

RESEARCH ARTICLE

Sex Differences in Associations of School Connectedness With Adolescent Sexual Risk-Taking in Nova Scotia, Canada

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ABSTRACT

BACKGROUND: Associations of lower school connectedness have been seen with adolescent sexual risk behaviors, but little is known about gender differences with respect to these relationships. Understanding any such differences could contribute to better supporting the school environment to promote youth sexual health.

METHODS: We used provincially representative cross-sectional data from 1415 sexually active students in grades 10 to 12 in Nova Scotia, Canada, to determine whether lower school connectedness was associated with students' sexual risk behaviors using multivariate logistic regression, stratifying by sex.

RESULTS: In boys, lower connectedness was associated with three risk behaviors, having ≥ 2 partners in the previous year (odds ratio [OR] 1.07; 95% confidence interval [CI] 1.01-1.13), no condom use at last intercourse (OR 1.06; 95% CI 1.01-1.12), and having unplanned intercourse due to substance use (OR 1.09; 95% CI 1.03-1.15). No such associations were seen in girls.

CONCLUSIONS: These results demonstrate that gender differences may exist for associations of school connectedness and sexual risk behaviors; connectedness may be more important for boys than for girls in this area of adolescent health. Educators should consider gender differences when designing interventions to maximize youth sexual health through school-based interventions. Further research on school connectedness and risk-taking should examine genders separately.

Keywords: adolescents; school connectedness; sexual risk behaviors; sex differences.

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About half (49%) of Nova Scotia adolescents aged 15 to 19 are sexually active (ie have had vaginal intercourse at least once), which is slightly more than the 43% of Canadian adolescents who have had vaginal intercourse. In addition, one third of sexually active Canadians aged 15 to 19 report having more than one sexual partner each year and 25% of these report not using a condom at last intercourse.¹ Substance use increases the likelihood

of both unwanted and unprotected intercourse,²⁻⁴ and 78% of Canadian adolescents ≥ 15 years used alcohol and 9.1% cannabis in 2011.⁵ In 2007 in Atlantic Canada, which includes Nova Scotia, 33% of sexually active students in grades 7 to 12 reported having had unplanned intercourse after the use of alcohol or drugs.⁶ Such behaviors increase the risk of teen pregnancy and sexually transmitted infections (STIs),^{1,7,8} which are a burden on both the

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individual and society.⁹ STIs cause pelvic inflammatory disease, infertility, and ectopic pregnancy,¹⁰ whereas adolescent pregnancy can result in preterm delivery, low birth weight infants, and higher infant mortality.¹¹ To prevent these negative health outcomes, it is important to understand the factors that either increase or decrease the risk of their occurring. This article examines associations of lower school connectedness with sexual behaviors, which can lead to such outcomes in high school students in Nova Scotia, Canada.

School connectedness involves students' perceptions of how supported, respected, and included they feel in the school environment,¹² as well as their beliefs about whether adults in the school care about their learning. There are strong correlations between school connectedness and positive youth development in a wide array of fields, including health, education, and psychology.¹³ The potential for school connectedness to have positive influences on these outcomes appears to be large.¹⁴ In attempting to understand how school connectedness is created and has an impact on youth health choices and behaviors, Catalano and Hawkins¹⁵ have argued that school bonding, the term they use for school connectedness, is a result of attachment and commitment to the school and involvement in it. Catalano and Hawkins' Social Development Model¹⁵ hypothesizes that children learn patterns of behavior from their social environment. This appears to happen in 4 ways: (1) their own perceptions of opportunities for being involved with others, (2) their actual involvement, (3) their ability and skill to be involved and interact with others, and (4) the resulting rewards they perceive as emanating from such involvement and interaction. Through these processes a social bond develops among the individual child, others in the school, and the activities that take place at school. Strong bonds are believed to make behaviors that are not in keeping with behaviors valued by others in the school less likely because the individual now has a stake in conforming to the school's values and norms. In this model, school bonding plays an important role in promoting positive childhood development, which includes avoidance of risk behaviors.

