REVISED NESARC PERSONALITY DISORDER DIAGNOSES: GENDER, PREVALENCE, AND COMORBIDITY WITH SUBSTANCE DEPENDENCE DISORDERS

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Abstract

We applied different diagnostic rules for diagnosing personality disorders to the NESARC epidemiological study of over 40,000 individuals. Specifically, unlike previous NESARC publications, we required that each personality disorder criterion be associated with significant distress or impairment in order to be counted toward a personality disorder (PD) diagnosis. Results demonstrated significant reductions in prevalence rates for PDs (9.1% versus 21.5% using original NESARC algorithms), and these revised prevalence rates were much more consistent with recent epidemiological studies in the U.S. and Great Britain. We also found gender differences in the prevalence rate for most PDs. Comorbidity analyses revealed strong associations between PDs and alcohol dependence, drug dependence, and tobacco dependence. PD diagnoses were also associated with scores on dysfunction and impairment, perceived stress and less social support, lifetime history of suicide attempts, interpersonal difficulties, and problems with legal authorities.

How best to define personality disorders and distinguish personality disorders from "normal" levels of personality traits or behaviors has been debated for some time. Most agree that impairment or dysfunction is an integral feature of whether extreme personality traits or behaviors constitute indicators of personality disorder. For example, DSM-IV-TR states that only "when personality traits are inflexible and maladaptive and cause significant functional impairment or subjective distress do they constitute Personality Disorders" (American Psychiatric Association, 2000, p. 686). Further, such consideration of significant distress or impairment is built into the General Diagnostic Criteria for a Personality Disorder (American Psychiatric Association, 2000, p. 689). Personality traits or behaviors are judged maladaptive (i.e., indicative of personality disorder) only if these traits or behaviors cause significant distress or impairment. Most see this as a very important addition to the nomenclature (e.g., Livesley, 1998, 2003).

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[1] All results presented in this section were obtained using SAS™ PROC SURVEYFREQ and PROC SURVEYLOGISTIC. SAS is a registered trademark of SAS Institute Inc., Cary, NC, USA.

[2] Prevalence rates for antisocial personality disorder for each respective method (NESARC and NESARC-REVISED) were identical because the antisocial items did not include the follow-up item assessing significant distress or impairment.

[3] Please note that the Coid et al. (2006) estimate includes the category of PD-Not Otherwise Specified (PD-NOS). Their PD prevalence estimate excluding the PD-NOS category was 4.4%.

[4] In all the tables that follow, parameter estimates and odds ratios for the original NESARC method may differ slightly from comparable estimates presented in previous NESARC publications. We discovered that missing data for some individuals for certain PDs was classified in the NESARC data set as absence of diagnosis instead of missing. Our analyses presented here, in contrast, treated all of these cases as missing.

Recently, one of the largest epidemiological studies assessing mental illness and its correlates was completed in the United States, the National Epidemiological Survey on Alcohol and Related Conditions (NESARC). The NESARC is a nationally representative, face-to-face survey that evaluated mental health in the civilian, noninstitutionalized population of the United States (Grant, Moore, Shepard, & Kaplan, 2003). Personality disorder features were assessed in two waves, separated by approximately three years (wave 1: 2001–2002; and wave 2: 2004–2005). Initial reports from the NESARC indicated very high prevalence rates for the personality disorders. For example, seven personality disorders were assessed at wave 1, and it was reported that the prevalence rate for any of these personality disorder diagnoses was approximately 15% (Grant, Stinson, et al., 2004). This estimate is not only larger than previous estimates, but it does not include an additional three personality disorders that were assessed at wave 2. One potential explanation for these high rates is the NESARC investigators' decision to only require extreme distress, impairment, or dysfunction for one of the requisite endorsed personality disorder items in order for a diagnosis to be assigned (see Grant, Hasin, et al., 2004). Given the general criteria for personality disorder presented in the DSM-IV-TR, it is of interest to determine the effect of requiring distress or impairment for each NESARC personality disorder symptom to count toward a diagnosis.

Relevant to this issue, Narrow, Rae, Robins, and Regier (2002) explored how one might define clinically significant impairment using items that are frequently administered in epidemiological studies. Prevalence rates of mental disorders assessed by major epidemiological studies were reduced drastically when attempts were made to operationalize the DSM clinical significance criterion and apply this to the assessment of Axis I mental disorders, as opposed to simply considering whether the correct number of criteria items were met for each disorder. Many were skeptical of the apparently high rates of mental disorders in the general population reported in the Epidemiologic Catchment Area (ECA; Robins & Regier, 1991) study and the National Comorbidity Study (NCS; Kessler et al., 1994). By considering respondents' answers to questions targeting communication with doctors and professionals about symptoms, taking more medication because of the symptoms, and whether the symptoms interfered with one's life or activities, Narrow et al. (2002) found that rates for any mental disorder dropped from 28.1% to 18.5% (one year prevalence). This implies that many who ostensibly meet diagnostic "symptom" criteria for a mental disorder may have neither a functional impairment nor experience significant distress. Thus, this may beg the question of whether these individuals, without distress or impairment associated with symptoms, should be diagnosed with a mental disorder in the traditional sense.

