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Life Events: A Complex Role In The Timing Of Suicidal Behavior Among Depressed Patients

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Abstract

Suicidal behavior is often conceptualized as a response to overwhelming stress. Our model posits that given a propensity for acting on suicidal urges, stressors such as life events or major depressive episodes (MDEs) determine the timing of suicidal acts.

Depressed patients (n=415) were assessed prospectively for suicide attempts and suicide, life events and MDE over 2 years. Longitudinal data was divided into 1-month intervals characterized by MDE (yes/no), suicidal behavior (yes/no), and life event scores. Marginal logistic regression models were fit, with suicidal behavior as the response variable and MDE and life event score in either the same or previous month, respectively, as time-varying covariates.

Among 7843 person-months, 33% had MDE and 73% had life events. MDE increased risk for suicidal behavior (OR=4.83, $p < 0.0001$). Life event scores were unrelated to the timing of suicidal behavior (OR=1.06 per 100 point increase, $p=0.32$), even during an MDE (OR=1.12, $p=0.15$). However, among those without Borderline Personality Disorders (BPD), both health and work related life events were key precipitants, as was recurrent MDE, with a 13-fold effect. The relationship of life events to suicidal behavior among those with BPD was more complex. Recurrent MDE was a robust precipitant for suicidal behavior, regardless of BPD comorbidity. The specific nature of life events is key to understanding the timing of suicidal behavior. Given unanticipated results regarding the role of BPD and study limitations, these findings require replication. Of note, that MDE, a treatable risk factor, strongly predicts suicidal behaviors is cause for hope.

Keywords

aggression; impulsivity; bipolar disorder; stress; major depression

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Introduction

Suicidal behavior has been conceptualized as a response to stress, often of catastrophic proportions, but methodological drawbacks hamper most studies addressing this hypothesis. Retrospective studies to identify predictors are subject to bias from several sources, with recall bias being particularly problematic, since suicide attempters or relatives interviewed in psychological autopsy studies after a suicide may preferentially recall “precipitating” life events in an effort to reduce cognitive dissonance. Prospective studies are best suited to studying the relationship between life events and suicidal behavior.¹ Nonetheless, we could find only 9 prospective studies in English, resulting in 12 publications addressing life events and suicidal behavior, not all focused on adults.²⁻¹³ Five^{2, 3, 8, 9, 11} of 12 studies^{4-7, 10, 12, 13} reported no association, some based on the same sample.^{3, 4, 12} Limitations include lack of contemporaneous assessments of life events and suicidal behavior^{2, 6-8, 10, 11} and life events measures that are not comprehensive.^{7, 8, 11} One prospective study examined life events' effect on suicidal behavior in major depression, the condition most commonly associated with it.²

In the stress diathesis model of suicidal behavior, suicidal behavior occurs when an individual with the diathesis is exposed to stress, which determines the behavior's timing.¹⁴ The diathesis includes “pessimism” and aggression/hostility, which increase suicidal behavior risk among depressed individuals followed for 2 years.¹⁴ Stress can take the form of life events or illness exacerbation such as recurrence of Major Depressive Episodes (MDE), which increases risk for suicidal behavior^{15, 16-18}. To test this stress diathesis model, we hypothesized that, in major mood disorders, the probability and timing of suicidal behavior would be related to presence of MDE, life events, or both during a 2 year period, independently from diathesis predictors: aggression/hostility factors and cognitive factors such as pessimism, female sex, and younger age.¹⁴ Given the close relationship of borderline personality disorder (BPD) to suicidal behavior that we^{19, 20} and others^{21, 22} have shown, post-hoc analyses examined the hypothesis separately in depressed patients with and without comorbid BPD.

Method

Subjects

Depressed patients (N= 415, Table 1 contains descriptive characteristics) recruited in New York and Pittsburgh provided written informed consent approved by the Institutional Review Board. About 57% of patients screened in person participated. Retention at one year was 84%. Patients had physical exams and routine blood tests, including urine toxicology. Exclusion criteria were current substance or alcohol abuse or dependence, and active medical conditions.

Baseline Assessments

Raters were at least Master's level psychologists or psychiatric nurses. Axis I and II disorders were assessed using Structured Clinical Interviews for DSM-IV,²³ International Personality Disorder Examinations²⁴ and Structured Clinical Interviews for DSM-IV Axis II

Disorders.²⁵ Other assessments included: Hamilton Depression Rating Scale,²⁶ Beck Depression Inventory,²⁷ Beck Hopelessness Scale,²⁸ Brown-Goodwin Lifetime Aggression History,²⁹ Buss-Durkee Hostility Index,³⁰ Barratt Impulsivity Scale,³¹ Reasons For Living Inventory³² and Scale for Suicidal Ideation.³³ Childhood physical or sexual abuse were rated as present or absent. Life events were recorded using the Recent Life Changes Questionnaire (RLCQ),^{34, 35} and the St Paul Ramsey Questionnaire,³⁶ which cover the previous 24 and 6 months respectively.

Suicidal behavior, including suicide and suicide attempt, was defined as a self-destructive act with some intent to end one's life^{37, 38} and recorded on the Columbia Suicide History Form (inter-rater reliability coefficient: 0.97).³⁹ This form uses the Columbia-Classification Algorithm for Suicide Attempts,⁴⁰ based on O'Carroll³⁷ and endorsed by the Institute of Medicine.³⁸ The same definition is used in the Columbia-Suicide Severity Rating Scale,⁴¹ with excellent validity compared to expert evaluation board determinations (>95% sensitivity and specificity).⁴¹

Prospective Assessments

Patients received open treatment and assessments at 3, 12 and 24 months. Interviews documented suicidal behavior, presence of MDE in monthly blocks using a SCID I based check-list, and life events in 3-month blocks (RLCQ). The RLCQ, a well-validated, reliable instrument,³⁴ documented life events in: 1) Health; 2) Work; 3) Home/Family; 4) Personal/Social; and 5) Financial Domains (Table 2 has domains, life event items, weights). Positive life events include "promotion at work" or "birth of a child." Negative life events include "trouble with a boss" or "minor injury or illness." Weights (in Life Change Units, or LCU) for each item were as per the scale's author. For example, "death of spouse" has the highest weight, 119 LCU, and "retirement" has a weight of 52 LCU.³⁴ Domain scores are computed by adding weighted scores of domain items measured in LCU. Total life event scores in LCU for each period are the sum of domain-specific scores. Of note, events are not necessarily new events. Participants rated ongoing events during all pertinent time blocks.

