

Self-esteem and the Initiation of Substance Use Among Adolescents

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ABSTRACT

OBJECTIVES: To investigate differences in the relationship between self-esteem and the initiation of substance use (tobacco, alcohol and marijuana) among male and female secondary school students in British Columbia.

METHODS: The data were collected in the 2010 fall and 2011 spring cycles of the British Columbia Adolescent Substance Use Survey (BASUS). The sample consisted of 1,267 adolescents (57% female) in Grades 8 and 9. Multivariate logistic regression models were used to examine the extent to which self-esteem and gender, and their interaction, influenced the odds of having initiated substance use at baseline and at follow-up 6 months later.

RESULTS: For each one-point increase on the Rosenberg Self-Esteem Scale, there was a reduction in the odds of initiating substance use by up to 9% for tobacco, 3% for alcohol, and 7% for marijuana. The relationships between self-esteem and the initiation of tobacco and alcohol use varied by gender, with boys having slightly less robust associations at the baseline assessment.

CONCLUSION: The results suggest that self-esteem is protective against the initiation of tobacco, alcohol, and marijuana use. Researchers are advised to consider the interactive effects of gender in future longitudinal research examining the relationship between self-esteem and the initiation of substance use, including implications related to the development of substance use prevention programs.

KEY WORDS: Substance use; adolescents; self-esteem, gender; tobacco, marijuana; alcohol

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

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Despite numerous anti-drug initiatives for adolescents, substance use remains a major public health problem.¹ Recent studies have shown that the incidence and prevalence rates of adolescents' substance use have increased across industrialized countries.^{2,3} In Canada, depending on the province, ethnicity, and gender, 46-62% of adolescents (approximately 12-18 years old) report alcohol use and 17-32% report cannabis use in the previous year.⁴ This is of concern because the early initiation of substance use increases the risk for future mortality, morbidity – including depression – and other problems such as delinquent behaviour, school dropout, social impairment, and legal problems.^{1,2,5}

Although observational studies cannot prove the existence of a causal relationship, researchers have reported an association between relatively poor self-esteem and substance use initiation.^{3,6-8} Despite the growing evidence of this link, however, some researchers have found an association between self-esteem and substance use only among boys,³ while others have found no association at all.⁵ The purpose of this study was to address these inconsistencies by examining the relationships between adolescents' self-esteem and the initiation of three types of substance use (tobacco, alcohol, and marijuana), stratified by gender, from cross-sectional and longitudinal perspectives.

METHODS

The data analyzed in this study were collected in the 2010 fall and 2011 spring cycles of the British Columbia Adolescent Substance Use Survey (BASUS). BASUS is a prospective cohort study of secondary school students recruited from 48 participating public secondary schools in British Columbia, Canada. The study design combined in-school recruitment of participants with the comple-

tion of web-based questionnaires. Students were recruited via in-school announcements, posters, advertisements in school newspapers, and take-home packages of printed material. The majority of students completed the questionnaires on their own time; however, several schools opted to allow their students to complete the questionnaires during class time in computer labs. School-specific response rates for the 48 participating schools ranged from 2% to 100% and averaged 20%. Each student received a \$25 gift card for each completed wave of the survey. Ethical approval for this study was obtained from the Behavioural Research Ethics Board of the University of British Columbia.

Self-esteem

The 10-item Rosenberg Self-Esteem Scale (RSES) was used to assess global self-esteem.⁹ Responses to the 10 items were scored using a four-point scale ranging from 4 (strongly agree) to 1 (strongly disagree) with items 2, 5, 6, 8, and 9 reverse scored. Higher scores indicate higher self-esteem (possible scores range from 10 to 40).

