HHS Public Access

Author manuscript

Injury. Author manuscript; available in PMC 2022 April 01.

Published in final edited form as:

Injury. 2021 April ; 52(4): 750–756. doi:10.1016/j.injury.2021.02.021.

The relationship between work and mental health outcomes in black men after serious injury

Aimee J. Palumbo[1,2], **Therese S. Richmond**[2,3], **Jessica Webster**[3], **Christopher Koilor**[3], **Sara F. Jacoby**[2,3]

[1]College of Public Health, Temple University, Philadelphia, PA, USA

[2]Penn Injury Science Center, University of Pennsylvania, Philadelphia, PA, USA

[3]School of Nursing, University of Pennsylvania, Philadelphia, PA, USA

Abstract

Objectives.—To explore the association between return to work (RTW) and mental health outcomes in Black men in Philadelphia recovering from serious traumatic injuries.

Methods.—We analyzed data from 498 Black men aged ≥ 18 years living in Philadelphia who were admitted to a Level I trauma center for injury between January 2013 and June 2017. We used multivariable logistic regression to estimate the association between pre-injury occupation, RTW and depression or PTSD 3 months after hospitalization.

Results.—In adjusted analyses, men who had not RTW at follow-up had higher odds of poor mental health outcomes than men who had RTW (OR: 2.7, 95% CI: 1.8, 4.2). Additional significant factors included: younger age, lack of or public health insurance and higher lifetime experiences of racism.

Conclusions.—The mental health recovery trajectory of injured Black men living in Philadelphia is associated with RTW and other factors that can influence financial stability and economic resources.

Policy implications.—Programmatic strategies that seek to optimize recovery after injury in Black men should include consideration of key structural factors such as employment, financial stability, and the impact of racism-related exposures.

Corresponding author: Sara F. Jacoby, Assistant Professor, Department of Family and Community Health, School of Nursing, Fagin Hall 412, 418 Curie Blvd, University of Pennsylvania, Philadelphia, PA 19104, Phone: 215-898-0438, sfjacoby@nursing.upenn.edu.

Conflicts of Interest:
Aimee J. Palumbo - Declarations of interest: none
Therese S. Richmond - Declarations of interest: none
Jessica Webster - Declarations of interest: none
Christopher Koilor - Declarations of interest: none
Sara F. Jacoby - Declarations of interest: none

Keywords

return to work; trauma; mental health; Black men

One's ability to work can suddenly and drastically change in the aftermath of a traumatic injury. Returning to work (RTW) can be a strong indication of healing and rehabilitation and may play a pivotal role in promoting physical and functional recovery.[1,2] This is not surprising given the long-established relationship between work and health: workers in jobs with higher earning potential and social capital experience better overall health outcomes.[3,4] This includes better mental health, as work can enhance individual satisfaction, social connections, and economic security.[5] Conversely, job loss and unemployment, and the economic deprivation, social stress, and downward social mobility that may follow, can be potent threats to health and well-being.[6]

In uninjured populations, RTW after a period of unemployment is beneficial to mental health.[7] The same may be true for populations who lose or have lapses in employment as a result of injury. However, injuries, particularly those that cause long term limitations, may limit the opportunities to reap the health benefits of stable work and financial security. In a recent study in Australia, only half of injured patients reported RTW after 6 months, and 1 in 5 had not returned after 2 years.[1] Mental health after injury may independently predict the likelihood of RTW; injured patients who were working prior to injury and who have symptoms of post-traumatic stress disorder (PTSD) or depression have a lower probability of RTW than patients without PTSD or depression.[8,9]

Different types of jobs and workplaces may hamper or enable the ability of injured people to RTW. For example, persons employed in "white-collar" jobs (i.e. managerial or professional jobs) and jobs with lower physical demands are more likely to RTW after injury.[1,10] By contrast, having lower education, being employed in "blue-collar" work (such as those who work in agricultural and construction industries), and household poverty are associated with prolonged disability and delayed RTW after injury.[11,12] Although many studies have explored relationships between work and health, and injury and RTW, few have identified the unique contribution of RTW after injury on mental health outcomes.[13] Rosenthal et al. found that full-time employment was associated with lower levels of depressive symptoms and healthier behaviors, suggesting that stress from underemployment after injury may lead to unhealthy coping strategies like alcohol consumption, cigarette smoking and unhealthy eating.[13]

The effects of work on post-injury mental health may be particularly pronounced in populations that experience social and economic marginalization leading to chronic un- and underemployment and poverty.[14,15] Low income and less educated Black workers experience worse mental health outcomes after job loss than their white counterparts.[16] Black workers are also less likely to be employed in occupations that accommodate changes in physical ability or provide comprehensive disability benefits.[17,18] In addition, Black workers' exposure to racism can compound the impact of work environment on psychological health as an ever present discriminatory factor in the labor market and an established driver of self-reported stress.[5,19]