Statistical Methods

To reduce baseline data dimensionality, two Principal Component Analyses (PCA) generated 'aggression/hostility' factors and factors originally named 'pessimism' factors, found to increase risk for suicidal behavior in our prior work¹⁴. Aggression/hostility factors were derived from the Barratt Impulsivity Scale, Buss-Durkee Hostility Inventory, and Brown-Goodwin Aggression History Scale. Two factors explained 83% of the variance and were retained for further analysis. 'Pessimism factors'¹⁴ were calculated by first performing individual linear regressions of the Beck Depression Inventory, Beck Hopelessness Scale, Reasons for Living Inventory, and Scale for Suicidal Ideation scores onto Hamilton Depression Rating Scale-17 scores. Residuals were entered into a PCA. Two factors, explaining 75% of the variance, were retained for further analysis. The first factor, based mostly on the Beck Depression Inventory and Hopelessness Scales, was renamed 'depressive cognitions.' The Scale for Suicidal Ideation and Reasons for Living Inventory (negatively scaled) loaded mostly onto the second factor, renamed 'suicide cognitions.'

Prediction of Suicidal Behavior—Each subject's follow-up period was divided into months designated by clinical state as having met MDE criteria: yes/no, and RLCQ total weighted score. Two models tested whether MDE or RLCQ score in the current or the prior month respectively, predicted suicidal behavior in the current month. Analyses were controlled for diathesis variables (sex, age, 2 aggression/hostility factors, and depressive and suicide cognitions factors) and variables entered into a marginal logistic regression model fit by proc glimmix from SAS 9.2, with suicidal behavior as the response variable and AR(1) correlation structure for the residuals. Results were verified using the Andersen-Gill extension to the Cox proportional hazards regression model,⁴² appropriate for analyzing multiple events per person, time-varying covariates constant over time intervals of different lengths, and censored times in study. Given potential effects of BPD on suicide risk, these models were re-run separately for patients with and without BPD. Both those with and without BPD may have had other PDs. Because the total RLCQ variable had outliers, analyses were repeated with scores censored at 500 LCU.

In 5 exploratory models per subsample (with and without BPD), RLCQ scores for each one of 5 life event domains and presence/absence of MDE during follow up, along with diathesis variables were tested as predictors of suicidal behavior, adjusted for multiple testing using Bonferroni's method. We also tested whether any of the 76 individual RLCQ items determined the timing of suicidal behavior, controlling for presence of MDE during follow up and diathesis variables, adjusted for multiple testing using the Benjamini-Hochberg procedure. This method controls the False Discovery Rate (FDR= ratio of false hypotheses to all null hypotheses that are rejected), appropriate when the goal is discovery, rather than confirmation.

Two final analyses were conducted based on data from depressed subjects with BPD. One included only “negative” items from the RLCQ scale, the other only independent life event items (unrelated to participants' behavior and outside their control, e.g., death of a friend) versus dependent life events (whose possibly influenced by participants' characteristics, e.g., interpersonal conflicts).⁴³

Results

Prospective data from 18 months per subject on average yielded 7843 person-months, the number of months observed for all study participants (Table 2). Life events in all 5 domains were common. Time in study was independent of baseline depression scores, attempt history, or clinical severity. Married patients were retained about 2 months longer than others ($t=2.57, df=413, p=0.0106$).

Suicidal behaviors occurred in 70/7843 (0.9%) person-months. Forty (9.6%) subjects manifested suicidal behavior during follow-up: 25 subjects had one behavior, 7 had 2 behaviors, and 8 had 3 or more, for a total of 70 suicidal behaviors. Three died by suicide. All but 7 subjects with suicidal behavior during follow-up were also baseline attempters. Most subjects (70.4%) had some months with MDE during follow-up. Patients with comorbid BPD were more likely to make suicide attempts and report life events (more

health, personal/social life events and trend in work-related, and home and family life events), but were not more likely to experience MDEs during follow up (Table 3).

In the entire sample of depressed patients, MDE was associated with a nearly five-fold increased odds of suicidal behavior during the same month, and 2.5-fold increased odds of suicidal behavior in the following month. The baseline suicide cognitions factor and female sex also predicted suicidal behavior (Table 4). Contrary to expectations, RLCQ scores during the concomitant or preceding month did not predict suicidal behavior either in the full model controlling for diathesis variables (Table 4), or in an unadjusted model (OR=1.06 per 100 point increase, 95%CI: 0.94-1.18, $p=0.33$) containing only RLCQ scores as predictors. Life events in the context of MDE did not have an effect either. Of note, life events did not predict MDE recurrence (data not shown). Censoring RLCQ scores at 500 LCU did not change results.

Among patients without BPD (Table 4), presence of MDE increased the odds of suicidal behavior thirteen-fold during the same month and nine-fold in the following month. The effect of life events was more moderate, with odds ratios for suicidal behavior of 1.33 and 1.06 per 100 RLCQ life change units during the same or following month, respectively. The baseline suicide cognitions factor and female sex predicted suicidal behavior, as well.

When RLCQ scores were explored by domain among those with no BPD, the Health related and Work related life events scores were risk factors for suicidal behavior, adjusting for MDE and diathesis variables (Table 5), after correction for multiple comparisons. Health life events include items that are also MDE symptoms (e.g. change in sleep), but were not higher in months with MDE (average difference in life event score, $p=0.9568$).

Among 76 individual life event items tested, 5 were associated with suicidal behavior in the same month and 3 predicted behavior in the next month, in patients without BPD after multiple testing adjustment. A further 6 events were associated with suicidal behavior in the same month and 10 were predictive in the next month ($p<0.05$, uncorrected). Most of these were work-or health-related (see Table 2). For 28 additional items, the life event did not occur in the same month as suicidal behavior and the model did not converge and therefore did not generate results (available upon request).