Substance Use

Tobacco use was measured with the question, "Have you ever tried any of the following?" (1) Cigarettes (the kind that come in a pack, not roll-your-own) – even one or two puffs, (2) Roll-your-own cig-

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arettes (tobacco only) – even one or two puffs, or (3) None of the above. Endorsement of (1) or (2) was coded as initiation of tobacco use. Alcohol use was measured with the question, “Have you ever had a drink of alcohol (beer, cider, cooler, wine, liquor) – not just a sip or taste of someone else’s drink?” with the response options: (1) Yes or (2) No. Cannabis use was measured with: “Have you ever used marijuana (also called cannabis, weed, pot, hash)?” with the response options (1) Yes or (2) No.

Analyses

To maintain sample size, 135 participants who did not answer 1 to 5 items on the 10-item RSES (i.e., they completed at least 5 of the 10 items) had their missing data imputed using the EM algorithm procedure in IBM® SPSS® Statistics Version 19.¹⁰ Total scores on the RSES were then calculated by summing responses to the 10 items (reverse coded, as needed). Each participant’s total score on the RSES was then mean-centred to facilitate the interpretation of the coefficients produced in the multiple logistic regression models. Six multivariate logistic regression models were examined, one for each type of substance use initiation at baseline and another for each type of substance use at the follow-up assessment approximately 6 months later. Ethnicity (“white” as the referent), age, gender (male as the referent), self-esteem (centred) and the multiplicative interaction between self-esteem and gender were entered into the models predicting initiation of each type of substance use. Only those participants who did not initiate use at baseline were examined in the three follow-up logistic regression analyses (i.e., the follow-up analyses were based on subsets of adolescents who had not initiated substance use at baseline).

RESULTS

The original BASUS sample was composed of 1,353 adolescents who participated in the fall 2010 survey. After deleting cases with substantial amounts of missing data, 1,267 participants remained for the baseline analyses. Of these, 1,000 (79%) participated in the spring 2011 follow-up survey, although a small number of these participants chose not to answer the alcohol initiation question (n=25) or the marijuana initiation question (n=27). Sample characteristics and rates of substance use initiation for the sample are presented in Table 1.

Results for the multivariate logistic regression models are presented in Table 2. The relationship between self-esteem and the initiation of substance use was either significant as a main effect or in the context of an interaction with gender in all baseline models. Self-esteem was not a significant predictor of substance use initiation in the follow-up analyses of participants who had not initiated substance use at baseline.

DISCUSSION

The relationship between the socio-demographic factors examined in this study and the initiation of substance use support existing research about their role as important risk factors for adolescents’ substance use. At baseline, our analysis showed that Aboriginal youth were more likely to initiate tobacco and marijuana use than were “white” youth (OR = 2.67 and OR = 3.49, respectively). Similar studies also have shown that Aboriginal youth have higher initiation and prevalence rates of substance use compared with other Canadian youth, with Aboriginal girls being at greatest risk.^{11,12}

Table 1. Participants’ Characteristics and Rates of Substance Use Initiation by Gender

Characteristic	Female (N=718) (57%)	Male (N=549) (43%)	Total (N=1267)
Age (years): N (%)			
13	211 (29)	178 (32)	389 (31)
14	498 (69)	359 (65)	857 (68)
≥15	9 (1)	12 (2)	21 (2)
Ethnicity: N (%)			
“White”	346 (48)	286 (52)	632 (50)
Aboriginal	51 (7)	29 (5)	80 (6)
Asian	223 (31)	156 (28)	379 (30)
Other	98 (14)	78 (14)	176 (14)
Self-esteem: Mean (sd)	30 (5.8)	32 (5.1)	31 (5.6)
Initiation of smoking: N (%)			
Baseline (n=1267)	64 (9)	54 (10)	118 (9)
Follow-up (n=1000)	63 (11)	47 (11)	110 (11)
Initiation of alcohol use: N (%)			
Baseline (n=1260)	269 (37)	239 (44)	508 (40)
Follow-up (n=975)	254 (44)	171 (43)	425 (44)
Initiation of marijuana use: N (%)			
Baseline (n=1260)	67 (9)	66 (12)	133 (11)
Follow-up (n=973)	76 (13)	62 (15)	138 (14)

Rate of initiation at follow-up includes those who initiated at baseline.

