Identifying Factors That Predict Longitudinal Outcomes of Untreated Common Mental Disorders

Christine Anne Henriksen, M.A., Murray B. Stein, M.D., M.P.H., Tracie O. Afifi, Ph.D., Murray W. Enns, M.D., Lisa M. Lix, Ph.D., Jitender Sareen, M.D.

Objective: Historically, meeting criteria for a mental disorder has been used as a proxy for the need for mental health services, yet research suggests that a significant proportion of disorders remit without treatment. In this study, risk factors for poor longitudinal outcomes of individuals with untreated common mental disorders were determined, with the goal of identifying individuals with unmet need and informing the development of targeted interventions.

Methods: Data came from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC), a longitudinal, nationally representative survey of the adult U.S. population (age ≥18; N=34,653). Respondents were assessed for past-year depressive, anxiety, and substance use disorders and mental health service use via face-to-face interviews conducted at two time points, three years apart. Among respondents without a history of mental health treatment, logistic regression analyses examined factors associated with persistence of the disorder, comorbidity, or suicide attempt (that is, presence of any axis I disorder in the past year at wave 2 or any suicide attempt during the follow-up) versus spontaneous recovery of baseline disorders.

Results: Certain sociodemographic factors, comorbid mental disorders at baseline (such as three or more axis I disorders, adjusted odds ratio [AOR]=1.64, 95% confidence interval [CI]=1.27–2.12), and childhood maltreatment (AOR=1.47, CI=1.23–1.75) were predictors of disorder persistence, comorbidity, or suicide attempt in depressive, anxiety, and substance use disorders during the follow-up.

Conclusions: In addition to considering the presence of a mental disorder, policy makers should consider other variables, such as childhood maltreatment and comorbidity, in estimating treatment need.

Psychiatric Services 2015; 66:163–170; doi: 10.1176/appi.ps.201300564

In order to guide policy on allocation of appropriate mental health services, there has been a worldwide effort to estimate mental health services need. Meeting criteria for a common mental disorder has been used as a proxy for the need for mental health services. However, most worldwide surveys have found high rates of common mental disorders in conjunction with low mental health service use (1–4). Among people with a mental disorder, the most important barrier to service use has been the lack of perceived need for help (1,5–7).

In the context of these findings, there has been increasing concern that a mental disorder diagnosis by itself is not a clear indicator of need for services. Our group recently published the first study examining the three-year outcomes of untreated common mental disorders (8). Using a longitudinal survey, we found that approximately 60% of people with an untreated mental disorder at baseline had a remission of their disorder without any subsequent treatment (and with no development of a comorbid disorder or any suicide attempt). These findings indicate that a substantial proportion of people who meet diagnostic criteria for a common mental disorder recover without needing formal treatment. On the other hand, approximately 40% had persistence of the same disorder, developed a comorbid disorder, or attempted suicide, and therefore they may have benefited from outreach interventions.

The aim of this study was to extend the literature by examining, with a longitudinal community-based survey, the risk factors for poor outcomes among individuals with untreated common mental disorders. Although previous research has examined predictors of persistence and recurrence of mental disorders in special populations (such as older adults or individuals with major depression) (9,10), no studies have considered a broad range of untreated mental disorders in the adult population (age ≥18) in a longitudinal sample. Such work could help identify people at risk of poor outcomes and inform the development of targeted interventions. Considering previous work showing that various sociodemographic factors (female sex, higher education, and middle age), childhood maltreatment, comorbid mental disorders, and comorbid general medical conditions are associated with higher likelihood of mental health service use and persistence (or recurrence) of mental disorders (6,9–14), we hypothesized that in the absence

of mental health treatment, these factors would be associated with poor longitudinal outcomes.

METHODS

Survey

Data were from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC), a longitudinal, nationally representative survey of the U.S. adult population (age ≥18) (15,16). In wave 1, after obtaining informed consent from participants, trained lay interviewers conducted face-to-face interviews with 43,093 noninstitutionalized respondents between 2001 and 2002 (15,17). Wave 2 followed up with 34,653 wave 1 respondents between 2004 and 2005, with a cumulative response rate of 70.2% for the two waves (16,18,19). The U.S. Census Bureau and U.S. Office of Management and Budget reviewed and provided ethical approval for the NESARC (17).

Measures

Axis I mental disorders. The Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version (AUDADIS-IV) (20) derived past-year axis I mental disorders according to *DSM-IV* (21) criteria. Axis I disorders include any mood disorder (major depression, dysthymia, and bipolar disorder), any anxiety disorder (social phobia, panic disorder, specific phobia, agoraphobia, and generalized anxiety disorder), and any substance use disorder (alcohol use disorders and illicit drug use disorders).

