

Original quantitative research

Determinants of psychological and social well-being among youth in Canada: investigating associations with sociodemographic factors, psychosocial context and substance use

Colin A. Capaldi, PhD; Mélanie Varin, MSc; Raelyne L. Dopko, PhD

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Abstract

Introduction: Positive mental health is an essential part of youth's healthy development. For instance, positive mental health is associated with greater self-reported physical health, closer relationships and fewer conduct problems in youth. As positive mental health promotion is a public health priority, examining its potential determinants is important.

Methods: We analyzed data from students in Grades 7–12 (secondary I–V in Quebec), from nine Canadian provinces, who participated in the 2016/2017 Canadian Student Tobacco, Alcohol and Drugs Survey. Psychological and social well-being (PSWB) was assessed using the Children's Intrinsic Needs Satisfaction Scale (CINSS). We conducted linear regression analyses to determine associations of sociodemographic, psychosocial and substance use variables with overall CINSS scores ($n = 37\ 897$).

Results: In general, youth in Canada reported fairly high PSWB. After adjusting for all included variables, being in a higher grade, being bullied, bullying others, reporting more behavioural problems and using cigarettes, e-cigarettes or cannabis at least once in the past 30 days were associated with lower overall CINSS scores for both male and female students. Reporting more prosocial behaviours was associated with higher overall scores for both sexes.

Conclusion: A number of sociodemographic, psychosocial and substance use factors are associated with PSWB among youth in Canada. Prospective longitudinal and intervention studies could examine whether changes in these potential risk/protective factors are accompanied by changes in positive mental health.

Keywords: *psychological well-being, social well-being, eudaimonic well-being, positive mental health, youth, substance use, bullying, demographic factors*

Introduction

The prevention of mental illness and the promotion of positive mental health have been identified as key priorities in Canada and worldwide.^{1,2} The Public Health Agency of Canada defines positive mental health as “the capacity of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the

challenges we face.”³ Positive mental health can decrease the likelihood of experiencing mental illness and can help in the recovery of those with mental disorders.^{4,7} In addition, positive mental health appears to be a protective factor against the onset and progression of some physical illnesses/diseases and mortality.^{8,9} Among youth in the United States, positive mental health outcomes have been found to be associated

Highlights

- This study examined correlates of psychological and social well-being (PSWB) among youth in Grades 7–12/secondary I–V in Canada.
- PSWB was lower for students in higher grades.
- Behavioural problems, being bullied and bullying others were associated with lower PSWB, while prosocial behaviours (e.g. helping, sharing) were associated with higher PSWB.
- Recent cigarette, e-cigarette and cannabis use were associated with lower PSWB.

with a more positive self-concept, closer interpersonal relationships, stronger sense of school connectedness, higher self-reported physical health and fewer conduct problems (e.g. substance use, truancy, being arrested).^{10,11}

A variety of conceptualizations and operationalizations of positive mental health and well-being abound, but one distinction that is commonly made is between hedonic well-being and eudaimonic well-being.¹² Hedonic well-being is often construed and measured as the *experience* of positive emotions and satisfaction with life.¹² Eudaimonic well-being, in contrast, is frequently construed and measured as positive psychological *functioning* (psychological well-being) and includes constructs such as personal growth, purpose/meaning in life, autonomy and environmental

Author reference:

Public Health Agency of Canada, Ottawa, Ontario, Canada

Correspondence: Colin Capaldi, Public Health Agency of Canada, 785 Carling Avenue, Ottawa, ON K1S 5H4; Tel: 613-299-7714; Email: colin.capaldi@canada.ca

mastery/competence, as well as aspects of positive social functioning (social well-being) such as positive relations with others, relatedness, social integration, social acceptance, social contribution, social actualization and social coherence.¹²⁻¹⁴

In this paper, we focus on the eudaimonic conceptualization of well-being and examine the psychological and social well-being (PSWB) of youth in Canada from the perspective of self-determination theory, as measured by the Children's Intrinsic Needs Satisfaction Scale (CINSS).¹⁵

Self-determination theory posits the existence of three basic psychological needs: the need for autonomy (to feel like one has free will and choice); the need for competence (to feel effective and capable); and the need for relatedness (to feel supported, cared about and connected to others).^{16,17} The satisfaction of these basic needs can be considered an indicator of PSWB.^{12,16,17}

In this paper, we follow the approach taken in the Positive Mental Health Surveillance Indicator Framework (PMHSIF) for youth¹⁸ by considering autonomy and competence as indicators of psychological well-being and relatedness as an indicator of social well-being.

