



Suicidal ideations and attempts among adolescents subjected to childhood sexual abuse and family conflict/violence: The mediating role of anger and depressed mood



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Based on a sample of 9085 16- to 19-year-old students attending all high schools in Iceland in 2004, the current study examines depressed mood and anger as potential mediators between family conflict/violence and sexual abuse, on the one hand, and suicidal ideations and suicide attempts on the other. Agnew's general strain theory provides the theoretical framework for the study. Structural equation modelling (SEM) was conducted allowing explicit modelling of both direct and mediating effects using observed and latent variables. The findings showed that both depressed mood and anger mediated the relationship between family conflict/violence and sexual abuse and suicidal attempts. However, when testing the mediating pathways between sexual abuse and family conflict/violence and suicidal ideations, only depressed mood but not anger turned out to be a significant mediator. The authors discuss how these findings may inform and facilitate the design and development of interventions to reduce the likelihood of suicide attempts among young people.

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Introduction

Individuals subjected to childhood adversities such as sexual abuse and family conflict are at increased risk of a wide range of medical, psychological and behavioural problems in adolescence and adulthood (Dube et al., 2001; Maniglio, 2009, 2010; Pagura, Cox, Sareen, & Enns, 2006). Studies have for example shown that child sexual abuse increases the likelihood of depression, aggression, self-destructive behaviours and deviance (for a review see, Kendall-Tackett, Williams, & Finkelhor, 1993). Also, a link has been established between sexual abuse and deviant behaviour, including property crimes, aggressive behaviour and violence (Garnefski & Arends, 1998; Swanston et al., 2003). Another major source of strain for children and adolescents is family conflict, that is, arguments and physical violence in the home, increasing the likelihood of depression, anger, delinquency and suicidal behaviour (Amato & Sobolewski, 2001; Asgeirsdottir, Sigfusdottir, Gudjonsson, & Sigurdsson,

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2011; Henning, Leitenberg, Coffey, Bennett, & Jankowski, 1997; Horwitz, Widom, McLaughlin, & White, 2001; Jekielek, 1998; Sigfusdottir, Asgeirsdottir, Gudjonsson, & Sigurdsson, 2008; Sigfusdottir, Farkas, & Silver, 2004).

Of all the negative emotional and behavioural outcomes of sexual abuse and family conflict, suicides are of gravest concern. Adolescent suicidal ideations in Western countries range from 15% to 25%, with adolescent females at the higher and males at the lower end (Grunbaum et al., 2004). The lifetime incidence of attempted suicide ranges from 1.5 to 10 percent among female adolescents and from 1.3 to 3.8 percent among their male peers. Completed suicides, however, are much more common among adolescent males than females in most Western countries (Andrews & Lewinsohn, 1992; Fergusson & Lynskey, 1995; Haavisto et al., 2005; Lewinsohn, Rohde, & Seeley, 1996).

Suicides have increased by 60% worldwide during the last four decades and are now among the three leading causes of death in this age group (Wasserman, Cheng, & Xinjiang, 2005). Studies have shown that diverse childhood adversities are important risk factors for adolescent suicidal behaviour, including suicidal ideations, suicidal plans and suicide attempts (Bebbington et al., 2009; Bridge, Goldstein, & Brent, 2006; Brown, Cohen, Johnson, & Smailes, 1999; Fergusson, Woodward, & Horwood, 2000; Johnson et al., 2002; Maniglio, 2011; Martin, Bergen, Richardson, Roeger, & Allison, 2004; Nelson et al., 2002). Studies have specifically revealed a strong relationship between both sexual abuse and family conflict and suicidal ideation and repeated suicide attempts (Brown et al., 1999; Garnefski & Arends, 1998; Luster & Small, 1997; Martin et al., 2004). Despite robust findings on the association between adverse childhood experiences and suicidal behaviour, exactly how sexual abuse and family conflict translate into suicidal behaviour is not well understood. In an extensive study recently published in JAMA psychiatry, the authors call for such an analysis (Nock et al., 2013), arguing that too much attention may hitherto have been given to preventing suicidal behaviour through reducing depression, while other emotions, such as anger, may be of equal or even greater importance.

