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Recommended Citation

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The Comorbidity and Temporal Relationship Between Anxiety Disorders,
Eating Disorders, and Personality Disorders

by

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Bachelors of Science in Dietetics

Final Examination:
April 14th, 2015

A capstone submitted in partial fulfillment
of the requirements for the
Degree of Masters of Public Health
in Health Behavior

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Acknowledgements

This study and paper would not have been possible if not for the help and encouragement of several faculty, family, and friends. To Drs. Corrine Williams, Katherine Eddens, and Christina Studts, my words can't describe how much your help meant to me. For your guidance and a laugh, thank you.

Mitchell C. Duross, MPH, RD, CSCS

Before pursuing his Masters of Public Health with the University of Kentucky, Mitchell Duross graduated from the University of Kentucky with a Bachelor's of Science in Dietetics. As a Lexington, Kentucky native, Mitchell seeks to take his passion in nutrition, exercise, and public health abroad. He remains a life-long learner and hopes to continue working in channels that allow him to combine his passions and grow.

Introduction

The Institute of Medicine (IoM) describes the burden of mental illness as one of the leading causes of disability and morbidity among all diseases [1]. Worldwide, nearly 1 in 4 adults experience at least one mental, emotional, or behavioral (MEB) disorder at one point in their life [2]. In the United States, it is estimated that nearly half of adults (46.4%) will experience lifetime prevalence of any clinical MEB disorder, including anxiety, mood, substance abuse, and impulse-control disorders [3]. These disorders cause distressing and impairing symptoms, which can inhibit personal well-being, interpersonal relationships, and community or societal contributions [4-6]. These conditions have tremendous impact on individuals, families, and communities, particularly when MEB disorders begin to afflict individuals from early pre-teen years, through adolescence, and into early adulthood [2, 3]. Individuals suffering from two or more mental disorders may find the combination even more debilitating, for a longer period of time. As a result, disability from mental disorders may account for 45% of years of quality life lost [7].

Mental disorders have been the subject of intense clinical research for the majority of the past century. This accrual of clinical evidence has expanded the collective knowledge surrounding mental disorder etiology, course, and prognosis. The resulting effect has refined and harmonized diagnostic criteria, which has allowed mental disorders to be classified—such as in the Diagnostic and Statistical Manual of Mental Disorders (DSM) of the United States and the International Classification of Diseases (ICD), used internationally—according to

similar characteristics. Within the last twenty-five years, clinical research investigating the connection between anxiety disorders and eating disorders [8-14], anxiety disorders and personality disorders [15-19], as well as eating disorders and personality disorders [9, 16, 20-25], conclude that associations exist among these disorders. Yet, the findings of the majority of these studies lack representativeness to the general population, and thus limit a true understanding of national burden. With that said, the recent advent of a population-based structured interview for diagnosing mental disorders among communities has allowed this gap in the literature to be filled [26, 27].

The National Comorbidity Study (NCS) [28] and the NCS-Replication (NCS-R) [3, 29], two cross-sectional studies investigating national prevalence and correlates of mental disorders in the United States, have been used to explore anxiety, eating, and personality disorders identified in clinical research. For instance, Hudson et al. [30] investigated the prevalence and correlates of eating disorders: anorexia nervosa, bulimia nervosa, and binge eating disorder. They found lifetime prevalence among women (0.9, 1.5, and 3.5%) to be nearly three times higher than among men (0.3, 0.5, and 2.5%). The study also found that many respondents with anorexia nervosa (47.9%), bulimia nervosa (80.6%), and binge eating disorder (65.1%) met criteria for at least one anxiety disorder during their lifetime. Lenzenweger et al. [31] also used the NCS-R to investigate the prevalence and correlates of personality disorders. Through multiple-imputation it was estimated that 9.1% of respondents could be diagnosed with at least one personality disorder at the time of the study's diagnostic interview. In

addition, they determined that the odds of the onset of any anxiety disorder within 12 months of the interview were 7 times higher given any personality disorder compared to no personality disorder.

Population-based structured interview data have provided a clearer understanding of the prevalence, age of onset, duration, severity, and correlates of mental disorders in the United States population. Specific studies, like those from the NCS-R, have described the associations between two classes of mental disorders. However, the present study addresses a current gap in the literature by ascertaining the comorbidities among anxiety, eating, and personality disorders, relationships which until now have remained relatively unexplored. Also of interest is whether a temporal relationship among these three classes of mental disorders exists, which could help inform preventative interventions targeting mental disorders, including early detection, knowledge of critical time periods, and prevention services. This study attempts to answer these questions by analyzing data from the NCS-R.

