Title

Post-traumatic stress disorder symptoms and associated health and social vulnerabilities in older jail inmates

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Authors

Flatt, Jason D
Williams, Brie A
Barnes, Deborah
et al.

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Objectives

To examine post-traumatic stress disorder (PTSD) symptoms in older jail inmates, and to determine whether adverse social and health-related characteristics were associated with having PTSD symptoms.

Method

We performed an exploratory cross-sectional study of 238 older (age ≥ 55 years) jail inmates from a county jail. PTSD symptoms were determined using the Primary Care PTSD (PC-PTSD) screen. Reporting three or more PTSD symptoms was defined as a positive screen. Descriptive statistics and multiple regression analyses were used to examine the prevalence of a positive PTSD screen and associations with social and health-related characteristics.

Results

The mean age was 59 years, 64% were Black, and 82% reported an annual income ≤ $15,000. Nearly 40% of older jail inmates had a positive PTSD screen and 10% reported a prior PTSD diagnosis by a physician. Older jail inmates with a positive PTSD screen were significantly more likely than those with a negative PTSD screen to report medication insecurity in the past year,

impairment in two or more activities of daily living, traumatic brain injury, pain in the past week, and poor self-rated health.

Conclusion

Over one in three of the older jail inmates in this study had a positive PTSD screen, though only one in five of those with a positive screen reported a prior PTSD diagnosis. Screening for PTSD in jails may help identify older inmates who would benefit from additional mental health treatment and reentry planning to improve health in this population.

Keywords (3 to 5): PTSD, incarceration, geriatric, health

Introduction

A rapidly growing number of older adults with complex health care needs are arrested and detained in U.S. jails each year (Snyder, 2012). Between 1996 and 2008, the population of older adults cycling through U.S. jails increased by more than 250% to over 500,000 (Beck & Berzofsky, 2010; Williams et al., 2014). These older inmates experience disproportionately high rates of chronic conditions and lower self-rated health and many suffer from mental health conditions, including major depression, mania or psychotic disorder (Chodos et al., 2014).

There is limited research on post-traumatic stress disorder (PTSD) among older jail inmates. In contrast to prisons, which generally house persons convicted of a crime and sentenced to incarceration for more than one year, jails house inmates who are awaiting trial or serving short sentences. Approximately 50% of jail inmates have not been convicted of a crime and are held in custody for being unable to meet the financial requirements of bail (Beck, 2006). The average length of stay in jails is less than 30 days. Evidence from the prison system suggests that PTSD may be a considerable but overlooked mental health challenge for older adults in the criminal justice system. Several prison studies have identified high rates of PTSD among prisoners compared to the general population (Ardino, 2012; Goff, Rose, Rose, & Purves, 2007). Others have shown that individuals of all ages involved within the criminal justice system are at a greater risk of exposure to stress and trauma (Sadeh & McNiel, 2015).

Older adults in the criminal justice system may be at an even greater risk for PTSD due to the high prevalence of early-life trauma and the impact of lifelong stress on this population (Krause, 2004; Maschi, Morgen, Zgoba, Courtney, & Ristow, 2011). According to the cumulative

advantage/disadvantage theory, the cumulative effects of experiencing trauma and stressful events over the life course may heighten the risk for poor physical and mental health in later life (Dannefer, 2003; Machi et al., 2011; Sachs-Ericsson, Joiner, Cougle, Stanley & Sheffler, 2016). It may also increase the risk for subsequent and reoccurring health problems and social disadvantages (poor health, disability, poverty, homelessness, discrimination, and violent trauma) over the life course. Criminal justice-involved older adults may be more likely to have experienced several traumatic and stressful life events (Machi et al., 2011). For instance, one study conducted in a state prison found that nearly 80% of older prisoners had experienced at least one or more traumatic or stressful events during their lifetime (Haugebrook, Zgoba, Maschi, Morgen, & Brown, 2010). A more recent study found similar rates of stress and trauma in 677 older prisoners, with 70% experiencing one or more traumatic or stressful life events and an average of 11 occurrences over their lifetime (Maschi, Viola, & Morgen, 2014). This included episodes of major distress over the past year, with more than half of participants reporting abuse or stress while incarcerated, money problems, and high levels of subjective distress (Maschi, Viola, & Morgren, 2014).

