

The Social Consequences of Psychiatric Disorders, III: Probability of Marital Stability

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Objective: The associations of prior DSM-III-R disorders with probability and timing of subsequent divorce were examined. **Method:** The data came from the part II subsample (N=5,877) of the National Comorbidity Survey. The respondents completed a structured diagnostic interview that retrospectively dated age at onset of each of 14 lifetime DSM-III-R disorders and recorded ages at first marriage and divorce. These data were used to estimate survival models describing the relationships between prior disorders and subsequent divorce. In addition, simulations were used to estimate the number of years spent out of marriage because of these causal relationships in the total U.S. population. **Results:** Prior psychiatric disorders were associated with a substantially higher risk of divorce. The simulations suggested that the effects of these associations in the U.S. population in the survey's age range are approximately 23 million lost years of marriage among men and 48 million lost years of marriage among women. **Conclusions:** Psychiatric disorders have a number of adverse consequences for those who suffer from them and for their families and communities. The results reported here suggest that an increase in the number of people who divorce and a decrease in the number of years of marriage in the population may be among them. The debate over whether society can afford to provide universal treatment for psychiatric disorders needs to take these costs into consideration.

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The debate over whether psychiatric disorders should have parity of coverage in national health insurance (1, 2) has led to new interest in the social consequences of psychiatric disorders (3-5). Studies have shown that psychiatric disorders often have substantial personal and social costs (4) and that the role impairment caused by these disorders can be as great as that associated with serious chronic physical illnesses (6). A smaller amount of research has suggested the existence of broader social consequences: early-onset psychiatric disorders have been associated with subsequent truncated educational attainment (7), higher risk of teenage childbearing (8), higher risk of early marriage (9), lower probability of late marriage (9), and lower family income (10, 11).

Building on these earlier findings, the study described in this report examined the effects of psychiatric disorders on divorce. Divorce is associated with a wide variety of quality of life indicators, including low economic

well-being, physical illness, and low overall life satisfaction (12-15), making it an important outcome. Previous research has documented that psychological distress (16) and psychiatric disorder (17-20) are both significant correlates of divorce. However, as these earlier studies were cross-sectional, they were unable to determine whether prior disorders predict subsequent divorce or only occur as a consequence of divorce. This relationship is important to determine in light of evidence that people with psychiatric disorders benefit from stable marital relationships (21) and are at special risk of adverse reactions due to marital disruption (22). We investigated this issue by using data from the National Comorbidity Survey (23) on the timing of onset of psychiatric disorders in relation to the timing of marital initiation and termination.

METHOD

Sample

The National Comorbidity Survey is based on a nationally representative population survey of 8,098 persons aged 15-54 years. Informed consent was obtained from all respondents and also from the parents of minors. The response rate was 82.4%. The present study was based on the part II probability subsample of 5,877 respondents. The data have been weighted to correct for differential probabilities

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of selection into part II and for differential probabilities of within-household selection and nonresponse (24). Comparisons of the part II demographic distributions with U.S. census data show that the sample is highly representative of the U.S. population in the age range of the sample (25). More details about the design and data collection methods of the National Comorbidity Survey have been reported elsewhere (24, 25).

Measures

Part II questions about age at first marriage, ages at subsequent marital transitions, and reasons for these transitions (widowhood versus divorce) were used to construct variables representing timing of first marriage and divorce. Consistent with previous research (25), early marriage was defined as marriage before age 19, on-time marriages as those that occurred in the age range 19–24 years, and late marriages as those after age 24.

DSM-III-R diagnoses were generated from a modified version of the Composite International Diagnostic Interview (26), a fully structured interview survey designed to be used by trained interviewers who are not clinicians. World Health Organization field trials have documented good reliability and validity of the interview diagnoses used here (27), including mood disorders (major depression, dysthymia, mania), anxiety disorders (panic disorder, generalized anxiety disorder, phobias, and posttraumatic stress disorder), and addictive disorders (alcohol abuse and dependence, drug abuse and dependence). Conduct disorder was also considered but was assessed with the Diagnostic Interview Schedule (28) since this disorder is not included in the Composite International Diagnostic Interview. Independent diagnoses of a random subsample of the respondents based on blind clinical reinterviews using the Structured Clinical Interview for DSM-III-R (29) documented good validity of the Composite International Diagnostic Interview diagnoses (30).

