

Risk of Suicide Ideation Associated with Problem-Solving Ability and Attitudes Toward Suicidal Behavior in University Students

Carmel McAuliffe, Paul Corcoran, Helen S. Keeley, and Ivan J. Perry

National Suicide Research Foundation, Cork, Ireland

Summary: The present paper investigates the risk of lifetime suicide ideation associated with problem-solving ability and attitudes toward suicidal behavior in a sample of 328 university students (41% male, 59% female). The response rate was 77% based on the total number of students registered for the relevant courses. A series of questions assessed lifetime suicide ideation, while problem solving and attitudes toward suicide were measured using the Self-Rating Problem Solving scale and four subscales of the Suicide Opinion Questionnaire, respectively (McLeavey, 1986; Domino et al., 1989). Almost one-third of the students surveyed had lifetime suicide ideation. Both genders were similar in terms of their suicide ideation history, problem solving, and attitudes toward suicidal behavior with the exception that male students were more in agreement with the attitude that suicidal behavior lacks real intent. Compared with 2% of nonideators and ideators, one in four planners reported that they would more than likely attempt suicide at some point in their life. Greater agreement with the attitude that suicidal behavior is normal was associated with significantly increased risk of being an ideator, as was poor problem solving and less agreement with the attitude that suicidal behavior is associated with mental illness.

Keywords: Suicide ideation, problem solving, attitudes

Introduction

Suicide ideation, defined as plans and wishes to commit suicide and as self-reported thoughts of engaging in suicide-related behavior, is common in young people (Beck et al., 1979; O'Carroll et al., 1996). In a literature review of surveys of young people in Western countries, lifetime prevalence of suicide ideation ranged from 8.9% to 64.8% (Bille-Brahe, 1997). The rates reported depend on how ideation is operationalized. This is well illustrated in a classic general population survey which found a step-wise reduction in rates with increased intensity of suicidal feelings, ranging from the feeling that life was not worth living (11.5%) to making an attempt to take one's life (1.1%) (Paykel et al., 1974). In an earlier general population survey, 15.9% of the sample reported that they had thought of

suicide at least once in their lifetime (Schwab et al., 1972). Similarly, in a national comorbidity study in the US, an estimated lifetime prevalence of suicide ideation was calculated at 13.5%, but with additional estimates of suicide plans at 3.9%, and suicide attempts at 4.6% (Kessler et al., 1999). In a nationally representative sample of undergraduate college students in the US, 10% of students had seriously considered attempting suicide during the twelve months preceding the survey, while 7% of respondents had made a suicide attempt (Brener et al., 1999). An Australian study of 1,678 university students also found a 7% prevalence rate of attempted suicide although 62% of the students surveyed showed some suicidal ideation (Schweitzer et al., 1995).

Most suicides have had suicide ideation (Leonard & Flinn, 1972). In a psychological autopsy study of adolescent suicides in Finland, 60% of adolescent suicides had

verbally expressed suicidal ideas (Marttunen et al., 1992). In a similar study in the US, 82% of adolescent suicides with a psychiatric disorder showed evidence of suicide ideation in the week before death (Brent et al., 1993). This is significant, given that the vast majority of suicides have a psychiatric disorder (Dorpat & Ripley, 1960; Barraclough et al., 1974; Foster et al., 1997; Appleby et al., 1999; Kelleher et al., 2000). Furthermore, a report from the National Comorbidity Survey in the US indicates that 34.7% of lifetime suicide ideators make a suicide attempt (Kessler et al., 1999). For these reasons, enquiring about suicide ideation has become a mandatory part of psychiatric consultations (Carson et al., 2000).

Since suicide ideation is relatively common and suicide a rare event, there is a need to identify factors that will distinguish those ideators at high risk of suicidal behavior. There is epidemiological evidence that among those who consider suicide (ideators), individuals who have formulated a plan of self-harm are at greater risk (Lewinsohn et al., 1996; Kessler et al., 1999). A nationally representative survey in the US of 5877 respondents aged 15 to 54 years reported cumulative probabilities of 72% for the transition from suicide plan to an attempt, in comparison with 26% for the transition from suicide ideation to an unplanned attempt (Kessler et al., 1999). The implications of these findings for prevention are that suicide ideators are an important risk group and that identification of planners—those ideators most likely to attempt or die by suicide—is a clinical priority (Bagley, 1975).