Previous research with children and youth from Montréal found that those who reported greater satisfaction of basic psychological needs (i.e. higher PSWB) reported fewer depressive symptoms and negative emotions, and more positive emotions concurrently and six weeks later.¹⁵ Similar to research investigating other positive mental health outcomes,¹⁹⁻²¹ the Montréal study also found that PSWB tended to be lower among older students.

In a large representative sample, recent involvement in bullying (i.e. being bullied or bullying others) and other problematic behaviour were associated with lower PSWB in youth in Canada, while engagement in prosocial behaviours was associated with higher PSWB.²² The study did not find large differences in PSWB between male and female youth.²²

While these studies document how a few sociodemographic and psychosocial factors may be related to PSWB, they do not consider numerous potential determinants of PSWB simultaneously. Other recent

research has examined how measures of eudaimonic well-being are associated with substance use in youth, but the samples are non-representative and/or the analyses only include well-being as an explanatory variable.²³⁻²⁵

Our aim was to examine whether a variety of sociodemographic, psychosocial and substance use-related factors are associated with PSWB in a representative sample of youth. Along with contributing to the literature on the correlates of PSWB, our research could also increase understanding of the distribution of PSWB across numerous characteristics and behaviours and allow for the better identification of youth subpopulations (e.g. those attending school in rural vs. urban areas) who might benefit from targeted interventions.^{26,27}

Methods

Data and participants

We analyzed data from the 2016/2017 cycle of the Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS). A sample of 52 103 students in Grades 7-12 (or secondary I-V in Quebec) in 699 public, private and Catholic schools from 117 school boards in nine Canadian provinces participated in the cycle. (New Brunswick declined to participate.) Data were not collected from students attending other types of schools (e.g. on First Nations reserves and military bases, virtual and international schools, special needs schools, schools for the visually and hearing impaired), schools in the three Canadian territories or schools with fewer than 20 students in an eligible grade.

The school response rate was 78% and the student response rate was 76%. Student non-responses were due to parents/guardians refusing to give their permission or students declining to participate or being absent on the day the survey was given in their school.

Students voluntarily completed paper surveys during a class period. The surveys took 40 minutes or less to complete. The CSTADS received ethical approval from the Health Canada Research Ethics Board, the ethics review boards in affiliated provincial institutions, school board ethics review committees and the Office of Research Ethics at the University of Waterloo.²⁸

Measures

Psychological and social well-being

The 18-item Children's Intrinsic Needs Satisfaction Scale (CINSS)¹⁵ was used as a measure of positive psychological and social functioning. Students responded on a 4-point scale that ranged from 1 ("really false for me") to 4 ("really true for me") to indicate how well each statement from the CINSS applied to them.

Six items assessed autonomy (e.g. "I feel free to express myself at home"), six items assessed competence (e.g. "I feel I do things well at school") and six items assessed relatedness (e.g. "My friends like me and care about me") across three domains (at home, at school and with peers). Although previous research has validated the three-factor structure of the CINSS among youth in Canada, the autonomy, competence and relatedness subscales all load onto a higher-order factor²² and were highly correlated with one another in the current cycle ($r_s \geq 0.78$). Thus, we calculated overall scores of PSWB for each student by summing their responses to all 18 items from the CINSS (Cronbach's $\alpha = 0.93$).

Potential determinants

Potential determinants of PSWB were identified from the CSTADS and grouped into three broad categories. The first category—sociodemographic factors—included the student's sex (male/female); grade (7-12); and the urban or rural status of the area where the student's school was located. The area was determined based on the school's postal code. For students in Quebec, secondary I-V was recoded to Grades 7-11.

The CSTADS also measured self-reported ethnicity, but we were unable to analyze this variable as we did not have access to the restricted version of the data.

The second category included variables that assessed aspects of the student's psychosocial context and behaviour. This included self-reports of being the target of bullying (being bullied at least once in the last 30 days/not being bullied); perpetrating bullying (bullying others at least once in the last 30 days/not bullying others); prosocial behaviour; and behavioural problems.

