Suicidal Ideation and Suicide Attempt Across Stages of Nonmedical Prescription Opioid Use and Presence of Prescription Opioid Disorders Among U.S. Adults

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ABSTRACT. Objective: This study compares the likelihood of suicidal ideation and suicide attempt across stages of nonmedical prescription opioid use and by presence of prescription opioid disorders (dependence and/or abuse) among adult respondents. **Method:** In the 2009 National Survey on Drug Use and Health, 37,933 adult respondents were asked if they had thought about suicide or had attempted suicide in the past year. The likelihood of ideation and attempt were compared across the following four categories: (a) those who never used prescription opioids, (b) former users, (c) persistent users, and (d) recent-onset users. Weighted multinomial logistic regressions were used to examine if these stages and presence of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition,* criteria for prescription opioid disorders were associated with suicidal ideation and suicide attempt. **Results:** Five percent of respondents (n = 2,021) reported suicidal ideation; of these, 15% (n = 310) reported attempt. Former and persistent nonmedical prescription opioid users had greater odds of suicidal ideation than those who never used these medications nonmedically. The stages of prescription opioid use were not associated with suicide attempt. Presence of prescription opioid disorders among past-year prescription opioid users was associated with suicidal ideation but not suicide attempt. **Conclusions:** The risk for suicidal ideation was greater in those who no longer used prescription opioids, in persistent users, and among nonmedical users who had a prescription opioid disorder compared with users without the disorder. The results suggest a need to continue monitoring for suicide risk even among those who have stopped using prescription opioids. (*J. Stud. Alcohol Drugs, 73,* 178–184, 2012)

THE INCREASE OF NONMEDICAL PRESCRIPTION opioid use in the United States has become a public health concern (Compton and Volkow, 2006; Zacny et al., 2003). A recent Drug Abuse Warning Network report found a statistically significant increase in number of emergency department visits involving prescription opioids (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010b). Given the extent of the problem, many studies have characterized individuals who use nonmedical prescription opioids to better understand the population of nonmedical prescription opioid users (Becker et al., 2008; Brands et al., 2004; Huang et al., 2006; Martins et al., 2009b; Sigmon, 2006). A strong association between psychiatric disorders and nonmedical prescription opioid use (Becker et al., 2008; Cicero et al., 2008) and disorders (Grella et al., 2009; Huang et al., 2006; Martins et al., 2009a) suggests the importance of addressing mental health problems among this population. A high risk for mental disorders motivates examination of risk for suicidal behavior (ideation and/or attempt), as mental disorders are among the strongest risk factors for suicidal ideation (Goldney et al., 2000).

However, little research has been conducted on this topic among the population of nonmedical prescription opioid users. Generally, drug users are at higher risk for suicide-related risks such as ideation, attempt, and death than those who do not misuse drugs (Borges et al., 2000; Wilcox et al., 2004), and nonmedical prescription opioid users are no exception (Borges et al., 2000). Most studies on suicide-related risks among drug users have focused on users of heroin (Darke and Ross, 2002) and cocaine (Garlow et al., 2003; Roy, 2001). At least one study indicated that a greater proportion of individuals who used nonmedical prescription opioids had a history of suicide attempt than those who used heroin alone among those in methadone-maintenance treatments (Brands et al., 2004). Additionally, individuals who use prescription opioids nonmedically may indicate underlying chronic pain. A number of studies, not specific to nonmedical prescription opioid users, have found that individuals with chronic pain are at an increased risk for suicidal ideation and suicide attempt (Tang and Crane, 2006).