Methods

Sample

Explained in greater detail elsewhere [3, 26], the NCS-R is a household survey used to assess national prevalence, correlates, and risk factors of mental health disorders in the United States. The NCS-R respondents were selected via households identified by a multi-stage cluster probability sampling strategy. Respondents included English-speaking U.S. adults aged 18 years and older.

Individuals residing in institutions such as prisons, nursing homes, and long-term medical or dependent care facilities, as well as military personnel residing within on a military base or reservation, were not included in the study. A fully structured diagnostic interview, specifically the World Health Organization Composite International Diagnostic Interview (WMH-CIDI), was administered using laptop, computer-assisted personal interview (CAPI) methods by trained professionals between February 2001 and April 2003. The survey was divided into two parts. Part I included assessment criteria of core WMH-CIDI disorders and was administered to all respondents (n = 9282). Part II was administered to both primary respondents and a probability sub-sample of secondary respondents who met one of three criteria for any core disorder, and included questions pertaining to correlates, risk factors, and other consequences of the disorder(s) (n = 5692). The response rate of both primary and secondary respondents was 72.4% of the 12,819 who were eligible. Interviewers obtained verbal informed consent before administering each interview. The Human Subjects Committees of Harvard Medical School and the University of Michigan approved NCS-R recruitment and consent. The University of Kentucky Institutional Review Board determined that the present study did not require IRB review due to the use of de-identified, secondary data.

Measures: Core Diagnostic Assessment

Diagnostic questions in the NCS-R were drawn from the World Mental Health Survey Initiative version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI). The WMH-CIDI is a standardized, lay-administered interview that yields diagnoses according to the criteria of the International Classification of Diseases, 10th Revision (ICD-10), and Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) for non-clinical settings. As described in greater detail in a previous report [32], good diagnostic agreement has been found between diagnoses obtained with WMH-CIDI and diagnoses based on a clinical research diagnostic interview: the Structured Clinical Interview (SCID) for DSM-IV. In order to test diagnostic concordance for the NCS-R, a probability sub-sample of NCS-R respondents were administered a blinded clinical reexamination interview (SCID) and compared to NCS-R respondents diagnosed with WMH-CIDI. Good diagnostic concordance was found for the three classes of core NCS-R disorders [3, 27] (anxiety disorders, mood disorders, and substance abuse disorders).

Measures: Secondary Diagnostic Assessment

Unlike the core diagnostic assessment questions, WMH-CIDI questions for disorders of secondary interest to the NCS-R—such as eating and personality disorders—were not validated against clinical research diagnostic interview data. Instead, for the three eating disorders of interest, relevant WMH-CIDI questions were consistent with DSM-IV diagnostic criteria, with one distinction. WMH-CIDI

asked whether respondents experienced 3 months of regular eating binges (at least twice a week), but to meet DSM-IV criteria, an individual must experience symptoms for at least 6 months. Additionally, the new DSM-V criteria reduces the minimum number of months of regular binges from 6 months to 3 months, and the number of eating binges per week from 2 to 1. Thus for this study, individuals displaying 3 months or more of regular eating binges would be classified as having binge eating disorder. For the nine personality disorders of interest, the WMH-CIDI screening questions were developed to be consistent with the International Personality Disorder Examination (IPDE) [33], which was previously found to be a significant predictor of clinical diagnoses of personality disorders. Organic exclusion rules and diagnostic hierarchy rules were applied in making diagnoses of both the core and secondary diagnostic assessment.

Measures: Variables of Interest

The current study focused on lifetime prevalence and age of onset of anxiety disorders (agoraphobia without panic disorder, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder with or without agoraphobia, post-traumatic stress disorder, separation anxiety disorder, social phobia, and specific phobia), eating disorders (anorexia nervosa, binge eating disorder, and bulimia nervosa), and personality disorders (paranoid, schizoid, dissocial, emotionally unstable, borderline, histrionic, and dependent personality disorders).

Questions from the WMH-CIDI were used to operationalize diagnostic criteria for all the mental disorders of interest. Diagnoses of anxiety and eating disorders were based on DSM-IV criteria. Full diagnostic algorithms for anxiety disorders and eating disorders were generated by NCS-R staff, as were the matched criteria from IPDE and WMH-CIDI for personality disorders. Though previous research [31] has analyzed prevalence of personality disorders using the NCS-R data, no diagnostic algorithms were provided based on their methods. Thus, in the current study, ICD-10 criteria and corresponding items from the IPDE were matched to WMH-CIDI personality disorder screening questions and used to assign diagnoses of personality disorders (see Appendix for details).

