Determinants of Poor Health Among Workers in Criminal Justice, Community and Social Services, and Healthcare: Adverse Childhood Experiences, Workplace Trauma Exposure, and Gender Differences

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Abstract

Adverse childhood experiences and workplace trauma exposure are associated with poor health. However, their differential impacts by gender are difficult to assess in studies of organizations with gender imbalances (e.g., law enforcement officers are more likely men whereas social workers are more likely women). Using a community-based participatory research framework, this study examines trauma exposure, mental and physical health, and substance use in an occupationally diverse sample (n=391). Trauma exposure was high and associated with poor health. Even though women experienced more adversity, they were often more resilient than men. Implications for trauma-informed workplaces are discussed.

Key Words: adverse childhood experiences, workplace trauma exposure, occupation-based trauma, mental health, physical health, substance use, gender differences, community-based participatory research.

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To what extent does trauma in the workplace impact health? The issue of occupation-based trauma (OBT) is receiving attention in both the scientific (e.g., NIH, 2019; NIJ, 2019) and programming (e.g., OVC, 2019) arenas. Workplaces are beginning to take OBT seriously, as evidenced by a shift from social norms that expect automatic resilience of workers to those that obligate organizations to recognize inevitable exposure to trauma and provide responses (Molnar et al., 2017). However, instituting trauma-informed workplaces is challenging. This paper examines workers who provide services to traumatized individuals as part of their job responsibilities. These individuals can belong to a wide range of professions, including law enforcement, healthcare, and social work. The organizations that employ them are often underfunded, under-resourced, understaffed, or overburdened with service responsibilities, and an established body of literature has sought to understand and address these deficiencies (Benton, 2016; Haley-Lock, 2007; Kim & Kao, 2014; Knapp, Smith, & Sprinkle, 2017; Lambert, Cluse-Tolar, Pasupuleti, Prior, & Allen, 2012; Lee, 2016; Macy, Giattina, Parish, & Crosby, 2010; Merchant & Whiting, 2015; Moe Barak, Nissly, & Levin, 2001; Schweitzer, Chianello, & Kothari, 2013; Seldon & Sowa, 2015; Wood, Wachter, Rhodes, & Wang, 2019). The current study seeks to add to this and related bodies of literature by addressing three additional issues—selection effects, measurement issues, and gender differences—that further complicate the understanding of the impact of trauma in the workplace and the appropriate response to it.

Selection Effects

Individuals with histories of trauma may select into professions with high trauma exposure, as is evident in the counseling-related professions (Elliott & Guy, 1993; Farber, Manevich, Metzger, & Saypol, 2005; Nikčević, Kramolisova-Advani, & Spada, 2007). Prior experience with trauma can increase authenticity and empathy, and many workers view these histories as an occupational asset (Ellis & Knight, 2021). However, personal experiences of trauma, especially in childhood, may increase risk for

OBT symptoms (e.g., exhaustion, cynicism, secondary traumatic stress, and PTSD; Howard et al., 2015; Molnar et al., 2017; Mott & Martin, 2019). Ultimately, it can be difficult to ascertain the driving force behind poor health outcomes, whether it be childhood or workplace trauma exposure (WTE), or both, or ongoing sociodemographic disadvantages like sexism, racism, and economic inequalities (Knight et al., 2018). The current study attends to this challenge by including multiple measures of trauma exposure and adversity. Understanding their differential impacts will be important both for organizations that are striving to be trauma-responsive and for individuals who want to heal from the consequences of trauma exposure. Likewise, a better understanding of these impacts may help untangle the question of individual versus organizational accountability when it comes to recognizing and addressing the issue of trauma among workers.

Measurement Issues

Measuring trauma exposure, trauma-related symptoms, and trauma-related outcomes is challenging. On the one hand, the family violence field has done a good job at measuring trauma exposure in the home (Feindler, Rathus, & Silver, 2003). For example, the movement to better understand and respond to adverse childhood experiences (ACEs) has pushed researchers to create better instruments (Cronholm, 2015; Mersky, Janczewski, & Topitzes, 2017). Even though research shows that retrospective measures like the ACEs questionnaire have methodological limitations, they nevertheless have practical utility and are predictive of important outcomes (Baldwin, Reuben, & Newbury, 2019). In contrast, relatively few measures of WTE are available (Molnar et al., 2017), and those that do exist tend to measure trauma symptoms (Elwood, Mott, Lohr, & Galovski, 2011) rather than exposure.