Although certain aspects of Narrow et al.'s approach have been criticized (Wakefield & Spitzer, 2002), their analysis does raise the issue of how clinically significant impairment is best defined, and how to incorporate impairment with an evaluation of symptoms (or in the case of the present analysis, maladaptive personality traits or features). Concerning the NESARC study, almost all personality disorder items that were endorsed (with the exception of the antisocial items) prompted the follow-up question, "Did this ever trouble you or cause problems at work or school, or with your family or other people?" A positive endorsement of this statement was used to indicate that the individual trait, behavior, or symptom caused significant distress, impairment, or dysfunction. As mentioned above, to receive a NESARC personality disorder diagnosis, authors of the interview required only one of the requisite number of personality disorder symptoms to be associated with significant distress, impairment, or dysfunction.

One potential consequence of having a low threshold for a personality disorder diagnosis (i.e., over-diagnosing a disorder) is that it may affect the comorbidity rates with other

disorders, potentially clouding both the clinical and etiological picture. Accurate personality disorder prevalence rates and comorbidity rates with other disorders are essential for etiological theories and design of clinical interventions.

Our re-analysis of the two waves of NESARC data is divided into three sections: First, we re-estimated the effect on personality disorder prevalence by requiring that each personality disorder criterion be associated with distress/impairment in order to count toward a diagnosis. Second, we compared the two methods of calculating a personality disorder diagnosis from NESARC data with respect to diagnoses' associations with gender. Third, we assessed differences in comorbidity rates with substance dependence diagnoses for the two methods, given that personality disorders are often comorbid with substance use disorders. In addition, we evaluated external correlates of our revised personality disorder diagnoses: questionnaire scores reflecting life satisfaction and functioning across a range of domains; perceived stress and social support; history of suicide attempt; interpersonal problems; and serious legal problems.

METHOD

The first wave of NESARC was conducted by the NIAAA in 2001–2002 ($N = 43,093$). A second wave of data collection, assessing the same sample, was conducted in 2004–2005 with an 87% retention rate (Grant et al., 2008). To ensure adequate inclusion of underrepresented groups, the NESARC over-sampled Black and Hispanic individuals, as well as young adults aged 18–24. NESARC data were weighted to adjust for probabilities of (1) the selection of a particular housing unit, (2) nonresponse at the household and person levels, (3) the selection of a particular person per household and (4) the over-sampling of young adults. Weighted data were adjusted to be representative of the United States population on the basis of age, gender, race, ethnicity, and region of the country.

PERSONALITY DISORDER ASSESSMENTS

Lifetime assessments of the following personality disorders (PDs) were made with the AUDADIS-IV interview during Wave 1 data collection; conduct disorder with and without antisocial PD, avoidant PD, dependent PD, obsessive compulsive PD, paranoid PD, schizoid PD, and histrionic PD. Schizotypal PD, narcissistic PD, and borderline PD were assessed during wave 2, as was antisocial PD a second time. To meet criteria for a PD, respondents were required to endorse the required number of DSM-IV symptoms for the disorder in question (e.g., at least five of the nine criteria for borderline PD), and at least one symptom must have caused social or occupational dysfunction. Test-retest reliabilities for AUDADIS-IV personality disorder diagnoses ranged from .40 (histrionic PD) to .71 (borderline PD; Grant, Stinson, et al., 2004; Grant et al., 2008).

SUBSTANCE DEPENDENCE DIAGNOSES

Because of increasing construct validity concerns with the construct of substance abuse (e.g., Martin, Chung, & Langenbucher, 2008), we focused our analyses of substance comorbidity on lifetime measures of alcohol dependence, drug dependence, and nicotine dependence at Wave 2 (which incorporated Wave 1 diagnostic information). Diagnoses were based on the AUDADIS-IV interview which has received considerable support as a reliable structured interview for substance use disorders (Grant, Dawson, Stinson, Chou, Kay, & Pickering, 2003).

QUALITY OF LIFE ASSESSMENT

Personality disorders, by definition, involve significant distress or dissatisfaction with life, as well as impairment or dysfunction in important areas of life (e.g., interpersonal,

occupational, role functioning). At both Wave 1 and Wave 2, NESARC participants completed Version 2 of the Short Form 12 Health Survey (SF-12v2; Ware, Kosinkski, Turner-Bowker, & Gandek, 2002), a 12-item measure that taps life satisfaction and current functioning (over the last four weeks). The SF-12v2 can be scored to produce a norm-based physical component summary score (NBPCS), a norm-based mental component summary score (NBMCS), and, in addition, eight individual scales: physical functioning, role physical (the extent to which health interferes with regular activities), bodily pain, general health, vitality, social functioning, role emotional (the extent to which emotional problems interfere with regular activities) and mental health. All standardized scale scores range from 0–100 and a mean of 50 ($SD = 10$); higher scores signify better functioning. Studies support the reliability and convergent validity of the SF-12v2 scale scores in both community and clinical samples (e.g., Ware et al., 2002). Previous studies using NESARC data have reported and compared SF-12v2 scores of different diagnostic subgroups of participants (Dawson, Li, Chou, & Grant, 2009; Grant, Hasin, et al., 2004).

