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Readjustment of Urban Veterans: a Mental Health and Substance Use Profile of Iraq and Afghanistan Veterans in Higher Education

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Abstract

Objective—To identify the prevalence of substance use and mental health problems among veterans and student service members/veterans (SSM/V) returning from Iraq and Afghanistan to New York City's low-income neighborhoods.

Participants—A sample of 122 veterans attending college and 116 veterans not enrolled recruited using respondent driven sampling.

Methods—Logistic regression analysis of variation in characteristics of those veterans attending college; linear regression examining effects of college attendance on life satisfaction.

Results—Having a traumatic brain injury or disability was positively associated with college attendance. Being married, employed, or in college was predictive of overall life satisfaction. SSM/V were significantly less likely to screen positive for depression or drug use disorder. African American veterans were significantly less likely to attend college than White or Hispanic veterans.

Conclusion—Substance use and some mental health disorders do not preclude inner-city veterans from entering higher education. This study contributes to the sparse literature on African American veterans and SSM/V.

Attending higher education represents an opportunity for many veterans to readjust to civilian life, though they often require special help in order to enter and persist in postsecondary settings. For example, student service members/veterans (SSM/V) represent a fairly distinct group of adult learners who often present social, cognitive, physical, and psychological readjustment challenges when transitioning to college environments.[1] They also face unique informational and bureaucratic hurdles related to reenrolling and supporting their postsecondary education.[2,3] American higher education has long been valued for conferring beneficial social, cognitive, and psychological development outcomes, and it has also been prized as a vehicle for social mobility, benefitting both individuals and society.[4,5] Since the passage of the Post-9/11 Veterans Assistance Act, over 850,000 military personnel

have returned from Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF, principally in Afghanistan), or Operation New Dawn (OND) to enter or reenter postsecondary education[6] with over two million expected to enroll over the next several years.[7] Colleges have much to learn in order to best serve this population and the literature on this topic is just starting to accumulate.[2,8,9] Those returning to low-income urban communities may face additional challenges during civilian readjustment,[10] though the role that higher education plays among veterans in urban areas is unknown.

In addition, African American and Hispanic populations are historically underrepresented in American higher education, which poses both social equity concerns and a threat to national economic health.[5,11,12] A report from the Lumina Foundation forecasted that the US may not be able to remain globally competitive without closing persistent deficits in higher education attainment among low-income and historically underrepresented groups of color.[13] Current enrollment models suggest that African American and Hispanic veterans are especially responsive to the Post 9/11 Veterans Assistance Act, with college enrollments for African American and Hispanic Veterans projected to increase 4.5% and 2.8%, respectively, compared to 2.2% among White veterans.[14] The growing population of returning African American and Hispanic veterans poised to enter postsecondary education thus represents an important social and economic opportunity, yet little is known about corresponding challenges to their success that may be related to the confluence of minority and military status.

This paper profiles this target population by examining the substance use and mental health concerns among those veterans returning to New York City's low-income predominately-minority neighborhoods that choose to attend college. Their experiences are contrasted with a comparison sample of similar veterans that could have but did not enroll in college. These comparable data provide insight into key characteristics of SSM/V and are used to establish four research hypotheses about this population of OEF/OIF/OND veterans. The remainder of this section introduces relevant background information for the four forthcoming hypotheses, which pertain to: (1) rates of college participation among African American and Hispanic veterans, (2) alcohol and other drug use, (3) mental health concerns, and (4) the effect of college attendance on overall life satisfaction.

Mental Health Barriers to Successful Reintegration for OEF/OIF/OND Veterans

For many veterans of past and current conflicts, successful reintegration into civilian life can be challenged by mental health concerns that have recently come to be referred to as "invisible wounds".[15] At present, public concern over such afflictions is elevated. The Department of Defense, Department of Veterans Affairs, Congress, and the President have moved to study mental health conditions and cognitive impairments resulting from deployment experiences.[15]

The conflicts in Afghanistan and Iraq have resulted in widespread and serious mental health challenges.[16] Because of innovations in body armor, field medicine, and ambulatory care, casualties are far fewer than in past conflicts,[15] but servicemen and women are redeployed

more often, and the nature of combat entails longer durations of heightened stress, owing partly to the threat of roadside bombs and improvised explosive devices.[17] Traumatic brain injury (TBI), for example, has been called the signature injury of this generation of military personnel[18] affecting between 15% and 23% of service members deployed in OEF, depending on the sample and methodology.[19] TBI is characterized as a blunt or penetrating head trauma that manifests various clinical symptoms that vary based on the severity of the trauma.[20] Post-traumatic stress disorder (PTSD), alcohol and drug use disorders (AUD, DUD), depression, and suicidal ideation are also important mental health concerns that are significantly more prevalent among veterans than in the general population.[19,21]

Service related mental health concerns can lead to subsidiary conditions that further challenge successful reintegration. A systematic review of the peer-reviewed literature on SSM/V populations[22] found that binge drinking and alcohol problems[23] were positively associated with depression, anxiety, and PTSD symptoms.[24,25] This link between mental health and alcohol use is especially crucial in light of the heightened risk of suicidal ideation, which is strongly associated with PTSD among SSM/V.[26] A growing body of work examines correlates of PTSD among SSM/V,[27,28] but no studies yet exist that report TBI prevalence specifically among SSM/V populations.