When assessing trauma symptoms, the literature points to differences in the specific measures used across professions. Though there is overlap (e.g, Bulter, Carello, & Maguin, 2017), the medical (e.g., Gomez-Urquiza et al., 2016) and criminal justice fields (e.g., Aguayo, Vargas, Canadas, & Dee la Fuente, 2017) seem to use burnout inventories more frequently, while for the social work field, secondary traumatic stress measures are more common (e.g., Molnar et al., 2020). In addition, the differential impacts of trauma exposure types are rarely assessed when documenting symptoms and health outcomes,

and as a result their effects are conflated and remain unknown (Knight et al., 2018). There also appear to be differences in the types of outcomes studied. The ACEs literature is well-known for addressing the impacts of childhood trauma on a variety of health outcomes (Hughes et al., 2017) and mortality (Chen, Turiano, Mroczek, & Miller, 2016), whereas research on workplace trauma is more weighted with studies on mental health (e.g., Sabin-Farrell & Turpin, 2003; Molnar, 2020). Few studies assess both mental and physical health despite their potential connection (Ohrnberger, Richera, & Sutton, 2017). The current study attends to these gaps in the literature by creating composite scores that combine 18 well-validated measures that assess health across four large domains: OBT, mental health, physical health, and substance use. Following Felitti's (1998) diagram of the ACEs pyramid, we selected these measures based on a similar conceptual model that links primary trauma, selection effects, OBT, risky health behaviors, and health impacts, all of which may limit the effectiveness of service provision (Ellis & Knight, 2021).

Gender Differences

It is well-known that there are gender imbalances in some professions—for instance, law enforcement officers are more likely men (Starheim, 2019), whereas social workers are more likely women (McPhail, 2004). Gender imbalances in organizations extend to the samples selected to study them (Baum, 2016) and make it difficult to test whether there are true gender differences in the impact of trauma exposure on health. The issue is further complicated given that women tend to report greater exposure to trauma and experience more trauma-related symptoms in general (Baum, 2014; Olff, Langeland, Draije, & Gersons, 2007; Valentine et al., 2019). Additionally, gender stereotypes in mental health diagnostic criteria are thought to exasperate gender differences (Ali, Caplan, & Fagnant, 2010). The current study attends to these issues, at least in part, by using data from a gender-balanced sample of workers from a diverse range of organizations to analyze how gender moderates the association between trauma and health. Following the multidimensional framework developed by the Office of Research on Women's Health (NIH, 2019), we posit that, ultimately, the health of women is affected by a complex interaction of a multitude of internal and external factors, including both sex and gender.[1]

The Current Study

This study responds to limitations in research regarding selection effects, measurement issues, and gender differences by examining a variety of trauma exposure and health survey measures collected from a sample of male and female workers across distinct organizational contexts (e.g., criminal justice, community and social services, and healthcare) and job types (e.g., police officers, social workers, and healthcare providers). By considering the dual contexts of ACEs and WTE, we aim to improve understanding of the determinates of poor health by answering the following five research questions:

1. Are there gender differences in occupation (organizational context and job type), trauma exposure (ACEs and WTE), and health (OBT, mental health, physical health, and substance use)?
2. To what extent are ACEs and WTE associated with OBT symptoms?
3. Net of other demographic factors, does gender moderate these relationships?
4. To what extent are OBT symptoms associated with mental health symptoms, physical health symptoms, and substance use?
5. Net of trauma exposure (ACEs and WTE) and other sociodemographic factors, does gender moderate these relationships?

Methods

Data

The cross-sectional, quantitative data (n=391) used for this study was collected as part of a larger multiphase community-based participatory research (CBPR; Israel et al., 2013) project that included a cross-sector community advisory board (CAB), the members of which represented several local organizations in one Mountain West community. Recruitment and data collection for this study unfolded in several stages. First, the principal investigators asked members of the CAB to draw on their familiarity with or employment at trauma-exposed agencies in the local community to nominate organizations for recruitment into the study. Eleven agencies were chosen for possible recruitment: five law enforcement agencies; one detention center; one child protective service (CPS) agency; one hospital (targeting emergency-room personnel and sexual assault nurse examiners); and three community-based

organizations that provide a variety of programs and services, such as responding to domestic violence, sexual assault, suicide, and housing and transportation crises. Second, the principal investigators sent emails to these agencies' leaders soliciting participation in the survey. Participants were offered three incentives for participation: (1) a $20 e-gift card for individual participants upon completion of the survey, (2) eligibility for individual participants to be selected into a pilot randomized controlled trial testing a multiday training intervention for secondary trauma, and (3) an individualized report compiled for each participating agency summarizing the anonymized results of their employees' surveys. Third, the principal investigators and a CAB member, serving as a trusted gatekeeper, met with nine of the chosen agencies to further explain the study. Ultimately all 11 agencies agreed to participate. Fourth, principal investigators emailed agency leaders with a link to an online survey that could be forwarded to their employees. In addition, flyers and stacks of small cards advertising the survey were given to agency leaders. Fifth, principal investigators sent weekly reminder emails to encourage participation.

To help assess whether responses were valid, the survey, designed in Qualtrics, included one validity item asking participants to "please select 'very often' for this response." The survey took participants approximately 30 to 45 minutes to complete and began by providing electronic consent. If participants elected to receive the $20 e-gift card after reaching the end of the survey, they were brought to a separate URL to enter their contact information. The study was conducted during the 2018–2019 academic year, and the Montana State University Institutional Review Board approved all procedures under protocol CE032318.