OTHER EXTERNAL CORRELATES

The Wave 2 NESARC survey also contained items related to perceived stress (4 items), perceived interpersonal social support (12 items), as well as single items about lifetime history of suicide attempts (yes/no), past year trouble with boss or employer (yes/no), past year separation/divorce or breakup (yes/no), past year serious problems with neighbor/friend/relative (yes/no), and past year serious problems with police/law authorities (yes/no).

RESULTS[a]

Table 1 presents prevalence rates of personality disorders in the NESARC study using (1) the original method of determining the presence of a personality disorder diagnosis (NESARC), which only requires at least one symptom to be associated with distress or impairment; and (2) an alternative method (NESARC-REVISED) that diagnoses personality disorder only if all symptoms counting toward diagnosis are associated with distress or impairment. For comparison, Table 1 also presents prevalence estimates obtained from nationally representative studies conducted in Great Britain (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006) and in the United States (NCS-R; Lenzenweger, Lane, Loranger, & Kessler, 2007).

As expected, prevalence rates of personality disorders using our revised method of diagnosis (NESARC-REVISED) were lower than those reported previously and sometimes markedly so. For example, prevalence of any personality disorder diagnosis decreased from 21.52% to 9.12%. Although all prevalence rate differences were significant for individual personality disorder diagnoses (except for antisocial personality disorder),[b] the largest drops in rates occurred for schizoid (3.13 to 0.57), schizotypal (3.93 to 0.62), histrionic (1.84 to 0.27), narcissistic (6.18 to 0.96), and obsessive compulsive (7.88 to 0.91) personality disorders.

Table 1 also reveals that the rates using the original NESARC scoring for PDs were generally much higher than estimates from the Great Britain (Coid et al., 2006) and NCS-R (Lenzenweger et al., 2007) studies, sometimes dramatically so. The overall estimate of any PD was 10.1[*] and 9.1 from these studies, respectively. In contrast, the NESARC-REVISED method of determining PD diagnoses resulted in an overall prevalence rate of PD (9.1) that was much closer to the estimates from the Great Britain and NCS-R studies.

We also examined whether the same gender associations with PD diagnoses would hold using the new method of requiring distress or impairment for each PD symptom to be counted toward a diagnosis.[**] As shown in Table 2, gender patterns were similar for many of the PD diagnostic categories: Any PD, antisocial PD, and narcissistic PD were

significantly more common in men than women; and paranoid, borderline, avoidant, and dependent PDs were significantly more common in women than men. Using the new PD diagnostic method, schizoid PD was significantly more common in men, schizotypal PD was no longer more common in men, histrionic PD was significantly more common in women, and obsessive compulsive PD was significantly more common in women.

Using the NESARC-REVISED diagnoses, we calculated the PD prevalence rates by racial/ethnic group, as well as by marital status. The prevalence rates of any PD diagnosis (and standard errors) for racial/ethnic groups were: White, non-Hispanic, 8.86 (0.14); Black, non-Hispanic, 10.33 (0.27); American Indian/Alaska Native, non-Hispanic, 17.37 (1.02); Asian/Native Hawaiian/Other Pacific Islander, non-Hispanic, 5.31 (0.15); and Hispanic, any race, 9.38 (0.19). Concerning *marital status*, the rates (and standard errors) of any PD diagnosis for each group were: Married, 7.18 (0.11); Living with someone as if married, 17.06 (0.59); Widowed, 3.99 (0.18); Divorced, 13.76 (0.38); Separated, 18.13 (0.55); and Never Married, 12.86 (0.24).

COMORBIDITY

As previously mentioned, having a very low threshold for a diagnosis may skew comorbidity rates with other disorders. Given the high rate of comorbidity between PDs and substance dependence disorders, as well as the significant implication this comorbidity has on the treatment of both disorders, it is important to examine whether rates of substance dependence change under the new diagnostic method. Table 3 depicts the prevalence rates and odds ratios for lifetime alcohol, drug, and nicotine dependence associated with a given personality disorder diagnosis, as calculated by the two methods. Concerning lifetime alcohol dependence, in almost every case, odds ratios were higher when using the new diagnostic method (the exception being dependent PD). Using the revised method of diagnosing PDs, the highest comorbidity rates for lifetime alcohol dependence were observed among those with antisocial (49.19% wave 1; 52.09% wave 2),[2] histrionic (49.79%), and borderline (47.41%) PDs.