PTSD is an area of growing concern for older adults as a larger number of Vietnam-era Veterans (nearly one million) are entering old age (Weiss, 1992). It has been estimated that more than 30% of Vietnam-era Veterans have experienced some degree of PTSD (Weiss, 1992), and those who have experienced combat may have a higher risk for PTSD (Kang, Aldwin, Choun, & Spiro, 2016; Sachs-Ericsson et al., 2016). Veterans with PTSD have higher rates of criminal justice involvement than those without PTSD (Elbogen et al., 2012). It is likely that as Vietnam-era Veterans age, the number of older Veterans with PTSD incarcerated in jails will grow.

PTSD may exacerbate the social disadvantages and health problems that are already common for older inmates. In the non-prisoner population, older adults with PTSD are more likely to experience recurring trauma, alcohol and substance use disorders, and chronic conditions, including hypertension, heart disease and arthritis (Pietrzak, Goldstein, Southwick, & Grant, 2012). On average, older jail inmates are disproportionately burdened by multiple chronic health conditions, pain, and functional impairment or disability, as well as behavioral health risk factors including alcohol and substance use disorders (Chodos, et al., 2014; Williams, et al., 2014). To our knowledge, no studies have investigated the presence of PTSD symptoms and related health and social characteristics in older jail inmates. In order to identify the degree to which evaluation and treatment services for PTSD may be needed for older jail inmates, we examined the prevalence of screening positive for PTSD as well as associations with adverse health and social outcomes among a sample of older jail inmates. We also examined whether screening positive for PTSD was more or less likely to occur in older Veterans vs. non-Veterans.

Methods

Research Design

We performed an exploratory cross-sectional study of the health and healthcare needs of 250 older jail inmates (age 55 or older) incarcerated in a county jail in San Francisco, CA, between May and November 2012. Previous studies in criminal justice populations have defined older adults as age 55 or older (Williams, Stern, Mellow, Safer, & Greifinger, 2012) because they

experience rates of functional impairment and multiple chronic conditions in older inmates that are comparable to non-incarcerated populations nearly 10-15 years older.

Participants

Utilizing consecutive sampling, inmates who spent 48 hours or more in jail were enrolled. The 48-hour cutoff was used because inmates are often unable to participate in interviews when in transit or in court after initial arrest. Older inmates were excluded from this study if they were housed in the jail but released from custody in under 48 hours, did not speak English, Spanish, or Cantonese as their primary language, or were deemed a safety risk to interviewers by the Sheriff's deputy on duty in the jail.

Once potential participants agreed to be contacted about the study, research staff briefly described the purpose and procedures of the study and answered participants' questions prior to obtaining consent. Consent for study participation was accomplished through a teach-to-goal method (Sudore et al., 2006), in which participants were required to correctly answer nine true or false questions about the study and related procedures in order to be eligible to participate. All interviews with Spanish and Cantonese-speaking participants were conducted by a native-speaking interviewer using professionally translated consent forms and study materials that had been back-translated and piloted to ensure accuracy. Consistent with federal regulations governing prisoner research (Code of Federal Regulations Title 45 Part 46 Subpart C, (2013), permitted practice in California (Smoyer, Blankenship, & Belt, 2009), and relevant ethical considerations (Hanson, Letourneau, Olver, & Miner, 2012), participants were paid $10 as compensation for their time. This study was approved by the Human Research Protection Program at the University of California, San Francisco.

Measures

Demographic characteristics

Participants completed a one-hour, face-to-face interview, including open- and closed-ended questions on physical and mental health (including function, cognition, and behavioral health), and social and demographic characteristics. Demographic characteristics included self-reported age, gender, race/ethnicity, and education (less than high school vs. general education development (GED) or higher). Annual self-reported income (categorized as ≤ $15,000 vs. > $15,000) was based on the new Affordable Care Act cut-off for Medicaid minimum income eligibility criteria of 133% of the federal poverty level in 2013 (The Henry J. Kaiser Family Foundation, 2013). Veteran status was measured with three questions that asked about past service in the U.S. Armed Forces (yes or no), seeing combat (yes or no), and the type of discharge (honorable or other).

