

Suicidal Behaviours Among Adolescents in Northern Nova Scotia

Gender Difference, Risk Factors and Health Service Utilization

JianLi Wang, PhD¹

Jean Hughes, PhD²

Gail Tomblin Murphy, MN, PhD cand.²

Janet A. Rigby, MA³

Donald B. Langille, MD³

ABSTRACT

Objectives: To estimate the 12-month prevalence of suicidal behaviours by gender and to investigate the gender-specific factors associated with suicidal behaviours and to describe health service utilization by suicidal adolescents.

Methods: This was a cross-sectional study. The baseline data of the Adolescent Health Study conducted in northern Nova Scotia were used.

Results: Female students were more likely to report suicidal behaviours than male students ($p < 0.005$). There was no gender difference in injurious suicide attempts. Depression was the strongest risk factor for suicidal behaviours in the two genders ($p < 0.005$). Female students who reported drug use and living in a non-intact family were at higher risk of suicide attempts. Low self-esteem was positively associated with suicidal ideation and suicide planning among male students. Suicidal girls were more likely to seek professional help for emotional disturbance than boys. Family doctors were the most frequently contacted professional by suicidal adolescents.

Conclusions: Some factors associated with suicidal behaviours among adolescents may be gender specific. Suicidal behaviours have been considered a depressive symptom. Most suicidal students, however, had not contacted a health professional for an emotional problem in this population. This presents challenges for prevention of suicidal behaviours among adolescents.

La traduction du résumé se trouve à la fin de l'article.

1. Departments of Psychiatry & Community Health Sciences, Faculty of Medicine, University of Calgary, Calgary, AB

2. School of Nursing, Dalhousie University, Halifax, NS

3. Department of Community Health & Epidemiology, Faculty of Medicine, Dalhousie University

Correspondence: JianLi Wang, Department of Psychiatry, Room 3645, 3500 - 26 Avenue, NE, Calgary, AB T1Y 6J4, Tel: 403-943-5540, Fax: 403-219-3095, E-mail: jianli.wang@calgaryhealthregion.ca

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Suicidal behaviours are an important public health problem because they are the precursors of completed suicide.^{1,2} Studies conducted in Quebec indicated that about 15.4% of high school students had suicidal ideation³ and 6.7% of high school students had tried to commit suicide at least once.⁴ In a study based on the Ontario Child Health Study, 5-10% of the boys and 10-20% of the girls aged 12-16 had had suicidal ideation or had made suicide attempts in the past 6 months.⁵ In addition to the high prevalence, community-based studies in different countries have reported gender differences in suicidal behaviours, with adolescent girls often having a higher prevalence.^{3,5,6-12} Gender differences in suicidal behaviours were not found in a study conducted in Alberta, in which 2.3% of girls and 2.1% of boys who were in grades 7-12 reported suicidal behaviours (either suicidal ideation or suicide attempts).¹³

Gender differences in suicidal behaviours suggest that the causal factors for suicidal behaviours may be different for males and females.¹⁴ Identifying gender-specific factors associated with suicidal behaviours and investigating health service use by suicidal adolescents have implications for service delivery in terms of designing education, detection, prevention and promotion programs. However, few studies have investigated gender-specific risk factors associated with suicidal behaviours^{6,11-13} and different studies have focused on different risk factors.

Charron¹⁵ suggests that suicidal behaviours are a function of personal characteristics and negative life experiences. Studies using adolescent samples have reported that suicidal behaviours are associated with personal characteristics such as older age,^{16,17} low self-esteem,¹⁸⁻²⁰ locus of control,²⁰⁻²² depression,^{18,20} alcohol consumption²⁰ and drug use;²⁰ with negative life experiences such as living in a single parent family,^{23,24} poor academic performance²⁵ and insufficient social support.^{26,27}

Despite the theoretical grounds and the reported associations between various factors and suicidal behaviours, it is not clear if these associations are gender specific. Results of a longitudinal study indicated that negative cognition, a history of major depressive disorders and low self-esteem predicted suicide attempts among young women; among young men, negative cog-

dition and a history of major depressive disorders predicted later suicide attempts.¹¹ When the effect of a history of suicidal ideation was considered, these factors were no longer associated with the later occurrence of suicide attempts.¹¹ Garrison et al.⁶ reported that alcohol use was associated with suicidal behaviours in white males, but not in females. Borowsky et al.¹² found that alcohol and drug use were associated with suicide attempts regardless of gender.