Concerning the comorbidity with lifetime drug dependence, odds ratios were higher for all diagnoses using revised PD diagnoses. Highest rates of comorbidity with drug dependence occurred among those with histrionic (29.72%), dependent (27.34%), and antisocial (23.41% wave 1; 26.65% wave 2) PDs. Finally, odds ratios were higher for all PDs and nicotine dependence using revised diagnoses. Highest rates of comorbidity were observed for antisocial (54.66% wave 1; 59.27% wave 2), borderline (53.87%), and dependent (53.68%) PDs.

EXTERNAL CORRELATES

To assess the external validity of our revised method of diagnosing PDs in the NESARC sample, we examined whether diagnostic members compared to those without a PD diagnosis would produce scores suggesting more distress, problems, and impairment across a range of relevant domains. Table 4 presents scores from the SF-12v2 questionnaire by diagnostic status. Not surprisingly, the raw difference score between those with and those without a PD diagnosis was higher for the revised NESARC PD scoring than the original diagnostic method across all domains of physical or mental disability, health or emotional problems interfering with activities, general health, vitality in life, and mental health. Table 4 also indicates that those with a PD diagnosis scored significantly higher than those without a PD diagnosis on perceived stress and significantly lower on interpersonal social support.

Table 5 presents the prevalence rates for lifetime history of suicidal behavior, for past year trouble with boss or co-worker, for past year separation/divorce/break-up, for past year

serious trouble with neighbor/friend/relative, and for past year serious legal trouble. Of particular note is that those who received a NESARC-REVISED PD diagnosis were 9.66 times as likely as those without a PD diagnosis to report a history of suicide attempt and were 5.63 times as likely to report a serious problem with the police or the law in the last year.

DISCUSSION

Several important findings emerged from our analyses. First, the application of our revised method of diagnosing PDs in the NESARC sample, one that required the endorsement of significant problems to be associated with each PD criterion, resulted in a drastic decrease in the prevalence rates for PDs. The mere decrease itself was not surprising given that this is a more stringent threshold. More to the point, our method resulted in prevalence rates much more in line with previous estimates of PDs in epidemiological studies conducted both in the U.S. (Lenzenweger et al., 2007) and in Great Britain (Coid et al., 2006). Many have been skeptical of the high rates of PDs reported in previous NESARC studies, with some arguing the high rates are due to the use of a non-standard diagnostic interview for PDs (Lenzenweger, 2008). However, our findings suggest that it may not be the NESARC items per se that lead to inflated rates, but rather the method used to determine whether a PD criterion is met. Our method of assigning a PD diagnosis only if the requisite number of PD criteria were associated with significant distress or impairment resulted in rates reassuringly closer to previous estimates. It seems difficult to argue that a person has a personality disorder if only one criterion of that disorder is associated with distress or impairment. Many standard PD structured interviews (e.g., the SIDP-IV; Pfohl, Blum, & Zimmerman, 1994) make clear that such an association needs to be probed if not intuitively obvious (e.g., suicidal behavior).

A second major finding from our study is that the revised method of diagnosing PDs results in different patterns of gender distribution among the PDs as well as increased association between many PDs and substance dependence diagnoses. Concerning the former, the DSM-IV-TR text provides some information on gender representation for each PD. However, this information is based, at best, on a variety of local and regional studies that are not necessarily representative of the population of this country or others. Given its very large sample size and careful sampling (and weighting) strategy, the NESARC study presents an extraordinary opportunity to examine the gender distribution among personality disorders. Our results suggest men are more likely to meet diagnostic criteria for PD overall, as well as for schizoid, antisocial, and narcissistic PDs individually. In contrast, women are more likely to receive a diagnosis of paranoid, borderline, histrionic, avoidant, dependent, and obsessive compulsive PD. These data are important because gender distributions based on clinical samples can be misleading because they are affected by self-selection for treatment (Morey, Warner, & Boggs, 2002; Widiger, 1998) and other factors such as the nature of the facility (inpatient, outpatient, forensic; Corbitt & Widiger, 1995).

Our analyses examining comorbidity rates as well as self-reported impairment and life satisfaction raise a number of interesting issues. Because many personality disorders involve emotion regulation problems and/or impulse problems, individuals with these diagnoses may be especially vulnerable to over-use and subsequently become dependent on substances. Highest comorbidity rates were found for nicotine and alcohol dependence. Almost one-half of those with any PD diagnosis met criteria for lifetime nicotine dependence while approximately 42% met criteria for lifetime alcohol dependence. Although the lowest comorbidity rates were found for lifetime drug dependence, examination of the odds ratios indicated that this comorbid condition was most strongly associated with PD diagnoses. Specifically, those with any PD diagnosis had over 12 times the risk of having a lifetime

diagnosis of drug dependence than those without a PD diagnosis. These data reinforce the perspective that dependence on substances is common among those with a PD, and the optimal assessment and treatment of PDs must take into account this comorbidity.