Respondents with a psychotic illness or bipolar disorder were excluded for several reasons. First, psychosis is difficult to measure in epidemiologic samples (22); in this study psychotic illness was measured through self-report, rather than with a diagnostic algorithm, as was done with all other mental disorders. Second, the debate around allocation of mental health services has been limited to nonpsychotic illness; few critics would argue that psychotic individuals are not in need of treatment. Finally, bipolar disorder was excluded due to difficulty defining remission; according to *DSM-IV*, once a person has had an episode of mania (or a major depressive episode and a hypomanic episode) he or she has a diagnosis of bipolar disorder. As a result, our analysis examined (nonbipolar and nonpsychotic) depressive, anxiety, and substance use disorders.

Mental health service use. For each depressive and anxiety disorder at wave 1, four questions examined whether a respondent ever sought treatment from a counselor, therapist, physician, psychologist, or similar mental health worker; went to an emergency room; stayed in a hospital overnight; or was prescribed medication for a mood disorder or for an anxiety disorder. In addition, respondents were asked at wave 1 whether they had ever sought treatment from a physician, counselor, Alcoholics or Narcotics Anonymous, or any other community agency or professional for a substance use problem. At wave 2 similar questions were posed to respondents, except the phrasing of each question regarding timing of service use was changed from "ever" to "since your last interview."

Suicide attempts. At wave 2 respondents were asked whether they had ever attempted suicide and if so, when the most recent attempt occurred.

Axis II personality disorders. The AUDADIS-IV assessed respondents for the lifetime presence of all ten *DSM-IV* personality disorders: schizoid, paranoid, antisocial, dependent, histrionic, obsessive-compulsive, avoidant, borderline, narcissistic, and schizotypal.

Sociodemographic factors. We included several sociodemographic factors, as assessed at wave 1, in our analyses: age, household income (<$20,000, $20,000–$34,999, $35,000–$59,999, and ≥$60,000), sex, marital status (married or common-law status; never married; or widowed, divorced, or separated), education (less than high school, high school, or some college or more), and race-ethnicity (white, black, Hispanic, or other).

Childhood maltreatment. Questions regarding childhood maltreatment were adapted from the Conflict Tactics Scale (23,24) and the Childhood Trauma Questionnaire (25). Participants were classified as having experienced childhood maltreatment if they experienced childhood physical, sexual, or emotional abuse; physical neglect; or emotional neglect. Our definitions of these types of abuse and neglect were consistent with those used in the Adverse Childhood Experiences Study (26,27) and identical to those used in previous research with the NESARC (28,29).

General medical conditions. Respondents answered questions about the presence of the following general medical conditions diagnosed by a physician: arteriosclerosis, hypertension, liver disease, chest pain or angina pectoris, tachycardia, heart attack, other heart disease, stomach ulcer, gastritis, and arthritis. A count of the number of past-year general medical conditions at wave 1 was created on the basis of these responses.

Health-related quality of life. The valid and reliable 12-Item Medical Outcomes Study–Short Form (SF-12) (30) measured respondents' past-month health-related quality of life. The SF-12 produces mental component summary (MCS) and physical component summary (PCS) scores ranging from 0 to 100. These scales are standardized to a mean of 50, with higher scores indicating better quality of life.

Main Outcomes

We determined the outcomes of individuals who had past-year depressive, anxiety, and substance use disorders at baseline who had not received any lifetime mental health services. Individuals who endorsed any service use during the three-year follow-up were excluded from the analysis. We then created two mutually exclusive outcomes concerning depressive, anxiety, and substance use disorder: nonremission—defined as mental disorder persistence in the past year at wave 2, presence of a comorbid disorder in the

past year at wave 2, or any suicide attempt during the three-year follow-up period—or spontaneous remission—defined as neither meeting criteria for any axis I mental disorder in the past year at wave 2 nor making a suicide attempt during the follow-up. We created four separate outcome variables to represent each class of disorder (that is, any depressive disorder, any anxiety disorder, any substance use disorder, and any disorder). It is important to note that we used a hierarchy rule such that respondents experiencing remission of their baseline disorder could be categorized in the remission group only if they did not have any of the other outcomes (suicide attempt during the three-year follow-up or meeting criteria for at least one axis I comorbid disorder during the past year at wave 2).

Analytic Strategy

Weights supplied by the NESARC were used to ensure that the analyses were representative of the U.S. population according to the 2000 Decennial Census (18). To account for the complex sampling frame of the survey, Taylor-series linearization was adopted when estimating regression coefficients and standard errors with SUDAAN 10.0.1 statistical software (31,32). We examined the associations among all predictors before conducting regression analyses to check for multicollinearity.

We used cross-tabulations to describe the data. Logistic regression analyses tested the associations between the sociodemographic factors; comorbid axis I, II, or III disorders; and childhood maltreatment history and nonremission (as defined above). We first examined the unadjusted association between each predictor of nonremission and then entered all predictors into the regression model simultaneously. Unadjusted and adjusted odds ratios and 95% confidence intervals are reported. Log-likelihood ratio statistics and Cox and Snell R^2 statistics assessed the goodness of fit for the model.

