Attempted suicide and repeated attempts from adolescence to early adulthood: depression and stressful events Av Latha Nrugham, Are Holen og Anne Mari Sund

Introduction

In adolescence, a past suicide attempt has been documented to be the most powerful predictor of a later attempt or completed suicide even when adjusting for psychiatric disorders (Nrugham, Larsson & Sund, 2008; Bridge, Goldstein & Brent, 2006; Lewinsohn, Rhode, Seeley & Baldwin, 2001). Among female adolescents, a prior suicide attempt has been found to be a stronger predictor of completed suicide (Grøholt, Ekeberg, Wichstrøm & Haldorsen, 1999). Prospective studies focussing on repeated suicide attempts have tended to use clinical samples (Sheikholeslami, Kani, Kani & Ghafelebashi, 2009; Hulten et al, 2001). Their findings about repeaters report higher levels of depression, hopelessness, higher levels of intent and impulsivity, but also the use of more violent suicide methods such as hanging and jumping from high places; in addition, they report more

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negative life events as well as limited social support. Adult clinical samples have also revealed differences between single-attempters and repeaters. The adult repeaters reported more stressful events (Joiner et al. 2007), they used poorer social problem solving skills and demonstrated increased

levels of psychopathology, of depression in particular (Forman, Berk, Henriques, Brown & Beck, 2004; Rudd, Joiner & Rajab, 1996). The relationship between stressful events and suicide attempts across the lifespan has been reported in retrospective clinical studies (Gladstone et al. 2004; Forman et al. 2004), in prospective longitudinal community-based studies (Johnson et al. 2002), in retrospective cross-sectional studies (Joiner et al, 2007), in reviews (Bridge et al. 2006; Gould, Greenberg, Velting, Shaffer, 2003; King et al. 2001; Paykel, 2001), and in psychological autopsies of adolescent suicides (Portzky, Audenaert & van Heeringen, 2005; Gould, Fischer, Parides, Flory & Shaffer, 1996). Among Norwegian adolescents, the non-intact biological parental unit has been found to be an associate of attempted or comple-

ABSTRACT

Background & Aim: The current study examined non-attempters, attempters and repeaters of suicide attempts in relation to stressful life events and their levels of depression symptoms in an extracted subset that was followed up from adolescence into early adulthood. Did repeaters consistently report more stressful events and depression than single attempters and non-attempters? If yes, was this increase of events located in the family or at school or in the domain of self and friends? **Method:** A representative sample of high school students (T1, n = 2464, mean age = 13.7 years, 50.8% female, 88.3% participation) was re-assessed with the same questionnaire after a year (T2Q). High scorers of depression on the Mood and Feelings Questionnaire (MFQ) were matched for gender and age with low-and-middle scorers and assessed diagnostically by face-to-face interviews at T2I (n = 345, 94% participation). The interviewed subset was reassessed again 5 years later (T3) with the same questionnaire (n = 252, mean age = 20.0 years, 73% participation) and by telephone interviews. Stressful events were detected from a list of three domains. **Results:** Repeaters of suicide attempts reported more stressful events and were consistently more depressed. Differences in domains of stressful life events were also observed.

Conclusion: Interventions including healthy coping in relation to stressful events and depression among adolescents may prevent suicide. **Key words:** longitudinal, K-SADS, adolescents, young adults.