Prosocial behaviour was measured using five items that asked students about their

willingness to help, be generous and show interest in others (e.g. “I often help people without being asked”).

Behavioural problems were measured using seven items that asked students about their respect for social boundaries, routines and rules (e.g. “I cut classes or skip school”).

For both the prosocial behaviour and behavioural problems items, students indicated how well each statement described them on 6-point scale from 1 (“definitely not like me”) to 6 (“definitely like me”). Overall scores for prosocial behaviour ($\alpha = 0.91$) and behavioural problems ($\alpha = 0.85$) were obtained by summing their respective items. The prosocial behaviour and behavioural problems items were first developed and validated for use in the Health Behaviour in School-aged Children (HBSC) survey.^{22,29,30}

The third category included substance use-related variables: self-reported cigarette use (smoked a cigarette at least once in the past 30 days/did not smoke a cigarette); e-cigarette use (smoked an e-cigarette at least once in the past 30 days/did not smoke an e-cigarette); alcohol use (drank alcohol at least once in the past 30 days/did not drink alcohol); and cannabis use (used cannabis at least once in the past 30 days/did not use cannabis). We focussed on reported use of each of these substances over the past 30 days because we assumed that recent substance use would be more strongly associated with current levels of PSWB and would be more accurately remembered. This approach also allowed us to examine the association of PSWB with experiences of substance use and experiences of bullying over the same time span.

Analysis

We conducted linear regression analyses to examine the association between PSWB and the sociodemographic, psychosocial and substance use variables in the overall sample and separately for female and male students.

The first set of regression analyses examined each potential determinant on its own (unadjusted results), while the second analysis examined all potential determinants together (fully adjusted results). In both sets of regression analyses, we

used sampling weights to adjust for the CSTADS sampling method and to make the results representative of youth from the target population.²⁸ Variance was estimated using the bootstrap resampling method with 500 replications to account for the complex sampling design. Analyses were conducted using statistical package SAS Enterprise Guide version 7.1 (SAS Institute, Cary, NC, USA).

To make the sample composition constant across the unadjusted and adjusted analyses, we excluded from the linear regression analyses individuals with missing responses on any of the relevant questions. In the adjusted models, there was no evidence of heteroscedasticity, multicollinearity or extreme skewness in the distribution of residuals.

Results

For sample characteristics on sociodemographic, psychosocial and substance use-related factors, see Table 1.

In general, the distribution of PSWB was negatively skewed as youth in Canada reported fairly high PSWB with an average score of 59.09 on the CINSS (scale range: 18–72; higher scores indicate greater well-being).

Unadjusted results

In the overall sample, all of the variables were significantly associated with PSWB when separate linear regression analyses were conducted (see the “Unadjusted” column of results for both sexes in Table 2). Being female, attending a school located in an urban area and reporting more prosocial behaviours were significantly related to higher PSWB. Being in a higher grade, being bullied, bullying others, reporting more behavioural problems and using a cigarette, an e-cigarette, alcohol or cannabis at least once in the past 30 days were significantly associated with lower PSWB.

The direction and significance of these associations were the same when results were stratified by sex, albeit with one exception: attending a school in an urban versus rural area was not significantly associated with PSWB for female students (see the “Unadjusted” columns of results for males and females in Table 2).

Adjusted results

In all three fully adjusted models, being in a higher grade, being bullied, bullying

others, reporting more behavioural problems and using a cigarette, an e-cigarette or cannabis at least once in the past 30 days were all significantly associated with lower PSWB, while reporting more prosocial behaviours was significantly associated with higher PSWB (see the “Adjusted” columns of results in Table 2).

Attending school in an urban area was significantly associated with lower PSWB in the overall sample and for female students, but not significantly associated with PSWB for male students.

Recent alcohol use was not significantly associated with PSWB in the overall sample, but a significant negative association between recent alcohol use and PSWB was found for male students and a significant positive association between these variables was found for female students.

Lastly, being female was significantly associated with lower PSWB in the overall sample. Collectively, the set of variables in the fully adjusted models explained one-fifth of the variance in PSWB (adjusted R^2 s = 0.20).

Discussion

The goal of this research was to examine how sociodemographic, psychosocial and substance use variables are associated with PSWB in youth in Canada. The results revealed that most of these factors were significantly associated with PSWB when examined individually and after adjustment.