According to a report by the Rand Center for Military Health Policy Research, approximately 18.5% of the general population of OEF/OIF veterans have either PTSD or depression, and 19.5% report probable TBI.[29] Mental health is a critical component of civilian reintegration, as more OEF/OIF veterans have died at their own hands from suicide and lethal drug overdoses than from combat itself.[30] Almost 30% of the Army's suicide deaths from 2003 to 2009, and over 45% of the non-fatal suicide behavior from 2005 to 2009 involved the use of drugs or alcohol.[31] A 2011 study by Rudd and colleagues reported that in a national sample of SSM/V, 46% had thoughts of suicide with 7.7% making an attempt; and of those student veterans who attempted suicide, 82% experienced significant PTSD symptoms.[26] Accordingly, the Departments of Defense and Veterans Affairs spent over $6 billion between 2002 and 2010 to treat and understand the scope of PTSD, TBI, and other combat related mental health concerns among both active and recently separated military personnel.[19]

Today's Campuses and the Needs of Today's Veterans

While institutional policies and programs have adapted with the intention to better serve student veterans, extant higher education literature has identified several barriers to their successful civilian reintegration.[3] A qualitative study of 25 OEF/OIF veterans across four four-year universities reported that the transition from combat veteran to college student was "the most difficult transition of all," and the structured life of the military can make it difficult to transition to a comparatively loosely configured campus where there is no chain of command from where to get answers.[32] Many campuses have support services for veterans, but the availability and level of support from veterans service offices and other campus support services vary from one institution to another.[3] A recent survey of 723 institutions found that 57% currently provide programs and services specifically designed for service members, with a greater percentage of public four- and two-year colleges having

veteran-specific programs than private institutions (74% and 66%, compared to 36%, respectively); and of that overall 57%, fewer than half have dedicated offices to serve student veterans.[33]

Campus climate issues are a perennial concern for both active and discharged military personnel. Sentiments of war opposition among civilian faculty and students were especially salient during the Vietnam conflict,[34] and some student veterans of OEF/OIF report that similar tensions exist today.[32] In part because of these real or perceived stigmas, student veterans frequently seek contacts with other veterans and military personnel to validate their experiences and aid the successful transition to college.[2] Emotional and social support is associated with better mental health outcomes and more positive academic adjustment among student veterans.[35] Accordingly, student veteran organizations, including formal campus clubs and groups, are frequently identified by veterans in focus groups as important factors in campus acculturation,[2,36,37] yet only 32% of institutions with services for veterans have student veteran organizations.[33]

Today's college campuses are also where a disproportionate amount of alcohol and substance misuse occurs.[38,39] According to the NIDA/NIH *Monitoring the Future* study conducted by Johnston and colleagues, 42% of college males and 35% of college females reported "binge drinking" within the past two weeks (defined in this present study as consuming five or more drinks on the same occasion for men and four or more drinks on the same occasion for women),[40] compared to 34% and 26% of same-aged non-college males and females, respectively.[41] Data specific to SSM/V are less common, but one study reported past-month binge drinking rates at 23% and 24% among SSM/V and civilian college students, respectively.[24] Another study found that SSM/V are more likely than civilian college students to drink for purposes of coping (as opposed to social or enhancement motives) which was linked to binge and problem drinking.[35] Student health literature is also replete with data about impacts to stress, sleep, and the struggles of older, non-traditional students to assimilate into the culture of academia.[42–44] The relationships of these factors however, are less clear specifically among SSM/V populations.

As one of the few recent studies to focus specifically on collegiate academic and health outcomes OEF/OIF veterans, Barry and colleagues found that posttraumatic stress and its associated problem drinking and alcohol-related consequences were linked with lower academic performance and persistence.[45] They examined associations between posttraumatic stress, alcohol use, and academic covariates (e.g., educational self-efficacy, grade point average), and compared outcomes across varying levels of military affiliation (e.g., civilian students, ROTC students, non-combat exposed veterans, and combat exposed-veterans). However, the authors noted the over-representation of White respondents as a limitation of their web-based survey approach, and called for future research to more specifically examine the experiences of African American and Hispanic veterans. Additionally, research has shown that veterans living in urban areas are at an increased risk of substance use.[21,46]

Hypotheses and Purposes of the Current Study

The aforementioned review of SSM/V literature includes several articles comparing characteristics of civilian students and SSM/V groups, but none compare SSM/V to veterans not attending college.[22] The present study also contributes uniquely to this growing body of research by comparing key mental health and substance use characteristics among underexplored populations of predominantly urban SSM/V and African American and Hispanic veterans.

This study seeks to further this literature by testing four hypotheses. First, it was hypothesized that African American and Hispanic veterans would be disproportionately underrepresented among SSM/Vs. Second, it was hypothesized that SSM/V would be more likely to exhibit problem levels of alcohol and drug consumption than veterans not in college. Third, we hypothesized that veterans not attending college may exhibit higher levels of physical and mental health problems compared to SSM/V. And lastly, it was hypothesized that college attendance would be associated with higher life satisfaction.