Bakgrunn og målsetning: I denne studien ble tre grupper ungdommer med høye depresjonsskårer undersøkt: noen som aldri hadde forsøkt å ta livet sitt, en gruppe bestående av personer som hadde forsøkt en enkelt gang og en gruppe som hadde forsøkt flere ganger. Dette ble sett i forhold til antall og type belastende livshendelser og depresjonsgrad. Ungdommene ble fulgt fra tidlige tenår frem til starten av deres voksenliv. Spørsmålene som studien ville belyse, var om ungdommer med gjentatte selvmordsforsøk rapporterte flere belastende livshendelser og/eller var mer deprimerte enn de som hadde forsøkt bare en gang eller ikke i det hele tatt. Hvis det skulle være vise seg å være tilfellet, ville man se nærmere på hvilke livsområder hvor det kunne finnes økt forekomst av belastende livshendelser – innen familien, skolen eller selv og venner. **Metode:** I utgangspunktet undersøkte man et større antall skoleelever (T1; n=2464; gj.snittsalder = 13.7 år; 50.8% kvinner; 88.3% deltakelse). De ble igjen undersøkt ett år senere med samme spørreskjema (T2). Elever som da hadde høye depresjonsskårer på Mood and Feelings Questionnaire (MFQ) ble matchet (2:1) for kjønn og alder med andre elever som hadde lave eller middels depresjonsskårer; de ble videre vurdert med et diagnostisk intervju ansikt til ansikt (T2; n=345; 94% deltakelse). Dette selekterte utvalget ble på nytt vurdert 5 år senere (T3) med samme spørreskjema (n =252; gj.snittsalder = 20.0; 73% deltakelse) og med telefonintervju hvor dessuten belastende livshendelser på tre livsområder ble kartlagt. **Funn:** Både de som hadde begått selvmordsforsøk en gang og de med gjentatte selvmordsforsøk rapporterte på alle tidspunkter langt flere belastende livshendelser enn andre ungdommer, de var dessuten gjennomgående dypere deprimerte enn øvrige. Det ble også funnet forskjeller i hvilke livsområder hvor de var mest belastet. **Konklusjoner:** Hjelpetiltak som stimulerer unge mennesker til bedre mestring av belastende livshendelser og som er deprimerte, kan trolig virke forebygge mot selvmord innen disse aldersgruppene.

ted suicide (Nrugham, Larsson & Sund, 2008; Wichstrøm, 2000; Grøholt, Ekeberg, Wichstrøm & Haldorsen, 1998; Grøholt, Ekeberg, Wichstrøm & Haldorsen, 1997). However, stressful life events alone did not predict suicidality among patients with MDD in the last 12 months; in a sample aged between 7 to 17 years (Myers et al. 1991); the same was the case for outpatients aged 14 to 72 years (Mann, Waternaux, Haas & Malone, 1999).

An additional matter to be considered is that clinical and non-clinical samples may not have similar risk factors (Agerbo, 2007). Apart from these gaps in our knowledge, it is not known whether

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specific domains of stressful life events, such as self and friends, school, or family, tend to be associated with suicidal behaviour. Such knowledge can aid clinicians mould their interventions to reduce suicidal behaviour among adolescents and young adults.

The present study compared the severity of depression symptom scores in relation to three domains of stressful life events between three groups: 'non-attempters', 'attempters' and 'repeaters'. We sought answers to the following questions: Did repeaters differ from single attempters and non-attempters on the severity of depression symptom scores and in the exposure to the domain of stressful events as they grew up? Did repeaters report persistent and more depressive symptoms than the others? Did repeaters consistently report more stressful events than single attempters and non-attempters? If yes, was this increase of events located in the family or at school or the domain of self and friends?

Method

Design and participants

A prospective design was used with a sample of predominantly depressed high school students followed up into early adulthood. This was done in two ways: longitudinally, within the groups, to cover the developmental aspect, and also, cross-sectionally between the three groups. The participants of this research project on depression titled "Youth and Mental Health", were derived from a non-clinical sample of adolescents of 8th and 9th classes (13 to 14 year olds) from two counties in Central Norway. The total population numbered 9292 in 1998. A clustered sampling technique resulted in a representative sample of 2792 students from 22 schools. Larsson & Sund (2008) have provided a detailed description of the procedure and sample. All assessments were approved by the Regional Committee for Medical Research Ethics, Central Norway. Informed consent, based on standards prescribed by The Norwegian Data Inspectorate, was obtained from the participants. Local school authorities, including the school boards, approved the study at T1 and T2.

Assessment time-points

T1: A questionnaire with an embedded screening segment for depression, the Mood and Feelings Questionnaire (MFQ, described below), was completed at school. $N = 2464$, mean age = 13.7 (SD = 0.5) years, 88.3% participation, 50.8% female.