Few studies have compared suicide ideators and nonideators in relation to problem-solving ability or attitudes toward suicide. Poorer problem solving and more positive attitudes toward suicide have been found in suicidal psychiatric patients when compared with nonsuicidal patients (Linehan et al., 1987). Similarly, suicidal psychiatric patients have poorer problem solving when compared with nonsuicide ideating controls (Schotte & Clum, 1987). However, the findings of these clinical studies may be confounded by the presence of a significant proportion of suicide attempters in the suicidal group. In the former study, approximately half of the “suicidal” patients had been admitted for current parasuicide, while in the latter the criteria for suicidality included unstandardized assignment to suicidal observation status, including self-injurious behavior, attempts at self-injurious behavior, suicide threats, and expressed suicide ideation (Schotte & Clum, 1987).

In one study of college students, there were no significant differences in cognitive rigidity or problem-solving skills when suicide ideators and nonideators were compared (Schotte & Clum, 1982). However suicide ideation has been found to correlate positively with the number of perceived problems in a sample of US college students (Mraz & Runco, 1994). Suicide ideators in a sample of Israeli adolescent military draftees were distinguished by positive attitudes toward suicide (Stein et al., 1998). In a study of university undergraduates, suicide ideators were less inclined than nonideators to believe that suicide at-

tempters are mentally ill or show loss of control (Limbacher & Domino, 1986). In these nonclinical studies, the presence of planners, rather than suicide attempters, in the ideator group may be a source of confounding influence.

The present paper establishes the prevalence of lifetime suicide ideation in a university student sample and its association with problem-solving ability and attitudes toward suicidal behavior.

Method

Subjects

Ethical approval for this study was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals, as part of a larger research protocol. Permission was obtained from the Registrar at University College, Cork, Ireland, to carry out the study. Directly prior to measurement, the relevant lecturer informed students that they were going to be asked to complete a questionnaire. It was explained to the students that the purpose of the study was to examine attitudes toward suicide and health-related issues, and that strict anonymity would be maintained throughout the study. Following informed consent from students, measurement was carried out during the current lecture period. Administrators were present throughout each session to answer queries and to collect the questionnaires at the end of the session. Contact telephone numbers were displayed for both the principal researcher (CMcA) and a senior registrar in psychiatry (HK) specializing in suicide research and bereavement counseling.

In total, 328 students from five faculties participated in the study. The overall response rate, based on the total number of students registered for the relevant courses, was 77%. This is an underestimate, as it does not allow for registered students who did not attend the lecture.

Measures

The schedule of assessments used was developed specifically for the present study and comprised four self-report sections measuring: demographic information, attitudes toward suicidal behavior, participants' own lifetime history of suicide ideation and behavior, and their problem-solving ability.

Attitudes toward suicide were measured using four factorially-derived scales from the Suicide Opinion Questionnaire (SOQ). These included the Mental Illness, Normality, Right to Die, and Cry for Help scales. The Mental Illness scale measures the attitude that people who engage in suicidal behavior suffer from mental illness or associated risk factors. The Normality scale contains items addressing the normality of suicidal behavior, and whether anyone might engage in it at some point in their lifetime. The Right to

Die scale examines attitudes toward peoples' right to die in certain circumstances. The Cry for Help scale examines attitudes toward suicidal behavior as something that is not motivated by any serious intent to die. The four scales combined comprise 40 items with a five-point Likert-type response format ("strongly agree" to "strongly disagree"). Assessing the reliability of the SOQ scales by measuring their internal reliability using Cronbach's α may be inappropriate, as the SOQ clinical scales deliberately measure a heterogeneous set of attitudes and opinions about suicide. Test-retest reliability coefficients have been advocated as an alternative (Domino, 1996). This was carried out in the present study based on follow-up interviews of 58 students, while reliability analysis based on Cronbach's α was carried out for the total sample.

