Available online at www.sciencedirect.com

ScienceDirect

Comprehensive Psychiatry 58 (2015) 1 – 10

COMPREHENSIVE PSYCHIATRY

www.elsevier.com/locate/comppsych

Non-suicidal self-injury and suicidal ideation as predictors of suicide attempts in adolescent girls: A multi-wave prospective study

Lori N. Scott[a,*], Paul A. Pilkonis[a], Alison E. Hipwell[a], Kate Keenan[b], Stephanie D. Stepp[a]

[a]University of Pittsburgh School of Medicine, Department of Psychiatry, 3811 O'Hara Street, Pittsburgh, PA 15213, USA

[b]University of Chicago, Department of Psychiatry Behavioral Neuroscience, 5841 South Maryland Avenue, Chicago, IL 60637, USA

Abstract

Although both suicide ideation (SI) and non-suicidal self-injury (NSSI) are known risk factors for suicidal behavior, few longitudinal studies have examined whether having a history of one or both of these factors prospectively predicts increased risk for suicide attempts. According to the theory of acquired capability for suicide, engagement in NSSI may reduce inhibitions around self-inflicted violence, imparting greater risk for suicide attempts among those with SI than would be observed in those with SI who do not have a history of NSSI. We used prospective data from the Pittsburgh Girls Study, a large community sample, to compare groups of girls reporting no SI or NSSI, SI only, or both NSSI and SI between early to late adolescence on any lifetime or recent suicide attempts in late adolescence and early adulthood. As compared to girls with no SI or NSSI history and those with only an SI history, girls with a history of both NSSI and SI were significantly more likely to subsequently report both lifetime and recent suicide attempts. Results are consistent with the acquired capability theory for suicide and suggest that adolescent girls who have engaged in NSSI and also report SI represent a particularly high-risk group in need of prevention and intervention efforts.

Suicide is the third leading cause of death among adolescents and young adults [1]. Although rates of completed suicide are consistently higher in males [2], females attempt suicide two to three times more often than males [3,4]. Suicide ideation (SI), defined as thinking about or planning to engage in behaviors with the intent to end one's life, strongly predicts suicide attempts [5]. SI tends to first emerge during adolescence, and the prevalence of SI is higher among adolescents compared to all other age groups [6], with especially high rates of SI among girls [5]. In addition, SI has been shown to significantly predict suicide attempts among psychiatrically hospitalized adolescent girls but not boys [7]. Thus, the prevention of SI may lead to significant decreases in morbidity and mortality for adolescent girls. Data regarding SI and suicide attempts in at-risk female community samples, however, are scarce, but are crucial for identifying those who are at highest risk. Furthermore, although an estimated 30% of adolescents report having thought of suicide at some point, only a small fraction of those who engage in SI ever attempt suicide [5]. Hence, identifying factors that increase the likelihood of the progression from ideation to suicide attempts is of utmost importance to prevention efforts.

Recent theoretical and empirical work suggests that individuals with SI who engage in non-suicidal self-injury (NSSI), defined as direct and deliberate destruction of one's own body tissue without suicidal intent [8], are at increased risk for suicide attempts [9–12]. NSSI occurs in as many as 13%–21% of community-based adolescents [13–15] and is a strong predictor of suicide attempts above and beyond other risk factors, including SI, depression, borderline personality disorder, family problems, and trauma or abuse exposure [9,16]. The age of onset of NSSI in community samples is in early adolescence, between the ages of 11 and 15 [15,17,18]. Some evidence suggests that NSSI is more prevalent and has an earlier age of onset among adolescent girls than among boys [16].

This research and the efforts of the authors were supported by grants from the National Institute of Mental Health (R01 MH101088, PI: Stepp; R01 MH56630, PI: Loeber; R01 MH056888, PI: Pilkonis; K01 MH101289, PI: Scott), the National Institute on Drug Abuse (R01 DA012237, PI: Chung), and by funding from the Office of Juvenile Justice and Delinquency Prevention, the FISA Foundation and the Falk Fund.

* Corresponding author at: Western Psychiatric Institute and Clinic, 3811 O'Hara St., Pittsburgh, PA 15213. Tel.: +1 412 383 5016; fax: +1 412 383 5068.