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Many studies that examine drug use in general and suicide-related risks have simply compared those who have ever used a specified drug with those who have never used that drug. However, variations exist even within those who use prescription opioids nonmedically, ranging from experimental or occasional use to chronic use. One study that differentiated persistent and recent-onset users of nonmedical prescription opioids found stronger associations of depressive symptoms with recent-onset use compared with nonuse, and with persistent use compared with former use (Dowling et al., 2006). These findings suggest that suicide-related risks may vary depending on the stage of nonmedical prescription opioid use as well. Data from the U.S. National Comorbidity Survey (1990–1992) have shown that current use of nonmedical prescription opioids increased risk for suicide attempt but former use did not (Borges et al., 2000). However, that study did not differentiate current users into persistent and recent-onset users.

The present study used recent data from another national epidemiological sample, the National Survey on Drug Use and Health (NSDUH), to examine further the likelihood of suicidal ideation and suicide attempt and its relationship with nonmedical prescription opioid use among adult respondents. We compared the odds of suicidal ideation and suicide attempt across four groups of individuals based on their nonmedical prescription opioid use: (a) those who never used prescription opioids nonmedically, (b) former users, (c) persistent users, and (d) recent-onset users. We also examined if nonmedical prescription drug use disorder increases the odds for suicidal ideation and suicide attempt.

Method

Data sources

Data for this study were drawn from the 2009 NSDUH public use files (SAMHSA, 2010c). The NSDUH is sponsored by SAMHSA and is designed to provide estimates of the prevalence of nonmedical use of legal and illegal drugs in the United States household population ages 12 years and older. Surveys have been conducted on a regular basis since 1971. Interviews were conducted using a computer-assisted questionnaire and audio computer-assisted self-interviewing to increase the validity of self-reports of illicit drug use and other sensitive behaviors by providing confidential means for the interviewees to respond to these questions (SAMHSA, 2010a). Respondents were offered a $30 incentive payment for participation in the survey. Overall weighted response rate for 2009 was 75.7%. Detailed information about the sampling and survey methodology in the NSDUH are found elsewhere (SAMHSA, 2010a). In this report, we focused on 37,933 respondents 18 years and older from 2009 NSDUH public use data (SAMHSA, 2010a).

Measurement

Suicidal ideation and suicide attempt. Suicidal ideation was assessed by asking whether respondents seriously thought about trying to kill themselves in the past 12 months. Suicide attempt was similarly assessed by asking if the respondent tried to kill himself or herself in the past 12 months.

Nonmedical prescription opioid use. Respondents were asked whether they had ever used a pain reliever that was not prescribed or if they had used a pain reliever for the experience or feeling it caused. If the response was affirmative, respondents were presented with pictures and names of different types of prescription opioids and asked if they had used them nonmedically (SAMHSA, 2010a). Past-year nonmedical prescription opioid use was based on the response to the following question: "How long has it been since you last used any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?" If the response indicated nonmedical use during the preceding 12 months, the respondent was classified as a nonmedical prescription opioid user within the past year. The respondents were also asked the year in which they started using prescription opioids nonmedically. Using these measures, we further classified respondents into those who had formerly used nonmedical prescription opioids, those who persistently used, and recent-onset users, as defined in a previous study (Dowling et al., 2006). Former users were defined as those who had initiated nonmedical prescription opioid use more than 2 years before the assessment and had not used nonmedical prescription opioids in the past year. Similarly, persistent users were those who had initiated use more than 2 years before the assessment and have also continued to use in the past year. Recent-onset users consisted of respondents who had initiated use within 2 years of the assessment.

Prescription opioid disorder because of nonmedical use. In the NSDUH, 10 questions were used to measure the seven *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 1994), symptoms of prescription opioid dependence experienced during the 12 months before the interview (SAMHSA, 2010a). Symptoms of past-year prescription opioid dependence were self-reported, and respondents were classified as dependent if they met the DSM-IV criteria for prescription opioid dependence (three of seven symptoms). The NSDUH includes five questions that examine the four prescription opioid abuse symptoms as defined by DSM-IV. Prescription opioid disorder was defined as meeting the criteria for prescription opioid abuse and/or dependence in the past year.