We developed control models that included constructs that were found in previous research to predict divorce (31–35) and that might also be predictors of subsequent psychiatric disorders. These included socioeconomic status of the respondent's family of origin, mother's age when the respondent was born, intactness of the family of origin, educational attainment of the respondent, parental psychopathology, measures of parental understanding and protectiveness, race, timing of marriage (early, on time, late), and geographic factors associated with differential access to marital partners (number of times the family of origin moved during the respondent's childhood, urbanicity of residence after the respondent left the family of origin, and region of residence—northeast, midwest, south, west). A predictor was included for whether the respondent (or spouse) was pregnant at the time of marriage, and time-varying predictors were included for number and ages of children from previous relationships and number and ages of children in the current marriage.

Analysis Procedures

The analyses were based on discrete-time survival models (36) using a person-year data structure in which we focused on respondent's first marriage to predict divorce. This structure was created by combining a separate observational record for each year of each respondent's life, beginning with the first year of marriage and including all years in the first marriage plus the first year of each divorce. Data were not available on the timing of subsequent marriages, so we were unable to study the effects of psychiatric disorders on the stability of remarriages.

The timing data were analyzed with a series of logistic regression equations in which time-varying variables defining prior history of each included disorder were analyzed as predictors of divorce, with controls for cohort, person-year, and the aforementioned sociodemographic control variables. The coefficients in these models, which are equivalent to discrete-time survival coefficients (36), were exponentiated for ease of interpretation and can be interpreted as odds ratios.

In addition to the survival analyses, we carried out simulations to compute attributable risk proportions in order to evaluate the social policy significance of the associations we documented. This was done

in four stages. In the first stage, a new person-year file was created and each respondent was allotted as many person-years as the number of years between the time of first marriage and the respondent's current age, regardless of whether he or she was ever divorced.

In the second stage, we estimated the best-fit summary model for divorce, determined as just described. This model included terms for the effects of all the psychiatric disorders that were significant in earlier models and control variables.

In the third stage, predicted probabilities of becoming divorced were calculated for each person-year of each respondent on the basis of the summary model. A second set of predicted probabilities was based on a model in which all the disorder coefficients were set to zero and the predictions were made entirely on the basis of the coefficients associated with the control variables.

In the final stage, we generated the cumulative predicted probabilities of divorce for each respondent for both prediction sets. We compared the sums of these cumulations across all respondents in order to estimate the effects of psychiatric disorders on number of lost years of marriage. This was based on the assumption that the survival coefficients represent causal effects of the disorders on subsequent divorce.

Because of the complex sample design and weighting of the National Comorbidity Survey, standard errors of the discrete-time survival coefficients and the simulated years of lost marriage were estimated by using the method of jackknife repeated replications (37). These estimates adjust for the clustering and weighting of cases in the initial household sampling. As already noted, the survival coefficients were exponentiated and are reported here in the form of odds ratios. The 95% confidence intervals of these coefficients are also reported and have been adjusted for design effects. Multivariate tests were based on Wald chi-square tests computed from coefficient variance-covariance matrices that were adjusted for design effects. When highlighting a result as being "significant," we are referring to statistical significance based on two-tailed design-based tests evaluated at the 0.05 level of significance.

RESULTS

Distributions of Marriage and Divorce

Kaplan-Meier cumulative probability curves (38) suggest that approximately 90% of the respondents in the National Comorbidity Survey will marry by the age of 54 (the upper end of the sample age range) and that slightly over one-half of these marriages will end in divorce. As of the time of interview, 3,972 of the 5,877 respondents had been married at least once (64.7% of the men and 70.5% of the women) and 1,538 had divorced at least once (24.2% of the men and 28.2% of the women). These results are consistent with U.S. census population data (39).

