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Research paper

Substance use disorders and self- and other-directed violence among adults: Results from the National Survey on Drug Use And Health

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ABSTRACT

Background: Previous studies have identified a violence typology of self- and other-directed violence. This study examines the extent to which substance use disorders (SUDs) as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*, independent of serious psychological distress, major depressive episodes, assault arrest, and criminal justice involvement, are associated with these violence categories.

Method: Data were obtained from the National Survey on Drug Use and Health (NSDUH) pooled across survey years 2008–2015, with a combined sample of 314,881 adult respondents. According to self-report data on suicide attempt (self-directed) and attacking someone with the intent for serious injury (other-directed), violence was categorized in four categories: none, self-directed only, other-directed only, and combined self-/other-directed. Multinomial logistic regression was used to estimate the adjusted odds ratios associated with the risk factors for different forms of violence.

Results: Nicotine dependence and the number of *DSM-IV* SUDs criteria (except the criterion of legal problems) for alcohol, marijuana, and pain reliever use disorders are significantly associated with the self-/other-directed violence categories.

Limitations: Cross-sectional data do not allow assessment of directionality of important factors.

Conclusions: The identification of the combined self- and other-directed violence among adults in the general population extends studies in the adolescent population, and significant correlation between self- and other-directed violence provides additional support for clinical studies that established this association. Findings expand the associated risk factors identified in previous studies for the adult population. Prevention and treatment programs need to address both forms of violence and suicidality.

1. Introduction

The relationship between suicidal behavior and interpersonal violence has been a focus of psychiatric studies in clinical populations for many years (Apter et al., 1993, 1995; Links et al., 2003; Plutchik et al., 1989). A systematic literature review of clinical and community studies on this topic supports the co-occurrence of aggression against self and aggression against others (O'Donnell et al., 2015). Studies have indicated high frequency of suicide attempts among incarcerated violent offenders (Coid et al., 2006; Cook, 2013; Corrigan and Watson, 2005). Externalizing disorders such as substance use disorders (SUDs) and antisocial personality disorder, typically viewed as risk factors for violence toward others (Elbogen and Johnson, 2009; Giancola, 2015; Klostermann and Fals-Stewart, 2006; Pernanen, 1991; Van Dorn et al., 2012), also have been shown to be independently related to suicidal behavior (Apter et al., 1991, 1995; Hills et al., 2005; Jokinen et al., 2010).

In many instances, mental disorders are implicated in violent behavior (Arseneault et al., 2000; Elbogen and Johnson, 2009; Pulay et al., 2008; Van Dorn et al., 2012). Although a comprehensive study of associations between violent behavior and psychiatric disorders in the general population indicated that only a minority (approximately 8%) of people with psychiatric disorders engaged in violent behavior, the risk for violence was significantly higher among those with SUDs and mood and personality disorders (Pulay et al., 2008).

Plutchik et al. (1989) have proposed a two-stage theory based on the proposition that aggression leads to violence toward self and others. In stage 1, co-occurring risk factors manifest aggression. In stage 2, the pattern of risk factors determines the target (i.e., self or others). Plutchik (1995) has noted that several risk factors (e.g., substance abuse, history of psychiatric hospitalization, poor impulse control) are common for violence against others and for suicide. Basing his premise

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on the presence of risk factors common to both suicidality and aggression toward others, Hillbrand (1995) proposed and identified a category that defined individuals as partaking in "combined violence" if they are violent to both themselves and others.

Studies on adolescents in the general population have established associations between suicide attempt/ideation and violence against others and have particularly focused on the joint presence of these behaviors (Harford et al., 2012, 2016; Swahn et al., 2013). In a national study of high school students, Harford et al. (2012) constructed a typology of violence based on suicidality and fighting behavior: self-directed, other-directed, combined (both self- and other-directed), and no violence. When compared with students in the other-directed and self-directed violence categories, those in the combined violence category were more likely to be younger, depressed, and to engage in substance abuse. Using a similar typology, Swahn et al. (2013) found significant associations between combined violence and early drinking onset, heavy drinking, and feelings of sadness. Harford et al. (2016) also found heavy episodic drinking to be more prevalent among youth in the combined violence category relative to other-directed and self-directed violence categories. The associations were even stronger among those meeting two or more alcohol use disorder (AUD) symptom criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*; American Psychiatric Association, 1994).

