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Recent medical service utilization and health conditions associated with a history of suicide attempts

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Abstract

Objectives—Suicide is a leading cause of death; unfortunately most individuals at risk for suicide are not identified, assessed or treated by the mental health system. Investigating medical healthcare utilization among individuals with a history of suicide attempt may identify alternative settings for case finding and brief intervention.

Methods—The study sample (n = 1422, 58% female, 72% African-American) is from a prospective cohort of adults (27–31 years) who participated in a randomized trial of school-based interventions. Logistic regression evaluated the relationship between lifetime history of suicide attempt with past year medical service utilization and selected self-reported health conditions, controlling for lifetime Major Depressive Disorder (MDD), demographic factors, health insurance status and employment.

Results—A suicide attempt history was associated with past year ED medical visits [aOR 1.51, 95% CI 1.04–2.18, p = .03], but not primary care visits or inpatient hospitalization, when controlling for MDD and other covariates. Severe headaches and chronic gastrointestinal conditions were also associated with lifetime suicide attempt (aOR 1.50 95% CI 1.03–2.17 and aOR 1.67 95% CI 1.06–2.63, respectively).

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Conclusions—Suicide prevention, including universal screening and brief intervention, is indicated in ED settings. Restricting screening to subgroups, such as those individuals presenting with depression, may miss at-risk individuals with somatic concerns.

Keywords

Suicide; Emergency Department; Depression

Suicide is the second leading cause of death in young adults ages 20-29 years in the United States [1], recently surpassing motor vehicle accidents as the leading cause of injury mortality [2]. A significant obstacle plaguing the suicide prevention field is how and where to best identify individuals at risk for suicidal behavior, as many suicidal individuals do not seek mental health treatment [3,4]. A critical suicide risk factor is lifetime suicide attempt [5], which is part of a comprehensive suicide risk assessment [6]. Assessment of suicide risk in healthcare settings is a Joint Commission National Patient Safety Goal [7] and recommended by the 2012 National Strategy on Suicide Prevention [8].

Proactive screening of and intervention with young adults in primary care clinics, medical inpatient units, and emergency departments (EDs) are promising methods of suicide prevention [9-11]. Suicide attempts and deaths are associated with a host of physical health problems, including asthma, heart disease and chronic pain [12-14]. Given the association of physical illness and suicidal behavior, individuals with a history of suicidal behavior may be more likely to present for medical healthcare than individuals without such behavior. In addition, many individuals who die by suicide attend EDs, primary care clinics or medical inpatient units in their last year of life [11, 15, 16]. ED settings in particular treat patients with many risk factors for suicide beyond psychiatric and medical illnesses, including alcohol and drug abuse, physical injury, and interpersonal violence [9]. Suicide screening has been studied in primary care clinics [17], medical inpatient units [18] and EDs [19] as a means to link patients endorsing suicide risk factors with appropriate and effective mental health treatment, either through brief intervention on-site or referrals to outpatient services.

Depression could partially explain the relationship between medical conditions, medical care and a history of suicide attempt, as it is a significant risk factor for suicide attempts and death [20] and as well as physical health diagnoses. The literature on medical healthcare utilization in individuals with depression is robust: depression is associated with increased utilization and costs of primary care [21], outpatient and inpatient services [22], and EDs [23-25]. Depression screening has been more widely implemented and exhaustively studied than suicide screening, and has been recommended by the US Prevention Task Force in primary care settings along with appropriate follow-up [26]. Screening for depression may be adequate to identify some individuals at risk for suicide, particularly in light of the existing financial and resource constraints. Alternatively, if medical conditions and medical service utilization are independently related to suicidal behavior, this would suggest that suicidal thoughts and behaviors should be assessed directly in medical settings.

