 58% of the persons interviewed and 16% were non-Hispanic White persons [53]. Although this dataset is dated, the NSAL is the best

data resource to address our research objective for the following reasons: 1) This is currently the most comprehensive large national survey of ethnically diverse Black populations [54]; 2) the data collection procedures included the utilization of multiple methodological innovations for conducting research within Black communities that incorporated the Wide Area Screening Procedure — a screening mechanism that assist with the identification of Blacks who live in areas where there are few Blacks [55]; and 3) the data has available psychosocial questions and sufficient working Black populations.

The NSAL employed multi-stage probability methods to generate the samples from 252 geographic areas across the United States. The sample of respondents was generated through a four-step sampling process. The NSAL conducted interviews that lasted approximately two hours and 20 minutes and were conducted using laptop computer-assisted personal interview methods in the homes of respondents. Race-ethnic matching of interviewer and respondents, along with community-based interviewers, were utilized in 86% of the interviews conducted. Approximately 14% of the interviews were conducted via the telephone either partially or entirely [53]. The NSAL represents a national household probability sample of African American ($n = 3570$), Afro-Caribbean ($n = 1621$), and non-Hispanic White ($n = 891$) adults. For this study, data were extracted from the public-use dataset of the NSAL for the sample of 3,570 persons who self-identified as Black or African American United States citizens (collectively identified as Black adults), and who were 18 years or older, employed, and answered questions relevant to this current study ($n = 2239$). Data from the NSAL were made available through the Inter-University Consortium for Political and Social Research at the University of Michigan (<http://www.icpsr.umich.edu/>).

Outcome Measure

Lifetime Post-Traumatic Stress Disorder (PTSD). A modified version of the World Health Organization Composite International Diagnostic Interview (WHO-CIDI) [56], based on International Classification of Diseases (ICD) [57] and the *Diagnostic and Statistical Manual of Mental Disorders-IV's (DSM-IV)* guidelines for PTSD criteria [58], was used to determine a diagnosis of PTSD [59]. Individuals were categorized as meeting DSM-IV criteria for lifetime PTSD or not (coded as 1 = lifetime PTSD or 0 = no lifetime PTSD).

Independent Variable

Work-Related Stress (WRS). The NSAL asked six questions about work conditions that could be considered stressful, as used in prior research [31]: 1) *worried about losing job in near future* (1 = worried a lot, 0 = somewhat

worried to not worried), 2) *Blacks treated unfairly at job* (1 = yes, 0 = no), 3) *at employment Blacks get better/worse jobs than Whites* (1 = worse, 0 = same or better), 4) *Do you have skills for a better job* (1 = yes, 0 = no), 5) *extent to which satisfied with job* (1 = very dissatisfied, 0 = somewhat dissatisfied to very satisfied), and 6) *number of hours worked* (1 = >40 hours per week, 0 = <40 hours per week). For each question, it was coded a “1” if respondent indicated a response that could be considered a stressful work-related condition and a “0” if considered not stressful. Each item was summed to create a WRS score ranging from 0 to 6 with higher scores representing higher experiences with WRS.

Behavioral Health Factors

In this study, based on the definition of the Substance Abuse and Mental Health Services Administration [26], behavioral health factors will be determined by alcohol abuse, marijuana use, cigarette use, and depression.

Lifetime Alcohol Abuse. A modified version of the WHO-CIDI [56], based on ICD [57] and *DSM-IV's* guidelines for alcohol abuse [58] was used to determine a diagnosis of alcohol abuse [59]. Individuals were categorized as meeting DSM-IV criteria for lifetime alcohol abuse or not (coded as 1 = lifetime alcohol abuse or 0 = no lifetime alcohol abuse).

Lifetime Cigarette Use. Cigarette use was assessed using the responses from respondents indicating whether they smoked 100 or more cigarettes in their lifetime. Individuals who responded affirmatively were categorized as meeting criteria for cigarette use; all other responses were categorized as not meeting criteria for cigarette use (coded as 1 = cigarette use or 0 = no cigarette use).