Statistical Analyses

This study examined the comorbidities among anxiety disorders, eating disorders, and personality disorders using NCS-R diagnostic criteria. Lifetime prevalence rates of anxiety and eating disorders were determined to estimate respondent burden. Lifetime prevalence rates were estimated based on the proportion of respondents who had ever had a disorder leading up to the fully structured diagnostic interview. Point prevalence estimates were used to assess burden from personality disorders at the time the respondent was administered the interview.

Ever having met criteria for a diagnosis was recorded into a dichotomous (Yes/No) variable for that disorder. To assess associations among the three

types of disorders, separate chi-square tests were performed utilizing pairs of the dichotomous indicator variables: Yes/No for any anxiety disorder diagnosed ever, Yes/No for any eating disorder diagnosed ever, and Yes/No for any personality disorder. To assess comorbidity among all three classes of disorders, a chi-square test was conducted using the dichotomous variable for personality, and a newly created dichotomous variable coded Yes/No for ever having diagnoses of both anxiety and eating disorders. To control for key sociodemographic characteristics of the sample, adjusted odds ratios were calculated controlling for gender, age, and race using logistic regression.

The second phase of analyses were used to determine whether a temporal relationship, or chronological sequence, of burden exists among the disorders of interest. Symptomatic age of onset was calculated for respondents who reported ever having an anxiety or eating disorder by subtracting number of years since diagnosis from age at the time of the survey. Next, five independent samples t-tests were performed with continuous outcome variables (anxiety and eating disorder age of onset) and the diagnostic dichotomous (Yes/No) variables of all three types of mental disorders.

Finally, to determine whether the presence or absence of any personality disorder during an individual's lifetime influenced the difference between the symptomatic age of onset between anxiety and eating disorders, a new variable was calculated representing the difference in years between symptomatic age of onset of anxiety and eating disorders. This difference served as the dependent variable in an independent samples t-test comparing mean difference in years

between those with and without personality disorders. All analyses used survey data from the NCS-R and SPSS version 21, two-tailed tests, and alpha set at .05.

Results

Among the 5692 respondents diagnosed with at least one core NCS-R disorder (anxiety, mood, substance abuse, or impulse control) (Table 1), 58.2% were female and 61.8% were between 25-54 years of age (average respondent age = 43.38 years). The majority identified their ethnicity as White (73.4%), followed by African-American (11.9%). Of the respondents diagnosed with at least one anxiety, eating, and/or personality disorder, the oldest median age, at the time of the interview, was found among those with any anxiety disorder at 41 years, followed by those with any eating disorder at 38 years, and finally those with any personality disorders at 36 years. Of the sociodemographic characteristics, gender was associated with presence of one key disorder, while race was associated with meeting criteria for any anxiety and/or personality disorders. Age was associated with meeting criteria for anxiety disorders, personality disorders, and several comorbidities. Table 1 shows these differences and additional significant findings between sociodemographic variables and outcomes.

Lifetime prevalence estimates for any anxiety disorder, any eating disorder, and any personality disorder were 59.8% (n = 3405), 2.8% (n = 161), and 13.5% (n = 771), respectively, among those diagnosed with at least one core

(Axis I of DSM-IV) disorder. Approximately 80% of respondents with any personality disorder (OR = 3.07, CI = 2.55 – 3.69) and 85.1% of respondents with any eating disorder (OR = 3.95, CI = 2.55 – 6.12) also met diagnostic criteria for at least one anxiety disorder during their lifetime (Table 2). Nearly one in three (31.06%) respondents diagnosed with any eating disorder also met diagnostic criteria for at least one personality disorder during their lifetime (OR = 3.01, CI = 2.13 – 4.23). Additionally, 49 respondents (0.53% of the 9282 sample) met criteria for all three types of mental disorders (OR = 3.73, CI = 2.61 – 5.33): anxiety, eating, and personality disorders.

The mean age of onset for any anxiety disorder was 14.9 years old (SD = 12.7, median = 11.0 years), while the mean age of onset for any eating disorder was 21.9 years old (SD = 10.7, median = 19.0 years). Mean age of onset for any anxiety disorder was significantly younger in respondents who were also diagnosed with either any eating disorder ($t(160.1) = 4.02, p < 0.001$) or any personality disorder ($t(1115.06) = 8.1, p < 0.001$) than in respondents with an anxiety disorder diagnosis alone. Mean age of onset for any eating disorder was younger in respondents who were also diagnosed with any personality disorder than respondents with an eating disorder diagnosis alone ($t(150.92) = 3.17, p = 0.002$).