Prediction of Divorce From Specific Prior Disorders

Gross associations between psychiatric disorders and divorce can be seen even in superficial analyses of the survey data. We found that 48.2% of the respondents who had an onset of at least one of the assessed psychiatric disorders either before or at some time during the first marriage subsequently divorced, compared to 35.9% of the respondents who had no disorder before or during the first marriage. More formal analyses were carried out on the basis of a series of 18 survival equations estimated separately for men, for women, and for men and women combined (a total of 54 equations): one for each of the 14 assessed disorders; one for each of three broad classes of disorders comprising the diag-

TABLE 1. Associations Between Specific Psychiatric Disorders and Subsequent Divorce in the First Marriage for Respondents in the National Comorbidity Survey, by Sex^a

Disorder ^b	Men		Women		Total	
	Odds Ratio ^c	95% Confidence Interval ^c	Odds Ratio ^c	95% Confidence Interval ^c	Odds Ratio ^c	95% Confidence Interval ^c
Mood disorders						
Major depressive episode	1.7 ^d	1.2–2.4	1.7 ^d	1.3–2.1	1.7 ^d	1.4–2.1
Dysthymia	1.4	0.8–2.6	1.5 ^d	1.2–2.0	1.5 ^d	1.1–2.0
Manic episode	3.3 ^d	1.3–8.7	4.8 ^d	1.4–16.3	3.2 ^d	1.2–8.6
Any mood disorder	1.7 ^d	1.2–2.4	1.6 ^d	1.3–2.0	1.7 ^d	1.4–2.0
Anxiety disorders						
Generalized anxiety disorder	2.3 ^d	1.5–3.5	1.4 ^d	1.0–2.0	1.7 ^d	1.2–2.2
Panic disorder	1.6 ^d	1.1–2.5	1.4	0.8–2.2	1.5 ^d	1.0–2.0
Posttraumatic stress disorder	1.6 ^d	1.0–2.6	1.6 ^d	1.2–2.2	1.6 ^d	1.3–2.0
Agoraphobia	1.5	0.9–2.4	1.6 ^d	1.2–2.3	1.6 ^d	1.2–2.1
Social phobia	1.1	0.8–1.5	0.8	0.6–1.1	0.9	0.7–1.1
Simple phobia	1.2	0.8–1.6	0.8	0.6–1.0	0.9	0.7–1.2
Any anxiety disorder	1.8 ^d	1.3–2.4	1.5 ^d	1.1–2.0	1.6 ^d	1.3–1.9
Substance use disorders						
Alcohol abuse	1.1	0.9–1.5	1.7 ^d	1.3–2.2	1.3 ^d	1.1–1.6
Alcohol dependence	1.3	1.0–1.8	2.0 ^d	1.4–3.0	1.4 ^d	1.1–1.8
Drug abuse	1.4 ^d	1.0–1.9	1.4	1.0–1.9	1.4 ^d	1.1–1.7
Drug dependence	1.4	1.0–2.0	1.3	0.9–1.9	1.4 ^d	1.1–1.7
Any substance use disorder	1.4 ^d	1.0–1.9	1.7 ^d	1.4–2.2	1.3 ^d	1.0–1.6
Conduct disorder	1.2	0.9–1.8	1.1	0.7–1.7	1.2	0.9–1.6
Number of disorders^e						
One disorder	1.3	0.9–1.8	1.7 ^d	1.3–2.3	1.3 ^d	1.1–1.7
Two disorders	2.3 ^d	1.4–3.7	1.7 ^d	1.3–2.4	1.5 ^d	1.2–1.9
Three or more disorders	2.5 ^d	1.5–4.0	2.5 ^d	1.8–3.5	1.9 ^d	1.5–2.4

^aThese results are based on a series of 18 discrete-time survival equations estimated separately for men, women, and men and women combined (54 total equations) to predict divorce from the first marriage. The predictors are psychiatric disorders that were in existence before divorce. There is one equation for each of the 14 individual disorders; one each for summary measures of the significant mood, anxiety, and substance use disorders found in the first 14 equations (dichotomies for any versus none of the significant disorders in each of the three sets); and one for number of disorders. We also controlled for a set of potential confounding variables described in the text. In addition to the 18 equations for individual disorders and combinations, an equation that evaluated the additive effects of all the disorders showed that, as a set, they significantly predicted divorce over and above the effects of the control variables when evaluated by using Wald chi-square tests (df=14) based on coefficient variance-covariance matrices adjusted for design effects (men: $\chi^2=49.4$, $p<0.001$; women: $\chi^2=68.9$, $p<0.001$; men and women combined: $\chi^2=117.3$, $p<0.001$).

^bDiagnoses of mood disorders, anxiety disorders, and substance use disorders were generated with the Composite International Diagnostic Interview and were based on DSM-III-R criteria. Conduct disorder was assessed with the Diagnostic Interview Schedule.