Unexpectedly, the initiation of alcohol use by Aboriginal youth was no more or less likely than that of “white” youth (OR = 1.02). A possible explanation for this finding is that adolescents’ alcohol use has become a social norm that does not vary by ethnicity in Canadian youth of this age.^{5,6,13} Being of Asian origin, compared with being a “white” youth, had a significant protective factor, at baseline, against initiation of tobacco, alcohol, and marijuana use (odds ratios of 0.31, 0.29, and 0.28, respectively). Asian youth also had reduced odds of reported initiation of tobacco, alcohol, and marijuana use, at follow-up (odds ratios of 0.43, 0.45, and 0.29, respectively). Though not the focus of this study, the magnitude of this association highlights a potentially rewarding area of research focused on identifying the underlying mechanisms. For example, several explanations for lower substance use among Asian youth have identified strong family involvement as an important socialization source that produces a cultural attitude towards substance use.^{11,14}

Considering the relationship between self-esteem and the initiation of tobacco use, the results of this study support previous research reports of a potentially protective role of self-esteem against the initiation of tobacco use. In the model predicting tobacco initiation at baseline, the significant interaction between gender and self-esteem indicates that the relationship between self-esteem and tobacco initiation was negligible (OR = 1.00) for boys and somewhat substantial and statistically significant for girls (OR = 0.91). It is important to note that these odds ratios represent the odds of initiation associated with a single-point increase on the total RSES score. For example, for each increase of one point on the RSES, the odds of initiating smoking among girls at baseline decreased by 9%; an increase of six points on RSES (1 standard deviation in this study) would equate to a 43% reduction in the odds of initiating smoking. The findings for alcohol initiation at baseline are similar to those found for tobacco initiation. Higher self-esteem scores were associated with relatively lower odds of initiating alcohol use, for both boys (OR = 0.97) and girls (OR = 0.92); however, the association was more robust in the girls, for whom a one-point increase in the total RSES score was associated with an 8% reduction in the odds of initiating alcohol use. Similar to the case with tobacco, no relationship was found between self-esteem and the initiation

Table 2. Odds Ratios for Multivariate Logistic Regression Models Predicting Initiation of Substance Use

Baseline Initiation	Tobacco (n=1267) Odds ratio (95% CI)	Alcohol (n=1260) Odds ratio (95% CI)	Marijuana (n=1260) Odds ratio (95% CI)
Ethnicity			
"White" (Referent)	1.00	1.00	1.00
Aboriginal	2.67 [1.50, 4.78]*	1.02 [0.63, 1.65]	3.57 [2.07, 6.16]*
Asian	0.31 [0.17, 0.56]*	0.29 [0.21, 0.38]*	0.28 [0.16, 0.50]*
Other	0.64 [0.34, 1.21]	0.60 [0.42, 0.85]*	0.62 [0.34, 1.13]
Age	1.82 [1.25, 2.66]*	1.38 [1.09, 1.75]*	1.57 [1.10, 2.25]*
Gender (Male Referent)	0.73 [0.48, 1.11]	0.68 [0.53, 0.86]*	0.56 [0.37, 0.83]*
Self-esteem	1.00 [0.95, 1.06]	0.97 [0.93, 1.00]*	0.95 [0.90, 1.00]*
Gender by self-esteem	0.91 [0.85, 0.98]*	0.95 [0.91, 0.99]*	0.96 [0.89, 1.03]
Follow-up Initiation	(n=918)	(n=595)	(n=883)
Ethnicity			
"White" (Referent)	1.00	1.00	1.00
Aboriginal	2.39 [0.80, 7.09]	0.85 [0.32, 2.23]	2.77 [1.10, 6.96]*
Asian	0.43 [0.18, 0.99]*	0.45 [0.27, 0.74]*	0.29 [0.13, 0.65]*
Other	0.61 [0.20, 1.83]	0.92 [0.48, 1.73]	0.99 [0.45, 2.16]
Age	0.77 [0.40, 1.48]	1.29 [0.89, 1.87]	1.61 [1.02, 2.52]*
Gender (Male Referent)	0.39 [0.18, 0.85]*	0.88 [0.56, 1.39]	0.63 [0.35, 1.13]
Self-esteem	0.95 [0.87, 1.04]	1.01 [0.95, 1.08]	0.99 [0.91, 1.08]
Gender by self-esteem	0.90 [0.80, 1.02]	0.93 [0.86, 1.01]	0.93 [0.84, 1.03]