RESULTS

Table 1 shows the sociodemographic distribution of the nonremission group and the spontaneous remission group. Across all disorder categories, adults in the nonremission group were younger than those in the spontaneous remission group. There was a greater proportion of women with depressive disorders in the nonremission group compared with the spontaneous remission group, whereas for substance use disorders, there was a greater proportion of men in the nonremission group.

Table 2 shows the results of the unadjusted logistic regressions examining the association between risk factors and persistence, comorbidity, and suicide attempt in untreated baseline depressive, anxiety, and substance use disorders. Meeting criteria for any personality disorder was associated with an increased likelihood of nonremission for all classes of disorders. Two factors—having two or more axis I mental disorders at baseline and childhood maltreatment—were also associated with an increased likelihood of nonremission for all disorders. Age was inversely associated with nonremission for anxiety, substance use disorders, and any disorder. Compared with men, women with a substance use disorder or any disorder were significantly less likely to have nonremission. Compared with individuals who were married or cohabiting, those who were never married had increased odds of nonremission of an anxiety disorder and for the composite any-disorder category. Number of general medical conditions was inversely associated with nonremission for the composite any-disorder category. Lower SF-12 MCS scores were associated with increased odds of nonremission for anxiety disorders, whereas higher SF-12 PCS scores were associated with increased odds of nonremission for the composite any-disorder category.

Table 3 provides the results of multivariable analyses for estimating risk factors associated with nonremission compared with spontaneous remission of baseline disorders. Two risk factors were significant across all depressive, anxiety, and substance use disorders. Participants with a baseline history of multiple axis I disorders had increased odds of nonremission for all depressive, anxiety, and substance use disorders. Childhood maltreatment also was associated with an increased likelihood of nonremission for depressive, anxiety, and substance use disorders, as well as for the any-disorder category. Axis II personality disorders were significantly associated with nonremission among those with an anxiety or substance use disorder (and also with depressive disorders, although not significantly so) and among individuals in the any-disorder category.

Other factors were associated with disorder persistence, comorbidity, and suicide attempt for specific depressive, anxiety, and substance use disorders but not for others. For example, there were sex differences in outcomes across different disorder types. Among persons with a baseline depressive disorder, women had significantly greater odds of nonremission. Being male was significantly associated with nonremission for substance use disorders and for the any-disorder category. Compared with whites, Hispanics had significantly lower odds of nonremission for substance use disorders, although this association may not be unique to substance use disorders, given that the trend was similar across other disorder categories. Among people with an anxiety disorder or a substance use disorder and those in the composite any-disorder category, older age was associated with decreased likelihood of nonremission. After adjustment for other covariates, analyses showed that number of general medical conditions at baseline and SF-12 scores were no longer associated with outcomes.

DISCUSSION

This study is the first to examine predictors of poor outcome among individuals age 18 and older with a broad range of common mental disorders but without a history of mental health treatment, and the findings extend the literature in

TABLE 1. Sociodemographic characteristics of NESARC respondents, by disorder[a]

Variable	Anxiety disorder				Depressive disorder				Substance use disorder				Any disorder			
	Spontaneous remission		Nonremission[b]		Spontaneous remission		Nonremission[b]		Spontaneous remission		Nonremission[b]		Spontaneous remission		Nonremission[b]	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age (M±SE)	45.1±.6		40.2±.8		41.7±1.6		38.6±1.2		35.9±.7		33.4±.6		41.6±.5		36.5±.5	
Sex																
Male	328	36.1	162	38.4	114	42.6	59	33.2	487	71.2	539	80.2	872	50.5	676	60.2
Female	691	63.9	341	61.6	190	57.4	146	66.8	249	28.8	161	19.8	1,060	49.5	563	39.8
Income																
$0–$19,999	257	20.4	133	23.7	85	20.5	69	27.8	148	18.7	113	14.8	460	19.5	271	19.0
$20,000–$34,999	196	17.4	108	17.6	68	22.3	49	21.6	146	17.1	162	22.3	383	17.8	287	21.1
$35,000–$59,999	270	27.7	136	28.9	78	25.8	51	29.6	208	27.0	197	27.6	513	26.7	331	27.6
≥$60,000	296	34.5	126	29.8	73	31.5	36	21.0	234	37.3	228	35.3	576	36.0	350	32.3
Education																
Less than high school	157	12.7	82	14.7	62	22.7	54	26.3	86	10.8	80	11.1	288	13.4	176	13.1
High school	315	31.5	146	30.0	97	28.1	57	26.4	212	27.3	225	31.3	581	29.4	379	30.3
Some college or more	547	55.8	275	55.3	145	49.2	94	47.3	438	61.9	395	57.6	1,063	57.3	684	56.6
Marital status																
Married or common-law status	574	66.3	252	60.3	120	46.0	79	44.6	312	49.5	303	49.3	960	58.1	562	52.6
Widowed, separated, or divorced	226	14.6	113	14.7	94	24.2	56	22.4	130	11.8	106	10.5	418	14.8	237	12.9
Never married	219	19.1	138	25.0	90	29.8	70	33.0	294	38.8	291	40.3	554	27.1	440	34.5
Race-ethnicity																
White	587	71.1	297	73.0	156	60.4	96	59.1	434	70.9	450	73.6	1,102	69.5	739	71.6
Black	208	12.5	108	11.7	56	12.6	55	15.7	130	9.9	107	10.1	374	11.7	243	11.9
Hispanic	181	10.4	81	10.5	20	12.2	17	11.3	144	13.5	123	11.7	371	12.1	216	11.7
Other	43	6.0	17	4.8	72	14.8	37	13.9	28	5.7	20	4.6	85	6.7	41	4.8

