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Prevalence of social and economic stressors among transgender veterans with alcohol and other drug use disorders

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ABSTRACT

Transgender persons have high rates of alcohol and other drug use disorders (AUD and DUD, respectively) and commonly experience social and economic stressors that may compound risk for adverse substance-related outcomes. National VA electronic health record data were extracted for all outpatients in each facility with documented alcohol screening 10/1/09–7/31/17. We describe the prevalence of eight individual-level social and economic stressors (barriers to accessing care, economic hardship, housing instability, homelessness, social and family problems, legal problems, military sexual trauma, and other victimization) among transgender patients with and without AUD and DUD (alone and in combination), overall and compared to cisgender patients in a national sample of VA outpatients. Among 8,872,793 patients, 8619 (0.1%) were transgender; the prevalence of AUD, DUD, and both was 8.6%, 7.2%, and 3.1% among transgender patients and 6.1%, 3.9%, and 1.7% among cisgender patients, respectively. Among all patients, prevalence of stressors was higher among those with AUD, DUD, or both, relative to those with neither. Within each of these groups, prevalence was 2–3 times higher among transgender compared to cisgender patients. For instance, prevalence of housing instability for transgender vs. cisgender patients with AUD, DUD, and both was: 40.8% vs 24.1%, 45.8% vs. 36.6%, and 57.4% vs. 47.0%, respectively. (all p-values <0.001). Social and economic stressors were prevalent among patients with AUD, DUD, or both, and the experience of these disorders and social and economic stressors was more common among transgender than cisgender patients in all groups. Further research regarding experiences of transgender persons and influences of stressors on risk of AUD and DUD, substance-related outcomes, and treatment uptake are needed. Routine screening for social and economic stressors among patients with substance use disorders (SUDs) could improve equitable substance-related care and outcomes. Treatment of SUDs among all persons should consider social and economic risk factors.

1. Introduction

Transgender persons—individuals who identify with a gender that differs from their sex assigned at birth—are more likely than cisgender persons to experience a variety of social and economic stressors, including housing instability and economic hardship (Balsam, Rothblum, & Beauchaine, 2005; Blosnich et al., 2013; Blosnich, Marsiglio, et al., 2017; Brown & Jones, 2016; Grant et al., 2010; Hughes, Johnson, & Wilsnack, 2001; Lehavot et al., 2016; Shipherd, Darling, Klap, Rose, & Yano, 2018; Stotzer, 2009), likely resulting from substantial exposure to

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transphobic discrimination and violence (Bradford, Reisner, Honnold, & Xavier, 2013; James et al., 2016; Lombardi, Wilchins, Priesing, & Malouf, 2002; White Hughto, Reisner, & Pachankis, 2015; Wolfe et al., 2021). The Minority Stress Model posits that discrimination, violence, rejection, and internalized stigma (e.g., internalized transphobia) (Meyer, 2003) negatively affect a person's resilience and ability to cope with stress (Hendricks & Testa, 2012), thereby increasing risk for adverse health outcomes, including substance use disorders (SUDs) (Hatzenbuehler, 2009; Labouvie & Bates, 2002; Meyer, 1995, 2003; Tartaglia & Bergagna, 2020).

Social and economic stressors may be both a cause and consequence of substance use and related disorders (Asana, Ayvaci, Pollio, Hong, & North, 2018; Braveman & Gottlieb, 2014; DiGuiseppi, Davis, Leightley, & Rice, 2020; Grant et al., 2015; Johnson & Chamberlain, 2008). More specifically, individual experiences of social and economic stress may increase risk of alcohol and drug use disorders (AUD and DUD, respectively) and related adverse outcomes (Giuse et al., 2017; Institute of Medicine, 2011; Mulia et al., 2008; Scheer & Pachankis, 2019; van Draanen et al., 2020), which may in turn increase likelihood of subsequent social and economic stressors and experiences of marginalization (Sheiham, 2009; World Health Organization, 2014). This overlapping phenomenon can be characterized as a syndemic, whereby two or more health-related issues interact synergistically and compound one another, further contributing to the burden of disease (Mendenhall, Kohrt, Norris, Ndetei, & Prabhakaran, 2017; Singer, Bulled, Ostrach, & Mendenhall, 2017).

Persons with chronic homelessness (Davidson et al., 2014) and justice system involvement (Blodgett et al., 2015) have higher rates of substance use relative to those without these social stressors. Similarly, trauma exposure and victimization—both in early life and adulthood—are predictive of substance use (Begle et al., 2010; Ullman, Relyea, Peter-Hagene, & Vasquez, 2013). The association between substance use and other stressors, such as economic hardship and lack of access to healthcare have also been hypothesized (Galea, Nandi, & Vlahov, 2004; Karriker-Jaffe et al., 2012, 2018; van Draanen et al., 2020), but to our knowledge, have not been studied in persons with SUDs across transgender status.

