

Suicidal behaviours in adolescents in Nova Scotia, Canada: protective associations with measures of social capital

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Abstract

Purpose Few studies of adolescent suicidality have examined its associations with social capital. We explored associations of measures of individual level social capital with self-reported suicide ideation and suicide attempt in adolescents in Cape Breton, Nova Scotia, Canada, controlling for other factors known to be associated with adolescent suicidality.

Methods We surveyed 1,597 grade 10–12 students at three high schools in 2006 using self-completion questionnaires. Both sexes were combined for analysis. Outcome measures were suicidal ideation and attempt in the previous year. Measures of social capital included perceptions of trustworthiness and helpfulness of others at school, frequency of religious attendance and participation in extracurricular activities. Logistic regressions were carried out to determine associations of social capital with suicidality while controlling for other factors.

Results Perceived trustworthiness and helpfulness were protective for suicidal ideation and suicide attempt in the previous year. In adjusted analyses, there were interactions of gender and social capital—females reporting more

social capital were more protected from suicide attempt relative to males with similar levels of social capital.

Conclusions This study provides initial evidence of protective associations of individual level social capital with adolescent suicidality. Our findings suggest that among adolescents low social capital as measured by perceptions of trust and helpfulness of others at school may be a warning sign for suicidality, particularly for females. It may be helpful to inquire of young people how they perceive the trustworthiness and helpfulness of their school environment as a measure of how supportive that environment might be to them when they are facing challenges to their mental health.

Keywords Sexual orientation · Adolescent · Suicidality · Social capital

Introduction

Teenagers can experience feelings of isolation and stress as they go through these often difficult years of development and identity formation [1, 2]. These processes are felt to be linked to suicidal behaviours, which are commonly seen in adolescents [3]. Approximately a third of American adolescents report suicidal thinking and 10% of high school students attempt suicide [4]. In Canada, adolescent suicide is the third leading cause of death among those aged 15–24 [5].

Adolescent suicidality can be thought of as the range of thoughts, intentions and behaviours that relate to suicide during youth [6]. In studying adolescent suicidality, researchers have sought to identify vulnerable groups in order to target interventions to prevent suicide behaviours. Factors correlated with adolescent suicidality include experience of

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family violence, having had a close friend or family member attempt suicide, substance misuse, depression, poor academic performance, lower religiosity and minority sexual orientation [7–14].

While considerable research has focused on life circumstances that increase suicidal risk, factors that may protect young people from suicidal behaviour also have been identified. Factors which seem to protect adolescents from suicide include school and parent/family connectedness; solid peer relationships, doing well in school and self-esteem [15]. One socio-cultural factor that may offer potential to reduce the risk of suicidality is social capital. Social capital can be viewed as the supportive resources that individuals can access through their social networks; it is often described and measured in terms of participation [16], including religious participation [17–19] and perceptions of social trust and reciprocity or helpfulness [20]. A social environment in which individuals perceive high levels of trust and helpfulness is felt to reduce stress and feelings of instability and hopelessness which can lead to self-destructive behaviours [20, 21]. Though the preceding situates social capital within the individual, it must be recognized that there is much debate about whether social capital is a property of individuals or of communities, that is, whether it is an individual or an ecological construct. If taken as the latter, the underlying difference with individual social capital is felt to be that, as a collective property of communities, social capital can benefit even those who do not contribute to it—communities with high levels of social capital in the form of, for example, citizen participation in voluntary associations to promote well-being, may provide safety nets to those who do not themselves contribute socially [22].

Lower social capital measured at the individual level has consistently been shown to be associated with adolescent health risk behaviours and outcomes such as heavy substance use [23, 24], multiple sexual risk behaviours [25] and self-rated health [26]. Individual level social capital also is associated with emotional and conduct disorders in children [27], and one study of adolescent suicidality in New Zealand found associations of adolescent suicidality with measures of family and school factors which could be conceived of as social capital, but which were not reported as such [10]. Low trust in neighbours has been linked at the individual level to depression in US adults [28] and at the ecological level low social trust has been linked to suicide in European countries [29]. Though there is recognition of the need to examine its relationship to mental health [30] and its potential for improving mental health [31], we are unaware of studies which have examined the associations of social capital and suicide behaviours in adolescents.

