Self-reported suicide attempts and associated risk and protective factors among secondary school students in New Zealand

Theresa M. Fleming, Sally N. Merry, Elizabeth M. Robinson, Simon J. Denny, Peter D. Watson

Objective: To examine associations between individual, family, school and community characteristics and rates of suicide attempts in a national population sample of New Zealand secondary school students.

Method: A total of 9570 randomly selected 9- to 13-year-old students from 114 schools were surveyed, using the New Zealand Adolescent Health Survey. This is a 523-item anonymous self-report comprehensive questionnaire delivered by Multi-Media Computer-Assisted Self-Interviewing. Multivariate analyses were used to examine correlates of self-reported suicide attempts within the last 12 months.

Results: In total, 739 participants (4.7% of males and 10.5% of females) reported having made a suicide attempt within the last 12 months. Depressive symptoms, alcohol abuse, having a friend or family member attempt suicide, family violence and non-heterosexual attractions were independently associated with increased rates of suicide attempts while parents caring, other family members caring, teachers being fair and feeling safe at school were independently associated with decreased rates of suicide attempts. Caring friendships, attending worship frequently, possible sexual abuse and anxiety symptoms were not independently associated with suicide attempts. Risk and protective factors operated in the same way for male and female students and for those with and without other suicide predictors.

Conclusions: New Zealand secondary school students, particularly female students, report high rates of suicide attempts. Risk of suicide attempts is lower in students reporting caring home and fair, safe school environments and this effect remains once depression is taken into account. This study confirms the importance of depression, substance use, problem behaviour, negative life events, exposure to suicide behaviour by others and the significance of sexual orientation in suicidal behaviour among school students and provides evidence of the importance of the family and school environments in reducing risk among this group.

Key words: Adolescents, protection, resilience, risk factors, suicide attempts.

Australian and New Zealand Journal of Psychiatry 2007; 41:213–221

Theresa M. Fleming, Clinical Lecture (Correspondence) Peter D. Watson, Senior Research Fellow

Department of Paediatrics, University of Auckland, Auckland, New Zealand. Email: adevidence@ihug.co.nz

Sally N. Merry, Child and Adolescent Psychiatrist

Department of Psychological Medicine, University of Auckland, Auckland, New Zealand

Elizabeth M. Robinson, Biostatistician

Department of Community Health, University of Auckland, Auckland, New Zealand

Simon J. Denny, Specialist Youth Physician

Counties Manukau District Health Board, Centre for Youth Health, Auckland, New Zealand.

Received 6 June 2006; accepted 23 June 2006.

Suicide attempts are common among adolescents, with a recent systematic international review of population-based studies estimating a mean proportion of 9.7% of adolescents reporting having ever made a suicide attempt [1]. Few young people who report having tried to kill themselves may in fact have wished to die, and very few will go on to complete suicide [1]. However, there is agreement that non-fatal suicide attempts are predictive of future suicide risk [2–4], may cause trauma in themselves, perhaps form part of a pathway towards suicide [4,5] and signal emotional distress. Risk factors for suicide attempts overlap substantially with risk factors for medically serious suicide attempts and death by suicide [6,7]. Thus, studying suicide attempts in population samples can provide opportunities for insight into suicide processes with greater statistical power than case control or mortality review studies [8].

Risk factors for suicide behaviour can be conceptualized in the following categories: ecological or sociocultural environmental factors; and, following Beautrais [3], factors of social disadvantage, biological and genetic risk, adverse early childhood experiences, personality and temperament characteristics, exposure to negative life events and psychopathology. There is a high level of consensus in the literature which points to multiple, typically cumulative, risk factors [5,8] and the importance of psychiatric disorder, especially depression (alone or in combination with substance abuse and/or disruptive behaviour), in understanding adolescent suicide behaviour [3,6,9].

Some young people, despite multiple risks, demonstrate positive adaptation and develop into healthy, competent adults. These young people have been described as 'resilient' [10–13] and there has been considerable research identifying factors that help them to thrive despite difficult circumstances. Studies have consistently identified characteristics such as high social and emotional competence, warm and caring families and safe communities as promoting good outcomes and decreasing the likelihood of problems including substance abuse, violence perpetration, problem behaviours and depression among adolescents [11–17]. Influential early work [10] focused on factors that were important for young people who were at risk but did not benefit others. It has increasingly emerged, however, that much of what is good for young people who are at risk is also good for young people who are not at risk [11], and significant studies have defined protective factors as those which decrease the likelihood of problem outcomes or increase the likelihood of positive outcomes (not just referring to interactive terms) [12,16–19]. It is that definition which is used here.