For patients with BPD, MDE increased the risk of suicidal behavior 3-fold in the same month, but had no effect in the following month. Surprisingly, life events in the prior month were protective against suicidal behavior and same month life events tended to be so, too. Restricting life event scores to negative items or to items representing independent or dependent life events, did not change results (data not shown). Of note, for patients with BPD, no life event domain was statistically significant after correction for multiple comparisons. However, two individual life event items were associated with suicidal behavior in the same month ($p<0.05$, uncorrected): “an illness or injury that kept you in bed a week or more or hospitalization” and “separation from spouse due to marital problems”, but no item predicted suicidal behavior the following month. Indeed, having comorbid BPD moderated the effect of life events on risk for suicidal behavior, rendering them less “effective” in precipitating suicidal acts (BPD*RLCQ interaction in the model that included

stress and diathesis variables: interaction $b=-0.006$, $SE=0.002$, $df=7407$, $t=-3.07$, $p=0.0021$.)

Discussion

In depressed patients without BPD, the effect of recurrent MDE on risk for suicidal behavior was marked, as reported previously^{15, 16, 17}. Life events, specifically, work and health related ones, also determined the timing of suicidal behavior, albeit with a more modest effect. That stressors (life events or MDE) and baseline diathesis features (female sex and “suicide cognitions”) determined the timing and risk of future suicidal behavior is consistent with our stress diathesis model.^{14, 20}

In contrast, in depressed patients with BPD, the role of MDE in precipitating suicidal behaviors was more modest. Moreover, depressed patients with BPD were not susceptible to life events as measured by the RLCQ. This is concordant with the notion that BPD patients report frequent intrapsychic pain, often unrelated to the salience of external events.^{44, 45} Perhaps life events have a lesser role in precipitating suicidal behavior among those with severe mental illness.⁴⁶ An alternative conceptualization is that given a strong diathesis such as MDE comorbid with BPD, daily hassles that do not qualify as a significant life event –not measured in this study- can precipitate suicidal behaviors.¹³ Few studies have focused on this, but suggest that daily hassles relate to suicidal ideation among adolescents^{47, 48} and older populations.⁴⁹ Life events were generally protective against suicidal behavior among BPD patients. One interpretation is that the RLCQ includes both positive and negative events. However, there was no effect when including only negative life events. Whether patients with BPD facing observable life events receive more psychosocial support, which may buffer against suicide attempts,^{50, 51} is an open question that our data does not address. Alternatively, patients with comorbid BPD may “organize” around a life event and paradoxically cope better (B. Stanley, personal communication). Nonetheless, consistent with a prospective study in personality disorders¹³ noting that negative love/marriage and crime/legal life events were risk factors for suicidal behavior and with clinical experience, our data suggests that marital problems are key in those with BPD, indicating that the nature of the life event matters.^{13, 52}

When the entire sample was examined, recurrent MDEs,¹⁵ female sex¹⁴ and high “suicide cognitions” factor scores (previously termed “pessimism”)¹⁴ predicted suicidal behavior. Contrary to our hypothesis, but consistent with several studies,^{2, 3, 8, 9, 11} life events did not appear to precipitate suicidal behavior in depressed patients, due to the striking opposing effects observed for life events among those with and without BPD. Curiously, in a prospective epidemiologic survey,⁴ negative events predicted first-onset suicidal behaviors over 3 years. However, in a depressed subsample from the same survey, not assessed for BPD, life events did not predict suicidal behaviors over 2 years, after controlling for demographic and clinical factors,³ underscoring the importance of examining diagnostic subsamples. Whether MDE affects appraisal of life events was not studied directly. However, the likelihood of suicidal behavior when patients were exposed to stress but not depressed did not differ from the likelihood when patients were both depressed and stressed

(interaction of MDE and life events was not significant). This suggests that a more negative appraisal of life events is not at work, at least in terms of increasing suicide risk.

For depressed patients with BPD, recurrent MDE predicted suicidal behavior in the same month, but not in the following one, indicating a short latency to suicidal behavior, which may reflect higher impulsivity, a core BPD trait.²² In depressed patients with BPD, suicide cognitions and other baseline diathesis factors did not predict suicidal behavior. However, BPD encompasses many clinical features related to the diathesis for suicidal behavior.¹⁴ Borderline patients are more pessimistic,⁵³ impulsive/aggressive,²² and report more history of trauma.⁵⁴ Thus, among those with BPD, stressors such as MDE and perhaps very specific life events determine the timing of suicidal behavior, also consistent with a stress-diathesis model.

Health domain life events precipitated suicidal behavior in those without BPD, and one item about hospitalization or staying in bed ill for a week did so in those with BPD, comporting with increased risk for suicide death observed after a cancer diagnosis⁵⁵, and World Mental Health Surveys⁵⁶ findings, wherein prior physical conditions increased risk for suicidal behavior, even adjusting for mental disorders. That MDE was a stronger predictor of suicidal behavior than life events is in agreement with Lewinsohn et al,⁸ who noted that health life events no longer predicted suicidal behaviors after controlling for depression, although they did not examine the effect of comorbid BPD. We found that health life event scores were not higher during months with MDE, and thus the modest health life events' effects in subjects without BPD were not explained by concomitant MDE. Of interest, Borg & Stahl⁹ observed that physical illness life events were actually more common among controls than suicides.

Of note, work stress had deleterious effects only in those without BPD. This was not due to differences in employment status between those with and without BPD (data not shown). Some data has linked suicidal behavior to work stress (for a review see⁵⁷), often cited in the press as a precipitant. That the effect is not present in depressed patients with BPD is consistent with findings in a prospective study in personality disorders.¹³ One possible explanation is that BPD patients react more intensely to interpersonal stressors.¹³

Female sex, baseline “suicide cognitions,” but not “depressive cognitions” predicted suicidal behavior in the full sample and the subset without BPD. This comports with reports that lifetime suicidal ideation⁵⁸ and the Reasons For Living Inventory⁵⁹ are useful in assessing risk for future suicidal behavior. Reasons For Living Inventory scores reflect a sense of connection with and responsibility towards others, features associated with lower suicidal ideation, and thus may capture elements relevant to the “suicidal debate” wherein individuals struggle with the decision to act on suicidal thoughts.⁵⁰ That such factors do not help patients with BPD may relate to the more impulsive nature of their suicidal behavior, minimizing protective effects of considerations captured by the Reasons For Living Inventory. The lack of effect of “depressive cognitions” is consistent with our past findings that hopelessness does not predict suicidal behavior,^{14, 19} in contrast with other reports^{60,61,62}.