Research on transgender persons has found that they experience high rates of heavy episodic drinking, AUDs, and other DUDs (Frost et al., 2020; James et al., 2016; Reisner, Greytak, Parsons, & Ybarra, 2015; Williams et al., 2021). Prevalence estimates of alcohol and other drug use among transgender persons range from 26.5% (nonmedical use of prescription drugs) to 72% (alcohol use) (Benotsch et al., 2013; Garofalo et al., 2006; Peacock, Andrinopoulos, & Hembling, 2015). Overall, estimates of unhealthy substance use are higher for transgender persons than cisgender persons (Benotsch et al., 2016; Garofalo et al., 2006; Hughes, 2015; Lombardi, 2007; Reisner, White, Mayer, & Mimiaga, 2014; Santos et al., 2014), and though some studies have specifically identified associations between alcohol use and transphobic discrimination (Nuttbrock et al., 2014; Reisner et al., 2015; Rowe, Santos, McFarland, & Wilson, 2014), studies focused on substance use and social and economic stressors among transgender persons have been limited to survey data (Grant et al., 2010; Keuroghlian et al., 2015). The present study describes these overlapping constructs in a large, non-recruited, national sample.

The VA is an ideal setting in which to study these topics; its administrative and healthcare data provide a unique opportunity to describe the prevalence of social and economic stressors among transgender persons across presence of SUDs because: 1) VA serves a large and growing number of transgender patients (Kauth, Blosnich, Marra, Keig, & Shipherd, 2017); 2) VA electronic health record (EHR) data can be used to measure social stressors (Blosnich, Marsiglio, et al., 2017; Blosnich, Montgomery, et al., 2020), in addition to diagnoses for AUD and DUD; and 3) VA data enable comparison of transgender Veterans to cisgender Veterans receiving VA care. Thus, we utilized data from a national sample of patients receiving VA care to describe the prevalence of social and economic stressors among transgender Veterans with and without AUD, DUD, and both, overall and compared to cisgender Veterans.

2. Material and methods

2.1. Data sources and population

We conducted a secondary analysis using data from a study designed to examine patterns of alcohol use and receipt of alcohol-related care among transgender Veterans (Williams et al., 2021). All data were extracted from the VA Corporate Data Warehouse (CDW), a national repository of clinical and administrative data (Souden, 2017). The study population included all VA outpatients at each facility who had at least one documented Alcohol Use Disorders Identification Test Consumption (AUDIT-C) screen between October 1, 2009 and July 31, 2017. The AUDIT-C is administered annually at VA primary care visits for >90% of VA outpatients (Bradley et al., 2006), thus this population is largely representative of the national VA outpatient population. Although patients could have multiple AUDIT-C screens during the study period, the most recent screen at each facility served as the index date, as this would best reflect the current social environment experienced by transgender Veterans. All study procedures were approved by Institutional Review Boards at the VA Puget Sound and the University of Washington.

2.2. Transgender status

Consistent with prior research, we identified transgender Veterans using a method based on International Classification of Disease, 9th and 10th Revision, Clinical Modification (ICD-9-CM and ICD-10-CM) codes related to transgender status (Supplemental Table 1). The use of ICD codes to ascertain transgender status was developed and validated by VA researchers (Blosnich et al., 2013; Blosnich, Brown, Wojcio, Jones, & Bossarte, 2014; Blosnich et al., 2016; Blosnich, Marsiglio, et al., 2017; Brown & Jones, 2016), and has been applied in studies using Centers for Medicare & Medicaid Services Data (Proctor, Haffer, Ewald, Hodge, & James, 2016). Patients with one or more of these codes from the beginning of CDW (1/1/99) to the end of the study (7/31/17) were considered transgender. Although this method does not capture self-reported gender identity, it has high concordance with structured chart reviews assessing the presence of transgender-related clinician notes to determine patients' gender identity (Blosnich et al., 2018).

2.3. Alcohol and drug use disorder

We used ICD-9-CM and ICD-10-CM diagnosis codes for abuse or dependence, excluding in remission (Supplemental Table 1) to define presence of AUD and DUD in the year prior to AUDIT-C screen. DUD included opioid use disorder, amphetamine/other stimulant use disorder, cocaine use disorder, cannabis use disorder, sedative use disorder, and/or hallucinogen use disorder.