We carried out a review of peer reviewed literature that specifically investigated protective factors or resilience for suicide attempts among adolescents (we excluded studies that were of specific risk groups only, were not published in English, where less than 90% of the sample were aged 12–20 years, or where sample size was less than 40). Factors that have been demonstrated to be associated with reduced suicide risk (at least with some gender or ethnic groups) include:

- Family dimensions of connectedness [18,19], caring and communication [20,21], cohesion [22], parental presence and shared family time or activity [18,23];
- School factors including feeling safe, cared for, treated fairly and achieving well at school [18,23];
- Individual factors such as positive friendships [24], religious influence [25], positive self-image [26] and self-esteem [8].

There have been contradictory findings, however, including negative findings regarding adolescent friendships [8,19,27] and religious identity [19]. Some variation in findings may be partly explained by the range of definitions of included variables and variance in included predictors. Unfortunately, few studies which have explicitly examined protective factors for suicide behaviours have included validated measures of major predictors for suicide such as depression, included significant numbers of suicide attemptors and employed standard definitions of suicide attempts. Of those that have, parental caring [8] and global self-worth [8] have been demonstrated to be protective, while Fergusson *et al.* [9] demonstrated that positive configurations of family history of suicide, childhood sexual abuse, personality factors, peer affiliations and school academic success reduced risk of suicide among young people in the Christchurch Health and Development study.

In the present analysis we examined whether previously reported protective factors for adolescent suicide attempts were associated with reduced risk of suicide attempts independently of significant risk factors for suicide. The study was part of a larger national study of New Zealand secondary school students [28] and utilizes previously validated measures of suicide predictors where available, within this data. Survey items that were not part of previously validated instruments were selected to be comparable to previous definitions of risk and protective factors

in adolescent health and were subjected to piloting [29].

The aims of the current study were to:

1. Estimate the prevalence of self-reported suicide attempts among New Zealand secondary school students.
2. Examine the association of parental caring and availability, family caring, caring friendships, school teachers caring and being fair, school safety and religious attendance with suicide attempt rates.
3. Identify whether these factors were independently associated with reduced rates of suicide attempts in a comprehensive model.

We used standard definitions of suicide attempts and included significant numbers of suicide attemptors in a contemporary, ethnically diverse sample which included approximately 4% of all New Zealand secondary school students.

Method

In 2001 we conducted a national secondary school student adolescent health survey. The survey is a 523-item anonymous cross-sectional self-report questionnaire, which utilizes a branching design and samples a wide range of health behaviours and individual, family, school and community characteristics. Approval for the study was granted by the University of Auckland Human Subjects Ethics Committee. Descriptions of the development and methodology of the survey have been published previously [28,29], hence a brief overview only is provided here. The questionnaire was delivered using Multi-Media Computer-Assisted Self-Interviewing on laptop computers. Students each sat in front of a passive matrix screen laptop computer. Questions and possible answers were read out over headphones as they appeared on the screen and students answered by using a mouse. A graphic interface and music accompanied the questionnaire. Survey participants reported a high level of interest in participating in the survey and in using the multimedia interface [29].

Sample

We randomly selected 133 schools from all 390 schools in New Zealand which had at least 50 students 9–13 years old (New Zealand secondary or high school years). In each consenting school a random list of 30% of eligible students was generated. The first 15% on the list were identified as selected students, the second 15% as reserve. On the day of the survey the selected students were invited to participate; if they did not consent or could not be located students on the reserve list were invited to participate. Students were ineligible if they were not New Zealand residents, had insufficient English language skills to participate or had a disability that prevented them from completing the questionnaire. An active written consent process was utilized for schools and for students. Parents were sent information about the survey and were able to have their children excluded from the survey.

Measures

Suicide attempts

The dependent variable for analyses was self-reported suicide attempts in the last 12 months, identified by an affirmative response to the question 'During the last 12 months, have you ever tried to kill yourself (attempt suicide)?