Among individuals with both an eating disorder and an anxiety disorder, the age of onset of anxiety disorders preceded the development of eating disorders by a mean of 9.3 years (SD = 11.6). Of respondents who met diagnostic criteria for at least one anxiety- and eating disorder, 82.6%

experienced anxiety symptoms prior to the symptoms of any eating disorder. The average difference in age of onset between anxiety and eating disorders between those with (M=-9.5 years, SD=13.3) and without personality disorders (M=-8.9 years, SD=7.7) was not found to be statistically significant ($t(135.55) = -0.32, p = 0.75$) (Table 3).

Discussion

To our knowledge, this study is the first to examine the comorbidity and temporal relationship between anxiety, eating, and personality disorders with a sample representing the general population and a standardized diagnostic interview format. Our results suggest a high proportion of the population will meet specific criteria for at least one disorder during their life, especially if exhibiting other clinical disorders, such as mood, substance abuse, and impulse-control disorders. Among the disorders of interest to this study, anxiety disorders are the most prevalent among the population, followed by personality disorders, and then, eating disorders. The burden is such that in a crowd of 100 people, 36 will experience an anxiety disorder during their lifetime; nearly 2 will experience an eating disorder during their lifetime; and 8 will meet diagnostic criteria for a personality disorder. These lifetime prevalence estimates are consistent with those found in other population-based surveys in both the United States [3, 28, 30, 31] and around the world [2].

These results suggest that anxiety plays a role in the development of secondary, or tertiary, comorbidity; however, this does not mean comorbidity is certain if an anxiety disorder emerges. In fact, the chances are low someone with an anxiety disorder would also be diagnosed with either an eating disorder (4%) or personality disorder (18%) during their lifetime. The chances are far higher, however, that someone with an eating disorder or personality disorder, or both, would also experience some type of an anxiety disorder. The same low chances can be observed for individuals with a personality disorder who might develop an eating disorder (6.5%), compared to the higher chances of those with an eating disorder also having a personality disorder. These comorbidity estimates between anxiety and eating disorders, as well as anxiety- and personality disorders, are consistent with the findings from Hudson et al [30] and Lenzenweger et al [31], respectively. Convergence here is critical since the present study also sought to answer national comorbidity between eating and personality disorders—an examination not yet conducted using representative methods—as well as comorbidity among all three. Similar to findings from two meta-analyses investigating the comorbidity between eating and personality disorders [34, 35], a systematic review [36], and two clinical studies [37, 38], this study found that nearly one in three respondents with personality disorder also meet criteria for an eating disorder. Further, we found 98% of respondents who met diagnostic criteria for both an eating disorder and personality disorder also met criteria for an anxiety disorder—a finding consistent with those found in

clinical research [21], albeit with all clinical mental disorders, not restricted to anxiety disorders alone.

To the question of whether or not a temporal relationship exists between these key disorders, individuals with comorbidity during their lifetime experience the onset of both anxiety and eating disorders earlier as compared to individuals with just one of the key disorders. Results showed that, on average, anxiety disorders precede eating disorders by about nine years, in the presence or absence of a personality disorder. Alone, onset of anxiety disorders appears to develop around the age of 15; in individuals with comorbidities of either eating or personality disorders, however, anxiety onset appears nearly 3 years earlier. Similarly, eating disorder onset appears to develop about 4.5 years earlier in those with personality disorder, than in those with otherwise no anxiety or personality disorder. To our knowledge, these findings are unique to representative surveys and are consistent with clinical studies investigating age of onset for anxiety disorders and eating disorders—including temporal relationships among these key disorders [10].

Applying the socioecological model as a framework, these findings have implications at every level for public health practice. At the individual level, these findings highlight the importance of early identification, screening, and intervention. This is especially true for those who develop these key disorders earlier in life, as these findings suggest it is these individuals who are at higher risk of developing secondary and, possibly, tertiary comorbidity. Since these disorders are found to develop at an early age, recognition of the potential signs

and symptoms need to be made apparent to parents and caregivers. Building awareness of the physical or behavioral signs of developing mental disorder, as well as education on mental health providers could greatly improve a child's chances of receiving the care they need. Mental health services must be available and accessible in the community. The traditional model of mental health services requires an individual to seek care from established mental health institutions. In addition to these institutions, an integrated care model enhances access by incorporating providers into public health departments, primary care clinics, and, appropriately, schools. Improved access in the community paves some of the way in normalizing care seeking, however, at the society level, strides need to continue to be made in allocating resources to preventive services, especially screening. Finally, societal stigma and institutional discrimination towards those affected by mental disorders must continue to be addressed in both our policies and social norms.