The objectives of this paper were to, among adolescents aged 14 to 20, (1) estimate the 12-month prevalence of various suicidal behaviours by gender; based on the findings of previous studies, we hypothesized that female students had a higher prevalence of suicidal behaviours than did male students; (2) identify the gender-specific factors associated with suicidal behaviours, and (3) describe health service utilization by adolescents with suicidal behaviours.

METHODS

For this analysis, we used the baseline data of the Adolescent Health Study (AHS) conducted in the northern part of Nova Scotia. The AHS is an ongoing longitudinal study, which was initiated in four major high schools in the northern part of Nova Scotia in 2000. All participating schools had grades 10 to 12, with one having grade 9. The age of the participants ranged from 14 to 20. All students ($n = 3035$) registered in these schools were invited to participate in the survey. Among them, 36 students were not able to provide informed consent and 7 did not participate due to parental refusal. Of the remaining students, 368 students did not attend school on the day of the survey. Among those who attended school that day ($n = 2624$), 2372 students (90.4%) participated in the baseline survey. Participating students anonymously completed self-administered questionnaires developed by the team members and reviewed by content experts at the provincial and federal levels.²⁸ The variables included in this analysis, based on the findings of previous studies, are described in Appendix I.

The overall and gender-specific prevalences of reported suicidal behaviours were calculated and compared. Univariate analyses were conducted to identify gender-

TABLE I

The 12-month Prevalence of Suicidal Behaviours (Overall and by Gender)

	Overall N=2353 N (%)	Boys n=1132 N (%)	Girls n=1219 N (%)	Fisher's Exact Test p Value
Suicidal ideation	16.6	12.8	19.9	<0.005
Suicide planning	11.8	9.4	13.9	<0.005
Suicide attempts	5.1	3.0	6.8	<0.005
Injurious suicide attempts	1.2	1.1	1.3	not significant
Any suicidal behaviours	19.3	15.3	22.8	<0.005

specific factors associated with suicidal behaviours. Effect modification between selected variables was investigated using logistic regression. Again, this was carried out in male and female subjects separately. Variables associated with reported suicidal behaviours in the univariate analyses and the significant interaction term(s) (if there was evidence of effect modification) were, then, incorporated into one model. Variables which were not associated with reported suicidal behaviours and were not part of the interaction term(s) were not included in the model. The results of 6 logistic regression models (suicidal ideation, suicide plan and suicide attempt by gender) are presented. Finally, the proportions of having contacted various health professionals for mood disturbance/level of happiness among those who reported suicidal behaviours were calculated and compared. This analysis was conducted using STATA 6.0.³⁵

RESULTS

Table I presents the overall and gender-specific 12-month prevalences of various suicidal behaviours. Females were more likely to report suicidal ideation, suicide planning, suicide attempts and any suicidal behaviours than were males ($p < 0.005$). However, male and female students did not differ in the prevalence of reported injurious suicide attempts.

Among male students, age, academic achievement, living arrangement and problem drinking were not related to any suicidal behaviours in the univariate analysis (Table II). These variables were neither confounders, nor effect modifiers; therefore, they were not included in the multivariate analyses. The results of multivariate analyses indicated that depression was positively associated with reported suicidal ideation, suicide planning and suicide attempts ($p < 0.005$). Self-esteem was negatively associated with these suicidal behav-

ious. Any drug use in the past 30 days, self-efficacy, locus of control, social support satisfaction and social support needs, which were all significantly associated with reported suicidal behaviours in the univariate analyses, were not related to suicidal behaviours when the effects of depression and self-esteem were considered.

Among female students, age was not associated with reported suicidal behaviours and problem drinking was not related to suicide planning (Table III). These two variables were, therefore, not incorporated into the logistic regression models. Depression was positively associated with all three suicidal behaviours ($p < 0.005$). Any drug use was found to be positively associated with reported suicidal ideation and suicide planning. Self-esteem was negatively correlated with reported suicide planning. There was evidence of interaction between any drug use in the past 30 days and living in a non-intact family. Female students who lived in a non-intact family and reported drug use in the past 30 days had a higher risk of suicide attempts than did others. The remaining variables were not associated with reported suicidal behaviours among female students.

The proportions of youth who reported having visited health professionals for emotional problems/level of happiness among those who reported suicidal behaviours are presented in Table IV. About one third of those with suicidal behaviours had sought professional help for emotional problems. Family doctors were the health professional most frequently contacted by these adolescents. Females were more likely than males to have contacted any health professional, especially a family doctor, for emotional problems.