Demographic information used in the analysis was age in years (from 12 years and under, to 17 years and over), gender and, as a proxy measure of socioeconomic status, school decile. School decile is a New Zealand government aggregate measure of employment, income and deprivation in the school community [30].

Measures of depression

There were two measures of depression included in this analysis. First, the presence of 'depressive symptoms' was identified by scores greater than the cut-off score on the Reynolds Adolescent Depression Scale. This is a self-report scale designed to measure current depressive symptoms among adolescents [31]. Discriminant validity utilizing the cut-off score as a threshold to identify a clinically relevant level of depressive symptomatology is high [31]. Second, students were identified as having an 'episode of depressed mood' if they reported feeling sad, down or depressed most of the day, almost every day, for a period of 2 weeks or more, within the last 12 months.

Anxiety symptoms were assessed using the Anxiety Disorders Index. This is a subscale of the Multidimensional Anxiety Scale for Children [32], designed to maximally discriminate between young people with and without clinical anxiety disorders [32]. Students who scored over the designated cut-off were classified as having anxiety symptoms.

Problem alcohol use was defined by frequent, moderate or heavy use, with 2 or more problematic consequences of use (wording of this and other questions available from the authors).

Problem marijuana use was defined by use of marijuana weekly or more often, plus reporting two or more problem consequences of marijuana use.

Problem behaviour was defined by the presence of three or more serious problem behaviours parallel to behaviours used to define the presence of conduct disorder in DSM-IV [33], plus the presence of a school or social problem.

Sexual abuse was defined by the young people reporting that they had definitely or maybe been touched in a sexual way that they did not want or that they had been made to do sexual things that they did not wish to do.

Others' suicide attempt was identified by an affirmative response to the question 'Has a friend or someone in your family ever tried to kill themselves (attempt suicide)? *Non-heterosexual orientation* was defined as being attracted to the same sex (as oneself), both sexes, neither sex or not sure.

Religious attendance was defined by often attending church/mosque/shrine or other place of worship.

Family characteristics

Family characteristics were assessed by the following single questionnaire items:

Family violence; adult to adult – having seen adults in the home physically hurting another adult within the last 12 months.
Family violence; adult to child – having seen adults in the home physically hurting a child within the last 12 months.
Parental caring – reporting that at least one parent, or person who acts as a parent, cares (about the student) a lot.
Other family members caring – other family members care (about the student) a lot.
Parental closeness – most of the time the student feels close to at least one parent, or person who acts as a parent.
Parental presence – each week the student spends enough time with at least one parent, or person who acts as a parent.
Family has meals together – the family eats evening meals together almost every day.

School and community characteristics

School and community characteristics were assessed by the following single questionnaire items:

Teachers are fair – teachers at school treat students fairly most of the time.
Safe at school – the student feels safe at school most of the time.
Adults at school care – adults at school (teachers, coaches or other adults) care (about the student) a lot.
Friends care – friends care (about the student) a lot.
Safe in neighbourhood – the student feels safe in their neighbourhood most of the time.

Analyses

Some schools had a higher proportion of their school roll sampled than others (due to factors such as minor inaccuracies in school rolls); therefore in all analyses data have been weighted to allow for unequal selection probabilities. Standard errors have been adjusted to allow for the correlation of data within schools. In the first stage of analysis we tested the association between hypothesized protective factors and suicide attempts using logistic regression analyses. Second, multiple logistic regression was used to investigate the associations between attempted suicide and protective factors when other predictors where taken into account. Factors that were significantly associated with suicide attempt rates in bivariate testing and had less than 10% missing responses (i.e. less than 10% of participants had not answered the question) were considered for inclusion in the model. Because of multicollinearity, where protective factors were correlated with other protective factors ($r = 0.35$ or more), only one of them was included in the model. The decile rating of the school was included in the model to control for socioeconomic status. All analyses were conducted using SAS (release 9.02002; SAS Institute Inc., Cary, NC, US) or SUDAAN software (release 7.5.6: Research Triangle Institute, NC, USA).