Major depressive episode

Presence of major depressive episode (MDE) was assessed using several questions that asked about clinical features of depression. All adult respondents were asked nine questions regarding the symptoms of MDE that follow the DMS-IV criteria (American Psychiatric Association, 1994) and were derived from the National Comorbidity Survey–Replication (Harvard School of Medicine, 2005). A respondent met criteria for lifetime MDE if respondents reported five or more of the symptoms nearly every day in the same 2-week period during their worst or most recent period. At least one of these five symptoms needed to include depressed mood or loss of interest or pleasure in daily activities (apathy) to meet MDE criteria. If some of these symptoms also occurred within the last 12 months, these respondents were further classified as those with past-year MDE. In the survey, respondents were considered as having an MDE even if the episode was related to substance use, grief, or physical comorbidity (SAMHSA, 2010a).

Other individual characteristics. All respondents provided information about their drug experiences and other personal data (e.g., demographic data). The demographic variables selected for this study were gender, age of respondent at time of interview, race/ethnicity (non-Hispanic Whites, non-Hispanic Blacks, Hispanics, and other [Native Americans, Asians, Hawaiians, Pacific Islanders, and non-Hispanics who reported more than one race were combined because of small sample size]), education (at least high school), marital status (married, single, and no longer married [widowed, divorced, or separated]), and employment status (employed if full time or part time). We also examined lifetime use of other drugs and past-year presence of other drug use disorders (including cocaine, heroin, inhalants, marijuana, and other nonmedical prescription drug use [stimulants, sedatives, tranquilizers]). The lifetime use of other drugs was measured by asking the respondents if they had ever used each of these drugs. Individuals who met DSM-IV criteria for abuse and/or dependence in the past year for any of these drugs were considered to have drug use disorders. For the purpose of analysis, lifetime use and disorders were counted as occurring for no drugs, one drug, or two or more drugs.

Statistical analyses

Initially, a Pearson test statistic, corrected for the survey design, was used to compare suicidal ideation and suicide attempt across demographic, nonmedical prescription opioid use and disorders and other drug use characteristics. This calculates the F statistic, but its p value can be interpreted similarly to the p value of the chi-square statistics in nonsurvey data (Koch et al., 1975; Rao and Scott, 1984). A set of logistic regression models estimated the odds of suicidal ideation and for attempt (among those with ideation) for former users, persistent users, and recent-onset users of nonmedical prescription opioids, as compared with never users. The second set of models focused on past-year nonmedical prescription opioid users to estimate the relative odds of ideation and attempt (among those with ideation) by presence of past-year prescription opioid disorders. These two sets of models were conducted in a stepwise manner (a) adjusting for demographics, (b) adjusting for demographics and lifetime use of other drugs, and (c) adjusting for demographics, lifetime use of other drugs, and MDE in the past year. The models that examined the association between past-year prescription opioid disorders were adjusted for presence of past-year other drug use disorders instead of lifetime use of other drugs. Because prior research suggested gender differences in nonmedical prescription opioid use (Cicero et al., 2008; Green et al., 2009; Tetrault et al., 2007), an interaction term was added to each model to examine if the relationships varied by gender. All analyses were conducted using a revised sampling weight that adjusted for complex sampling design as recommended by NSDUH and were conducted with Stata version 10 (StataCorp LP, College Station, TX).

Results

Of the 37,933 adult respondents, 15% (n = 7,468) reported nonmedical use of prescription opioids during their lifetime. Nine percent (n = 3,769) of the adult respondents were former users of nonmedical prescription opioids who reported use more than 2 years ago, 4% (n = 2,031) were persistent users, and 2% (n = 1,668) were recent-onset users. Five percent (n = 3,080) used nonmedical prescription opioids in the past year (includes both recent-onset and persistent users), of whom 15% (n = 487) also met DSM-IV criteria for prescription opioid disorders (abuse and/or dependence) (Table 1).