[a] NESARC, National Epidemiologic Survey of Alcohol and Related Conditions (N=34,653 at wave 2). All frequencies are unweighted, and all percentages are weighted.

[b] Defined as persistence of wave 1 mental disorder in past year at wave 2, presence of a comorbid disorder in past year at wave 2, or any suicide attempt during the three-year follow-up period between waves 1 and 2

several important ways. First, these results suggest that comorbidity with other axis I and II disorders should be considered as an additional measure for estimating need for mental health services in a population. In this study, comorbid disorders were robustly associated with a lower likelihood of remission without treatment across depressive, anxiety, and substance use disorders. It is likely that the presence of multiple psychiatric disorders indicates more severe or more complex cases that are most in need of intervention. Mackenzie and colleagues (9) also found that disorder severity and complexity were robust correlates of persistent mood and anxiety disorders among older adults, although their study included individuals with a history of mental health treatment whereas ours focused exclusively on those without a history of treatment. Similarly, greater symptom severity and comorbid depression or anxiety have both been found to be associated with persistence of depression and anxiety disorders in longitudinal studies of individuals with and without a history of mental health treatment (33,34).

Most previous studies have not considered personality disorders in estimates of treatment need, for several reasons. First, most large cross-national studies have not assessed personality disorders (with the exception of antisocial personality disorder). Second, for most personality disorders, with the exception of borderline

TABLE 2. Likelihood of mental disorder persistence, presence of a comorbid disorder, and suicide attempt in untreated depressive, anxiety, and substance use disorders

		Anxiety disorder[a]		Depressive disorder[a]		Substance use disorder[a]		Any disorder	
Explanatory variable	N	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age		.98***	.98–.99	.99	.98–1.00	.99**	.98–1.00	.98***	.97–.99
Female (reference: male)	1,623	.91	.69–1.20	1.49	.97–2.30	.61***	.47–.80	.67***	.56–.80
Household income									
$0–$19,999 (reference)	731	1.00		1.00		1.00		1.00	
$20,000–$34,999	670	.87	.59–1.29	.71	.39–1.30	1.65*	1.06–2.58	1.22	.92–1.62
$35,000–$59,999	844	.90	.64–1.26	.84	.45–1.59	1.30	.89–1.89	1.06	.82–1.37
≥$60,000	926	.74	.53–1.04	.49*	.25–.97	1.20	.80–1.80	.92	.71–1.20
Education									
Less than high school (reference)	464	1.00		1.00		1.00		1.00	
High school	960	.82	.54–1.25	.81	.40–1.63	1.13	.73–1.74	1.05	.79–1.40
Some college or more	1,747	.85	.59–1.22	.83	.44–1.58	.91	.59–1.40	1.01	.77–1.32
Race-ethnicity									
White (reference)	1,841	1.00		1.00		1.00		1.00	
Black	617	.91	.67–1.24	1.28	.71–2.30	.98	.71–1.37	.98	.79–1.22
Hispanic	587	.98	.66–1.47	.96	.53–1.74	.83	.58–1.20	.93	.72–1.22
Other	126	.78	.42–1.44	.95	.40–2.25	.77	.40–1.50	.70	.46–1.06
Marital status									
Married or common-law status (reference)	1,522	1.00		1.00		1.00		1.00	
Widowed, separated, or divorced	655	1.11	.81–1.52	.95	.55–1.66	.89	.59–1.34	.96	.75–1.23
Never married	994	1.44*	1.02–2.02	1.14	.62–2.11	1.04	.78–1.39	1.40**	1.15–1.71
Any axis II personality disorder (reference: none)	893	2.01***	1.54–2.64	1.67*	1.02–2.73	2.10***	1.53–2.88	1.80***	1.48–2.18
Number of lifetime axis I disorders at baseline									
1 (reference)	1,781	1.00		1.00		1.00		1.00	
2	886	1.65**	1.22–2.23	2.06**	1.22–3.48	1.62**	1.18–2.21	1.39**	1.14–1.70
≥3	504	3.51***	2.56–4.82	3.26***	1.75–6.07	2.09***	1.44–3.03	2.06***	1.61–2.63
Number of past-year general medical conditions at wave 1		.94	.82–1.08	.87	.66–1.16	.83	.67–1.03	.84**	.75–.93
History of childhood maltreatment (reference: none)	1,286	1.65***	1.27–2.14	2.12**	1.32–3.40	1.49**	1.17–1.90	1.53***	1.30–1.80
SF-12 physical component score[b]		1.00	.99–1.01	1.01	.99–1.03	1.01	.99–1.02	1.01**	1.00–1.02
SF-12 mental component score[b]		.98**	.96–.99	.99	.96–1.01	.99	.98–1.01	.99	.98–1.00