Marijuana Use. Marijuana use was assessed from respondents' answers to the two following questions: 1) *Have you ever used marijuana?* (1 = yes, 0 = no), and 2) *Have you used marijuana in the past 12 months* (1 = yes, 0 = no). Individuals who responded “yes” to both questions were coded as meeting criteria for marijuana use and those who responded “no” to any of the questions did not meet criteria for marijuana use (coded as 1 = marijuana use or 0 = no marijuana use).

Lifetime Depression. A modified version of the WHO-CIDI [56] based on ICD [57] and *DSM-IV's* guidelines for major depressive disorder [58] was used to determine a diagnosis of depression [59]. Individuals were categorized as meeting DSM criteria for depression or not (coded as 1 = depression or 0 = no depression).

Coping

John Henryism Active Coping (JHAC). The JHAC was assessed from responses to the 12-item JHAC Scale available in the NSAL and based on the coding procedure

utilized in Merritt and colleagues' study [60]. The JHAC scale assesses three major areas of coping: increased mental and physical energy, detailed attention to goal attainment, and hard work. Each item has a high-effort content that allows for five response options from completely true (coded as 1) to completely false (coded as 5). Each item was reverse coded and then summed to create a JHAC range score from 12 to 60 with higher scores representing higher JHAC.

Discrimination

Major Discrimination. Following the work of Thorpe and colleagues, major discrimination was created from the nine-item Major Experiences of Discrimination Scale (MEDS) available in the NSAL [61,62]. The MEDS ask if respondents were ever: 1) unfairly fired, 2) not hired for unfair reasons, 3) unfairly denied promotion, 4) unfairly treated/abused by police, 5) unfairly discouraged from continuing education by teacher/advisor, 6) unfairly prevented from moving into neighborhood, 7) neighbors made life difficult for family, 8) unfairly denied loan, 9) received unusually bad service from repairman. Each item was coded as “yes” or “no.” Each item was summed to create a MEDS score ranging from 0 to 9 with higher scores representing higher experiences with major discrimination. Consistent with analyses conducted by Thorpe and colleagues and due to the non-normal distribution of the MEDS scores, a dichotomous variable was created to identify those who reported experiencing at least one major discrimination relative to those who reported no experiences of major discrimination (coded as 1 = experienced major discrimination or 0 = no experiences of major discrimination) [61].

Covariates

Socio-Demographic. The socio-demographic factors include age (coded in years), sex (coded as 0 = female or 1 = male), and marital status (coded as 0 = not married or 1 = married).

Socioeconomic Status (SES). SES include education (coded as 0 = less than high school graduate or 1 = high school graduate or more); and household income (coded as 0 = <\$30,000 or 1 = ≥\$30,000).

Statistical Analysis

Sample characteristics were summarized for the entire sample. Rao-Scott chi-square and Student's t-tests statistics are used to examine differences in characteristics between Black working adults with PTSD and non-PTSD Black working adults as well as determine any associations between study variables and PTSD. The OR and corresponding 95% CIs were derived from logistic regression analyses. The OR of PTSD with the association

Table 1. Distribution of Characteristics of Working Black Adults by PTSD^a status in the 2001–2003 National Survey of American Life