* Indicates statistical significance $p < 0.05$.

of alcohol use at follow-up. Higher self-esteem scores were associated with reduced odds of having initiated marijuana use at baseline only (OR = 0.95) and this relationship did not vary by gender.

The results of this study suggest that self-esteem is protective against young adolescents' initiation of tobacco, alcohol, and marijuana use. For each one-point increase on the RSES, there was a reduction in the odds of initiating substance use of up to 9%. Although these results are supported by the literature,^{3,6,7} caution is warranted in deriving causal interpretations from cross-sectional data. In addition, there is the possibility that an order effect bias resulted from the placement of the RSES items immediately after the substance use items in the questionnaire. It is possible that the participants' answers to the substance use questions may have temporarily influenced their perceptions of their self-esteem. This effect may have contributed to the findings observed in this study if the action of remembering and reporting substance use caused the participants to report lower levels of self-esteem (i.e., remembering and reporting substance use triggered a temporary lowering of self-esteem). Additionally, the relationship between self-esteem and the initiation of substance use varied by gender, with boys demonstrating a less robust association. Although no relationship was found between self-esteem and the initiation of substance use at follow-up, this could be due, in part, to the reduced power associated with a relatively smaller sample size (compared with baseline) in this particular analysis. The reduced statistical power associated with the smaller sample sizes in the follow-up analyses also may have contributed to the lack of significant gender by self-esteem interactions. The finding of significant interactions only at baseline highlights the need for longitudinal investigations that include gender interactions when examining the posited protective effect of self-esteem for adolescents.

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RÉSUMÉ

OBJECTIFS : Étudier les différences dans la relation entre l'estime de soi et le début de la consommation de substances (tabac, alcool et marijuana) chez les élèves du secondaire en Colombie-Britannique.

MÉTHODE : Nos données ont été recueillies pendant les cycles de l'automne 2010 et du printemps 2011 de l'enquête BASUS (British Columbia Adolescent Substance Use Survey). L'échantillon comprenait 1 267 adolescents (57 % de filles) de 8^e et de 9^e année. À l'aide de modèles de régression logistique multivariée, nous avons examiné la mesure dans laquelle l'estime de soi et le sexe, et leur interaction, influencent la probabilité d'avoir déjà consommé des substances au début de l'étude et au suivi six mois plus tard.

RÉSULTATS : Pour chaque point d'augmentation sur l'échelle de l'estime de soi de Rosenberg, la probabilité d'avoir commencé à consommer des substances diminuait jusqu'à 9 % pour le tabac, jusqu'à 3 % pour l'alcool et jusqu'à 7 % pour la marijuana. La relation entre l'estime de soi et le

début de la consommation de tabac et d'alcool variait selon le sexe, les garçons présentant une association légèrement moins forte à l'évaluation préliminaire.

CONCLUSION : Il semble que l'estime de soi protège contre l'initiation à la consommation de tabac, d'alcool et de marijuana. Nous conseillons aux chercheurs d'examiner les effets interactifs du sexe dans les futures études longitudinales sur le lien entre l'estime de soi et le début de la consommation de substances, y compris les conséquences de l'élaboration de programmes de prévention.

MOTS CLÉS : consommation de substances; adolescents; estime de soi, sexe; tabac, marijuana; alcool