Sample

Initially, the current study collected data from n=431 criminal justice, community and social service, and healthcare workers. A sample size of n=343 (343/431=80%) was yielded through the recruitment and data collection procedures for the 11 agencies described above. Additionally, several workers from other agencies took the survey, presumably after learning about it from colleagues or reading the flyers, adding n=22 (5%) to the sample. Paramedics from an emergency medical service company, n=7, were the largest group of workers unaffiliated with the 11 chosen agencies. Also, n=13

(3%) completed at least 35% of the survey but did not provide their agency's name. A pilot survey was administered to n=13 (3%) workers recruited by CAB members primarily from the 11 agencies chosen for the study. No substantive changes were made to the final survey, and so data from pilot participants were retained in the dataset. Subtracting from the sample size were the following: participants who failed to complete more than 35% of the survey (n=19; 4%); participants who failed to correctly answer the validity item (n=13; 3%); and participants who identified themselves as volunteers (n=8; 2%). Altogether, this resulted in a final analytic sample for this study of n=391 (see Table 1). To calculate participation rates, the principal investigators asked agency leaders to provide the number of employees working at their organizations at the time of the survey. All agencies complied with the exception of the hospital. Overall, the online survey yielded a high participation rate (Blumenberg et al., 2019; Nulty, 2008; Van Mol, 2017) at approximately 50%, 50%, 54%, 71%, and 78% for the five law enforcement agencies; 70% for the detention center; 77% for CPS; and 49%, 84%, and 95% for the three community-based agencies.

Measures

Composite outcomes. Table 2 lists the measures used to create composite outcomes assessing four domains of health: (1) *occupation-based trauma (OBT) symptoms* from the Secondary Traumatic Stress Scale (STSS, Bride et al., 2004, α=.93), PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5, Weathers et al., 2013, α=.95), and Maslach Burnout Inventory General Survey (MBI-GS, Maslach et al., 2016, α=.92 for exhaustion and α=.87 for cynicism); (2) *mental health symptoms* from the Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983, α=.91), Generalized Anxiety Disorder 7-Item Scale (GAD-7, Spitzer, et al., 2006, α=.91), Personal Health Questionnaire Depression Scale (PHQ-8, Kroenke, Spitzer, Berry, & Mokdad, 2009, α=.87), and Well-Being Index (WHO-5, World Health Organization, 1998, α=.90); (3) *physical health symptoms* from the Body Mass Index (BMI, National Heart, Lung, & Blood Institute, 1998), Jenkins Sleep Scale (JSS, Jenkins, Stanton, Niemcryk, & Rose, 1988, α=.85), and Health-Related Quality of Life (HRQOL, Center for Disease Control, 2000); and (4) *substance use* from the AUDIT Alcohol Questionnaire (Bush et al.,

1998, α=.83) and Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool (TAPS, McNeely et al., 2016).

Within each of these domains, measures were first standardized (M=0, SD=1) and then the mean was calculated across the multiple measures. Table 2 lists the measures used for each composite outcome and includes the composite alpha value, the number of items in each component measure, a sample item, the item range, and coding notes (e.g., reverse coded). The alphas were highest for mental health then OBT symptoms. Note that supplemental analyzes were run using a composite measure of OBT that did not include the PCL-5 given that it can assess but is not exclusive to trauma in the workplace (α=.84). Results did not change except for disability in Model 3 which shifted from marginally significant at p=.06 to p=.04. The alphas for physical health symptoms and substance use were lower, as they summarize a more diverse set of components and less clearly reflect a single dimension. The composites nonetheless are useful in offering an average of the respondents' physical and substance abuse problems.

Trauma exposure predictors. Participants were asked about potential trauma exposure in childhood and in the workplace. *Adverse childhood experiences (ACEs*) were assessed using the Behavioral Risk Factor Surveillance System Adverse Childhood Experiences Module (CDC, 2019). The questionnaire consists of 11 items asking about the participants' exposure to eight different types of negative experiences before the age of 18: emotional abuse, physical abuse, sexual abuse, intimate partner violence, household substance abuse, household mental illness, incarcerated household member, and parental separation or divorce. Following Merrick (2018), a prevalence indicator was created for each of the eight negative experiences. These were summed to generate the total number of ACEs. For the sample overall, 28% reported no ACEs, 19% reported one ACE, 21% reported two ACEs, 13% reported three ACEs, and 19% reported four or more. Participants' level of *workplace trauma exposure (WTE)* was assessed by asking, "Overall, how much of your work involves (directly or indirectly) engaging with traumatized individuals or traumatic material?" Responses were on a 5-point scale ranging from 0 (none at all) to 4 (a great deal). Altogether, 2% reported none, 11% reported a little, 19% reported a moderate amount, 25% reported a lot, and 44% reported a great deal.