METHODS

Study design and procedures

Data presented are drawn from the first wave of a longitudinal investigation, *Veteran Reintegration, Mental Health, and Substance Abuse in the Inner-City Project*, funded by the National Institute of Alcohol Abuse and Alcoholism (NIAAA). The project includes quantitative panel surveys to examine the experiences of recently separated OEF/OIF/OND veterans returning to low-income predominantly minority sections of New York City (NYC). Field staff members recruited participants from neighborhoods known to have met project criteria using respondent driven sampling (RDS), which is similar to snowball sampling as a recruitment method but uses important tracking and analytical procedures. All participants had separated from the military between August 2008 and March 2012. A total of 269 veterans were recruited between February 2011 and April 2012.

Potential participants were asked to show verification of their military service (e.g., DD214 discharge papers and separation documents), which was also used as a unique identifier to assure that participants were not included in the study more than once. All participants completed an informed consent procedure where the benefits and possible risks were discussed prior to participation. Participation entailed a quantitative structured interview with a field staff member, who were all veterans themselves, hired and trained to conduct human subject research in accordance with the aims of this project. Field staff administered questions directly from the survey instrument, which consisted of 27 sections including most important to this analysis demographic information, military experience, mental health, and alcohol and drug use. Interviews were held in person in a mutually convenient private location and lasted approximately one hour. Participants were paid $40 for completing an interview. All recruitment, interview and data management procedures were approved by the [BLINDED] Institutional Review Board.

The participant sample of recently-discharged OEF/OIF veterans was recruited using RDS, which was developed to target hard to enumerate populations.[47,48] RDS is similar to snowball sampling in that participants recruit each other in "waves" to constitute a fully networked sample, but the referral process in RDS is carefully tracked and uses a sophisticated and reliable estimation procedure to account for "homophily," or the propensity for subpopulations to recruit other members that are similar to themselves.[49] RDS improves upon snowball sampling by viewing the referral process as a Markov chain to calculate unbiased estimates for the target population,[47,48] which in this case is veterans returning to inner-city New York.

Both RDS and snowball sampling are network-based approaches that start with a few members of the target population called "seeds," who are then asked to recruit other members of the target population, called referrals. Participants were provided with a $20 incentive payment for each referral they provided who completed an interview. The referrals of the initial seeds are referred to as "wave 1" followed subsequently by the "wave 2" referral group and so forth.

The criteria for inclusion entailed a stratified purposive sample of 20 diverse initial seeds by race/ethnicity (12 African American; 4 Hispanic; 4 White) gender (14 male; 6 female), and combat experience (14 combat veterans; 6 who did not experience combat). Initial seeds must have returned from Iraq or Afghanistan within 24 months and were selected from different high-poverty neighborhoods in NYC (e.g., South Bronx, Brownsville, Washington Heights).

The RDS procedure is particularly appropriate when the target population is highly networked and social. For RDS to be valid, the network formed by members of the target population must be irreducible—that is, all potential participants must know other members of the target population such that all network chains eventually link all participants to one another. RDS has been used to study specific sex and drug use behaviors in many populations [47,50–58] including undergraduate students.[59] To the best of our knowledge however, this is the first study to use RDS to study veterans.

Sample

This study compares 122 undergraduate SSM/V to 116 veterans not attending college, recruited from low-income, predominantly African American and Hispanic neighborhoods of NYC. Participants who were attending graduate school and vocational or training programs (n = 9), and veterans currently in high school (n = 3) were excluded from analyses due to low response rates and having substantively different circumstances from either of the groups studied. Veterans not in college but who had already received a BA/BS degree (n = 19) were also excluded because of different motivations for not attending college after returning from duty, and because of different career opportunities afforded by their degree attainment. In this manner, the analysis compared those attending either a community college or 4-year undergraduate institution with those who were not attending but could have been. The home institutions of SSM/V are omitted to preserve anonymity. Most of the undergraduates were attending colleges within the City University of New York (CUNY) system.

Measures

College Attendance and Demographic Information—Participants provided demographic data including sex, race/ethnicity, marital status, and service branch. For the purposes of this study, SSM/V status was recoded a dichotomous variable that we refer to as "college attendance," meaning current full- or part-time enrollment at a community college or 4-year institution at the time of participation (N = 122).

Alcohol Use Disorder (AUD) and Drug Use Disorder (DUD)—Our data captured which substances were most commonly used, how frequently they were used, and whether their use occurred before, during, or post-deployment. Alcohol use disorder (AUD) and drug use disorder (DUD) were assessed using questions from the NSDUH which are based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition or DSM-IV.[60] DUD includes drug abuse or drug dependence. Drug dependence uses a 12-item drug dependence scale (α = .83) of dichotomous yes/no questions (e.g., "unable to keep set limits on substance use or used more often than intended") that are summed to a final summary range of 0 to 7 whereby any sum score of 3 or higher indicates dependence. Drug abuse uses a scale of 4 dichotomous items (α = .83) whereby any one positive response indicates abuse. Alcohol dependence uses a similar 10-item scale (α = .83), and alcohol abuse uses a 4-item scale (α = .85) with the same summary score cut points of 7 and 1 indicating alcohol dependence and abuse, respectively. As with DUD, AUD includes the presence of either alcohol abuse or dependence. More information on standard definitions and cut points for AUD/DUD measures can be found in the NSDUH codebook.[60]

