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Risk factors for the incidence and persistence of suicide-related outcomes: A 10-year follow-up study using the National Comorbidity Surveys

Guilherme Borges, Sc.D., Jules Angst, M.D., Matthew K. Nock, Ph.D., Ayelet Meron Ruscio, Ph.D., and Ronald C. Kessler, Ph.D.

From the National Institute of Psychiatry & Universidad Autonoma Metropolitana, Mexico City (Borges), Zurich University Psychiatric Hospital, Zurich (Angst), the Department of Psychology, Harvard University, Cambridge, MA (Nock), Department of Psychology, University of Pennsylvania, Philadelphia, PA (Ruscio) and the Department of Health Care Policy, Harvard Medical School, Boston, MA (Kessler). Address reprint requests to NCS Coordinator, Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston MA 02115; NCS@hcp.med.harvard.edu.

Abstract

Background—We report prospective associations of baseline risk factors with the first onset and persistence of suicide-related outcomes (SROs; ideation, plans, gestures, and attempts) over a 10-year interval among respondents who participated in both the 1990–02 National Comorbidity Survey (NCS) and the 2000–02 National Comorbidity Survey follow-up (NCS-2).

Methods—A total of 5001 NCS respondents were re-interviewed (87.6% of baseline sample) in the NCS-2. Three sets of baseline (NCS) risk factors were considered as predictors of the first onset and persistence of SROs: socio-demographics, lifetime DSM-III-R disorders, and SROs.

Results—New onsets included 6.2% suicide ideation, 2.3% plan, 0.7% gesture, and 0.9% attempts. More than one-third of respondents with a baseline history of suicide ideation continued to have suicide ideation at some time over the intervening decade. Persistence was lower for other SROs. The strongest predictors of later SROs were baseline SROs. Prospective associations of baseline mental disorders with later SROs were largely limited to the onset and persistence of ideation.

Limitations—Although data were gathered prospectively, they were based on retrospective reports at both baseline and follow-up.

Conclusions—Baseline history of SROs explained much of the association of mental disorders with later SROs. It is important clinically to note that many of the risk factors known to predict onset of SROs also predict persistence of SROs.

Keywords

Suicide; suicide attempts; mental disorder; epidemiology; prospective studies; longitudinal research

Nonfatal suicide-related outcomes (SROs), including suicide ideation, plans, gestures, and attempts, are prevalent in the U.S. and around the world (Kessler et al., 1999; 2005; Moscicki, 1999; Nock & Kessler, 2006; WHO, 2005). Prior research has aimed at identifying risk factors

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that can be used to inform scientific understanding of this problem as well as clinical prediction and prevention efforts (e.g., Beautrais et al., 1996; Dilsaver et al., 1994; Goldstein et al., 1991; Gould et al., 1996; Kessler et al., 1999; Nock and Kessler, 2006; Shaffer et al., 1996). This prior work has been limited in several important ways. First, most studies used cross-sectional designs that restricted the inferences that could be drawn about temporal order between predictors and outcomes. Second, most studies, including the few that used prospective designs (e.g., Bourgeois et al., 2004; Kuo et al., 2001; Pokorny, 1983), relied on non-representative samples, limiting the generalizability of results. Third, virtually all prior studies focused on a limited range of SROs and failed to examine predictors of transitions among different SROs. The last of these limitations is especially important for clinical purposes, as clinicians often are faced with the task of determining the likelihood that a patient with suicide ideation subsequently will make a suicide plan or attempt.

This study addresses each of these limitations with data on the associations of baseline socio-demographics, SROs, and lifetime DSM-II-R mental disorders with the subsequent first onset and persistence of SROs over the 10-year interval among respondents who participated in both the 1990–02 National Comorbidity Survey (NCS) (Kessler et al., 1994) and the 2000–02 National Comorbidity Survey follow-up (NCS-2) (Kessler and Walters, 2002; Kessler et al., 2003).