Results

Figure 1 shows the number of participating students and the reasons for non-participation. Participants reported their age as: 12 years and under, 80 students (0.8%); 13 years, 1972 (20.6%); 14 years, 2285 (23.9%); 15 years, 2179 (22.8%); 16 years, 1725 (18%); 17 years and over, 1308 (13.7%). 21 students did not specify their age. 5154 (54%) were female and 4416 male. Ethnicity, categorized according to the New Zealand Census 1996 ethnicity prioritization method [34], was New Zealand Maori 24.7%, Pacific Island 8.2%, Asian 7.2%, New Zealand European 55.3% and other/unspecified 4.6%.

Rates of suicide attempts

Suicide attempts in the last 12 months were reported by 7.8% of students, 4.7% (3.9–5.6) of males and 10.5% (9.3–11.7) of females, with the peak incidence for both males and females at 15 years.

Protective factors and suicide attempt

There were no significant interactions between gender and suicide risk or protective factors so results are given for males and females combined. Positive family and school environments were reported by the majority of students, although friends caring a lot and religious attendance were less common (Table 1). In bivariate testing, positive configurations of home, school and community were associated with lower rates of suicide attempts, except for friends caring and attending worship, which were not statistically significant (Table 1).

Multivariable analysis

All variables entered into the multivariate model, except for sexual abuse and the family having meals together, remained significant (Table 2). There were no significant interactions of protective factors with gender or risk variables. Older age, male gender, parents and other family members caring, teachers being fair and feeling safe at school were all associated with significantly lower rates of suicide attempts while symptoms of depressed mood, alcohol abuse, family violence, non-heterosexual orientation and others' suicide attempt were all independently associated with increased suicide risk. Depressive symptoms and episode of low mood were the strongest correlates of suicide attempt.

The model used excluded problem behaviour, marijuana abuse and neighbourhood safety due to high numbers of missing for these variables. Each of these was considered potentially important so the model was re-run with these included on the reduced dataset. The factors significant in our first model remained significant.

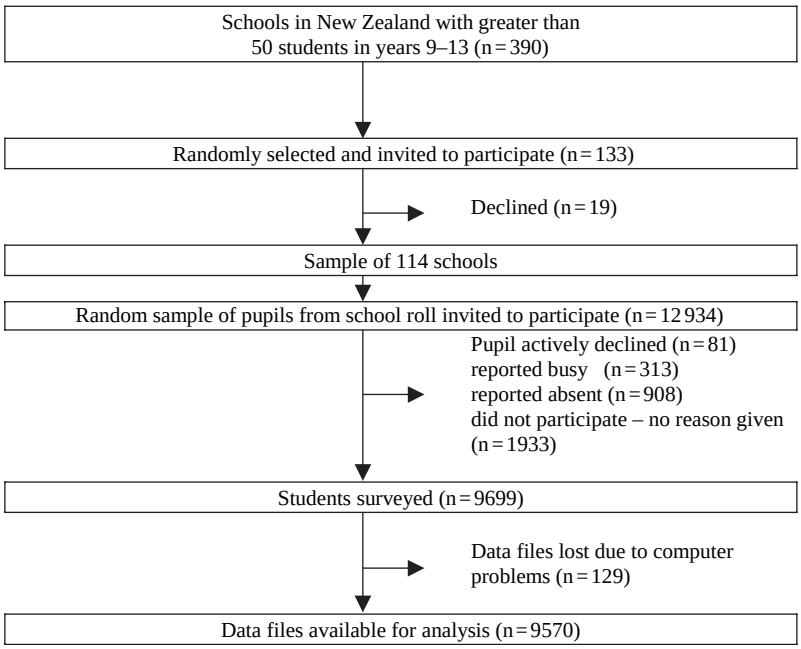

Figure 1. Selection of pupil sample.

Discussion

In this large nationally representative study, New Zealand secondary school students, particularly female students, reported high rates of suicide attempts. We have shown that risk of suicide attempts was lower in those students that had caring home and fair, safe school environments and that this effect remained once depression was taken into account. This has important implications in attempts to reduce suicidal behaviour. Although depression remains the main risk factor and efforts to address it and other suicide predictors must be a high priority, this study provides evidence of the importance of the family and school environments in reducing risk for young people.