In this investigation we explored associations between adolescent suicide behaviours and social capital measured

at the individual level, while controlling for established risk factors, in a group of students attending high school in Cape Breton Regional Municipality (CBRM), an area in the province of Nova Scotia, Canada. CBRM has a population of slightly over 100,000 residents, of whom about 8,000 are between the ages of 15 and 19; it is an area with somewhat lower than average levels of income and employment relative to many other areas of Nova Scotia [32]. We hypothesized that adolescents with more individual level social capital would be at less risk for suicidal ideation and suicide attempt after controlling for other factors known to be associated with adolescent suicidality.

Methods

Sample

Our sample was made up of 1,629 students in grades 10–12 attending three high schools in CBRM. All students attending the three schools who were registered for class during the time that the survey was administered were eligible to participate, so that the study population consists of all students who chose to participate, rather than a representative sample of students. Genders were approximately equally represented (50.8% male, 49.2% female). The mean age of the sample was 16.8 years ($SD = 1.1$).

Procedure

The survey was carried out in May 2006 as part of an overall assessment of school-based health services. Parents were sent advance notice of the survey by mail and were given the opportunity to discuss any concerns about the survey with the researchers. However, parental consent was not sought. Informed consent was obtained from students prior to beginning the survey. Teachers, trained 2 weeks previously by the researchers, administered a cross-sectional self-report survey which asked students about factors such as access to health services, health behaviours and related conditions and their school and home environments. Surveys were completed during regular class time, and the entire process took approximately 1 h. The survey and its administration protocol were approved by the Dalhousie University Health Sciences Research Ethics Board.

Measures

All questions used in the survey had been previously assessed for test–retest reliability and had Cohen's kappa scores of 0.5 or higher [33]. Students were asked about their sex (male or female); whether they lived with both of their parents or in another situation; their academic

performance based on the average mark they received on their last report card (dichotomized as <70% vs. 70% or greater); alcohol bingeing (\geq five drinks in one sitting \geq three times in the last 30 days) and regular use of marijuana (using marijuana \geq three times in the last 30 days), risk of depression, sexual orientation, whether they had considered, planned, or attempted suicide in the 12 months previous to the survey and four measures of social capital.

Risk of depression was measured using the Center for Epidemiological Study Depression (CES-D) scale. Appropriate cut-offs for adolescents were used (≥ 24 for females, ≥ 22 for boys) [34] to indicate elevated risk of depression. To determine sexual orientation, we used instrumentation from the McCreary Centre Society Adolescent Survey, which samples large numbers of youth in British Columbia at regular intervals [35]. Students were asked to respond to one of six categories about feeling attracted to others: (1) “100% heterosexual” (attracted to persons of the opposite sex); (2) “Mostly heterosexual”; (3) “Not sure”; (4) “Bisexual” (attracted to both males and females); (5) “Mostly homosexual”; and, (6) 100% homosexual (‘gay or lesbian’, attracted to persons of the same sex”. Those choosing (1) or (2) were classified as heterosexual; those choosing (3)–(6) were classified as having minority sexual orientation.

Suicidal thinking/planning and suicide attempt were measured as ever having had these experiences in the previous year, based on the Centers for Disease Control Youth Risk Behavior Surveillance System [36]. Students were asked to respond “yes” or “no” to the question, “During the past 12 months, did you ever seriously consider attempting suicide?” and, “During the past 12 months did you make a plan about how you would attempt suicide?”. Students who indicated they had seriously considered or made a plan for suicide in the previous year were defined as having had suicidal ideation. To assess suicide attempts, students were asked to indicate how many times they had attempted suicide in response to the question, “During the past 12 months, how many times did you actually attempt suicide?”. Suicide attempt was defined as indicating having made one or more attempts in the previous year.

Our measures of social capital were meant to cover concepts of participation with others, including religious attendance and perceptions of trust and reciprocity within participants’ school environments. Participation with others is considered “structural” social capital, whereas trust and reciprocity tap into “cognitive” social capital [37]. To measure participation with others respondents were asked to indicate from a list of five types of participation [participating in (1) team sports; (2) music, dance or drama; (3) youth groups; (4) individual sports competing against others; and (5) student council or other student committees]

with which of these they were involved. Positive responses were summed to create a continuous measure of participation ranging in value from 0 to 5, with higher scores representing more participation. Religious participation was measured using a four-item scale which was dichotomized as attending services never/a few times a year (coded “0”) versus at least once a month/at least once a week (coded “1”). School trust and helpfulness were based on the work of Berkman and Kawachi [38]. For perceived trust students were asked to endorse one of the two following statements: “Most of the people I go to school with can be trusted” or “You can’t be too careful of the people I go to school with”. For perceived helpfulness, students were asked to endorse either: “Most of the time, the people I got to school with try to be helpful” or “Most of the time, the people I go to school with look out for themselves”. Responses to the first options of each item were scored as “1”, and responses to the second option were scored as “0”, so that these variables represented having these forms of cognitive social capital.