Although validation of PD diagnoses is challenging and the subject of debate, we were able to replicate the findings of Grant, Hasin, et al. (2004) and demonstrated that the revised PD diagnoses were associated with questionnaire-based reports of dissatisfaction and dysfunction. Those with and those without a PD diagnosis differed significantly on SF-12v2 scores across all domains. This was true not only for scales that assess mental and emotional health, but also for general health, physical disability, and social functioning. The last finding is noteworthy. PDs are considered "interpersonal" in nature because they manifest themselves in such a way as to disrupt relationships, whether with a romantic partner, family member, friend, or co-worker. Ultimately, this affects the number of friends and confidants, as well as the quality of and satisfaction from these relationships.

Extending previously published NESARC findings, we found that those with a PD diagnosis endorsed significantly more perceived stress and less interpersonal support. Further, those receiving a PD diagnosis reported markedly higher rates of suicidal behavior and legal trouble, as well as significantly higher rates of occupational, romantic, and interpersonal problems over the preceding year. In aggregate these results support the validity of the PD diagnoses, indicating the associated personal, occupational, and interpersonal impairment and problems associated with Axis II disorders.

Several limitations of this study should be noted. First, some have criticized the NESARC PD interview items because they were not drawn from traditional Axis II PD semi-structured interviews. Ideally, this would have been the case. However, it is important to note that no single PD interview has been shown superior to others. Further, it has been known for some time that these alternative interviews do not always agree with each other (e.g., Skodol, Rosnick, Kellman, Oldham, & Hyler, 1991). This state of affairs suggests that regardless of the interview used, efforts must be made to externally validate the derived diagnoses by examining comorbidity rates with other disorders and associations with independent measures of impairment and distress. Another limitation of the NESARC study is that all PDs were not assessed in the same wave of data collection, and only antisocial PD items were assessed at both waves. This design feature necessitated calculating gender, substance dependence, and functioning score relations based on PD diagnoses assessed at different measurement occasions for some disorders. Third, we are limited in our choice of external validators for the PDs. For example, complete psychiatric history in family members, longitudinal course (longer than the two years afforded by the NESARC study), and informant reports would supplement the information that is available in the data set. Finally, although we have emphasized the role of different diagnostic rules in discrepant prevalence rate estimates, there are certainly other factors that can influence prevalence rates. For example, survey designs, rates of response, assessment instruments, and sampling procedures are all factors that can affect the prevalence rates obtained in any given study. Further research is needed to investigate these and other factors in epidemiological studies of PD.

Despite these qualifications, our study provides population-based estimates of PD prevalence that take into account the requirement of significant distress or impairment. We recommend that other investigators use the scoring method we have developed and adopted in their future analyses of the extremely rich and promising NESARC data set.

Acknowledgments

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TABLE 1

Prevalence Estimates of DSM-IV Personality Disorders from Representative National Samples

Personality Disorder	Great Britain[*]	NCS-R[**]	NESARC	NESARC-Revised
Paranoid	0.7	—	4.4	1.9
Schizoid	0.8	—	3.1	0.6
Schizotypal	0.1	—	3.9	0.6
Any Cluster A	*1.6*	*5.7*	*7.1*	*2.1*
Antisocial	0.6	0.6	3.8	3.8
Borderline	0.7	1.4	5.9	2.7
Histrionic	—	—	1.8	0.3
Narcissistic	—	—	6.2	1.0
Any Cluster B	*1.2*	*1.5*	*9.7*	*5.5*
Avoidant	0.8	—	2.4	1.2
Dependent	0.1	—	0.5	0.3
Obsessive-Compulsive	1.9	—	7.9	1.9
Any Cluster C	*2.6*	*6.0*	*8.1*	*2.3*
Any Personality Disorder	*10.1*[a]	*9.1*[b]	*21.5*	*9.1*

Notes.

[a] includes PD-NOS.

[b] includes PD-NOS; NCS-R prevalence rates estimates were not available for some individual PD categories due to low base rates in subsample from which estimates were projected.

[*] rates from Coid et al. (2006).

[**] rates from Lenzenweger et al. (2007).

TABLE 2

Prevalence Rate (95% CI) of Personality Disorders (PDs) by Gender and Associated Odds Ratio (95% CI)