METHODS

Sample

The baseline NCS was a nationally representative survey of 8098 respondents ages 15–54 carried out between September 1990 and February 1992. Respondents were selected from a stratified, multistage area probability sample of US households as well as a supplemental sample of students living in campus housing. The response rate was 82.4%. Interviews were conducted by professional survey interviewers and were administered in two parts. Part I included the core diagnostic interview and core correlates and was administered to all NCS respondents. Part II included additional disorders and risk factors and was administered to a probability sub-sample of 5877 respondents including (a) all respondents ages 15–24, (b) all others with any lifetime DSM-III-R disorder assessed in Part I, and (c) a random sub-sample of remaining Part I respondents. The Part II sample was weighted to adjust for differential probabilities of selection and for nonresponse bias (Kessler et al., 1995). Further details about the NCS design are reported elsewhere (Kessler et al., 1994).

The NCS-2 sought to trace and re-interview the Part II NCS respondents a decade after the baseline NCS. Of the original 5877 respondents, 5463 were successfully traced, of whom 166 were deceased. A total of 5001 respondents were re-interviewed, yielding a conditional response rate of 87.6%. The unconditional response rate, which takes into account the baseline NCS response rate of 82.4%, is 72.2% (0.876×0.824). NCS-2 respondents were assessed using an expanded version of the baseline NCS interview that asked about the onset, course, and severity of mental illness during the years between the two surveys. Relative to other baseline NCS respondents, NCS-2 respondents were significantly more likely to be female, well educated, and residents of rural areas. A propensity score adjustment weight (Rosenbaum and Rubin, 1983) was used to correct the NCS-2 sample for these discrepancies. Importantly, there was no difference between NCS-2 respondents and non-respondents in their reports of suicide-related outcomes at the baseline assessment ($\chi^2_6 = 7.08, p = .313$).

Measures of suicide-related outcomes

SROs were assessed using parallel questions in the NCS and NCS-2. At the baseline NCS assessment, respondents were asked about lifetime experiences of suicidal ideation (“Have you

ever seriously thought about committing suicide?”), suicide plans (“Have you ever made a plan for committing suicide?”), and suicide attempts (“Have you ever attempted suicide?”). Because self-administered surveys have been shown to yield higher rates of reporting of embarrassing behaviors than interviewer-administered surveys (Turner et al., 1998), these experiences were listed in a self-administered booklet and referred to by number (Events 13, 14, and 15) for respondents who were able to read. Respondents were asked whether each experience ever happened to them and, if so, the age of onset and recency of the experience. Those who reported “Event 15” (a suicide attempt) were presented with three statements and asked to identify the one that best described their experience: “1. I made a serious attempt to kill myself and it was only luck that I did not succeed; 2. I tried to kill myself but I knew the method was not foolproof; 3. My attempt was a cry for help, I did not want to die.” In line with contemporary distinctions between suicidal and self-injurious behavior (see Nock and Kessler, 2006; O’Carroll et al., 1996; APA, 2003), respondents endorsing statements 1 or 2 were considered to have made a suicide attempt, whereas respondents endorsing statement 3 were considered to have made a suicide gesture.

At the NCS-2 assessment, respondents were asked a similar series of questions, this time focusing on the interval between the two surveys (“Did Experience [A or B or C] happen to you at any time since [NCS YEAR]?”) rather than on a lifetime assessment. We distinguished between new onsets (i.e., SROs at follow-up among those who denied ever having such experiences at baseline); and persistence (i.e., SROs at follow-up among respondents who also reported such experiences at baseline).

Risk factors

We considered three sets of risk factors, each assessed at the baseline NCS: socio-demographics, lifetime history of SROs, and lifetime history of DSM-III-R mental disorders. Socio-demographics included age, sex, race-ethnicity, marital status, employment status, religious affiliation, education, family income, and having/not having a young child. SROs included lifetime suicidal ideation, plans, gestures, and attempts, as well as years since first onset of ideation as of the baseline assessment. DSM-III-R disorders included mood disorders (major depressive, bipolar I, and dysthymic disorders), anxiety disorders (panic disorder, agoraphobia without panic, social phobia, simple phobia, generalized anxiety disorder, posttraumatic stress disorder), substance use disorders (alcohol or other drug abuse or dependence), and antisocial spectrum disorders (conduct disorder and antisocial personality disorder as well as adult antisocial behavior). These lifetime disorders were assessed with a modified version of the World Health Organization Composite International Diagnostic Interview (CIDI) (WHO, 1990; Robins et al., 1988; Kessler et al., 1998).