Binge Drinking—Binge drinking is defined for males as consuming five or more drinks during a single occasion (four or more drinks for females), and "heavy drinking" is defined as binge drinking on five or more of the last 30 days. These definitions are commonly used in collegiate alcohol and drug use literature,[40] in highly-cited programs such as the *Monitoring the Future* survey of collegiate and adolescent drug use trends.[38,41]

Traumatic Brain Injury (TBI)—TBI was assessed using the same screener employed by the U.S. Military on their Post-Deployment Health Assessment (PDHA) that identifies traumatic events and related mental health consequences.[61] This measure entails having experienced one of five traumatic events (e.g., "blast or explosion," "fall") and having immediately experienced one of three symptoms immediately afterward (e.g., "headaches," "memory problems"). We did not differentiate between mild and more severe TBI. Graham and Cardon found that mild TBI was more likely to be associated with chronic substance abuse and that the direction of causality went both ways.[62] We screened for TBI using the scale included in the PDHA. However, this screen is not the same as a clinical diagnosis.

Posttraumatic Stress Disorder (PTSD)—PTSD was assessed using the PTSD Checklist of 17 items on a 5-point scale of the severity of stress symptoms with higher scores indicating more severe stress effects. Sample items include "repeated, disturbing dreams of a stressful military experience," and "feeling distant or cut off from other people." This scale was designed for use for the military (i.e., PCL-M) using a standard cut point of

50 (out of a possible 85) and including at least one intrusion, three avoidance, and two hyperarousal items[63,64] (M = 39.68, SD = 17.86; α = .96).

Major Depressive Disorder (MDD)—MDD was assessed using the nine-item Patient Health Questionnaire screener (i.e., PHQ-9).[65] MDD was identified as having at least 5 of the 9 symptoms occurring on at least half of the past 30 days and one of the symptoms so identified was either anhedonia or depressed mood (M = 10.00, SD = 6.82; α = .90). In addition, functional impairment was also required to classify a person as having MDD. Both the PCL-M and PHQ-9 have demonstrated reliability, validity and diagnostic utility, both within military populations and in the current sample.

Suicidal Ideation—Suicidal ideation was assessed using the PHQ-9 question "thoughts that you would be better off dead or hurting yourself in some way," a positive indication of which included the responses on a four-point frequency scale of "more than half the days" or "nearly every day" as opposed to "not at all" or "few or several days".

Perceived Supportiveness of Informal Interactions—Dichotomous measures for the perceived supportiveness of veterans groups and friends/peers in the military were constructed from two separate questions using a five-point scale with an indicator of high support including the responses "(4) quite a bit" and "(5) extremely" supportive, with "(3) moderate," "(2) a little bit" and "(1) not at all" responses indicating lower support.

Feelings of Pride and Regret from Serving in the Military—A similar dichotomous transformation of a five-point agreement scale occurred with two other question items. Responses of "(5) agree strongly" and "(4) agree somewhat" indicated that respondents were "proud to have served [their] country". Responses of "(1) disagree strongly" and "(2) disagree somewhat" indicated disagreement that "joining the military was the biggest mistake of [their] life".

Life Satisfaction—"Life satisfaction" was a five item measure adapted from the satisfaction with life scale (SWLS).[66] The SWLS has demonstrated good convergent validity with other scales and sufficient sensitivity to military populations.[67] For this study, the original seven-point response scale was reduced to five points to match the response format of other questions included in the reintegration study. The original SWLS includes five general questions about life satisfaction including, "If I could live my life over, I would change almost nothing," and "In most ways my life is close to my ideal." These were included in this study. The SWLS includes three other general questions including "I am satisfied with my life." These questions were replaced with questions regarding three domains of satisfaction of key interest regarding reintegration including "I am very satisfied with my family life," "work," and "social life." The revised scale showed good reliability for use with the project sample (M = 3.04, SD = 1.06; α = .80).

Analyses—Descriptive statistics and target population estimates were calculated with the RDS Analysis Tool, or RDSAT version 6.0.1, available from the RDS website.[68] RDSAT estimates the prevalence of characteristics and uses a bootstrap procedure to estimate standard errors (SEs). The SEs were used in a conventional z-test to examine whether

differences of interest were statistically significant. RDSAT however, currently does not have the capacity to conduct regression analysis, so multivariate analyses were performed using SPSS 20.0 (SPSS, Chicago, Illinois).[69] In the two regression models reported, the data are treated as a convenience sample. Thus instead of transition (or referral) probabilities used with descriptive findings, multivariate analyses were based on conventional sample characteristics and ignore the dependency in the sampling structure.

A logistic regression model was used to analyze the association between demographic, health, and substance use covariates as independent variables on college attendance, the dependent variable. This model corresponded to our first, second, and third hypotheses concerning college attendance rates across racial/ethnic groups, alcohol and drug use, and mental health correlates, respectively. In this model the Wald statistic was used to test whether the variation associated with each variable was statistically significant. A separate linear regression model was used to examine the effect of college attendance and other covariates as independent variables on life satisfaction as the dependent variable to correspond with our fourth hypothesis. ANOVA was used in the linear regression model to identify the amount of association with each variable, to test whether the variation was statistically significant, and to determine which variables had the largest influence.