Students experiencing weak connections with their school are more likely to have poorer self-rated health,¹⁶ poorer psychological status,^{17,18} and lower likelihood of completing school.¹⁹ They are also more likely to engage in suicidal behaviors,²⁰ weapons violence²¹, and substance use.²² Some of these studies have shown gender differences in associations of low school connectedness with adolescent health and behavior. For example, Shochet²³ found that lower connectedness was associated with anxiety in adolescent girls, but not in boys, and Faulkner,¹⁶ studying Canadian adolescents, found that such

associations were seen with poorer self-reported health in girls, but not in boys.

A number of studies have examined associations of school connectedness and sexual risk behaviors in adolescents. However, few such studies have looked at a range of sexual risk behaviors, with most examining whether school connectedness affects onset of sexual activity.²³⁻²⁷ Studies that have examined specific risk behaviors such as condom use and number of sexual partners have often focused on participation in sports as a measure of school connectedness.²⁸⁻³⁰ Of the 2 studies that used an established measure of school connectedness to examine specific risk behaviors, 1 was a study of 280 incarcerated female adolescents in the United States,³¹ and 1 was a larger longitudinal study that found associations of lower school connectedness with having sex while using substances.³² None of these studies examined associations of school connectedness and adolescent sexual risk behaviors stratified by gender. We address the following questions among a representative cross-sectional sample of sexually active Nova Scotia students: (1) Is lower school connectedness independently associated with increased sexual risk-taking as measured by a range of such behaviors? and (2) Do these associations vary by gender?

METHODS

Participants

We used provincially representative data collected from Nova Scotia students in grades 10 to 12. Eight randomly selected schools participated. In these schools, 2781 students responded (response rate 57%). Of these, 1415 (54%) were sexually experienced and made up our sample.

Instruments and Measures

The 2010-2011 Health Behavior Survey (HBS) is a representative sample of high school students in the province of Nova Scotia, Canada. Nova Scotia is the most populated province in Atlantic Canada, with almost 1 million people.³³ The HBS was implemented as part of Health Canada's 2010-2011 Youth Smoking Survey (YSS), the primary purpose of which was to examine smoking and related factors in Canadian youth. The HBS added questions to the YSS for secondary school students in Nova Scotia only. The HBS thus relied on the YSS sampling frame, which was aimed at obtaining a representative sample of students in all 10 provinces in Canada. The target population for the YSS comprised of all young Canadians attending both private and publicly funded schools. Sampling was based on a stratified multistage design. Sampling was stratified according to health region smoking rate and the type of school (elementary or secondary).

In stage 1, the smoking rate among 15- to 19-year-olds for each health region was calculated using the Canadian Community Health Survey. The total eligible grade enrolment in a health region was used as a weight to compute the median smoking rate for each province. Each school's postal code was used to identify the health region where it was located. Schools were then categorized as "low" or "high" smoking rate stratum based on the smoking rate in their health region compared to the median, greater than or equal to the median was categorized as "high." In stage 2, schools were stratified into elementary or secondary school strata. Of the 10 secondary Nova Scotia schools that took part in the YSS itself, 8 schools agreed to participate in the HBS. All students in each participating school were eligible to take part in the survey. Data were collected between November 2010 and May 2011. A detailed description of the YSS methodology has been documented elsewhere.³⁴

Dependent Variables

Sexual risk behaviors included (1) having had more than one sexual partner in the previous year, (2) having had unplanned sex due to use of alcohol or drugs at least once in the previous year, (3) not using a condom at last intercourse, and (4) for female participants, not using effective contraception (hormonal contraception, condom, or intrauterine device) at last intercourse, all measured dichotomously. These measures have established reliability for use in high school students in Nova Scotia.³⁵

Independent Variable

School connectedness was measured according to how strongly students agreed or disagreed with the following 5 statements (scale score range, 5 to 20, with a higher score indicating lower school connectedness, Cronbach's alpha for this sample = 0.82): (1) "I feel close to people in my school," (2) "I feel I am part of my school," (3) "I am happy to be in my school," (4) "I feel the teachers at my school treat me fairly," and (5) "I feel safe in my school" based on a scale developed for the US National Longitudinal Study of Adolescent Health.³⁶

Covariates

Several studies³⁷⁻³⁹ have reported associations between low school connectedness and depression, whereas depression in adolescents also is associated with sexual risk behaviors.⁴⁰ Depression was measured using an 8-item version of the Center for Epidemiological Studies Depression Scale (CES-D; range 0 to 24, Cronbach's alpha for this sample = 0.91) with a higher score signifying increased depressive symptoms, using a cut point of 7 or above to indicate

a higher risk of being depressed over the previous 7 days.⁴¹ Though this shortened CES-D was initially developed for use in older women, it has been used in other studies of adolescent behaviors in both genders^{26,42-45} and results are comparable to prevalence estimates in adolescents using the full 20-item CES-D and a 12-item version.^{46,47}

Poorer school academic performance is known to be associated with adolescent sexual activity.^{24,48} Students were asked about what best described their school marks in the past year and categorized these as more than 84% (reference category), 70% to 84%, and 59% and lower.