Table 1 shows the distribution of stage of nonmedical prescription opioid use, presence of prescription opioid disorders, other drug use and other drug use disorders, and demographic characteristics, as well as prevalence of suicidal ideation and suicide attempt (among ideators) across these characteristics. Overall, 2,021 (5%) of the respondents reported having suicidal ideation in the past year; 310 of those with ideation (15%) also reported suicide attempt in the past year.

Approximately 7% of the former users (n = 310), 11% of the persistent users (n = 287), and 9% of the recent-onset users (n = 178) reported ideation, whereas 3% of never users reported ideation, $F(2.58, 155.01) = 91.91$, $p < .001$. A greater proportion of persistent (17%) and recent-onset (19%) users with ideation also reported attempt as compared with former and never users (7% and 11%, respectively), $F(2.64, 158.11) = 4.04$, $p < .01$. Twenty-three percent of nonmedical users with past-year prescription opioid disorder

TABLE 1. Prevalence of suicidal ideation and suicide attempt (among ideators) by nonmedical prescription opioid use, disorder, and demographic characteristics, NSDUH 2009[a,b,c]

Variable	Overall (n = 37,933) n	Reported ideation (n = 2,021; 5%) n (%)	Test statistic	p	Among ideators: With ideation (n = 2,021) n	Among ideators: Reported attempt (n = 310; 15%) n (%)	Among ideators: Test statistic	Among ideators: p
Stages of nonmedical prescription opioid use								
Never users	30,465	1,246 (3)			1,246	163 (11)		
Former users	3,769	310 (7)	F(2.58, 155.01)		310	43 (7)	F(2.64, 158.11)	
Persistent users	2,031	287 (11)	= 91.91	**<.001**	287	63 (17)	= 4.04	**.01**
Recent-onset users	1,668	178 (9)			178	41 (19)		
Gender								
Male	17,696	837 (4)	F(1, 60) = 0.23	.34	837	118 (12)	F(1, 60)	.63
Female	20,237	1,184 (4)			1,184	192 (11)	= 0.23	
Age, in years								
18–25	18,924	1,216 (6)	F(1.59, 95.69)		1,216	216 (17)	F(1.82, 108.93)	
26–34	5,613	271 (4)	= 33.98	**<.001**	271	33 (9)	= 5.78	**.005**
35 and older	13,396	534 (3)			534	61 (10)		
Marital status								
Married	13,487	431 (2)	F(1.86, 111.39)		431	49 (9)	F(1.99, 119.49)	
No longer married	4,267	283 (5)	= 58.62	**<.001**	283	42 (10)	= 2.26	.11
Never married	20,179	1,307 (6)			1,307	219 (14)		
Education								
Less than high school	6,372	423 (5)	F(1, 60)	**.006**	423	93 (15)	F(1,60)	.10
High school and above	31,561	1,598 (4)	= 8.08		1,598	217 (11)	= 2.86	
Race								
Non-Hispanic White	24,078	1,294 (4)			1,294	175 (10)		
Non-Hispanic Black	4,651	231 (3)	F(2.87, 172.25)	.13	231	47 (18)	F(2.86, 171.33)	.14
Hispanic	5,942	278 (3)	= 1.90		278	48 (10)	= 1.89	
Other	3,262	218 (4)			218	40 (15)		
Unemployment								
No	25,323	1,176 (3)	F(1,60)	**<.001**	1,176	143 (8)	F(1,60)	**.003**
Yes	12,610	845 (4)	= 12.44		845	167 (16)	= 14.55	
Other lifetime drug use								
None	17,792	536 (2)	F(1.79, 107.17)		536	61 (12)	F(1.93, 115.70)	
One	9,531	497 (3)	= 92.94	**<.001**	497	83 (14)	= 2.36	.10
Two or more	10,610	988 (7)			988	166 (10)		
Other drug use disorder								
None	36,277	1,734 (3)	F(1.92, 115.23)		1,734	245 (11)	F(1.93, 115.70)	
One	1,386	206 (14)	= 160.94	**<.001**	206	39 (16)	= 2.36	.11
Two or more	270	81 (32)			81	26 (20)		
Past-year major depressive episode								
No	34,709	1,065 (2)	F(1, 60)		1,065	126 (10)	F(1, 60)	.08
Yes	3,011	935 (26)	= 1508.06	**<.001**	935	178 (14)	= 3.12	
Prescription opioid disorders among past-year users (n = 3,080)								
No	2,593	291 (9)	F(1, 60)	**<.001**	291	59 (17)	F(1, 60)	.94
Yes	487	121 (23)	= 36.42		121	33 (17)	= 0.005	