Analysis

All analyses were carried out using SPSS Version 17.0 [39]. We combined males and females to maximize statistical power after stratifying the data by sex and determining that univariate associations of social capital with suicidal behaviours were essentially the same in both males and females. We initially examined respondent characteristics descriptively. Then we carried out unadjusted univariate logistic regressions to determine associations of respondents’ characteristics and social capital measures with suicidal behaviours. This was followed by adjusted multivariate models controlling for participant age and school site and including all covariates to examine independent associations of social capital measures with suicide behaviours. The adjusted models were assessed for goodness-of-fit using the Hosmer–Lemeshow test and interactions of gender with social capital measures were carried out.

Results

The overall response rate to the survey was 92% of students registered for class during the time the survey was applied. Of the 1,629 students (793 females; 804 males) who responded to the survey, 1597 (98%) provided information about all three measures of social capital; analyses were carried out on these respondents. Descriptive statistics are provided in Table 1. Overall, 16.7% of students had had suicidal ideation in the previous year (females 19.1%;

Table 1 Respondent characteristics ($N = 1,597$)

	<i>N</i>	%
Females	793	50.3
Males	804	49.7
Not living with both parents	583	36.5
Academic performance < 70%	429	26.9
≥3 Alcohol binges last month	507	31.7
Used marijuana ≥3 times last month	351	22.0
At risk for depression	426	26.7
Minority sexual orientation	81	5.1
See people at school as trustworthy	732	45.8
See people at school as being helpful	931	58.3
Higher frequency of religious attendance	382	23.9
Participation score (Mean and SD)	1.43 (1.08)	
Suicide ideation in the last 12 months	266	16.7
Attempted suicide in the last 12 months	77	4.8

males 14.3%; $P = 0.011$) and 4.8% had attempted suicide (females 6.1%; males 3.6%; $P = 0.023$), not shown.

Suicidal ideation

Table 2 shows results of unadjusted and adjusted logistic regressions explaining suicidal ideation. Being female, not living with both parents, doing less well at school, using marijuana regularly, being at risk of depression and being of minority orientation all had a significant positive association with ideation. All measures of social capital, with the exception of overall participation, were significantly protectively associated with suicidal ideation. In the adjusted analysis, heavy marijuana use (OR 1.85; 95% CI 1.27–2.71), being at risk for depression (OR 7.19; 95% CI

5.23–9.88) and minority sexual orientation (OR 2.01; 95% CI 1.12–3.63) were associated with ideation. Among measures of social capital, seeing others at school as trustworthy was significantly protectively associated with suicidal ideation (OR 0.68; 95% CI 0.48–0.95), as was seeing people at school as helpful (OR 0.57; 95% CI 0.39–0.83). There were no significant interactions of gender with any of the four social capital measures.

Suicide attempt

Table 3 presents unadjusted and adjusted logistic regressions which examine suicide attempt in the past year. Unadjusted analysis showed that being female, doing less well at school, being at risk for depression and being of minority orientation were associated with having reported a suicide attempt. Two of the four measures of social capital, perceived trust and perceived helpfulness at school, were significantly protectively associated with suicide attempt. In the adjusted analysis doing less well at school (OR 1.79; 95% CI 1.07–3.00), being at risk for depression (OR 3.63; 95% CI 2.16–6.09) and having minority orientation (OR 2.27; 95% CI 1.08–4.79) were associated with attempt. Among the social capital measures, seeing others at school as trustworthy (OR 0.52; 95% CI 0.27–1.00) and seeing those at school being helpful (OR 0.57; 95% CI 0.32–0.99) were protectively associated with suicide attempt. There were significant interactions of gender and social capital. Females with trust in those at school were less likely to have reported a suicide attempt than males with such trust (OR 0.13; 95% CI 0.03–0.55; $P = 0.003$); similarly, females who reported perception of helpfulness at school (OR 0.34; 95% CI 0.12–0.99; $P = 0.047$) were less likely to report a suicide attempt than males with a perception of helpfulness (not shown).

