Linking Suicide to marital status

(CBS) The following study, "Marital Status and Suicide in the National Longitudinal Mortality Study," by Augustine J. Kposowa, Ph.D., at the University of California at Riverside, was published in the *Journal of Epidemiology And Community Health* in March 2000.

Abstract: Objectives: The purpose of the study was to examine the effect of marital status on the risk of suicide, using a large nationally representative sample. A related objective was to investigate the association between marital status and suicide by sex.

Methods: Cox proportional hazards regression models were applied to data from the National Longitudinal Mortality Study, based on the 1979-1989 follow-up. In estimating the effect of marital status, adjustments were made for age, sex, race, education, family income, and region of residence.

Results: For the entire sample, higher risks of suicide were found in divorced than in married individuals. Divorced and separated persons were over twice as likely to commit suicide as married individuals (RR=2.08, 95% CI=1.58,2.72). Being single or widowed had no significant effect on suicide risk. When data were stratified by sex, it was observed that the risk of suicide among divorced men was over twice that of married men (RR=2.38, CI=1.77,3.20). Among women, however, there were no statistically significant differentials in the risk of suicide by marital status categories.

Conclusions: Marital status, especially divorce, has strong net effect on mortality from suicide, but only among men. The study showed that in epidemiologic research on suicide, more accurate results would be obtained if samples are stratified on the basis of key demographic or social characteristics. The study further observed that failure to control for relevant socioeconomic variables or combining men and women in the same models could produce misleading results.

Keywords: suicide, marital status, divorce, widowhood, single, socioeconomic status, effect modification.

Key Points: Elevated risks of suicide were observed among divorced and separated men, but not among women.

However, being single or widowed had no significant effect on suicide.

Results obtained remained even after adjusting for socioeconomic and demographic variables.

The effect of divorce on suicide risk may be due to absence of social integration, and elevated psychological distress.

Accordingly, socioeconomic variables should be taken into account in epidemiologic research on suicide.

Marital Status and Suicide in the National Longitudinal Mortality Study: Introduction: Previous studies have reported a link between marital status and suicide.1-3 They have shown that married persons experience lower suicide rates than single, never married individuals, and that divorced, separated and widowed individuals have the highest rates.2,4 One of the most prominent explanations given in past tudies to account for the observed differentials in the risk of suicide by marital status is that marriage provides social and emotional stability, whereas divorce, separation, singlehood and widowhood do not.1,5 Accordingly, marriage offers the best protection against suicide because it provides social and community integration, and reduces social isolation.1,3,6

An issue that remains relatively unaddressed in public health research is whether the reported protection provided by marriage against suicide holds for men and women equally. In addition, past studies that have reported associations between marital status and suicide have failed to control for the potentially confounding effects of socioeconomic variables. For example, in a previous report, divorced individuals were found to be 2.9 times as likely to die of suicide than married individuals.2 Widowed persons were observed to be 2.8 times more likely to die from suicide compared to

married persons, and single individuals experienced a suicide risk that was 1.9 times that of married people. However, that study controlled for only age.2 A more recent research also controlled for only age in studying the effect of marital status on suicide.4 Hence, it is unknown whether the observed relationship between marital status and suicide would remain after socioeconomic factors are taken into account.

In the present study, a nationally representative sample is used to examine the risk of suicide by marital status. More specifically, the following questions are addressed: (1) Are divorce, widowhood, and being single significant risk factors for suicide? (2) Do these risks vary by sex? (3) Does the effect of marital status remain after controlling for socioeconomic variables? (4) What are implications of answers to the above questions for research and public health policy?

Methods: Data Source: The National Longitudinal Mortality Study (NLMS), 1979-1989 was used to estimate the effects of marital status on death from suicide.7 The NLMS is a prospective study of mortality among the noninstitutionalized population of the United States.8,9 The samples are derived from the Current Population Survey (CPS), which is conducted by the U.S. Bureau of the Census.10-11

The Current Population Survey (CPS) is a joint project between the U.S. Bureau of Labor Statistics and the U.S. Bureau of the Census. It is a complex national survey based on a sample of about 50,000 households conducted monthly, and it is the primary source of information on the labor force characteristics of the population of the United States. In the Current Population Survey, comprehensive information is given or collected on the employment status, occupation, and industry of persons 15 years old and older. Additional data are obtained concerning weeks worked and hours per week worked, reason for not working full-time, total income, and income components. Information is also collected on demographic charactristics, such as age, sex, race, household relationship, and Hispanic origin for each person in the household.

