

Posttraumatic Stress Disorder and Substance Use Disorder Comorbidity Among Individuals With Physical Disabilities: Findings From the National Comorbidity Survey Replication

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Co-occurring posttraumatic stress disorder (PTSD) and substance use disorder (SUD) affects multiple domains of functioning and presents complex challenges to recovery. Using data from the National Comorbidity Study Replication, a national epidemiological study of mental disorders (weighted $N = 4,883$), the current study sought to determine the prevalence of PTSD and SUD, the symptom presentation of these disorders, and help-seeking behaviors in relation to PTSD and SUD among individuals with physical disabilities (weighted $n = 491$; nondisabled weighted $n = 4,392$). Results indicated that individuals with physical disabilities exhibited higher rates of PTSD, SUD, and comorbid PTSD/SUD than nondisabled individuals. For example, they were 2.6 times more likely to meet criteria for lifetime PTSD, 1.5 times more likely for lifetime SUD, and 3.6 times more likely for lifetime PTSD/SUD compared to their nondisabled peers. Additionally, individuals with physical disabilities endorsed more recent/severe PTSD symptoms and more lifetime trauma events than nondisabled individuals with an average of 5 different trauma events compared to 3 in the nondisabled group. No significant pattern of differences was noted for SUD symptom presentation, or for receipt of lifetime or past-year PTSD or SUD treatment. Implications of these findings and recommendations for future research are discussed.

Comorbid posttraumatic stress disorder (PTSD) and substance use disorder (SUD) affects multiple domains of functioning and presents complex challenges to recovery (Najavits et al., 2008). Individuals with physical disabilities experience higher rates of lifetime trauma and PTSD, and exhibit more severe SUD than their nondisabled peers (Gilson, Chilcoat, & Stapleton, 1996; Martz & Cook, 2001; Nosek, Foley, Hughes, & Howland, 2001; Sareen, Cox, Clara, & Asmundson, 2005). Section 3 of the American with Disabilities Act of 1990 defines a physical disability as “any physical impairment that substantially limits one or more major life activities,” which persists for more than 6 months. This definition includes physiological disorders or conditions, cosmetic disfigurements, or anatomical losses (e.g., musculoskeletal, sensory, and/or neurological systems). Those with intersecting minority identities

(i.e., women with physical disabilities, ethnic minority individuals with physical disabilities) report even higher rates of behavioral health problems (Banks, 2012).

Individuals with physical disabilities report more lifetime trauma than their nondisabled peers, including interpersonal violence and neglect (Nosek et al., 2001). Additionally, multiple types of physical disability are associated with higher rates of PTSD, including spinal cord injury, amputation, and various musculoskeletal, cardiovascular, gastrointestinal, metabolic, and neurological disorders (Martz & Cook, 2001; Sareen et al., 2005). There are a number of relationships between PTSD and physical disability. For example, trauma can lead to both physical disability and PTSD (Jurišić & Marušič, 2009; Mona, Cameron, & Crawford, 2005). Second, PTSD may precede disability onset, with these events largely unrelated. Third, pre-existing physical disability may create vulnerability to trauma by reducing social support, increasing need for assistance with activities of daily living, and limiting escape options and access to resources (Nosek et al., 2001). In the aftermath of trauma, these barriers also increase risk for developing PTSD (Peek & Stough, 2010; Shih, Schell, Hambarsoomian, Belzberg, & Marshall, 2010).

Individuals with physical disabilities also report higher rates of alcohol dependence, drug abuse, and drug dependence than nondisabled individuals (Brucker, 2007), with SUD rates

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twice that in the general population (Krahn, Farrell, Gabriel, & Deck, 2006). Severe and chronic SUD may result in physical injuries that later develop into physical disabilities. Or for individuals with pre-existing physical disabilities, increased risk for developing SUD may be related to chronic medical difficulties, lack of societal access, unemployment, isolation, perceived discrimination, and level of disability acceptance (Li & Moore, 2001).

Individuals with physical disabilities access PTSD and SUD treatment at markedly lower rates than nondisabled individuals (Krahn et al., 2006; Mona et al., 2005), with access issues especially salient for female and ethnic minority individuals with physical disabilities (Banks, 2012). Barriers include lack of physical access to agencies and limited clinician competency in both disability issues and PTSD/SUD (Nosek et al., 2001). Experiences of inaccessibility and misunderstanding in behavioral health care settings often cause reluctance to seek formal help in the future (Mona et al., 2005).

Concerning the co-occurrence of trauma and SUD, women with physical disabilities who have experienced violence are more likely to use illicit substances than those who have not experienced violence (Li & Ford, 1998). This initial finding, however, has not been expanded and no investigations of comorbid PTSD/SUD among individuals with physical disabilities appear to have been conducted (i.e., empirical literature regarding co-occurring PTSD/SUD within other subgroups of disability could not be found when searching PubMed and Google Scholar using combinations of the following terms: “disability,” “trauma,” “PTSD,” “substance/alcohol/drug use,” “substance/alcohol/drug abuse,” “substance/alcohol/drug/chemical dependence,” “comorbid,” “co-occurring”). Moreover, epidemiological findings to corroborate PTSD and SUD disparities in this population are often unreliable due to inadequate measures of disability, small sample sizes, and lack of accessibility accommodations (Livermore, Whalen, Prenovitz, Aggarwal, & Bardos, 2011). The lack of sound behavioral health data creates significant barriers to establishing public health priorities and directing funding to resources for this group.