Characteristics	Overall (<i>n</i> = 2239)	PTSD ^a (<i>n</i> = 193) 8.6%	No PTSD ^a (<i>n</i> = 2046)
Demographic			
Age, <i>M</i> ^b (<i>SE</i>) ^c	38.6 (.36)	36.2 (.87)	38.8 (.37)*
[Range]	18-83	18-75	18-83
Male, %	47.0	24.0	49.2*
Married, %	45.4	40.2	46.0
Socioeconomic Status (SES)			
High-school graduate, %	44.8	44.8	44.8
At or above \$30,000, %	58.3	53.5	58.8
Coping			
John Henryism Active Coping, <i>M</i> ^b (<i>SE</i>) ^c	20.4 (.16)	19.6 (.51)	20.5 (.18)
[Range]	0-41	0-33	0-41
Discrimination			
Major Discrimination, %	60.2	81.5	61.4*
Behavioral Health Factors			
Lifetime alcohol abuse, %	9.2	21.1	8.1*
Lifetime marijuana use, %	50.6	63.3	49.3*
Lifetime cigarette use, %	40.2	48.0	39.5
Depression, %	11.7	36.3	9.3*
Work-Related Stress (WRS), <i>M</i>^b (<i>SE</i>)^c			
	1.96 (.03)	2.23 (.08)	1.93 (.03)*
[Range]	0-6	0-6	0-6

Note: **p* < .05. ^aPTSD = Posttraumatic stress disorder, ^b*M* = Mean, ^c*SE* = Standard error

of WRS, demographic, SES, coping (JHAC), discrimination (MEDS), and behavioral health factors (alcohol abuse, marijuana use, cigarette use, and depression) were determined by the analyses. Three models were specified. Model 1 examined the relationship between WRS and PTSD adjusting for demographic and SES. Model 2 examined the relationship between behavioral health factors and PTSD adjusting for covariates (demographic, SES, coping) and PTSD. Model 3 examined the relationship between WRS and PTSD, adjusting for behavioral health factors and covariates. Estimated causal mediation of the associations between WRS and PTSD by major discrimination, alcohol abuse, or depression was investigated using the Stata *medeff* package [63]. These analyses accounted for survey design complexity (incorporating robust standard errors, stratification, clustering, and weighting to produce nationally representative results) of NSAL. All *p* values were two-sided and type I error threshold set at 0.05. All the analyses for the study were performed using the complex survey design feature in Stata version 14 [64].

RESULTS

The distribution of select characteristics of working Black adults in the NSAL for the total sample and by PTSD status is displayed in Table 1. The mean age of the 2239 participants was 38.6 ± 0.4 years. In this sample of working Black adults, less than half were male, married, high school graduates, and reported high-effort coping on the JHAC, alcohol abuse, cigarette use, and depression. The majority of the sample reported incomes of at least \$30,000, experiencing major discrimination and marijuana use. This sample of working Black adults had a relatively low WRS mean score of 1.96 ± 0.03 out of 6.

Working Black adults who met criteria for a PTSD diagnosis (8.6%) were more likely to be younger, female, to have experienced major discrimination, alcohol abuse, marijuana use, and depression relative to working Black adults with no PTSD diagnosis. Working Black adults who met criteria for a PTSD diagnosis were more likely to report experiencing WRS compared to working Black adults with no PTSD diagnosis. No significant differences were observed between working Black adults who met criteria for a PTSD diagnosis and working Black adults with no PTSD diagnosis with respect to marital status,

Table 2. Association Between Work-related Stress, Covariates, and PTSD^a Among Working Black Adults in the 2001–2003 National Survey of American Life (N = 2239)

Variable	Model 1 OR ^b (95% CI ^c)	Model 2 OR ^b (95% CI ^c)	Model 3 OR ^b (95% CI ^c)
Demographic			
Age	0.99 (0.97-1.01)	0.98 (0.95-1.01)	0.98 (0.96-1.00)
Male	0.23 (0.13-0.42)	0.14 (0.08-0.27)	0.15 (0.08-0.27)
Married	0.93 (0.56-1.55)	0.99 (0.55-1.76)	1.02 (0.57-1.80)
Socioeconomic Status (SES)			
High-school graduate	0.85 (0.51-1.41)	0.77 (0.45-1.32)	0.78 (0.45-1.33)
At or above \$30,000	1.09 (0.67-1.85)	1.33 (0.74-2.38)	1.31 (0.74-2.35)
Coping			
John Henryism Active Coping	0.83 (0.51-1.38)	0.83 (0.49-1.43)	0.83 (0.49-1.43)
Discrimination			
Major Discrimination		1.28 (1.11-1.48)	1.27 (1.10-1.47)
Behavioral Health Factors			
Lifetime alcohol abuse		3.36 (1.58-7.14)	3.36 (1.58-7.11)
Lifetime marijuana use		1.72 (0.99-2.99)	1.70 (0.98-2.98)
Lifetime cigarette use		1.67 (0.93-3.00)	1.62 (0.90-2.94)
Depression		4.23 (2.33-7.61)	4.17 (2.31-7.58)
Work-related Stress (WRS)	1.24 (1.04-1.48)		1.09 (0.87-1.36)