Agnew's (1992) general strain theory offers an ideal framework for understanding these associations between childhood adversities, emotions and suicidal behaviour. The theory proposes that adolescents are pressed into deviant behaviour, including suicidal behaviour, by negative emotional responses due to being trapped in an aversive environment. This leads to frustration and possibly to desperate avoidance and/or anger-based deviance (Agnew, 1985, 1992). Hence, the theory proposes that anger energizes the individual for action, lowers inhibitions, and increases the likelihood of acting out. Tests of the theory have found that both depression and anger are important mediators in the relationship between childhood adversity and deviant behaviour (Molnar, Berkman, & Buka, 2001; Sigfusdottir et al., 2008). However, while anger and depression frequently co-occur (Curran, 1987; Renouf & Harter, 1990; Rutter, 1989), these emotions do not relate in the same way to behavioural outcomes (Asgeirsdottir et al., 2011; Sigfusdottir et al., 2004, 2008). While anger has been shown to increase the likelihood of acting out, for example by stealing, vandalizing or committing violent acts, depression is not related to such behaviour (Sigfusdottir et al., 2004). Recent studies have shown that the relationship between these phenomena is even more complex than that. Hence, while anger energizes the individual for actions, and increases the likelihood of acting-out behaviour, depression increases the likelihood of behaviour directed to oneself. Thus, depressed mood has turned out to be an important mediator between childhood adversities and self-injurious behaviour as well as having twice as strong an effect as anger on suicidal behaviour (Asgeirsdottir et al., 2011; Sigfusdottir et al., 2008).

Prior studies have not distinguished between forms of suicidal behaviour, such as suicidal ideation or suicide attempts triggered by stressful experiences. Also, they have not included both anger and depressed mood as mediators between childhood adversities and suicidal behaviour. Hence, studies that have revealed a predictive effect of depression (Dube et al., 2001) or anger (Giegling et al., 2009) on suicidal behaviour, have not controlled for possible comorbid effects of these emotions. In light of the very complex nature of the effects of childhood adversities on emotions and behaviour, showing that particular emotions are conducive to certain types of behaviour, it is important to examine whether childhood adversities are differently associated with suicidal ideation and suicide attempts.

Suicidal ideation and suicide attempts are different phenomena, where suicide attempts warrant special attention because it is a stronger predictor of successful suicides than suicidal ideation. Suicidal ideation is defined as thoughts or wishes to be dead or to kill oneself, while suicide attempts are self-inflicted behaviours intended to result in death (Lewinsohn et al., 1996). Those suffering from suicidal ideation and those attempting suicide are distinct groups, although overlapping (Farberow, 1981; Linehan, Charles, Egan, Devine, & Laffaw, 1986). Suicidal ideation is relatively common, but past suicide attempts represent the strongest risk factor for future suicide attempts and completions (Farberow, 1989; Lewinsohn et al., 1996).

Gender differences

Prior studies have indicated that the relationship between childhood adversities, emotions and behaviour is gender specific, where adolescent females and males experience somewhat different types of adversities and the effects of adversities associate differently with emotions and behaviour among females and males (Sigfusdottir & Silver, 2009). Whereas adolescent females have consistently been found to be more likely to respond to stress with internalizing emotions (Broidy, 2001; Cyranowski, Frank, Young, & Shear, 2000; Piquero & Sealock, 2000), the relationship between adversities and anger turns out to be similar in strength for adolescent males and females (Sigfusdottir & Silver, 2009). Emotions also seem to associate differently with behaviour for adolescent females and males, with the link between anger and delinquent behaviour, for example in the form of stealing and vandalizing being much stronger for males than females (Sigfusdottir et al., 2004). In line with these prior findings showing that the association between childhood adversities, emotions and behaviour differ for adolescent males and females, we tested the models separately for gender.

The current study

In line with Agnew's general strain theory and prior research showing that depressed mood is much less likely than anger to result in outward deviance (Asgeirsdottir et al., 2011; Anderson & Hunter, 2012; Broidy, 2001; Jang & Rhodes, 2012; Sigfusdottir et al., 2004, 2008), the current study proposes that childhood adversities (i.e. family conflict/violence and sexual abuse) may, through anger and depressed mood, be differentially associated with suicidal ideations and suicidal attempts. Hence, we expect that depressed mood will more strongly be directed inwards on suicidal ideation than on suicide attempts, while anger will be more strongly directed outwards on suicide attempts than suicide ideations. The study controlled for potentially confounding demographic variables, including family structure and socioeconomic status (Finkelhor, 1993; Turner, Finkelhor, & Ormrod, 2006). We propose the following hypotheses:

Hypothesis 1. Exposure to childhood adversities in the form of family conflict/violence and sexual abuse is positively associated with anger, depressed mood, suicidal ideations and suicidal attempts.

Hypothesis 2. Depressed mood associated with childhood adversities such as family conflict/violence and sexual abuse is more strongly related, as a mediator, to suicidal ideations than to suicide attempts.