The National Comorbidity Survey Replication (NCS-R) is one of three Collaborative Psychiatric Epidemiology Surveys (CPES), which investigated the prevalence, correlates, and risk factors of behavioral health disorders within the general U.S. population (Alegria, Jackson, Kessler, & Takeuchi, 2008). Conducting a secondary analysis of NCS-R data, we sought to answer the following questions: (a) Compared to nondisabled individuals, what is the prevalence of PTSD, SUD, and comorbid PTSD/SUD among individuals with physical disabilities; (b) what are their trauma characteristics and PTSD/SUD symptom presentation; (c) what are their rates of PTSD/SUD help-seeking; and (d) what are the PTSD/SUD prevalence, symptom presentation, and help-seeking behaviors of individuals with physical disabilities with intersecting minority identities?

We hypothesized that compared to nondisabled individuals, individuals with physical disabilities would exhibit higher rates of trauma, PTSD, SUD, and comorbid PTSD/SUD. We hypoth-

esized that individuals with physical disabilities with PTSD and/or SUD would report more severe symptom presentation of these disorders and endorse lower rates of help-seeking and treatment satisfaction than nondisabled individuals. Additionally, we expected that women and ethnic minority individuals with physical disabilities would evidence higher rates of PTSD/SUD, more severe symptom presentation, and lower rates of help-seeking compared to individuals with physical disabilities without multiple minority identities.

Method

Participants

In the sample, 10.1% identified as having a physical disability, 95% CI [9.2, 11.0], weighted $n = 491$. Aligning with reported disparities affecting individuals with physical disabilities (Hubert, Bloch, & Fries, 1993), the current subsample of individuals with physical disabilities were approximately 8 years older, reported a lower yearly household income, were more likely to be divorced/separated/widowed, less likely to have earned a high school diploma, and less likely to be employed than nondisabled respondents (see Table 1). To account for the effects of these disparities on current findings, age, household income, marital status, years of education, and work status were entered in all analyses described below.

Measures

The NCS-R survey was based on the World Health Organization's expanded version of the Composite International Diagnostic Interview (CIDI) developed for the World Mental Health (WMH) Survey Initiative, the WMH-CIDI, as described by Kessler and Üstün (2004). CIDI validity studies suggest that there is a significant correlation between diagnoses based on data collected using the CIDI and diagnoses made by clinicians who reinterview a sample of respondents (Kessler & Üstün, 2004). Additionally, as part of the WMH-CIDI development process, debriefing interviews were conducted with CIDI respondents and several methodological improvements were made to the instrument based on findings from the debriefing interviews. See Kessler, Wittchen, Abelson, and Zhao (2000) and Kessler and Üstün (2004) for a detailed discussion of the content additions and methodological enhancements that were incorporated in the WMH-CIDI instrument.

Data on the following NCS-R topics were downloaded from the CPES website (www.icpsr.umich.edu/icpsrweb/CPES): demographics, physical disability status, lifetime, 12-month, and 30-day diagnoses based on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., *DSM-IV*; American Psychiatric Association, 1994), trauma characteristics and PTSD symptom presentation, substance use characteristics and SUD symptom presentation, and help-seeking. Demographic variables included data on respondents' age, household income,

Table 1
 Respondent Demographics by Disability Status

Variable	Individuals with physical disabilities ^a		Nondisabled individuals ^b		Test statistic
	<i>M</i> or %	<i>SE</i>	<i>M</i> or %	<i>SE</i>	
Age (years)	52.37	0.89	44.18	0.54	8.06***
Household income (\$)	44,149.70	2,546.71	59,989.36	1,697.04	-5.48***
Sex					0.75
Male	48.4	2.9	45.7	1.3	
Female	51.6	2.9	54.3	1.3	
Race/ancestry					0.97
Nonminority	75.2	3.4	72.1	1.9	
Minority	24.8	3.4	27.9	1.9	
Region of U.S.					0.28
Northeast	20.3	4.0	19.3	2.7	
Midwest	23.5	3.1	24.1	1.8	
South	32.7	2.6	34.4	1.8	
West	23.4	2.8	22.2	1.5	
Marital status					15.54***
Married/cohabitating	51.7	2.8	55.6	1.3	
Divorced/separated/widowed	32.9	2.2	20.0	0.8	
Never married	15.4	2.4	24.4	1.2	
Years of education					5.49***
0–11 years	23.2	2.4	16.6	0.9	
12 years	30.5	2.6	33.0	1.0	
13–15 years	28.2	1.9	27.2	0.8	
16 years or more	18.0	1.8	23.2	1.2	
Work status					114.82***
Employed	34.3	2.3	67.1	1.2	
Unemployed	5.5	1.1	5.0	0.6	
Not in labor force	60.2	2.1	28.0	1.1	

Note. Test statistic is *t* or Rao-Scott χ^2 adjusted *F*.

^aWeighted *n* = 491. ^bWeighted *n* = 4,392.

p* < .05. *p* < .01. ****p* < .001.

sex, race/ancestry, U.S. region, marital status, years of education, and work status.

Physical disability status was determined using the following NCS-R question: “Do you have any of the following conditions: Any physical handicap or disability?” Anyone with a positive response was categorized as an “individual with physical disabilities” and respondents who did not endorse this item were categorized as “nondisabled” individuals. (Note: This item does not represent a comprehensive assessment of physical disability status, excluding type of physical disability, age of disability onset, and disability severity. We determined this variable to be the best available in this dataset to serve as a proxy for disability status.)