DISCUSSION

The AHS data indicated that female students had a higher prevalence of suicidal behaviours than did male students, which

TABLE II

The Associations Between Selected Variables and Suicidal Behaviours and the Results of Multivariate Logistic Regression with Suicidal Behaviours as Dependent Variables Among Male Students

	Ideation		Planning		Attempts	
	Crude n=1127 Coef. (SE)	Adjusted n=951 Coef. (SE)	Crude n=1125 Coef. (SE)	Adjusted n=950 Coef. (SE)	Crude n=1128 Coef. (SE)	Adjusted n=952 Coef. (SE)
Age	<0.01 (0.07)		0.02 (0.08)		-0.12 (0.14)	
Academic achievement	0.18 (0.18)		<0.01 (0.21)		0.12 (0.35)	
Living arrangement	0.24 (0.19)		0.41 (0.21)		0.37 (0.36)	
Problem drinking	0.15 (0.18)		0.03 (0.21)		0.72 (0.38)	
Any drug use	0.51 (0.19)*	0.37 (0.23)	0.50 (0.22)*	0.36 (0.25)	0.76 (0.34)*	0.51 (0.42)
Depression	0.10 (0.01)**	0.05 (0.01)**	0.08 (0.01)**	0.04 (0.01)**	0.10 (0.01)**	0.06 (0.02)**
Self-esteem	-0.16 (0.01)**	-0.10 (0.02)**	-0.15 (0.02)**	-0.10 (0.02)**	-0.16 (0.03)**	-0.08 (0.04)*
Self-efficacy	-0.13 (0.02)**	0.01 (0.03)	-0.08 (0.02)**	0.06 (0.03)	-0.14 (0.03)**	-0.01 (0.04)
Locus of control	0.13 (0.02)**	0.03 (0.03)	0.11 (0.02)**	0.02 (0.03)	0.15 (0.03)**	0.01(0.05)
Social support satisfaction	-0.27 (0.03)**	-0.05 (0.05)	-0.20 (0.04)**	-0.04 (0.06)	-0.28 (0.06)**	0.01(0.10)
Social support need	0.34 (0.04)**	0.18 (0.06)**	0.24 (0.05)**	0.09 (0.07)	0.36 (0.08)**	0.18 (0.11)

* p < 0.05
 ** p < 0.005
 Coef. (SE): Coefficient (Standard Error)
 Blank: the variables were not included in the multivariate model.

TABLE III

The Associations Between Selected Variables and Suicidal Behaviours and the Results of Multivariate Logistic Regression with Suicidal Behaviours as Dependent Variables Among Female Students

	Ideation		Planning		Attempts	
	Crude n=1215 Coef. (SE)	Adjusted n=1005 Coef. (SE)	Crude n=1215 Coef. (SE)	Adjusted n=1004 Coef. (SE)	Crude n=1213 Coef. (SE)	Adjusted n=1003
Age	-0.04 (0.06)		0.02 (0.07)		-0.10 (0.10)	
School mark < 70	0.56 (0.16)**	0.15 (0.21)	0.67 (0.18)**	0.31 (0.22)	0.73 (0.24)**	0.14 (0.30)
Living arrangement	0.51 (0.15)*	0.16 (0.19)	0.37 (0.17)*	0.05 (0.21)	0.79 (0.23)**	-0.50 (0.51)
Problem drinking	0.30 (0.15)*	-0.17 (0.21)	0.31 (0.17)		0.53 (0.23)*	0.05 (0.30)
Any drug use	0.96 (0.16)**	0.58 (0.21)**	1.07 (0.18)**	0.64 (0.21)**	1.48 (0.26)**	0.38 (0.40)
Depression	0.11 (0.01)**	0.09 (0.01)**	0.09 (0.01)**	0.06 (0.01)**	0.09 (0.01)**	0.08 (0.02)**
Self-esteem	-0.14 (0.01)**	-0.02 (0.02)	-0.13 (0.01)**	-0.06 (0.02)**	-0.12 (0.02)**	-0.01 (0.03)
Self-efficacy	-0.14 (0.02)**	-0.01 (0.02)	-0.11 (0.02)**	0.01 (0.02)	-0.12 (0.02)**	0.02 (0.03)
Locus of control	0.15 (0.02)**	0.02 (0.02)	0.13 (0.02)**	0.01 (0.03)	0.16 (0.02)**	0.03(0.03)
Social support satisfaction	-0.30 (0.03)**	-0.08 (0.05)	-0.28 (0.03)**	-0.04 (0.05)	-0.31 (0.05)**	-0.08 (0.07)
Social support need	0.30 (0.04)**	-0.03(0.06)	0.30 (0.04)**	0.03 (0.06)	0.33 (0.06)**	0.01 (0.08)
Drug use x non-intact family						1.30 (0.62)*

* p < 0.05
 ** p < 0.005
 Coef. (SE): Coefficient (Standard Error)
 The p value for the interaction term was based on the test of homogeneity.
 Blank: problem drinking was not included in the model.