2.4. Social and economic stressors

Guided by the Minority Stress Model, we examined the following social and economic stressors: homelessness, housing instability (a broader term that encompasses chronic homelessness as well as spending one or more nights without shelter), economic hardship, legal problems, social and family problems, barriers to accessing healthcare, military sexual trauma (MST), and other victimization. We defined each stressor using methods that have been previously employed with VA EHR data (Blosnich, Marsiglio, et al., 2017; Blosnich, Montgomery, et al., 2020), based on a combination of outpatient clinic stop codes, inpatient specialty codes, templated social work referral assessments, ICD-9 and ICD-10 codes, and clinical screening questions (Supplemental Table 1). We identified the presence of each stressor in the two years

prior to AUDIT-C screen, except for MST, which we ascertained at any time prior to AUDIT-C screen as it captures a static variable (history of trauma exposure).

2.5. Additional descriptive variables

Age, race, ethnicity, marital status, and VA copay status were extracted from the CDW at the time of AUDIT-C screen. VA copay status was included as a proxy for socioeconomic status whereby those having no copay required were considered the most disadvantaged. Clinical characteristics, including presence of tobacco use disorder, mood disorders (depression, anxiety, bipolar disorder, other mood disorder), PTSD, suicide risk (ICD codes for suicide ideation and attempt/self-harm; does not include death by suicide), and Charlson comorbidity index (Deyo, Cherkin, & Ciol, 1992) were measured using ICD-9 and ICD-10 codes in the year prior to AUDIT-C screen. HIV and hepatitis C were measured using ICD-9 and ICD-10 codes in the 2 years prior to AUDIT-C screen.

2.6. Statistical analyses

We described demographic and clinical characteristics overall and stratified by transgender status. We also described the prevalence of each stressor stratified by transgender status, in the overall population, and separately among Veterans with AUD and/or DUD. Subsequently, to describe the intersecting relationship between social and economic stressors, AUD, and DUD among transgender patients, we estimated the prevalence of each stressor among transgender and cisgender Veterans with AUD only, with DUD only, with both AUD and DUD, and with neither AUD nor DUD. We used Chi-square tests to compare prevalence of stressors between transgender and cisgender Veterans and used a p-value of <0.001 as a cutoff for statistical significance due to the large number of comparisons.

3. Results

3.1. Study population characteristics

Between October 1, 2009 and July 31, 2017, 8,872,793 patients met inclusion criteria, of whom 8619 (0.1%) were transgender (Table 1). Demographic and other population characteristics are presented in Table 1. Transgender patients had a mean age of 52 and were predominantly of non-Hispanic White race/ethnicity (76.9%) and unmarried (72.3%). In this sample of transgender patients, 38.1% had no copay required due to means, 25.1% had PTSD, 4.4% had diagnostic codes related to suicidal ideation or attempt, and 1.9% had HIV. Cisgender patients were generally older (mean age 61), less likely to be of non-Hispanic White race/ethnicity (71.5%), more likely to be married (53.0%), and less likely to have no copay required (33.9%). The cisgender population also had lower prevalence of PTSD (13.3%), suicidal ideation or attempt (1.0%), and HIV (0.4%).

3.2. Prevalence of AUD, DUD, and social and economic stressors across groups

In the overall sample, 6.1% had AUD only, 3.9% had DUD only, and 1.7% had both. Among transgender patients, 8.6% had AUD only, 7.2% had DUD only, and 3.1% had both. Among cisgender patients, 6.1% had AUD only, 3.9% had DUD only, and 1.7% had both.

Among all patients, 0.7% had barriers to access to care, 3.8% had economic hardship, 6.1% had housing instability, 5.1% had homelessness, 6.9% had social and family problems, 1.4% had legal problems, 3.9% had military sexual trauma, and 0.7% had other victimization. Transgender patients experienced all eight stressors at a significantly higher rate than cisgender patients (all $p < 0.001$; Table 2).

Table 1
Demographic and clinical characteristics of a national sample of transgender and cisgender Veterans 2013–2017