Statistical analyses

Cross-tabulations were used to estimate cumulative incidence and persistence of SRO's at the NCS-2 assessment. Multivariate logistic regression analysis (Hosmer and Lemeshow, 1989) was used to estimate prospective associations of assessed risk factors with suicidal ideation and, among ideators, with suicide plan, gesture, and attempt. Continuous variables were divided into categories to minimize effects of extreme values, and categories were combined to stabilize associations when odds-ratios (OR's) did not differ meaningfully. Standard errors and significance tests were estimated using the Taylor series method (Wolter, 1985) implemented in the SUDAAN software system (SUDAAN, 2002) to adjust for design effects. Multivariate significance was evaluated using Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was evaluated using two-tailed .05-level tests.

RESULTS

Cumulative incidence and persistence

At baseline, 13.3% (664 weighted cases) of the respondents who subsequently participated in the NCS-2 reported lifetime suicidal ideation, while 4.0% reported a lifetime suicide plan, 2.3% a suicide gesture, and 2.2% a suicide attempt. The vast majority of baseline respondents (4337 weighted cases) denied ever having any SRO. During the intervening decade, 6.2% of the respondents who previously denied any lifetime SRO reported a first onset of ideation, while 2.3% reported a first suicide plan, 0.7% a first suicide gesture, and 0.9% a first suicide attempt. (Table 1) Of the 664 respondents with a lifetime history of suicidal ideation at baseline, 35.0% also reported ideation during the follow-up period. The persistence of suicide plans (21.2%), gestures (10.8%), and attempts (15.4%) was lower, but still substantial in light of the low base rates of these behaviors.

Effects of risk factor

The baseline risk factors considered here were found generally not to differ in their associations with first onset and persistence of SRO's. As a result, only pooled results are presented here. (Results disaggregated by onset and persistence are available on request.) For the socio-demographics, the only exception to the above statement is age. The youngest respondents (ages 15–24 at baseline) were significantly more likely than older respondents to report a subsequent first onset of ideation in the NCS-2 (OR = 2.2, 95% Confidence Interval [CI] = 1.7–2.8) but less likely than older respondents to report persistence of ideation (OR = 0.5, 95% CI = 0.3–0.8). The few mental disorders that differentially predicted first onset and persistence were inconsistent across different SROs.

Socio-demographic predictors—The strongest prospective socio-demographic predictor of suicidal ideation is “other” employment status (OR = 2.7), which consists largely of the disabled and otherwise unemployed. (Table 2) Other significant predictors (OR's in parentheses) include being younger than 25 years (1.3), Non-Hispanic Black race-ethnicity (0.6), previously married (1.9), and the parent of a young child (1.7). Only a few socio-demographics predict SROs among NCS-R ideators: Catholic religious affiliation predicts suicide plan (0.6); being younger than 25 years predicts suicide gestures (2.4); having a young child predicts suicide gesture (3.0) and attempts (0.4).

Baseline SROs—By far the strongest predictor of suicidal ideation at follow-up (OR's in parentheses) is a history of prior ideation (13.4). Prior ideation is negatively related, though, to plan (0.4) and attempt (0.2) at follow-up. With increasing years since first onset of ideation, the risk of subsequent ideation (0.3) and plan (0.8) decreases. In contrast, prior suicide planning is associated with higher risk of subsequent suicide plan (2.8) and gesture (2.5). Prior gesture is meaningfully related to subsequent gesture [2.5 (95% CI = 0.8–7.9)] and attempt [2.4 (95% CI = 0.7–8.4)], although neither association is statistically significant. Only a history of prior suicide attempt is significantly positively related to future suicide attempt (8.8).

Baseline lifetime DSM-III-R disorders—Nearly all baseline lifetime DSM-III-R disorders significantly and positively predict suicidal ideation at follow-up, even after controlling for baseline socio-demographics and SROs. (Table 3) OR's for individual disorders are in the range 1.0–2.1, with odds of subsequent ideation increasing monotonically with number of disorders ($\chi^2_2 = 26.6$, $p < .001$). In contrast, mental disorders among ideators do not consistently predict subsequent suicide plan, with only three disorders significant and the monotonic relationship and number of disorders no longer significant ($\chi^2_2 = 5.3$, $p = .151$). Neither individual disorders nor number of disorders significantly predict subsequent gesture or attempt. It should be noted that this lack of significance is not due merely to the reduced statistical power to predict the

rarer outcomes, as inspection of OR's shows that the associations of baseline disorders with subsequent plans and especially gestures and attempts are substantially weaker than with ideation.