Hypothesis 3. Anger associated with childhood adversities such as family conflict/violence and sexual abuse is more strongly related, as a mediator, to suicide attempts than to suicidal ideations.

Method

Respondents and procedure

The study data were drawn from a cross-sectional national survey of 9085 16- to 19-year-old students at all high schools in Iceland in the year 2004 (Kristjansson, Baldursdottir, Sigfusdottir, & Sigfusson, 2005). The sample included 4652 (51%) females and 4433 (49%) males; the average age of respondents was 17.2 years ($SD = 1.1$). The survey, which was administered to all respondents on October 20th, included 67% of all registered students and approximately 80% of all full-time students in this age group in Iceland who should have been present on that day.

The respondents were made aware of the sensitivity of some questions and assured that they were free to decline to participate and withdraw at any time. They were also given contact information they could use if they required assistance or information after completing the survey. The survey was anonymous and administered by teachers in a test-like school environment. The respondents had 80 min (two school periods) to answer the questions, after which they sealed the survey in an unmarked envelope. In accordance with the requirements of Iceland's Privacy and Data Protection Authority, which include rules on anonymity and informed consent, the data collection was conducted by and under the direction of the Icelandic Centre for Social Research and Analysis in cooperation with Iceland's Government Agency for Child Protection.

Measures

Eight measures were used in the study, five of which were defined as observed variables and three as latent variables (also referred to as unobserved variables). Observed variables are, according to definition, variables which are directly measured (Arbuckle, 2008). Observed variables are often based on a single question asking about specific and quite concrete behaviour or situation. In the current study the five observed variables defined were family structure, family conflict/violence, sexual abuse, suicidal ideations and suicide attempts. Latent variables are according to definition variables which are not directly measured, but unobservable and therefore inferred from set of questions (each of which is directly measured) (Arbuckle, 2008). The three latent variables used in the study were parental education (inferred from two questions), depressed mood (inferred from eight questions) and anger (inferred from five questions). Below is a more detailed description of the observed and latent variables used in the study.

Family structure. Respondents were asked whether they lived with both biological parents ("living with both biological parents" = 1) or in other family arrangements ("living in other family arrangements" = 0). Responses on this observed variable ranged from 0 to 1.

Parental education. Respondents were asked two questions about their parents' educational attainments, indicating whether each parent had "finished elementary school or less" = 0, "started a school on the secondary level" = 1, "finished secondary level" = 2, "started university level" = 3, "earned a university degree" = 4. Responses on this latent variable ranged from 0 to 8.

Family conflict/violence. Respondents were asked whether they had ever experienced the following: 1) "Witnessed severe arguments between their parents", 2) "Had severe arguments with their parents", 3) "Witnessed physical violence at home including an adult", or 4) "Experienced physical violence at home, including an adult" (yes = 1; no = 0). Responses on this observed variable ranged from 0 (experiencing none of these events) to 4 (experiencing all of these events).

Sexual abuse. Respondents were asked about the occurrence and severity of sexual abuse before the age of 18 (Mossige, 2004) (for a detailed description of this measure, see Asgeirsdottir et al., 2011; Asgeirsdottir, Gudjonsson, Sigurdsson, & Sigfusdottir, 2010). A distinction was made between three levels of severity: The "least severe" level involved indecent

exposure or touching, excluding genitals; “severe abuse” involved indecent touching of genitals; and “very severe abuse” involved intercourse against the will of the respondent. Responses on this observed variable ranged from 0 to 3 (“never” = 0; “least severe” = 1, “severe” = 2; “very severe” = 3).

Depressed mood. Eight questions were drawn from the depression dimension of SCL-90, a multidimensional self-report symptom inventory (Derogatis & Cleary, 1977; Derogatis, Lipman, & Covi, 1973). Respondents were asked how often during the previous week each statement applied to them (see all statements in Table 3) using a four point scale (“never” = 0, “seldom” = 1, “sometimes” = 2, “often” = 3). Responses on this latent variable ranged from 0 to 24. The scale demonstrated good internal consistency with a Cronbach’s alpha of .89.

Anger. Five questions were drawn from the anger-hostility dimension of SCL-90, a multidimensional self-report symptom inventory (Derogatis et al., 1973; Derogatis & Cleary, 1977). Respondents were asked how often during the previous week each statement applied to them (see all statements in Table 3) using a four point scale (“never” = 0, “seldom” = 1, “sometimes” = 2, “often” = 3). Responses on this latent variable ranged from 0 to 15. The scale demonstrated good internal consistency with a Cronbach’s alpha of .82.