Data on lifetime, 12-month, and 30-day *DSM-IV* diagnoses were downloaded for diagnoses of PTSD, alcohol abuse, alcohol dependence, drug abuse, and drug dependence. Substances covered in the drug abuse/dependence questions include am-

phetamines/other stimulants, cannabinoids, cocaine, phencyclidine (PCP)/other hallucinogens, inhalants, heroin/other opiates, barbiturates/other sedatives and tranquilizers, and club drugs. Organic exclusion rules and hierarchy rules were used to make all diagnoses other than SUD—SUD patients were diagnosed without hierarchy in recognition that substance abuse often is a stage in the progression to dependence (Kessler et al., 2005).

Data on trauma characteristics and PTSD symptom presentation included variables querying number of trauma event types, age at worst trauma event, PTSD age of onset, PTSD age of recency, frequency of intense PTSD reactions (1 = *less than once a month*, 2 = *one to two times a month*, 3 = *three to five times a month*, 4 = *six to ten times a month*, 5 = *more than ten times a month*), amount of distress caused by intense PTSD reactions (1 = *none*, 2 = *mild*, 3 = *moderate*, 4 = *severe*, 5 = *very severe*), and intense PTSD reactions’ interference with daily life (1 = *not at all*, 2 = *a little*, 3 = *some*, 4 = *a lot*, 5 = *extremely*). Data

on substance use characteristics and SUD symptom presentation including variables on age of first substance use, age of first alcohol-related problem, age of first drug-related problem, SUD age of onset, and SUD age of recency.

Help-seeking behavior was investigated using data on variables querying respondents' receipt of helpful/effective lifetime PTSD treatment, receipt of past-year PTSD treatment, receipt of helpful/effective lifetime SUD treatment, receipt of past-year SUD treatment, number of SUD-related hospitalizations, and frequency of SUD self-help group attendance.

Procedure

The Survey Research Center of the Institute for Social Research collected NCS-R data between February 2001 and April 2003, conducting computer-assisted personal interviews in respondents' homes (Alegria et al., 2008; Kessler et al., 2004). Surveys were administered to 9,282 noninstitutionalized English-speaking adults aged 18 years or older residing in the contiguous US, obtaining a 4-stage national area probability sample. The NCS-R was administered in two parts: Part I included a core diagnostic assessment administered to all respondents; Part II included questions on risk factors, consequences, other correlates, and additional disorders (including PTSD and SUD). Part II was administered to only 5,692 of Part I respondents. Part I respondents who met lifetime criteria for any Part I disorder and a one-in-three probability subsample of other Part I respondents went on to Part II of the survey.

Data Analysis

Data were analyzed using SPSS Version 19 Complex Samples module and included the application of weighting and sampling error estimation. The CPES uses weights to enable computation of unbiased or nearly unbiased estimates of population statistics for the larger CPES survey population of US residents. These weights adjust for probability of selection into the study and differences between the sample and US population on age, sex, race/ethnicity, education, marital status, region, and urbanicity (Kessler et al., 2004). Separate weights are available for both NCS-R Part I and Part II, with the Part II weights applying additional adjustment for probability of selection into Part II of the survey. Because current analyses included variables from both Part I and Part II of the survey, the Part II weight was applied for all analyses, as recommended by NCS-R analysts (Alegria et al., 2008).

Taylor Series linearization estimation of sampling errors was used for descriptive statistics, cross-tabulated data, general linear model, and logistic regression. Stratification and clustering variables designed by CPES were applied along with the analysis weight and were used throughout all analyses.

Variables were computed for comorbid PTSD/alcohol abuse, PTSD/alcohol dependence, PTSD/drug abuse, and PTSD/drug dependence, identifying only respondents who met criteria for both diagnoses. Cross tabulations were conducted to ascertain prevalence of PTSD, SUD, and comorbid PTSD/SUD. Logistic

regressions were conducted to determine if disability status was a significant predictor of being diagnosed with PTSD, SUD, or comorbid PTSD/SUD. Separate regressions were conducted for lifetime, 12-month, and 30-day PTSD and SUD diagnoses. For comorbid PTSD/SUD, separate regressions were conducted for lifetime and 12-month comorbidity; 30-day analyses could not be conducted due to inadequate subsample size at this level of specificity. General linear models were built to investigate the relationship of disability status to trauma characteristics and PTSD symptom presentation, as well as substance use characteristics and SUD symptom presentation. Cross tabulations and logistic regressions were conducted to investigate the relationship between disability status and PTSD/SUD help-seeking. To investigate the relative impact of intersecting minority identities, the above analyses were repeated split by sex and ethnic minority status.

Results

Overall, individuals with physical disabilities exhibited higher rates of PTSD, SUD, and comorbid PTSD/SUD than nondisabled individuals. Results are located in Table 2 and Table 3; they are outlined below.

Individuals with physical disabilities exhibited a higher prevalence of meeting diagnostic criteria for PTSD than nondisabled individuals—2.6 times more likely over the course of their lifetime, 3.0 times more likely during the past 12 months, and 3.3 times more likely during the past 30 days. PTSD was more prevalent among women with physical disabilities (21.7%) than men with physical disabilities (10.2%). Ethnic minority individuals with physical disabilities had a higher prevalence (22.6%) than nonminority individuals with physical disabilities (14.0%).