Several limitations of this study should be considered. First, lifetime prevalence estimates, comorbidity estimates, and age of onset distributions could be conservative due to a number of reasons. Recall bias is a possibility since results on the key mental health disorders were determined based on retrospective answers to interview questions spanning an individual's lifetime. People with a mental disorder may be under-represented due to the sampling frame (for instance: institutionalized and homeless individuals were not represented). Negative stigma surrounding mental disorders can bring about social desirability bias in self-report studies such as the NCS-R, due to an

unwillingness to answer truthfully about embarrassing or unwanted behaviors or to minimize symptoms. Finally, the chance of participation reluctance, in the form of non-response selection bias is a concern; however, this concern is minimal due to insignificant differences found between respondents and non-respondents [27].

Second, though the NCS-R staff and Hudson et al [30] provided diagnostic algorithms for any anxiety disorder and any eating disorder, a diagnostic algorithm for personality disorders had to be created for the current study, as the methods by which Lenzenweger et al [31] diagnosed personality disorders were not shared. In creating the diagnostic tool (see Table 4), we were limited to using the ICD-10 criteria, and not the DSM-IV criteria that was used in assessing anxiety and eating disorders. This may be a large limitation since the validity of the categorization used in the present study is not known. However, Lenzenweger et al. identified 751 respondents with any personality disorder (outside of Antisocial- and Borderline Personality Disorder), which is very consistent with the 771 respondents classified in the current study.

Third, although good diagnostic concordance between the population-based survey (WMH-CIDI, used in the NCS-R) and the clinical re-examination survey (SCID) was previously found among anxiety, mood, and substance abuse disorders, WMH-CIDI eating disorders and personality disorders have not been validated in such a way.

This leads to the fourth limitation, and the strengths of this study: a lay administered diagnostic interview is not the same as a clinical diagnostic

interview conducted by clinicians who also consider factors external to the interview; however, the steps taken in the NCS-R to acquire a representative sample that will answer validated questions by trained interviewers is likely the best that can be done when attempting to answer population-wide questions. One key improvement that could be made in this manner of surveying would be to adopt a longitudinal design, with, perhaps a 5-year incremental design, to reduce recall bias and improve estimates of temporal relationships.

Conclusion

This research offers confirmation that anxiety, eating, and personality disorders are prevalent mental illnesses in the United States, and that they are highly comorbid in individuals previously suffering altered thinking, mood, or behavior. Additionally, these results provide practitioners and researchers evidence that: 1) key mental disorders develop early in the lives of those they afflict; 2) these disorders can and commonly do occur in a relatively predictable sequence; 3) these disorders can occur in close proximity to one another; and 4) anxiety disorders and eating disorders can manifest earlier in life, of those at higher risk for comorbidity. These findings highlight the importance of early identification and intervention.

This study provides an objective, empirical timeline of symptomatic onset, which can facilitate the integration of mental health promotion, mental illness prevention, and treatment. Such a timeline is critical in the timely implementation

of evidenced-based programs concerned with mental health promotion and mental illness prevention and treatment, especially when the course and outcomes of disorders could directly tie in with secondary or tertiary comorbidity. Support continues to grow in improving the effectiveness of preventive interventions and services that can reduce or eliminate the onset of these key mental disorders, especially during developmental years. Given an understanding of these temporal findings, interventions tailored to specific mental disorders have an opportunity to improve their target population's outcomes by incorporating prevention practices that foster positive mental health among children, adolescents, and young adults. These efforts could mitigate comorbidity onset or reduce severity of concurrent symptoms of dual diagnoses.

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Appendix 1—Public-Use, Diagnostic Variables for Personality Disorder in the NCS-R.