Black men in urban settings across the United States (US) are arguably among the most vulnerable to cumulative risks for serious injuries, PTSD and depression, and chronic underemployment and poverty.[20] Recent research has demonstrated that Black men who experience serious injuries in Philadelphia, PA are at high risk for poor mental health outcomes,[21] as their already high exposure to stressors is compounded by the trauma of injury, treatment in the healthcare system, and return to communities where, in many cases, their injury occurred.[20,22] No previous research has explored the unique contributions of RTW after injury on mental health outcomes in urban Black men. Therefore, the goals of this study were two-fold. First, we aimed to describe the extent to which RTW predicts mental health outcomes in Black men after a serious injury. Second, we aimed to identify the factors that influence the relationship between RTW and mental health outcomes, hypothesizing that the type of work performed prior to injury and exposure to racism would be associated with RTW and mental health.

Methods

Data source and variables

This analysis uses data collected from a longitudinal cohort study that explores mental health outcomes following traumatic injury among Black men. The study consecutively enrolled 623 Black men aged ≥ 18 years living in the Philadelphia metropolitan region admitted to Level 1 trauma center with a diagnosis of injury between January 2013 and June 2017. A Level 1 trauma center is a designation indicating that hospital has been accredited at the State-level, and according to standards codified by the American College of Surgeons Committee on Trauma, to have every available resource needed to provide total care for any aspect of severe injuries.[23] Eligibility for the study required the ability to speak and understand English, a normal cognitive status at the time of study entry, and ability to provide written informed consent. Men were excluded if they had pre-existing cognitive status dysfunction (e.g., dementia) or were being treated for depression or PTSD at the time of their injury. The study protocol was reviewed to ensure that it met regulatory and ethical criteria required to protect the rights and welfare of human research subjects and was approved by the Institutional Review Board at by the Institutional Review Board at the University of Pennsylvania.

All participants provided written informed consent prior to any data collection activities and then provided information at a baseline interview (during hospitalization) on their demographic characteristics, previous trauma exposures, and other factors that could influence their mental health outcomes. Participants' injury characteristics were collected from the medical record and trauma registry.

Outcome assessment

Participants completed a follow-up interview at approximately 3 months post-discharge, during which they were assessed for symptoms of depression and PTSD. Depression symptoms were assessed using the Quick Inventory of Depressive Symptoms ($QID\text{-}SR_{16}$), which is a validated self-report scale that assesses the main criteria for Major Depressive Disorder (in the DSM-IV and DSM-5) and was used as a measurement symptom severity.[24]

PTSD was assessed using the PTSD Checklist-5 (PCL-5), which is a validated self-report scale that corresponds with DSM-5 diagnostic criteria for PTSD.[25] Both variables were dichotomized for analysis and standard cutoff values of participants' scores were used to determine whether participants screened positive for depression (score >10) and PTSD (score >33).[26–28] Given the high correlation between depression and PTSD scores in this cohort ($r=0.77$, $p<0.01$), the outcome of 'poor mental health' is the dependent variable in our analysis and was defined by score above the standard cutoff for either depression or PTSD.

Post-Injury Work Status

Current employment and type of work were obtained at the baseline interview. At follow-up interviews, participants were asked whether they returned to the same type of work as before they were injured with one of four possible responses: "No," "Yes – but with limitations," "Yes – part-time," and "Yes – no change." RTW was dichotomized so one category included RTW in any capacity (any "Yes" response) and the other category comprised men who had not returned to work. Analysis was conducted among all men regardless of their employment status at baseline, since being able to work and feel productive may be an important component of recovery regardless of prior employment status. However, we anticipated that the impact of RTW might be most acute for men who were in fact employed at the time of their injury. To explore this further, we also conducted the analysis using the subset of men who reported being employed at baseline.