In the literature concerning medical service utilization in individuals at risk for suicide, samples are primarily drawn from patient populations, such as individuals presenting to an ED or those who have made suicide attempts. This approach is limited by lack of

appropriate comparison groups to ascertain whether individuals with such a history are more likely to use medical services than individuals without such a history. The current study addresses this limitation as the first known examination of suicide attempt history and medical healthcare utilization in a community sample of young adults. We controlled for gender, ethnicity, employment, insurance status, intervention status and lifetime Major Depressive Disorder (MDD) diagnosis as these factors may impact both suicidal behavior and health care utilization [27,28, 29]. We hypothesized that ED utilization for medical reasons would be independently associated with lifetime suicidal behavior. We explored whether self-reported health conditions of chronic gastrointestinal disease (e.g., Crohn's disease or colitis), hypertension, severe headache, asthma and musculoskeletal injuries were associated with lifetime suicide attempt. These diagnoses were chosen as they correspond to some of the most common presenting complaints to EDs [30]. Utilization of specific medical services in this population can inform suicide prevention and screening efforts by evaluating which: 1.) medical healthcare settings and 2.) health conditions may be particularly important in suicide screening efforts.

Methods

Participants and Procedures

Data for this study consist of cumulative lifetime measures from participants in a randomized school-based effectiveness trial. Details of the trial are available elsewhere [31,32]. In brief, the trial recruited two successive cohorts of students [1196 from Cohort 1 in 1985 and 1115 from Cohort 2 in 1986] as they entered first grade in 19 elementary schools in Baltimore, MD (49.8% male and 67.1% ethnic minority consistent with the population in Baltimore City schools). Since 1985, participants have been assessed through middle school and twice in young adulthood, including most recently when participants were 27-31 years old. Our study sample is restricted to the 1422 individuals participating in the most recent wave who have complete data on their past year health care utilization and lifetime suicide attempt history (58% female and 72% African American). The 889 individuals (38% of the original sample) who were lost to follow-up over the 25 years of the study were more likely to be male and non-African American ($p < .01$).

Standardized assessments were conducted by trained lay interviewers with the most recent wave collected via a computerized interview that was both interviewer and respondent driven when assessing potentially sensitive topics such as drug involvement. This study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board. All participants provided informed consent to participate.

Measures

Recent Medical Healthcare Utilization: Participants indicated how often they utilized three types of healthcare for medical reasons in the year prior to the interview at 27-31 years. The responses to the following questions: 1.) excepting childbirth, how many times they stayed in a hospital overnight or longer in the last year, 2.) how many times they received medical care in an ED in the last year, and 3) the last time they received a routine physical or

medical checkup from a health care professional were dichotomized into ‘yes’ (one or more times in the last year) and ‘no’ (0 times).

Health Conditions: Self-report of physical and medical conditions in either of the young adult interviews (collected at ages 20-22 and 27-31 years) were used to operationalize this construct. Participants were asked if they ever had any of the following conditions: asthma, severe headaches lasting more than four hours, chronic stomach troubles such as ulcers, Crohn's disease or colitis, high blood pressure or hypertension, or any severe injury to the neck, back, or shoulder. A positive response in either interview in young adulthood was coded as ‘yes’ for each condition separately.

Psychiatric Diagnoses and Suicide Attempts: The Composite International Diagnostic Interview-University of Michigan Version (CIDI-UM) [33] was used to assess the history of MDD. This measure generates DSM-IV and ICD-9 diagnoses consistent with assessments used in the National Comorbidity Survey [34]. A separate question taken from the MDD module of the National Institute of Mental Health Diagnostic Interview Schedule [35] ascertained a history of suicide attempts: “Have you ever attempted suicide (yes/no)?” In a modification from standard CIDI assessment, each participant was asked every MDD symptom level questions including the suicide attempt question to ascertain a comprehensive view of symptoms. A positive response at either of the young adult interviews was coded as ‘yes.’

Demographic and Insurance Variables: Gender, race and intervention status were ascertained from the initial baseline assessment from school records in first grade. All other demographic and insurance variables were assessed at the 27-31 year interview. Participants were asked whether they were employed and whether their healthcare was currently covered by Medicare, Medicaid or “health insurance obtained privately or through a current or former employer or union.” They were also asked whether they did not have resources for medicine or medical care in the last year. Each of these responses were dichotomized into “yes” or “no” responses.

Statistical Analyses

Because suicide attempt history was evaluated over the participant's lifetime and healthcare utilization was evaluated in the year before evaluation (which occurred at ages 27- 31 years), age of first and last suicide attempt were evaluated to investigate temporal ordering. Analyses were conducted across three steps. First, following initial exploratory analysis, differences in demographic characteristics, medical healthcare utilization, and health conditions by a history of suicide attempt were evaluated via bivariate chi-square analyses. Second, multivariate logistic regression models were used to evaluate the relationship of suicide attempt to past year inpatient hospitalization, primary care and emergency department visits. Multivariate analyses controlled for demographic factors, insurance status, employment and a lifetime history of MDD. Third, multivariate logistic regression models explored the association between a suicide attempt history and the specified health conditions.