	Transgender (N = 8619)	Cisgender (N = 8,864,174)	Total (N = 8,872,793)
Age (years)			
Under 30	1159 (13.5)	552,068 (6.2)	553,227 (6.2)
30-39	1323 (15.4)	828,099 (9.3)	829,422 (9.4)
40-49	1057 (12.3)	838,943 (9.5)	840,000 (9.5)
50-59	1706 (19.8)	1,301,861 (14.7)	1,303,567 (14.7)
60+	3374 (39.2)	5,343,203 (60.3)	5,346,577 (60.3)
Age (years) (mean, SD)	51.7 (16.5)	61.2 (17.7)	61.2 (17.7)
Race/Ethnicity			
Black non-Hispanic	919 (10.7)	1,491,965 (16.8)	1,492,884 (16.8)
Hispanic	429 (5.0)	510,902 (5.8)	511,331 (5.8)
White non-Hispanic	6630 (76.9)	6,338,799 (71.5)	6,345,429 (71.5)
Other	331 (3.8)	250,783 (2.8)	251,114 (2.8)
Unknown	310 (3.6)	271,725 (3.1)	272,035 (3.1)
Marital Status			
Divorced/Separated	3223 (37.4)	2,307,428 (26.0)	2,310,651 (26.0)
Married	2383 (27.7)	4,701,083 (53.0)	4,703,466 (53.0)
Never married/ single	2637 (30.6)	1,209,985 (13.7)	1,212,622 (13.7)
Widowed	318 (3.7)	597,223 (6.7)	597,541 (6.7)
Unknown/Missing	58 (0.7)	48,455 (0.6)	48,513 (0.6)
Copay Status			
Copay required due to means	924 (10.7)	2,077,865 (23.4)	2,078,789 (23.4)
No copay required due to disability	2165 (25.1)	1,655,621 (18.7)	1,657,786 (18.7)
No copay required due to means/other	3280 (38.1)	3,007,928 (33.9)	3,011,208 (33.9)
Missing/Unassigned	2250 (26.1)	2,122,760 (23.9)	2,125,010 (24.0)
Alcohol Use Disorder (AUD)	737 (8.6)	537,664 (6.1)	538,401 (6.1)
Any Drug Use Disorder (DUD)	622 (7.2)	342,789 (3.9)	343,411 (3.9)
AUD and DUD	265 (3.1)	150,783 (1.7)	151,048 (1.7)
AUDIT-C Score			
0	4068 (47.2)	4,230,571 (47.7)	4,234,639 (47.7)
1-3	3566 (41.4)	3,342,126 (37.7)	3,345,692 (37.7)
4-7	744 (8.6)	1,004,987 (11.3)	1,005,731 (11.3)
8-12	241 (2.8)	286,490 (3.2)	286,731 (3.2)
Health Conditions			
Tobacco Use Disorder	1261 (14.6)	983,683 (11.1)	984,944 (11.1)
Major Depression	2557 (29.7)	912,846 (10.3)	915,403 (10.3)
Other Depression	1433 (16.6)	741,993 (8.4)	743,426 (8.4)
Anxiety	1559 (18.1)	605,341 (6.8)	606,900 (6.8)
Bipolar	729 (8.5)	208,945 (2.4)	209,674 (2.4)
Other Mood Disorder	855 (9.9)	314,553 (3.6)	315,408 (3.6)
PTSD	2162 (25.1)	1,176,799 (13.3)	1,178,961 (13.3)
Suicide Risk	377 (4.4)	89,324 (1.0)	89,701 (1.0)
HIV	164 (1.9)	37,298 (0.4)	37,462 (0.4)
Hepatitis C	305 (3.5)	263,253 (3.0)	263,558 (3.0)
Charlson Comorbidity Index			
0	5312 (61.6)	4,816,880 (54.3)	4,822,192 (54.4)
1-2	2128 (24.7)	2,712,541 (30.6)	2,714,669 (30.6)
3-4	668 (7.8)	890,146 (10.0)	890,814 (10.0)
5+	511 (5.9)	444,607 (5.0)	445,118 (5.0)

Table 2
Prevalence of Social determinants of health among transgender and cisgender VA outpatients: overall and stratified by presence of alcohol and drug use disorder (N = 8,872,793).