Job classification

In order to assess the potential impact of job type, we used the NIOSH Industry and Occupation Computerized Coding System (NIOCCS) auto-coding system to classify as many job descriptions as possible into a 2010 Standard Occupational Classification (SOC) code.[29,30] Job texts that were unable to be coded through the auto-coding system were manually searched and subsequently coded using an online tool.[31] Three independent raters were used to classify each job and ensure reliability of classification; any job where all three reviewers did not agree was reviewed by the team until consensus was reached. Non-traditional jobs or jobs that could not be classified according to SOC were manually assigned their own classification code and characteristics. The job coding was limited to the 23 major occupational groups as defined by NIOSH, which were then collapsed into larger categories to allow sufficient sample size in each category (Table 1). Of the 498 participants who were retained at follow-up, job description was non-missing for 465 men (93%). Among these descriptions, 28 men (6%) reported being on social security or disability, 11 (2%) were full-time students, and one participant reported military service that could not be further classified, leaving 425 men with job descriptions that could be assessed. Of the 425 men with classifiable jobs, 180 jobs (42%) could not be auto-coded and required review by the raters. One-hundred fifty-two (36%) of jobs were auto-coded by NIOCCS and 64 of those jobs were changed/refined based on manual review by the raters. Twenty-two men reported odd jobs and three men reported illegal or undocumented work, all of which were classified as 'Other' (6%). Jobs for 395 men were classified into 20 categories that were collapsed into three larger categories: (1) management, professional, and sales; (2) service; and (3) manual labor. Five men who reported general 'labor' as their work were classified into the larger category of manual labor (Table 1).

Confounders

Perceptions of exposure to racism were assessed using a modified version of the Perceived Ethnic Discrimination Questionnaire—Community Version (PEDQ-CV).[32] The PEDQ-CV consists of 17 Likert-scale questions that measure lifetime racial discrimination across several domains. Previous factor analysis found a discrimination at work subscale that included four questions related to unfair treatment at work or school; however, factor analysis of responses in our population did not reveal similar factors.[32] This may be because the original derivation of the work subscale used data from a limited number of Black participants and most participants were women, whereas our sample is Black men living in urban areas. For this population, discrimination at work may not be easily separated from discrimination experiences in other contexts, thus we used the total scale score of lifetime experience of racism in our analysis. Each question ranged from 1 to 5 (for "never" to "often") and we used an average score of all questions; exposure was dichotomized as having experienced substantial perceived discrimination ("racism") if the average score was greater than 2.

Statistical analysis

Bivariate associations between work, screening positive for depression and PTSD, and other potentially confounding variables were estimated using chi-square statistics for categorical variables and analysis of variance for continuous variables. Adjusted multivariable logistic regression (proc logistic) was used to estimate odds ratios and 95% confidence intervals to explore whether *not* returning to work (the independent variable) was associated with the odds of poor mental health (the dependent variable), after adjusting for age (as a continuous variable) and other categorical confounders including education, experience of racism, insurance status, and job type. All variables considered for inclusion in the model, along with their categories, are listed in Table 2; age is described using means with standard deviations and categorical variables are described using frequencies (N) and row percentages (%). Area under the ROC curve was used to assist in selecting the best fitting model, with values closer to 1 indicating better fit. All regression analyses were conducted both with the full cohort and with a dataset limited to men who reported being employed at the time of injury. These analyses were conducted using SAS 9.4.

Results

A total of 623 men were enrolled in the parent cohort study and, of these, 503 (81%) participated in 3-month follow-up interviews and 498 had complete and usable outcome data. Study participants were interviewed in the hospital when medically stable with follow-up interviews conducted on average 130 days (~4.3 months) after injury in participants' homes. The average age of men in this cohort was 37, with ages ranging from 18 to 88 years. At the time of follow-up, only 37% (n=185) of men had RTW. Before their injury, many men (38%) worked in manual labor jobs, and a greater proportion of these men had not RTW at follow-up when compared to men who did other types of work, but the differences were not statistically significant (Table 2). Forty-one percent of participants reported poor mental health at follow-up, and not having RTW was strongly associated with screening positive for both depression ($p<0.01$) and PTSD ($p<0.01$) (Table 2).

Many men reported (41%) having experienced substantial racism (mean score >2) in their lives prior to injury; just 10% reported never experiencing racism (mean score = 1). Age, education, type of insurance, and lifetime experience of racism were independently associated with both RTW and screening positive for depression or PTSD. Participants who had not RTW were slightly older ($p<0.01$), had less education ($p<0.01$), and a higher proportion reported experiencing racism ($p=0.03$) compared to men who had RTW after injury. Overall, 41% of participants had no insurance and 32% had public insurance (Medicaid or Medicare); a greater proportion of men with public insurance had not RTW compared to men with other types of insurance (Table 2). The additional variables that were evaluated but not retained in the final adjusted model due to lack of significant association with either poor mental health or RTW included: marital status, presence of children in the household, perceived social support, income, and perceptions of financial insecurity. Income was associated with poor mental health but not RTW. However, 32% of participants refused or reported unknown income; of the men who did report their income, over half reported earning less than $20,000 and no association was observed between self-reported income and job type ($p=0.24$).