Results

In this sample, 11% of participants ($n = 153$) had a history of suicide attempt. The mean age of first suicide attempt was 16.1 years ($SD = 4.0$) and 49 (32%) reported more than one suicide attempt (reported number of attempts ranged from 1 to 10). When participants were asked about their age of their most recent suicide attempt, only 15 (10%, and 9 out of these 15 reported multiple lifetime attempts) reported that they had attempted suicide after the age of 25 years, suggesting that the majority of reported health care utilization occurred well *after* the suicide attempt.

The majority of the sample (76%) had been to a primary care physician ($n = 1075$), 11% ($n = 150$) had been medically hospitalized, and 33% ($n = 471$) had been to the ED for a medical reason in the last year (Table 1). Rates of health conditions included 47% of the sample reporting severe headaches ($n = 668$), 29% with neck, shoulder or back injury ($n = 415$), 23% with asthma ($n = 329$), 19% with high blood pressure or hypertension ($n = 277$) and 12% with chronic gastrointestinal disease ($n = 177$).

Bivariate analyses of demographics, insurance, employment, recent medical healthcare utilization and health conditions in individuals with and without a history of suicide attempt by age 27-31 years are presented in Table 1. Females and non-African Americans were more likely to have a history of a suicide attempt ($p < 0.01$). Individuals with a history of suicide attempt were less likely to report current employment or private insurance. They were more likely to report receiving financial assistance through Medicare or Medicaid and lacking financial resources for medical care than those without a suicide attempt. Individuals with a lifetime suicide attempt were more likely to meet criteria for lifetime MDD; 43% ($n = 66$) of participants with lifetime suicide attempt also had a depression diagnosis. Individuals with a history of suicide attempt were more likely to report medical hospitalization and ED visits, but not a primary care visit in the last year. Further analysis of ED visits showed that individuals with suicide attempts were more likely to report two or more visits in the last year. A history of suicide attempt was significantly associated with each health condition except for neck, shoulder and back injury.

Multivariate analysis of medical healthcare utilization is presented in Table 2. All multivariate analyses controlled for gender, African American race, intervention status, private insurance, and current employment. Models are presented unadjusted and then adjusted with or without lifetime MDD as a covariate. Lifetime suicide attempt was not associated with primary care utilization in the last year in any model. Lifetime suicide attempt was associated with medical hospitalization but not when controlling for lifetime MDD. In contrast, suicide attempt was associated with increased odds of medical ED visit in the last year, both with and without lifetime MDD as a covariate.

Table 3 presents the multivariate analysis of health conditions by lifetime suicide attempt. The relationship between neck, shoulder and back injury and lifetime history of suicide attempt did not reach significance in any model. Lifetime suicide attempt was associated with self-reported asthma and high blood pressure or hypertension, but not when controlling for lifetime MDD. Lifetime suicide attempt was associated with increased odds of self-

reported headaches lasting over four hours and chronic stomach troubles both with and without MDD included as a covariate.

Discussion

From a community-based sample assessed across young adulthood, individuals with a history of suicide attempt were more likely to present to the ED for medical reasons in the year prior than individuals without a suicide attempt history. This pattern was consistent after controlling for demographic factors, health insurance status, employment and a history of MDD. Suicide attempt history was associated with medical inpatient utilization in this sample, but not when controlling for MDD history. Primary care utilization was not associated with suicide attempt history in the multivariate model. Individuals with a suicide attempt history were more likely to report a history of headache and chronic gastrointestinal conditions, after controlling for demographic, insurance, employment and psychiatric factors.

Increased ED visits by individuals with a suicide attempt history highlight the importance of this setting in suicide prevention. In recent years, suicide-related screening [36], intervention [8] and improvements in the continuity of care [37] have been proposed in EDs as suicide prevention strategies. Current efforts have also emphasized the importance of screening all ED patients, not just those with psychiatric complaints. From these results and an ED care perspective, individuals with a history of suicide attempt may be high utilizers of medical ED resources (even adjusting for health insurance coverage and employment status) which is likely associated with significant cost and burden. This increase in service utilization may persist well after the suicide attempt occurs, as the mean age of first suicide attempt in this sample was 16 years. Interventions with the purpose of identifying individuals at risk for suicide, providing brief intervention such as a safety plan [38] and linking patients with appropriate services may be beneficial for both suicide prevention and ED cost reduction.

