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Implications of two-stage depression screening for identifying persons with thoughts of self-harm☆

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ABSTRACT

Objective: Persons with thoughts of self-harm may need evaluation for suicide risk. We examine the prevalence of thoughts of self-harm and whether persons with thoughts of self-harm are identified when two-stage depression screening is used.
Methods: Data are from the 2005–2010 National Health and Nutrition Examination Surveys. Persons responding positively to question nine of the Patient Health Questionnaire-9 (PHQ-9) are identified as having thoughts of self-harm. We compare two depression cutoff scores for the Patient Health Questionnaire-2 (PHQ-2) to see what percentage of persons with thoughts of self-harm would be identified as needing further screening with the PHQ-9.
Results: The prevalence of thoughts of self-harm was 3.5%. Persons 12–17 years old, poor and reporting fair or poor health were more likely to report thoughts of self-harm. A cutoff score of three on the PHQ-2 identified 49% of persons with thoughts of self-harm for further screening with the PHQ-9. A cut point of two increased the proportion of persons with thoughts of self-harm continuing for further screening to 76%.
Conclusions: Using a lower cutoff score, two, the PHQ-2 captures more persons with thoughts of self-harm. One quarter of persons with self-harm thoughts may not be identified for further screening when two-stage screening is used.

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1. Introduction

Suicide is the 10th leading cause of death for all ages [1]. Suicidal ideation, plans and attempts are strongly associated with an increased risk of completed suicide. Nonsuicidal self-injury (NSSI) and passive death wishes are also associated with suicidal behavior [2–6]. In addition, passive death wishes have been found to be related to all-cause mortality among older patients [7].

Thoughts of self-harm are indicative of emotional distress and are strongly associated with mental illnesses, especially major depression [8–11]. Many authors have recommended that persons with thoughts of self-harm be evaluated to assess suicide risk and need for referral to mental health services [3,6,12,13].

The Patient Health Questionnaire-9 (PHQ-9) is a nine-item instrument commonly used to screen for depression in primary care settings [14]. It is modeled after the nine Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria for major depression [15]. The last criterion in the DSM-IV is thoughts of death or suicide, which are assessed in the PHQ-9 by asking about death wishes or thoughts of hurting yourself in some way. Positive answers to this question could mean that the respondent has passive death wishes, thinks of or engages in NSSI or engages in suicidal behavior, which includes suicidal ideation, plans or attempts. The term *thoughts of self-harm* as used in this report includes all of these.

Almost half of persons who commit suicide, especially older individuals, have seen their primary care provider in the month before the suicide [16], providing a potential opportunity for their identification. Studies have used the ninth question of the PHQ-9, in the context of using the full instrument to screen for depression, to identify suicidal thoughts [17,18].

Most studies that describe the characteristics of persons who endorse the ninth question of the PHQ-9 describe special populations: persons with cancer [18] or congestive heart failure [19], older recipients of home delivered meals [20] or primary care patients already identified as having psychiatric illness [21]. The National Health and Nutrition Examination Survey (NHANES) provides the opportunity to describe persons in the general population who answer the ninth question of the PHQ-9 positively.

Some primary care practices that screen for depression use a two-stage screening process [22–24]. The Patient Health Questionnaire-2 (PHQ-2) [25], consisting of the first two questions on the PHQ-9 that assess depressed mood and little interest or pleasure in doing things, is given first, and persons who screen positive are then given the

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remaining seven questions. As the PHQ-2 does not include the question on self-harm, it is important to know what proportion of people with thoughts of self-harm would screen positive for depression on the PHQ-2, then go on for further screening with the remaining seven questions of the PHQ-9 and, thereby, be identified as having thoughts of self-harm. Of particular interest are persons who have not seen a mental health professional in the past year. Such persons would be much less likely to have been previously assessed for thoughts of self-harm than would persons who had seen a mental health professional at least once. This study examines the prevalence of thoughts of self-harm in different population subgroups and the implications of two-stage screening for depression for identifying persons with thoughts of self-harm both in the total population and among those who have not seen a mental health professional in the past year.

2. Methods

2.1. Data source

The data used in this study come from the NHANES, an ongoing series of cross-sectional examination surveys designed to provide nationally representative estimates of the US civilian noninstitutionalized population. Briefly, the NHANES sample is selected using a complex, stratified, multistage design, and survey participants are interviewed in the home and then undergo a standardized physical examination in a mobile examination center (MEC). Specific subgroups of the population, including adolescents, adults over 60 years of age, African-Americans and Hispanics, are oversampled in some years. Data from multiple 2-year cycles are combined for reliable estimates. The NHANES protocol was approved by the National Center for Health Statistics Ethics Review Board. Written consent was obtained for persons 18 and older and written informed assent for youths 12–17 years. Examined persons received remuneration for their participation in the survey depending on their age and examination content. Further details of the design and content of the NHANES have been published elsewhere [26]. This report is based on data from 2005 to 2010.