T2: The questionnaire was again completed at school by the same sample a year later. $N = 2432$, mean age = 14.9 (SD = 0.5) years, 86.7% participation, 50.3% female.

Subset. Those with MFQ scores above 25 were defined as high scorers. One adolescent was selected at random from the low (0-6) or middle scorers (7-24) and matched for age and gender with every two high-scorers. Of the 364 adolescents thus selected, 345 were diagnostically interviewed face-to-face at school by one of six trained interviewers. The high-scorers numbered 225, and the comparison group, 120. The participation rate was 94.7% with 72.5% females.

T3: Adolescents who had been interviewed and had consented to be invited again at T2 were contacted at T3 about 5 years later ($n = 337$). Those willing to be invited ($n = 303$) were sent questionnaires by mail and interviewed by telephone. The T3 questionnaire participation rate was 73%, $n = 252$, mean age = 20.0 (SD = 0.6) years, 77% females. The analyses of this study were limited to these 252 young adults. More details provided in Nrugham, Holen & Sund, 2010.

Measures

Interview. The Kiddie - Schedule for Affective Disorders and Schizophrenia - Present and Lifetime version (K-SADS-PL) is a well-established, semi-structured diagnostic interview (Kaufman et al. 1997). It assesses current and past episodes of Axis I psychopathology according to the DSM-III-R & IV-TR criteria in children and adolescents. Probes and objective criteria for clinical thresholds are given in the screening and supplement sections. For nearly 80% of

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the adolescents, at least one of their parental figures was separately interviewed face-to-face as an additional informant at T2. The interviewer's summary scores were based on all available interview information.

Blind interviews were conducted by experienced clinicians trained both in assessing psychopathology and in the use of K-SADS. The average time between completion of the questionnaire and the interview, was 20 days at T2, and at T3, 21 days. Inter-Rater Reliability (IRR) using taped recordings, before interviewing was good with Cohen's kappa of 0.71 at T2 for all screening symptoms and affective supplements, and with a kappa at 0.70 for all screening and supplement symptoms at T3. Interview integrity was maintained at T2 and T3 with an average kappa of 0.83 at T2, and 0.80 at T3. The IRRs were obtained with co-author AMS, an experienced, practising and academic psychiatrist (see Nrugham,

Figure 1 Flow of participants in the Youth and Mental Health Study over the three timeframes from T1 to T3.
T1= 1998; T2 = 1999/2000, T3 = 2004/2005.

Holen & Sund, 2010, for further details). The interview was used to extract a single variable: attempted suicide (described below).

Questionnaire. The questionnaire was a compilation of several segments. Not living with both biological parents by T2 was derived from the information about the civil status of the parents and the adolescent's residence by T2.

Acts of self-harm, as differentiated from suicidal acts by either the interviewer or the respondent, were excluded

Depression was explored by the 34 items of the MFQ – Mood and Feelings Questionnaire covering the DSM-III-R criteria for major depression (Angold et al. 1989). This instrument has been used to identify respondents in a diagnostic interview; it was found age sensitive among girls both in a non-clinical sample (Goodyer & Cooper, 1993) and in several clinical samples (Kent, Vostanis & Feehan, 1997; Wood, Kroll, Moore & Harrington, 1995). The MFQ consists of descriptive phrases about the participant's feelings or behaviour in the last two weeks. Each item was rated on a 0-2 scale. The total score ranges from 0 to 68. The mean MFQ score of the original sample was 10.6 (SD = 9.5) at T1 (Sund et al., 2001). Psychometric properties of the MFQ were excellent with the original sample (Sund et al. 2001).

Stressful Events were assessed by a list of 33 items at T1 and T2, with 47 items at T3. The list drew on existing instruments: Coddington's (1972) Life Event Scale, Colton's (1985) Children's Own Perceptions and Experiences of Stressors (COPEs), Swearingen & Cohen's (1985) Junior High School Life Events. It also included some additional self-made items based on stressors regarded as salient in early adolescence (see Sund et al. 2003, for details).