Habitual problem solving was measured using the Self-Rating Problem Solving Scale (SRPS; McLeavey, 1986). Items measure respondents' feelings and reactions to their everyday interpersonal problems, problem-solving strategies, and self-evaluation of problem-solving ability. It consists of twenty-five items, with a five-point Likert scale.

Lifetime history of suicide ideation was examined by asking participants the following questions: "Have you ever considered suicide?", "Did these thoughts include a fairly detailed plan?", and "Have you ever attempted suicide?" using a yes/no response format. Lifetime ideation was operationalized as three mutually exclusive categories:

1. Nonideators were respondents who reported never having considered or attempted suicide at any point in their lifetime;
2. Ideators without a plan were respondents who reported having considered suicide at some point in their lifetime but never having made a plan or an attempt;
3. Planners were ideators whose ideation included a detailed plan.

Students with a history of suicide ideation were asked to indicate the severity of these thoughts using a visual analog scale ranging from "trivial" to "very serious." Responses were scored within the numeric range 1–7. All students were asked to answer: "What is the probability that at some point in your life you might attempt suicide?", and responses were collapsed into the following: *Zero*, *Less than 10%*, *50–50*, and *More likely than not*. The 209 students surveyed in the Commerce and Law lectures were asked whether they had suicide ideation in the past month and past year.

Statistical Analyses

Reliability analysis was carried out on the various scales utilizing Cronbach's α as the measurement of internal consistency. The test-retest reliability analysis of the scales involved correlation analysis to assess the strength of the

linear relationship between the scale scores at test and re-test.

Various descriptive statistics were calculated. For prevalence rates, 95% confidence intervals were calculated. Chi-square tests were utilized to assess the significance of the association between two categorical variables, while correlation analysis, used to assess the strength of the linear association between two continuous variables, involved the calculation and significance testing of Pearson's Correlation Coefficient, except for nonnormal data where Spearman's rank correlation coefficient was used.

Student's *t*-test was used in testing the significance of differences between two groups in relation to continuous variables except if data was nonnormal and then the non-parametric Mann-Whitney U-test was used. Analysis of variance (ANOVA) was used to assess the effects of gender, ideation, and their interaction on the scores on the SRPS scale and the four SOQ subscales.

Separate hierarchical logistic regression analyses, one for the SRPS scale and for each of the SOQ sub-scales, were carried out to predict the presence of lifetime suicide ideation in the students using sex, age, and ethnicity in the first block of predictor variables and one of the scales in the second block. One final hierarchical logistic regression analysis was carried out, differing from the above in that all scales were included in the model. Wald statistics and their significance, as well as odds ratios with 95% confidence intervals, were calculated.

Results

Sample

The sample of 328 students was made up of 119 Physiology students (Medicine, Dentistry, and Science faculties), 109 commerce students, and 100 law students. There were 134 (41%) males and 194 (59%) females. The mean age was 19.6 years ($SD = 2.2$ years) with a modal age of 19 years and a range from 17 to 38 years. The vast majority (297, 91%) was Irish. Half of the remaining 30 students were Malaysian, and one did not indicate a nationality.

Reliability

Descriptive and reliability statistics for the SRPS scale and SOQ subscales, based on the measurement of internal consistency using Cronbach's α , are provided in Table 1, which also details the test-retest correlations.

Over two-thirds (223, 68%) of the students had never considered suicide (nonideators), which gives a lifetime prevalence of suicide ideation of 32% (95% CI: 27–37%). One in four had a history of ideation without a plan (83, 26%), while 6.1% had engaged in ideation with a plan ($n = 20$; 95% CI: 3.5–8.7%). There was no difference in the

Table 1. Descriptive and reliability statistics for the SRPS scale and SOQ subscales.

Scale	<i>n</i>	Mean	<i>SD</i>	Range	Cronbach's α	Test-retest correlation*
SRPS	272	89.0	9.5	54–111	0.788	0.648
Mental illness	321	39.3	4.8	27– 55	0.563	0.674
Normality	321	18.3	3.9	7– 32	0.523	0.650
Right to die	321	19.9	4.9	8– 38	0.736	0.767
Cry for help	322	36.6	4.1	24– 48	0.419	0.587

* $p < .001$ (based on the analysis of follow-up data from 58 students).