Health-related characteristics

Participants reported current self-rated health based on a five-point scale from poor to excellent, which was a previously validated item from the SF-12 (Jenkinson et al., 1997). Health conditions were assessed through a combination of chart review and self-report using previously validated questions from the Health and Retirement Study (National Institute on Aging, 2012). The use of self-report has been validated in older adults, including with vulnerable populations such as the homeless. Medical chart review was conducted for all participants who consented in order to increase detection of diagnoses for those participants who do not know their medical conditions. Prior to their participation in this study, all inmates received a brief medical screening by a jail

clinician at intake. Medical data from any prior jail stays was also included in the jail medical record. Traumatic Brain Injury (TBI) was assessed by asking participants if they had ever, in their lives, experienced an injury to the head that knocked them out or left them dazed, confused, or disoriented. Participants who answered yes were asked how many such injuries they had sustained. For each reported injury, participants were asked if the injury results in no loss of consciousness, loss of consciousness for less than 30 minutes, or loss of consciousness for 30 minutes or more. Functional impairment was defined as reporting difficulty with two or more Activities of Daily Living (ADLs), including bathing, feeding, dressing, transferring, or toileting (Lawton & Brody, 1969).

Social-related characteristics

Social factors included food and medication insecurity, drug use, and problem alcohol use (Stewart, Thrasher, Goldberg, & Shea, 2012). Food and medication insecurity were each assessed with one, yes or no question on whether there was ever a time that participants did not have enough money for food and prescribed medications in the past 12 months. Drug use was assessed via a diagnosis in the jail medical record and/or participants' response to a validated item from the Drug Abuse Screening Test (Skinner, 1982). Problem alcohol use was assessed via the AUDIT-C, a three-item alcohol screen which has been shown to have a high sensitivity (86%) and specificity (72%) for identifying individuals who engage in heavy drinking and alcohol abuse or dependence (K. Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). Participants also self-reported if their arrest was for alcohol or drug-related charges. Homelessness was defined as having a history of pre-detainment homelessness (needing to spend one or more nights outside or in a homeless shelter within the 30 days prior to incarceration) to be consistent with the most

common definition in the field (Homeless Emergency Assistance and Rapid Transition to Housing Act, 2009).

Post-Traumatic Stress Disorder Symptoms

Prior diagnosis of PTSD by a physician was measured using self-report. Participants were asked to report any prior psychiatric diagnoses, to which PTSD was a possible response. In addition, all participants completed the validated Primary Care PTSD (PC-PTSD) screen (Prins et al., 2003). The PC-PTSD was originally designed to screen patients of busy primary care offices for referral for a diagnostic interview. The PC-PTSD is a 4-item screen that assesses four factors commonly experienced by those with PTSD: re-experiencing, numbing, avoidance, and hyper-arousal (Asmundson et al., 2000). The PC-PTSD asks a series of four yes or no questions, such as "During your life, have you had any experience that was so frightening, horrible or upsetting that, in the past month, you recently have had nightmares about it or thought about it when you did not want to?" Previous studies with middle-aged Veterans and individuals with substance use disorders showed that a cutoff score of three out of four on the PC-PTSD had high sensitivity and specificity (>80%) for detecting PTSD symptoms compared to the Davidson Trauma Scale and Clinician Administered PTSD Scale (Calhoun et al., 2010; Kimerling, Trafton, & Nguyen, 2006). Accordingly, participants in this study with a positive screen were defined as those who reported three or more PTSD symptoms on the PC-PTSD. Cronbach's alpha for the PC-PTSD in this study was .85.

Analyses

Descriptive statistics were generated for all demographic, heath and social characteristics. Associations between health and social characteristics and a positive screen on the PC-PTSD were examined using bivariate analyses, including chi-square tests for categorical variables and t-tests for continuous variables. PC-PTSD results were also examined by Veteran status to account for the higher prevalence of PTSD in this population.