Notes: Bolded parameter estimates indicate those that are statistically significant ($p < 0.05$). ^aPTSD = Posttraumatic stress disorder, ^bOR = odds ratio, ^cCI = confidence interval

being a high school graduate, reporting an income of at least \$30,000, reporting high-effort coping on the JHAC, and reporting cigarette use.

The association between WRS, behavioral health factors, covariates, and PTSD are displayed in Table 2. In the first model we examined the relationship between PTSD and WRS adjusting for demographic, SES, and coping. Working Black adult males (OR: 0.23, 95% CI: 0.13-0.42) were associated with lower odds of experiencing PTSD relative to working Black females. Working Black adults with higher WRS scores (OR: 1.24, 95% CI: 1.04-1.48) was associated with higher odds of experiencing PTSD than those who reported lower WRS scores. No other significant relationships were observed between PTSD and the remaining demographic and SES variables.

In the second model we examined the association between behavioral health factors (discrimination, alcohol abuse, marijuana use, cigarette use, depression) and PTSD adjusting for demographic, SES, and coping. Working Black adult males (OR: 0.16, 95% CI: 0.08-0.29) were associated with lower odds of experiencing PTSD compared to working Black females. Black working adults who reported experiencing major discrimination (OR: 1.28, 95% CI: 1.11-1.48), alcohol abuse (OR: 3.36, 95% CI: 1.58-7.14), or depression (OR: 4.23, 95% CI: 2.33-7.61) were associated with higher odds of PTSD than those who did not report experiencing major

discrimination, alcohol abuse, or depression. No other significant relationships were observed between PTSD and the remaining covariates.

The third model examined the association between WRS and PTSD, adjusting for behavioral health factors and covariates. Working Black adult males (OR: 0.15, 95% CI: 0.08-0.27) were associated with lower odds of experiencing PTSD compared to working Black females. Working Black adults who reported experiencing major discrimination (OR: 1.27, 95% CI: 1.10-1.47), alcohol abuse (OR: 3.36, 95% CI: 1.58-7.11), or depression (OR: 4.17, 95% CI: 2.31-7.58) had higher odds of experiencing PTSD than those who did not experience discrimination, alcohol abuse, or depression. WRS was attenuated and no longer significant. No other significant relationships were observed between PTSD and the remaining covariates.

The attenuation of WRS in the fully adjusted model suggested mediation. Mediation analyses were conducted separately with three statistically significant behavioral health factors (major discrimination, alcohol abuse, and depression). Table 3 shows the mediation effect of the association between WRS and PTSD by major discrimination, alcohol abuse, or depression. Results of the *medeff* package in Stata show that the average direct effect of WRS on PTSD was similar for all three mediation models: 0.65 ± 0.37 for discrimination, 0.68 ± 0.38 for alcohol abuse, and 0.67 ± 0.38 for depression. The average

Table 3. Mediation effect of the association between work-related stress and PTSD by behavioral health factors (discrimination, alcohol, and depression) among working Black Adults in the 2001–2003 National Survey of American Life (N = 2239)

Mediators	Average direct effect	Average indirect effect	% ^a of TE ^b mediated
	Mean (SE) ^c	Mean (SE) ^c	Mean, % ^a
¹ Discrimination	0.65 (0.37)	0.35 (0.10)	33.67
² Alcohol	0.68 (0.38)	0.09 (0.04)	11.20
³ Depression	0.67 (0.38)	0.14 (0.06)	16.34