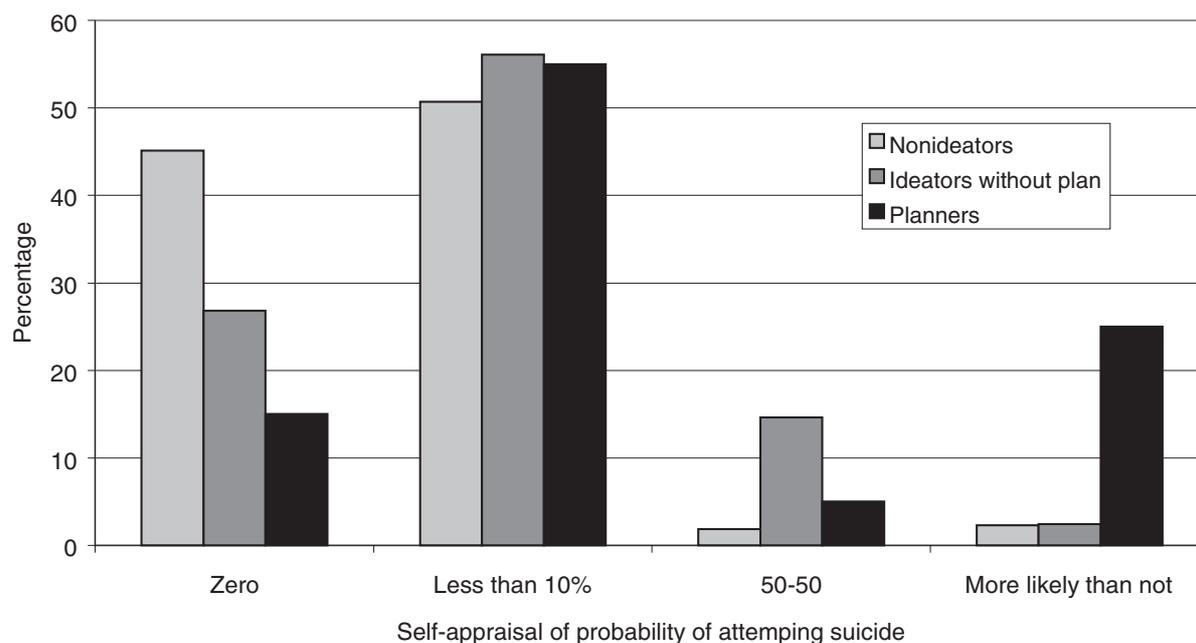


Figure 1. Self-appraisal of lifetime probability of attempting suicide by ideator group.

breakdown of students by ideator group for males and females. Five students, four of whom were female, had made a suicide attempt in the past, resulting in a lifetime prevalence of 1.5% (95% CI: 0.2–2.8%). All of the attempters indicated that their past ideation had included a detailed plan. The prevalence of suicide ideation in the past month and year were 1.9% (95% CI: 0.1–3.8%) and 10.0% (95% CI: 5.9–14.1%), respectively. Among ideators, those who had formulated a plan experienced significantly more severe ideation (median = 2.0, inter-quartile range = 1.5–3.0) than those who did not (median = 4.5, inter-quartile range = 3.1–5.4; Mann-Whitney $U = 265.5$, $p < .001$).

The majority of respondents (195, 62%) would not rule out a suicide attempt at some stage in their lifetime. The pattern of responses, obtained from a visual analog scale, varied significantly across the three ideator groups ($\chi^2 = 52.024$, $df = 6$, $p < .001$) (Figure 1). Almost half of the nonideators felt that there was no chance that they might at some time make a suicide attempt, whereas one-quarter of ideators without a plan and only one in seven planners indicated this to be the case. One in four planners felt that it was more likely than not that they would make an attempt at suicide in the future. Only 2% of nonideators and ideators without a plan gave this response.