Demographic variables. As shown in Table 3, respondents were asked their *age* (M=37.43, SD=11.14) and *gender/sex* (55% women; included in this category are the only n=2 participants who responded as "other" and both wrote "fluid" in the optional text entry box), as well as whether they were a *person of color (POC;* 8%), held a *bachelor's degree or higher* (67%), were *married or living with partner* (72%), had a *low household income* (19%; defined as less than $29,999, the third lowest of 14 categories ranging from under $9,999 to $130,000), reported a *disability* (14%; ADHD/ADD, learning, psychological, traumatic brain injury, or other), were a *veteran* (17%), and the number of *years in the job* they had been working (M=8.79, SD=6.18).

Analytic Strategy

Data were analyzed using SPSS, Version 25. To answer the first research question exploring gender differences, all measures were assessed using one-way ANOVA and chi-square tests (Pearson or Fisher's Exact, depending on sample size). To answer subsequent research questions regarding the determinants of poor health, OLS regression models tested bivariate and multivariate associations. Model building unfolded using the following six-step sequence, based first on examining background factors and then on examining trauma-related predictors: (1) all social and work demographic predictors were entered into a model, (2) all gender and demographic interactions were added, (3) the model was trimmed of nonsignificant predictors, (4) trauma-related predictors were entered, (5) all gender and trauma-related interactions were added, and (6) once more, the model was trimmed of nonsignificant trauma-related predictors. Significant main effects in earlier models were retained throughout a sequence of models regardless of significance in later models. Final models are presented in the results section. Note that intraclass correlations were calculated and that findings suggested little clustering on outcomes at the agency level ($p<.05$). As such, multilevel regression modeling was not warranted. Missing data (see Table 3) are minimal (about 1% on average) except for three variables that were added to the survey at a later time (i.e., not missing at random): disability status (28% missing), veteran status (28% missing), and WTE (19% missing). To help retain the overall sample size, missing data for these variables were recoded

to their mean and missing data indicators were added to models, as appropriate. Otherwise, casewise deletion was used.

Results

Gender Differences

Our first research question asks if there were gender differences in occupation (organizational context and job type), trauma exposure (ACEs and WTE), and health (OBT, mental health, physical health, and substance use). Several statistically significant gender differences were found. In terms of organizational context, Table 1 shows that women were more likely to be employed in community and social services (90.6%) and healthcare (74.3%), whereas men were more likely to be employed in criminal justice (77.1%). For specific job types, women were more likely to be social workers, office and administrative support, nurses, educators and trainers, and administrators, whereas men were more likely to be law enforcement and detention officers. No statistically significant gender differences were found among healthcare technicians, physicians, or respondents categorized as "other."

In terms of demographics, Table 2 shows that more women than men were a person of color, earned a bachelor's degree or higher, and had a low household income. More men than women were married or living with a partner, reported veteran status, and held greater years in their job. No differences were found for documented disability. Turning to trauma exposure, ACEs were higher for women (M=2.41, SD=2.11) than for men (M=1.51, SD=1.62; F=21.53, $p<.001$), but no statistically significant gender differences were found for WTE. Considering health, mental health symptoms were higher for women (M=.21, SD=.97) than for men (M=-.26, SD=.98; F=22.11, $p<.001$). Likewise, physical health symptoms were higher for women (M=.09, SD=1.05) than for men (M=-.12, SD=.93; F=4.15, $p=.04$). No statistically significant gender differences were found for OBT symptoms and substance use. In sum, these findings suggest that women, in comparison to men, faced significantly more adversity. Despite having a higher education, women held jobs largely congruent with traditional gender roles and were more likely to report having a lower income, being a person of color, facing greater childhood adversity,

and experiencing poorer mental and physical health. Women and men did not appear different in terms of age, WTE, OBT symptoms, or substance use.

Childhood and Workplace Trauma Exposures

Our next two research questions ask the following: (1) To what extent are ACEs and WTE associated with OBT symptoms? and (2) Net of other demographic factors, does gender moderate these relationships? To answer these questions, we began by exploring bivariate associations. Scores for both ACEs (r=.21, p<.001) and WTE (r=.15, p<.001) were correlated with OBT symptoms. Likewise, at the multivariate level, these associations retained their statistical significance when both predictors, ACEs and WTE, were entered into a model simultaneously (ACEs: b=.10, p<.001 and WTE: b=.14, p<.006; not presented in tables).