Adolescent sexual activity increases with age^{25,49} and the specific factors associated with sexual experience in teens vary by age.⁵⁰ In addition, as students mature, their attachment to the school environment decreases²⁵ and their likelihood of a depressive episode increases.⁵¹ We controlled for age by using school grade level.

Having had intercourse at an early age places adolescents at subsequent risk of behaviors that can compromise their sexual well-being.⁵² There is also evidence that having early sexual experience may lead to depressive symptoms.^{53,54} We therefore controlled for having had early intercourse (ie, before age 15) among this group of sexually experienced adolescents.

Procedures

Teachers administered the anonymous survey using standardized protocols during a designated class period, avoiding circulating among students in order to protect their confidentiality. Students were asked to place their completed surveys in an envelope and seal it before it was collected by another student. The survey took 30 to 40 minutes to complete. A project data collector was present throughout the data collection period and was available to answer students' questions or concerns about the survey.

Data Analysis

The independent variable (lower school connectedness) and the covariates were first examined by gender to see if boys and girls differed significantly with respect to these variables, using the chi-square statistic for categorical data and tests of means for continuous data. Univariate logistic regression analysis was then carried out separately for each gender to determine associations of these variables with the dependent variables (the sexual risk behaviors). Finally, the independent variable and the covariates were entered into logistic regression models predicting the sexual risk behaviors. All data were analyzed using SPSS V.17.0 (SPSS Inc, Chicago, IL). Survey weights were used in all analyses to produce population

Table 1. Characteristics of the Sample (Percent or Means [SD]), by Sex

	Boys (N = 665)	Girls (N = 750)	Statistical Test
Grade			
10	25.4	24.2	$\chi^2 = 1.084, df = 2, p = .582$
11	33.9	32.3	
12	40.7	43.5	
School mark			
$\geq 85\%$	21.8	27.9	$\chi^2 = 29.896, df = 2, p \leq .001$
70%-84%	38.3	46.1	
$\leq 59\%$	39.8	26	
Had intercourse before age 15			
Yes	40.8	30.4	$\chi^2 = 16.479, df = 1, p \leq .001$
No	59.2	69.6	
< 1 sexual partner in past year			
Yes	43.3	38.1	$\chi^2 = 3.983, df = 1, p < .05$
No	56.7	61.9	
Unintended sex due to substance use in past year			
Yes	33.3	31.8	$\chi^2 = 0.340, df = 1, p = .560$
No	66.7	68.2	
No condom use at last intercourse			
Yes	37.8	42.2	$\chi^2 = 2.841, df = 1, p = .092$
No	62.2	57.8	
No effective contraception at last intercourse (females)	—	14.5	—
At risk of depression			
Yes	17.2	36.2	$\chi^2 = 65.878, df = 1, p < .001$
No	82.8	63.8	
School connectedness (score range 4-20, higher score means less connectedness)	10.56 (3.2)	10.7 (2.8)	$t = -1.479, df = 1413, p = .139$

Table 2. Univariate Associations of the Independent Variable and Covariables With Sexual Risk Behaviors in Boys

	≥ 2 Partners in the Previous Year OR	No Condom Use at Last Intercourse OR	Unplanned Sex Past Year Due to Substance Use OR
Grade			
10	1.0	1.0	1.0
11	1.70 (1.16-2.51)**	1.18 (0.80-1.76)	1.93 (1.27-2.93)**
12	1.38 (0.96-2.01)	1.25 (0.85-1.83)	1.75 (1.16-2.64)**
School mark			
$\geq 85\%$	1.0	1.0	1.0
70%-84%	0.83 (0.56-1.23)	0.78 (0.52-1.18)	0.80 (0.52-1.23)
$\leq 59\%$	1.55 (1.05-2.29)*	1.53 (1.03-2.28)*	1.72 (1.14-2.59)*
Intercourse before age 15			
No	1.0	1.0	1.0
Yes	2.83 (2.09-3.84)***	1.67 (1.23-2.27)**	2.42 (1.76-3.33)***
At risk of depression			
No	1.0	1.0	1.0
Yes	1.59 (1.09-2.34)*	1.26 (0.85-1.85)	1.56 (1.05-2.30)*
School connectedness	1.07 (1.03-1.13)**	1.07 (1.02-1.12)**	1.09 (1.04-1.15)***