TABLE IV

Proportions of Visiting Health Professionals for Mood Disturbance/Level of Happiness by Adolescents with Suicidal Behaviours (Overall and by Gender)

	Overall N=435 (%)	Boys n=164 (%)	Girls n=269 (%)	Fisher's Exact Test p Value
Family doctor	23.0	15.2	27.5	0.003
Other doctors	8.1	6.7	8.9	NS
Other health professional	10.8	7.3	13.0	NS
Any health professional	37.2	26.8	43.5	<0.005

was consistent with previous studies.³⁻¹² The gender-specific prevalence rates of suicidal behaviours in our analysis were higher than those reported by the study conducted in Alberta.¹³ The 12-month prevalence of reported suicidal behaviours among female students was comparable with that in the Ontario Child Health Study.⁵ However, the prevalence of any suicidal behaviours among male students was higher than that reported in 1988 by Joffe et al.⁵ The dis-

crepancies may be partly due to regional differences. It is also possible that there has been an increase of suicidal behaviours among male adolescents. The data provided no evidence that male and female students were different in terms of the prevalence of injurious suicide attempts. Since the number of subjects who reported injurious suicide attempts in the AHS was relatively small, this particular finding needs to be replicated in future studies.

The results of this analysis demonstrated that some factors associated with reported suicidal behaviours are gender-specific among adolescents. In a theoretical framework established by Dieserud et al.,³⁶ low self-esteem was considered a variable with its effect on suicidal behaviours being mediated by depression. Our analysis showed that male students with low self-esteem were more likely to report suicidal ideation and suicide planning, controlling for the effects of depression, general self-efficacy, locus of control, social support and drug use. This was not observed among female students. Therefore, depression was not a mediating variable in the relationship between self-esteem and suicidal behaviours. These findings are important because suicidal ideation and planning are the precursors of suicide attempts and

of completed suicide, and low self-esteem may affect male and female students to different degrees in terms of the risk of suicidal behaviours.

Living in a non-intact family and drug use may interact with each other to increase the risk of suicide attempts among adolescent girls. This particular finding is plausible because both factors have been found to be associated with suicidal behaviours among adolescents, and drug users among adolescents were more likely to be from single-parent families.^{37,38} However, the AHS data could not answer why family structure interacted only with drug use but not with problem drinking and why it was only found among female students.

We found that depression was the most prominent factor for reported suicidal behaviours in both male and female students. This finding was consistent with those of a recent study¹⁰ and is not surprising because suicidal behaviours are usually considered depressive symptoms. This highlights the importance of providing accessible mental health services for adolescents. Unlike previous studies, we found no evidence that problem drinking, self-efficacy, locus of control and social support need or satisfaction, were associated with reported suicidal behaviours in this population in the multivariate analyses. This is an indication that the effects of these factors on suicidal behaviours could have been mediated by depression. Therefore, it is important to consider the effect of depression when the relationship between any behavioural or psychological factors and suicidal behaviours are examined.

Suicidal girls were more likely to contact professionals for mood disturbance/level of happiness than were boys, with family physicians being the health professional most often contacted. Thus, family physicians should inquire about suicidal behaviours in young women with emotional disturbance and should be sensitive to their needs. However, the results showed that most students with reported suicidal behaviours did not contact a health professional for emotional problems. This highlights the importance of school-based health promotion initiatives for depression and suicidal behaviours. Our data could not definitely determine the proportion of those who need help for suicidal behaviours and those who actually sought such