	Transgender (N = 8619)	Cisgender (N = 8,864,174)	Chi-Square	Total (N = 8,872,793)
	N (%)	N (%)	p-value	N (%)
Barriers to Access to Care				
All patients[a,d]	165 (1.9)	64,613 (0.7)	<0.001	64,778 (0.7)
Patients with AUD[b,e]	21 (2.8)	9111 (1.7)	0.015	9132 (1.7)
Patients with DUD[c,f]	24 (3.9)	7939 (2.3)	0.011	7963 (2.3)
Patients with AUD & DUD[g]	10 (3.8)	4144 (2.8)	0.308	4154 (2.8)
Patients with neither AUD nor DUD[h]	130 (1.7)	51,707 (0.6)	<0.001	51,837 (0.6)
Economic Hardship				
All patients	932 (10.8)	336,874 (3.8)	<0.001	337,806 (3.8)
Patients with AUD	211 (28.6)	85,502 (15.9)	<0.001	85,713 (15.9)
Patients with DUD	203 (32.6)	80,154 (23.4)	<0.001	80,357 (23.4)
Patients with AUD & DUD	119 (44.9)	49,226 (32.7)	<0.001	49,345 (32.7)
Patients with neither AUD nor DUD	637 (8.5)	220,444 (2.7)	<0.001	221,081 (2.7)
Housing Instability				
All patients	1469 (17.0)	537,250 (6.1)	<0.001	538,719 (6.1)
Patients with AUD	301 (40.8)	129,702 (24.1)	<0.001	130,003 (24.2)
Patients with DUD	285 (45.8)	125,405 (36.6)	<0.001	125,690 (36.6)
Patients with AUD & DUD	152 (57.4)	70,861 (47.0)	0.001	71,013 (47.0)
Patients with neither AUD nor DUD	1035 (13.8)	353,004 (4.4)	<0.001	354,039 (4.4)
Homelessness				
All patients	1249 (14.5)	451,806 (5.1)	<0.001	453,055 (5.1)
Patients with AUD	281 (38.1)	119,798 (22.3)	<0.001	120,079 (22.3)
Patients with DUD	267 (42.9)	117,421 (34.3)	<0.001	117,688 (34.3)
Patients with AUD & DUD	144 (54.3)	67,196 (44.6)	0.001	67,340 (44.6)
Patients with neither AUD nor DUD	845 (11.2)	281,783 (3.5)	<0.001	282,628 (3.5)
Social & Family Problems				
All patients	1490 (17.3)	608,202 (6.9)	<0.001	609,692 (6.9)
Patients with AUD	233 (31.6)	85,595 (15.9)	<0.001	85,828 (15.9)
Patients with DUD	190 (30.6)	72,198 (21.1)	<0.001	72,388 (21.1)
Patients with AUD & DUD	98 (37.0)	38,848 (25.8)	<0.001	38,946 (25.8)
Patients with neither AUD nor DUD	1165 (15.5)	489,257 (6.0)	<0.001	490,422 (6.0)
Legal Problems				
All patients	261 (3.0)	125,122 (1.4)	<0.001	125,383 (1.4)
Patients with AUD	83 (11.3)	42,050 (7.8)	0.001	42,133 (7.8)
Patients with DUD	91 (14.6)	37,864 (11.1)	0.004	37,955 (11.1)
Patients with AUD & DUD	54 (20.4)	23,259 (15.4)	0.026	23,313 (15.4)
	141 (1.9)	68,467 (0.8)	<0.001	68,608 (0.8)
Patients with neither AUD nor DUD				
Military Sexual Trauma				
All patients	1437 (16.7)	345,055 (3.9)	<0.001	346,492 (3.9)
Patients with AUD	157 (21.3)	30,237 (5.6)	<0.001	30,394 (5.7)
Patients with DUD	151 (24.3)	27,262 (8.0)	<0.001	27,413 (8.0)
Patients with AUD & DUD	73 (27.6)	12,711 (8.4)	<0.001	12,784 (8.5)
Patients with neither AUD nor DUD	1202 (16.0)	300,267 (3.7)	<0.001	301,469 (3.7)
Other Victimization				
All patients	275 (3.2)	61,937 (0.7)	<0.001	62,212 (0.7)
Patients with AUD	54 (7.3)	11,172 (2.1)	<0.001	11,226 (2.1)
Patients with DUD	54 (8.7)	9886 (2.9)	<0.001	9940 (2.9)
Patients with AUD & DUD	30 (11.3)	5829 (3.9)	<0.001	5859 (3.9)
Patients with neither AUD nor DUD	197 (2.6)	46,708 (0.6)	<0.001	46,905 (0.6)

[a] All VA outpatients at each facility who had at least one documented Alcohol Use Disorders Identification Test Consumption (AUDIT-C) screen between October 1, 2009 and July 31, 2017.
[b] All patients with ICD codes for alcohol abuse or dependence, excluding those for remission, documented in the year prior to the most recent AUDIT-C screen.
[c] All patients with the presence of ICD-9 and ICD-10 codes for abuse or dependence (excluding remission) of any of the following substances: opioids, amphetamines and other stimulants, cocaine, cannabis, sedatives, and hallucinogens in the year prior to the most recent AUDIT-C screen.
[d] All patients N = 8,872,793.
[e] Patients with AUD N = 538,401.
[f] Patients with DUD N = 343,411.
[g] Patients with AUD & DUD N = 151,048.
[h] Patients with neither AUD nor DUD N = 8,142,029.