Limitations

Our study shares limitations –including recall bias—of studies using checklists to assess life events.^{36, 63, 64} But we did collect data systematically at several follow-up time-points. Further, RLCQ life events' relationship to suicidal behaviors may be obscured by confounders such as appraisal and subjective scoring, as opposed to external rater scoring of the life event's magnitude,⁶³ as in contextual interview methods.^{65,66} Life events' effects may be stronger in first-time attempters and mental illness may be more relevant to suicide re-attempters.^{4, 12} With only seven first-time attempters, we could not address this. However, a Finnish study suggested depressed mood was essential in first onset of suicidal ideation, even in the setting of life events,⁶⁷ consistent with our results. Many stressful life events were relatively rare, decreasing item-wise analyses' power. This may be especially so for major life events (e.g., death of spouse) in this relatively young sample. In addition, it may be that cumulative or chronic stress, or other complex combinations of life events rather than discrete life events affect risk for suicidal behavior, parallel to evidence in depression of cumulative effects of chronic repeated stressors when short-term adaptation to acute stressors is not adequately shut off.⁶⁸

Exclusion of patients with medical problems and with current substance or alcohol use disorders limits generalizability. Moreover, given variability in treatment, it is difficult to ascertain its effect on suicidal behavior. However, since antidepressant treatment effects on suicide risk, over and above effects on mood, are not robust,⁶⁹ treatment data may not be as critical for this study's purposes. Finally, although the role of life events may differ for attempts and suicide, suicides were too rare for separate analyses.

Conclusions

MDE is a much stronger predictor of suicidal behavior risk than life events. Whereas the effect of life events was confined to those without comorbid BPD, MDE's effect was robust regardless of comorbid BPD. Our findings show the importance of aggressive maintenance treatment strategies in preventing MDEs to reduce future suicidal behavior.

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References

1. Oquendo MA, Currier D, Mann JJ. Prospective studies of suicidal behavior in major depressive and bipolar disorders: what is the evidence for predictive risk factors? *Acta Psychiatr Scand.* 2006; 114:151–158. [PubMed: 16889585]
2. Holma KM, Melartin TK, Haukka J, Holma IA, Sokero TP, Isometsa ET. Incidence and predictors of suicide attempts in DSM-IV major depressive disorder: a five-year prospective study. *Am J Psychiatry.* 2010; 167:801–808. [PubMed: 20478879]
3. Spijker J, de Graaf R, Ten Have M, Nolen WA, Speckens A. Predictors of suicidality in depressive spectrum disorders in the general population: results of the Netherlands Mental Health Survey and Incidence Study. *Soc Psychiatry Psychiatr Epidemiol.* 2010; 45:513–521. [PubMed: 19618093]
4. Ten Have M, de Graaf R, van Dorsselaer S, Verdurmen J, van 't Land H, Vollebergh W, et al. Incidence and course of suicidal ideation and suicide attempts in the general population. *Can J Psychiatry.* 2009; 54:824–833. [PubMed: 20047721]
5. Brent DA, Kolko DJ, Wartella ME, Boylan MB, Moritz G, Baugher M, et al. Adolescent psychiatric inpatients' risk of suicide attempt at 6-month follow-up. *J Am Acad Child Adolesc Psychiatry.* 1993; 32:95–105. [PubMed: 8428891]
6. Pfeffer CR, Klerman GL, Hurt SW, Kakuma T, Peskin JR, Siefker CA. Suicidal children grow up: rates and psychosocial risk factors for suicide attempts during follow-up. *J Am Acad Child Adolesc Psychiatry.* 1993; 32:106–113. [PubMed: 8428862]
7. Wong JP, Stewart SM, Claassen C, Lee PW, Rao U, Lam TH. Repeat suicide attempts in Hong Kong community adolescents. *Soc Sci Med.* 2008; 66:232–241. [PubMed: 17919796]
8. Lewinsohn PM, Rohde P, Seeley JR. Psychosocial risk factors for future adolescent suicide attempts. *J Consult Clin Psychol.* 1994; 62:297–305. [PubMed: 8201067]
9. Borg SE, Stahl M. Prediction of suicide. A prospective study of suicides and controls among psychiatric patients. *Acta Psychiatr Scand.* 1982; 65:221–232. [PubMed: 7072514]
10. Caspi A, Sugden K, Moffitt TE, Taylor A, Craig IW, Harrington H, et al. Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science.* 2003; 301:386–389. [PubMed: 12869766]
11. McKeown RE, Garrison CZ, Cuffe SP, Waller JL, Jackson KL, Addy CL. Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *J Am Acad Child Adolesc Psychiatry.* 1998; 37:612–619. [PubMed: 9628081]
12. Neeleman J, de Graaf R, Vollebergh W. The suicidal process; prospective comparison between early and later stages. *J Affect Disord.* 2004; 82:43–52. [PubMed: 15465575]
13. Yen S, Pagano ME, Shea MT, Grilo CM, Gunderson JG, Skodol AE, et al. Recent life events preceding suicide attempts in a personality disorder sample: findings from the collaborative longitudinal personality disorders study. *J Consult Clin Psychol.* 2005; 73:99–105. [PubMed: 15709836]
14. Oquendo MA, Galfalvy H, Russo S, Ellis SP, Grunebaum MF, Burke A, et al. Prospective study of clinical predictors of suicidal acts after a major depressive episode in patients with major depressive disorder or bipolar disorder. *Am J Psychiatry.* 2004; 161:1433–1441. [PubMed: 15285970]
15. Oquendo MA, Kamali M, Ellis SP, Grunebaum MF, Malone KM, Brodsky BS, et al. Adequacy of antidepressant treatment after discharge and the occurrence of suicidal acts in major depression: a prospective study. *Am J Psychiatry.* 2002; 159:1746–1751. [PubMed: 12359682]
16. Sokero TP, Melartin TK, Rytsala HJ, Leskela US, Lestela-Mielonen PS, Isometsa ET. Prospective study of risk factors for attempted suicide among patients with DSM-IV major depressive disorder. *Br J Psychiatry.* 2005; 186:314–318. [PubMed: 15802688]
17. Valtonen HM, Suominen K, Haukka J, Mantere O, Leppamaki S, Arvilommi P, et al. Differences in incidence of suicide attempts during phases of bipolar I and II disorders. *Bipolar Disord.* 2008; 10:588–596. [PubMed: 18657243]
18. Riihimaki K, Vuorilehto M, Melartin T, Haukka J, Isometsa E. Incidence and predictors of suicide attempts among primary-care patients with depressive disorders: a 5-year prospective study. *Psychol Med.* 2013:1–12.