Furthermore, the stressful events were grouped into three domains: school, family, self and friends. Examples: school event: 'teacher has ridiculed you in front of the class'; family event: 'family member seriously ill or injured'; self & friends' event: 'I have been a victim of sexual harassment' or 'I have been a victim of a criminal act' and 'A friend has serious problems'. The response options were 'yes' and 'no'. The time span covered the past 12 months. The total score ranged between 0-33 at T2 and 0-47 at T3. The number of endorsed stressful events in each domain was summed up for the analyses. The language of the questionnaire was made age-appropriate at T3 for the added fourteen items covering such as romantic relationships, pregnancy and abortion.

The non-participants (n = 93) at T3 were more often males [(1) = 5.7, $p < 0.01$] and victims of criminal acts [(1) = 6.9, $p < 0.008$] by T2, and the females were more likely to have experienced sexual harassment [(1) = 4.64, $p < 0.03$] by age 15. At T2, a significant difference between the mean depression scores of the participants and the non-participants was not observed.

Attempted suicide status. This variable with three groups as described below was constructed by using positive responses, either from the interview or the questionnaire. Acts of self-harm, as differentiated from suicidal acts by either the interviewer or the respondent, were excluded. Only those suicidal acts were included that reached a clinical thresh-

old as assessed by the interviewers. The questions about suicidal behaviour were in the screening probes for depression in K-SADS. A positive and clinical threshold response to the question "Have you ever (or since the last interview) tried to kill yourself or done something which could have killed you?" was defined as a suicidal act. The item of the questionnaire was taken from the 'Young in Norway' study (Wichstrøm, 2000), a previous national survey: "Have you ever tried to commit suicide?" The response options were: "No, never"; "Yes, once"; "Yes, several times".

From the information thus pooled, three groups were derived: (a) non-attempters (n = 177, females = 137), those who had never reported any suicidal act; (b) attempters (n = 52, females = 37), those who reported one suicidal act at any one assessment point, T1, T2, or T3 and, (c) repeaters (n = 23, females = 20), those who reported at least one suicidal act by T2 and, had tried again between T2-T3. This requirement of a suicide attempt at both assessments was not without cost. The advantage was that consistency in suicidal behaviour across the period of adolescence was ensured. The disadvantage was that those who only had repeated within each assessment time period, would be counted as attempters, not repeaters. However, as the focus of the present study was on the longitudinal perspective, the trade-off was accepted in favour of temporal stability across adolescence.

Statistical analyses

Missing data on continuous variables were few and treated with Expectation Maximization, or the Regression method as per the indicators given by Little's Missing Completely at Random chi-squared test value's significance (Tabachnick & Fidell, 2006). Details have been provided earlier (Nrugham, Larsson, Sund, 2008). Due to cluster sampling, the probability of intra-school correlation coefficient for depression symptom scores at T2 was estimated and found to be 0.013. The total variance attributable to differences between schools was therefore rather small, and indicated that it was safe to proceed with the usual variance and regression analyses (Norusis, 2004).

This requirement of a suicide attempt at both assessments was not without cost

Repeated measures ANOVA was used to test for significance of the longitudinal differences between depression symptoms and the domains of stressful events (Tabachnick & Fidell, 2006; Field, 2005). Mauchly's test indicated that the assumption of sphericity had been violated except for stressful events in the family and school domains. The degrees of freedom were corrected by using Greenhouse-Geisser estimates of sphericity for relevant variables. Corrected F-statistics and partial eta-squared values as effect size are reported. Bonferroni corrections were applied to control Type I error rate. One-way ANOVA tests were used to check for significant cross-sectional differences between groups. Contrasts were planned with the t-statistic, and effect sizes (r) were calculated for significant t values. Corresponding values of Cohen's d are reported here as effect size indicators. Post hoc tests were used to confirm the contrasts. Due to unequal sample sizes, Gabriel's

Table 1 Suicide attempt status, depression and stressful life events at ages 14 (T1), 15(T2) and 20(T3).