Personality Disorder	Wave	NESARC			NESARC-REVISED		
		Female	Male	Odds Ratio[*]	Female	Male	Odds Ratio[*]
Any PD	2	19.90(19.60–20.20)	23.28(22.85–23.71)	1.22(1.19–1.25)	7.99(7.78–8.20)	10.34(10.05–10.64)	1.33(1.28–1.38)
Cluster A							
Paranoid	1	4.95 (4.80– 5.11)	3.83 (3.64– 4.02)	0.77(0.72–0.82)	2.29(2.19–2.40)	1.48 (1.37– 1.58)	0.64(0.59–0.69)
Schizoid	1	3.07 (2.94– 3.20)	3.18 (3.01– 3.35)	1.04(0.98–1.11)	0.52(0.48–0.55)	0.63 (0.56– 0.70)	1.23(1.08–1.39)
Schizotypal	2	3.65 (3.52– 3.79)	4.24 (4.04– 4.44)	1.17(1.10–1.24)	0.65(0.59–0.72)	0.58 (0.52– 0.64)	0.89(0.75–1.05)
Cluster B							
Antisocial	1	1.89 (1.79– 1.99)	5.53 (5.31– 5.75)	3.04(2.85–3.25)	1.93(1.83–2.04)	5.66 (5.43– 5.89)	3.04(2.85–3.25)
	2	1.93 (1.82– 2.03)	5.93 (5.69– 6.17)	3.21(3.00–3.42)	1.93(1.82–2.04)	5.93 (5.69– 6.17)	3.21(3.00–3.42)
Borderline	2	6.16 (5.98– 6.35)	5.59 (5.37– 5.81)	0.90(0.86–0.94)	3.02(2.88–3.16)	2.44 (2.29– 2.60)	0.80(0.75–0.86)
Histrionic	1	1.80 (1.71– 1.89)	1.89 (1.77– 2.00)	1.05(0.97–1.15)	0.29(0.26–0.33)	0.24 (0.21– 0.27)	0.82(0.69–0.98)
Narcissistic	2	4.80 (4.62– 4.98)	7.68 (7.45– 7.92)	1.65(1.58–1.73)	0.74(0.67–0.82)	1.19 (1.11– 1.28)	1.61(1.43–1.81)
Cluster C							
Avoidant	1	2.76 (2.63– 2.89)	1.91 (1.78– 2.05)	0.69(0.63–0.76)	1.37(1.27–1.47)	0.91 (0.81– 1.01)	0.66(0.57–0.76)
Dependent	1	0.61 (0.56– 0.66)	0.37 (0.31– 0.42)	0.61(0.51–0.72)	0.33(0.29–0.37)	0.20 (0.15– 0.24)	0.59(0.46–0.77)
Obsessive-Compulshive	1	7.89 (7.67– 8.11)	7.87 (7.63– 8.12)	1.00(0.96–1.05)	1.99(1.91–2.07)	1.82 (1.72– 1.92)	0.91(0.85–0.98)

Notes. CI = 95% Confidence Interval

[*] Odds Ratio greater than 1.0 indicates that men are more likely diagnosed than women.

TABLE 3

Comorbidity between Personality Disorder (PD) Diagnoses and Lifetime Substance Dependence Diagnoses and Associated Odds Ratio (95% CI)