Table 2 Associations of predictor variables and suicidal ideation

	Unadjusted odds ratio (95% CI)	<i>P</i>	Adjusted odds ratio ^a (95% CI)	<i>P</i>
Female gender	1.41 (1.08–1.84)	0.011	1.08 (0.78–1.48)	0.648
Not living with both parents	1.67 (1.28–2.19)	<0.001	1.28 (0.93–1.76)	0.125
Average school mark < 70%	1.38 (1.03–1.83)	0.029	1.03 (0.73–1.46)	0.861
Binge drinking ≥3 times in past month	1.10 (0.83 – 1.45)	0.514	0.81 (0.57–1.15)	0.235
Marijuana use ≥3 times in past month	1.64 (1.22–2.20)	0.001	1.85 (1.27–2.71)	0.001
At risk for depression	9.63 (7.16–12.94)	<0.001	7.19 (5.23–9.88)	<0.001
Minority sexual orientation	3.77 (2.37–6.00)	<0.001	2.01 (1.12–3.63)	0.020
See people at school as trustworthy	0.41 (0.32–0.54)	<0.001	0.68 (0.48–0.95)	0.003
See people at school as being helpful	0.31 (0.23–0.43)	<0.001	0.57 (0.39–0.83)	0.024
Higher frequency of religious attendance	0.64 (0.46–0.90)	0.010	0.68 (0.45–1.03)	0.070
Higher participation score	0.89 (0.78–1.01)	0.065	0.92 (0.79–1.27)	0.260

^a Controlling for age and school site

Table 3 Associations of predictor variables and suicide attempt

	Unadjusted odds ratio (95% CI)	<i>P</i>	Adjusted odds ratio ^a (95% CI)	<i>P</i>
Female gender	1.72 (1.07–2.75)	0.023	1.48 (0.88–2.49)	0.140
Not living with both parents	1.47 (0.93–2.33)	0.101	1.07 (0.65–1.76)	0.803
Average school mark < 70%	2.06 (1.29–3.29)	0.002	1.79 (1.07–3.00)	0.028
Binge drinking ≥ 3 times in past month	1.23 (0.77–1.99)	0.387	1.05 (0.61–1.80)	0.856
Marijuana use ≥ 3 times in past month	1.45 (0.87–2.41)	0.154	1.41 (0.78–2.53)	0.257
At risk for depression	5.49 (3.39–8.89)	<0.001	3.63 (2.16–6.09)	<0.001
Minority sexual orientation ^a	3.43 (1.74–6.79)	<0.001	2.27 (1.08–4.79)	0.032
See people at school as trustworthy	0.35 (0.21–0.56)	<0.001	0.52 (0.27–1.00)	0.050
See people at school as being helpful	0.30 (0.17–0.52)	<0.001	0.57 (0.32–0.99)	0.045
Higher frequency of religious attendance	1.11 (0.66–1.87)	0.701	1.44 (0.79–2.60)	0.232
Higher participation score	0.93 (0.75–1.16)	0.527	0.94 (0.75–1.19)	0.619

^a Controlling for age and school site

Discussion

The primary aim of this paper was to examine associations of social capital with suicidal behaviours in adolescents attending high school in Nova Scotia. The levels of suicidal behaviours observed in this adolescent population (16.7% suicidal ideation and 4.9% suicide attempt in the previous year) are similar to those seen in other areas of Nova Scotia in 2000, where suicidal ideation was seen in 16.5% of respondents of the same age as reported here and attempt was reported by 4.4% [40]. They also are comparable with the results of the 2007 Youth Risk Behavior Surveillance Survey in the United States, where 18.7% of females and 10.3% of males reported ideation and 9.3% of females and 4.6% of males reported attempt [41].

We found support for a relationship between two measures of cognitive social capital (perceived trustworthiness and helpfulness of others at school) with suicidality, which were protective for both suicidal ideation and suicide attempt within the previous 12 months. Overall, participation in activities, including religious attendance, which are forms of structural social capital, was not associated with either suicidal behaviour. In adjusted analyses for suicide attempt, there were also interactions of gender with social capital, suggesting that the relationship between social capital and suicidality operates differently for adolescent males and females. For females, having more social capital had a far greater protective effect for suicide attempt relative to young males with similar levels of social capital. These findings were present after controlling for other important factors including depression, sexual orientation and substance use. Very little research has been carried out to assess relationships of social capital and suicidality, though there recently has been recognition of a need for such work [30, 31].