Suicidal ideations and suicide attempts. Suicidal ideation and suicidal attempts were measured with questions from the *Youth in Iceland* study (Bjarnason & Thorlindsson, 1994). Participants were asked about suicidal ideations (“Have you ever seriously considered committing suicide?”) and suicidal attempts (“Have you ever attempted to commit suicide?” and “Have you attempted to commit suicide during this school year?”). Two observed measures were created, each serving as a dependent variable. One dependent variable measured suicidal ideations only, where those who reported having seriously considered committing suicide without having made an attempt to commit suicide were assigned a value of 1 and all other responses were assigned a value of 0. The second dependent variable measured suicide attempts, where those who reported having ever or in the last school year attempted suicide were assigned the value 1 and all other responses received a value of 0 (0 = “no”, or 1 = “yes”).

Statistical analysis

First, descriptive statistics and correlations statistics between all the variables in the study were calculated. In calculating the correlations, Pearson *r* correlation coefficients were calculated. Because the dependent variables of suicidal ideations and suicidal attempts were dichotomous variables the Point Biserial correlation coefficients (rpb) were calculated using the Pearson *r* correlation test (Field, 2005).

Amos 17.0 was used to conduct structural equation modelling (SEM), which combines common factor analysis and the general linear model. The use of SEM makes it possible to model both direct and mediating (indirect) effects using both observed and latent variables (Arbuckle, 2008; Maruyama, 1998). The SEM model was tested for females and males separately (defined as two groups). All the variables were included in the model, the control variables (family structure and parental

Table 1
Descriptive statistics for the observed and latent variables used in the study for female and male participants.

Observed variables	Range	N		% (n)	
	Categories	Females	Males	Females	Males
Family structure	0–1	4640	4418		
Living in other arrangements (0)				29.7 (1376)	27.3 (1206)
Living with both parents (1)				70.3 (3264)	72.7 (3212)
Sexual abuse	0–3	4305	3798		
No (0)				64.3 (2766)	82.2 (3211)
Least severe (1)				15.8 (681)	4.6 (173)
Mid severe (2)				12.0 (518)	10.3 (391)
Most severe (3)				7.9 (340)	2.9 (112)
Family conflict/violence	0–4	4529	4231		
No (0)				43.9 (1986)	51.8 (2190)
One type (1)				29.9 (1353)	25.1 (1063)
Two types (2)				18.2 (824)	16.1 (681)
Three types (3)				4.7 (215)	3.5 (146)
Four types (4)				3.3 (151)	3.6 (151)
Suicidal ideations only	0–1	4491	4095		
No (0)				82.4 (3699)	86.6 (3545)
Yes (1)				17.6 (792)	13.4 (550)
Suicidal attempts	0–1	4513	4120		
No (0)				89.8 (4052)	93.1 (3836)
Yes (1)				10.2 (461)	6.9 (284)
Latent variables	Range	N		Mean (SD)	
		Females	Males	Females	Males
Parental education	0–8	4190	3803	4.38 (2.44)	4.52 (2.42)
Depressed mood	0–24	4551	4296	6.84 (5.88)	4.80 (4.91)
Anger	0–15	4607	4344	3.47 (3.28)	3.08 (3.09)

Table 2Bivariate correlation between all the study variables using Pearson's *r* coefficients, for female and male participants.

	Family structure	Sexual abuse	Family conflict/violence	Depressed mood	Anger	Suicidal ideations only	Suicidal attempts
	Females/males	Females/males	Females/males	Females/males	Females/males	Females/males	Females/males
Family struct.	1.00/1.00						
Sexual abuse	-.10*/-.05*	1.00/1.00					
Family conflict/violence	-.22*/-.23*	.23*/.16*	1.00/1.00				
Depressed mood	-.11*/-.07*	.24*/.10*	.25*/.24*	1.00/1.00			
Anger	-.08*/-.05*	.22*/.15*	.30*/.27*	.57*/.48*	1.00/1.00		
Suicidal ideations only	-.06*/-.09*	.14*/.12*	.14*/.25*	.27*/.38*	.18*/.25*	1.00/1.00	
Suicidal attempts	-.08*/-.05*	.27*/.16*	.21*/.23*	.30*/.25*	.25*/.23*	-.16*/-.11*	1.00/1.00

*Significant at $p < .001$ (2-tailed).