Among ideators (with or without a plan), severity of suicide ideation correlated significantly and negatively with scores on the SRPS scale (Spearman's $r = -.316$, $p = .002$), and the Mental Illness (Spearman's $r = -.203$, $p = .039$) and Cry for Help (Spearman's $r = -.211$, $p = .031$) SOQ subscales. This indicates that the more severe the ideation, the poorer the problem solving and the lesser the agreement with the opinions that suicide is related to mental illness and that people engaging in suicidal behavior do not wish to die.

The results of an ANOVA comparing the effects of gender, ideation, and their interaction on the scores on the SRPS scale and the four SOQ subscales are summarized in Table 2. The only significant gender difference was in relation to the Cry for Help scale. Male students were more in agreement with the attitude that nonfatal suicidal behavior lacks real intent. However, the magnitude of this gender difference was small, as the mean score for males (mean = 37.27, $SD = 4.17$) was just 3.3% higher than for females (mean = 36.09, $SD = 3.97$). There was no significant interaction effect of gender and ideation on any of the scales. Ideators and nonideators differed highly significantly with respect to scores on the SRPS scale and the Normality and Right to Die SOQ subscales and significantly on the Mental

Table 2. ANOVA results comparing the effects of gender, ideation, and their interaction on the scores on the SRPS scale and the four SOQ subscales.

Scale	Effect	<i>F</i>	<i>df</i>	<i>p</i>
SRPS	Gender	1.339	1, 267	0.248
	Ideation	24.526	1, 267	<0.001
	Gender*Ideation	1.266	1, 267	0.261
Mental illness	Gender	1.197	1, 316	0.275
	Ideation	4.886	1, 316	0.028
	Gender*Ideation	1.291	1, 316	0.257
Normality	Gender	0.189	1, 316	0.664
	Ideation	82.083	1, 316	<0.001
	Gender*Ideation	0.312	1, 316	0.577
Right to die	Gender	0.005	1, 316	0.941
	Ideation	18.074	1, 316	<0.001
	Gender*Ideation	1.536	1, 316	0.216
Cry for help	Gender	6.526	1, 317	0.011
	Ideation	0.007	1, 317	0.936
	Gender*Ideation	0.195	1, 317	0.659

Note. Gender*Ideation represents the effect of the interaction of gender and ideation on the scale score.

Table 3. Results of hierarchical logistic regression analyses using the SRPS scale and four SOQ subscales to predict the presence of lifetime suicide ideation.

Scale	Odds ratio ¹	95% CI	Odds ratio ²	95% CI
SRPS	0.928	0.900–0.957	0.941	0.908–0.974
Mental illness	0.950	0.900–1.003	0.909	0.844–0.978
Normality	1.385	1.268–1.512	1.416	1.265–1.585
Right to die	1.113	1.054–1.175	0.991	0.917–1.070
Cry for help	1.003	0.944–1.066	1.056	0.972–1.147

¹Odds ratios are adjusted for sex, age, and ethnicity. ²Odds ratios are adjusted for sex, age, and ethnicity and the other scales.

Illness subscale. Ideators had poorer problem solving (−6.9%; ideator mean = 84.83, *SD* = 10.67 vs. nonideator mean = 91.13, *SD* = 8.10) and were more in agreement with the attitudes that suicidal behavior is normal (+22.3%; ideator mean = 20.87, *SD* = 3.71 vs. nonideator mean = 17.07, *SD* = 3.37) and that people have the right to die by suicide (+12.1%; ideator mean = 21.50, *SD* = 4.46 vs. Nonideator mean = 19.18, *SD* = 4.88). They were less in agreement with the attitude that suicidal behavior is associated with mental illness (−2.9%; ideator mean = 38.51, *SD* = 4.86 vs. nonideator mean = 39.66, *SD* = 4.71).