¹Adjusted for sex, alcohol, depression. ²Adjusted for sex, discrimination, depression. ³Adjusted for sex, discrimination, alcohol. ^a%, percentage, ^bTE = total effect, ^cSE = standard error.

indirect effect of WRS on PTSD through the behavioral health factors were 0.09 ± 0.04 for alcohol abuse, 0.14 ± 0.06 for depression, and 0.35 ± 0.10 for major discrimination. On average, major discrimination or unmeasured factors associated with major discrimination mediated 33.67% of the association between WRS and PTSD. On average, alcohol abuse or unmeasured factors associated with alcohol abuse mediated 11.20% of the association between WRS and PTSD. Depression or unmeasured factors associated with depression, on average, mediated 16.34% of the association between WRS and PTSD.

DISCUSSION

The objective of this study was to examine how WRS is associated with risk of PTSD among working Black adults and the influence of accompanying factors. Consistent with other research findings, the prevalence of PTSD in this working Black population (8.6%) was higher than the nationally reported lifetime prevalence rate (6.1%) [1,5,6]. Although this sample of Black working adults had a relatively low WRS mean score overall, those who reported a diagnosis of PTSD had a higher WRS mean score than those without a PTSD diagnosis. Other researchers have found that higher WRS is related to greater risk for PTSD [3]. These results reflect the potential morbidity and financial burden of PTSD among working Black adults exposed to WRS; which may be used to inform the development of priorities in PTSD prevention and policy.

Results showed that working Black females were associated with greater risk for PTSD than working Black males. These results are consistent with findings from a meta-analysis of studies that examined sex-specific risk of traumatic stress and PTSD and found that females were more likely to meet criteria for PTSD than males; although males reported experiencing more traumatic stress [65]. More specific, the traumatic responses to stressors were more profound in Black females than Black males [66]. An explanation for these findings may be explicated through our understanding of the discrimi-

nation experienced at the intersection of race and gender by Black females, termed *double subordination* by Fuller [67], and described by the *double jeopardy* and *intersectionality* theories [68]. Black females' membership in two marginalized groups exposes them to the cumulative effects of multidirectional discrimination that may affect their ability to cope and heighten their risk for PTSD. For instance, the coping strategies used by Black females during the *superwoman schema* process — characterized by “obligation to manifest strength, emotional suppression, resistance to vulnerability and dependence, determination to succeed, and obligation to help others [...]” (p. 679) [69], influence the way they may suppress and embody the stressors associated with the intersection of race and gender leading to PTSD symptoms [69].

The main study results provided evidence for an association of WRS with higher risk for PTSD even after adjusting for demographic, SES, and coping which have similarly been identified in the literature [2,3]. However, the relationship was attenuated when major discrimination, alcohol abuse, and depression were added to the model — with major discrimination demonstrating the greatest effect. The “triple ACES-effect” may serve as a potential underlying mechanism explaining the mediation effects revealed in the study. Further conceptual work and empirical analyses including adverse childhood, community, and cultural experiences with PTSD and WRS are needed to clarify these findings. First, the traumatic experiences during childhood may help to explain depression's mediating role in this current study. Researchers found a significant dose-response relationship between exposure to adverse childhood experiences and depression — with Black adults showing markedly higher depressive symptoms than White adults with similar levels of childhood trauma exposure [24]. Since Black adults tend to have been exposed to higher adverse childhood experiences than White adults, those memories have a greater chance of converting to depressive symptoms that show up in the workplace and increase risk for PTSD. Secondly, adverse community experiences could shed some light on the mediating effects of alcohol abuse.

Black adults are more likely to live in racially segregated neighborhoods with greater concentrated poverty which can lead to low-quality housing and higher community violence [70]. This seems to influence the availability of coping strategies linked to poor health behaviors such as alcohol abuse [41,42]. Although alcohol abuse may provide momentary relief from work-related stressors it seems to increase risk for symptoms of PTSD [25].