Further analyses (results not shown, but available on request) showed that the 15 baseline mental disorders, when considered as a set, have substantially stronger associations with subsequent SROs in models that do not control for baseline SROs than in models that do control for baseline SROs. Furthermore, after controlling for baseline SROs number of baseline disorders is consistently more important than types of disorders in predicting subsequent SROs. No consistent differences in the OR's associated with baseline disorders were found in analyses that examined predictive associations separately in sub-samples defined on the basis of age of onset, duration, severity, or recency of disorder.

DISCUSSION

These results are limited in four important ways. First, although data were gathered prospectively, they were based on retrospective reports at both baseline and follow-up. Respondents may have forgotten events, made errors regarding the timing of events, or may have been biased by current mood states at the time of the interviews. If such factors played a role they are most likely to have led to an underestimate of the incidence of suicide-related outcomes. Second, although we examined a wide range of risk factors measured during the baseline interviews, we were unable to carefully assess changes in these factors (such as marriage, or onset of a new mental disorder) over the 10-year follow-up period. Future studies in this area would be strengthened with the use of more frequent assessment and the examination of if and how changes in these constructs influence subsequent suicide-related outcomes. Third, several study constructs, including the presence of each suicide-related outcome, were assessed using single items. The single NCS item used to distinguish suicide gestures from attempts, in particular, doubtlessly yielded a less accurate classification of intent than one based on clinical assessment. Fourth, we considered only a restricted set of self-injurious behaviors and DSM-IV disorders. We did not examine non-suicidal self-injury (i.e., self-mutilation) (Nock and Prinstein, 2005) and several mental disorders known to be associated with suicide-related outcomes (e.g., schizophrenia; Hawton et al., 2005). Each of these limitations restricts the inferences that can be drawn from this study and represents areas for improvement in future studies.

These limitations notwithstanding, the study provides important information about the incidence and persistence of suicide-related outcomes. Our estimates of new onsets of suicide ideation (6.2%), plan (2.3%), gesture (0.7%), and attempt (0.9%) during the 10-year time interval between the two surveys are consistent with estimates from prior studies using similar time frames (Kuo et al., 2001; Sareen et al., 2005; Wang et al., 2006), but extend these earlier studies by using nationally representative data and by examining a broader range of suicide-related outcomes (i.e., suicide plans and gestures). Importantly, more than one-third of the respondents who reported a history of suicide ideation at baseline continued to experience suicide ideation during the follow-up period. The other SROs also persisted during follow-up for a sizeable minority of cases. Interestingly, we found that the factors associated with SRO persistence were very similar to the ones related to new onsets. This is an important finding for both scientists and clinicians as it suggests that many of the risk factors known to predict the onset of SROs in prior studies will be useful in predicting the continuation of these outcomes over time.

Many of the findings from the risk factor analyses are consistent with prior research on the prediction of SROs; however, several aspects of these results merit further comment. The finding that the presence of a young child in the home is associated with a decreased risk of

suicide attempt is consistent with prior work on this topic (Marzuk et al., 1997; Qin and Mortensen, 2003). However, our results show that this same factor is also associated with a significantly *increased* risk of suicide ideation and of suicide gesture among ideators. This finding underscores the high levels of stress that can be associated with having young children in the home (Abidin and Wilfong, 1989), suggests a need for increased monitoring and prevention efforts aimed at parents of young children, and highlights the importance of examining distinct types of suicide-related outcomes when attempting to predict such outcomes.

Our results support and extend the well-documented finding among both adults (Brown et al., 2000; Goldstein et al., 1991; Moscicki, 1997, 1999) and adolescents (Nock and Kazdin, 2002) that the strongest predictor of SROs is past history of the same outcomes. Beyond replicating this result, we found that a prior history of suicide ideation predicts subsequent ideation, but that history of suicide ideation in the absence of a plan or attempt is *negatively* related to subsequent risk of suicide plan and attempt. Only prior history of a suicide plan is associated with subsequent plan and gestures, and only prior history of a suicide attempt is associated with subsequent risk of suicide attempt. In other words, a history of not acting on suicide ideation is a significant predictor of continuing not to do so. This finding is consistent with our previous work based on cross-sectional analysis (Kessler et al., 1999; Borges et al., 2006). This consistent finding provides empirical support for the clinical view that persistent suicide ideation in the absence of making suicide plans or attempts does not increase the risk of suicide plans and attempts, and may actually decrease such risk.