Multivariate logistic regression models were used to examine independent relationships between social and health-related characteristics and odds of positive PTSD screen, with results presented as odds ratios (OR) and 95% confidence intervals (CIs). Only health and social characteristics that were significantly associated with a positive PTSD screen (p-value < 0.05) in bivariate analyses were tested in the final models. Based on a priori expectations, models were adjusted for age (years), race/ethnicity (White vs. non-White), education (< high school, high school/GED or some college or higher), and income (≤$15,000 vs. > $15,000). All analyses were conducted using SPSS (Statistical Package for Social Sciences) version 22.0. Study data were collected and managed using REDCap electronic data capture (Harris et al., 2009).

Results

Over the study period, 319 older inmates were recruited using consecutive sampling of which 23 (7%) were ineligible (7 (2%) did not speak English, Spanish or Cantonese and 16 (5%) were deemed a safety risk to the study interviewers by the Sheriff's department). From the remaining 296 invited to participate, 44 (15%) declined participation and 252 (85%) enrolled. Two (<1%) withdrew from the study, resulting in a final sample of 250. Among those who did not meet inclusion criteria, declined to participate, or withdrew, no significant differences in age were found. Of the 250 enrolled participants, 13 (5%) did not complete the PC-PTSD resulting in a

final sample of 237 older inmates included in these analyses. Those who did not complete the PC-PTSD did not significantly differ demographically from those who completed the screening. The average age of participants was 59.0 years (SD = 3.9, range 55 to 74). Participants were predominantly men (95%) and Black (64%), Table 1. Nearly 1 in 4 (56, 24%) were Veterans. The majority reported at least a high school degree or GED (76%). Nearly 82% reported having an annual income ≤ $15,000.

A total of 93 (39%) participants had a positive screen on the 4-item PC-PTSD, with 20 (22%) of these reporting a prior diagnosis of PTSD by a physician, Table 1. Only five (4%) participants with a negative PTSD screen reported a prior diagnosis of PTSD by a physician. With regards to the prevalence of reporting yes to each of the 4-items of the PC-PTSD, more than half of older jail inmates reported that they had nightmares (50%) or tried to avoid situations that reminded them of a past traumatic event (53%). Forty four percent reported being on guard, watchful or easily started, and 40% reported feeling numb or detached from others, activities, or their surroundings.

Participants who screened positive were younger (average age of 58.3 years versus 59.4, p=0.02), reported five or more lifetime arrests (94% vs. 81%, p = 0.007), food insecurity in the past year (74% vs. 59%, p = 0.02) and medication insecurity in the past year (53% vs. 35%, p = 0.006). Several health-related characteristics were also associated with screening positive. Older inmates with a positive PTSD screen were more likely to report their health as poor or fair (63% vs. 47% p = 0.01), report experiencing a past TBI (87% vs. 61%, p < 0.001), have two or more ADL impairments (41% vs. 19%, p<0.001), and report pain in the past week (85% vs. 68%, p = 0.003). Veterans were more likely to report a previous diagnosis of PTSD by a physician than

non-Veterans (27% vs. 6%, $p<0.001$). However, non-Veterans were just as likely as Veterans to have a positive PTSD screen using the PC-PTSD.

After adjusting for age, race/ethnicity, education, and income, older jail inmates who reported a past TBI had nearly four times the odds of a positive PTSD screen (Table 2). Those with two or more ADL impairments had more than three times the odds of a positive PTSD screen (OR = 3.11, 95% CI = 1.65 – 5.86). Having poor/fair self-rated health, pain in the past week, and mediation insecurity in the past year were also independently associated with an increased odds of a positive PTSD screen.

Discussion

We found that among older jail inmates nearly 40% screened positive for PTSD using the PC-PTSD, but only one out of five who screened positive reported having been given a previous diagnosis of PTSD from a physician. After accounting for demographic characteristics, older inmates with a history of TBI and two or more ADL impairments were more than three times as likely to screen positive for PTSD compared to those who did not have these health conditions. Additional health-related characteristics that were associated with a positive PTSD screen included poorer self-rated health, pain, and medication insecurity.