RESULTS

Sample and Target Population Characteristics

According to population-level RDSAT estimates, 27% of the target population of OEF/OIF veterans attended college, whereas within the sample, 51% (122 of 238) were undergraduates. The oversample of undergraduates resulted from many of the original seeds being recruited at or near college campuses. Though recruitment occurred over a four-year period, a one-way ANOVA found no statistical difference between the two groups in terms of time between recruitment and separation from the military.

Both the in- and out-of-college veteran populations were several years older on average than traditionally-aged undergraduate college students (18–23 years old), and student veterans were nearly two years younger than veterans not enrolled. The sample also consists of a higher representation of African Americans (n=142), and veterans who served in the Army (n=146) compared to other branches of service (e.g., Marines, Navy, Air Force).

Table 1 displays the demographic composition of the SSM/V and non-college-attending veteran samples, which relates directly to our first hypothesis. These bivariate comparisons indicate that SSM/V are significantly less likely than their non-student counterparts to be African American (53% versus 79%) and substantially more likely to be White (18% versus 10%) or Hispanic (21% versus 2%). Indeed, nearly all of the eligible Hispanic veterans were enrolled in college. The college-attending and non-college-attending populations were similar with regard to gender, age, and military component. The SSM/V sample was less likely to have served in the Army and more likely to have served their last deployment somewhere other than in Afghanistan or Iraq.

Alcohol and Drug Use

Our second hypothesis concerned heightened rates of drug and alcohol use among SSM/V, and these results are shown in Table 2. An estimated 28% percent of SSM/V screened positive for an alcohol use disorder (AUD; either alcohol dependence or alcohol abuse) compared to 29% of veterans not attending college, a difference that was not statistically significant. SSM/V were significantly more likely to drink any alcohol within the past month, but both groups reported approximately equal problems associated with alcohol seeking and cessation. This was not the case with drug use disorders (DUD) where rates of occurrence were significantly higher among non-student veterans.

Participants were asked about their use of alcohol, tobacco, caffeine and over the counter supplements, and every major category of illicit and prescription drug. Of this relatively comprehensive drug use screening, four substances emerged as especially prevalent, or—from the literature—as problematic among OEF/OIF/OND veteran populations: alcohol, marijuana, prescription opiates (pain-killers), and tobacco. Binge drinking was slightly higher among SSM/V, although this difference was not statistically significant. Marijuana use was significantly lower among SSM/V (24%) than non-student veterans (44%). Similarly, the use of painkillers was lower among SSM/V (2%) compared to non-student veterans (8%), although the difference was not statistically significant. Cigarette use among non-student veterans (63%) was significantly higher than SSM/V (33%).

Mental Health Concerns

Table 2 also compares the mental health of SSM/V and veterans not attending higher education, which responds to our third hypothesis. SSM/V had significantly higher levels of TBI; more than twice as many SSM/V were identified as likely having TBI compared to their non-college attending counterparts. The rates for PTSD (18%–25%) and MDD (18%–20%) were comparable between the two subsamples and were substantial. A substantial percentage of the non-college attending population had a mental health concern (30%). The rate was somewhat higher (44%) among the SSM/V population, although the difference was not significant. As discussed, suicidal ideation is a pressing concern among contemporary war veterans,[30] thus we asked one question about the degree to which veterans were bothered by “thoughts that [they] would be better off dead or hurting [themselves] in some way.” Only six of the 120 SSM/V who responded to that question (5%) responded affirmatively to having thoughts of suicide or self-harm compared to 11 of the 114 respondents not attending college (10%), a difference that was not statistically significant.

Multivariate analysis of factors influencing college attendance and life satisfaction

A logistic regression model was used to analyze the effect of multiple demographic and health covariates on college attendance, and these results are reported in Table 3. This model confirmed bivariate findings in Tables 1 and 2 and identified which factors had the greatest association with college attendance, controlling for all of the other factors. The presence of TBI (AOR = 2.8) or a physical disability (AOR = 3.3) was positively associated with college attendance. MDD was negatively associated with college attendance (AOR = .3). Race also emerged as a significant predictor of college attendance. Compared to African American veterans in the sample (the reference category, AOR=1.0), both White (AOR = 1.7) and

Hispanic (AOR = 4.1) veterans were significantly more likely to attend college after controlling for other covariates in the model. Other covariates entered into the model included gender, age, relationship status, PTSD, and SUD, but all emerged as not-significantly associated with college attendance, after controlling for all other covariates.