education), the childhood adversities variables (family conflict/violence and sexual abuse), the hypothesised mediators (depressed mood and anger), and the suicidal variables (suicidal ideations and attempts). The model included a specification and test of a measurement model and a structural model. First, the measurement model was specified and tested. As required, all the latent variables in the measurement model were measured with multiple indicators (ranging from two to eight) (Anderson & Gerbing, 1982, 1988; Gerbing & Anderson, 1993; Lanza, Flaherty, & Collins, 2003). The factor loadings of indicators on each of the latent constructs were all substantial and statistically significant. Second, a confirmatory structural model was specified indicating the relations of the constructs to one another, as posited by the theory and hypotheses put forward (Anderson & Gerbing, 1988). The fit of the theoretical model was tested by considering together the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the chi-square statistic, as recommended by McDonald and Ho (2002). Generally, models are considered a good fit if the CFI is at least .90 and the RMSEA is .05 or less. When testing if depressed mood and anger mediated the relationship between family conflict/violence and sexual abuse and suicidal ideations and attempts the direct and indirect effects were calculated and reported as unstandardized and standardized estimates. To estimate the mediation effects the unstandardized estimates of paths *a*, between childhood adversities variables (family conflict/violence and sexual abuse) and emotional problems (depressed mood and anger) were multiplied by paths *b*, the unstandardized estimates of the paths from emotional problems to suicidal behaviour (ideations and attempts). A total of 16 mediating pathways (8 for females and 8 for males) were estimated. To test for statistical significance of the mediating effects the joint significance test was used, which is a variation of Baron and Kenny (1986) mediation test (Fritz & MacKinnon,

Table 3

Standardized factor loadings for indicators on the latent constructs for female and male participants and fit measures for the structural model.

	Parental education	Depressed mood	Anger
	Females/males	Females/males	Females/males
Parental education			
Mother's education	.61/.76		
Father's education	.72/.59		
Depressed mood			
Felt sad or had little interest in doing things		.73/.65	
Felt lonely		.71/.74	
Cried easily or wanted to cry		.73/.56	
Found it difficult to fall asleep or stay asleep		.54/.50	
Felt blue		.85/.84	
Felt no interest in things		.80/.77	
Felt low in energy or slowed down		.72/.71	
Felt hopeless about the future		.71/.74	
Anger			
Easily annoyed or irritated			.61/.57
Experienced temper outbursts that you could not control			.82/.78
Had the urges to break or smash things			.77/.72
Got into argument			.71/.70
Shouted or threw things			.67/.70
Fit measures for the structural model			
Number of distinct sample moments		460	
Number of distinct parameters to be estimated		158	
Degrees of freedom (460–158)		302	
Chi-square		6435	
CFI Baseline Comparisons		.90	
RMSEA		.047	

All factor loadings are significant at $p < .001$ (2-tailed).

2007; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The joint significance test uses the significance of a and b (as described above) to test for significance of a mediation. If both a and b are significant it follows that mediation is present.

Finally, to test for differences between the two groups of female and male participants Amos was used to calculate a table of critical ratios of differences among all pairs of free parameters, where values larger than 1.96 indicated a significant difference between females and males on the corresponding parameter (Arbuckle, 2008). Some of the respondents did not answer all of the questions. Missing values on variables ranged from 0.3% (27) on family structure to 10.8% (985) on sexual abuse. On the dependent variables, missing values were 5.5% (499) for suicidal ideations and 5.0% (452) for suicide attempts. The full information maximum likelihood estimation procedure was used to handle missing data (Arbuckle, 2008). Amos uses observed information to produce the maximum likelihood estimation of parameters, assuming missing at random (Acock, 2005). This method has been shown to outperform most common methods of handling missing data, including data deletion and mean substitution methods (Enders & Bandalos, 2001).

Results

Descriptive statistics are demonstrated in Table 1, showing range, number and percentages for adolescent females and males responses on the observed variables (categorical variables) and range, number, mean and standard deviations for females and males responses on the latent variables (scales).

Intercorrelations between all the variables in the study are shown in Table 2. They indicated significant correlations between all the variables included in the analysis ($p < .001$, two tailed). The association between childhood adversities and emotions ranged from $r = .10$ between sexual abuse and depressed mood among males to $r = .30$ between family conflict/violence and anger among females. Also, there were significant associations between childhood adversities and the outcome variables, ranging from $r = .12$ between sexual abuse and suicidal ideations among males to $r = .27$ between sexual abuse and suicidal attempts among females. As regards the association between emotions and suicidal ideations and suicidal attempts, the bivariate results ranged from $r = .23$ between anger and suicidal attempts among males to $r = .38$ between depressed mood and suicidal ideations among males. In line with prior studies showing comorbidity between anger and depressed mood in children and adolescents, the findings revealed that depressed mood and anger were highly correlated for both females ($r = .57$) and males ($r = .48$).