19. Oquendo MA, Bongiovi-Garcia ME, Galfalvy H, Goldberg PH, Grunebaum MF, Burke AK, et al. Sex differences in clinical predictors of suicidal acts after major depression: a prospective study. *Am J Psychiatry*. 2007; 164:134–141. [PubMed: 17202555]
20. Mann JJ, Waternaux C, Haas GL, Malone KM. Toward a clinical model of suicidal behavior in psychiatric patients. *Am J Psychiatry*. 1999; 156:181–189. [PubMed: 9989552]
21. Oldham JM. Borderline personality disorder and suicidality. *Am J Psychiatry*. 2006; 163:20–26. [PubMed: 16390884]
22. Leichsenring F, Leibing E, Kruse J, New AS, Leweke F. Borderline personality disorder. *Lancet*. 2011; 377:74–84. [PubMed: 21195251]
23. Spitzer, RL.; Williams, JBW. Biometrics Research. New York: New York State Psychiatric Institute; 1985. Structured Clinical Interview for DSMIII-R—Patient Version (SCID-P).
24. Loranger AW, Sartorius N, Andreoli A, Berger P, Buchheim P, Channabasavanna SM, et al. The International Personality Disorder Examination. The World Health Organization/Alcohol, Drug Abuse, and Mental Health Administration international pilot study of personality disorders. *Arch Gen Psychiatry*. 1994; 51:215–224. [PubMed: 8122958]
25. First, MB.; Gibbon, M.; Spitzer, RL.; Williams, JB. Biometrics Research. New York: New York Psychiatric Institute; 1996. Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II), version 2.
26. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960; 23:56–62. [PubMed: 14399272]
27. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961; 4:561–571. [PubMed: 13688369]
28. Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the hopelessness scale. *J Consult Clin Psychol*. 1974; 42:861–865. [PubMed: 4436473]
29. Brown GL, Goodwin FK, Ballenger JC, Goyer PF, Major LF. Aggression in humans correlates with cerebrospinal fluid amine metabolites. *Psychiatry Res*. 1979; 1:131–139. [PubMed: 95232]
30. Buss AH, Durkee A. An inventory for assessing different kinds of hostility. *J Consult Psychol*. 1957; 21:343–349. [PubMed: 13463189]
31. Barratt ES. Factor Analysis of Some Psychometric Measures of Impulsiveness and Anxiety. *Psychol Rep*. 1965; 16:547–554. [PubMed: 14285869]
32. Linehan MM, Goodstein JL, Nielsen SL, Chiles JA. Reasons for staying alive when you are thinking of killing yourself: the reasons for living inventory. *J Consult Clin Psychol*. 1983; 51:276–286. [PubMed: 6841772]
33. Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the Scale for Suicide Ideation. *J Consult Clin Psychol*. 1979; 47:343–352. [PubMed: 469082]
34. Miller MA, Rahe RH. Life changes scaling for the 1990s. *J Psychosom Res*. 1997; 43:279–292. [PubMed: 9304554]
35. Rahe RH. Epidemiological studies of life change and illness. *Int J Psychiatry Med*. 1975; 6:133–146. [PubMed: 773851]
36. Paykel ES. Methodological aspects of life events research. *J Psychosom Res*. 1983; 27:341–352. [PubMed: 6668560]
37. O'Carroll PW, Berman AL, Maris RW, Moscicki EK, Tanney BL, Silverman MM. Beyond the Tower of Babel: a nomenclature for suicidology. *Suicide Life Threat Behav*. 1996; 26:237–252. [PubMed: 8897663]
38. Reducing Suicide: A National Imperative. The National Academies Press; 2002.
39. Oquendo, MA.; Halberstam, B.; Mann, JJ. Risk Factors for Suicidal Behavior: The Utility and Limitations of Research Instruments. In: First, MB., editor. *Standardized Evaluation in Clinical Practice*. American Psychiatric Publishing; 2003. p. 103-130.
40. Posner K, Oquendo MA, Gould M, Stanley B, Davies M. Columbia Classification Algorithm of Suicide Assessment (C-CASA): classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *Am J Psychiatry*. 2007; 164:1035–1043. [PubMed: 17606655]
41. Posner K, Brown GK, Stanley B, Brent DA, Yershova KV, Oquendo MA, et al. The Columbia-Suicide Severity Rating Scale: initial validity and internal consistency findings from three