The role of depression in medical service utilization has implications for how systematic screening is implemented. A history of MDD was included in the analyses as depression is a leading risk factor for suicide attempt [20]. In these results, it appears that increased ED utilization for medical reasons in individuals with suicide attempts was not solely driven by depression diagnosis. Therefore, while MDD assessment may be sufficient in primary care settings or medical inpatient units, identification of individuals at suicide risk in the ED may require the direct assessment of suicidal thoughts and behaviors [8]. Such direct screening of suicide may also identify a smaller subset of ED patients requiring further evaluation than depression screening; in a pilot study for the multi-site NIMH-funded Emergency Department Safety Assessment and Follow-up Evaluation (ED-SAFE), in which 2,243 adult medical patients were screened across six EDs, while 34.5% screened positive for depression, only 12.8% had prior attempts and 3.3% had current suicidal ideation [19].

Two health conditions associated with a history of suicide attempt were headaches and chronic gastrointestinal conditions. The current study used self-reported symptoms, without clinical confirmation of specific diagnoses, which is a significant limitation; however, both headache and gastrointestinal pain-related conditions have been associated with suicide risk

in previous investigations using clinician-administered assessments [39,40]. For example, Crohn's Disease and Ulcerative Colitis have both been associated with death by suicide in analyses of Danish national registry data [41] and clinician-diagnosed migraine headache has been prospectively associated with suicide attempt at two-year follow-up, when controlling for anxiety and depression diagnosis [42]. Consequently, individuals reporting physical symptoms of abdominal pain and severe headache may benefit from careful suicide screening and assessment in ED and other medical healthcare settings. Conversely, for mental health clinicians treating patients at increased risk of suicide, additional assessment of pain-related conditions and stomach discomfort is indicated.

Strengths of this study include an epidemiologically sampled population from a single urban area, which allowed comparison of individuals with and without a suicide attempt history, as well as utilizers and non-utilizers of medical healthcare services. Second, this community-based sample also ensures that participants are not limited to clinical patients or individuals with a particular type of health insurance coverage, providing a sample with a wide range of clinical functioning. Third, diagnostic assessments, correlating to DSM-IV criteria were used for MDD diagnosis, rather than symptom checklists. Lastly, suicidal behavior was assessed separately from MDD assessment, rather than through gated questions, which may reduce under-reporting of suicidal behavior.

Limitations include a retention rate of 62% over the 25 years of the study, with higher participation rates of female and African American individuals at 30-32 years. All data on suicide attempts, healthcare utilization and physical health symptoms were self-reported and not confirmed by chart review or insurance records. Consequently, reasons for medical visits were not collected and a definite link between past-year healthcare utilization and lifetime medical illness cannot be made. Additional replication of all findings using medical record data and clinician-administered measures is warranted. In addition, many in the sample grew up in an urban environment often under conditions of poverty, violence and exposure to adversity which may influence later mental and physical health outcomes [43]. ED visits in individuals with a history of suicide attempt may be driven by other factors, such as alcohol use, acute trauma or impulsivity, which is beyond the scope of this project. However, this analysis represents a first step in exploring medical healthcare utilization in individuals at risk for suicide, separate from depression diagnoses and provides further support for ED-based suicide prevention. Future results from ED-SAFE and other ED-based studies may further elucidate the interaction between suicide risk, physical illness and ED utilization.

Conclusion

Patterns of healthcare utilization in individuals with a lifetime suicide attempt history suggest that the ED is an ideal setting for suicide prevention efforts, beyond assessment of depression. Patients reporting pain-related conditions, such as headaches and gastrointestinal disorders, may also require additional suicide risk assessment. Further population-based, prospective research is needed on the interaction between suicide attempt, health conditions and medical healthcare utilization. With this knowledge, appropriate screening instruments and interventions can be developed to reduce suicidal behavior, as well as alleviate clinical and financial burden to the healthcare system.