The factor loadings of indicators on each of the latent variables in the study are shown in Table 3 along with fit measures for the structural model. The factor loadings were all high and statistically significant ($p < .001$) for both female and male participants. The fit measures indicated that apart from the chi-square test, which turned out to be significant due to large sample size (see Gerbing & Anderson, 1993), the model fitted the data well. The structural model, tested for females and males separately, had a CFI value of .90 and an RMSEA of .047, which indicates a good fit.

Table 4 shows the standardized and unstandardized regression weights for the structural equation model with depressed mood and anger as mediating factors for female and male participants. Exposure to sexual abuse was positively related to both depressed mood and anger. Similarly, family conflict/violence was positively related to both depressed mood and anger. With regard to the dependent variables, the results indicated that depressed mood was significantly related to both suicidal ideations and suicide attempts for both females and males. However, anger was only significantly related to suicide attempts. As can be seen in Table 4, when controlling for the other variables in the model, anger turned out to be not significantly related to suicidal ideations.

The results for the mediating (indirect) effects of depressed mood in the relationship between sexual abuse and family conflict/violence and suicidal ideations and suicide attempts were significant at the .01 level for both males and females. For family conflict/violence and sexual abuse, the mediating effects through depressed mood on suicidal ideations (females, $\beta = .05$ and $\beta = .05$, $t > 1.96$; males, $\beta = .06$ and $\beta = .02$, $t > 1.96$) and suicide attempts (females, $\beta = .04$ and $\beta = .03$, $t > 1.96$; males, $\beta = .04$ and $\beta = .01$, $t > 1.96$) were significant for both males and females.

Looking at the mediating effects through anger, it turned out that anger played a significant role in mediating the effects of family conflict/violence (females, $\beta = .03$, $t > 1.96$; males, $\beta = .04$, $t > 1.96$) and sexual abuse (females, $\beta = .02$, $t > 1.96$; males, $\beta = .02$, $t > 1.96$) on suicide attempts among both females and males. However, anger did not significantly mediate the link between family conflict/violence or sexual abuse and suicidal ideations (see Fig. 1).

Finally, to test for differences between female and male participants Amos was used to calculate a table of critical ratios of differences among all pairs of free parameters. The results indicated significant differences on three parameters. First, sexual abuse was more strongly related to depressed mood among females than among males. As Table 2 indicates, the unstandardized coefficients for the relationship between sexual abuse and depressed mood were .13 for females but .05 for males. Second, the direct effects of sexual abuse on suicidal ideations and suicide attempts were marginally stronger for females (.02 and .05) than for males (.00 and .03).

Discussion

Using Agnew's general strain theory as a framework, we tested a model to determine how family conflict/violence, sexual abuse and psychological distress, in the form of anger and depressed mood, were related to two different forms of suicidal behaviour: suicidal ideations and suicide attempts. A number of observations emerged from the analysis.

Table 4

Standardized and unstandardized regression weights for the structural equation model with depressed mood and anger as mediating factors, for female and male participants.

	Standardized coefficients		Unstandardized coefficients		S.E.		C.R.	
	Females	Males	Females	Males	Females	Males	Females	Males
Hypothesized relationships								
Sexual abuse → Depressed mood	.20***	.08***	.128	.054	.010	.012	12.431	4.477
Sexual abuse → Anger	.17***	.13***	.105	.087	.010	.012	10.714	7.266
Sexual abuse → Suicidal ideations	.06***	.00	.023	.001	.006	.007	3.827	.450
Sexual abuse → Suicidal attempts	.18***	.10***	.054	.032	.005	.005	11.763	6.300
Family conflict/violence → Depressed mood	.21***	.24***	.128	.129	.009	.009	13.498	14.559
Family conflict/violence → Anger	.28***	.30***	.155	.152	.009	.009	16.727	16.552
Family conflict/violence → Suicidal ideations	.07***	.08***	.023	.026	.006	.005	4.051	4.696
Family conflict/violence → Suicidal attempts	.10***	.14***	.027	.033	.004	.004	6.141	8.236
Depressed mood → Suicidal ideations	.23***	.26***	.133	.158	.010	.010	13.716	15.267
Depressed mood → Suicidal attempts	.17***	.16***	.080	.070	.007	.007	10.867	9.549
Anger → Suicidal ideations	.02	.00	.012	.000	.011	.011	1.093	-.019
Anger → Suicidal attempts	.11***	.13***	.055	.058	.008	.008	6.551	7.064
Control relationships								
Parental education → Sexual abuse	-.08***	-.07**	-.090	-.050	.022	.016	-4.182	-3.144
Parental education → Family conflict/violence	-.02	-.03	-.026	-.024	.022	.018	-1.187	-1.306
Parental education → Depressed mood	-.07***	-.04*	-.050	-.022	.014	.010	-3.576	-2.060
Parental education → Anger	-.12***	-.08**	-.079	-.038	.014	.011	-5.821	-3.376
Parental education → Suicidal ideations	-.03	.03	-.013	.009	.008	.006	-1.585	1.480
Parental education → Suicidal attempts	-.03	-.06**	-.009	-.012	.006	.005	-1.548	-2.647
Family structure → Sexual abuse	-.10***	-.04**	-.209	-.077	.032	.028	-6.484	-2.716
Family structure → Family conflict/violence	-.22***	-.23***	-.502	-.545	.033	.035	-15.031	-15.439
Family structure → Depressed mood	-.05**	-.01	-.063	-.016	.021	.020	-2.962	-.813
Family structure → Anger	.00	.03	.003	.034	.020	.020	.171	1.735
Family structure → Suicidal ideations	-.01	-.04*	-.007	-.030	.012	.012	-.549	-2.514
Family structure → Suicidal attempts	-.01	.01	-.006	.005	.009	.009	-.600	.548