Depression was assessed using the PHQ-9, a screening instrument that asks about the frequency of depression symptoms over the last 2 weeks [14]. For each question, response categories "not at all," "several days," "more than half the days" and "nearly every day" were given a score of 0–3. The PHQ-9 was asked during the private interview in the MEC. Questions were administered in English or Spanish; proxy interviews and interpreters were not permitted.

A total of 28,860 persons 12 and older were selected to participate in NHANES; 21,997 (76.2%) completed the household interview, of whom 96.7% also completed the health examination component. Analyses for this study included 19,143 persons (66.3%) who had no missing data for questions 1, 2 and 9 of the PHQ-9.

2.2. Measurement

Thoughts of self-harm were measured using the ninth question of the PHQ-9: "Over the last two weeks, how often have you been bothered by the following problems: Thoughts that you would be better off dead or of hurting yourself in some way?" Any score greater than zero (not at all) was considered a positive answer to the question on self-harm [14]. Any respondent answering positively to the question on self-harm was referred to the examining physician at the MEC for evaluation.

The PHQ-2 score has a range of 0–6. The depression cutoff score for the PHQ-2 suggested by Kroenke et al. is three [25]. We examine the cut point of three and a lower cut point of two, as has been done in other studies [27–30].

We examined the prevalence of thoughts of self-harm by demographic variables including age group (12–17, 18–39, 40–59 and 60 or more years), gender, race/ethnicity (Mexican American, non-Hispanic Black, non-Hispanic White and other), poverty status (less than 100% of the income to poverty ratio, 100% to less than 200% of the income to poverty ratio and greater than or equal to 200% of the income to poverty ratio), marital status (married or living with partner, widowed/separated/divorced and never married) and education (less than high school, high school diploma and more than high school). We also looked at the association of self-harm thoughts with self-rated health and contact with a mental health professional. Marital status and education were examined only in the subgroup ages 20 and over. Contact with a mental health professional was assessed using the following question: "During the past 12 months, have you seen or talked to a mental health professional such as a psychologist, psychiatrist, psychiatric nurse, or clinical social worker about your health?" Self-rated health was assessed in the MEC on the same day as the PHQ-9 was given. Other covariates were assessed as part of the household interview.

2.3. Data analysis

NHANES sample examination weights, which account for the differential probabilities of selection, nonresponse and noncoverage were used for all analyses. Standard errors of the percentages were estimated using Taylor series linearization, a method that incorporates the sample design and weights. Data analyses were performed using SAS version 9.2 (SAS Institute, Cary, NC) and SUDAAN version 9.0 (RTI, Research Triangle Park, NC).

Overall differences between groups were evaluated using the chi-square statistic. If the chi-square test was significant, differences between subgroups were evaluated using the t statistic. Logistic regression models were used to examine the crude and adjusted odds ratios (ORs) for thoughts of self-harm in the different groups.

3. Results

A total of 3.5% of the noninstitutionalized population ages 12 and over reported thoughts of self-harm (Table 1). Approximately 5.7% of persons ages 12–17 years old reported thoughts of self-harm, more than any other age group. Only 2.2% of persons 60 years and older reported thoughts of self-harm. Nine percent of persons who rated their health as fair or poor reported thoughts of self-harm. Persons living at or near poverty had higher rates of thoughts of self-harm than persons living at 200% or above of the poverty income ratio. Among persons ages 20 and over, persons who were married or living with a partner were less likely to have thoughts of self-harm than persons who were not married. Persons with less than a high school education were more likely to have thoughts of self-harm than others.

A total of 8% of noninstitutionalized Americans reported having seen a mental health professional in the past year. Among persons with thoughts of self-harm, one quarter reported any contact with a mental health professional in the past year. Mexican Americans were much less likely than all other race/ethnic groups to have seen a mental health professional (data not shown). The rate of thoughts of self-harm in the population without any contact with a mental health professional in the past year was 2.8% (Table 1).

In the model adjusting for all covariates except marital status and education, sex was not significantly associated with thoughts of self-harm (Table 1). Although crude ORs showed that non-Hispanic White persons were less likely than any other race/ethnic group to report thoughts of self-harm, these differences disappeared in the adjusted model. Persons living at or near the poverty level had more than twice the odds of thoughts of self-harm. Persons who rated their health as fair, poor or good had higher odds of thoughts of self-harm than persons reporting very good or excellent health. Among persons with