Given the high rates of positive PTSD screens and low prior PTSD diagnoses in this study, jails may be an important site for the first-time diagnosis of PTSD in older adults. Healthcare providers in county jails should be aware of the high risk of PTSD among older jail inmates and its co-occurrence with several adverse social and health characteristics. Providing psychiatric screening at the time of incarceration for this population that proactively includes screening for

PTSD may provide an opportunity for diagnosis and referral to appropriate treatments plans and mental health resources upon release to the community (Hills, Siegfried, & Ickowitz, 2004). Furthermore, since jail detainment is relatively short-term, reentry coordination between jail and community-based health providers is of critical importance for this population. It has been recommended that discharge planning or continuity of care programs be implemented and/or expanded for inmates with psychiatric conditions who are returning to the community (Baillargeon, Binswanger, Penn, Williams & Murray, 2009). Older inmates with PTSD and psychiatric co-morbidities may particularly benefit from long-term, community-based outpatient services that can help them to better manage their mental health problems and reduce their risk of recidivism (Baillargeon et al., 2009; Quanbeck et al., 2005).

While jail inmates who were Veterans were more likely to report having a previous diagnosis of PTSD by a physician, the proportion of older jail inmates with a positive screen for PTSD did not differ according to Veteran status. This suggests that Veterans may benefit from service-connected access to VA health care services while older jail inmates without VA service-connected healthcare, many of whom in this study were also too young to access Medicare, likely struggle to identify and access adequate community-based PTSD care. These findings point to a need for increased focus on screening older adults in jail for PTSD, and connecting them, when possible, with post-jail assessment and care services, for all criminal justice-involved older adults regardless of Veteran status.

This study also found that older jail inmates who reported experiencing a past TBI were more likely to screen positive for PTSD, and more than 70% of study participants reported having had a prior TBI. This finding is consistent with other research showing that prisoners have a high

prevalence of TBI ranging from 65 to 86% (Slaughter, Fann, & Ehde, 2003; W. H. Williams et al., 2010). A study on the prevalence of TBI in one county jail found that 87% reported a past TBI (Slaughter, et al., 2003), and past TBI was associated with psychiatric disorders, anger and aggression. Information about the prevalence of PTSD among those with a TBI in the general population is still emerging, with research involving those in the military showing prevalence of PTSD following TBI ranging from 0 to 50% (Kennedy et al, 2007). However, one recent study found that Veterans with a TBI were three times more likely than those without a TBI to have PTSD (Carlson et al., 2010; Tanev, Pentel, Kredlow, & Charney, 2014). The causal mechanisms remain unclear, but it has been suggested that biological changes due to trauma to the brain (resulting in structural, endocrine, and neurochemical changes) appear to be similar to the pathophysiology of PTSD (Kennedy et al., 2007). Given the high rates of having a history of TBI and a positive PTSD screen, this study suggests that screening for a history of TBI and current PTSD during jail health screenings that are conducted when all persons are booked into jails could greatly aid in identifying older adults with undiagnosed or untreated PTSD. This would lead to a better understanding of the prevalence of PTSD and co-morbid TBI in the growing population of older adults cycling in and out of jail. This would have immediate policy implications for the types of mental health treatment and training needed in local jails, the resources needed to optimize community-based mental health programs, and that factors that need to be considered when designing training programs for community professionals who come into contact with this population (e.g., police sensitivity trainings) with the aim of reducing recidivism and optimizing mental health care for those with PTSD. This information would also likely motivate policies aimed at improving reentry programs to ensure continuity of care and case management for medically vulnerable inmates returning to the community. Having a

positive screen for PTSD was also associated with several other adverse health conditions, including impairment of two or more ADLs, poorer self-rated health, and having pain in the past week. Several studies have shown that older inmates in jail and prison have a higher prevalence of chronic health conditions compared to non-criminal justice involved populations (Binswanger, Krueger, & Steiner, 2009; Nowotny, Cepeda, James-Hawkins, & Boardman, 2015). It appears that older inmates with a positive PTSD screen may suffer from a still greater risk of these adverse health conditions. This increased risk is supported by past research that emphasizes the cumulative effects of stress and trauma on physical health as well as an increased risk for disability in late life (Sledjeski, Speisman, & Dierker, 2008). Increased interventions to address chronic health problems and co-occurring symptoms of PTSD should be considered for aging adults involved in the criminal justice system.