3.3. Prevalence of social and economic stressors in veterans with alcohol use disorder, drug use disorder, or both

The prevalence of social and economic stressors increased nearly linearly for patients with AUD, DUD, or both relative to those without either (the only exception being that the prevalence of social and family problems was not significantly higher among those with DUD than AUD; Table 2, Fig. 1). In every group of patients based on SUD diagnoses, the prevalence of social and economic stressors was significantly higher among transgender than cisgender patients (Fig. 1). For instance, among patients with AUD, the prevalence was nearly 2 times higher for transgender compared to cisgender patients for several stressors (barriers to access to care 2.8% vs. 1.7%, economic hardship 28.6% vs. 15.9%, housing instability 40.8% vs. 24.1%, homelessness 38.1% vs. 22.3%, social and family problems 31.6% vs. 15.9%, and legal problems 11.3% vs. 7.8%), and over 3 times higher for MST (21.3% vs. 5.6%) and other victimization (7.3% vs. 2.1%) (p-values ≤0.001 for all except barriers to accessing care (p = 0.015)). Similarly, though differences were smaller than with AUD, among patients with DUD, the prevalence of all stressors was greater among transgender than cisgender patients (barriers to access to care 3.9% vs. 2.3%, economic hardship 32.6% vs. 23.4%, housing instability 45.8% vs. 36.6%, homelessness 42.9% vs. 34.3%, social and family problems 30.6% vs. 21.1%, and legal problems 14.6% vs. 11.1%). Notably, among those with DUD, prevalence of other victimization was nearly 3 times higher in transgender than in cisgender persons (8.7% vs.

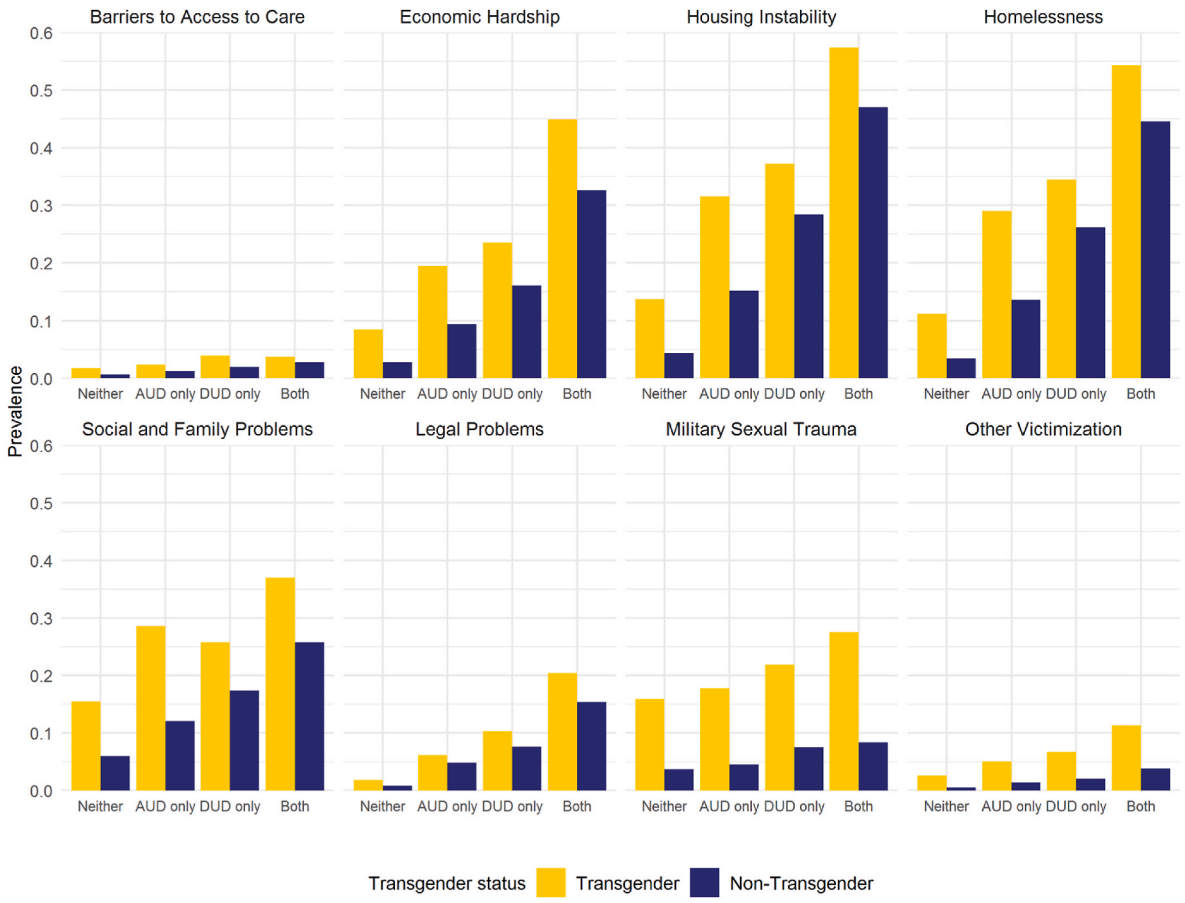

Fig. 1. Prevalence of social stressors among transgender and cisgender VA outpatients stratified by presence of AUD and/or DUD.