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References

- Centers for Disease Control and Prevention. National Center for Injury Prevention and Control.. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. 2012. Available from URL: www.cdc.gov/ncipc/wisqars
- Rockett IR, Reiger MD, Kapusta ND, et al. Leading causes of unintentional and intentional injury: United States, 2000–2009. *Am J Public Health*. 2012; 102:e84–92. [PubMed: 22994256]
- Michelmores L, Hindley P. Help-seeking for suicidal thoughts and self-harm in young people: a systematic review. *Suicide Life Threat Behav*. 2012; 42:507–24. [PubMed: 22889130]
- Pagura J, Fotti S, Katz LY, et al. Help seeking and perceived need for mental health care among individuals in Canada with suicidal behaviors. *Psychiatr Serv*. 2009; 60:943–9. [PubMed: 19564225]
- Suominen K, Isometsä E, Suokas J, et al. Completed suicide after a suicide attempt: a 37-year follow-up study. *Am J Psychiatry*. 2004; 161:562–3. [PubMed: 14992984]
- Simon, R. Assessing and Managing Suicide Risk: Guidelines for Clinically Based Risk Management. American Psychiatric Association; Washington, D.C.: 2003.
- The Joint Commission. Behavioral Health Care. 2012 National Patient Safety Goals [online].. 2012. Available from URL: http://www.jointcommission.org/assets/1/6/NPSG_Chapter_Jan2012_BHC.pdf
- U.S. Department of Health and Human Services (HHS) Office of the Surgeon General and National Action Alliance for Suicide Prevention. 2012 National Strategy for Suicide Prevention: Goals and Objectives for Action. HHS; Washington, DC: 2012.
- Larkin GL, Beautrais AL. Emergency departments are underutilized sites for suicide prevention. *Crisis*. 2010; 31:1–6. [PubMed: 20197251]
- O'Connor E, Gaynes B, Burda BU, et al. Screening for Suicide Risk in Primary Care: A Systematic Evidence Review for the U.S. Preventive Services Task Force. 2013 Agency for Healthcare Research and Quality Rockville, MD Evidence Synthesis No. 103. AHRQ Publication No. 13-05188-EF-1.
- Qin P, Webb R, Kapur N, et al. Hospitalization for physical illness and risk of subsequent suicide: a population study. *J Intern Med*. 2013; 273:48–58. [PubMed: 22775487]
- Webb RT, Kontopantelis E, Doran T, et al. Suicide risk in primary care patients with major physical diseases: a case-control study. *Arch Gen Psychiatry*. 2012; 69:256–64. [PubMed: 22393218]
- Batty GD, Kivimäki M, Park IS, et al. Diabetes and raised blood glucose as risk factors for future suicide: cohort study of 1 234 927 Korean men and women. *J Epidemiol Community Health*. 2012; 66:650–2. [PubMed: 22301278]
- Druss B, Pincus H. Suicidal ideation and suicide attempts in general medical illnesses. *Arch Intern Med*. 2000; 160:1522–6. [PubMed: 10826468]
- Gairin I, House A, Owens D. Attendance at the accident and emergency department in the year before suicide: retrospective study. *Br J Psychiatry*. 2003; 183:28–33. [PubMed: 12835240]
- Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. *Am J Psychiatry*. 2002; 159:909–16. [PubMed: 12042175]
- Olfson M, Weissman MM, Leon AC, et al. Suicidal ideation in primary care. *J Gen Intern Med*. 1996; 11:447–53. [PubMed: 8872781]
- Horowitz LM, Snyder D, Ludi E, et al. Ask suicide-screening questions to everyone in medical settings: the asQ'em Quality Improvement Project. *Psychosomatics*. 2013; 54:239–47. [PubMed: 23398908]