Appendix I

Variables Included in this Analysis

Variables	Description
Suicidal ideation ²⁹	Based on the question "during the past 12 months, did you every seriously consider attempting suicide?" Possible answers: yes vs. no
Suicide planning ²⁹	Based on the question "during the past 12 months, did you make a plan about how you would attempt suicide?" Possible answers: yes vs. no
Suicide attempts ²⁹	Based on the question "during the past 12 months, how many times did you actually attempt suicide?" An answer of 1 or more was considered having attempted suicide in this analysis.
Injurious suicide attempts	For those who attempted suicide in the past 12 months, "did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?" Possible answers: yes vs. no
Depression ³⁰	Measured by the 20-item Centres for Epidemiological Studies – Depression Scale. A score of 0 to 60 was possible, with a higher score indicating a higher level of depression. Depression was analyzed as a continuous variable in this analysis.
School mark	Based on the question "what was your average mark in school last year?" Participants might choose one of 6 categories (less than 50 to 90-100). In this analysis, this variable was dichotomized as 70 + and below 70.
Living arrangement	Participants might identify themselves as "living with two parents, living with one parent and other living arrangements." Other living arrangements" referred to living alone, living with friend or partner, living with step parent(s) or guardian(s). In this analysis, "living with two parents" was considered as living in an intact family.
Drug use	Based on the answers to the questions if the participants used the following drugs in the past 30 days: marijuana, LSD, opiates, stimulants, barbiturates, tranquilizers, cocaine, anabolic steroids, solvents/glue, psilocybin and others. An answer of "yes" to any of these questions was considered an indication of using drug(s) in the past 30 days.
Problem drinking	Problem drinking was defined as one or more days in the past 30 days prior to the survey in which one had 5 or more drinks of alcohol in a row (within a couple of hours).
Self-esteem ³¹	10 items, on a 5-point scale (strongly disagree to strongly agree) to measure self-esteem in adolescents. A higher score indicates a higher level of self-esteem. This was considered as a continuous variable in this analysis.
Self-efficacy ³²	10-item scale measuring perceived self-efficacy. This variable was analyzed as a continuous variable in this analysis, with a higher score indicating higher level of self-efficacy.
Locus of control ³³	40 items (yes or no) to measure the locus of control of reinforcement dimension in a wide range of children. This variable was analyzed as a continuous variable, with a lower score indicating better internal locus of control.
Social support ³⁴	12 multiple choice items to measure two dimensions – satisfaction and need of social support networks. The higher the score, the more need of social support and the better satisfaction with received social support. This was analyzed as a continuous variable in this analysis.

help. Speaking to a health professional about emotional disturbance does not necessarily mean that these students are seeking help in terms of suicidal behaviours. Additionally, for those who spoke to a health professional for emotional disturbance/level of happiness, it is not clear whether the current service system did enough to meet their needs. Answers to these questions are essential for child and adolescent mental health service planning. However, this is beyond the scope of our current data. This should be investigated by future studies.

There were some limitations with this analysis. It was cross-sectional in nature and, therefore, causal relationships could not be confirmed. The AHS relied on self-reported information, with a possibility of reporting bias. Nevertheless, this analysis was based on

information collected from almost all high school students in this region, enhancing the validity of these estimates. The gender-specific factors associated with suicidal behaviours identified in this analysis need to be replicated by future studies so that mental health promotion and prevention strategies can be formulated.

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RÉSUMÉ

Objectifs : Estimer la prévalence sur 12 mois des comportements suicidaires selon le sexe, étudier les facteurs propres à chaque sexe associés à ces comportements et décrire l'utilisation des services de santé par les adolescents suicidaires.

Méthode : Étude transversale fondée sur les données de référence d'une étude sur la santé des adolescents menée dans le nord de la Nouvelle-Écosse.

Résultats : Les élèves de sexe féminin étaient plus susceptibles que les élèves de sexe masculin de mentionner des comportements suicidaires ($p < 0,005$). Il n'y avait aucune différence entre les sexes dans le nombre de tentatives de suicide avec blessures. La dépression était le principal facteur de risque de comportement suicidaire chez les deux sexes ($p < 0,005$). Les filles qui disaient consommer des drogues et vivre dans une famille dissociée couraient un risque plus élevé de commettre des tentatives de suicide. La faible estime de soi était positivement associée aux idées suicidaires et aux projets de suicide chez les garçons. Les filles suicidaires étaient plus susceptibles que les garçons de chercher de l'aide professionnelle pour leurs troubles affectifs. Les médecins de famille étaient les professionnels les plus souvent contactés par les adolescents suicidaires.

Conclusions : Certains facteurs associés aux comportements suicidaires chez les adolescents peuvent être propres à l'un ou l'autre sexe. On considère les comportements suicidaires comme un symptôme de dépression. Dans la population à l'étude, cependant, la plupart des élèves suicidaires n'avaient pas contacté un professionnel de la santé en réponse à un problème affectif. Ceci présente un défi pour la prévention des comportements suicidaires chez les adolescents.