Planners' scores indicated that they had the poorest problem solving, were most in agreement with the attitudes that suicidal behavior is normal and that people have the right to die by suicide and least in agreement with the attitude that suicidal behavior is associated with mental illness. However, they did not differ significantly on any scale from those whose ideation did not include a plan (SRPS: $t = 1.175$, $df = 86$, $p = .243$; Mental Illness: $t = 0.784$, $df = 23$, $p = .441$; Normality: $t = -0.731$, $df = 23$, $p = .472$; Right to Die: $t = -0.479$, $df = 22$, $p = .637$; Cry for Help: $t = 0.915$, $df = 101$, $p = .362$). This was due to the magnitude of the differences rather than the small number of planners present ($n = 20$).

Table 3 summarizes the results of hierarchical logistic regression analyses carried out using the SRPS scale and each of the four SOQ subscales to predict the presence of lifetime suicide ideation. Adjusting for sex, age, and ethnicity, the odds of being an ideator were highly significantly associated with scores on the SRPS scale and the Normality and Right to Die SOQ subscales. The Mental Illness subscale failed to significantly affect these odds. The adjusted odds ratios from a final hierarchical logistic regression analysis, which included the SRPS scale and the four SOQ subscales in the model along with sex, age, and ethnicity, indicated that the experience of lifetime suicide ideation was significantly associated with Normality ($OR = 1.416$, 95% CI: 1.265–1.585), SRPS ($OR = 0.941$, 95% CI: 0.908–0.974), and Mental Illness ($OR = 0.909$, 95% CI: 0.844–0.978). The odds ratio associated with the Right to Die subscale was no longer significant when adjustment was made for the other scales. The model indicated that a unit increase on the Normality subscale was associated with a 42% increase in the odds of being an ideator. Similar increases on the SRPS scale and Mental Illness subscale were associated respectively with 6% and 9% decreases in the odds of being an ideator.

Discussion

The present study found the lifetime prevalence of suicide ideation among Irish university students to be 32%. Approximately one-in-five of the students with a history of suicide ideation had made a plan of self-harm and rated their ideation as significantly more severe. While lifetime history of attempted suicide was rare—indicating that suicide ideation is a low-risk common factor for attempted suicide—all attempters had ideation that included a fairly detailed plan, which suggests that ideation characterized by a plan may be a more important risk indicator. One-in-ten students reported that they had engaged in suicide ideation during the past year. The fact that a significant proportion of this student body had considered suicide has important service implications for university and college administrators.

While it is difficult to extrapolate from thoughts of self-harm to overt self-harm, it was possible to assess students' subjective estimates of the probability of personally attempting suicide in the future. These self-reported estimates—using a visual analog scale—provided further evidence of the importance of planning in attempted suicide. While just under half of the students ruled out making a suicide attempt, one in four planners said that it was actually more likely than not that they would attempt suicide, in comparison with negligible proportions of ideators without a plan and nonideators.

Ideators (with or without a plan) had significantly poorer problem-solving scores than nonideators, and agreed more with the attitude that suicidal behavior is normal and that people have the right to die. They were significantly less in agreement with the attitude that suicidal behavior is associated with mental illness. Ideators who reported greater severity of lifetime suicide ideation had poorer problem-solving scores and were more likely to disagree with the attitude that suicidal behavior is associated with mental illness and that it lacks suicide intent. These findings provide tentative evidence that—at an attitudinal level—beliefs about the normality of suicidal behavior may be more important in determining whether an individual *ever* engages in suicide ideation, while beliefs about the relationship of mental illness and suicidal intent with suicidal behavior have more significant associations with the *severity* of suicide ideation. Assessment of the severity of lifetime suicide ideation at its worst point has already been used to identify a subgroup of psychiatric outpatients at relatively high risk for eventual suicide (Beck et al., 1999). The present findings indicate that, as a group, ideators have an attitudinal and problem-solving profile that is distinct from nonideators and that ideators who rate their suicide ideation more seriously tend to have more tolerant attitudes toward suicidal behavior and poorer problem-solving skills.