[a] Individuals may be represented in more than one column (for example, individuals with an anxiety disorder could also be represented in the depressive disorder column or the substance use disorder column).
[b] SF-12, 12-Item Short-Form Health Survey
*p≤.05, **p≤.01, ***p≤.001

personality disorder, there is little evidence for effective interventions. Two large longitudinal studies have found personality disorders to be associated with persistence of major depression (35,36). When these results are taken as a whole and considered in the context of accumulating evidence of the deleterious outcomes associated with several personality disorders (37–41), evidence suggests that estimates of treatment need should also consider the presence of personality disorders.

Another important finding of this study is that childhood maltreatment was consistently associated with poor outcomes for depressive, anxiety, and substance use disorders. Our results are consistent with previous work demonstrating that childhood maltreatment is associated with the onset and persistence of mental disorders (42,43). They are also in line with a study that found that harsh physical punishment was associated with persistent depressive symptoms in a nonclinical sample (44). Childhood maltreatment has also been found to be associated with help seeking and perceived need for care, even in the absence of a lifetime disorder (12). Thus in addition to considering criteria that indicate presence of a mental disorder, we suggest that consideration also be given to persons with a history of childhood maltreatment when estimating the need for mental health services.

Moreover, our findings suggest that certain groups with untreated mental disorders (younger individuals, women with depressive disorders, and men with substance use disorders) should be specifically targeted for intervention because they may have a lower likelihood of remitting without treatment. These findings are consistent with previous work that has examined correlates of help seeking (6,11–13), as well as with studies that have examined persistence of depression and alcohol use disorders in population-based samples of individuals who have and who have not sought treatment (45–47).

TABLE 3. Multivariable model predicting likelihood of persistence, presence of a comorbid disorder, and suicide attempt in depressive, anxiety, and substance use disorders without baseline or follow-up treatment[a]

		Anxiety disorder[b]		Depressive disorder[c]		Substance use disorder[d]		Any disorder[e]	
Explanatory variable	N	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Age		.98***	.97–.99	.99	.97–1.01	.98*	.97–1.00	.98***	.97–.99
Female (reference: male)	1,623	1.15	.87–1.51	1.75*	1.09–2.82	.58***	.44–.78	.71***	.59–.86
Household income									
$0–$19,999 (reference)	731	1.00		1.00		1.00		1.00	
$20,000–$34,999	670	.82	.52–1.29	.72	.38–1.35	1.74*	1.10–2.76	1.22	.90–1.66
$35,000–$59,999	844	.86	.56–1.32	.71	.34–1.47	1.26	.83–1.90	.99	.74–1.31
≥$60,000	926	.82	.52–1.30	.52	.23–1.18	1.32	.83–2.09	.97	.71–1.33
Education									
Less than high school (reference)	464	1.00		1.00		1.00		1.00	
High school	960	.84	.52–1.36	.81	.39–1.70	1.17	.72–1.91	1.05	.77–1.44
Some college or more	1,747	.90	.56–1.43	.83	.41–1.70	1.02	.62–1.66	1.01	.73–1.40
Race-ethnicity									
White (reference)	1,841	1.00		1.00		1.00		1.00	
Black	617	.86	.60–1.23	1.37	.72–2.59	.88	.61–1.28	.90	.71–1.16
Hispanic	587	.87	.54–1.40	.88	.45–1.71	.61*	.40–.92	.74	.55–1.00
Other	126	.79	.40–1.59	1.00	.40–2.53	.72	.34–1.49	.69	.44–1.10
Marital status									
Married or common-law status (reference)	1,522	1.00		1.00		1.00		1.00	
Widowed, separated, or divorced	655	1.22	.85–1.74	.98	.51–1.88	.97	.64–1.47	1.16	.89–1.51
Never married	994	1.01	.67–1.53	1.00	.48–2.06	.84	.58–1.21	.97	.76–1.24
Any axis II personality disorder (reference: none)	893	1.44*	1.05–1.98	1.12	.66–1.89	1.67**	1.20–2.34	1.47***	1.19–1.81
Number of lifetime axis I disorders at baseline									
1 (reference)	1,781	1.00		1.00		1.00		1.00	
2	886	1.52**	1.11–2.09	2.05*	1.17–3.60	1.61**	1.15–2.24	1.33**	1.08–1.64
≥3	504	2.71***	1.92–3.84	2.89***	1.57–5.32	1.65*	1.11–2.45	1.64***	1.27–2.12
Number of past-year general medical conditions at wave 1		1.07	.92–1.25	1.01	.72–1.42	.87	.66–1.15	1.00	.88–1.13
History of childhood maltreatment (reference: none)	1,286	1.44*	1.08–1.92	2.01**	1.26–3.21	1.45**	1.10–1.91	1.47***	1.23–1.75
SF-12 physical component score[f]		1.00	.98–1.01	1.02	.99–1.05	1.00	.98–1.02	1.00	.99–1.01
SF-12 mental component score[f]		.99	.98–1.01	1.00	.97–1.02	1.00	.98–1.02	1.00	.99–1.01