The rates of suicide attempts in this study are higher than those identified in previous New Zealand studies [35,36] and are higher than international means identified by Evans *et al.* [1] in their recent review. New Zealand has high youth suicide rates compared with other OECD countries and New Zealand youth may have high rates of non-fatal suicide behaviour; however, differences in findings may be at least in part due to methodological differences. High rates of disclosure of suicide attempts are reported in anonymous as opposed to interview-based methodologies [1] and the Multi-Media Computer-Assisted Self-Interviewing technology has been identified as very acceptable to young people [29]. Differences from previous New Zealand research may also reflect sample differences. Participants in the Dunedin and Christchurch longitudinal studies were born in the late 1970s and came from specific geographical regions of New Zealand. In contrast this study includes a more recent, culturally diverse sample of young people from all regions of New Zealand.

We have confirmed that depressive symptoms, alcohol abuse, non-heterosexual orientation and exposure to suicide behaviour by others are each associated with increased risk of suicide attempts in this population, as has been found in other studies [19]. The single most powerfully associated risk factor with suicide attempts was the presence of depressive symptoms. This finding has been replicated widely and underscores the importance of considering this construct in understanding and preventing suicidal behaviour. Witnessing family violence is increasingly recognized as important in young people's wellbeing [37] and exposure to family violence, whether directed at a child or an adult in the home, was independently associated with significant increases in risk in this study. In contrast, possible or actual sexual abuse was not associated with increased risk in this study. Sexual abuse has been found to increase risk of suicide attempts among young people in a robust systematic review [38]. Our use of a single item which potentially includes both serious and relatively less important experiences, may have led to an

Table 1. Association of hypothesized protective factors with suicide attempt

	Number of students reporting factor	Per cent of attempted suicide	Odds ration (95% confidence interval)	p-value
Parental caring				
Yes	8664	6.4	0.20 (0.16–0.24)	p <0.0001
No	723	25.4		
Other family members caring				
Yes	5747	4.7	0.34 (0.29–0.39)	p <0.0001
No	3608	12.8		
Parental closeness				
Yes	6640	5.4	0.36 (0.31–0.42)	p <0.0001
No	2752	13.7		
Parental presence				
Yes	5753	5.4	0.44 (0.37–0.52)	p <0.0001
No	3635	11.5		
Family has meals together				
Yes	5756	5.7	0.48 (0.41–0.57)	p <0.0001
No	3593	11.1		
Adults at school care				
Yes	8335	6.6	0.35 (0.28–0.43)	p <0.0001
No	1000	16.9		
Teachers are fair				
Yes	8824	6.6	0.36 (0.3–0.43)	p <0.0001
No	527	16.9		
Safe at school				
Yes	7345	5.7	0.34 (0.28–0.41)	p <0.0001
No	2025	15		
Safe in neighbourhood				
Yes	7285	5.7	0.40 (0.32–0.49)	p <0.0001
No	1315	13.2		
Friends care				
Yes	4858	6.8	0.87 (0.72–1.06)	p =0.02
No	3943	7.7		
Religious attendance				
Yes	1439	7.3	1.05 (0.76–1.44)	p =0.8
No	7224	7.0		

underestimate of effect. Our finding that anxiety made a marginal independent contribution to suicide attempts once other risks are taken into account is consistent with other studies [19].

The strength of this study is that as well as including the factors above, we examined the impact of family and community factors in a large sample of young people. In many studies in which 'protective factors' are considered, important predictors are not included in the model. W e have included important risks and have found that parents and other family members caring, teachers being fair and feeling safe at school were each associated with lower rates of suicide attempts among students even when depressive symptoms, anxiety symptoms, alcohol abuse, family violence, sexual orientation and exposure to suicide attempts by others were taken into account. Positive family and school environments have been shown to be associated with reduced rates of depression and other problems known to contribute to suicide risk [13,15,16,39] and their direct role in mediating suicide risk has been unclear. In this case we suggest that caring families and positive school environments may act on suicidal behaviours both indirectly, by reducing depression and other risk factors, and directly, by reducing the chance that young people will respond to low mood or other stressful situations by attempting suicide.