* $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed).
OR, odds ratio.

estimates and adjust for both the unequal probability of selection and student nonresponse.

RESULTS

Univariate Analysis

The sample is described by gender in Table 1. There were more students in the higher grades though both

sexes were equally represented across each grade level. Girls differed significantly from boys in being less likely to have had intercourse before age 15 and less likely to have had more than 1 sexual partner in the previous year. Girls were more likely to be at higher risk of depression. There was no difference by gender in mean school connectedness score.

Table 3. Univariate Associations the Independent Variable and Covariables With Sexual Risk Behaviors in Girls

	≥2 Partners in the Previous Year OR (95% CI)	No Condom Use at Last Vaginal Intercourse OR (95% CI)	Unplanned Sex Past Year Due to Substance Use OR (95% CI)	No Effective Contraception at Last Vaginal Intercourse OR (95% CI)
Grade				
10	1.0	1.0	1.0	1.0
11	0.81 (0.53-1.23)	2.30 (1.49-3.53)***	0.78 (0.51-1.19)	1.56 (0.90-2.70)
12	0.84 (0.56-1.24)	1.53 (1.02-2.31)**	0.60 (0.40-0.90)*	0.69 (0.39-1.24)
School mark				
≥85%	1.0	1.0	1.0	1.0
70%-84%	0.91 (0.62-1.33)	1.34 (0.91-1.96)	0.82 (0.55-1.23)	1.34 (0.75-2.42)
≤59%	1.71 (1.11-2.62)*	1.69 (1.10-2.60)*	1.24 (0.80-1.93)	2.39 (1.30-4.38)**
Intercourse before age 15				
No	1.0	1.0	1.0	1.0
Yes	3.08 (2.18-4.35)***	1.48 (1.06-2.07)*	2.71 (1.91-3.85)***	1.67 (1.21-2.31)**
At risk of depression				
No	1.0	1.0	1.0	1.0
Yes	1.67 (1.21-2.32)**	1.76 (1.27-2.43)**	1.89 (1.35-2.65)***	2.90 (1.86-4.51)***
School connectedness	1.04 (0.99-1.10)	1.09 (1.03-1.15)**	1.04 (0.99-1.10)	1.11 (1.03-1.20)**

*p < .05; **p < .01; ***p < .001 (2-tailed).
OR, odds ratio; CI, confidence interval.

Table 4. Multivariate Associations of the Independent Variable and Covariables With Sexual Risk Behaviors in Boys

	≥2 Partners in the Previous Year OR (95% CI)	No Condom Use at Last Vaginal Intercourse OR (95% CI)	Unplanned Sex Past Year Due to Substance Use OR (95% CI)
Grade			
10	1.0	1.0	1.0
11	2.50 (1.63-3.85)***	1.39 (0.91-2.12)	2.62 (1.65-4.17)**
12	2.30 (1.51-3.51)**	1.54 (1.02-2.33)*	2.73 (1.72-4.33)***
School mark			
≥85%	1.0	1.0	1.0
70%-84%	0.72 (0.47-1.11)	0.30 (0.47-1.12)	0.69 (0.43-1.09)
≤69%	1.18 (0.77-1.82)	1.30 (0.85-1.98)	1.38 (0.88-2.18)
Intercourse before age 15			
No	1.0	1.0	1.0
Yes	3.15 (2.24-4.42)***	1.68 (1.20-2.34)**	2.74 (1.90-3.95)***
At risk of depression			
No	1.0	1.0	1.0
Yes	1.05 (0.68-1.62)	0.87 (0.56-1.34)	0.95 (0.60-1.50)
Lower school connectedness	1.07 (1.01-1.13)*	1.06 (1.01-1.12)*	1.09 (1.03-1.15)**

*p < .05; **p < .01; ***p < .001 (2-tailed).
OR, odds ratio; CI, confidence interval.