After adjusting for confounding variables, men who had not RTW had 2.7 times the odds of poor mental health than men who had RTW (Odds Ratio [OR]: 2.7, 95% Confidence Interval[CI]: 1.8, 4.2, Table 3). Age, insurance type, and lifetime experience of racism were all strong predictors of poor mental health (all $p<0.01$), with men who had an average racism score >2 having a substantially higher odds of poor mental health than those who had a racism score ≤ 2 (OR: 2.4, 95% CI: 1.6, 3.6, Table 3). Notably, increased age was positively associated with no RTW negatively associated with screening positive for depression or PTSD, so the association of no RTW and poor mental health became even stronger after controlling for age (data not shown). Having public insurance or no insurance was associated with increased odds of poor mental health (OR: 2.7, 95% CI: 1.5, 4.9; OR: 3.2, 95% CI: 1.8, 5.6; respectively). Among men who reported employment of some kind at the time of injury (n=258), 43% had RTW at follow-up. After adjusting for confounders, similar associations between RTW and poor mental health were observed, though the magnitude of the associations was attenuated (Table 3). In addition, in this model, education was no longer statistically significant, however, insurance status and experience of racism remained significantly associated with poor mental health outcomes.

Discussion

This study explored the association between work and mental health outcomes in Black men in Philadelphia recovering from traumatic injury. Overall, we found 37% of our study population had RTW in some capacity at post-discharge follow-up; among men employed at the time of injury, employed in non-manual labor jobs, or with higher education, these proportions were even higher. This is consistent with previous studies that found 44–46% of previously employed men had RTW at 6-months after an injury and RTW was associated with more years of education.[10,33] Although the rates of RTW may be consistent with previous studies, we found that over half of men who had not RTW screened positive for PTSD or depression. Even when controlling for potentially confounding factors, men who

had not RTW had more than twice the odds of poor mental health outcomes when compared with men had RTW.

Contrary to what we hypothesized, the type of job that men held at the time of injury did not confound the association between RTW and mental health outcomes. Although some previous studies found that occupation type was not associated with RTW 6 months following injury,[10,33] recent larger studies found that occupation type was an important factor associated with RTW after 6 months or more.[1,2] Notably, these studies focused on work status at 6 months or more following injury, and our RTW status was assessed earlier; it may have been too early to observe differences. There were several instances in which it was difficult to classify participants' jobs into the standardized jobs types defined by NIOCCS. It is possible that lack of association between occupation type and mental health was due to some degree of job type misclassification. Most of the jobs listed by men could not be coded automatically; although the primary study from which data for this study was derived was not designed to collect detailed occupational information, previous studies have found much higher rates of automated occupational coding.[34] The inability to reliably code jobs automatically may, in fact, reflect the complicated nature of the precariousness of work that cohort members performed prior to injury and that many of these men acquired their economic resources through multiple jobs across multiple sectors of the economy.

While previous research has identified professional, "white-collar" jobs as health protective, cohort members who reported employment in management, professional, and sales jobs reported income that was relatively low, with 75% reporting annual household income below the median income for Philadelphia and 51% (n=35) reporting income below $20,000. This speaks to the deep poverty impacting Black men in this cohort, and Black residents of Philadelphia in general,[35] and may be another reason why expected differences were not observed. Although poverty has declined nationwide, pockets of severe poverty continue, especially in Philadelphia where the poverty rate has not changed meaningfully since 2015.[36] While many of the men in our study were employed at baseline, Black men in Philadelphia have the highest rates of unemployment of any demographic group in the city. Furthermore, certain neighborhoods in Philadelphia, including the neighborhoods of many men in this study, have unemployment rates over 50% higher than the average rate for the city.[37] Thus, in addition to the personal barriers that impede recovery and RTW, these men may face additional structural barriers that further limit their ability to RTW if they are not able to return to a job they had prior to their injury.

A substantial proportion of participants presented to the hospital without health insurance and there are long-standing racial disparities in insurance coverage rates.[38] Inadequate insurance coverage may restrict access to and appropriate use of rehabilitative services after injury and the ability to access mental health services.[10] Although the Affordable Care Act has expanded access to public insurance, the cost barriers for people without insurance and with private insurance increased between 1999 and 2010.[39] The combination of low income and increasing cost of accessing services may explain why men with no insurance had a three-fold increased odds of poor mental health when compared to men with private insurance.