We found that older jail inmates with a positive PTSD screen were more likely to report five or more lifetime arrests. Nearly all jail inmates return to the community within six months of their incarceration and many experience difficulties managing their health following release. These difficulties result in higher rates of acute care use and an increased risk of mortality (Binswanger et al., 2007; Chodos, et al., 2014; B. A. Williams et al., 2010). Older jail inmates with PTSD symptoms may face even more difficulties when returning to their communities due to comorbid health conditions and additional social vulnerabilities, such as food and medication insecurity. Returning to the community requires these older individuals to navigate complex and often-underfunded health and social service programs, including limited access to affordable housing and healthcare. These challenges may, if unmet, increase older former inmates' risk for repeat arrest and future incarceration. Recent research about prisoners with PTSD has found that they are 43% more likely to be rearrested in the same year compared to those without PTSD (Kaba et

al., 2015), further underscoring our finding that older jail inmates with symptoms of PTSD should be considered a high-risk population in need of enhanced medical and social services. As such, coordination of correctional and community health services for this population prior to reentry could be important for improving access to care, adherence to mental and other health treatment plans, and reducing health disparities and recidivism (Binswanger, Redmond, Steiner, & Hicks, 2012). The majority of research on effective treatments for individuals with PTSD has been done with younger populations. Some research on treatments for PTSD in middle-aged adults suggests that cognitive behavioral therapies, including cognitive restructuring, exposure therapy, and narrative/life-review interventions, may hold promise for treating older inmates with PTSD returning to the community (Böttche, Kuwert, & Knaevelsrud, 2012; Sachs-Ericsson et al., 2016).

Limitations

Several limitations should be considered when interpreting the results of this study. First, this was an exploratory cross-sectional study., and fFuture research on PTSD in older inmates is needed to further our understanding of the role that associated health and social factors play in the occurrence of PTSD in this population, including analysis of the relationship between PTSD and criminal justice involvement among aging veteransshould consider whether the rates of PTSD differ for Veterans involved in the criminal justice system. Second, this study was conducted with a relatively small sample of older jail inmates, including a very small number of older women, and may lack adequate power to detect important differences. Despite these limitations, this study is, to our knowledge, the first descriptive study of the association between PTSD and health and social vulnerabilities experienced by older jail inmates and is therefore an

essential first step in better understanding the mental health and healthcare needs of this understudied population. Third, findings on the health and social characteristics were primarily based on self-report; however, past research has validated the use of self-reports of these conditions in older adults (T. L. Bush, Miller, Golden, & Hale, 1989). Additionally, to minimize the underrepresentation of health conditions, we abstracted health conditions from jail medical records. Fourth, this study was conducted in one urban jail system, which may limit the generalizability of findings to other jail and prison populations. Also while the use of the PC-PTSD has not been validated in criminal justice populations, several studies have cross-validated this tool in Veterans, military populations and individuals with substance abuse disorders (van Dam, Ehring, Vedel, & Emmelkamp, 2010). Finally, this tool is limited in that it is only intended to screen for PTSD and further assessment would be necessary to make a PTSD diagnosis. Future research aimed at validating this tool with criminal justice populations, including an examination of the psychometric properties of the PC-PTSD screen, and determining the prevalence of diagnosed PTSD in this population is needed.

Conclusion

Findings from this study suggest that jail may represent a crucial site for the initial diagnosis and treatment planning for PTSD in the growing population of criminal justice-involved older adults. Our results suggest that older jail inmates who screen positive for PTSD on a brief screening tool are a medically vulnerable group who may benefit from additional efforts aimed at improving post-release health outcomes, including reentry planning and increased access to mental health and community services.

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