The data in Table 2 and Table 3 show univariate associations of lower school connectedness and the covariates with sexual risk behaviors for boys and girls, respectively. Lower school connectedness was significantly associated with all 3 risk behaviors in boys, as was early intercourse, whereas risk of depression was associated with having 2 or more sexual partners in the previous year and having unplanned sex due to substance use. In girls, lower school connectedness was associated with not using a condom at last intercourse and with having no effective contraception at last intercourse, whereas risk of depression and early intercourse were both associated with all 4 risk behaviors.

Multivariate Analysis

Tables 4 and 5 show results of the multivariate analysis for boys and girls, respectively. For boys (Table 4), lower school connectedness remained significantly associated with having 2 or more sexual partners in the previous year (odds ratio [OR] 1.07; 95% confidence interval [CI] 1.01-1.13), not using a condom at last intercourse (OR 1.06; 95% CI 1.01-1.12), and having unplanned intercourse due to substance use (OR 1.09; 95% CI 1.03-1.15). Thus, in boys, each 1-unit rise in the continuous measure used to assess low school connectedness meant a 7% increase in the likelihood of more than 1 partner, a 6% rise for not using a condom, and a 9% rise for sex

Table 5. Multivariate Associations of the Independent Variable and Covariables With Sexual Risk Behaviors in Girls

	≥ 2 Partners in the Previous Year OR (95% CI)	No Condom Use at Last Vaginal Intercourse OR (95% CI)	Unplanned Sex Past Year Due to Substance Use OR (95% CI)	No Effective Contraception at Last Vaginal Intercourse OR (95% CI)
Grade				
10	1.0	1.0	1.0	1.0
11	1.12 (0.71-1.77)	2.87 1.81-4.56***	0.98 (0.62-1.54)	1.93 (1.06-3.51)*
12	1.43 (0.91-2.24)	2.11 (1.34-3.34)**	0.87 (0.55-1.37)	1.01 (0.54-1.92)
School mark				
≥85%	1.0	1.0	1.0	1.0
70%-84%	0.77 (0.51-1.15)	1.22 (0.82-1.82)	0.73 (0.48-1.11)	1.29 (0.70-2.36)
≤69%	1.19 (0.75-1.91)	1.37 (0.86-2.19)	0.87 (0.54-1.41)	1.91 (1.00-3.65)*
Intercourse before age 15				
No	1.0	1.0	1.0	1.0
Yes	3.10 (2.11-4.56)***	1.52 (1.04-2.23)*	2.36 (1.61-3.47)***	1.31 (0.80-2.16)
At risk of depression				
No	1.0	1.0	1.0	1.0
Yes	1.41 (0.98-2.03)	1.58 (1.10-2.26)*	1.63 (1.12-2.36)**	2.39 (1.47-3.87)***
School connectedness	1.00 (0.94-1.06)	1.05 (0.99-1.12)	1.00 (0.94-1.06)	1.03 (0.95-1.12)

*p < .05; **p < .01; ***p < .001 (2-tailed).
OR, odds ratio; CI, confidence interval.

due to substance use. Risk of depression was no longer associated with having more than 1 partner or having unplanned sex due to substance use, whereas having had intercourse before age 15 remained significantly associated with all 3 sexual risk behaviors.

For girls (Table 5), school connectedness was no longer associated with not using a condom at last intercourse and having no effective contraception at last intercourse. Risk of depression remained positively associated with all 4 risk behaviors and having had early intercourse was associated with 3 of the risk behaviors.

DISCUSSION

Examining a representative sample of Nova Scotia students in grades 10 to 12, we found that lower school connectedness was associated with sexual risk behaviors in boys; no such associations were seen in girls. Levels of school connectedness did not differ by sex, as has been seen in some studies,^{55,56} but not in others.^{16,57} Our study adds to the literature by demonstrating differential associations of school connectedness on an array of sexual risk behaviors when examined by sex.