Findings of multiple effects of family and school environments are consistent with contemporary developmental theories locating the central importance and multiple effects of families and everyday contexts in young people's lives [11,16,39,40]. Major domains

Table 2. Multivairate logistic regression for suicide attempts in previous year

Variable	Odds ratio (95% confidence Interval)	p-value
Age (years)		
13 and under	3.93 (2.34–6.59)	p <0.0001
14	3.90 (2.38–6.40)	
15	4.95 (3.01–8.13)	
16	3.36 (2.15–5.25)	
17 and over (reference)	1.00	
Gender (Male compared with female)	0.58 (0.44–0.78)	p =0.0004
Parental caring	0.59 (0.43–0.82)	p =0.002
Other family members caring	0.68 (0.56–0.83)	p =0.0001
Family has meals together	0.84 (0.66–1.06)	p =0.14
Teachers are fair	0.65 (0.48–0.89)	p =0.007
Safe at school	0.77 (0.60–0.99)	p =0.04
2 weeks of depressed mood†	3.97 (2.89–5.45)	p <0.0001
RADS over cut-off‡	3.65 (2.51–5.29)	p <0.0001
Both measures of depression	8.56 (5.85–12.53)	p <0.0001
Anxiety symptoms§	1.45 (0.98–2.13)	p =0.03
Alcohol abuse	2.17 (1.45–3.22)	p =0.0002
Family violence adult-adult	1.92 (1.37–2.7)	p =0.0003
Family violence adult-child	1.41 (1.14–1.72)	p =0.002
Non–heterosexual orientation	1.79 (1.28–2.44)	p =0.0007
Sexual abuse	1.27 (0.97–1.64)	p =0.08
Others suicide attempt	2.94 (2.33–3.70)	p <0.0001

†Episode of depressed mood for 2 weeks or more in the last 12 months; ‡Scores over cut-off on RADS [22]; §Scores over cut-off on anxiety disorders index subscale of Multidimensional Anxiety Scale for Children [23]. Three or more antisocial behaviours and a school or social problem frequent use with two or more problem consequences of use adults in the home physically hurting another adult adults in the home physically hurting a child definitely or maybe being touched in a sexual way or made to do sexual things that they did not wish to do identifying as attracted to the same sex as oneself, both sexes, not sure or neither sex. RADS, Reynolds Adolescent Depression Scale.

in which young people grow have been shown to have both risk reduction and asset enhancing effects, directly and indirectly influencing outcomes for young people [11,12,40]. Risk and protective factors in this study fitted a main effects model with no statistically significant interaction between these factors. This is a common, although not universal, finding in research which examines both risk and protective processes [9,11,12,40]. These findings underscore the importance of comprehensive models that accommodate the full range of vulnerabilities and opportunities in young people's development. To consider only one side of the risk/protection equation is not supported by evidence [9,12,40].

In our multivariate analysis the independent effect size of positive family and school characteristics was modest, so the case for these factors should not be overstated. However, in contrast to extensively researched and validated measures of risk the science of measuring protective factors is relatively new. Our single item measures with use of categorical cut-offs are likely to have provided low estimates of effect [41]. Development of more robust measures of these factors may result in greater identification of impact.

We did not find caring friendships were associated with reduced suicide attempt rates in this study. This finding is consistent with most other studies of adolescent populations [8,9,19,27]. Adolescent friendships may be important in terms of suicide ideation or where other dimensions of peer relationships (such as bullying) are targeted [19,42], but may be less significant in suicide attempt risk. That religious attendance was not shown to be associated with reduced suicide attempt rates for New Zealand secondary school students is consistent with the majority of population-based studies of suicidal behaviour in adolescents [19].

Limitations

This study is a cross-sectional survey; therefore, findings are of associations and causation is not established with this study design. We were not able to include some important, potentially confounding, factors known to be linked to suicidal behaviour, such as biological or genetic risk, personality and coping styles.

We have missed students who were absent from school on the day of the survey. There is evidence that adolescents who attend school are healthier than those who do not [13]; further, the effect of school environments is likely to be most important for those who are in them.

In this study we have addressed risk and protective factors for suicide attempts and while there is some over-lap between suicide attempts and completed suicide [6,7], there are also important differences. For example, while females are more likely to attempt suicide, males have higher rates of completing suicide [7]. More minor expressions of suicide may also be relatively more influenced by social and environmental events [5], while fatal suicide behaviour is more

strongly predicted by mood disorder [5,7]. Our findings cannot be extrapolated directly to those who complete suicide; however, there is evidence that those attempting suicide are at much higher risk of later completed suicide, making this an important group in which to intervene [5].