[a] Individuals may be represented in more than one column (for example, individuals with an anxiety disorder could also be represented in the depressive disorder column or the substance use disorder column). Adjusted odds ratios (AORs) include all the variables in the same model with the reference category, remission without treatment.

[b] Goodness of fit: log-likeliood ratio=132.74, df=19, $p<.05$, Cox and Snell R^2 =.086

[c] Goodness of fit: log-likelihood ratio=61.56, df=19, $p<.05$, Cox and Snell R^2 =.117

[d] Goodness of fit: log-likelihood ratio=101.99, df=19, $p<.05$, Cox and Snell R^2 =.070

[e] Goodness of fit: log-likelihood ratio=204.02, df=19, $p<.05$, Cox and Snell R^2 =.064

[f] SF-12, 12-Item Short-Form Health Survey

*p≤.05, **p≤.01, ***p≤.001

Surprisingly, household income and number of general medical conditions were not associated with remission without treatment in fully adjusted models. These results are in contrast to previous work that has consistently shown that low socioeconomic status is associated with poor mental and general medical outcomes (48). General health problems are commonly comorbid with mental disorders, and we had suspected that disease burden would be associated with outcomes. One possible explanation for these null findings is that the general medical conditions contained in the NESARC are of varying severity, and specific conditions may be associated with more distress than others. Unfortunately, it was beyond the scope of this study to examine specific general medical conditions and their association with remission. However, future studies should consider this issue.

The study had several limitations. First, mental disorder diagnoses were generated by a single data source, the AUDADIS-IV diagnostic algorithms, and these results may not match those based on clinical interviews (18). Fortunately, research has indicated that there are no significant differences in diagnoses based on trained lay interviews and professional clinical interviews (49). Second, given the retrospective nature of the interviews, recall bias may have affected the recollection of when specific symptoms occurred. However, focusing on past-year disorders at both time points would likely attenuate the impact of recall bias.

Third, not all axis I disorders were assessed at both waves of the NESARC (for example, obsessive-compulsive disorder and posttraumatic stress disorder), which prevented us from examining predictors of poor outcome of all depressive, anxiety, and substance use disorders. It is unclear whether the results would also generalize to these disorders. Fourth, a recent reliability study found self-reported suicide attempts in the NESARC to be only modestly reliable (50).

Fifth, the study was based on *DSM-IV* diagnostic criteria. As such, the results may not be applicable to *DSM-5* mental disorders. Sixth, to reduce the number of comparisons, we chose to limit our analyses to categories of mental disorder rather than investigating individual disorders. It is possible that individual depressive, anxiety, and substance use disorders have unique correlates of persistence, comorbidity, and suicide attempt.

Seventh, we were unable to examine symptom severity as a predictor of persistence, comorbidity, and suicide attempt because there are not adequate measures of mental disorder severity in the NESARC. Finally, it is unclear whether the results of this study generalize to other countries where access to services and attitudes toward mental health and treatment providers differ. Future studies should investigate whether the associations found in this study hold true in other areas of the world.

CONCLUSIONS

This study suggests that beyond looking at the presence of a depressive, anxiety, or substance use disorder, policy makers should consider other important factors, such as childhood maltreatment and comorbid axis I and axis II disorders, when estimating need for mental health services. These results warrant the development of targeted prevention and intervention strategies aimed to help individuals with multiple disorders, childhood maltreatment histories, or both, especially when we consider these results in the context of low treatment seeking among these individuals (1,3,4). Future studies should test public health outreach interventions for persons with untreated depressive, anxiety, and substance use disorders to determine whether such interventions improve outcomes and are cost-effective.

AUTHOR AND ARTICLE INFORMATION

Ms. Henriksen is with the Department of Psychology, Dr. Afifi and Dr. Lix are with the Department of Community Health Sciences, and Dr. Enns and Dr. Sareen are with the Department of Psychiatry, all at the University of Manitoba, Winnipeg, Manitoba, Canada (e-mail: umhenri5@cc.umanitoba.ca). Dr. Stein is with the Departments of Psychiatry and Family and Preventive Medicine, University of California, San Diego.