The linear regression analysis of variation in life satisfaction (results not reported in a table) found two covariates were identified as having a significant association with life satisfaction. The life satisfaction level associated with the reference group was a score of 2.5 on the scale from 1 to 5. First, being married as opposed to single was associated with a six-tenths increase in life satisfaction score. Those veterans that were cohabiting had a similar (.1 higher) level of life satisfaction as those who were single (single veterans were the reference category). Thus, cohabitation was not associated with the same level of life satisfaction as marriage. Being separated, widowed, or divorced showed no increase or decrease in life satisfaction score compared to single veterans. Second, college attendance and employment status had slightly larger effects than marital status. Veterans who were either in college or not in college and employed each had similarly higher levels of life satisfaction (.7 higher) than the reference group of veterans that were unemployed and not looking for work. Other control variables included in the analysis were not associated with variation in life satisfaction, including gender, race/ethnicity, age, and even disability. These findings indicate that college attendance, marriage, and employment were strongly linked to greater life satisfaction.

Perceived peer support and participation in veterans groups

Table 4 displays issues of pride and support from veterans groups. SSM/V were generally more likely than veterans not enrolled to be proud of their service (94% vs. 86%) and to disagree that joining the military had been a big mistake (91% vs. 73%). They were also substantially more likely to report that their veteran peers were a source of support (62% vs. 32%). However, this support appears to derive from informal interactions. Relatively few veterans in our target population reported attending a veterans group (20%–31%) and even fewer reported that such groups had been a source of support to them.

COMMENT

Descriptive findings from these data provide insight into the post-deployment health characteristics of a specific population of SSM/V and veterans not attending college. Additionally, the multivariate analyses supply strong evidence of factors that contribute both to college attendance, and the impact of college attendance on overall life satisfaction. In short, going to college is a very important factor in the lives of OEF/OIF veterans, but veterans who are African American or depressed are significantly less likely to enter postsecondary education.

African Americans and Latinos/as are traditionally underrepresented in higher education,[5,70] thus from a social equity standpoint it was disappointing to partly affirm our first hypothesis and find that African American veterans in the sample were not attending higher education at rates proportional to White and Hispanic veterans. However, Hispanic veterans—of whom many in the present NYC-based sample identified as Puerto Rican—were found to be

significantly more likely to go to college than both African American and White veterans. This surprising finding raises important research questions about why this sample of Hispanic veterans felt especially inclined to enter higher education, and how their motives may be different compared to their college-eligible Hispanic civilian counterparts.

Considering the heightened rates of heavy drinking among the general college student population, our second hypothesis posited that veterans attending college may place themselves at an increased risk for binge drinking or developing an AUD. This ultimately was not substantiated by the data. SSM/V were more likely to consume alcohol in the month prior to their participation, but there was no statistical difference in terms of binge drinking, heavy drinking, or screening positive for an AUD (DUD prevalence was, however, significantly higher among veterans not attending college). One possible explanation for this relates to the characteristics of our sample of SSM/V compared to the alcohol risk-profile of traditional college students. For example, enrolled veterans in our sample were significantly older than traditionally aged college students, and many commuted to campus or lived with family and spouses, away from venues where heavy drinking is likely to occur.[40]

Contradicting our third hypothesis that mental health problems would be higher among veterans not in college, SSM/V are equally likely to screen positive for possible PTSD, and surprisingly, more likely to screen positive for TBI than those not attending college. Furthermore, veterans with either TBI or physical disabilities were actually found to be significantly more likely to attend college. With the exception of severe depression, these findings seem to disaffirm the second hypothesis that mental and physical health afflictions prevent veterans from enrolling in higher education. This was an unexpected finding and we do not have a clear explanation for why this this occurred. One possibility is that veterans suffering from combat injuries to the body or brain may be drawn to the resources and opportunities afforded through pursuing postsecondary education, but more research—particularly qualitative investigations—will be helpful in order to truly understand the mechanisms and motives that account for demographic drivers of college attendance.

The multivariate analysis of the life satisfaction measure affirmed our fourth hypothesis that attending college is positively associated with life satisfaction. However, veterans without bachelors' degrees or higher who are not in college experience similar levels of satisfaction if they are employed. Furthermore, being married was also strongly associated with life satisfaction. Thus college attendance is indeed helpful, but it is not the only—nor necessarily is it the strongest—characteristic contributing to higher levels of overall life satisfaction among veterans.

And lastly, SSM/V were significantly more likely to feel supported by their fellow peers who served in the military, which is consistent with prior research.[35–37] Recalling political tensions that sometimes occur on campuses and in classrooms during both the Vietnam[34] and contemporary eras,[32] our results show that today's veterans are quite proud, especially those in college. Any comparisons made across generations, however, should take into account that OEF/OIF veterans were not underpaid, conscripted enlistees, as was the case during Vietnam. In terms of college support services being utilized, a relatively small number of SSM/V participated in formal group meetings for veterans, which may indicate

that something valuable and therapeutic could be occurring through informal interactions in the college environment that these data were unable to capture.

Limitations

An important limitation is that our data is cross sectional and thus investigators cannot currently infer with certainty whether student veterans are faring differently specifically because of the college environment or vice versa. Reverse causation is certainly a possibility; higher education may have a positive effect on, for example, mental health outcomes, but it is also possible that veterans who are less depressed may simply be more able to attend and persist in higher education, thus influencing both their decision to enroll and accounting for different outcomes between the two groups. These results represent the first wave of a multi-year longitudinal study. Future analyses with subsequent waves of data may be better able to assess causality.