In an Australian study of injury outcomes, the perception of having been wronged or discriminated against in the aftermath of an injuring event was associated with increased risk of not RTW following injury.[40] Although we were unable to discern perceptions of discrimination proximate to the injury itself, we found that experiences of racism within and beyond the workplace to be a significant factor in the relationship between RTW and mental health outcomes. Although these experiences were measured via self-report instruments and were not specific to either current or past jobs, it is reasonable to expect that experiences in seeking, performing and losing work would influence overall perceptions of racism. These experiences may limit men's motivation to RTW after injury if their workplace is an environment in which they feel discriminated against or feel lack social and practical support, as there is strong evidence that social support is protective against depression and is associated with increased likelihood of RTW.[10,33,41] Experiences of racism may not only influence likelihood of RTW, but also the ability to fully recover after trauma. Lifetime experiences of race-based discrimination and systemic racism may limit trust in medical providers and health seeking behavior, further potentiating poor physical and mental health outcomes after injury.[42,43]

The findings of this study should be interpreted in the context of its limitations. This is secondary analysis of a study which was not designed to specifically explore the influence of work on post-injury outcomes. Therefore, this current study may not have been powered to detect statistically significant differences in mental health outcomes across multiple types of work. We were unable to assess the effects of theoretically important confounding or mediating factors not captured in the parent study such as: access to disability insurance, and variables that quantify the physical demands of individuals' work, or the extent of social and economic support (either at work or at home) available to men following their hospitalization. Inclusion of these factors in future research may yield more robust models through which we may better explore the underlying pathways in the complex relationships between injury, financial security, work, racial discrimination and mental health. Nonetheless, this study expands on previous associations found between specific employment and work related factors and health inequalities after injury.[44] It also demonstrates the importance of structural vulnerabilities[45] as influences on the recovery trajectory of injured Black men living in Philadelphia and likely many other cities in the US. These are the kinds of vulnerabilities, or risks for negative health outcomes, that hinge on position within a socioeconomic, political and cultural/normative hierarchy and that take shape in the way that work and employment, demographic attributes, and social identity challenge the opportunity to achieve as full a recovery as is possible.[45,46]

Public and Clinical Health Implications.

This study identifies the importance of supporting Black men living in urban areas to RTW and enhance their economic security following serious injury, not just as a marker of trauma recovery, but also as a component of mental health care after hospitalization. Interventions that support RTW can be situated within or in addition to injury recovery strategies that enhance engagement with mental health services for patients who meet screening criteria for depression and PTSD. Our findings further demonstrate the impact that experiences of racism within and beyond the workplace may play in mental health outcomes after injury.

Given the prevalence of PTSD and depression in recently injured Black men in Philadelphia, [21] future research and programmatic strategies should include attention to structural vulnerabilities after injury including workplace characteristics and work-related stressors to understand and integrate how those factors influence opportunities for optimal recovery.

Acknowledgements:

This study was funded, in part, by the National Institute of Nursing Research of the National Institutes of Health (grant R01NR013503, Richmond) and the Penn Injury Science Center (Palumbo and Jacoby) with support from the Centers for Disease Control (R49CE002474). The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the National Institutes of Health or the Centers for Disease Control and Prevention.

References

1. Collie A, Simpson PM, Cameron PA, et al. Patterns and Predictors of Return to Work After Major Trauma Overview of Participants. Ann Surg. 2019;269(5):972–8. doi:10.1097/SLA.0000000000002666 [PubMed: 29342014]
2. Gabbe BJ, Simpson PM, Harrison JE, et al. Return to Work and Functional Outcomes After Major Trauma: Who Recovers, When, and How Well? Ann Surg. 2016;263(4):623–32. doi:10.1097/SLA.0000000000001564 [PubMed: 26779977]
3. Marmot MG, Smith GD, Stansfeld S, et al. Health inequalities among British civil servants: the Whitehall II study. Lancet. 1991;337(8754):1387–93. [PubMed: 1674771]
4. Adler NE, Boyce T, Chesney MA, et al. Socioeconomic status and health. The challenge of the gradient. Am Psychol. 1994;49(1):15–24. [PubMed: 8122813]
5. Blustein DL. The Role of Work in Psychological Health and Well-Being: A Conceptual, Historical, and Public Policy Perspective. Am Psychol. 2008;63(4):228–40. doi:10.1037/0003-066X.63.4.228 [PubMed: 18473608]
6. Brand JE. The Far-Reaching Impact of Job Loss and Unemployment. Annu Rev Sociol. 2015;41:359–75. doi:10.1146/annurev-soc-071913-043237 [PubMed: 26336327]
7. Rueda S, Chambers L, Wilson M, et al. Association of returning to work with better health in working-aged adults: A systematic review. Am J Public Health. 2012;102(3):541–56. doi:10.2105/AJPH.2011.300401 [PubMed: 22390520]
8. Zatzick D, Jurkovich GJ, Rivara FP, et al. A national US study of posttraumatic stress disorder, depression, and work and functional outcomes after hospitalization for traumatic injury. Ann Surg. 2008;248(3):429–37. doi:10.1097/SLA.0b013e318185a6b8 [PubMed: 18791363]
9. Mason S, Wardrope J, Turpin G, Rowlands A. Outcomes after injury: A comparison of workplace and non workplace injury. J Trauma. 2002;53(July):98–103. [PubMed: 12131397]
10. MacKenzie EJ, Morris JA Jr., Jurkovich GJ, et al. Return to work following injury: the role of economic, social, and job-related factors. Am J Public Health. 1998;88(11):1630–7. doi:10.2105/AJPH.88.11.1630 [PubMed: 9807528]
11. Krause N, Frank JW, Dasinger LK, Sullivan TJ, Sinclair SJ. Determinants of duration of disability and return to work after work related injury and illness: Challenges for future research. Am J Ind Med. 2001;40(4):464–84. [PubMed: 11598995]
12. Meerding WJ, Looman CWN, Essink-Bot M-L, Toet H, Mulder S, van Beeck EF. Distribution and determinants of health and work status in a comprehensive population of injury patients. J Trauma. 2004;56(1):150–61. doi:10.1097/01.TA.0000062969.65847.8B [PubMed: 14749582]
13. Rosenthal L, Carroll-scott A, Earnshaw VA, Santilli A, Ickovics JR. The importance of full-time work for urban adults' mental and physical Health. Soc Sci Med. 2012;75(9):1692–6. doi:10.1016/j.socscimed.2012.07.003.The [PubMed: 22858166]
14. Wilson V Black Unemployment Is at Least Twice as High as White Unemployment at the National Level and in 14 States and the District of Columbia. Washington, D.C.; 2019.
15. Thiede BC, Kim H, Valasik M. Concentrated Poverty Increases in Both Rural and Urban Areas since 2000, Reversing Declines in the 1990s. Durham, NH; 2017.