19. Allen MH, Abar BW, McCormick M, et al. Screening for suicidal ideation and attempts among emergency department medical patients: instrument and results from the Psychiatric Emergency Research Collaboration. *Suicide Life Threat Behav.* 2013; 43:313–23. [PubMed: 23413776]
20. Nock MK, Hwang I, Sampson NA, et al. Mental disorders, comorbidity and suicidal behavior: results from the National Comorbidity Survey Replication. *Mol Psychiatry.* 2010; 15:868–76. [PubMed: 19337207]
21. Forda JA, Trestman RL, Steinberg K, et al. Prospective association of anxiety, depressive, and addictive disorders with high utilization of primary, specialty and emergency medical care. *Soc Sci Med.* 2004; 58:2145–48. [PubMed: 15047073]
22. Rowan PJ, Davidson K, Campbell JA, et al. Depressive symptoms predict medical care utilization in a population based sample. *Psychol Med.* 2002; 32:903–8. [PubMed: 12171384]
23. Sandoval E, Smith S, Walter J, et al. A comparison of frequent and infrequent visitors to an urban emergency department. *J Emerg Med.* 2010; 38:115–21. [PubMed: 18462906]
24. Himelhoch S, Weller WE, Wu AW, et al. Chronic medical illness, depression, and use of acute medical services among Medicare beneficiaries. *Med Care.* 2004; 42:512–21. [PubMed: 15167319]
25. Koopmans GT, Lamers LM. Is the impact of depressive complaints on the use of general health care services dependent on severity of somatic morbidity? *J Psychosom Res.* 2006; 61:41–50. [PubMed: 16813844]
26. O'Connor EA, Whitlock EP, Beil TL, et al. Screening for depression in adult patients in primary care settings: a systematic evidence review. *Ann Intern Med.* 2009; 151:793–803. [PubMed: 19949145]
27. Bertakis KD, Azari R, Helms LJ, et al. Gender differences in the utilization of health care services. *J Fam Pract.* 2000; 49:147–52. [PubMed: 10718692]
28. Lundin A, Lundberg I, Hallsten L, et al. Unemployment and mortality--a longitudinal prospective study on selection and causation in 49321 Swedish middle-aged men. *J Epidemiol Community Health.* 2010; 64:22–8. [PubMed: 19289388]
29. Wilcox HC, Kellam SG, Brown CH, et al. The impact of two universal randomized first- and second grade classroom interventions on young adult suicide ideation and attempts. *Drug Alcohol Depend.* 2008; 95(Suppl1):S60–73. [PubMed: 18329189]
30. National Center Health Statistics. National Hospital Ambulatory Medical Care Survey: 2010 Emergency Department Summary Tables. Hyattsville, MD: 2011.
31. Kellam SG, Werthamer-Larsson L, Dolan LJ, et al. Developmental epidemiologically based preventative trials: baseline modeling of early target behaviors and depressive symptoms. *American J Community Psychol.* 1991; 19:563–84.
32. Kellam SG, Rebok GW, Ialongo N, et al. The course and malleability of aggressive behavior from early first grade into middle school. *Journal Child Psychol Psychiatry.* 1994; 35:259–81.
33. World Health Organization. World Health Organization Composite International Diagnostic Interview (CIDI) Core Version 2.1. World Health Organization; Geneva, Switzerland: 1997. Interviewer's Manual
34. Kessler RC, Wittchen H-U, Abelson JM, et al. Methodological studies of the Composite International Diagnostic Interview (CIDI) in the US National Comorbidity Survey. *Int J Methods Psychiatr Res.* 1998; 7:33–55.
35. Robins LN, Helzer JE, Croughan J, et al. National Institute of Mental Health Diagnostic Interview Schedule. Its history, characteristics, and validity. *Arch Gen Psychiatry.* 1981; 38:381–9. [PubMed: 6260053]
36. D'Onofrio G, Jauch E, Jagoda A, et al. NIH Roundtable on Opportunities to Advance Research on Neurologic and Psychiatric Emergencies. *Ann Emerg Med.* 2010; 56:551–64. [PubMed: 21036295]
37. Knesper, DJ. American Association of Suicidology, & Suicide Prevention Resource Center. Continuity of care for suicide prevention and research: Suicide attempts and suicide deaths subsequent to discharge from the emergency department or psychiatry inpatient unit. Education Development Center, Inc; Newton, MA: 2010.