PEA40	Never met person didn't like	PEA62	Refused to hold job, even when expected
PEA41	Have always told the truth	PEA63	Will lie/con to serve my purpose
PEA42	I always win at games	PEA64	Lose temper and get in physical fights
PEA43	Have never been bored	PEA65	Take chances/do reckless things
PEA44	Never get lost even in unfamiliar place	PEA66	Hard to stay out of trouble
PEA45	Never annoyed when others cut ahead in line	PEA67	At times, fail to meet financial obligations
PEA46	Table manners at home as good as in restaurant	PEA68	Intentionally damaged others' things
PEA47	Have never lost anything	PEA69	Will give false info about self to keep job/impress
PEA48	Regardless of temperature, always comfortable	PEA70	Argue/fight when people try to stop me from actions
PEA49	Not bothered by someone taking advantage of me	PEA71	Feelings always changing
PEA50	Show my feelings for everyone to see	PEA72	Get so angry, I sometimes break/smash things
PEA51	Get in intense relationships that don't last	PEA73	Let others make my big decisions
PEA52	Often feel empty inside	PEA74	Feel uncomfortable/helpless when alone
PEA53	I'm very moody	PEA75	Ask advice/reassurance about everyday decisions
PEA54	Giving into urges gets me in trouble	PEA76	Keep to myself even when others around
PEA55	Have tantrums/angry outbursts	PEA77	People think I am too strict about rules/reg.
PEA56	When under stress, things around don't seem real	PEA78	People think I am too stiff/formal
PEA57	Go to extremes to keep people from leaving me	PEA79	Feel awkward in social situation
PEA58	Can't decide what kind of person I want to be	PEA80	Others make fun behind my back
PEA59	Never been arrested	PEA81	Prefer activities I can do by myself
PEA60	Done things that could get person arrested	PEA82	Held grudges for years
PEA61	Feel bad when hurt or upset someone	PEA83	Convinced conspiracy behind many things in world

Appendix 2—International Personality Disorder Examination (IPDE) Items Matched With Public-Use, Diagnostic Variables for Personality Disorder in the NCS-R.

Paranoid Personality Disorder	
	<i>At least four of the following must be present:</i>
--	Excessive sensitivity to setbacks and rebuffs
Yes- PEA 82	Tendency to bear grudges persistently, e.g. refusal to forgive insults, injuries, or slights
Yes- PEA 83	Suspiciousness and a pervasive tendency to distort experience by misconstruing the neutral or friendly actions of others as hostile or contemptuous
Yes- PEA 63	A combative and tenacious sense of personal rights out of keeping with the actual situation
--	Recurrent suspicions, without justification, regarding sexual fidelity of spouse or sexual partner
Yes- PEA 69	Persistent self-referential attitude, associated particularly with excessive self-importance
Yes- PEA 83	Preoccupation with unsubstantiated "conspiratorial" explanations of events either immediate to the patient or in the world at large

Schizoid personality disorder	
	<i>At least four of the following criteria must be present:</i>
Yes- PEA 52	Few, if any, activities provide pleasure
No- PEA 50	Display of emotional coldness, detachment, or flattened affectivity
--	Limited capacity to express either warm, tender feelings or anger toward others
No- PEA 50	An appearance of indifference to either praise or criticism
--	Little interest in having sexual experiences with another person (taking into account age)
Yes- PEA 81	Consistent choice of solitary activities
--	Excessive preoccupation with fantasy and introspection
Yes- PEA 57	No desire for, or possession of, any close friends or confiding relationship (or only one)
Yes- PEA 60, 62, 67; No- PEA 61	Marked insensitivity to prevailing social norms and conventions; disregard for such norms and conventions is unintentional

Dissocial personality disorder	
	<i>At least three of the following must be present:</i>
No- PEA 61	Callous unconcern for the feelings of others
Yes- PEA 60, 62, 67; No- PEA 61	Gross and persistent attitude of irresponsibility and disregard for social norms, rules, and obligations
Yes- PEA 51	Incapacity to maintain enduring relationships, though with no difficulty in establishing them
Yes- PEA 55, 64, 70	Very low tolerance for frustration and a low threshold for discharge of aggression including violence

Yes- PEA 63, 69; No- PEA 61	Incapacity to experience guilt, or to profit from adverse experience, particularly punishment
--	Marked proneness to blame others, or to offer plausible rationalizations for the behavior that has brought the individual into conflict with society

Emotionally Unstable Personality Disorder-Impulsive Type	
	<i>At least three of the following must be present, one of which must be Ω:</i>
Yes- PEA 54, 65	Marked tendency to act unexpectedly and without consideration of the consequences
Yes- PEA 70	Ω Marked tendency to quarrelsome behavior and to conflicts with others, especially when impulsive acts are thwarted or criticized
Yes- PEA 64, 72	Liability to outbursts of anger or violence, with inability to control the resulting behavioral explosions
--	Difficulty in maintaining any course of action that offers no immediate reward
Yes- PEA 53	Unstable and capricious mood

Borderline type	
	<i>At least three of the symptoms mentioned in Impulsive Type must be present, with at least two of the following in addition:</i>
Yes- PEA 58, 71	Disturbances in and uncertainty about self-image, aims, and internal preferences (including sexual)
Yes- PEA 51, 74	Liability to become involved in intense and unstable relationships, often leading to emotional crises
Yes- PEA 57	Excessive efforts to avoid abandonment
--	Recurrent threats or acts of self-harm
Yes- PEA 52	Chronic feelings of emptiness