Compared to nondisabled individuals, individuals with physical disabilities were 1.5 times more likely to meet criteria for lifetime SUD, with higher prevalence across all SUD diagnoses we analyzed (alcohol abuse, alcohol dependence, drug abuse, and drug dependence). Additionally, individuals with physical disabilities had higher rates of past 12-month and past 30-day drug dependence. SUD was more prevalent among men with physical disabilities than women with physical disabilities for alcohol abuse (26.7% vs. 12.4%), alcohol dependence (12.0% vs. 6.3%), drug abuse (13.6% vs. 9.3%), and drug dependence (5.7% vs. 4.8%). Similarly, minority individuals with physical disabilities evidenced higher rates of SUD compared to their nonminority peers for alcohol abuse (21.4% vs. 18.7%), alcohol dependence (9.8% vs. 8.8%), drug abuse (12.9% vs. 10.8%), and drug dependence (7.4% vs. 4.5%).

Compared to nondisabled individuals, individuals with physical disabilities were more likely to meet diagnostic criteria for both lifetime PTSD and SUD (relative risk = 3.6). Depending on substance type and severity, relative risk ranged from 3.4 to 4.1. Additionally, individuals with physical disabilities were 3.0 times more likely to meet criteria for past-year PTSD/alcohol dependence and past-year PTSD/drug abuse. It should be noted,

Table 2

Prevalence of PTSD and SUD by Disability Status With Age, Household Income, Marital Status, Years of Education, and Work Status in the Model

Variable	Individuals with physical disabilities ^a		Nondisabled individuals ^b		OR	95% CI	Wald <i>F</i>
	%	SE	%	SE			
Lifetime							
PTSD	16.1	1.6	6.3	0.4	3.07	[2.3, 4.1]	60.59***
Any SUD	21.6	1.5	14.0	0.6	2.11	[1.7, 2.6]	57.32***
Alcohol abuse	19.3	1.5	12.6	0.6	2.02	[1.6, 2.5]	40.18***
Alcohol dependence	9.0	1.4	5.1	0.4	2.20	[1.4, 3.4]	12.73***
Drug abuse	11.4	1.1	7.8	0.5	2.33	[1.8, 3.0]	39.95***
Drug dependence	5.2	0.9	3.0	0.3	2.70	[1.8, 4.1]	22.79***
12-Month							
PTSD	9.6	1.3	3.2	0.3	3.50	[2.4, 5.1]	47.21***
Any SUD	2.5	0.6	4.2	0.4	0.94	[0.5, 1.6]	0.05
Alcohol abuse	2.0	0.6	3.1	0.3	1.00	[0.5, 1.9]	0.00
Alcohol dependence	1.5	0.4	1.4	0.2	1.49	[0.8, 2.7]	1.74
Drug abuse	1.3	0.5	1.4	0.2	1.76	[0.8, 3.8]	2.13
Drug dependence	0.8	0.3	0.4	0.1	3.47	[1.3, 9.3]	6.50*
30-Day							
PTSD	5.0	0.8	1.5	0.2	3.48	[2.4, 5.0]	49.27***
Any SUD	1.1	0.4	1.5	0.2	1.16	[0.5, 2.6]	0.14
Alcohol abuse	0.4	0.2	0.9	0.2	0.71	[0.2, 2.4]	0.32
Alcohol dependence	0.7	0.3	0.6	0.1	1.52	[0.6, 4.0]	0.79
Drug abuse	0.9	0.4	0.4	0.1	2.83	[1.0, 8.1]	3.95
Drug dependence	0.7	0.3	0.1	0.1	7.22	[1.6, 32.4]	7.05*

Note. OR = odds ratio; CI = confidence interval; PTSD = posttraumatic stress disorder; SUD = substance use disorder.

^aWeighted $n = 491$. ^bWeighted $n = 4,392$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

however, that because subsample sizes at this level of analysis were greatly reduced findings on 12-month comorbidity should be interpreted with caution.

Women and men with physical disabilities evidenced largely similar rates of comorbid PTSD/SUD: PTSD/alcohol abuse (5.6% vs. 5.1%), PTSD/alcohol dependence (3.2% vs. 3.4%), PTSD/drug abuse (4.8% vs. 3.5%), and PTSD/drug dependence (3.1% vs. 2.7%). Minority individuals with physical disabilities, however, were more likely to meet criteria for comorbid lifetime PTSD/SUD compared to their nonminority peers: PTSD/alcohol abuse (6.6% vs. 4.9%), PTSD/alcohol dependence (5.2% vs. 2.6%), PTSD/drug abuse (6.7% vs. 3.3%), and PTSD/drug dependence (4.9% vs. 2.2%).

Overall, individuals with physical disabilities endorsed more lifetime trauma events and more severe PTSD symptoms than nondisabled individuals. SUD symptom presentation was largely similar between groups, with the exception of earlier use of alcohol and marijuana among individuals with physical disabilities. Results are provided in Table 4 and Table 5; they are outlined below.