Next, we assessed whether gender moderates these associations, net of demographics, using the six-step sequence described in the analytic strategy above. The final model for OBT symptoms presented in Table 4 shows that gender moderates the association between ACEs and OBT. For women, the relationship was positive and marginally significant (b=.06, p=.06). For men, the relationship was significantly more positive (b=.13, p=.02, indicates the difference between men and women). Conversely, gender did not moderate the association between WTE and OBT. For both men and women, the relationship was positive and significant (b=.11, p=.02). We also explored associations among demographic factors. Age was negatively and significantly associated with OBT (b=-.02, p<.001), whereas number of years in the job was positively and significantly associated with OBT (b=.04, p<.001). No other demographic factors were significantly related to OBT, and gender did not moderate any of the demographic relationships. In sum, the answers to these two research questions were nuanced. First, men with higher ACE scores had higher OBT scores. This relationship was only marginally significant for women, suggesting that women are more resilient in the face of ACEs. In other words, gender moderated the association of ACEs with OBT symptoms, such that women were less affected than men by past trauma. Second, regardless of gender, participants with higher WTE scores and participants who were younger in age or who had more years in the job had higher OBT symptoms. Altogether these findings

suggest that greater ACEs (especially for men), WTE, and years in the job, as well as being younger, all increase risk for OBT.

Occupation-Based Trauma Symptoms and Health

Our final set of research questions ask the following: (1) To what extent are OBT symptoms associated with mental health symptoms, physical health symptoms, and substance use? and (2) Net of trauma exposure (ACEs and WTE) and other sociodemographic factors, does gender moderate these relationships?

Mental Health. Again, we began by exploring bivariate and then multivariate associations. OBT symptoms were correlated with mental health (r=.77, p<.001). However, when ACEs, WTE, and OBT were simultaneously entered into a multivariate model, only ACEs (b=.09, p<.001) and OBT (b=.74, p<.001) retained their significance (not presented in tables). Next, we assessed whether gender moderated these associations, net of demographics, using the six-step sequence described in the analytic strategy above. The final model for mental health presented in Table 4 shows that gender did not have a moderating effect on ACEs, WTE, or OBT. For both men and women alike, ACEs (b=.08, p<.001) and OBT (b=.74, p<.001) were positively and significantly associated with mental health symptoms. Examining demographic factors, gender moderated the relationship between being a person of color and mental health symptoms. For women, being a person of color was negatively and significantly associated with mental health symptoms (b=-.44, p<.001), whereas for men, the effect of being a person of color was significantly larger than for women (b=.65, p=.02, indicates the difference between men and women). The overall effect for men thus equals .21. Stated somewhat differently, this means that nonwhite men had more and nonwhite women had fewer mental health symptoms. No other demographic factors were significantly related to mental health, and gender did not moderate any of the other demographic relationships. Altogether, OBT was associated with greater mental health symptoms, net of trauma exposure (ACEs and WTE) and demographic factors. ACEs were also associated with greater scores, as was being a man of color.

Physical Health. At the bivariate level, OBT was correlated with physical health (r=.45, p<.001). At the multivariate level, when ACEs, WTE, and OBT were simultaneously entered into a multivariate model, only ACEs (b=.11, p<.001) and OBT (b=.41, p<.001) retained their significance (not presented in tables). When assessing the moderating effects of gender, net of demographic factors, the final model for physical health symptoms in Table 4 shows no gender differences in effects. For both men and women, ACEs (b=.10, p<.001) and OBT (b=.41, p<.001) were positively and significantly associated with physical health symptoms. When considering demographic factors, having a bachelor's degree or higher was negatively and significantly associated with physical health symptoms (b=-.34, p<.001). No other demographic factors were significantly related to physical health, and gender did not moderate any of the demographic relationships. Overall, OBT was associated with greater physical health symptoms, net of trauma exposure (ACEs and WTE) and demographic factors. ACEs were also associated with greater physical health symptoms. In contrast, holding a bachelor's degree or higher was associated with fewer physical health symptoms.

Substance Use. At the bivariate level, OBT was marginally correlated with physical health (r=.09, p<.09). At the multivariate level, when ACEs, WTE, and OBT were simultaneously entered into a multivariate model, only ACEs (b=.07, p<.01) retained its significance (not presented in tables). When assessing the moderating effects of gender, net of demographic factors, the final model for substance abuse in Table 4 shows no gender differences. For both men and women, only ACEs were positively and significantly associated with substance use (b=.08, p<.001). Exploring demographics, age (b=-.01, p<.001) and being married or living together (b=-.31, p=.01) were negatively and significantly associated with substance use scores. In total, OBT was not associated with greater substance use, net of trauma exposure (ACEs and WTE) and demographic factors. ACEs, however, were associated with greater substance use. In contrast, being older, as well as being married or living together, was associated with lower substance use.

Discussion

A body of research shows that childhood trauma is associated with poor health outcomes (Kalmakis & Chandler, 2015, Felitti et al., 1998). The current study builds on this work by analyzing trauma and health survey data collected from a gender-balanced sample of workers across a diverse set of organizations as part of a multiphase CBPR project. We focused on the role of gender and, in doing so, pushed forward our understanding on several fronts. The current study begins by exploring basic gender differences across two occupational contexts, two types of trauma exposure, and four domains of health. The extent to which ACEs and WTE were associated with OBT symptoms was then tested. Last, the degree to which OBT symptoms were a determinant of mental health, physical health, and substance use was assessed. Importantly, the moderating effect of gender was examined, net of controls. Taken together, findings from these analyses can help inform the movement to create trauma-informed workplaces (Clement et al., 2018).