E-mail address: scottln2@upmc.edu (L.N. Scott).

http://dx.doi.org/10.1016/j.comppsych.2014.12.011

0010-440X/

Given the developmental emergence of NSSI and SI, it is not surprising that the two often co-occur during adolescence [19–21], and overlap between the two likely increases the risk for suicidal behavior. According to the theory of acquired capability for suicide [22], one must not only desire to end one's life but must also overcome the fear and pain associated with self-inflicted harm to increase one's capability for engaging in suicide-related behaviors. NSSI may increase the capability for self-inflicted violence via desensitization to the fear and pain associated with these behaviors. Thus, those with a history of both NSSI and SI may be at greatest risk for suicidal behavior as compared to those with neither or only one of these risk factors. Evidence supporting the acquired capability theory has recently begun to emerge [16]. For example, higher frequency of NSSI is associated with more lethal suicide attempts [23], and a longer duration of engagement in NSSI is associated with more frequent suicide attempts [21]. Studies have also shown that adolescents with a history of both attempted suicide and NSSI report less fear about engaging in suicidal behavior than those with suicide attempts and no history of NSSI [24,25], suggesting that NSSI may desensitize individuals to the fear associated with suicide [16]. In addition, results of a recent meta-analysis examining multiple risk factors for suicide attempts found that a combination of SI and NSSI was strongly associated with history of suicide attempts [26]. These data, however, were based mostly on retrospective studies of individuals with histories of NSSI and/or past suicidal behavior, and we could not find any published studies that have prospectively examined both NSSI and SI in predicting future suicidal behavior.

To aid in the identification of youth who are at greatest risk for future suicide attempts and most in need of early intervention, it is important to examine the degree to which the co-occurrence of NSSI with SI in adolescence prospectively predicts risk for suicide attempts. Accordingly, the current study utilizes prospective data from a large and diverse community sample of adolescent girls to examine the combination of NSSI and SI during early to late adolescence as a correlate of lifetime suicidal behavior and a predictor of subsequent suicide attempts. Girls with "no SI or NSSI", and those with histories of "SI only" or "both SI and NSSI" from age 10 through adolescence were compared in their propensity for reporting lifetime and recent (past year) suicide attempts in late adolescence and early adulthood. In accordance with previous studies showing high rates of SI among those who self-injure [19,27], there was not sufficient representation of "NSSI only" (i.e., NSSI without any history of SI; $n = 21$) in this sample to examine this subgroup. To determine the unique risk for future suicidal behavior associated with combined SI and NSSI histories, we controlled for several other known risk factors for suicide attempts as demonstrated in previous studies [16], including various types of family adversity and trauma, depression, and borderline personality disorder (BPD) symptoms. We hypothesized that although those with "SI only" would be more likely to attempt suicide than those without SI or NSSI, girls with histories of both SI and NSSI would demonstrate the highest rates of reported lifetime and recent suicide attempts. In other words, we expected that the combination of NSSI with SI would impart significantly greater risk for suicide attempts than would SI alone or having no history of SI or NSSI.

2. Method

2.1. Participants and sample description

The Pittsburgh Girls Study (PGS; $N = 2450$) is a high-risk urban community sample of four cohorts of girls, ages 5–8 at the first assessment year, and their primary caretaker, who have completed annual assessments according to an accelerated longitudinal design. The study sample was identified by oversampling low income neighborhoods, such that neighborhoods in which at least 25% of families were living at or below poverty level were fully enumerated and a random selection of 50% of households in all other neighborhoods was enumerated [28,29]. The current analyses include all four age cohorts, covering ages 10–21 years (see Table 1). NSSI and SI data were collected from early adolescence, starting with age 10 for SI and age 13 for NSSI, through the 12th assessment wave (when girls were ages 16–19). Suicide attempts were assessed in the 13th and 14th annual assessment waves (when girls were ages 17–20 and 18–21, respectively). All data for this study were collected in calendar years 2003 through 2014. We included girls who had sufficient data to run the analyses, which required having completed the wave 12 assessment (when the covariates, depression and BPD symptoms, were assessed), at least one assessment of SI and NSSI at any time from ages 10 through wave 12, and at least one assessment of suicide-related behavior in either wave 13 or 14 ($N = 1971$). There are no known completed suicides in the PGS. From this sample, and as we expected based on prior studies [19,27], only a very small percentage (1.1%; $n = 21$) endorsed a history of NSSI without endorsing any history of SI. To minimize noise that may be potentially introduced by these outliers, these cases were excluded from the final analyses (final $N = 1950$). However, all substantive results and conclusions remained unchanged if these cases were included.

As compared to those who were excluded (total $n = 500$) due to missing data ($n = 479$) or being in the NSSI only group ($n = 21$), those who were included in the analyses ($n = 1950$) were more likely to identify as minority race ($\chi^2 = 23.08$, $df = 1$, $p < .001$) and to report having received public assistance ($\chi^2 = 11.98$, $df = 1$, $p < .001$) and living in a single parent household ($\chi^2 = 7.028$, $df = 1$, $p = .008$) in the first assessment wave. Those who were included ($n = 1950$) did not differ from those who were excluded but provided suicide attempt data in waves 13 or 14 ($n = 248$) in likelihood of reporting lifetime ($\chi^2 = 0.44$, $df = 1$, *ns*) or recent ($\chi^2 = 1.40$, $df = 1$, *ns*) suicide attempts. The majority