Number of trauma event types experienced was higher among individuals with physical disabilities ($M = 5.04$, $SE = 0.19$) than nondisabled individuals ($M = 3.35$, $SE = 0.07$), Wald $F = 71.36$, $p < .001$. Age at worst trauma event did not vary by disability status (physical disability: $M = 24.40$ years, $SE = 1.42$; nondisabled: $M = 23.18$ years, $SE = 0.59$; Wald $F = 0.44$, *ns.*), nor did PTSD age of onset or recency (Table 4). Compared to nondisabled individuals, however, individuals with physical disabilities and PTSD endorsed intense posttraumatic reactions of greater frequency, higher severity, and greater level of interference with daily life. Age of first alcohol use and marijuana use were lower among individuals with physical disabilities than nondisabled individuals. No differences between disability status were observed for age of first alcohol-related problem, age of first drug-related problem, age of first cocaine use or prescription drug abuse, age of SUD onset, or recency of SUD.

Individuals with physical disabilities and nondisabled individuals reported similar rates of receiving lifetime and past-year PTSD and SUD treatment. Results are outlined below. No significant differences were noted in ability to receive PTSD

Table 3

Prevalence of Comorbid PTSD/SUD by Disability Status With Age, Household Income, Marital Status, Years of Education, and Work Status in the Model

Variable	Individuals with physical disabilities ^a		Nondisabled individuals disabilities ^b		OR	[95% CI]	Wald <i>F</i>
	%	SE	%	SE			
Lifetime							
PTSD/Any SUD	6.4	0.9	1.8	0.2	4.08	[2.9, 5.8]	65.38***
PTSD/Alcohol abuse	5.4	1.7	1.6	0.4	3.54	[2.4, 5.2]	43.01***
PTSD/Alcohol dependence	3.3	0.8	0.9	0.1	4.30	[2.3, 8.0]	22.46***
PTSD/Drug abuse	4.2	0.8	1.1	0.1	4.40	[2.8, 6.8]	46.11***
PTSD/Drug dependence	2.9	0.9	0.7	0.1	4.79	[2.6, 8.8]	26.92***
12-Month							
PTSD/Any SUD	0.7	0.3	0.4	0.1	2.19	[0.8, 5.7]	2.79
PTSD/Alcohol abuse	0.5	0.3	0.3	0.1	1.76	[0.5, 6.5]	0.77
PTSD/Alcohol dependence	0.6	0.3	0.2	0.1	4.80	[1.8, 12.6]	10.72**
PTSD/Drug abuse	0.3	0.2	0.1	0.0	5.40	[1.5, 19.3]	7.11*
PTSD/Drug dependence	0.1	0.1	0.1	0.0	2.70	[0.4, 17.0]	1.19

Note. PTSD = posttraumatic stress disorder; SUD = substance use disorder; OR = odds ratio; CI = confidence interval.

^aWeighted $n = 491$. ^bWeighted $n = 4,392$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

treatment, with 77.5% of individuals with physical disabilities diagnosed with PTSD reporting ever receiving treatment (nondisabled = 69.1%) and 49.9% reporting past-year treatment (nondisabled = 31.3%). Analyses split by sex revealed that women with physical disabilities were more likely than men with physical disabilities to receive past-year PTSD treatment (55.2% vs. 28.7%) and lifetime helpful/effective PTSD treatment (84.0% vs. 54.0%). Minority individuals with physical disabilities were less likely than their nonminority peers to have received past-year treatment (32.7% vs. 57.1%) or lifetime helpful/effective treatment (68.0% vs. 80.0%).

No significant differences based on disability status were found in ability to obtain SUD treatment, with 49.6% of individuals with physical disabilities diagnosed with SUD reporting ever receiving helpful treatment (nondisabled = 56.7%) and 15.4% reporting past-year treatment (nondisabled = 15.0%). Similarly, no differences in SUD-related hospitalizations or attendance at self-help groups were noted based on disability status. Analyses split by sex revealed that women with physical disabilities were less likely than men with physical disabilities to have seen a doctor about substances (31.7% vs. 46.0%) and less likely to have attended self-help groups (31.7% vs.

Table 4

Characteristics of Trauma and PTSD Symptom Presentation by Disability Status With Age, Household Income, Marital Status, Years of Education, and Work Status in the Model

Variable	Individuals with physical disabilities ^a		Nondisabled individuals ^b		Wald <i>F</i>
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	
PTSD age of onset	22.02	1.42	21.14	0.52	0.29
PTSD age of recency	36.61	1.26	33.97	0.60	4.05
Intense reactions					
Frequency	3.97	0.12	3.62	0.07	4.45*
Distress	3.90	0.10	3.53	0.05	9.91**
Interference with daily life	3.65	0.14	3.24	0.06	6.08*

Note. PTSD = posttraumatic stress disorder.

^aWeighted $n = 93$. ^bWeighted $n = 344$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5

Characteristics of Substance Use and SUD Symptom Presentation by Disability Status With Age, Household Income, Marital Status, Years of Education, and Work Status in the Model

Variable	Individuals with physical disabilities ^{a,b}		Nondisabled individuals disabilities ^{b,c}		Wald <i>F</i>
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	
Age of first substance use					
Alcohol	14.71	0.35	15.52	0.11	5.77*
Marijuana	17.12	0.37	18.21	0.19	5.34*
Cocaine	21.95	0.76	21.42	0.30	0.37
Prescription drugs (illicit)	19.53	1.23	20.16	0.35	0.22
Other drugs	19.30	0.70	18.41	0.27	1.25
Age first alcohol-related problem	20.71	0.83	21.91	0.34	1.46
Age first drug-related problem	20.19	0.77	19.38	0.18	0.88
SUD age of onset					
Alcohol abuse	20.63	0.76	22.21	0.30	3.31
Alcohol dependence	22.09	1.15	23.26	0.40	1.04
Drug abuse	20.02	0.68	19.52	0.20	0.42
Drug dependence	22.07	1.01	21.28	0.42	0.58
SUD age of recency					
Alcohol abuse	32.68	0.69	32.49	0.38	0.04
Alcohol dependence	33.91	0.94	33.68	0.34	0.05
Drug abuse	25.47	0.99	27.20	0.36	2.30
Drug dependence	30.36	1.33	28.85	0.43	1.49

Note. SUD = substance use disorder.