Notes: **Bold** indicates statistical significance; NSDUH = National Survey on Drug Use and Health. [a]All percentages are weighted; [b]includes Native Americans, Asians, Hawaiians, Pacific Islanders, and non-Hispanics who reported more than one race; [c]other drugs include cocaine, heroin, inhalants, marijuana, and other nonmedical prescription drug use (stimulants, sedatives, tranquilizers).

reported ideation in the past year; in contrast, only 9% of nonmedical prescription opioid users who did not meet criteria for dependence and/or abuse reported ideation, $F(1, 60) = 36.42$, $p < .001$. The occurrence of attempt did not differ by presence of prescription opioid disorders among those with ideation. Prevalence of suicidal ideation differed significantly across most demographic and drug use characteristics except for gender and race. Prevalence of suicide attempt among those who reported ideation did not differ for most characteristics except for age and unemployment.

Table 2 compares the odds of suicidal ideation and suicide attempt across nonmedical prescription opioid former users, persistent users, and recent-onset users relative to never users. Without any adjustments for demographic and drug use characteristics, former, persistent, and recent-onset

TABLE 2. Stages of nonmedical prescription opioid use and presence of prescription opioid disorders on odds for ideation and attempt among adult respondents, NSDUH 2009 (n = 37,933)

	Ideation				Attempt among ideators			
Variable	uOR [95% CI]	aOR [95% CI] demographics[1]	aOR [95% CI] demographics + drug use[2,3]	aOR [95% CI] demographics + drug use + MDE[4]	uOR [95% CI]	aOR [95% CI] demographics[1]	aOR [95% CI] demographics + drug use[2,3]	aOR [95% CI] demographics + drug use + MDE[4]
Stages of nonmedical prescription opioid use (ref.: never users)								
Former users	**2.68 [2.16, 3.34]*** **	**2.54 [2.05, 3.16]*** **	**1.62 [1.29, 2.03]*** **	**1.42 [1.11, 1.81]** **	0.60 [0.32, 1.15]	0.68 [0.35, 1.32]	0.79 [0.42, 1.50]	0.78 [0.41, 1.49]
Persistent users	**4.27 [3.32, 5.49]*** **	**3.51 [2.70, 4.58]*** **	**2.16 [1.64, 2.84]*** **	**1.52 [1.10, 2.10]** *	**1.69 [1.01, 2.83]** *	1.53 [0.92,2.56]	1.84 [1.07,3.16]	1.73 [0.97,3.09]
Recent-onset users	**3.11 [2.40, 4.03]*** **	**2.21 [1.71, 2.86]*** **	**1.51 [1.17, 1.95]** **	1.27 [0.94, 1.73]	1.84 [1.00, 3.45]	1.29 [0.67, 2.50]	1.46 [0.74, 2.88]	1.52 [0.78, 2.96]
Abuse and/or dependence among past-year users	**3.10 [2.10, 4.59]*** **	**3.02 [2.02, 4.53]*** **	**2.38 [1.52, 3.71]*** **	**1.88 [1.13, 3.12]** *	0.97 [0.42, 2.26]	0.98 [0.43, 2.23]	0.89 [0.37, 2.17]	0.87 [0.37, 2.04]