Lastly, racial phenomena such as stereotypes, prejudices, and discrimination experienced by Black adult workers become crystalized into chronic racial inequities in the workplace. This ultimately influences PTSD which has been found to be linked to perceived discrimination, racial microaggressions, and racial stigmatization [71]. Paradies and colleagues evaluated data from 293 studies published between 1983 and 2013 and found an extensive association of self-reported racism with negative mental health outcomes [19]. More than 20% of the studies reported an association with psychological distress and 4.8% with PTSD. Negative mental health outcomes had the largest mean weighted effect size when compared to positive mental health, physical health, and general health, with PTSD demonstrating the largest effect size. This is important because in the workplace the negative racialized employment experiences of Black adults have remained constant since 1990 and is associated with PTSD [9,72].

The differential experiences of racism among Black adults when compared to other ethnic groups may provide some explanations for the etiology of PTSD among Black adults. When comparing these differences, it was found that Black adults experienced significantly more episodes of discrimination associated with PTSD [73]. Several researchers have found similar results. Among a sample of 806 participants living in low-income predominantly Black neighborhoods, any person who reported experiencing any discrimination was significantly more likely to meet criteria for PTSD [72]. Sibrava and colleagues found that in their sample of Black adults, PTSD remission rates over 5 years of follow up was 0.35 and significantly associated with reported frequency of experiences with discrimination [18].

The “triple-ACEs-effect” provides a foundation for the exploration of the deleterious effects caused by racialized social systems in the US on working Black adults. Working Black adults seem to experience traumatic exposures that may be explained through alcohol abuse, depression, and major discrimination linked to WRS and associated with PTSD. In addition, these relationships may be correlated with Black adults’ exposure to childhood, community, and cultural adversities.

Strengths and Limitations

To the best of the author’s knowledge, this is the

first study to examine factors that influence how WRS is associated with PTSD among a nationally representative sample of working Black adults in the US. Additionally, there is not much literature aimed at understanding the mental health of working Black adults, so this current study provides a starting point for future research. Along with the strengths identified, there are several limitations that must be acknowledged. Limitations of this study include the cross-sectional nature that precludes causal inference. Therefore, we cannot definitively state that higher WRS lead to PTSD. This study is not generalizable to workers in other racial/ethnic groups and should be replicated to other Black adults across the diaspora, Hispanic, Asian, or White adults. The lifetime depression and alcohol experiences of this sample does not capture the full alcohol abuse and depression among this sample of working Black adults, as they are cumulative measures that also include those that experienced these behavioral health issues a long time ago. However, it does give a rough estimation of the extent of the alcohol abuse and depression in this population. There were several items in the Major Experiences of Depression Scale that may be capturing some component of work-related stress that have potential to lead to biased estimates. To address this, collinearity and multicollinearity was tested using estimation set forth by Tabachnic and Fidell [74] and Yoo and colleagues [75]. The results demonstrated a weak bivariate correlation (0.15) below the cutoff threshold of a strong linear association (0.35 to 0.9) identified in the literature. Another limitation of the study is that adverse childhood experiences could not be captured in this study. If such a measure were available, it would allow for the empirical test of the “triple-ACEs effect.”

CONCLUSION

Findings from this study emphasize a relationship between WRS and PTSD among working Black adults which have implications for the public health field. The results suggest that when disseminating programs and policies targeted to working Black adults, public health practitioners should be alerted to the relationship between WRS and PTSD and the potential contributing factors (alcohol abuse, depression, and discrimination). Special attention should be given to working Black females with their worse PTSD status and major discrimination experiences which demonstrated greater effect on the relationship between WRS and PTSD. This may equip public health practitioners with tools to develop and deliver culturally responsive trauma-informed public health interventions for working Black adults who are experiencing WRS. In so doing, this may help reduce PTSD symptoms for working Black adults.

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