Although this is the first study of which we are aware which has examined associations between individual level social capital and suicidality in adolescents, our results are compatible with studies which have examined associations of common mental disorders with social capital at the individual level. An overview of such relationships concluded that there is strong evidence to support protective associations of cognitive social capital with these disorders. As with our study, that review did not find consistent protective effects of structural social capital [37]. In addition, a New Zealand study of 9,579 students aged 9–13 found protective associations of perceptions of feeling safe at school and being fairly treated by teachers, which may be considered forms of social capital, for suicide attempt [10]. The current study adds to this work by specifically considering several forms of social capital in relationship to both suicidal ideation and suicide attempt.

The finding that cognitive social capital is independently protectively associated with suicidal ideation and attempt in adolescents raises questions about the mechanisms underlying these associations. It might be that reverse causation is at work—negative perceptions associated with depression alters one's view of his or her environment and result in feelings of low trust and reciprocity. However, we controlled for risk of depression, which weighs against such an interpretation. One possible explanation is that cognitive social capital acts as a stress buffer for adolescents, with its perceived availability as manifested by trust in others and a feeling they would help if called upon, leading to a more benign interpretation of life stressors and thus protection from negative responses to them [20, 42]. This suggests that it would be advantageous to work to enhance trust and helpfulness in school environments such that students have an increased perception of the presence of these types of social capital. From a clinical perspective,

it may be helpful for psychiatrists to inquire of young people how they perceive the trustworthiness and helpfulness of their school environment as a measure of how supportive that environment might be to them when they are facing challenges to their mental health. Young females are already at an increased risk of suicidal behaviour, and our findings suggest that low social capital among adolescent girls may be an important warning sign. This type of inquiry also might aid in deciding such issues as how ready a young person suffering mental illness is to be discharged from hospital [22].

We found gender differences in protective associations of measures of social capital and suicide attempt. While studies of associations of individually measured social capital with health outcomes which also examine differences between females and males are few, one study of social trust and self-rated health in UK adults found that this association was important for women, but not for men [43]. In addition, research in Washington state found that a composite measure of social capital related to positive school affiliation (caring environment, good teaching, interested teachers, fair grading and fair discipline) was associated with self-rated health in females, but not in males [44]. Such observations, compatible with our own, may be due to the fact that females tend to mobilize supports more than males in times of stress, and a perceived lack of availability of supports may contribute to poorer mental health outcomes as seen here [38]. More work is required to determine if social capital does in fact have differing impacts on male and female adolescents.

Our study is not without limitations. The cross-sectional nature of the data does not allow for assessment of causality, and the location of the study, in one area of Nova Scotia, may limit generalizability. Our results relied upon self-report and it is possible that some of the “independent” variables may have actually been affected by mood state. For instance, perception of family affluence or social capital may be adversely affected by being depressed. We used only the measures of social capital available to us in performing a secondary analysis of data collected for other purposes, and some of these measures were fairly simple, so that for example, religious attendance may not cover other aspects of religiosity such as importance of religion in one’s life. Religiosity is known to be associated with increased social trust [45], which we did find was protective for suicidal behaviours, so that our measure may have missed such aspects of religiosity. There also may be aspects of participation with others that our survey measure did not capture. Social capital is a complex construct with many facets and much debate about its interpretation [37], including whether for psychiatric research it is best measured at the individual or the collective level [22], and future studies should use additional and more flexible

measures. Finally, given the low frequency of suicide attempt, statistical power may have been an issue in examining associations of some independent variables with it, for example regular use of marijuana.

In conclusion, our study investigated the association between individually measured social capital and suicidality in a sample of Nova Scotia adolescents, adding for the first time an assessment of the role of social capital in these relationships. Low perceptions of trustworthiness and helpfulness of others have independent associations with suicidal behaviours in adolescents. Our findings indicate the need to understand better the mechanisms linking social capital to suicidality and that health practitioners, particularly those working in the school setting, might consider the role that increasing social capital could play in promoting adolescent mental health.

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