Notes: **Bold** indicates statistical significance. NSDUH = National Survey on Drug Use and Health; uOR = unadjusted odds ratio; aOR = adjusted odds ratio; MDE = major depressive episode. [1]aOR for stages of nonmedical prescription opioid use: odds ratio adjusted for gender, age, education, race, marital status, unemployment; [2]aOR for stages of nonmedical prescription opioid use: odds ratio adjusted for demographics described above and other lifetime drug use (cocaine, heroin, inhalants, marijuana, and other nonmedical prescription drugs use [stimulants, sedatives, tranquilizers]); [3]aOR for prescription opioid disorder: odds ratio adjusted for gender, age, education, race, marital status, unemployment, other past-year drug use disorder (cocaine, heroin, inhalants, marijuana, and other nonmedical prescription drugs use [stimulants, sedatives, tranquilizers]); [4]aOR adjusted for demographics described above, other lifetime drug use (for stages of nonmedical prescription opioid use), or other past-year drug use (for prescription opioid disorder) and past-year MDE.
*$p < .05$; **$p < .01$; ***$p < .001$.

users were each more likely to report ideation compared with never users of nonmedical prescription opioids (unadjusted odds ratio [uOR] for former users = 2.68, 95% CI [2.16, 3.34]; uOR for persistent users = 4.27, 95% CI [3.32, 5.49]; uOR for recent-onset users = 3.11, 95% CI [2.40, 4.03]). The associations were still present after adjusting for demographic characteristics, although these ORs were reduced to 2.54 (95% CI [2.05, 3.16]), 3.51 (95% CI [2.70, 4.58]), and 2.21 (95% CI [1.71, 2.86]) for former, persistent, and recent-onset users, respectively. With the addition of other lifetime drug use in the model, the associations persisted, although the magnitude diminished considerably, with ORs ranging from 1.51 for recent-onset users to 2.16 for persistent users. Once the model further adjusted for presence of past-year MDE, only former and persistent users had increased odds of suicidal ideation (adjusted OR [aOR] for former users = 1.42, 95% CI [1.11, 1.81]; aOR for persistent users = 1.52, 95% CI [1.10, 2.10]) as compared with never users. Among ideators, persistent users also had increased odds for attempt as compared with never users (uOR = 1.69, 95% CI [1.01, 2.83]). This association was no longer significant after adjusting for demographics.

The association between suicidal ideation, attempt, and prescription opioid disorders is shown on the bottom row of Table 2. Among individuals who used prescription opioids nonmedically in the past year, those who also met criteria for prescription opioid disorders had more than threefold increased odds for reporting ideation compared with those without prescription opioid disorders (uOR = 3.10, 95% CI [2.10, 4.59]). The ORs reduced slightly after adjusting for demographics characteristics (aOR = 3.02, 95% CI [2.02, 4.53]). The magnitude of the OR further diminished but the association was still present when other drug use disorders and past-year MDE were included in the model (aOR = 1.88, 95% CI [1.13, 3.12]). Presence of prescription opioid disorders was not associated with suicide attempt among those who reported ideation and use prescription opioids nonmedically in the past year. No significant gender differences were noted in any association.

Discussion

Using data from a U.S. household sample of adults 18 years and older, we found that former and persistent users but not recent-onset users of nonmedical prescription opioids were more likely to report suicidal ideation as compared with those who never used these drugs. These associations were accounted for in part by demographics, other lifetime drug use, and past-year MDE; however, the associations remained even after these adjustments. The odds of reporting ideation did not differ across these stages of nonmedical prescription opioid use. Among past-year nonmedical prescription opioid users, individuals who met criteria for prescription opioid disorders were also more likely to report suicidal ideation but were no more likely to report suicide attempt.