Our results regarding the considerably weaker associations of baseline mental disorders with subsequent plans, gestures, and attempts than with ideation suggest that the effects of mental disorders on SROs are largely mediated by effects on ideation and that the determinants of the transition from ideation to plans, gestures, and attempts are controlled by other factors. It is interesting to note in this regard that our finding that the predictive effects of baseline mental disorders on subsequent SROs become substantially smaller when baseline SROs are controlled suggests that mental disorders are important risk factors for SROs at least partly because earlier SROs were associated with those baseline disorders. This pattern is indirectly consistent with the finding that within-episode SROs have considerable consistency across depressive episodes (Williams et al., 2006) and raises the possibility that the same consistency might also exist for other disorders. But this possibility fails to account for the initial onset of SROs and, importantly, for the transition from ideation to plans, gestures, and attempts. It is clear from our results that these critical transitions are controlled by factors other than those examined here. The determinants of these transitions would seem to be the most important focus for future research.

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Table 1
Onset (cumulative incidence) and persistence of suicide-related outcomes in the NCS-2

	Onset since NCS n (unweighted)	Onset since NCS n (weighted)	% (SE)	n (unweighted)	Persistence given NCS lifetime prevalence n (weighted)	% (SE)
Ideation	324/4104	269/4337	6.2 (0.5)	322/897	232/664	35.0 (1.8)
Plan	147/4736	108/4800	2.3 (0.2)	50/265	43/201	21.2 (3.2)
Gesture	41/4858	34/4888	0.7 (0.2)	14/143	12/112	10.8 (0.9)
Attempt	65/4845	45/4889	0.9 (0.1)	19/156	17/112	15.4 (3.4)

Table 2
Baseline socio-demographics and lifetime SROs as predictors of suicide ideation, plans, gestures and attempts in the NCS-2L