- multisite studies with adolescents and adults. *Am J Psychiatry*. 2011; 168:1266–1277. [PubMed: 22193671]
42. Andersen PaG R. Cox's regression model for counting processes, a large sample study. *Annals of Statistics*. 1982; 10:1100–1120.
 43. Liu RT, Alloy LB. Stress generation in depression: A systematic review of the empirical literature and recommendations for future study. *Clin Psychol Rev*. 2010; 30:582–593. [PubMed: 20478648]
 44. Zanarini MC, Frankenburg FR. The essential nature of borderline psychopathology. *J Pers Disord*. 2007; 21:518–535. [PubMed: 17953504]
 45. New AS, Aan Het Rot M, Ripoll LH, Perez-Rodriguez MM, Lazarus S, Zipursky E, et al. Empathy and alexithymia in borderline personality disorder: clinical and laboratory measures. *J Pers Disord*. 2012; 26:660–675. [PubMed: 23013336]
 46. Cooper J, Appleby L, Amos T. Life events preceding suicide by young people. *Social Psychiatry and Psychiatric Epidemiology*. 2002; 37:271–275. [PubMed: 12111032]
 47. Mazza JJ, Reynolds WM. A longitudinal investigation of depression, hopelessness, social support, and major and minor life events and their relation to suicidal ideation in adolescents. *Suicide Life Threat Behav*. 1998; 28:358–374. [PubMed: 9894304]
 48. Chang HJ, Yang CY, Lin CR, Ku YL, Lee MB. Determinants of suicidal ideation in Taiwanese urban adolescents. *J Formos Med Assoc*. 2008; 107:156–164. [PubMed: 18285248]
 49. Lapiere S, Boyer R, Desjardins S, Dube M, Lorrain D, Preville M, et al. Daily hassles, physical illness, and sleep problems in older adults with wishes to die. *Int Psychogeriatr*. 2012; 24:243–252. [PubMed: 21843401]
 50. Joiner TE Jr, Van Orden KA, Witte TK, Selby EA, Ribeiro JD, Lewis R, et al. Main predictions of the interpersonal-psychological theory of suicidal behavior: empirical tests in two samples of young adults. *J Abnorm Psychol*. 2009; 118:634–646. [PubMed: 19685959]
 51. Oquendo MA, Ellis SP, Greenwald S, Malone KM, Weissman MM, Mann JJ. Ethnic and sex differences in suicide rates relative to major depression in the United States. *Am J Psychiatry*. 2001; 158:1652–1658. [PubMed: 11578998]
 52. Blasco-Fontecilla H, Baca-Garcia E, Duberstein P, Perez-Rodriguez MM, Dervic K, Saiz-Ruiz J, et al. An exploratory study of the relationship between diverse life events and specific personality disorders in a sample of suicide attempters. *J Pers Disord*. 2010; 24:773–784. [PubMed: 21158599]
 53. APA. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. American Psychiatric Association; Washington, D.C.: 2013.
 54. Yen S, Shea MT, Battle CL, Johnson DM, Zlotnick C, Dolan-Sewell R, et al. Traumatic exposure and posttraumatic stress disorder in borderline, schizotypal, avoidant, and obsessive-compulsive personality disorders: findings from the collaborative longitudinal personality disorders study. *J Nerv Ment Dis*. 2002; 190:510–518. [PubMed: 12193835]
 55. Fang F, Fall K, Mittleman MA, Soren P, Ye W, Adami HO, et al. Suicide and cardiovascular death after a cancer diagnosis. *N Engl J Med*. 2012; 366:1310–1318. [PubMed: 22475594]
 56. Scott KM, Hwang I, Chiu WT, Kessler RC, Sampson NA, Angermeyer M, et al. Chronic physical conditions and their association with first onset of suicidal behavior in the world mental health surveys. *Psychosom Med*. 2010; 72:712–719. [PubMed: 20498290]
 57. Woo JM, Postolache TT. The impact of work environment on mood disorders and suicide: Evidence and implications. *Int J Disabil Hum Dev*. 2008; 7:185–200. [PubMed: 18836547]
 58. Beck AT, Brown GK, Steer RA, Dahlsgaard KK, Grisham JR. Suicide ideation at its worst point: a predictor of eventual suicide in psychiatric outpatients. *Suicide Life Threat Behav*. 1999; 29:1–9. [PubMed: 10322616]
 59. Lizardi D, Currier D, Galfalvy H, Sher L, Burke A, Mann J, et al. Perceived reasons for living at index hospitalization and future suicide attempt. *J Nerv Ment Dis*. 2007; 195:451–455. [PubMed: 17502812]
 60. Beck AT, Steer RA, Beck JS, Newman CF. Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide Life Threat Behav*. 1993; 23:139–145. [PubMed: 8342213]

61. David Klonsky E, Kotov R, Bakst S, Rabinowitz J, Bromet EJ. Hopelessness as a predictor of attempted suicide among first admission patients with psychosis: a 10-year cohort study. *Suicide Life Threat Behav.* 2012; 42:1–10. [PubMed: 22320192]
62. Links P, Nisenbaum R, Ambreen M, Balderson K, Bergmans Y, Eynan R, et al. Prospective study of risk factors for increased suicide ideation and behavior following recent discharge. *Gen Hosp Psychiatry.* 2012; 34:88–97. [PubMed: 21997244]
63. Raphael KG, Cloitre M, Dohrenwend BP. Problems of recall and misclassification with checklist methods of measuring stressful life events. *Health Psychol.* 1991; 10:62–74. [PubMed: 2026132]
64. Paykel ES. Life events and affective disorders. *Acta Psychiatr Scand Suppl.* 2003:61–66. [PubMed: 12956817]
65. Brown, GW.; Harris, TO. *Social origins of depression.* Tavistock; London: 1978.
66. Paykel ES. The Interview for Recent Life Events. *Psychol Med.* 1997; 27:301–310. [PubMed: 9089823]
67. Hintikka J, Koivumaa-Honkanen H, Lehto SM, Tolmunen T, Honkalampi K, Haatainen K, et al. Are factors associated with suicidal ideation true risk factors? A 3-year prospective follow-up study in a general population. *Soc Psychiatry Psychiatr Epidemiol.* 2009; 44:29–33. [PubMed: 18600285]
68. McEwen BS. Mood disorders and allostatic load. *Biol Psychiatry.* 2003; 54:200–207. [PubMed: 12893096]
69. Gibbons RD, Brown CH, Hur K, Davis J, Mann JJ. Suicidal thoughts and behavior with antidepressant treatment: reanalysis of the randomized placebo-controlled studies of fluoxetine and venlafaxine. *Arch Gen Psychiatry.* 2012; 69:580–587. [PubMed: 22309973]

Table 1
Baseline Descriptive Statistics (N=415)