Personality Disorder	Wave	Lifetime Diagnosis	NESARC			NESARC-REVISED		
			Diagnosed (SE)	Non-diag (SE)	Odds Ratio (CI)	Diagnosed (sE)	Non-diag (SE)	Odds Ratio (CL)
Any PD	2	Alcohol Dependence	30.70(0.36)	11.01(0.14)	3.58 (3.44– 3.73)	41.88(0.59)	12.58(0.14)	5.01 (4.76– 5.26)
		Drug Dependence	10.58(0.19)	1.40(0.05)	8.36 (7.71– 9.06)	18.65(0.35)	1.84(0.05)	12.24(11.44–13.09)
		Nicotine Dependence	38.36(0.32)	18.95(0.18)	2.66 (2.56– 2.77)	48.15(0.55)	20.62(0.16)	3.57 (3.39– 3.76)
Cluster A								
Paranoid	1	Alcohol Dependence	32.90(0.83)	11.57(0.12)	3.75 (3.47– 4.05)	38.27(1.04)	12.04(0.11)	4.53 (4.11– 4.99)
		Drug Dependence	13.38(0.57)	2.10(0.04)	7.22 (6.42– 8.11)	17.13(0.74)	2.33(0.05)	8.67 (7.59– 9.90)
		Nicotine Dependence	39.98(0.69)	16.90(0.14)	3.28 (3.06– 3.50)	45.17(0.95)	17.42(0.13)	3.91 (3.58– 4.26)
Schizoid	1	Alcohol Dependence	28.76(0.81)	12.00(0.12)	2.96 (2.72– 3.22)	37.82(1.01)	12.40(0.12)	4.30 (3.70– 4.99)
		Drug Dependence	11.81(0.61)	2.30(0.04)	5.68 (4.97– 6.49)	20.01(0.66)	2.51(0.04)	9.72 (8.57–11.02)
		Nicotine Dependence	37.14(0.72)	17.30(0.12)	2.82 (2.64– 3.02)	47.95(0.97)	17.77(0.13)	4.26 (3.73– 4.87)
Schizotypal	2	Alcohol Dependence	34.58(0.95)	14.50(0.14)	3.12 (2.87– 3.39)	42.38(1.08)	15.12(0.15)	4.13 (3.68– 4.63)
		Drug Dependence	16.63(0.68)	2.84(0.05)	6.84 (6.15– 7.60)	25.08(0.91)	3.25(0.06)	9.98 (8.83–11.29)
		Nicotine Dependence	42.42(0.84)	22.38(0.15)	2.56 (2.38– 2.75)	48.71(2.16)	23.01(0.15)	3.18 (2.62– 3.86)
Cluster B								
Antisocial	1	Alcohol Dependence	49.19(0.81)	11.09(0.11)	7.76 (7.26– 8.30)	49.19(0.81)	11.09(0.11)	7.76 (7.26– 8.30)
		Drug Dependence	23.41(0.66)	1.80(0.04)	16.64(15.07–18.37)	23.41(0.66)	1.80(0.04)	16.64(15.07–18.37)
		Nicotine Dependence	54.66(0.88)	16.48(0.13)	6.11 (5.64– 6.61)	54.66(0.88)	16.48(0.13)	6.11 (5.64– 6.61)
	2	Alcohol Dependence	52.09(0.79)	13.78(0.15)	6.80 (6.33– 7.31)	52.09(0.79)	13.78(0.15)	6.80 (6.33– 7.31)
		Drug Dependence	26.65(0.59)	2.44(0.05)	14.54(13.41–15.76)	26.65(0.59)	2.44(0.05)	14.54(13.41–15.76)
		Nicotine Dependence	59.27(0.94)	21.67(0.16)	5.26 (4.82– 5.74)	59.27(0.94)	21.67(0.16)	5.26 (4.82– 5.74)
Borderline	2	Alcohol Dependence	41.59(0.68)	13.63(0.14)	4.51 (4.26– 4.77)	47.41(0.81)	14.38(0.14)	5.37 (5.02– 5.75)
		Drug Dependence	17.69(0.44)	2.48(0.06)	8.45 (7.78– 9.18)	22.76(0.69)	2.83(0.06)	10.11 (9.16–11.15)
		Nicotine Dependence	48.63(0.57)	21.56(0.14)	3.45 (3.28– 3.62)	53.87(0.80)	22.29(0.15)	4.07 (3.79– 4.37)
Histrionic	1	Alcohol Dependence	41.90(1.20)	11.97(0.12)	5.30 (4.77– 5.90)	49.79(1.82)	12.44(0.12)	6.98 (5.79– 8.42)
		Drug Dependence	17.78(0.87)	2.32(0.05)	9.12 (7.95–10.46)	29.72(1.56)	2.54(0.05)	16.23(12.98–20.28)
		Nicotine Dependence	44.19(0.88)	17.42(0.13)	3.75 (3.47– 4.06)	47.69(1.70)	17.85(0.12)	4.20 (3.52– 5.00)
Narcissistic	2	Alcohol Dependence	30.62(0.54)	14.27(0.15)	2.65 (2.52– 2.79)	39.03(1.14)	15.06(0.15)	3.61 (3.15– 4.14)
		Drug Dependence	11.98(0.33)	2.81(0.06)	4.71 (4.36– 5.08)	16.54(0.60)	3.25(0.06)	5.89 (5.06– 6.86)

Personality Disorder	Wave	Lifetime Diagnosis	NESARC			NESARC-REVISED		
			Diagnosed (SE)	Non-diag (SE)	Odds Ratio (CI)	Diagnosed (sE)	Non-diag (SE)	Odds Ratio (CL)
		Nicotine Dependence	35.88(0.54)	22.32(0.15)	1.95 (1.86– 2.04)	44.22(0.97)	22.96(0.15)	2.66 (2.37– 2.99)
Cluster C								
Avoidant	1	Alcohol Dependence	31.35(1.08)	12.05(0.12)	3.33 (2.99– 3.71)	34.91(1.10)	12.26(0.12)	3.84 (3.39– 4.35)
		Drug Dependence	13.95(0.57)	2.32(0.04)	6.82 (6.12– 7.59)	19.56(0.55)	2.41(0.04)	9.86 (8.64–11.25)
		Nicotine Dependence	37.50(0.93)	17.43(0.13)	2.84 (2.61– 3.10)	43.32(0.98)	17.62(0.13)	3.57 (3.18– 4.02)
Dependent	1	Alcohol Dependence	32.19(2.10)	12.43(0.12)	3.34 (2.67– 4.19)	28.04(1.39)	12.49(0.12)	2.73 (2.07– 3.60)
		Drug Dependence	22.76(1.14)	2.51(0.05)	11.48 (9.21–14.30)	27.34(1.22)	2.54(0.05)	14.43(11.00–18.93)
		Nicotine Dependence	49.84(1.43)	17.78(0.12)	4.59 (3.91– 5.40)	53.68(1.66)	17.85(0.12)	5.33 (4.15– 6.84)
Obsessive- compulsive	1	Alcohol Dependence	25.13(0.51)	11.43(0.11)	2.60 (2.46– 2.75)	31.85(0.75)	12.16(0.11)	3.38 (3.13– 3.64)
		Drug Dependence	8.30(0.38)	2.11(0.05)	4.21 (3.74– 4.73)	11.31(0.50)	2.44(0.04)	5.10 (4.51– 5.77)
		Nicotine Dependence	32.13(0.56)	16.70(0.14)	2.36 (2.22– 2.51)	35.68(0.63)	17.61(0.12)	2.60 (2.41– 2.79)