Low prevalence rates of prescription drug use (e.g., pain relievers, stimulants, etc.) and illicit drug use (e.g., hallucinogens, cocaine, methamphetamine, etc.) within this sample prevented more meaningful intergroup comparisons with any substance other than alcohol, tobacco, and marijuana. The relatively small sample size also imposed restrictions on the number of covariates in the logistic regression models. Mental health variables, for example, were unable to be included in the linear regression due to a high degree of multicolinearity (both individually and as combined measures) between PTSD, TBI, SUD, and depression. Women comprised only 14% of the current sample (n=34), which was not a large enough group to conduct analyses involving the subgroup of returning servicewomen attending college (n=20 compared to 13 not enrolled). Unlike servicemen however, more servicewomen attend college than not, which is consistent with national college enrollment trends.

Findings are limited by the fact that RDS is a relatively new sampling methodology and this is the first study to use RDS to examine a veterans population. The findings could be biased to the extent that veterans populations are not as networked as discussed in the methods section or that the controls for homophily instituted in RDSAT are less appropriate for veterans. Ultimately, research comparing findings obtained with RDS should be compared to known population parameters to firmly establish the validity of RDS. To our knowledge, only one study has ever compared RDS findings with administrative records in a student sample, and found strong concordance.[59] Another methods based limitation is that multivariate procedures for analyzing RDS data have not yet been developed, which led to the use of conventional multivariate procedures that will tend to underestimate standard errors.

And lastly, due to the specific sample characteristics of the population recruited for this study, findings from this study may not be generalizable to other veteran and SSM/V groups or to the larger population of returning veterans. NYC is perhaps a unique context where state and local not-for-profit support is relatively extensive and resources are available to veterans as they navigate the readjustment experience. Noting the heightened risk for substance abuse among veterans living in urban environments,[21,46] NYC is the most densely populated urban environment in the United States, thus the living environment and research setting shared by all participants in this sample may represent an environmental extreme.

Researchers looking to build upon the findings of this study must consider that the study participants were urban living, predominantly low-income, and African American veterans who mostly served in the Army.

Conclusions

Going to college is helpful to the transitional experience of recently separated SSM/V, but so is being married or being employed. Our findings advance this research by informing which groups of veterans are likely to go to college, and identifying barriers to getting there. The comparative prevalence estimates of key health characteristics in a population (e.g., inner-city, African American veterans) that have been difficult to capture in prior studies is another contribution of this work. These descriptive findings provide some guidance for veterans' affairs and students with disability services practitioners on any campus that serves the growing population of returning servicemen and servicewomen. Forthcoming longitudinal analyses from the parent study will focus on factors that predict college attendance, and on the role of college attendance in overall life satisfaction and successful civilian reintegration.

Initial results suggest that it is a positive mental health indicator that veterans are able to enroll and persist in college where positive effects may or may not occur. TBI and PTSD do not appear to be preventative barriers for veterans who wish to attend higher education, but depression may very well be, which is worthy of future exploration. What we do know is that the rate of depression is nearly twice as high among veterans not in college, thus future research should consider the social benefits of reintegrating alongside a peer group that is significantly less depressed. For returning OEF/OIF veterans, that group can be found in college. Perhaps this logic accounts for why the supportive effects of connecting with fellow veterans are significantly higher among those in college. In either case, both veterans and veterans' affairs practitioners should strongly encourage student veterans to network with one another, which may include creating or joining student veteran organizations on campus.

Additionally, a high proportion of SSM/V will matriculate with mental or physical disabilities, thus offices for students with disabilities should be highly coordinated with any campus outpost designed to serve SSM/V. Considering the relative rates of mental health symptoms found in this study, campuses with sizable SSM/V populations should have student health practitioners who are trained to recognize and treat combat symptoms.

Contextualizing the findings of previous studies that report similar rates of problem drinking between SSM/V and civilian student populations,[24] our sample of SSM/V drank more often than veterans not attending college, though this did not constitute any higher likelihood of AUD. Future research should also explore why tobacco, marijuana, and drug use disorders may be less common among veterans attending college.

It is premature to declare that college is the appropriate place for all veterans. What is clear, however, is that approximately one-quarter of veterans living in low-income urban environments are in college and generally faring much better than those who are not. Longitudinal and qualitative investigations could help determine whether the presence of

severe depression inhibits veterans' decisions to enroll and persist in higher education, or whether attending college by itself can moderate depression. In any case, exploring the causal relationship between mental health, substance abuse, and college attendance could be another valuable direction of future research.

More research is especially needed on the experiences women SSM/V. Women are a population of special concern in the veterans affairs research literature, partly because of increased reported instances of military sexual trauma,[71] and servicewomen are more likely to suffer PTSD[7272] but less likely to report it.[73] More than 182,000 women have been deployed in OEF/OIF/OND, representing 11% of the armed services population, compared to only 3% in 1973.[74]

It remains to be proven what specifically it is about the college environment that seems be helpful to reintegrate the growing number of OEF/OIF/OND veterans expected to enroll in higher education. The relative rates of alcohol and other drug use, and of physical and mental health afflictions within this target population of SSM/V provides a useful baseline for college health practitioners. This research adds to the growing literature on SSM/V populations and particularly the paucity of research on African American and Hispanic veterans.