	Total sample				Among NCS-2 lifetime suicidal ideators							
	OR	Ideation 646/5001 (95% CI)	χ^2	OR	Plan 197/1221 (95% CI)	χ^2	OR	Gesture 55/1221 (95% CI)	χ^2	OR	Attempt 84/1221 (95% CI)	χ^2
Baseline age												
15-24	1.3*	(1.0-1.8)		1.3	(0.8-2.2)		2.4*	(1.0-6.0)		1.1	(0.5-2.4)	
25-55	1.0			1.0			1.0			1.0		
Sex												
Female	1.2	(0.9-1.6)		1.3	(0.9-1.9)		2.6	(0.9-7.6)		1.0	(0.6-1.6)	
Male	1.0		12.21*	1.0		7.82*	1.0		1.51	1.0		2.28
Race/ethnicity												
Non-Hispanic White	1.0	(0.4-0.8)		1.0	(0.5-2.2)		1.0	(0.1-2.9)		1.0	(0.8-3.7)	
Non-Hispanic Black	0.6*	(0.7-1.5)		1.1	(0.3-1.2)		0.6	(0.5-2.5)		1.6	(0.2-2.5)	
Hispanic	1.0	(0.7-2.7)		0.6	(0.2-1.1)		1.1	(0.0-3.7)		0.7	(0.2-4.3)	
Other	1.4		21.65*	0.4		1.57	0.4		2.33	0.8		0.87
Baseline marital status												
Married or cohabiting	1.0	(1.4-2.5)		1.0	(0.5-1.3)		1.0	(0.1-1.4)		1.0	(0.7-2.1)	
Previously married	1.9*	(0.8-1.9)		0.8	(0.7-2.3)		0.4	(0.1-2.7)		1.2	(0.6-4.1)	
Never married	1.3		41.74*	1.3		3.12	0.6		1.93	1.5		1.72
Baseline employment Status												
Working or Student	1.0	(0.6-1.5)		1.0	(0.9-3.9)		1.0	(0.6-3.9)		1.0	(0.2-3.5)	
Homemaker	1.0	(1.9-3.7)		1.9	(0.6-2.1)		1.5	(0.6-3.4)		0.8	(0.7-3.7)	
Other	2.7*		3.10	1.1		2.67	1.4		2.62	1.6		14.14*
Baseline education												
0-11 years	1.0	(0.7-1.5)		0.7	(0.3-1.4)		1.7	(0.6-4.8)		1.6	(0.5-4.8)	
12 years	0.8	(0.6-1.2)		0.7	(0.4-1.2)		0.9	(0.3-2.1)		0.7	(0.3-1.8)	
13-15 years	1.1	(0.8-1.5)		0.8	(0.5-1.4)		1.3	(0.5-3.9)		2.3	(0.9-5.6)	
16 and more	1.0			1.0			1.0			1.0		
Baseline poverty level												
Poverty	1.2	(0.9-1.6)		1.0	(0.6-1.7)		1.8	(0.8-3.9)		0.9	(0.3-2.5)	
All others	1.0		19.74*	1.0		2.48	1.0		10.88*	1.0		6.68*
Baseline parenting status												
No young child	1.0	(1.3-2.4)		1.0	(0.6-1.9)		1.0	(0.2-1.8)		1.0	(0.5-2.6)	
Child 0-4 years old	1.7*	(1.2-2.5)		1.1	(0.9-2.5)		0.7	(1.2-7.3)		1.1	(0.2-1.0)	
Child 5-12 years old	1.7*		5.63	1.5		8.27*	3.0*		4.28	0.4*		3.73
Religion												
Protestant	1.0	(0.7-1.1)		1.0	(0.3-1.0)		1.0	(0.7-3.3)		1.0	(0.3-1.4)	
Catholic	0.9	(0.9-2.3)		0.6*	(0.5-2.7)		1.5	(0.5-5.2)		0.6	(0.1-2.6)	
Other	1.4	(0.8-2.1)		1.1	(0.5-2.7)		0.4	(0.1-1.4)		0.5	(0.8-3.0)	
No preference	1.3	(10.5-17.2)		1.1	(0.3-0.8)		0.7	(0.3-1.8)		1.5*	(0.1-0.5)	
13.4*				0.4*			0.2			0.2		
Baseline lifetime suicide Ideation												
Baseline years (x 10) since first ideation ²	0.3*	(0.2-0.4)		0.8*	(0.6-0.9)		0.8	(0.5-1.3)		0.9	(0.7-1.2)	
Baseline lifetime suicide plan												
Baseline lifetime suicide gesture				2.8*	(1.5-5.3)		2.5*	(1.0-6.5)		1.1	(0.5-2.6)	
Baseline lifetime suicide attempt				2.5	(0.8-7.9)		2.5	(0.8-7.9)		2.4	(0.7-8.4)	
				1.5	(0.4-5.2)		1.5	(0.4-5.2)		8.8*	(3.2-24.6)	

Total sample		Among NCS-2 lifetime suicidal ideators						
OR	Ideation 646/5001 (95% CI)	χ^2	Plan 197/1221 (95% CI)	OR	Gesture 55/1221 (95% CI)	OR	Attempt 84/1221 (95% CI)	χ^2

Odds ratios (OR) from logistic regression coefficients. The 95% Confidence Interval (95% CI) were obtained using the Taylor series linearization method.

* Significant at the .05 level, two-sided test

Table 3
Mental disorders at baseline NCS as predictors of suicide ideation, plans, gestures and attempts in the NCS-2¹.