While the planners had the poorest problem solving, were most in agreement with the attitudes that suicidal behavior is normal and that people have the right to die, and least in agreement with the attitude that suicidal behavior

is associated with mental illness, the small magnitude of the differences meant that they were not significant. Thus, the significant differences between ideators and nonideators were not confounded by the presence of planners in the ideator group. Planners may differ on other characteristics that were not examined in the present study. The only gender difference identified on any of the scales was in responses to the Cry for Help scale. Males were significantly more in agreement with the attitude that suicidal behavior lacks suicide intent. Although the actual magnitude of this difference was small, it may have important behavioral implications. In two earlier surveys of a college student population, disbelief in the seriousness of suicidal intent of a friend was the attitude that best differentiated males from females (Wellman & Wellman, 1986). In one of the surveys, males indicated that they would go so far as to deny the suicidal feelings of a friend, i.e., by believing that the friend was only joking about suicide.

The logistic regression analyses showed that after adjusting for age, sex, and ethnicity, greater agreement with the attitude that suicidal behavior is normal was associated with significantly increased risk of being an ideator, as were poor problem solving and less agreement with the attitude that suicidal behavior is associated with mental illness.

There is a fundamental dilemma in relating attitudes concerning suicide to suicidal behavior and this is part of the wider problem that attitudes are not always directly related to behavior. The more tolerant attitudes observed among ideators (with or without a plan) and in particular the attitude that suicidal behavior is normal, implies that ideators consider suicidal behavior as an option for themselves. However, the behavioral implications of this are less clear. In comparison with parasuicides, suicide ideators have been found to rate more highly the efficacy of suicide as a solution to their problems (Linehan et al., 1987). Attitudes and other variables associated with ideation may be distinct from those associated with attempted suicide or suicide.

This study confirms that suicide ideation is prevalent in the student population. It is associated with poorer problem-solving ability and more tolerant attitudes toward suicidal behavior, particularly, the attitude that suicidal behavior is normal. However, the study cannot determine whether poorer problem solving and more tolerant attitudes toward suicidal behavior increase the risk of suicide ideation or are the consequences of engaging in suicide ideation. Prospective studies are required in order to address this problem in relation to both suicide ideation and attempted suicide.

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About the authors:

Carmel McAuliffe, MPhil MA, is currently working as a Research Coordinator on a Parasuicide Intervention Study Programme with the South Lee Mental Health Services of the Southern Health Board in Cork, Ireland. She previously worked as a Research Psychologist with the National Suicide Research Foundation, Cork. She is currently working on her PhD at the Department of Psychiatry, University College, Cork, investigating psychological characteristics predictive of repetition of parasuicide.

Paul Corcoran, BSc MSc, is Deputy Director of the National Suicide Research Foundation, Cork, Ireland. He is currently completing his doctorate in Epidemiology at the Department of Epidemiology and Public Health, University College, Cork, Ireland. He is also a member of the National Suicide Review Group, set up following a recommendation of the Irish National Task Force on Suicide and an Officer of Statistics to the Irish Central Statistics Office with responsibility for analysis of the data collected on each death subject to an inquest in Ireland.

Dr. Helen Keeley is currently working as a temporary Consultant in Child and Adolescent Psychiatry with the Brothers of Charity Child and Adolescent Mental Health Services in Cork, Ireland. She previously worked as Research Registrar and Deputy Director with the National Suicide Research Foundation, Cork before completing Higher Training in Child and Adolescent Psychiatry at the Tavistock and Portman NHS Trust in London. She maintains an active involvement in suicide research with a particular interest in biological systemic approaches, especially in the younger age group.

Prof. Ivan Perry received his postgraduate training in Epidemiology at the London School of Hygiene and Tropical Medicine and the Royal Free Hospital School of Medicine, London. Before coming to UCC, he was a Senior Lecturer in Epidemiology and Assistant Director of the UK Small Area Health Statistics Unit, Department of Epidemiology & Public Health, Imperial College School of Medicine at St. Mary's, University of London. His current major

interests are: chronic disease epidemiology with a focus on the role of diet and lifestyle in the etiology of cardiovascular disease and type 2 diabetes; obstetrical epidemiology with ongoing work on the causes and consequences of raised blood pressure in pregnancy; and health services research.

Address for correspondence:

Carmel McAuliffe
1 Perrott Avenue
College Road
Cork
Ireland
Tel. +353 21 427-7499
Fax +353 21 427-7545
E-mail nsrf@iol.ie