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Table 1

Variation in Demographic Characteristics between Veterans Enrolled in College and not Enrolled in College

	% with Characteristic by College Enrollment Status	
	Non-Student Veterans	SSM/V[a]
(Sample Size)	**(116)**	**(122)**
% of Target Population	**72.6**	**27.4**
Gender		
Male	90.7	86.9
Female	9.3	13.1
Race/Ethnicity		
African American	78.9	52.8**
White (non-Hisp)	9.5	17.9
Hispanic (non-Af Am)	1.9	21.3**
Other	9.8	8.0
Age		
19–29	48.1	59.4
30–39	39.3	28.9
40+	12.6	11.7
Military Branch		
Army	70.9	51.3*
Marines	15.3	25.1
Navy	9.7	22.2
Air Force/Coast Guard[b]	1.7	6.6
Component		
Active Duty	84.1	88.4
Reserves/Guard	15.9	11.6
Last Deployment		
OEF/OND (Afghanistan)	17.9	11.9
OIF (Iraq)	80.9	76.3
Other	1.2	11.8*

* $p < 0.05$.

** $p < 0.01$.

[a] Student Service Members/Veterans

[b] RDSAT is sometimes unable to obtain a target population estimate due to the characteristics of the referral chains, especially when such estimates are small. This was the case with the proportion who served in the Air Force/Coast Guard. The estimates provided here are the conventional sample estimates.

Table 2

Variation in Mental Health Concerns, and Alcohol, Tobacco, and Other Drug Use between Veterans Enrolled in College and not Enrolled in College

	% by College Enrollment Status	
	Non-Student Veterans	**SSM/V[a]**
Mental Health Concerns		
TBI	14.7	36.6**
PTSD	18.0	24.7
Depression (MDD)	18.5	19.9
Any of the mental health concerns	29.7	43.7
Substance Use Disorders		
Alcohol use disorder (AUD)	29.2	28.1
Drug use disorder (DUD)	24.9	10.0*
Any substance use disorder (SUD)	34.9	28.1
Alcohol		
Any alcohol use, last 30 days	53.9	76.0*
Binge drinking (5 or more drinks on the same occasion or men, 4 or more for women), last 30 days	33.2	38.8
Heavy drinking (binge drinking 5 or more days within the past 30 days), last 30 days	13.9	16.9
Marijuana		
Marijuana use, last 30 days	44.0	23.9*
Pain medications		
Prescription painkiller use, last 30 days	8.0	2.3
Tobacco		
Cigarette use, last 30 days	62.6	33.2**

* $p < 0.05$.

** $p < 0.01$.

[a] Student Service Members/Veterans

Table 3

Covariates of College Attendance (Logistic Regression)

Model variables entered	Odds-Ratio of attending college	95% CI	Wald Statistic
Base odds	.55	0.3–1.0	3.5
Gender			1.2
Male[a]	1.0	--	
Female	1.6	0.7–3.6	
Race/Ethnicity			10.4**
African American[a]	1.0	--	
White (non-Hispanic)	1.7	0.8–3.9	
Hispanic (non-African American)	4.1	1.6–10.1	
Other	0.7	0.5–2.1	
Age			4.8
24 and under	1.8	0.8–4.1	
25–29[a]	1.0	--	
30–34	1.5	0.7–3.3	
35 and over	0.6	0.3–1.6	
Relationship Status			1.3
Married	0.9	0.4–2.5	
Cohabiting	2.1	0.6–7.3	
Single[a]	1.0	--	
Sep./Div./Wid.	1.0	0.5–2.4	
Disabled	3.3	1.5–7.3	8.7**
Severe Depression (MDD)	0.3	0.1–1.0	4.0*
TBI	2.8	1.3–6.0	6.9**
PTSD	0.6	0.3–1.2	1.8
SUD	0.6	0.3–1.3	1.5

[a]Reference category

*$p < 0.05$.

**$p < 0.01$.

Table 4

Variation in Perceived Supportiveness of Fellow Veterans and of Veterans Groups between SSM/V and Veterans not Attending College

	% with Characteristic by College Enrollment Status	
	Non-Student Veterans	**SSM/V[a]**
Agreed that "I am proud of having served my country"	86.2%	94.2%**
Disagreed that "Joining the military was one of the biggest mistakes of my life"[c]	73.3%	91.0%**
"Since returning to civilian life, [my] friends/peers from the military have been a source of support that made [me] feel good or satisfied"[d]	32.5	62.0**
About how often have you been attending activities with a veterans group or multiple groups? (IAVA, VFW, American Legion)" [% at least monthly attendance]	19.5	30.6
"Since returning to civilian life, veterans group(s) have been a source of support that made [me] feel good or satisfied"[d]	8.2	15.3

* $p < 0.05$.

** $p < 0.01$.

[a] Student Service Members/Veterans

[b] Includes responses: (5) "agree strongly" and (4) "agree somewhat"

[c] Includes responses: (1) "disagree strongly" and (2) "disagree somewhat"

[d] Includes responses: (5) "extremely supportive" and (4) "quite a bit supportive"