Comparing non-attempters, suicide attempters and repeaters with regard to their levels of depression and their number of reported stressful life events within three domains (School, Family, and Self & friends) in a school sample ($n = 252$) assessed at T1 (age 14), at T2 (age 15), and from which a subset of mainly high scorers on depression (measured by the Mood and Feelings Questionnaire) was followed up at T3 (age 20). ANOVA results presented in F-values.

Variables	Non-attempters ($n = 177$)	Attempters ($n = 52$)	Repeaters ($n = 23$)				
	M (SD)	M (SD)	M (SD)	F value	df2	t-statistic (df)	Cohen's d
Depression scores							
Depression T1	15.2 (10.8)	22.3 (13.3)	26.8 (11.6)	15.4***	249	^a 3.8 (249)*** ^b 4.5 (249)***	0.5 1.0
Depression T2 [§]	23.0 (13.9)	34.0 (12.5)	35.1(12.2)	20.4***	55.4	^a 5.4 (91.5)*** ^b 4.3 (29.9)***	0.8 0.9
Stressful Life Events (SLE) in School, Family, Self & friends							
T1							
SLEs – School	8.7 (1.5)	8.9 (1.4)	9.0 (1.4)	0.9	249		
SLEs – Family	21.6 (2.1)	22.5 (2.5)	23.1 (1.9)	6.9***	249	^a 3.5 (249)*** ^b 3.0 (249)**	0.3 0.7
SLEs – Self & friends	7.6 (0.8)	7.9 (1.1)	8.1 (0.8)	4.4*	249	^a 2.3 (249)* ^b 2.2 (249)*	0.3 0.6
T2							
SLEs – School	1.9 (1.5)	3.1 (1.6)	3.4 (1.1)	18.3***	249	^a 4.7 (249)*** ^b 4.4 (249)***	0.7 1.1
SLEs – Family [§]	2.8 (2.3)	4.6(3.3)	4.6 (2.4)	10.8***	50.6	^b 3.4 (27.7)**	0.7
SLEs – Self & friends	0.9 (1.1)	1.5 (1.2)	1.7 (1.3)	7.8***	249	^a 3.1 (249)*** ^b 2.8 (249)***	0.5 0.6
T3							
SLEs – School	5.7 (0.9)	6.0 (1.0)	5.9 (1.2)	1.8	249		
SLEs – Family	24.2 (2.0)	24.8 (2.0)	24.8 (2.1)	2.6	249		
SLEs – Self & friends [§]	22.1 (1.9)	23.0 (2.7)	24.0 (2.7)	7.4***	47.6	^a 2.3 (66.8)* ^b 3.2 (24.9)**	0.3 0.8

§ = Welch's F statistic reported due to violation of homogeneity of variances. Degrees of freedom (1) = 2, unless otherwise specified. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.
a = between non-attempters and attempters; b = between non-attempters and repeaters.

test was used (Field, 2005). Analyses were one-tailed as per the hypothesis, and the α -level was set to $p < 0.05$.

Results

Non-attempters, attempters and repeaters – longitudinal overview

Significant differences were seen within each of the three groups: between ages 14, 15 and 20, in the domain of stressful events at school [$F(3.9, 494.9) = 5.8, p < 0.0005, \eta^2 = .04$] and in the domain of stressful events related to self and friends [$F(2.9, 367.2) = 3.4, p < 0.05, \eta^2 = .02$]. Post hoc tests with Bonferroni corrections revealed significant differences for all variables between non-attempters as compared to single attempters and repeaters.

The repeaters ($n = 19, 82.6\%$) were significantly more likely to be not living with both biological parents at age 15 than the attempters ($n = 22, 42.3\%$) and the non-attempters

($n = 51, 28.8\%$), $t = 10.9, p < 0.01$. Age differences between these three groups were not statistically significant. Table 1 displays the temporal comparisons of the depression scores and stressful life events among the non-attempters, attempters and repeaters. All three groups had higher mean depression scores at age 15 than at age 14. The attempters and repeaters reported scores indicating major depression. The actual number of stressful events decreased at age 15 for all three groups in the three stress domains. However, significant differences between the groups were seen in all domains, with attempters and repeaters reporting more events than non-attempters. At age 20, when the number of stressful events within the family and, with self and friends were at the highest for all three groups, family-related events remained at the same level in all the groups, as seen in Table 1.