Previous studies have noted that individuals who use illegal drugs have increased risk for suicidal behavior

(Borges et al., 2000; Darke and Ross, 2002). This study further found that ideation is not similarly associated with different stages of nonmedical prescription opioid use. Although all stages of nonmedical prescription opioid use were strongly associated with suicidal ideation, the associations with recent-onset users was no longer significant after accounting for past-year MDE. The presence of MDE is a strong risk factor for suicidal ideation (Goldney et al., 2000), and recent studies suggest that past-year MDE can also be a risk factor for nonmedical prescription opioid use, possibly through self-medication (Khantzian, 1985). At least one study noted that presence of mood and anxiety disorders increased the risk of incident nonmedical prescription drug use (Martins et al., 2011). As such, MDE could have been a strong shared factor that largely explained the association between recent nonmedical prescription opioid use and suicidal ideation. However, it is still concerning to find that suicidal ideation may still persist even when individuals were no longer using prescription opioids nonmedically, which suggests a need for continued monitoring of suicide risk for these individuals. Given that the association remained even after adjusting for MDE, there may be other factors that potentially explain the association between former and persistent nonmedical prescription opioid users and suicidal ideation.

Several studies have suggested that drug users, at least with respect to heroin users, have greater risk for suicidal behavior because these individuals may have shared vulnerability, such as family and social dysfunctions (Darke and Ross, 2002; Maloney et al., 2007). Such unobserved factors may have contributed to the association between prescription opioid disorders and ideation in our study as well. Individuals who are receiving prescription opioids may also have increased risk for chronic pain, which has been associated with suicidal behavior in earlier research (Cheatle, 2011) and suicide (Ilgen et al., 2010) independent of psychiatric comorbidities.

It is also possible that former nonmedical prescription opioid use increased the risk for suicidal ideation. Neurobiological changes may increase suicidal behavior (Bondy and Zill, 2009), although the extent to which chronic use of prescription opioids contributes to these changes has not been specifically examined. A more recent longitudinal study suggested there is a strong association between mood disorder and nonmedical use of prescription opioids, whereby nonmedical prescription opioids may increase the risk for mood/anxiety disorder (Schepis and Hakes, 2011).

Severity and dependence of drug use, not specific to prescription opioids, has also been associated with increased risk for suicidal ideation in previous studies (Borges et al., 2000; Cottler et al., 2005). The current study is one of the few to support that severe prescription opioid use, as indicated by presence of dependence and/or abuse, is also associated with increased odds for suicidal ideation. Furthermore, our findings are generally consistent with previous findings that suggest that those who use drugs illegally and meet the criteria for drug use disorders are at increased risk for suicidal ideation but not attempt among those who report ideation (Borges et al., 2008).

Several limitations should caution the interpretation of the findings. Although large epidemiological data sets are useful for examining risks for suicidal ideation and suicide attempt across nonmedical prescription opioid users at different stages of use and prescription opioid disorders, we cannot infer causal relationship because of the cross-sectional design of this study. The results from NSDUH also may not be generalizable to nonhousehold populations, such as incarcerated individuals. The suicide attempt question did not delve into details about severity of attempt. The survey does not ask about chronic pain, which could be an important issue. Moreover, NSDUH data do not ask respondents about their reasons for nonmedical prescription opioid use (e.g., to relieve psychiatric symptoms or to get high). The surveys were based on self-report, but the use of a computerized reporting system minimizes the impact of social desirability bias on reporting (Turner et al., 1998).

However, the study is one of the few to compare the likelihood of suicidal ideation across those with different stages of nonmedical prescription opioid use and by presence of prescription opioid disorders because of nonmedical use. The results reinforce that those with more advanced stages of nonmedical prescription opioid use, as reflected by presence of dependence/abuse and persistent use, are a high-risk group for suicidal ideation among those who are using prescription opioids nonmedically. The results further suggest that suicidal ideation may persist even among those who no longer use nonmedical prescription opioids. The focus on mental health and monitoring of suicidal ideation should expand beyond current users of nonmedical prescription opioids to former users of nonmedical prescription opioids.

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