^aWeighted *n* = 491. ^bTotal *n* varies by row, based on prevalence of substance use and each particular disorder. ^cWeighted *n* = 4,392.

p* < .05. *p* < .01. ****p* < .001.

46.0%), but more likely to perceive receiving helpful/effective treatment (55.1% vs. 46.5%). Minority individuals with physical disabilities were less likely than their nonminority peers to have seen a doctor about substances (35.3% vs. 42.6%), less likely to have attended self-help groups (35.3% vs. 42.6%), and less likely to perceive receiving helpful/effective treatment (33.4% vs. 54.8%).

Given findings that individuals with physical disabilities experienced more trauma event types than nondisabled individuals, we conducted post hoc analyses, repeating the first set of prevalence analyses, with number of trauma event types added to the model (see Table 6). With number of trauma event types in the model, significant disparities in lifetime, 12-month, and 30-day PTSD rates persisted; however, SUD disparities did not. Rates of lifetime alcohol and drug dependence, 12-month drug dependence, and 30-day drug dependence were no longer significantly different between individuals with physical disabilities and nondisabled individuals.

Discussion

Using NCS-R data, the current study reported the prevalence and symptom presentation of PTSD and SUD in a national

subsample of individuals with physical disabilities. We hypothesized that the prevalence of PTSD, SUD, and comorbid PTSD/SUD would be higher among individuals with physical disabilities than nondisabled individuals. Aligning with previous findings (Gilson et al., 1996; Martz & Cook, 2001; Sareen et al., 2005), this hypothesis was supported. Individuals with physical disabilities were more likely to meet diagnostic criteria for lifetime, 12-month, and 30-day PTSD, lifetime alcohol and drug abuse/dependence, 12-month and 30-day drug dependence, and lifetime comorbid PTSD/SUD. Due to lack of data on disability onset, however, it is unclear whether physical disability preceded or followed PTSD/SUD onset and interpretations about causality cannot be made.

Additionally, we hypothesized that individuals with physical disabilities would report more trauma and more severe symptoms of PTSD and SUD than nondisabled individuals. This hypothesis was partially supported. Individuals with physical disabilities endorsed more trauma event types than their nondisabled peers, similar to previous findings regarding trauma and individuals with physical disabilities (Nosek et al., 2001). Individuals with physical disabilities also reported higher levels of posttraumatic distress, higher frequency of trauma reactions, and greater disruption of daily life than nondisabled individuals. One explanation for disparate rates of PTSD within the current

Table 6

Prevalence of PTSD and SUD by Disability Status With Number of Trauma Event Types, Age, Household Income, Marital Status, Years of Education, and Work Status in the Model

Variable	Individuals with physical disabilities ^a		Nondisabled individuals disabilities ^b		OR	95% CI	Wald F
	%	SE	%	SE			
Lifetime							
PTSD	16.1	1.6	6.3	0.4	1.83	[1.3, 2.5]	15.05***
Alcohol abuse	19.3	1.5	12.6	0.6	1.31	[1.0, 1.7]	5.31*
Alcohol dependence	9.0	1.4	5.1	0.4	1.30	[0.8, 2.1]	1.15
Drug abuse	11.4	1.1	7.8	0.5	1.39	[1.0, 1.9]	5.41*
Drug dependence	5.2	0.9	3.0	0.3	1.44	[0.9, 2.3]	2.53
12-Month							
PTSD	9.6	1.3	3.2	0.3	2.03	[1.4, 3.0]	13.92***
Alcohol abuse	2.0	0.6	3.1	0.3	0.58	[0.3, 1.2]	2.28
Alcohol dependence	1.5	0.4	1.4	0.2	0.89	[0.5, 1.8]	0.12
Drug abuse	1.3	0.5	1.4	0.2	1.03	[0.4, 2.4]	0.01
Drug dependence	0.8	0.3	0.4	0.1	1.95	[0.6, 6.1]	1.40
30-Day							
PTSD	5.0	0.8	1.5	0.2	1.79	[1.2, 2.6]	9.30**
Alcohol abuse	0.4	0.2	0.9	0.2	0.55	[0.2, 1.9]	0.92
Alcohol dependence	0.7	0.3	0.6	0.1	0.85	[0.3, 2.2]	0.12
Drug abuse	0.9	0.4	0.4	0.1	1.77	[0.6, 5.6]	0.99
Drug dependence	0.7	0.3	0.1	0.1	3.44	[0.5, 21.8]	1.82

Note. PTSD = posttraumatic stress disorder; SUD = substance use disorder; OR = odds ratio; CI = confidence interval.