Note. SE = Standard error; CI = 95% Confidence Interval

TABLE 4

SF-12v2 Scores, Perceived Stress, and Interpersonal Support by Personality Disorder (PD) Diagnostic Status

	NESARC Any PD			NESARC-Revised Any PD		
	Non-diag (SE)	Diagnosed (SE)	Difference (CI)	Non-diag (SE)	Diagnosed (SE)	Difference (CI)
SF-12v2 Scale						
Physical Disability Scale	50.55(0.11)	49.19(0.18)	1.36 (1.04– 1.68)	50.40(0.11)	48.82(0.28)	1.58 (1.06– 2.09)
Mental Disability Scale	52.57(0.09)	47.27(0.16)	5.30 (4.99– 5.62)	52.08(0.08)	44.96(0.26)	7.11 (6.61– 7.62)
Physical Functioning Scale	51.14(0.10)	49.61(0.17)	1.53 (1.23– 1.84)	50.98(0.10)	49.14(0.27)	1.84 (1.33– 2.34)
Role Physical Scale	50.50(0.10)	47.96(0.17)	2.54 (2.21– 2.88)	50.24(0.09)	47.10(0.26)	3.14 (2.63– 3.65)
Bodily Pain Scale	51.41(0.10)	48.17(0.18)	3.24 (2.90– 3.59)	51.08(0.10)	47.07(0.28)	4.01 (3.48– 4.54)
General Health Scale	50.50(0.12)	47.55(0.20)	2.95 (2.58– 3.32)	50.22(0.12)	46.25(0.31)	3.98 (3.41– 4.54)
Vitality Scale	52.96(0.11)	49.98(0.18)	2.98 (2.65– 3.32)	52.67(0.11)	48.84(0.25)	3.83 (3.38– 4.27)
Social Functioning Scale	52.58(0.07)	48.17(0.17)	4.41 (4.07– 4.75)	52.19(0.07)	46.11(0.28)	6.08 (5.54– 6.62)
Role Emotional Scale	50.27(0.10)	46.24(0.17)	4.04 (3.69– 4.39)	49.90(0.09)	44.50(0.29)	5.40 (4.83– 5.97)
Mental Health Scale	53.13(0.09)	47.60(0.17)	5.53 (5.21– 5.86)	52.60(0.09)	45.37(0.26)	7.22 (6.71– 7.73)
Stress and Interpersonal Support						
Perceived Stress Scale	1.87(0.01)	2.32(0.01)	−0.45(−0.47—0.42)	1.92(0.01)	2.49(0.02)	−0.57(−0.61—0.53)
Interpersonal Social Support	3.58(0.01)	3.41(0.01)	0.17 (0.15– 0.19)	3.56(0.00)	3.36(0.01)	0.20 (0.18– 0.23)

Note. Higher SF-12v2 scores indicate better functioning or satisfaction. *Role physical* subscale assesses the extent to which health interferes with regular activities; *Role Emotional* subscale assesses the extent to which emotional problems interfere with regular activities. For *Perceived Stress scale,* higher scores reflect more perceived stress. For *Interpersonal Social Support,* higher scores reflect more interpersonal support

SE = Standard error; CI = 95% Confidence Interval

TABLE 5

Rates (SE) and Associated Odds Ratios (95% CI) of Life Experiences Given Personality Disorder (PD) Diagnosis

	NESARC Any PD			NESARC-Revised Any PD		
	Diagnosed (SE)	Non-diag (SE)	Odds Ratio (CI)	Diagnosed (SE)	Non-diag (SE)	Odds Ratio (CI)
Suicide attempt (lifetime)	10.54(0.21)	1.43(0.03)	8.14(7.65–8.66)	16.80(0.37)	2.05(0.05)	9.66(9.00–10.37)
Trouble with boss/co-worker	15.85(0.23)	5.86(0.09)	3.02(2.89–3.16)	19.53(0.41)	6.86(0.09)	3.30(3.12– 3.48)
Separated/divorced/break-up	9.36(0.16)	3.54(0.07)	2.81(2.68–2.95)	12.01(0.26)	4.07(0.06)	3.22(3.05– 3.40)
Serious problems with neighbor/friend/relative	11.86(0.22)	3.78(0.07)	3.43(3.24–3.63)	15.52(0.41)	4.52(0.07)	3.88(3.61– 4.17)
Serious problems with police/law	2.93(0.13)	0.74(0.03)	4.05(3.62–4.54)	4.67(0.27)	0.86(0.03)	5.63(4.82– 6.58)

Note. Rates are for the past year (12 months) unless otherwise noted (i.e., lifetime history of one or more suicide attempts).