Compared to adolescents, there have been fewer studies of combined violence against self and others among adults. In one study using data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), Harford et al. (2013) derived a violence typology based on a latent class analysis (LCA) of five other-directed and four self-directed indicators of violent behavior among adults. The LCA identified four broad categories that best fit the data statistically, including other-directed violence, self-directed violence, combined other- and self-directed violence, and no or minimal violence. The combined form of violence, compared with self- or other-directed forms of violence alone, was more strongly associated with SUDs (88.2% for combined vs. 81.1% for other-directed and 60.3% for self-directed), mood disorders (63.3% for combined vs. 18.3% for other-directed and 40.6% for self-directed), and personality disorders (76.2% for combined vs. 42.1% for other-directed and 46.5% for self-directed). However, because of a limited number of suicide attempt cases in the NESARC study, both suicide ideation and suicide attempt were used to define the self-directed violence category. The inclusion of more prevalent thoughts of one's own death (10% to 13%) with suicide attempt (2%) clouds distinctions between ideation and behavior. The use of broad categories of SUDs (i.e., alcohol use or drug use disorders) can mask the presence of different associations of specific substances with violence. The extent to which the combined form of violence is a meaningful and reliable phenomenon requires replication in other independent adult samples.

In view of these limitations, the current study seeks to use data from the National Survey on Drug Use and Health (NSDUH) to examine suicide attempt and other-directed violence among American adults. The major focus is to identify associations between specific SUDs and violence. SUDs, except nicotine dependence, are expressed by the increasing number of SUD criteria in categories representing different levels of severity. The confounders including serious psychological distress (SPD), *DSM-IV* major depressive episode (MDE), criminal justice involvement, and assault arrest, were also examined as potential risk factors for violence. Based on current literature, it is hypothesized that SUDs will evidence stronger associations with combined self- and other-directed violence than either self-directed or other-directed violence or no violence. Because the suicide rate in the United States is at a 30-year high (Curtin et al., 2016) and violent crime rate increased by 3.1% in 2015 after 2 years of decline (Federal Bureau of Investigation, 2016), this study is timely and addresses an important public health issue in suicide and violence prevention. By confirming SUDs as important risk factors for violence, this study is intended to raise public awareness of the consequences of SUDs and can be useful to inform health professionals about how to provide SUD patients with better care that will reduce violence and improve their quality of life.

2. Methods

2.1. Study design

The study sample is based on the adult sample from the NSDUH, annual surveys of the civilian noninstitutionalized U.S. population ages 12 and older. The NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration and conducted annually under contract with RTI International. The survey collects information on demographics, substance use, and mental health using a combination of computer-assisted face-to-face interviews and audio computer-assisted self-administered interviews. Participants are selected by an independent multistage area probability sample design (i.e., census tracts as the first stage followed by census block groups, segments, dwelling units, and individuals) for each of the 50 states and the District of Columbia. Young people are oversampled. The 1999–2013 sample design requires approximately equal samples sizes among three age groups: ages 12–17, ages 18–25, and ages 26 and older. The 2014–2017 design, however, places 50% of sample in the 26-and-older age group to more accurately estimate drug use and related mental health measures among the aging drug use population. Nearly 70,000 respondents are interviewed in each survey year, and the weighted interview response rate exceeds 70%. Detailed information on NSDUH data collection procedures, sample designs, and methodologies are described in the *2014 NSDUH Methodological Resource Book* (Center for Behavioral Health Statistics and Quality, 2015). The present study was based on public use data, which include about 83% of all of the original respondents due to a subsampling step used in the disclosure protection procedures. In view of the relatively small samples for critical variables (e.g., suicide attempt, illicit substance disorders, minorities), we pooled data from several consecutive national surveys from 2008 to 2015 to augment our study sample, which comprised 314,881 adults ages 18 and older.

2.2. Measures

2.2.1. Dependent variables

Two dichotomous variables were first created and assigned for self- and other-directed violence. They were used to form a four-level violence typology based on a two-way contingency table from the cross-tabulation of other-directed violence and self-directed violence. The resulting four violence categories are none, self-directed only, other-directed only, and combined self-/other-directed. Specifically, for other-directed violence, respondents were asked, "During the past 12 months, how many times have you attacked someone with the intent to seriously hurt them?" This single item alone measured other-directed violence in a dichotomous category (one or more times = 1; none = 0). For self-directed violence, respondents were asked "During the past 12 months, did you try to kill yourself?" This single item alone measured self-directed violence in a dichotomous category (yes = 1; no = 0). The association between self- and other-directed violence was estimated by tetrachoric correlation between the respective dichotomous variables as if they were measured on a continuous scale. Technically, assuming a latent bivariate normal distribution (X_1, $\times_2$) for each pair of two dichotomous variables (v_1,v_2), with a threshold model for the manifest variables, $v_i = 1$ if and only if $X_i > 0$, tetrachoric correlation is the correlation of $\times_1$ and $\times_2$.

2.2.2. Independent variables

SUDs included disorders pertaining to the use of alcohol, nicotine, marijuana, cocaine, hallucinogens, heroin, inhalants, pain relievers, sedatives, stimulants, and tranquilizers. Other than nicotine