2.9%), and MST was more than 4 times higher (24.3% vs. 8.0%) (p-values $\leq$0.001 for all except barriers to accessing care ($p = 0.011$). The same was true among patients with both AUD and DUD: transgender patients had higher prevalence of all eight stressors compared to cisgender patients (barriers to access to care 3.8% vs. 2.8%, economic hardship 44.9% vs. 32.7%, housing instability 57.4% vs. 47.0%, homelessness 54.3% vs. 44.6%, social and family problems 37.0% vs. 25.8%, and legal problems 20.4% vs. 15.4%. Again, military sexual trauma and other victimization were each around 3 times more prevalent in transgender persons than in cisgender persons (27.6% vs. 8.4% and 11.3% vs. 3.9%, respectively) (Table 2).

4. Discussion

In this large sample of transgender and cisgender VA patients, we found that those with AUD and/or DUD experience individual-level social and economic stressors at alarmingly high rates relative to those without, and that rates of these stressors are particularly high among transgender patients regardless of SUDs. These findings highlight that patients with AUD and/or DUD—particularly transgender patients with these conditions—are at high risk for negative health outcomes and health disparities associated with adverse social determinants of health (Adler, Glymour, & Fielding, 2016).

To our knowledge, this is the first study to describe the prevalence of individual-level social and economic stressors and experiences of marginalization among transgender Veterans with and without AUD and/or DUD and to compare them to those of cisgender Veterans with and without AUD and/or DUD. We were able to measure eight facets of social and economic hardship using multiple dimensions of administrative data in a large, non-recruited, national sample, while previous studies of substance use and social and economic stressors among transgender persons have largely been limited to survey data (Grant et al., 2010; Keuroghlian et al., 2015). Our overall prevalence estimates of social and economic stressors for transgender Veterans regardless of substance use are generally consistent with previous estimates (Blosnich, Marsiglio, et al., 2017; Brown and Jones, 2016; Grant et al., 2010; Shipherd, Mizock, Maguen, & Green, 2012), with slight differences, likely reflecting different study windows, as we limited ascertainment of most stressors (except MST) to a two-year time period. Additionally, aligning with Kilbourne et al.'s stages of disparities research (Kilbourne, Switzer, Hyman, Crowley-Matoka, & Fine, 2006), this study represents an important formative step in detecting the extent to which the sociodemographic status and/or the social experience of these groups (those with AUD/DUD and transgender persons) may increase likelihood of SUDs. However, we cannot know the directional nature of these phenomena, and AUD and/or DUD may conversely contribute to exposure to or experience of social and economic stressors.

Findings indicate substantial syndemic risks of social and economic stressors among patients with AUD and/or DUD, particularly among transgender persons. Even in the absence of SUD, transgender individuals shoulder a disproportionate burden of social and economic stressors (Blosnich, Marsiglio, et al., 2017), reflecting downstream sequelae of social norms and systems that privilege gender-"normative" identities and underlie transphobic stigma and discrimination (Meyer, 1995, 2003). However, while the prevalence of each stressor explored in this study was higher in transgender than cisgender patients, in many cases, prevalence increased more steeply across SUD diagnoses (from AUD only to DUD only to both AUD and DUD) among cisgender than transgender patients. For instance, in the subgroup with AUD and DUD, we saw both the highest prevalence of stressors and the smallest disparity between transgender and cisgender patients. Conversely, the largest relative disparity in social and economic stressors is between

transgender and cisgender patients with no SUD. These findings suggest that the syndemic harms of social and economic stressors with AUD and DUD may be worse for cisgender persons than for transgender persons, while overall, transgender persons experience the greatest risks of both stressors and SUD. These findings align with the Minority Stress Theory such that the daily lived experience of transphobic discrimination, which impacts both stressors and substance use, may make the direct impacts of SUD on social and economic stressors less obvious among transgender people compared to cisgender people (Ditzen & Heinrichs, 2014; Meyer, 2003). In other words, though transgender persons have higher risk of both, cisgender persons appear to experience a greater interaction or syndemic effect between the two. Findings may also support the idea that transphobic stigma and discrimination is a "fundamental cause" influencing adverse health through multiple mechanisms and risk factors (Link & Phelan, 1995). Further research is needed to explore the directionality of the relationship between social and economic stressors and SUDs, for both transgender and cisgender persons, as well as to test Fundamental Cause Theory in transgender populations highly impacted by chronic structural and interpersonal discrimination.

Further, though the impact of these social and economic stressors on adverse physical and mental health outcomes has been well-established in the literature (Adler & Stewart, 2010; Braveman, Egerter, & Williams, 2011; Marmot & Bell, 2012), most healthcare systems do not screen for these stressors and patients' broader lived experience is rarely addressed in addictions and/or other behavioral interventions in clinical settings. Interventions that address the lived experiences of persons with addictions are in their nascence and should be further developed and tested (Tsui et al., 2021), particularly for transgender individuals (Austin & Goodman, 2017; Blosnich et al., 2013; Blosnich, Lehavot, et al., 2017; Brown & Jones, 2016; Glick et al., 2018; Hatzenbuehler et al., 2013; Hatzenbuehler & Pachankis, 2016; Lehavot & Simoni, 2011).