In the CPS, a stratified cluster sample of households is obtained, and monthly personal and telephone interviews are conducted with the most knowledgeable adult member of the household. Each month, interviewers contact the sampled units to obtain information on social, economic, and demographic characteristics about all persons residing at the address.10 To improve the reliability of estimates of month-to-month and year-to-year change, 8 panels are used to rotate the sample each month. A sample unit is interviewed for four consecutive months, and then after an 8-month rest period, for the same four months a year later. Each month a new panel of addresses, or one-eighth of the total sample, is introduced. Thus, in a particular month, one panel is being interviewed for the first time, one panel for the second, one panel for the third, one panel for the fourth, one panel for the fifth, one panel for the sixth, one panel for the seventh, and one panel for the eighth and final time.10 The Current Population Survey has a response rate of 96%.10-11

The public use data file employed in the present study consisted of a cohort of 5 national samples derived from the Current Population Surveys conducted in March 1979, April, August, and December 1980, and March 1981. The mortality experiences of the cohort members were studied until 1989.8-10

Data from death certificates on the fact and cause of deaths occurring in 1979 through 1989 were matched with the socioeconomic and demographic characteristics of the 1979-81 population cohorts using the National Death Index (NDI) to link the two databases.12

The National Death Index was originally designed to provide a simplified method of identifying the mortality experiences of participants in prospective studies. The NDI is a centralized and computerized index of death records that began with deaths in 1979. It is maintained by the National Center for Health Statistics using information provided by state and vital statistics offices.12 A more detailed description of the data collection process, including cohort selection, sampling, reliability, and weighting has been presented elsewhere.8-11

Variables and Measures: The dependent variable was the risk of suicide. Deaths resulting from suicide were identified using cause of death codes E950-E959 from the International Classification of Diseases, Ninth Revision, Clinical Modification.13 In estimating the risk of overall mortality from suicide, all persons surviving beyond the 9-year follow-up and those dying during the follow-up from causes other than suicide were treated as right censored observations.

The sample comprised 471,922 individuals 15 years and above at the beginning of the study, of whom 545 had committed suicide by the end of the nine-year follow-up period. The present analysis was restricted to suicideamong non-Hispanic white, non-Hispanic African American, and Hispanic males and females. Other racial/ethnic groups (Asians and Native Americans) were excluded because only 11 people committed suicide among them during the follow-up period. This number was determined to be too small for meaningful statistical analysis.

The risk of suicide was estimated as a function of marital status, and of control variables including age, sex,

race/ethnicity, education, family income, and region of residence.

Marital status at the beginning of follow-up was measured by four dummy variables, one for single (never married), one for those currently married, one for widows, and one for those divorced or separated. Following the practice of most epidemiologic studies, persons currently married at the beginning of the study constituted the reference category.2,14-15

Age at the baseline was captured by defining it in terms of series of dummy vectors, one each for age groups 15-24, 25-34, 35-44, 45-54, 55-64, and 65 and above. The age group 15-24 served as the reference category.

Race/ethnicity was defined in terms of two dummy variables, one for non-Hispanic African Americans and one for Hispanics. Non-Hispanic whites, who have generally experienced the highest rates of suicide in the United States constituted the reference group.

Education was measured by a series of dummy variables, one for 0-8 years of schooling, one for 9 to 11 years of education, one for high school education (12 years), and one for 13 to 15 years. Individuals with 16 or more years of schooling constituted the reference group.

Annual family income (adjusted for inflation to 1980 dollars) was indexed by 5 dummy variables, one each for less than $5,000, $5,000-$9,999, $10,000-19,999, $20,000-$24,999, and one for unknown income. Those with family incomes of $25,000 or more were the omitted group.

Region of residence was obtained by dividing the country into two main regions, west and non-west. Past studies, especially in sociology have reported an east-west gradient in suicide in the United States, with both divorce and suicide being highest in the western states.3,6,16 Although no theoretical explanation has been given for this empirical phenomenon, to reduce the likelihood of drawing false inferences, I controlled for western residence. Region of residence was measured as a dummy variable with western states, as defined by the U.S. census,17 coded 1, and other states coded 0. The states coded 1 include: Alaska, Arizona, California, Hawaii, Montana, Nevada, Oregon, Utah, and Washington.

Statistical methods: Cox's proportional hazards model was applied to the NLMS data to compare the risk of suicide among marital status groups while controlling for confounders, including age, sex, race, education, income, and region of residence.18 Effect modification was evaluated by using multivariate hazard functions with interaction terms for sex and arital status. I report point estimates and 95% confidence intervals of the relative risks of suicide for the total sample, and for men and women separately.

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