Histrionic Personality Disorders	
	<i>At least four of the following must be present:</i>
Yes- PEA 50, 53	Self-dramatization, theatricality, or exaggerated expression of emotions
Yes- PEA 73, 75; No- PEA 70	Suggestibility (the individual is easily influenced by others or by circumstances)
Yes- PEA 53, 71	Shallow and labile affectivity
Yes- PEA 74; No- PEA 76, 79, 81	Continual seeking for excitement and activities in which the individual is the center of attention
--	Inappropriate seductiveness in appearance or behavior
--	Over-concern with physical attractiveness

Dependent Personality Disorder	
	<i>At least four of the following must be present:</i>
Yes- PEA 73	Encouraging or allowing others to make most of one's important life decisions
Yes- PEA 45, 49	Subordination of one's own needs to those of others on whom one is dependent and undue compliance with their wishes

--	Unwillingness to make even reasonable demands on the people one depends on
Yes- PEA 74	Feeling uncomfortable or helpless when alone, because of exaggerated fears of inability to care for oneself
--	Preoccupation with fears of being left to care for oneself
Yes- PEA 75	Limited capacity to make everyday decisions without an excessive amount of advice and reassurance from others

Table 1– Sociodemographic Characteristics of the Respondents to the NCS-R (n = 5692) Who Met Diagnostic Criteria For One or More: Anxiety Disorder (AD), Eating Disorder (ED), and/or Personality Disorder (PD).

	Total		Any AD		Any ED		Any PD		Comorbidity, AD + ED		Comorbidity, ED + PD		Comorbidity, AD + PD		Comorbidity, AD + ED + PD	
	# (%)	Y (%)	# (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)	Y (%)	N (%)
Total	5692 (100)	3405 (59.8)	2287 (40.2)	161 (2.8)	5531 (97.2)	771 (13.5)	4921 (86.5)	137 (2.4)	5555 (97.6)	50 (0.9)	5642 (99.1)	617 (10.8)	5075 (89.2)	49 (0.9)	5643 (99.1)	
Gender																
Female	3310 (58.2)	2157 (63.3)	1153 (50.4)	124 (77.0)	3186 (57.6)	408 (52.9)	2902 (69.0)	107 (78.1)	3203 (57.7)	36 (72.0)	3274 (68.0)	351 (56.9)	2959 (58.3)	35 (71.4)	3275 (68.0)	
Age, years																
18-24	798 (14.0)	493 (14.5)	305 (13.3)	24 (14.9)	774 (14.0)	183 (23.7)	615 (12.5)	21 (15.3)	777 (14.0)	11 (22.0)	787 (13.9)	139 (22.5)	659 (13.0)	11 (22.4)	787 (13.9)	
25-34	1141 (20.0)	707 (20.8)	434 (19.0)	38 (23.6)	1103 (19.9)	217 (28.1)	924 (18.8)	33 (24.1)	1108 (19.9)	14 (28.0)	1127 (20.0)	167 (27.1)	974 (19.2)	14 (28.6)	1127 (20.0)	
35-44	1258 (22.1)	827 (24.3)	431 (18.8)	44 (27.3)	1214 (21.9)	181 (23.5)	1077 (21.9)	38 (27.7)	1220 (22.0)	15 (30.0)	1243 (22.0)	148 (24.0)	1110 (21.9)	14 (28.6)	1244 (22.0)	
45-54	1123 (19.7)	713 (20.9)	410 (17.9)	28 (17.4)	1095 (19.8)	105 (13.6)	1018 (20.7)	26 (19.0)	1097 (19.7)	9 (18.0)	1114 (19.7)	95 (15.4)	1028 (20.3)	9 (18.4)	1114 (19.7)	
55-64	663 (11.6)	376 (11.0)	287 (12.5)	19 (11.8)	644 (11.6)	53 (6.9)	610 (12.4)	13 (9.5)	650 (11.7)	1 (2.0)	662 (11.7)	44 (7.1)	619 (12.2)	1 (2.0)	662 (11.7)	
65-74	418 (7.3)	186 (5.5)	232 (10.1)	7 (4.3)	411 (7.4)	22 (2.9)	396 (8.0)	5 (3.6)	413 (7.4)	0 0.0	418 (7.4)	17 (2.8)	401 (7.9)	0 0.0	418 (7.4)	
75 and older	291 (5.1)	103 (3.0)	188 (8.2)	1 (0.6)	290 (5.2)	10 (1.3)	281 (5.7)	1 (0.7)	290 (5.2)	0 0.0	291 (5.2)	7 (1.1)	284 (5.6)	0 0.0	291 (5.2)	
Race / Ethnicity																
Asian, All Other	83 (1.5)	38 (1.1)	45 (2.0)	1 (0.6)	82 (1.5)	13 (1.7)	70 (1.4)	0 0.0	83 (1.5)	0 0.0	83 (1.5)	10 (1.6)	73 (1.4)	0 0.0	83 (1.5)	
Mexican	346 (6.1)	191 (5.6)	155 (6.8)	11 (6.8)	335 (6.1)	70 (9.1)	276 (5.6)	9 (6.6)	337 (6.1)	3 (6.0)	343 (6.1)	47 (7.6)	299 (5.9)	3 (6.1)	343 (6.1)	
Hispanic, All Other	181 (3.2)	105 (3.1)	76 (3.3)	4 (2.5)	177 (3.2)	34 (4.4)	147 (3.0)	4 (2.9)	177 (3.2)	3 (6.0)	178 (3.2)	30 (4.9)	151 (3.0)	3 (6.1)	178 (3.2)	
Afro-Caribbean	38 (0.7)	20 (0.6)	18 (0.8)	3 (1.9)	35 (0.6)	7 (0.9)	31 (0.6)	3 (2.2)	35 (0.6)	2 (4.0)	36 (0.6)	5 (0.8)	33 (0.7)	2 (4.1)	36 (0.6)	
African American	679 (11.9)	404 (11.9)	275 (12.0)	16 (9.9)	663 (12.0)	145 (18.8)	534 (10.9)	14 (10.2)	665 (12.0)	8 (16.0)	671 (11.9)	109 (17.7)	570 (11.2)	7 (14.3)	672 (11.9)	
White, Non-Latino	4180 (73.4)	2510 (73.7)	1670 (73.0)	121 (75.2)	4059 (73.4)	456 (59.1)	3724 (75.7)	102 (74.5)	4078 (73.4)	32 (64.0)	4148 (73.5)	376 (60.9)	3804 (75.0)	32 (65.3)	4148 (73.5)	
All Other	185 (3.3)	137 (4.0)	48 (2.1)	5 (3.1)	180 (3.3)	46 (6.0)	139 (2.8)	5 (3.6)	180 (3.2)	2 (4.0)	183 (3.2)	40 (6.5)	145 (2.9)	2 (4.1)	183 (3.2)	