16. Hamilton VL, Broman CL, Hoffman WS, Deborah S. Hard Times and Vulnerable People: Initial Effects of Plant Closing on Autoworkers' Mental Health. J Health Soc Behav. 1990;31(2):123–40. [PubMed: 2102492]
17. Melamed D, Zuganelli DH. Ecological Race Differences in the Occupational Structure. Sociol Spectr. 2013;33(4):341–57. doi:10.1080/02732173.2013.732888
18. Stoll MA, Holzer HJ, Ihlanfeldt KR. Within Cities and Suburbs: Racial Residential Concentration and the Spatial Distribution of Employment Opportunities across Submetropolitan Areas; 1999.
19. Din-Dzietham R, Nembhard WN, Collins R, Davis SK. Perceived stress following race-based discrimination at work is associated with hypertension in African-Americans. The metro Atlanta heart disease study, 1999–2001. Soc Sci Med. 2004;58(3):449–61. doi:10.1016/S0277-9536(03)00211-9 [PubMed: 14652043]
20. Alim TN, Graves E, Mellman T a, et al. Trauma exposure, posttraumatic stress disorder and depression in an African-American primary care population. J Natl Med Assoc. 2006;98(10):1630–6. [PubMed: 17052054]
21. Richmond TS, Wiebe DJ, Reilly PM, Rich J, Shults J, Kassam-Adams N. Contributors to Postinjury Mental Health in Urban Black Men with Serious Injuries. JAMA Surg. 2019. doi:10.1001/jamasurg.2019.1622
22. Rich JA, Grey CM. Pathways to Recurrent Trauma Among Young Black Men: Traumatic Stress, Substance Use, and the "Code of the Street." Am J Public Health. 2005;95(5):816–24. [PubMed: 15855457]
23. PTSF. PA Trauma Systems Foundation. http://www.ptsf.org/our-trauma-centers/whats-trauma. Published 2018.
24. Rush AJ, Trivedi MH, Ibrahim HM, et al. The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), Clinician Rating (QIDS-C), and Self-Report (QIDS-SR): A Psychometric Evaluation in Patients with Chronic Major Depression. Biol Psychiatry. 2003;54(5):573–83. doi:10.1016/S0006-3223(03)01866-8 [PubMed: 12946886]
25. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL. The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. J Trauma Stress. 2015;28:489–98. doi:10.1002/jts [PubMed: 26606250]
26. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). Natl Cent PTSD. 2013;5(8):2002. doi:10.1037/t02622-000
27. Quick inventory of depressive symptomatology. Traumadissociation.com.
28. Lamoureux BE, Linardatos E, Fresco DM, Bartko D, Logue E, Milo L. Using the QIDS-SR16 to Identify Major Depressive Disorder in Primary Care Medical Patients. Behav Ther. 2010;41(3):423–31. doi:10.1016/j.beth.2009.12.002 [PubMed: 20569790]
29. Bureau of Labor Statistics US. SOC 2010 User Guide. 2010;(2).
30. The National Institute for Occupational Safety and Health (NIOSH). Coding Software. Industry and Occupation Coding.
31. O*NET-SOC Auto Coder. 2017.
32. Brondolo E, Kelly KP, Coakley V, et al. The perceived ethnic discrimination questionnaire: Development and preliminary validation of a community version. J Appl Soc Psychol. 2005;35(2):335–65. doi:10.1111/j.1559-1816.2005.tb02124.x
33. MacKenzie EJ, Shapiro S, Smith RT, Siegel JH, Moody M, Pitt A. Factors influencing return to work following hospitalization for traumatic injury. Am J Public Health. 1987;77(3):329–34. doi:10.2105/AJPH.77.3.329 [PubMed: 3812840]
34. Burstyn I, Slutsky A, Lee D, Singer A, An Y, Michael YL. Beyond Crosswalks: Reliability of Exposure Assessment Following Automated Coding of Free-Text Job Descriptions for Occupational Epidemiology. Ann Occup Hyg. 2014;58(4):482–92. doi:10.1093/annhyg/meu006 [PubMed: 24504175]
35. The Pew Charitable Trusts. Philadelphia's Poor: Who They Are, Where They Live, and How That Has Changed Washington, D.C.; 2017.
36. Lubrano A Around the country, incomes are rising. In Philly, they're falling. The Philadelphia Inquirer. 9 2018.
37. Philadelphia Works. Philadelphia's Labor Force. Workforce Trends & Data.