Five core findings emerged from our diverse sample of workers in criminal justice, community and social services, and healthcare. First, women faced significantly more adversity. Despite having a higher education, women held jobs largely congruent with traditional gender roles and were more likely to report being a person of color, having a lower income, and experiencing greater childhood adversity and poorer mental and physical health. The women and men in our sample, however, were not different in terms of age, WTE, OBT symptoms, or substance use. Second, greater ACEs (especially for men) and WTE, as well as more years in the job and being younger, increased risk for OBT. Third, OBT and ACEs but not WTE increased risk for mental and physical health symptoms. Only ACEs increased risk for substance use. Fourth, the effect of these predictors was largely similar for both women and men. However, gender moderated the association of ACEs with OBT symptoms and of race with mental health symptoms, such that women were less affected than men by past trauma and by being a person of color. Fifth, respondents with a college degree reported fewer physical health symptoms, and those who were married, cohabitating, or older reported less substance use. Taken together, our core findings add to the

research needed to help understand the interwoven roles of gender, childhood adversity, and WTE on four domains of health.

It is important to recognize the study's limitations before considering the implications of these findings for trauma-responsive organizations. To start, we used a cross-sectional research design that surveyed a convenience sample of professionals working in trauma-exposed organizations, thus limiting causal interpretations and generalizability. Goals for future research include a longitudinal survey and comparison data. Nevertheless, this study successfully surveyed a balanced sample of male and female professionals working in different organizational contexts, achieved a relatively high response, and attained a sample size that was generally larger than those used in most studies of this kind (see Molnar et al., 2020).

In addition, the current study followed a CBPR protocol where building trusting and equitable relationships with community partners was paramount (Israel et al., 2013; Wallerstein & Duran, 2006). As such, we limited data collection to self-report in this early phase of the project and instead relied on a variety of different health measures. Other indicators, such as biomarkers that assess inflammation and cortisol, could help illuminate findings and reveal additional gender differences (e.g., Meewisse, Reitsma, de Vries, Gersons, & Olff, 2007). Last, WTE was measured using one item. Future research should include more detailed measures. Bride (2007) and Butler et al. (2017), for instance, included three related questions (i.e., the extent to which a respondent's work involved traumatized populations, addressed client traumas, and evoked feelings of fear, helplessness, or horror). The trauma field is in need of a thorough, valid, and reliable WTE measure that can be used across a variety of organizational contexts and job types. Still, this study shows that measuring exposure, even with one item, is useful. Despite these limitations, the study will make a substantial contribution to the existing literature.

The findings have significant implications for research and practice as well. Supporting prior research (Baird & Kracen, 2006; Brady, 2007; Choi, 2011; Cieslak et al., 2013; DeVylder, Lalane, & Fedian, 2019; Esaki & Larkin, 2013; Howard et al., 2015; Jordon, 2010; Molnar et al., 2020; Mott & Martin, 2019; Nelson-Gardell & Harris, 2003; Salloum, Kondrat, Johnco & Olson, 2015; Shoji et al.,

2015; Slattery, 2009; Williams, Helm, & Clemens, 2012), trauma exposure was high, a history of trauma was associated with OBT, and, in turn, OBT was associated with poor health. Adding to the research, this study found that even though women experienced more adversity, they were more resilient than men to OBT in the face of ACEs. Altogether, these findings suggest that interventions for OBT that attend to the overlap in different forms of trauma exposure experienced by workers and potential gender differences are needed, though more research is warranted. Evidence-based trainings, for instance, can help organizations and workers recognize that not all symptoms of trauma are a direct result of WTE. Frontline workers employed outside the mental health field—in hospitals and law enforcement agencies, for example—may be less likely to understand that OBT and its health consequences likely stem from a complex mix of exposure, ongoing adversity, and retraumatization (Bulter, Marquin, & Carello, 2018). It is often the case, for instance, that social workers (who were more likely women in our sample) are encouraged during their training to attend to their past histories of trauma through counseling and related forms of self-care (Stozier & Stacey, 2001). Future research exploring academic background and training requirements is recommended as these factors may help explain the resiliency that some women experience. When workers and organizations understand and attend to the different sources of trauma exposure and their health impacts, they can be better supported and ultimately improve services for those who need it most.

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Table 1. Organizational Contexts and Job Types (*n* =391).