Few studies have looked at a range of sexual risk behaviors in association with school connectedness, with most examining whether or not school connectedness affected onset of sexual activity.^{58,23-27} Several of those studies that did examine specific sexual risk behaviors used limited measures of school connectedness,²⁸⁻³⁰ and I was limited by its small sample size.³¹ While these previous studies have shown protective associations of school connectedness with sexual risk behaviors,²⁸⁻³⁰ the current study is, to

our knowledge, the first to examine boys separately from girls. This study found a protective association of school connectedness with having intercourse under the influence of substances, not using a condom at last intercourse, and having multiple sexual partners in boys, whereas no such associations were seen in girls. The results presented here indicate that school connectedness may be a more important factor for boys than for girls in protecting against sexual risk behaviors. School connectedness is seen as a construct that is helpful in a wide variety of aspects of adolescents' lives, and it may be its supportive aspects that are most important. Attachment to important adults at school, informal control over behavior created by bonding with a unit of socialization such as a school that is mediated by beliefs in the values of that social unit are theoretical mechanisms by which school connectedness is believed to exercise its influence.^{15,59}

There is evidence that taking action to increase school connectedness results in decreased sexual risk-taking over time. The Seattle Social Development Project, which used a social development model and involved students beginning as early as grade 1, showed that at age 21, single individuals in the intervention group were more likely to use condoms than those in the control group, and girls in the intervention group were less likely to have become pregnant than those in the control group.⁶⁰ That research did not examine results by sex, except when looking at the occurrence of pregnancy by age 21. Interactions of ethnicity and intervention group were reported, but no interactions were reported for sex and intervention group. There may be sex differences in the way schools are perceived and

interpreted,¹⁶ and sex differences in associations of school connectedness have been seen with other health outcomes.^{16,23} The results presented here indicate that with respect to sexual risk behaviors, these potential differences may be important to consider—though school connectedness is important for all students, it may be more so for the healthy sexual development of boys. Further research on the impact of efforts to enhance students' feelings of connectedness to their schools on students' sexual health is required. Such research should seek to determine whether, in the area of sexual health, intervention effects have more of an impact on boys, and which particular aspects of school connectedness are most important. Such research should also include separate analysis by sex, or at a minimum, examine data before undertaking combined analysis to be certain that looking at both sexes together is justified.

Limitations

Our study has limitations. First, it is cross-sectional, such that the directions of the associations seen cannot be ascertained. Second, key indicators such as socioeconomic status, social capital, and parental education and employment were not included in the survey, such that they could not be included in our analysis. Third, it should also be noted that the measure of depression risk used relates to the 7 days previous to administration of the survey, whereas the sexual health behaviors could have occurred at any time in the previous year. Finally, the survey is based largely on self-report data with its potential for social desirability bias.⁶¹

Conclusions

These results add to our understanding of the role school connectedness may play in adolescent sexual risk behaviors, addressing gaps in the literature by analyzing associations of school connectedness with an array of specific sexual risk behaviors separately by sex. The results indicate that school connectedness may be protective for a range of such behaviors and that its protective effect may be more important for boys. Educators, health promoters, and policymakers should consider these findings when designing interventions meant to maximize youth sexual health through school-based interventions.

IMPLICATIONS FOR SCHOOL HEALTH

Increasing school connectedness is a potentially powerful tool for creating the conditions that will allow youth to develop in a positive way. The Wingspread Declaration points out that the conditions that are required for youth to be connected to their schools are well-known, that the educational and health benefits

of increasing school connectedness are also well-researched, and that effective ways of increasing school connectedness involve the concerted efforts of school administration, teachers, parents, and students.¹³

School connectedness can be enhanced. One review concluded that 4 school-associated factors contribute most to school connectedness: (1) organizational structure (eg, smaller schools and smaller class sizes), (2) functional aspects of schools (eg, fair and clear disciplinary expectations), (3) the built environment of the school (eg, well-maintained facilities), and (4) interpersonal support (eg, positive relationships among students, staff, and students).⁶² An intervention study of elementary schools in Seattle, Washington (The Seattle Social Development Project) found that teacher training in classroom management to enhance school bonding, parent training to promote family and school bonding, and student training in social competence had a positive influence on students' feelings about school and increased their school attachment.⁶³ Such approaches to increasing feelings of support, respect, and inclusion among students should be both promoted to and encouraged by school boards, principals, teachers, parents, and students themselves.

Human Subjects Approval Statement

All protocol and materials of the HBS received ethical approval from the University of Waterloo (the principal coordinator of the YSS/HBS), Dalhousie University, Health Canada, and institutions of consortium members where required.

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