^aWeighted $n = 491$. ^bWeighted $n = 4,392$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

sample is the high number of trauma events among individuals with physical disabilities compared to nondisabled individuals. Post hoc analyses, however, indicated that although trauma exposure contributes partially to disparate rates of PTSD, these disparities are not fully explained by number of trauma event types. Therefore, other unstudied factors—potentially related to disability experience—may explain the higher prevalence of PTSD among individuals with physical disabilities.

Departing from previous research reporting higher severity SUD among individuals with physical disabilities, current findings indicate that SUD symptoms were largely similar between the groups. Interestingly, when the number of trauma event types was added in SUD analyses, formerly significant disparities in rates of alcohol and drug dependence disappeared. This finding may indicate that, for individuals with physical disabilities, SUD is largely attributable to increased rates of trauma exposure. More research, however, is needed to investigate the relationships between these variables, as currently unstudied variables may explain the association between trauma exposure and SUD (e.g., social support, mood disorders).

Based on evidence that individuals with physical disabilities experience significant barriers to accessing appropriate behavioral healthcare (Mona et al., 2005; Nosek et al., 2001), we

hypothesized that rates of PTSD and SUD treatment would be lower within this group compared to nondisabled individuals. Departing from the literature, our findings were no significant differences in ability to receive effective PTSD or SUD treatment, SUD self-help group attendance, or SUD-related hospitalizations. Although these results seemingly suggest no difference in access to effective health care, a more in-depth investigation of disability characteristics, access barriers, and satisfaction with treatment might reveal disparities discussed in the literature.

Our findings are consistent with the literature on individuals with physical disabilities and intersecting minority identities (Banks, 2012). Women with physical disabilities were more likely to meet criteria for lifetime PTSD; these women were also more likely to seek PTSD treatment than men with physical disabilities and PTSD. Men with physical disabilities, however, were more likely to meet criteria for lifetime SUD and seek SUD treatment. Ethnic minority individuals with physical disabilities were more likely to meet criteria for all diagnoses analyzed (lifetime PTSD, SUD, and comorbid PTSD/SUD), but less likely to seek treatment compared to their nonminority peers. These findings suggest that individuals with physical disabilities and intersecting minority identities may be

subpopulations most in need of targeted research and services to reduce behavioral health disparities.

There are limitations that deserve explication. Available epidemiological surveys apply inadequate and inconsistent measures of disability as a key diversity variable (Livermore et al., 2011). The NCS-R is also subject to this limitation, in that the physical disability variable used as a proxy for disability status in the current analysis is not a comprehensive measure of this construct. The NCS-R does not include questions about type of physical disability (e.g., chronic pain, amputation, injury) or onset of disability (i.e., from birth or acquired later in life). We know only that our target sample comprised individuals who endorse having a “physical handicap or disability,” limiting our ability to generalize findings to the heterogeneous U.S. disability community.

Generalizability is also limited due to sampling methodology, with individuals with sensory disabilities excluded from the current analyses. Although the NCS-R queried hearing and vision loss, these data were not made public due to small subsample sizes and methodological concerns (i.e., survey methodology sampled only English-speaking individuals, no documentation of provision of interpreters or other accommodations for individuals with hearing loss). Therefore, similar to previous epidemiological research, individuals from the deaf population were excluded from the current sample, unless they were individuals with mild hearing loss and/or effective assistive technology (i.e., hearing aids, cochlear implants) that allowed them access to the spoken English interview. Given recent findings that deaf individuals experience higher rates of trauma, PTSD, and SUD than hearing individuals, future epidemiological research should ensure access for this severely underserved population (Anderson, Leigh, & Samar, 2011; Schild & Dalenberg, 2012; Titus, Schiller, & Guthmann, 2008).

Although relationships were found between physical disability status and diagnoses of PTSD/SUD, conclusions regarding causality between disability and PTSD/SUD should be drawn with extreme caution. Available data do not specify whether onset of physical disability preceded PTSD/SUD onset, was a direct consequence of a trauma or substance use event, or occurred after the onset of PTSD/SUD. Future longitudinal analyses should be conducted to investigate the relationships among these variables, to determine if disability increases vulnerability for the development of PTSD/SUD, or vice versa.

Although causality cannot be inferred, our study nevertheless provides initial evidence of disparate rates of PTSD, SUD, and comorbid PTSD/SUD among individuals with physical disabilities. These findings justify the need to direct prevention and intervention efforts to this population, especially among individuals with physical disabilities and intersecting minority identities. Extensive research is needed to increase our understanding of the behavioral health challenges and needs of individuals with physical disabilities. Ongoing epidemiological efforts should apply clearer definitions of disability, include more meaningful disability variables, and recruit and provide access to individuals with disabilities. The persistent literature

gap on individuals with physical disabilities precludes our ability to assess the health and well-being of the population, design effective programs and policies to improve health and accessible health care, and obtain funding to support initiatives to reduce severe health disparities.