	Full Sample:		Women:		Men:		Gender Difference:
	n	%	n	%	n	%	p-value
Organizational Context:							
Criminal Justice	188	48.3	43	22.9	145	77.1	0.00 ***
Community and Social Service	127	32.6	115	90.6	12	9.4	0.00 ***
Healthcare	74	19.0	55	74.3	19	25.7	0.00 ***
Job Type:							
Law Enforcement Officers	127	32.5	16	12.6	111	87.4	0.00 ***
Social Workers	80	20.5	75	93.8	5	6.3	0.00 ***
Detention Officers	38	9.7	5	13.2	33	86.8	0.00 ***
Healthcare Technicians	38	9.7	25	65.8	13	34.2	0.11
Office and Administrative Support	32	8.2	31	96.9	1	3.1	0.00 ***
Nurses	31	7.9	28	90.3	3	9.7	0.00 ***
Educators and Trainers	16	4.1	16	100.0	0	0.0	0.00 ***
Other	15	3.8	9	60.0	6	40.0	0.69
Administrators	8	2.0	8	100.0	0	0.0	0.01 **
Physicians	6	1.5	2	33.3	4	66.7	0.42

Note: Two cases missing data for organizational context. Gender differences tested using Fisher's Exact Tests.

***p≤.001,**p≤.01, *p≤.05, t≤.10 (2-tailed)

Table 2. List of Measures Used for Composite Outcomes.

Composite/Measure:	# Items:	Sample Item:	Item Range and Coding Notes:
Occupation-based Trauma Symptoms:	α=.86		
Secondary Traumatic Stress[1]	17	"It seemed as if I was reliving the traumas experienced by my clients."	1 (never) to 5 (very often)
PTSD Symptoms[2]	20	"Repeated, disturbing, and unwanted memories of the stressful experience?"	0 (not all) to 5 (extremely)
Burnout-related Exhaustion[3]	5	"I feel emotionally drained from my work."	0 (never) to 5 (everyday)
Burnout-related Cynicism[3]	5	"I have become more cynical about whether my work contributes anything."	0 (never) to 5 (everyday)
Mental Health Symptoms:	α=.91		
Perceived Stress [4]	10	"How often have you found that you could not cope with all the things that you had to do?"	0 (never) to 4 (very often)
Anxiety[5]	7	"Feeling nervous, anxious or on edge."	0 (not at all) to 3 (nearly every day)
Depression[6]	8	"Feeling down, depressed, or hopeless."	0 (not at all) to 3 (nearly every day)
Poor Well-being[7]	5	"I have felt cheerful and in good spirits."	0 (at no time) to 5 (all the time); reverse coded
Physical Health Symptoms:	α=.65		
Body Mass[8]	2	"What is your height (in feet and inches)?"	weight (lbs.) × 703, then ÷ by height^2 (inches)
Sleep Distrubance[9]	4	"Have trouble falling asleep?"	0 (not at all) to 5 (22 to 31 days)
General Health[10]	1	"Would you say that in general your health is —"	0 (poor) to 4 (excellent)
Unhealthy Days[10]	1	"...how many days during the past 30 days was your physical health not good?"	0-30 days
Limited Activity[10]	1	"...how many days did poor physical or mental health keep you from doing your usual activities…"	0-30 days
Substance Use:	α=.64		
Alcohol Problems[11]	10	"How many drinks containing alcohol do you have on a typical day when you are drinking?"	0 (varies) to 4 (varies)
Tobacco[12]	1	"In the past year… used any tobacco product (e.g., cigarettes, e-cigarettes, cigars, pipes, or smokeless tobacco)?"	0 (never) to 4 (daily or almost daily)
Marijuana[12]	1	"Used marijuana?"	0 (never) to 4 (daily or almost daily)
Prescription Medication (not prescribed)[12]	1	"Used any prescription medications just for the feeling, more than prescribed or that were not prescribed for you?"	0 (never) to 4 (daily or almost daily)
Illicit Drugs[12]	1	"Used any other drugs including cocaine or crack, heroin, meth, hallucinogens, ecstasy/MDMA?"	0 (never) to 4 (daily or almost daily)

Note: [1]Secondary Traumatic Stress Scale, [2]PTSD Checklist for DSM-5, [3]Maslach Burnout Inventory General Survey, [4]Perceived Stress Scale, [5]Generalized Anxiety Disorder 7-item Scale, [6]Personal Health Questionnaire Depression Scale, [7]Well-Being Index, [8]Body Mass Index, [9]Jenkins Sleep Scale, [10]Health-Related Quality of Life, [11]AUDIT Alcohol Questionnaire, [12]Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool. Items were summed unless otherwise noted.

Table 3. Descriptive Statistics: Demographics, Trauma Exposure, and Health Correlates (n=391).