Conclusion

Adolescent depression, alcohol and substance abuse, problem behaviour, experiences of family violence, suicide behaviour by others and issues of sexual orientation increase risk of suicide attempts among high school students, while caring families and fair and safe school environments are associated with decreased rates of suicide attempts.

There is strong evidence that to reduce suicidal behaviours it is vital to prevent, recognize and address mental ill health and tackle risk factors particular to suicide [43]. This study suggests aspects of family and school environments which may also be significant in preventing non-fatal suicide attempts among secondary school students.

References

1. Evans E, Hawton K, Rodham K, Deeks J. The prevalence of suicidal phenomena in adolescents: a systematic review of population-based studies. *Suicide Life Threat Behav* 2005; 35:239–250.
2. Fergusson DM, Horwood LJ, Ridder EM, Beautrais AL. Suicidal behaviors in adolescence and subsequent mental health outcomes in young adulthood. *Psychol Med* 2005; 35:983–993.
3. Beautrais AL. Life course factors associated with suicidal behaviors in young people. *Am Behav Sci* 2003; 46:1137–1156.
4. Van Herringen K, Hawton K, Williams JMG. Pathways to Suicide: an Integrative Approach. In: Hawton K, Van Herringen K, eds. *The international handbook of suicide and attempted suicide*, Chichester: Wiley, 2000:223–234.
5. Neeleman J, deGraff R, Vollebergh W. The suicidal process: prospective comparison between early and later stages. *J Affect Disord* 2004; 82:43–52.
6. Gould MS, Greenberg T, Velting DM, Shaffer D. Youth suicide risk and preventive interventions: a review of the past 10 years. *J Am Acad Child Adolesc Psychiatry* 2003; 42:386–405.
7. Beautrais AL. Suicide and serious suicide attempts in youth: a multiple-group comparison study. *Am J Psychiatry* 2003; 1:1093–1099.
8. Wichstrom L. Predictors of adolescent suicide attempts: a nationally representative longitudinal study of Norwegian adolescents. *J Am Acad Child Adolesc Psychiatry* 2000; 39:603–610.
9. Fergusson DM, Beautrais AL, Horwood LJ. Vulnerability and resiliency to suicidal behaviors in young people. *Psychol Med* 2003; 33:61–73.
10. Rutter M. Resilience in the face of adversity: protective factors and resistance to psychiatric disorder. *Br J Psychiatry* 1985; 147:598–611.
11. Wright M, O'D, Masten AS. Resilience processes in development. Fostering positive adaptation in the context of adversity. In: Goldstein S, Brooks R, eds. *Handbook of resilience in children*, New York: Kluwer Academic/Plenum, 2005:17–37.
12. Luthar S, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. *Child Dev* 2000; 71:543–562.
13. Denny S, Clark T, Fleming T, Wall M. Emotional resilience: risk and protective factors for depression among alternative education students in New Zealand. *Am J Orthopsychiatry* 2004; 74:137–149.
14. WHO/UNFPA/UNICEF Study Group on Programming for Adolescent Health. *Programming for adolescent health and development: report of a WHO/UNFPA/UNICEF Study Group on Programming for Adolescent Health*. Geneva: World Health Organization, 1999.
15. Resnick MD, Bearman PS, Blum RW *et al*. Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. *J Am Med Assoc* 1997; 278:823–832.
16. Catalano RF, Hawkins JD, Berglund ML *et al*. Prevention science and positive youth development: competitive or cooperative frameworks? *J Adolesc Health* 2002; 31:230–239.
17. Werner E, Smith R. *Vulnerable but invincible: a study of resilient children*, New York: McGraw-Hill, 1982.
18. Borowsky IW, Ireland M, Resnick MD. Adolescent suicide attempts: risks and protectors. *Pediatrics* 2001; 107:485–493.
19. Evans E, Hawton K, Rodham K. Factors associated with suicidal phenomena in adolescents: a systematic review of populationbased studies. *Clin Psychol Rev* 2004; 24:957–579.
20. Borowsky IW, Resnick MD, Ireland M, Blum RW. Suicide attempts among American Indian and Alaska Native youth: risk and protective factors. *Arch Pediatr Adolesc Med* 1999; 153:573–580.
21. Blum R, Harmon B, Harris L, Bergeisen L, Resnick M. American Indian-Alaska Native youth health. *J Am Med Assoc* 1992; 267:1637–1644.
22. McKeown R, Garrison C, Cuffe S, Waller J, Jackson K, Addy C. Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *J Am Acad Child Adolesc Psychiatry* 1998; 37:612–619.
23. Svetaz MV, Ireland M, Blum R. Adolescents with learning difficulties: risk and protective factors associated with emotional wellbeing: findings from the National Longitudinal Study of Adolescent Health. *J Adolesc Health* 2000; 27:340–348.
24. Rubenstein J, Heeren T, Housman D, Rubin C, Stechler G. Suicidal behavior in 'normal' adolescents: risk and protective factors. *Am J Orthopsychiatry* 1989; 59:59–71.
25. Rew L, Thomas N, Horner SD, Resnick M, Beuhring T. Correlates of recent suicide attempts in a triethnic group of adolescents. *J Nurs Scholarsh* 2001; 33:361–367.
26. Anteghini M, Fonseca H, Ireland M, Blum R. Health risk behaviors and associated risk and protective factors among Brazilian adolescents in Santos, Brazil. *J Adolesc Health* 2001; 28:295–302.
27. Rubenstein J, Halton A, Kasten L, Rubin C, Stechler G. Suicidal behavior in adolescents: stress and protection in different family contexts. *Am J Orthopsychiatry* 1998; 68:274–284.
28. Adolescent Health Research Group. A health profile of New Zealand youth who attend secondary school. *NZ Med J* 2003; 116:1–9. [online]. [Cited 1 March 2004.] Available from URL: http://www.nzma.org.nz/journal/116-1171/380
29. Watson PD, Denny S, Adair V *et al*. Adolescents' perceptions of a health survey using multimedia computer-assisted