Preparation of this article was supported by Manitoba Health Research Council Chair award 1111 to Dr. Sareen.

The authors report no financial relationships with commercial interests.

REFERENCES

1. Andrews G, Henderson S, Hall W: Prevalence, comorbidity, disability and service utilization: overview of the Australian National Mental Health Survey. British Journal of Psychiatry 178:145–153, 2001
2. Kessler RC, Frank RG, Edlund M, et al: Differences in the use of psychiatric outpatient services between the United States and Ontario. New England Journal of Medicine 336:551–557, 1997
3. Kessler RC, Demler O, Frank RG, et al: Prevalence and treatment of mental disorders, 1990 to 2003. New England Journal of Medicine 352:2515–2523, 2005
4. Wang PS, Aguilar-Gaxiola S, Alonso J, et al: Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO World Mental Health Surveys. Lancet 370:841–850, 2007
5. Kessler RC, Berglund PA, Bruce ML, et al: The prevalence and correlates of untreated serious mental illness. Health Services Research 36:987–1007, 2001
6. Mojtabai R, Olfson M, Mechanic D: Perceived need and help-seeking in adults with mood, anxiety, or substance use disorders. Archives of General Psychiatry 59:77–84, 2002
7. Mojtabai R, Olfson M, Sampson NA, et al: Barriers to mental health treatment: results from the National Comorbidity Survey Replication. Psychological Medicine 41:1751–1761, 2011
8. Sareen J, Henriksen CA, Stein MB, et al: Common mental disorder diagnosis and need for treatment are not the same: findings from a population-based longitudinal survey. Psychological Medicine 43:1941–1951, 2013
9. Mackenzie CS, El-Gabalawy R, Chou KL, et al: Prevalence and predictors of persistent versus remitting mood, anxiety, and substance disorders in a national sample of older adults. American Journal of Geriatric Psychiatry 22:854–865, 2013
10. Wang JL, Patten S, Sareen J, et al: Development and validation of a prediction algorithm for use by health professionals in prediction of recurrence of major depression. Depression and Anxiety 31: 451–457, 2014
11. Sareen J, Cox BJ, Afifi TO, et al: Perceived need for mental health treatment in a nationally representative Canadian sample. Canadian Journal of Psychiatry 50:643–651, 2005
12. Sareen J, Fleisher W, Cox BJ, et al: Childhood adversity and perceived need for mental health care: findings from a Canadian community sample. Journal of Nervous and Mental Disease 193: 396–404, 2005
13. Sareen J, Stein MB, Campbell DW, et al: The relation between perceived need for mental health treatment, DSM diagnosis, and quality of life: a Canadian population-based survey. Canadian Journal of Psychiatry 50:87–94, 2005
14. Wang PS, Lane M, Olfson M, et al: Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. Archives of General Psychiatry 62:629–640, 2005
15. Grant BF, Kaplan K, Shepard J, et al: Source and Accuracy Statement for Wave 1 of the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions. Rockville, Md, National Institute on Alcohol Abuse and Alcoholism, 2003
16. Grant BF, Kaplan KD: Source and Accuracy Statement for the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Rockville, Md, National Institute on Alcohol Abuse and Alcoholism, 2005
17. Compton WM, Grant BF, Colliver JD, et al: Prevalence of marijuana use disorders in the United States: 1991–1992 and 2001–2002. JAMA 291:2114–2121, 2004
18. Ruan WJ, Goldstein RB, Chou SP, et al: The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of new psychiatric diagnostic modules and risk factors in a general population sample. Drug and Alcohol Dependence 92: 27–36, 2008
19. Grant BF, Goldstein RB, Chou SP, et al: Sociodemographic and psychopathologic predictors of first incidence of DSM-IV substance use, mood and anxiety disorders: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Molecular Psychiatry 14:1051–1066, 2009