	Full Sample:						Women:		Men:		Gender Difference:	
	n	Missing	Min	Max	M/%	SD	M/%	SD	M/%	SD	F/X^2	P-Value
Male	391	0	0.00	1.00	45.00%	—	—	—	—	—	—	—
Age	382	9	19.00	72.00	37.43	11.14	36.85	12.08	38.13	9.87	1.26	0.26
Person of Color	389	2	0.00	1.00	7.71%	—	10.75%	—	4.00%	—	6.16	0.01 **
Bachelor's Degree or Higher	391	0	0.00	1.00	66.75%	—	76.74%	—	54.55%	—	21.49	0.00 ***
Married or Living with Partner	388	3	0.00	1.00	72.00%	—	65.00%	—	81.00%	—	12.36	0.00 ***
Low Household Income	386	5	0.00	1.00	19.43%	—	30.19%	—	6.32%	—	34.77	0.00 ***
Disability	391	0	0.00	1.00	13.52%	—	11.96%	—	15.43%	—	1.40	0.24
Veteran	391	0	0.00	1.00	16.79%	—	9.28%	—	25.96%	—	27.21	0.00 ***
Years in Job	389	2	0.08	25.00	5.79	6.18	4.58	5.61	7.27	6.53	19.12	0.00 ***
Adverse Childhood Experiences	380	11	0.00	8.00	2.02	1.96	2.42	2.11	1.51	1.62	21.53	0.00 ***
Workplace Trauma Exposure	391	0	0.00	4.00	2.97	1.00	2.96	1.03	2.99	0.96	0.05	0.83
Occupation-Based Trauma Symptoms	390	1	-1.77	2.85	0.00	1.00	0.06	0.92	-0.07	1.08	1.44	0.23
Mental Health Symptoms	385	6	-1.83	3.04	0.00	1.00	0.21	0.97	-0.26	0.98	22.11	0.00 ***
Physical Health Symptoms	382	9	-1.78	4.07	0.00	1.00	0.09	1.05	-0.12	0.93	4.15	0.04 *
Substance Use	381	10	-0.94	7.45	0.00	1.00	-0.01	1.01	0.02	0.99	0.08	0.78

Note: Gender differences tested using ANOVA and Chi-Square Tests.

***$p \leq .001$,**$p \leq .01$, *$p \leq .05$, $t \leq .10$ (2-tailed)

Table 4. Multivariate OLS Regression - Final Models

	Final Model 1				Final Model 2				Final Model 3				Final Model 4			
	DV=Occupation-Based Trauma Symptoms				DV=Mental Health Symptoms				DV=Physical Health Symptoms				DV=Substance Use			
	b	SE	*b**	*p*	*b*	SE	*b**	*p*	*b*	SE	*b**	*p*	*b*	SE	*b**	*p*
Constant	0.10	0.25	—	0.69	0.11	0.12	—	0.35	-0.10	0.12	—	0.43	0.51	0.20		0.01 *
Male	-0.30	0.14	-0.15	0.04 *	-0.35	0.07	-0.18	0.00 ***	-0.02	0.10	-0.01	0.84	0.18	0.11	0.09	0.09 *t*
Age	-0.02	0.01	-0.23	0.00 ***	0.00	0.00	-0.01	0.84	—	—	—	—	-0.01	0.01	-0.16	0.00 ***
Person of Color	—	—	—	—	-0.44	0.13	-0.12	0.00 ***	—	—	—	—	—	—	—	—
Bachelor's Degree or Higher	—	—	—	—	—	—	—	—	-0.34	0.10	-0.16	0.00 ***	—	—	—	—
Married or Living with Partner	—	—	—	—	—	—	—	—	—	—	—	—	-0.31	0.12	-0.14	0.01 *
Low Household Income	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Disability	—	—	—	—	—	—	—	—	0.29	0.15	0.09	0.06 *t*	—	—	—	—
Disability - Missing	—	—	—	—	—	—	—	—	0.35	0.10	0.16	0.00 ***	—	—	—	—
Veteran	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Veteran - Missing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Years in Job	0.04	0.01	0.24	0.00 ***	-0.01	0.01	-0.06	0.11	—	—	—	—	—	—	—	—
Adverse Childhood Experiences	0.06	0.03	0.12	0.06 *t*	0.08	0.02	0.16	0.00 ***	0.10	0.02	0.19	0.00 ***	0.08	0.03	0.16	0.00 ***
Workplace Trauma Exposure	0.11	0.05	0.11	0.02 *	—	—	—	—	—	—	—	—	—	—	—	—
Workplace Trauma Exposure - Missing	0.25	0.14	0.10	0.06 *t*	—	—	—	—	—	—	—	—	—	—	—	—
Occupation-Based Trauma Symptoms	—	—	—	—	0.74	0.03	0.73	0.00 ***	0.41	0.05	0.41	0.00 ***	—	—	—	—
Male × Adverse Childhood Experiences	0.13	0.05	0.17	0.02 *	—	—	—	—	—	—	—	—	—	—	—	—
Male × Person of Color	—	—	—	—	0.65	0.28	0.08	0.02 *	—	—	—	—	—	—	—	—
Adjusted R^2			0.11				0.66				0.30				0.07	
Analytic *n*			370				368				380				369	

Note: *b* =regression coefficient, SE=standard error, *b** =standardized regression coefficient, *p* =p-value. All predictors and all gender by predictor interactions were tested in earlier models.

***$p \leq .001$,**$p \leq .01$, *$p \leq .05$, *t* ≤.10 (2-tailed)

Endnotes

[1] The survey for the current study asked, “What is your sex/gender?” Response options included “other” and a text-entry option.