^cThe odds ratios are exponentiated discrete-time survival coefficients. The 95% confidence intervals were estimated by using jackknife repeated replications to adjust for weighting and clustering of observations.

^dThe lower bound of the 95% confidence interval for this odds ratio is greater than 1.0. Cases where the reported lower bound equals 1.0 are rounded to 1.0 but are actually greater than 1.0 and less than 1.06.

^eWe evaluated the effects of number of disorders by comparing the chi-square of an equation that included only one dummy variable for disorders coded as 1 for respondents with one or more disorders and 0 for respondents with no disorders to an equation that included three dummy variables for number of disorders. The chi-square difference was evaluated by using Wald tests (df=2) based on coefficient variance-covariance matrices adjusted for design effects. A significant dose-response relationship was found for men ($\chi^2=8.3$, $p=0.02$) and for the total sample ($\chi^2=8.0$, $p=0.02$) but not for women ($\chi^2=5.7$, $p=0.06$).

noses significant in the first set of equations (anxiety disorders, mood disorders, addictive disorders); and an overall summary equation for total number of disorders from the list of significant disorders. Disorders were coded as time-varying predictors on the basis of the ages at onset. Sociodemographic control variables were included in all models.

Additional models were estimated to examine possible

interactions between psychiatric disorders and gender, cohort, and marital timing. We found no significant interactions involving either cohort or marital timing. However, significant interactions involving gender were found. Therefore, the results reported here are shown separately for men and women as well as for the total sample.

These results are presented in table 1. As shown there, the odds ratios for the effects of most psychiatric disorders in predicting subsequent divorce from the first marriage are greater than 1.0 and statistically significant. The only consistent exceptions to this general pattern for both men and women are insignificant effects of social phobia and simple phobia. The largest odds ratio is associated with mania for both men and women. The odds ratios associated with the summary measures of any mood disorder, any anxiety disorder, and any substance use disorder are all significant for both men and women and fall in a range between 1.4 (substance use disorders among men) and 1.8 (anxiety disorders among men). The odds ratios for conduct disorder are modest. There was a significant dose-response relationship between number of disorders and subsequent divorce for both men and women.

Lost Years of Marriage Associated With Prior Disorders

Simulation was used to estimate the proportion of first divorces attributable to psychiatric disorders. The results suggested that this was true of 5.9% of the divorces among men (with a standard error of 1.6%) and 10.3% of the divorces among women (with a standard error of 2.2%). If these results were interpreted in causal terms, they would indicate that the prevalence of first divorces would be reduced by these proportions if previous onsets of psychiatric disorders were pre-

vented. These proportions translate into approximately 2.9 million divorces in the U.S. population.

We also simulated the number of years out of marriage due to divorce associated with prior psychiatric disorders. If these results were interpreted in causal terms, they would suggest that men in the United States would have spent 23.1 million more years in marriage (with a standard error of 6.2 million) and women would have spent 47.6 million more years in marriage (with a standard error of 11.1 million) were it not for their psychiatric disorders.

DISCUSSION

The validity of these results is contingent on respondent recall of lifetime psychiatric disorders and ages at onset. We attempted to minimize recall problems by using a variety of memory-priming techniques in the survey data collection (40). However, despite these efforts, errors in recall undoubtedly occurred and could have led to bias in the estimated associations (41). Within the constraints of this limitation, though, the results suggest that psychiatric disorders are significant predictors of subsequent first divorce.

The research design does not permit these associations to be interpreted unequivocally as causal. It is possible that unmeasured third variables, such as childhood adversity or stressful living conditions, could have led both to psychiatric disorders and to subsequent adverse marital outcomes. However, a causal interpretation is also plausible, as psychiatric disorders can create interpersonal difficulties (42) and the latter can lead to divorce (43).

Future effectiveness trials are needed to adjudicate between these contending causal interpretations to determine whether divorce can be prevented through treatment of psychiatric problems. As noted in the introduction, positive results would be relevant to the debate on mental health insurance coverage. An implicit assumption of the payers and health policy analysts who are reluctant to expand coverage for psychiatric disorders is that the overall costs of doing so would be greater than the costs of not doing so (44, 45). The results reported here add to a growing body of evidence suggesting that this assumption may not be correct. It is important to include in cost-benefit analyses the costs associated with the myriad of ways in which psychiatric disorders can have adverse life course consequences for the ill people themselves, their families, and the communities in which they live.

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