*: Pearson's Chi Square, p < 0.05

Table 2—Mental Disorder Predictors of Additional Lifetime Mental Disorders, Including Any Anxiety Disorder (AD), Any Eating Disorder (ED), and Any Personality Disorder Among Part II respondents of the NCS-R (n = 5692).

Predictor Variable	Outcome Variable								
	Any PD		A.O.R.	95% CI	Any ED		A.O.R.	95% CI	
	No	Yes			No	Yes			
Any AD	No	2133 (43.3)	154 (20.0)	3.13	2.58 - 3.79	2263 (40.9)	24 (14.9)	3.45	2.22 - 5.37
	Yes	2788 (56.7)	617 (80.0)			3268 (59.1)	137 (85.1)		
Any ED	No	4810 (97.7)	721 (93.5)	3.14	2.20 - 4.49				
	Yes	111 (2.3)	50 (6.5)						
Any AD + ED	No	4833 (98.2)	722 (93.6)	3.89	2.68 - 5.65				
	Yes	88 (1.8)	49 (6.4)						

A.O.R.'s were calculated controlling for gender, age, and race.

Table 3—Mean Age of Onset for Any Anxiety Disorder (ADO) and Any Eating Disorder (EDO) Considering Individuals With or Without Any Eating Disorder (ED), Any Anxiety Disorder (AD), and Any Personality Disorder (PD) Among Respondents of Part II of the NCS-R (n = 5692).

	Any ED		t	df	Any AD		t	df	Any PD		t	df
	No	Yes			No	Yes			No	Yes		
ADO	15.05 (12.8)	11.78 (9.2)	4.02*	160.1					15.62 (13.1)	11.75 (10.2)	8.1*	1115.06
EDO					26.13 (14.4)	21.14 (9.8)	1.63	26.8	23.32 (11.8)	18.68 (6.7)	3.17**	150.92
Diff. btn. ADO & EDO									-9.51 (13.3)	-8.94 (7.7)	-0.32	135.55

* p < 0.001

** p < 0.01