References

- Alegria, M., Jackson, J. S., Kessler, R. C., & Takeuchi, D. (2008). *Collaborative Psychiatric Epidemiology Surveys: 2001–2003 [United States], User Guide*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Anderson, M. L., Leigh, I. W., & Samar, V. J. (2011). Intimate partner violence against deaf women: A review. *Aggression and Violent Behavior, 16*, 200–206. doi:10.1016/j.avb.2011.02.006
- Banks, M. E. (2012). Multiple minority identities and mental health: Social and research implications of diversity within and between groups. In R. Nettles & R. Balter (Eds.), *Multiple Minority Identities: Applications for Practice, Research, and Training* (pp. 35–58). New York, NY: Springer.
- Brucker, D. (2007). Estimating the prevalence of substance use, abuse, and dependence among social security disability benefit recipients. *Journal of Disability Policy Studies, 18*, 148–159. doi:10.1177/10442073070180030301
- Gilson, S. F., Chilcoat, H. D., & Stapleton, J. M. (1996). Illicit drug use by persons with disabilities: Insights from the National Household Survey on Drug Abuse. *American Journal of Public Health, 86*, 1613–1615. doi:10.2105/AJPH.86.11.1613
- Hubert, H. B., Bloch, D. A., & Fries, J. F. (1993). Risk factors for physical disability in an aging cohort: The NHANES I Epidemiologic Followup Study. *The Journal of Rheumatology, 20*, 480–488.
- Jurišić, B., & Marušić, A. (2009). Suicidal ideation and behavior and some psychological correlates in physically disabled motor-vehicle accident survivors. *Crisis, 30*, 34–38. doi:10.1027/0227-5910.30.1.34
- Kessler, R. C., Berglund, P., Chiu, W. T., Demler, O., Heeringa, S., Hiripi, E., . . . Zheng, H. (2004). The U.S. National Comorbidity Survey Replication: Design and field procedures. *International Journal of Methods in Psychiatric Research, 13*, 69–92. doi:10.1002/mpr.167
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*, 593–602. doi:10.1001/archpsyc.62.6.593
- Kessler, R. C., & Üstün, T. B. (2004). The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research, 13*, 93–121. doi:10.1002/mpr.168
- Kessler, R. C., Wittchen, H.-U., Abelson, J., & Zhao, S. (2000). Methodological issues in assessing psychiatric disorders with self-reports. In A. A. Stone, J. S. Turkkan, C. A. Barchrach, J. B. Jobe, H. S. Kurtzman, & V. S. Cain (Eds.), *The science of self-report: Implications for research and practice* (pp. 229–255). Mahwah, NJ: Erlbaum.
- Krahn, G., Farrell, N., Gabriel, R., & Deck, D. (2006). Access barriers to substance abuse treatment for persons with disabilities: An exploratory study. *Journal of Substance Abuse Treatment, 31*, 375–384. doi:10.1016/j.jsat.2006.05.011
- Li, L., & Ford, J. A. (1998). Illicit drug use by women with disabilities. *The American Journal of Drug and Alcohol Abuse, 24*, 405–418. doi:10.3109/00952999809016906

- Li, L., & Moore, D. (2001). Disability and illicit drug use: An application of labeling theory. *Deviant Behavior, 22*, 1–21. doi:10.1080/016396201750065784
- Livemore, G., Whalen, D., Prenovitz, S., Aggarwal, R., & Bardos, M. (2011). *Disability data in national surveys*: Washington, DC: Office of Disability, Aging and Long-Term Care Policy, Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.
- Martz, E., & Cook, D. W. (2001). Physical impairments as risk factors for the development of posttraumatic stress disorder. *Rehabilitation Counseling Bulletin, 44*, 217–221. doi:10.1177/003435520104400404
- Mona, L. R., Cameron, R. P., & Crawford, D. (2005). Stress and trauma in the lives of women with disabilities. In K. A. Kendall-Tackett (Ed.), *Handbook of women, stress, and trauma* (pp. 229–244). New York, NY: Routledge.
- Najavits, L. M., Rynkala, D., Back, S. E., Bolston, E., Mueser, K. T., & Brady, K. T. (2008). Treatment for PTSD and comorbid disorders: A review of the literature. In E. B. Foa, T. M. Keane, M. J. Friedman, & J. Cohen (Eds.), *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies*. (2nd ed.). New York, NY: Guilford Press.
- Nosek, M. A., Foley, C. C., Hughes, R. B., & Howland, C. A. (2001). Vulnerabilities for abuse among women with disabilities. *Sexuality and Disability, 19*, 177–189. doi:10.1023/A:1013152530758
- Peek, L., & Stough, L. M. (2010). Children with disabilities in the context of disaster: A social vulnerability perspective. *Child Development, 81*, 1260–1270. doi:10.1111/j.1467-8624.2010.01466.x
- Sareen, J., Cox, B. J., Clara, I., & Asmundson, G. J. (2005). The relationship between anxiety disorders and physical disorders in the U.S. National Comorbidity Survey. *Depression and Anxiety, 21*, 193–202. doi:10.1002/da.20072
- Schild, S., & Dalenberg, C. J. (2012). Trauma exposure and traumatic symptoms in deaf adults. *Psychological Trauma: Research, Practice, and Policy, 4*, 117–127. doi:10.1037/a0021578
- Shih, R. A., Schell, T. L., Hambarsoomian, K., Belzberg, H., & Marshall, G. N. (2010). Prevalence of posttraumatic stress disorder and major depression after trauma center hospitalization. *Journal of Trauma and Acute Care Surgery, 69*, 1560–1566. doi:10.1097/TA.0b013e3181e59c05
- Titus, J. C., Schiller, J. A., & Guthmann, D. (2008). Characteristics of youths with hearing loss admitted to substance abuse treatment. *Journal of Deaf Studies and Deaf Education, 13*, 336–350. doi:10.1093/deafed/enm068

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