38. Richardson LD, Norris M. Access to Health and Health Care: How Race and Ethnicity Matter. Mt Sinai J Med. 2010;77:166–77. doi:10.1002/MSJ [PubMed: 20309927]

39. Rowan K, McAlpinea D, Blewett L. Access and Cost Barriers to Mental Health Care by Insurance Status, 1999 to 2010. Heal Aff (Millwood). 2013;32(10):1723–30. doi:10.1377/hlthaff.2013.0133.Access

40. Giummarra MJ, Cameron PA, Ponsford J, et al. Return to Work After Traumatic Injury: Increased Work-Related Disability in Injured Persons Receiving Financial Compensation is Mediated by Perceived Injustice. J Occup Rehabil. 2017;27(2):173–85. doi:10.1007/s10926-016-9642-5 [PubMed: 27150733]

41. Gariépy G, Honkaniemi H, Quesnel-Vallée A. Social support and protection from depression: Systematic review of current findings in western countries. Br J Psychiatry. 2016;209(4):284–93. doi:10.1192/bjp.bp.115.169094 [PubMed: 27445355]

42. Feagin J, Bennefield Z. Systemic racism and U.S. health care. Soc Sci Med. 2014;103. doi:10.1016/j.socscimed.2013.09.006

43. Dovidio JF, Penner LA, Albrecht TL, Norton WE, Gaertner SL, Shelton JN. Disparities and distrust: the implications of psychological processes for understanding racial disparities in health and health care. Soc Sci Med. 2008;67(3):478–86. doi:10.1016/j.socscimed.2008.03.019 [PubMed: 18508171]

44. Muntaner C, Solar O, Vanroelen C, et al. Unemployment, informal work, precarious employment, child labor, slavery, and health inequalities: pathways and mechanisms. Int J Heal Serv. 2010;40(2):281–95. doi:10.2190/HS.40.2.h

45. Bourgois P, Holmes SM, Sue K, Quesada J. Structural Vulnerability: Operationalizing the Concept to Address Health Disparities in Clinical Care. Acad Med. 2017;92(3):299–307. doi:10.1097/ACM.0000000000001294 [PubMed: 27415443]

46. Bourgois P, Hart LK. Commentary on Genberg et al. (2011): The structural vulnerability imposed by hypersegregated US inner-city neighborhoods - a theoretical and practical challenge for substance abuse research. Addiction. 2011;106(11):1975–7. doi:10.1111/j.1360-0443.2011.03615.x [PubMed: 21978310]

Highlights

- For Black men who survive serious injuries, work-related factors are associated with mental health recovery
- Men who had not returned to work had twice the odds of poor mental health than men who had returned to work
- Experiences of racism and health insurance status were also associated with mental health outcomes after injury

Table 1.

General occupational and Standard Occupational Classification and other categories of study participants (N=425).

General category	Standard Occupational Classification (SOC) Category	SOC Code	N (%)
Management, professional, sales			*95 (22)*
	Management	11	9 (2)
	Business and financial operations	13	5 (1)
	Computer and mathematical	15	4 (1)
	Life, physical, and social science	19	1 (0)
	Community and social service	21	6 (1)
	Education, training, and library	25	2 (0)
	Arts, design, entertainment, sports and media	27	5 (1)
	Healthcare practitioners and technical	29	3 (1)
	Sales and related	41	31 (7)
	Office and administrative support	43	29 (7)
Service			*114 (27)*
	Healthcare support	31	4 (1)
	Protective service	33	19 (4)
	Food preparation and serving related	35	43 (10)
	Building and grounds cleaning and maintenance	37	35 (8)
	Personal care and service	39	13 (3)
Manual labor			*191 (51)*
	Farming, fishing, and forestry	45	1 (0)
	Construction and extraction	47	85 (20)
	Installation, maintenance, and repair	49	29 (7)
	Production	51	19 (4)
	Transportation and material moving	53	52 (12)
	General ‘labor’	n/a	5 (1)
Other			*25 (6)*
	Odd jobs	n/a	22 (5)
	Illegal/unreported work	n/a	3 (1)

Table 2.