	Total sample				Among NCS-2 lifetime suicidal ideators			
	Ideation 646/5001		Plan 197/1221		Gesture 55/956		Attempt 84/1221	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Mood Disorders								
Major depressive	1.4*	(1.0 - 1.9)	1.2	(0.8 - 1.9)	1.1	(0.5 - 2.3)	1.0	(0.5 - 2.0)
Bipolar	1.5	(0.7 - 3.0)	2.1	(0.9 - 4.8)	0.9	(0.2 - 3.2)	0.4	(0.1 - 1.9)
Dysthymia	1.9*	(1.1 - 3.3)	1.0	(0.5 - 2.0)	0.9	(0.3 - 3.5)	1.0	(0.2 - 3.8)
Any mood disorder	1.6*	(1.2 - 2.0)	1.5*	(1.0 - 2.2)	1.1	(0.6 - 2.1)	0.9	(0.5 - 1.8)
Anxiety Disorders								
Panic disorder	2.1*	(1.4 - 3.3)	1.6	(0.9 - 2.6)	1.8	(0.8 - 4.0)	0.7	(0.2 - 2.2)
Agoraphobia without panic	1.3	(0.8 - 2.1)	1.4	(0.7 - 2.6)	1.6	(0.7 - 3.3)	0.6	(0.2 - 1.4)
Social phobia	1.6*	(1.2 - 2.2)	1.4	(0.9 - 2.3)	1.0	(0.5 - 2.2)	1.0	(0.6 - 1.9)
Simple phobia	1.6*	(1.0 - 2.4)	1.3	(0.9 - 1.9)	1.0	(0.4 - 2.4)	0.7	(0.3 - 1.5)
Generalized anxiety disorder	2.1*	(1.4 - 3.1)	1.9*	(1.1 - 3.3)	1.3	(0.4 - 4.2)	0.5	(0.2 - 1.2)
Post-traumatic stress disorder	1.8*	(1.1 - 2.8)	1.3	(0.8 - 2.1)	0.8	(0.3 - 1.9)	1.1	(0.4 - 2.9)
Any anxiety disorder	1.7*	(1.3 - 2.2)	1.4	(0.9 - 2.0)	0.7	(0.3 - 1.4)	0.8	(0.4 - 1.7)
Substance Disorder								
Alcohol abuse.	1.0	(0.7 - 1.4)	0.7	(0.4 - 1.4)	0.2*	(0.1 - 0.7)	1.2	(0.5 - 3.0)
Alcohol dependence	1.5*	(1.0 - 2.1)	1.5*	(1.0 - 2.2)	1.3	(0.7 - 2.5)	1.1	(0.6 - 2.1)
Alcohol abuse/dependence	1.3*	(1.0 - 1.8)	1.2	(0.8 - 1.8)	0.9	(0.5 - 1.6)	1.2	(0.6 - 2.3)
Drug abuse.	1.4	(0.8 - 2.3)	1.5	(0.7 - 3.2)	1.4	(0.3 - 6.3)	0.9	(0.3 - 3.0)
Drug dependence	1.9*	(1.3 - 2.8)	0.9	(0.6 - 1.6)	0.9	(0.4 - 1.8)	1.3	(0.6 - 2.7)
Drug abuse/dependence	1.8*	(1.2 - 2.5)	1.1	(0.7 - 1.8)	1.0	(0.5 - 2.1)	1.2	(0.6 - 2.3)
Any substance disorder	1.6*	(1.2 - 2.2)	1.1	(0.7 - 1.7)	0.9	(0.5 - 1.7)	1.1	(0.6 - 2.3)
Impulse-control disorders								
Adult antisocial behavior	1.7*	(1.0 - 2.8)	1.6*	(1.1 - 2.6)	0.9	(0.4 - 2.3)	1.2	(0.5 - 2.4)
Conduct disorder	1.7*	(1.2 - 2.3)	1.4	(0.8 - 2.4)	0.5	(0.2 - 1.3)	1.3	(0.7 - 2.4)
Antisocial personality disorder	1.9*	(1.0 - 3.6)	1.7	(1.0 - 3.1)	1.3	(0.5 - 3.7)	1.2	(0.4 - 3.1)
Any Disorder	1.8*	(1.3 - 2.6)	1.3	(0.7 - 2.2)	0.7	(0.3 - 1.7)	0.8	(0.3 - 1.9)
Exactly one disorder	1.4*	(0.9 - 2.1)	1.1	(0.5 - 2.4)	0.7	(0.2 - 2.5)	0.8	(0.3 - 2.1)
Exactly two disorders	1.7*	(1.1 - 2.7)	1.6	(0.7 - 3.2)	0.5	(0.2 - 1.4)	0.7	(0.2 - 2.3)
Three or more disorders	2.6*	(1.8 - 3.9)	1.7	(0.9 - 3.2)	0.6	(0.3 - 1.6)	0.9	(0.4 - 2.4)
χ^2_3	26.57*		5.31		2.01		0.82	

¹ Odds ratios (OR) from logistic regression coefficients. The 95% Confidence Interval (95% CI) were obtained using the Taylor series linearization method. Based on separate multivariate logistic regression equations for each DSM-III-R disorder and a single equation for number of disorders, controlling for baseline demographics and the baseline SROs in Table 2

² The χ^2_3 test evaluates the significance of a count of number of lifetime baseline disorders (1,2,3+) predicting NCS-2 outcomes

* Significant at the .05 level, two-sided test