20. Grant BF, Dawson DA, Hasin DS: The Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version. Rockville, Md, National Institute on Alcohol Abuse and Alcoholism, 2001
21. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington, DC, American Psychiatric Association, 1994
22. Kendler KS, Gallagher TJ, Abelson JM, et al: Lifetime prevalence, demographic risk factors, and diagnostic validity of nonaffective psychosis as assessed in a US community sample: National Comorbidity Survey. Archives of General Psychiatry 53:1022–1031, 1996
23. Straus MA: Measuring intrafamily conflict and violence: the Conflict Tactics (CT) Scales. Journal of Marriage and the Family 41: 75–88, 1979
24. Straus MA, Hamby SL, Boney-McCoy S, et al: The revised Conflict Tactics Scales (CTS2): development and preliminary psychometric data. Journal of Family Issues 17:283–316, 1996
25. Bernstein DP, Fink L, Handelsman L, et al: Initial reliability and validity of a new retrospective measure of child abuse and neglect. American Journal of Psychiatry 151:1132–1136, 1994
26. Dong M, Anda RF, Dube SR, et al: The relationship of exposure to childhood sexual abuse to other forms of abuse, neglect, and household dysfunction during childhood. Child Abuse and Neglect 27:625–639, 2003
27. Dube SR, Felitti VJ, Dong M, et al: Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the Adverse Childhood Experiences Study. Pediatrics 111:564–572, 2003
28. Afifi TO, Henriksen CA, Asmundson GJ, et al: Childhood maltreatment and substance use disorders among men and women in a nationally representative sample. Canadian Journal of Psychiatry 57:677–686, 2012
29. Afifi TO, Mather A, Boman J, et al: Childhood adversity and personality disorders: results from a nationally representative population-based study. Journal of Psychiatric Research 45:814–822, 2011
30. Ware J, Jr, Kosinski M, Keller SD: A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. Medical Care 34:220–233, 1996
31. Shah BV, Barnswell BG, Bieler GS: SUDAAN User's Manual: Software for Analysis of Correlated Data. Research Triangle Park, NC, Research Triangle Institute, 1995
32. SUDAAN: Software for the Statistical Analysis of Correlated Data, Release 7.5. Research Triangle Park, NC, Research Triangle Institute, 2000
33. Blanco C, Xu Y, Schneier FR, et al: Predictors of persistence of social anxiety disorder: a national study. Journal of Psychiatric Research 45:1557–1563, 2011
34. Penninx BWJH, Nolen WA, Lamers F, et al: Two-year course of depressive and anxiety disorders: results from the Netherlands Study of Depression and Anxiety (NESDA). Journal of Affective Disorders 133:76–85, 2011
35. Markowitz JC, Skodol AE, Petkova E, et al: Longitudinal effects of personality disorders on psychosocial functioning of patients with major depressive disorder. Journal of Clinical Psychiatry 68:186–193, 2007
36. Skodol AE, Grilo CM, Keyes KM, et al: Relationship of personality disorders to the course of major depressive disorder in a nationally representative sample. American Journal of Psychiatry 168:257–264, 2011
37. Grant BF, Hasin DS, Stinson FS, et al: Prevalence, correlates, and disability of personality disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Clinical Psychiatry 65:948–958, 2004
38. Skodol AE, Gunderson JG, McGlashan TH, et al: Functional impairment in patients with schizotypal, borderline, avoidant, or obsessive-compulsive personality disorder. American Journal of Psychiatry 159:276–283, 2002
39. Grant BF, Chou SP, Goldstein RB, et al: Prevalence, correlates, disability, and comorbidity of DSM-IV borderline personality disorder: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Clinical Psychiatry 69: 533–545, 2008
40. Pulay AJ, Stinson FS, Dawson DA, et al: Prevalence, correlates, disability, and comorbidity of DSM-IV schizotypal personality disorder: results from the wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Primary Care Companion to the Journal of Clinical Psychiatry 11:53–67, 2009
41. Stinson FS, Dawson DA, Goldstein RB, et al: Prevalence, correlates, disability, and comorbidity of DSM-IV narcissistic personality disorder: results from the wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Clinical Psychiatry 69:1033–1045, 2008
42. Kessler RC, McLaughlin KA, Green JG, et al: Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. British Journal of Psychiatry 197:378–385, 2010
43. Nanni V, Uher R, Danese A: Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: a meta-analysis. American Journal of Psychiatry 169:141–151, 2012
44. Lara ME, Klein DN, Kasch KL: Psychosocial predictors of the short-term course and outcome of major depression: a longitudinal study of a nonclinical sample with recent-onset episodes. Journal of Abnormal Psychology 109:644–650, 2000
45. Spijker J, Bijl RV, de Graaf R, et al: Determinants of poor 1-year outcome of DSM-III-R major depression in the general population: results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). Acta Psychiatrica Scandinavica 103: 122–130, 2001
46. Schutte KK, Moos RH, Brennan PL: Predictors of untreated remission from late-life drinking problems. Journal of Studies on Alcohol and Drugs 67:354–362, 2006
47. Tuithof M, Ten Have M, van den Brink W, et al: Predicting persistency of DSM-5 alcohol use disorder and examining drinking patterns of recently remitted individuals: a prospective general population study. Addiction 108:2091–2099, 2013
48. Sareen J, Afifi TO, McMillan KA, et al: Relationship between household income and mental disorders: findings from a population-based longitudinal study. Archives of General Psychiatry 68:419–427, 2011
49. Amstadter AB, Richardson L, Acierno R, et al: Does interviewer status matter? An examination of lay interviewers and medical doctor interviewers in an epidemiological study in Vietnam. International Perspectives in Victimology 5:55, 2010
50. Palmetto NP, Link BG: The reliability of adult lifetime suicide attempt reports in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Comprehensive Psychiatry 51: e8, 2010