Differences between non-attempters, attempters and repeaters
Contrasts were set up to detect the source of the group differences revealed above. The last two columns in Table 1 provide an overview of the significant findings with Cohen's *d* values of effect size. The post hoc tests confirmed all the differences.

Discussion

The main new findings of the present study were two: (a) repeaters of suicide attempts reported more stressful events and were consistently more depressed, (b) stressful events within the family, and within the domain of self and friends peaked at age 20. The stressful events at school were highest at 14 years, across all three groups.

Wilson et al. (1995) suggested that suicidal adolescents may have difficulties in seeing their personal contributions to stressful situations which in turn could lead to a reduction in the use of healthy coping. Their suggestion may be useful in the interpretation of our findings as applied to attempters and repeaters. Difficulties emerging in suicidal adolescents may be amplified and stabilised among repeaters.

Severity of depression symptoms and domain of stressful events

Non-attempters, attempters and repeaters had higher mean depression scores at age 15 than at age 14, which is in line with earlier reports about high school adolescents (Lewinsohn et al. 2001; 1993). Repeaters were least likely to be living with both biological parents by the age of 15; they were followed by attempters, both findings are in line with earlier reports (Wagner, Cole & Schwartzman, 1995; Wichstrøm, 2000). The stressful events of repeaters originated mostly in their families by age 14, spread into their schools by age 15, and moved into the domain of self and friends by age 20. The level of depression symptom scores reported by repeaters was higher and more consistent than the others, with the exception of attempters at age 15. Our findings profiled the repeaters as not only consistently reporting more stressful events in all areas, but also,

Suicidal adolescents may have difficulties in seeing their personal contributions to stressful situations which in turn could lead to a reduction in the use of healthy coping

they had less internal and external supports than the other two groups; the same was found for adults (Forman et al. 2004; Rudd et al. 1996). Attempters and repeaters appeared to be more similar than dissimilar. Together, they differed sharply from the non-attempters. The suicidal risk of individuals is remarkably stable across adolescence into adulthood (Nrugham et al. 2008; Lewinsohn et al. 2001).

The stress-diathesis model of behaviour in adult psychiatric patients proposes that the risks for suicidal acts are not merely determined by their illness but also by a diathesis, a pre-existing psychological vulnerability (Mann et al. 1999). To a certain extent, our findings were able to extend this model to adolescents, as the repeaters consistently reported more stressful events in all domains, and also, as they

had less internal support than the other two groups. This finding is in line with reports on adult samples (Forman et al. 2004; Rudd et al. 1996). Thus we observe that adolescents were alike and yet, different from adults in the relationships between attempted suicide, depression symptom scores and stressful events.

Limitations and strengths

Several limitations of the present study merit consideration. The small sample of repeaters was a result of the low frequency of attempted suicide. Caution is imposed on the interpretation of the findings due to reduced power to detect otherwise significant differences, increased chance of Type II errors, and increased number of stressful events introduced at T3. It must also be considered that more than two-thirds of the subset was of the female gender.

Attempters and repeaters appeared to be more similar than dissimilar. Together, they differed sharply from the non-attempters.

This sample resembles an outpatient population more than any other due to the over-sampling of depressed adolescents at age 15 and the clinical thresholds of suicide attempts used in the interview.

However, the study also has several substantial strengths: a longitudinal design placed at a crucial developmental life phase of a large population-based sample pool from which the subset was drawn, the choice of measures for depression symptoms, stressful events, and suicidal behaviour.

Conclusion and implications

Among these vulnerable adolescents, stressful life events begin in school and then move on to the domains of family, self and friends. Our findings provide specific indicators for practical preventive interventions: the provision of timely and appropriate help to families grappling with multiple crises, especially families with adolescents. Clinical interventions especially in schools focusing on the development and mastery of healthy coping may be more effective before age 15.

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