*** Significant at $p < .001$ (2-tailed).

** Significant at $p < .01$ (2-tailed).

* Significant at $p < .05$ (2-tailed).

C.R.– Stands for the critical ratio for regression weight, where regression weight estimate is divided by the estimate of its standard error (S.E.).

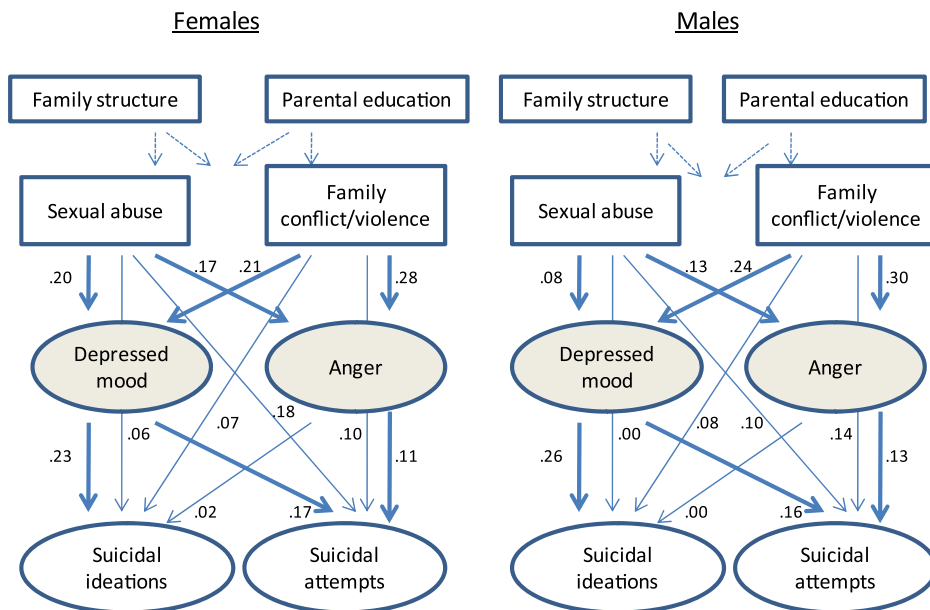


Fig. 1. Associations between sexual abuse, family conflict/violence, suicidal ideations and suicidal attempts (using standardized coefficients), with depressed mood and anger as mediating factors, model tested for females and males separately. Bold lines demonstrate significant mediating pathways and broken lines control relationships.

Our study supports the first hypothesis, showing that exposure to childhood adversities in the form of family conflict/violence and sexual abuse is positively related to both anger and depressed mood as well as suicidal ideations and suicidal attempts among adolescents. Exposure to family conflict/violence and to sexual abuse therefore increases the likelihood of both depressed mood and anger as well as suicidal ideations and suicidal attempts among adolescent females and males. This finding highlights the importance of including multiple predictors as well as multiple emotional reactions in studies on the effects of childhood adversities, emotions and behaviour (Asgeirsdottir et al., 2011; Sigfusdottir et al., 2004). The second and third hypotheses are also supported; depressed mood related to childhood adversities is more strongly associated with suicidal ideations than with suicide attempts, and anger is more strongly associated with suicide attempts than with suicidal ideations, for both males and females. In fact, when both depressed mood and anger are included in the model, anger is not linked to suicidal ideations at all. This is interesting in light of the fact that when looking at the bivariate results, one might conclude that anger served as an important mediator between childhood adversities and suicidal ideations. In fact among males, the association between anger and suicidal ideations is $r = .25$ while the association between anger and suicidal attempts is $r = .23$. In line with prior studies, these findings show that while anger and depressed mood are highly comorbid in the sense that they co-occur to a great extent (Curran, 1987; Gispert, Davis, Marsh, & Wheeler, 1987; Renouf & Harter, 1990; Rutter, 1989), they differ in their associations with behavioural outcomes (Sigfusdottir et al., 2004). The findings support general strain theory, which proposes that anger energizes the individual for action, lowers inhibitions, and increases the likelihood of acting out, namely by attempting suicide. Depressed mood, however, is less likely to result in action, but more likely to result in suicidal ideation, or thoughts or wishes to be dead. We need to keep in mind though, that after controlling for anger, depressed mood is still quite strongly related to suicide attempts. Anger on the other hand, when controlling for depressed mood, is associated with suicide attempts but not suicidal ideations.