self-administered interview. *Aust NZ J Public Health* 2001; 25:520–524.
30. Ministry of Education. *How the decile is calculated*. [online]. [Cited 1 June 2005.] Available from URL: http://www.minedu.govt.nz/index.cfm?layout=document&documentid=7697&data=1
31. Reynolds WM. *Reynolds adolescent depression scale (RADS): professional manual*, Odessa, FL: Psychological Assessment Resources, 1987.
32. March J. *Multidimensional anxiety scale for children: technical manual*, North Tonawanda, NY: Multi-health Systems, 1997.
33. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*, 4th edn. Washington, DC: American Psychiatric Association, 1994.
34. Lang K. *Measuring ethnicity in the New Zealand population census*, Wellington: Statistics New Zealand, 2002.
35. Fergusson D, Woodward L, Horward L. Risk factors and life processes associated with the onset of suicidal behaviour during adolescence and early adulthood. *Psychol Med* 2000; 30:23–39.
36. Feehan M, McGee R, Nada Raja S, Williams S. DSM-III-R disorders in New Zealand 18-year-olds. *Aust NZ J Psychiatry* 1994; 28:87–99.
37. Edelson JL. Children's witnessing of adult domestic violence. *J Interpers Violence* 1999; 14:839–870.
38. Evans E, Hawton K, Rodham K. Suicidal phenomena and abuse in adolescents: a review of epidemiological studies. *Child Abuse Negl* 2005; 29:45–58.
39. Cichetti D, Toth SL. The development of depression in children and adolescents. *Am Psychol* 1998; 53:221–241.
40. Masten AS, Hubbard JJ, Gest SD, Tellegen A, Garmezy N, Ramirez M. Competence in the context of adversity: pathways to resilience and maladaptation from childhood to late adolescence. *Dev Psychopathol* 1999; 11:143–169.
41. Striener DL, Norman GR. *Health measurement scales: a practical guide to their development and use*, 3rd edn, Oxford: Oxford University Press, 2003.
42. Bearman PS, Moody J. Suicide and friendships among american adolescents. *Am J Public Health* 2004; 94:89–95.
43. Mann JJ, Apter A, Bertolote J *et al*. Suicide prevention strategies: a systematic review. *J Am Med Assoc* 2005; 294:2064–2074.