Variables	N	Percent
% Female	240/415	57.8%
Childhood abuse (%)	177/384	46.1%
Currently employed (%)	148/415	35.7%
Childhood Separation under 15 (%)	145/411	35.3%
Comorbid past substance abuse (%)	171/415	41.2%
Cigarette Smoking (%)	141/413	34.1%
Borderline Personality Disorder	113/414	27.3%
MDD vs. Bipolar Disorder	294/415	70.8%
		MEAN ± SD
Age (yr)	415	38.1±11.8
Number of MDE	395	12.0±24.6
Hamilton Depression Rating Scale	414	19.7±5.7
St. Paul-Ramsey Questionnaire	405	1.9±0.76
<i>Aggression/Impulsivity</i>		
Brown-Goodwin History of Aggression	404	18.8±5.6
Buss-Durkee Hostility Inventory	367	36.0±11.9
Barratt Impulsivity Scale	357	52.8±16.5
<i>Depressive and suicidal cognitions</i>		
Beck Depression Inventory	413	27.1±11.2
Hopelessness Scale	410	12.0±5.8
Scale for Suicidal Ideation	379	12.2±10.4
Reasons for Living Scale	372	155.0±45.3

Table 2
Relative Weights of Life Events and Frequencies of Person-Months with a given Life Event in the Recent Life Changes Questionnaire listed by Domain

Item Number	Life Event	Weight (LCU)*	Number of Person-Months with Life event (N= 7843)	% of subjects with Life Event
Health				
	An injury or illness which: kept you in bed a week or more, or sent you to the hospital	74	667	28
1A [§] &				
1B	was less serious than above	44	600	41
2	Major change in eating habits	26	884	42
3 [§]	Major change in sleeping habits	27	873	41
1A [§] &	Major change in your usual type and/or amount of recreation	26	857	18
5	Major dental work	28	364	28
Work				
6	Change to a new type of work	51	851	41
7	Change in your work hours or conditions	35	827	39
	Change in your responsibilities at work:			
8A	more responsibilities	29	531	27
8B [§]	fewer responsibilities	21	199	11
8C [§]	promotion	31	113	7
8D [§]	demotion	42	71	4
8E	Transfer	32	16	1
	Troubles at work:			
9A [§]	with your boss	29	415	18
9B [§]	with coworkers	35	298	15
9C [§]	with persons under your supervision	35	92	5
9D [§]	other work troubles	28	376	18
10	Major business adjustment	60	143	9
11	Retirement	52	32	2

Item Number	Life Event	Weight (LCU)*	Number of Person-Months with Life event (N= 7843)	% of subjects with Life Event
	Loss of job:			
12A	laid off from work	68	184	9
12B	fired from work	79	135	9
13	Correspondence course to help you in your work	18	178	9
Home and family				
	Change in residence:			
14A	move within the same town or city	25	496	25
14B	move to a different town, city, or state	47	364	18
15	Change in family get-togethers	25	412	23
16	Major change in health or behavior of family member	55	653	32
17	Major change in living conditions	42	381	23
18	Death of spouse	119	26	2
	Death of other family member:			
19A	Child	123	13	1
19B	brother or sister	102	32	2
19C	Parent	100	72	5
19D	other close family member	100	239	14
20 [§]	Death of a close friend	70	164	11
	Change in the marital status of your parents:			
21A	Divorce	59	43	3
21B	remarriage	50	39	3
22	Marriage	50	41	3
23	Change in arguments with spouse	50	243	14
24	In-law problems	38	93	5
	Separation from spouse:			
25A	due to work	53	47	3
25B ^{&}	due to marital problems	76	136	7
26	Reconciliation with a spouse	45	63	4
27	Divorce	96	85	4

Item Number	Life Event	Weight (LCU)*	Number of Person-Months with Life event (N= 7843)	% of subjects with Life Event
	Gain of a new family member:			
28A	birth of a child	66	61	4
28B	adoption of a child	65	15	1
28C	a relative moving in with you	59	76	4
29	Spouse beginning or ending work	46	63	4
30	Pregnancy	67	26	2
	Child leaving home:			
31A	to attend college	41	27	2
31B	due to marriage	41	28	2
31C	for other reasons	45	66	4
32 ^{\$}	Miscarriage or abortion	65	23	2
33	Birth of grandchild	43	58	4
Personal and social				
34	Major personal achievement	36	559	31
35	Change in personal habits	26	695	34
36	Sexual difficulties	44	746	29
37	Beginning or ending school or college	38	357	20
38	Change of school or college	35	108	6
39	Vacation	24	550	28
40	Change in religious beliefs	29	147	8
41	Change in social activities	27	671	33
42 ^{\$}	Minor violation of the law	20	200	12
43	Being held in jail	75	46	3
44 ^{\$}	Change in political beliefs	24	86	5
45	New, close, personal relationship	37	514	28
46	Engagement to marry	45	66	5
47	Falling out of a close personal relationship	47	632	32
48	Girlfriend or boyfriend problems	39	602	24
49	Loss or damage to personal property	43	196	11

Item Number	Life Event	Weight (LCU)*	Number of Person-Months with Life event (N= 7843)	% of subjects with Life Event
50	An accident	48	157	9
51	Major decision regarding your immediate future	51	657	32
Financial				
52	Moderate purchase	20	497	27
53	Major purchase	37	147	9
54	Foreclosure on a mortgage or loan	58	30	2
	Major change in finances:			
55A	increased income	38	356	19
55B	decreased income	60	916	41
55C	investment and/or credit difficulties	56	380	18

* LCU= life change units

§ Significantly associated with suicide attempt risk in depressed patients without BPD

& Significantly associated with suicide attempt risk in depressed patients with BPD

Table 3
Frequency of Life Events assessed with the Recent Life Changes Questionnaire, Major Depressive Episode and Suicide or Suicide Attempt during 2-year follow up period (N=415 subjects, n=7,843 person-months)