38. Stanley B, Brown GK. Safety planning intervention: a brief intervention to mitigate suicide risk. *Cogn Behav Pract.* 2012; 19:256–64.
39. Ilgen MA, Kleinberg F, Ignacio RV, et al. Noncancer pain conditions and risk of suicide. *JAMA Psychiatry.* 2013; 22:1–6.
40. Scott KM, Hwang I, Chiu WT, et al. Chronic physical conditions and their association with first onset of suicidal behavior in the world mental health surveys. *Psychosom Med.* 2010; 72:712–9. [PubMed: 20498290]
41. Gradus JL, Qin P, Lincoln AK, et al. Inflammatory bowel disease and completed suicide in Danish adults. *Inflamm Bowel Dis.* 2010; 16:2158–61. [PubMed: 20848460]
42. Breslau N, Schultz L, Lipton R, et al. Migraine headaches and suicide attempt. *Headache.* 2012; 52:723–31. [PubMed: 22404176]
43. Shonkoff JP, Garner AS, Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics.* 2012; 129:e232–e246. [PubMed: 22201156]

Table 1

Demographics, Insurance, Employment, Recent Medical Utilization and Health Conditions by Suicide Attempt

n(%)	Total (n =1422)	History of suicide attempt		P
		No (n = 1269)	Yes (n = 153)	
Demographic Variables				
Female Gender	822(58)	718(57)	104(68)	<.01
African American Race	1017(72)	923(73)	94(61)	<.01
Employment and Insurance				
Self-reported employment	998(72)	907(73)	91(62)	<.01
Lacked resources for medicine and medical care in last year	117(8)	92(7)	25(16)	<.01
Private insurance or through current or former employment	690(48)	648(51)	42(27)	<.01
Medicare	72(5)	55(4)	17(11)	<.01
Medicaid	236(17)	199(16)	37(24)	<.01
Psychiatric Diagnosis				
Lifetime History of MDD	238(17)	176(14)	66(43)	<.01
Medical Health Visits in Last Year				
Primary Care	1075(76)	964(76)	111(73)	.35
Hospitalization	150(11)	125(10)	25(16)	.01
Emergency Department	471(33)	403(31)	68(44)	<.01
Two or more visits	230 (16)	193(15)	37(24)	<.01
Health conditions				
Headache 4+ hours	668(47)	574(45)	94(61)	<.01
Severe Neck, shoulder or back injury	415(29)	361(28)	54(35)	.08
Asthma	329(23)	282(22)	47(31)	.02
High Blood Pressure/Hypertension	277(19)	237(19)	40(26)	.03
Chronic Stomach Disease	177(12)	143(11)	34(22)	<.01

Note: Unadjusted variables

MDD: Major Depressive Disorder

Table 2
Estimated Association between Medical Healthcare Utilization in Past Year and Lifetime History of Suicide Attempt

	Unadjusted Model			Adjusted for Demographic Characteristics ^I			Adjusted for Demographic Characteristics ^I and Lifetime MDD		
	OR	95%CI	p	AdjOR	95%CI	p	AdjOR	95%CI	p
Primary Care	0.84	0.57-1.22	.35	0.87	0.57-1.31	.50	0.91	0.59-1.40	.67
Hospitalization	1.79	1.12-2.85	.01	1.73	1.06-2.82	.03	1.52	0.92-2.50	.10
Emergency Department	1.72	1.22-2.42	<.01	1.75	1.22-2.50	<.01	1.51	1.04-2.18	.03

^I Demographic Characteristics were gender, intervention status, ethnicity, insurance and employment.

Table 3

Estimated association between Self-Reported Health Conditions and Lifetime History of Suicide Attempt[/]

	Unadjusted Model			Adjusted for Demographic Characteristics [/]			Adjusted for Demographic Characteristics [/] and Lifetime MDD		
	OR	95%CI	p	AdjOR	95%CI	p	AdjOR	95%CI	p
Asthma	1.55	1.07-2.24	.02	1.42	0.96-2.09	.08	1.30	0.87-1.95	.19
Headaches 4+ hours	1.93	1.37-2.72	<.01	1.77	1.23-2.53	<.01	1.50	1.03-2.17	.03
Chronic Stomach Illness	2.25	1.48-3.42	<.01	1.92	1.23-2.98	<.01	1.67	1.06-2.63	.03
High Blood Pressure/Hypertension	1.53	1.05-2.27	.03	1.53	1.02-2.30	.04	1.41	0.93-2.14	.11
Neck/shoulder/back injury	1.37	0.96-1.95	.08	1.46	1.00-2.11	.05	1.24	0.84-1.83	.28

[/]Demographic Characteristics were gender, intervention status, ethnicity, insurance and employment.