Descriptive characteristics of study participants by follow-up return to work (RTW) status (N=498)

Variable	Category	RTW at follow-up, N(%)		P value
		No (*n=313*)	Yes (*n=185*)	
Age (mean, StDev)		38.9 (16.1)	33.4 (13.7)	<0.001
Baseline employment status				0.003
	Employed	148 (57.4)	110 (42.6)	
	Unemployed	136 (72.3)	52 (27.7)	
	Homemaker/Student/Retired	29 (55.7)	23 (44.2)	
Job classification				0.22
	Management, professional, sales	52 (54.7)	43 (45.3)	
	Service	69 (60.5)	45 (39.5)	
	Manual labor	125 (64.7)	67 (35.3)	
	Other	16 (64.0)	9 (36.0)	
	Missing or non-working	53 (71.6)	21 (28.4)	
Needed to but couldn't see a doctor because of cost				0.21
	Yes	116 (67.4)	56 (32.6)	
	No	195 (60.2)	129 (39.8)	
Insurance				<0.01
	Private insurance	60 (54.1)	51 (45.9)	
	Public insurance	119 (74.4)	41 (25.6)	
	No insurance/self-pay	122 (59.2)	84 (40.8)	
	Missing or unknown	12 (57.1)	9 (42.9)	
Income category				0.36
	Less than 20K	129 (67.5)	62 (32.5)	
	Between 20 and 40K	52 (59.1)	36 (40.9)	
	Greater than 40K	33 (56.9)	25 (43.1)	
	Unknown	91 (62.8)	54 (37.2)	
	Refused	8 (50.0)	8 (50.0)	
Education				<0.01
	Less than HS	78 (72.9)	29 (27.1)	
	HS diploma/GED	160 (64.3)	89 (35.7)	
	More than HS	75 (52.8)	67 (47.2)	
Discrimination at work subscale (>2)				0.03
	No	185 (59.3)	127 (40.7)	
	Yes	128 (68.8)	58 (31.2)	
Discrimination (full scale >2)				0.03
	No	172 (58.9)	120 (41.1)	
	Yes	141 (68.4)	65 (31.6)	
Depression screen positive				<0.01
	No	176 (54.5)	147 (45.5)	
	Yes	137 (78.3)	38 (21.7)	

Variable	Category	RTW at follow-up, N(%)		P value
		No (*n=313*)	Yes (*n=185*)	
PTSD screen positive				<0.01
	No	205 (57.7)	150 (42.3)	
	Yes	108 (75.5)	35 (24.5)	
Poor Mental Health (PTSD or Depression)				<0.01
	No	160 (54.2)	135 (45.8)	
	Yes	153 (75.4)	50 (24.6)	

Table 3.

Relative odds of poor mental health (PSTD or depression) after injury among all participants and among participants employed at baseline

	All participants (N=498)		Employed at baseline (N=258)	
Variable	**OR**	**95% Confidence Interval**	**OR**	**95% Confidence Interval**
Area under ROC curve	*0.733*		*0.727*	
Not returning to work	2.7	1.8, 4.2	2.1	1.2, 3.8
Age	0.97	0.96, 0.98	0.97	0.95, 0.99
Education				
HS/GED (vs More than HS)	1.4	0.86, 2.3	1.2	0.60, 2.3
Less than HS (vs More than HS)	1.9	1.0, 3.4	1.9	0.76, 4.7
Racism (yes vs no)	2.4	1.6, 3.6	2.0	1.2, 3.6
Insurance				
Public vs. Private	2.7	1.5, 4.9	3.0	1.3, 6.8
No insurance/self-pay vs. Private	3.2	1.8, 5.6	2.5	1.2, 5.2
Missing vs. Private	2.7	0.96, 7.8	1.8	0.42, 7.4
Job type				
Manual labor vs. management	1.2	0.69, 2.2	1.6	0.73, 3.5
Service vs. management	0.81	0.43, 1.5	1.3	0.58, 3.1
Other vs. management	0.67	0.25, 1.8	0.77	0.14, 4.2
Missing vs. management	1.4	0.68, 2.8	2.6	0.69, 9.9