Life Events	% subjects with life event during 2-year follow up		% person-months with life Events			P value
	No BPD	BPD	No BPD	BPD	T * (df=411)	
Health	75%	84%	29%	37%	2.65	0.0084
Work-related	64%	70%	24%	29%	1.94	0.0527
Home and Family	73%	84%	29%	34%	1.88	0.0608
Personal/Social	85%	84%	39%	48%	2.59	0.0098
Financial	66%	62%	25%	22%	-1.10	0.2723
Any kind of event	97%	100%	68%	75%	2.69	0.0075
MDE	69%	74%	30%	33%	1.23	0.2201
Suicidal Behavior	7%	18%	0.6%	1.8%	4.52	<0.0001

* Comparisons by BPD diagnosis were tested with marginal logistic regression models

Table 4
Predictors of Suicides and Suicide Attempts during a 2 year follow up period

Predictor variables	Current Month Predictors*			Prior Month Predictors*			p-value
	OR	95% Confidence Interval	p-value	OR	95% Confidence Interval	p-value	
Total Sample							
MDE	4.83*	2.84	8.23	2.40*	1.46	3.94	0.0006
RLCQ**	1.06*	0.94	1.20	1.01*	0.87	1.18	0.8914
Aggression/hostility 1	1.19	0.93	1.53	1.25	0.97	1.61	0.0802
Aggression/hostility 2	1.09	0.85	1.39	1.11	0.87	1.43	0.4052
Depressive cognitions	1.21	0.92	1.59	1.23	0.92	1.62	0.1692
Suicide cognitions	1.49	1.11	2.00	1.51	1.12	2.02	0.0071
Age	0.98	0.95	1.00	0.98	0.95	1.00	0.1114
Female	2.40	1.28	4.51	2.47	1.31	4.66	0.0055
# Months***	1.01	0.98	1.04	1.01	0.98	1.04	0.6445
Depressed patients, no BPD							
MDE	13.19*	4.52	38.51	9.39*	3.60	24.52	0.0001
RLCQ**	1.33*	1.03	1.72	1.21*	1.06	1.38	0.005
Aggression/hostility 1	1.15	0.77	1.74	1.31	0.88	1.96	0.182
Aggression/hostility 2	0.93	0.64	1.35	0.97	0.68	1.40	0.889
Depressive cognitions	1.20	0.80	1.78	1.23	0.82	1.84	0.315
Suicide cognitions	1.90	1.20	3.02	1.84	1.17	2.91	0.009
Age	0.99	0.95	1.02	0.98	0.95	1.02	0.394
Female	3.00	1.22	7.69	2.86	1.18	7.14	0.0211
# Months***	1.01	0.96	1.06	1.01	0.96	1.06	0.694
Depressed patients with BPD							
MDE	3.03*	1.46	6.30	1.04*	0.49	2.22	0.916
RLCQ total**	0.76*	0.55	1.06	0.66*	0.46	0.97	0.035
Aggression/hostility 1	0.95	0.64	1.42	0.99	0.68	1.46	0.977

	Current Month Predictors*				Prior Month Predictors*			
Aggression/hostility 2	1.08	0.74	1.58	0.682	1.10	0.76	1.60	0.606
Depressive cognitions	1.16	0.75	1.80	0.515	1.16	0.74	1.82	0.525
Suicide cognitions	1.06	0.70	1.60	0.793	1.16	0.76	1.76	0.480
Age	0.99	0.95	1.03	0.482	1.00	0.96	1.04	0.859
Female	1.02	0.38	2.70	0.9759	1.18	0.44	3.23	0.747
# Months ***	1.00	0.98	1.05	0.933	1.00	0.95	1.05	0.968

* Time varying predictors only: MDE and RLCQ

** OR was reported for 100 life change units increase of the total score.

*** variable accounts for the passage of time

MDE=Major Depressive Episode, RLCQ=Recent Life Changes Questionnaire (weighted score in life change units)

Table 5

Effect of Health and Work Life Event Domain Score (Recent Life Changes Questionnaire) as Risk Factors for Suicide and Suicide Attempt adjusted for other predictors. Model restricted to patients without Borderline Personality Disorder.

Predictor variables	Current Month Predictors*			Prior Month Predictors*			p-value	
	OR	95%CI	p-value	OR	95%CI	p-value		
MDE	12.80	4.16	39.32	< 0.0001	8.68	3.54	21.25	0.0001
Health RLCQ score **	2.78	1.39	5.57	0.0039	2.60	1.38	4.89	0.0031
Aggression/hostility 1	1.18	0.76	1.83	0.4643	1.31	0.89	1.93	0.1677
Aggression/hostility 2	0.96	0.66	1.41	0.8382	0.97	0.69	1.36	0.8496
Depressive cognitions	1.20	0.79	1.84	0.3897	1.22	0.84	1.78	0.2973
Suicidal cognitions	1.91	1.17	3.12	0.0099	1.81	1.17	2.78	0.0077
Age	0.99	0.95	1.03	0.4846	0.98	0.95	1.02	0.3274
Female	3.00	1.14	8.33	0.0268	2.94	1.27	7.14	0.0133
~Months***	1.01	0.96	1.06	0.6846	1.01	0.97	1.06	0.5845
MDE	13.85	4.40	43.67	< 0.0001	9.46	3.52	25.41	0.0001
Work RLCQ score ***	2.14	1.36	3.35	0.0010	2.11	1.38	3.23	0.0006
Aggression/hostility 1	1.20	0.78	1.85	0.4165	1.33	0.88	2.00	0.1782
Aggression/hostility 2	0.94	0.64	1.38	0.7699	0.95	0.66	1.37	0.7912
Depressive cognitions	1.19	0.78	1.81	0.4303	1.20	0.80	1.80	0.3856
Suicidal cognitions	2.08	1.24	3.50	0.0060	1.98	1.21	3.24	0.0072
Age	0.99	0.95	1.03	0.5815	0.99	0.95	1.02	0.4529
Female	3.00	1.10	8.33	0.0322	2.94	1.15	7.69	0.0257
#Months***	1.00	0.95	1.06	0.9118	1.01	0.96	1.06	0.8174

* Time varying variables only: MDE and RLCQ

** OR and 95%CI computed for 100 points increase in life event change units

*** variable accounts for the passage of time

MDE=Major Depressive Episode

RLCQ=Recent Life Changes Questionnaire sub-score in life change units or item presence (yes/no)