These findings are of key importance in understanding the differences in the association between childhood adversities and diverse forms of suicidal behaviour. That is, suicide attempts are a stronger predictor of committed suicides than suicidal ideations, and thus need special attention. Our findings show that as in other Western countries (Grunbaum et al., 2004), suicidal ideation without suicide attempts is relatively common; 17.6% of adolescent females and 13.4% of adolescent males in the current study report having at some point seriously considered committing suicide. While suicide attempts are less common, with 10.2% of females and 6.9% of males reporting ever having attempted suicide, other studies have shown that prior suicide attempts are the strongest risk factor for future attempts and completions (Farberow, 1989; Lewinsohn et al., 1996). While adolescent females are more likely to consider and attempt suicide, adolescent males are more likely to complete such attempts (Andrews & Lewinsohn, 1992; Fergusson & Lynskey, 1995; Haavisto et al., 2005; Lewinsohn et al., 1996).

In order to develop effective prevention and intervention strategies, the findings of the current study benefit our understanding of the processes through which childhood adversities lead to different emotions and hence to different outcomes with respect to suicidal ideation and suicide attempts. While depressed mood is commonly viewed as a prerequisite for committing suicide, and interventions to prevent suicidal behaviour often focus on recognizing and diminishing depression (Mann et al., 2005), the effects of anger have received much less attention in prevention work. In an extensive study on adolescent suicidal behaviour recently published in JAMA psychiatry (Nock et al., 2013), the authors raise concerns that reducing symptoms of depression does not necessarily lead to a decline in suicides as well. The study included 6483 adolescents aged 13–18 years and their parents, and showed that for the majority of adolescents being treated for mental health issues, the treatment did not stem their suicidal behaviour. The researchers point out that more work is needed to increase our understanding of the pathways to adolescent suicidal behaviours, and to develop actionable strategies for clinical prediction and prevention of these behaviours.

The findings of the current study underline the importance of including a focus on anger, not only depression, in prevention and intervention efforts. This may be even more important for adolescent males than females since adolescent males are four times as likely to die by suicide, relative to adolescent females, not least because males use more effective measures to commit suicide. The current study suggests that anger, as an energizing force, may also explain higher levels of committed suicides among adolescent males than females. While adolescent females are more prone to anger than males are, they are also much more likely to suffer from depression; accordingly, anger and depression are comorbid much more often among females than males (Sigfusdottir et al., 2004). As pointed out before, depressed mood and anger can have counteractive effects on behaviour. High levels of depressed mood hence may prevent adolescents from responding to their feelings of anger by taking action. As females in general experience higher levels of depressed mood, this may explain why they are less likely to complete their suicide attempts than males are.

The current study has limitations. First, it is based on cross-sectional data, making it impossible to draw inferences about the temporal sequence of the constructs under study. That is, this method does not give an opportunity to conclude whether sexual abuse and family conflict/violence occurred prior or possibly after the reported emotions, suicidal ideation and suicide attempts. Such a test awaits future research. Second, the study relies on self-reported measures, which may lead to bias or inaccurate descriptions of emotions and behaviours. Despite these limitations, there is reason to be confident about the reliability of the data, since the aim of the study was not to establish rates or prevalence of stressful life events, emotions, and behaviour, but to draw conclusions about the direct and indirect relationships between them. Also, the study offers some valuable benefits; a very large sample size, the national and geographical population representation of the data and sophisticated analytical strategy.

In conclusion, the current study is important, as understanding of the processes through which childhood adversities lead to different emotions and hence to different outcomes in the form of suicidal ideation and suicide attempts, may have important implications for prevention and intervention strategies.

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