The present study highlighted concerningly high rates of housing instability and homelessness among patients (particularly transgender patients, with rates >50%) who have co-occurring AUD and DUD. The VA has social programs for housing, employment, and justice system involvement (Finlay et al., 2016; Gabrielian et al., 2015; Twamley et al., 2013). While evidence suggests that supportive housing programs are reaching transgender VA patients (Blosnich, Rodriguez, et al., 2020; Montgomery, Shipherd, Kauth, Harris, & Blosnich, 2020), it is unclear whether other VA social programs are also reaching these patients, and whether these programs are addressing SUDs synergistically. Evaluations of these efforts are needed, including implementation and evaluation of provider and staff training programs to create welcoming environments for minority patient populations (van Heesewijk, Kent, van de Grift, Harleman, & Muntinga, 2022). Finally, the present study's findings highlight the adverse sequelae of transphobic social structures and norms. Structural (e.g., policy) and cultural (e.g., social marketing) interventions should be developed and tested to address these potential fundamental causes to eliminate inequities in stressors and substance use (Eder et al., 2021; National Academies of Science, 2019).

4.1. Limitations

Our study has several limitations. First, transphobic stigma and discrimination are fundamental causes of health inequities (Garofalo et al., 2006; Glynn & van den Berg, 2017; Lehavot & Simoni, 2011; Lombardi, 2007) but were not measured directly in this study. However, the high rates of social and family problems and MST suggest that many transgender Veterans with AUD/DUD are exposed to hostile and stressful social environments associated with minority stress. Next, transgender patients were identified using ICD-9 and ICD-10 codes associated with transgender status. Although these processes have been validated in administrative data (Blosnich et al., 2013, 2014, 2016; Brown & Jones, 2016), it may have resulted in misclassification, as it is not based on self-identification. Similarly, the use of administrative data to define social and economic stressors may have resulted in an underestimation of their prevalence. Providers may differentially ask clinical screening questions or differentially apply ICD-9 and 10 codes, and patients may not always feel comfortable discussing their experiences with these stressors with their provider (Vest et al., 2017). Additionally, this study was cross-sectional; our results do not indicate causal associations nor explore mechanisms underlying patterns observed. Our findings among transgender persons receiving VA healthcare may also not be generalizable to other transgender populations, especially given that VA has structural interventions in place to support transgender health (Department of Veterans Affairs, 2020). Transgender Veterans eligible for VA benefits likely have better access to a wider range of healthcare compared to other transgender persons. Because this VA administrative data did not ascertain gender identity, this study unfortunately could not assess differences across self-identified gender groups. Transgender men, transgender women, and gender non-binary individuals may have important differences in experiences of social and economic stressors, which should be further studied and considered when designing policy. Additionally, there may be important differences in experiences of social stressors within intersectional groups of transgender persons defined by race and ethnicity which this study did not ascertain. Consistent with intersectionality theory, belonging to multiple marginalized and minoritized groups compounds risk for unequal and disparate outcomes (Bowleg, 2012) and may heighten the burden of these stressors experienced by transgender persons with intersecting marginalized identities and lead to differences in downstream health outcomes. Lastly, it must be noted that these data were collected between 2009 and 2017, and in recent years, the sociopolitical climate for transgender people has inarguably shifted toward increased anti-transgender policy and rhetoric (Barbee, Deal, & Gonzales, 2022; Cahill, Miller, & Keuroghlian, 2022; Horne, McGinley, Yel, & Maroney, 2022). As such, our findings may underestimate the current prevalence of and relationships between stressors, SUDs, and disparities (Burgess, Kauth, Klemt, Shanawani, & Shipherd, 2019).

5. Conclusions

Social and economic stressors are highly prevalent among VA patients with SUDs, particularly those who are transgender, likely resulting from transphobic structures and social norms that engender substantial discrimination and stigma consistent with Minority Stress Theory. Findings illuminate the need for interventions aimed at supporting social needs among patients with AUD and/or DUD, including interventions focused on screening for and addressing social and economic stressors, to better support vulnerable populations (e.g., transgender persons) whose heightened exposure to these stressors may be linked to their substance use and subsequent health outcomes. It is imperative that leaders and policy makers address the transphobic structures that lead to high rates of social and economic stressors among transgender persons. To better serve transgender Veterans and transgender persons at large, particularly those with SUD, further research should be done on the interventions, structures, and policies that reduce the experience of social stressors and marginalization in this population.

Ethical statement

All study procedures were approved by Institutional Review Boards at the VA Puget Sound and the University of Washington.

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Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmph.2022.101153.

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