In terms of the psychosocial context of both male and female youth in Canada, behavioural problems, being bullied and bullying others were associated with lower PSWB, while prosocial behaviour was associated with higher PSWB. These variables remained significantly associated with PSWB in the adjusted models. This expands on Orpana et al.’s study, which used an earlier cycle of the CSTADS and did not control for other potential determinants.²²

The positive association between prosocial behaviour and PSWB we observed in the current study extends previous findings of fairly consistent cross-cultural support for higher hedonic well-being in people (aged 15 years and older) who engage in prosocial behaviour (i.e. volunteering or

TABLE 1
Sample characteristics and descriptive statistics of CINSS, prosocial behaviour scale and behavioural problems scale, CSTADS, 2016/2017

Variables	% (95% CI), weighted
Sex (n = 52 103)	
Male	51.33 (51.33, 51.33)
Female	48.67 (48.67, 48.67)
Grade (n = 52 103)	
Grade 7	16.37 (16.37, 16.37)
Grade 8	16.26 (16.25, 16.26)
Grade 9	17.11 (17.11, 17.11)
Grade 10	17.08 (17.08, 17.08)
Grade 11	17.01 (17.00, 17.01)
Grade 12	16.18 (16.18, 16.18)
Area (n = 52 103)	
Rural	16.00 (14.26, 17.74)
Urban	84.00 (82.26, 85.74)
Bullied by others (n = 49 543)	
No	76.53 (76.18, 76.87)
Yes	23.47 (23.13, 23.82)
Bullied others (n = 49 781)	
No	86.79 (86.51, 87.07)
Yes	13.21 (12.93, 13.49)
Cigarette use (n = 52 031)	
No	93.82 (93.54, 94.09)
Yes	6.18 (5.91, 6.46)
E-cigarette use (n = 51 719)	
No	89.02 (88.74, 89.29)
Yes	10.98 (10.71, 11.26)
Alcohol use (n = 49 336)	
No	72.87 (72.39, 73.35)
Yes	27.13 (26.65, 27.62)
Cannabis use (n = 50 867)	
No	89.11 (88.74, 89.48)
Yes	10.89 (10.52, 11.26)
Variables	Mean (95% CI), weighted
Prosocial behaviour (n = 49 016)	19.49 (19.46, 19.53)
Behavioural problems (n = 49 537)	10.75 (10.71, 10.78)
CINSS (n = 45 130)	59.09 (59.02, 59.15)

Abbreviations: CINSS, Children's Intrinsic Needs Satisfaction Scale; CSTADS, Canadian Student Tobacco, Alcohol and Drugs Survey.

donating to charity).³¹ The current study also extends research with American adults that found positive relationships between prosocial behaviour and more eudaimonic aspects of well-being, such as meaning in life.^{32,33}

Behavioural problems were also robustly associated with PSWB. This result may

not be surprising as externalizing behaviours (e.g. aggression, rule-breaking) are common to a number of mental disorders in childhood and adolescence.³⁴

The current results also build upon a large international body of research showing a link between being bullied/bullying others and negative mental health outcomes

(e.g. suicidal ideation).³⁵⁻³⁷ This suggests that aspects of positive psychological and social functioning may be also negatively affected by being bullied/bullying others. Future research could examine whether interventions that are effective at decreasing bullying perpetration and victimization³⁸ or other behavioural problems³⁹ are accompanied by increases in PSWB.

However, given the cross-sectional nature of the CSTADS data and that some protective factors against bullying overlap with aspects of PSWB,⁴⁰ it is important to acknowledge that the current research cannot establish causality and that the link between bullying and PSWB is likely bidirectional. A similar caveat applies to PSWB's relationship with prosocial behaviour and behavioural problems.

Beyond the psychosocial context, PSWB tended to be lower in youth who recently engaged in substance use. We found this pattern for cigarette, e-cigarette and cannabis use in the overall and sex-stratified unadjusted and adjusted models. In other words, use of each of these substances in the past 30 days was uniquely related to lower PSWB in Canadian youth. As brain development is ongoing during adolescence and can be disturbed by substance use during this sensitive time,⁴¹ it is not surprising that psychological/social functioning might also be negatively affected.

The negative association between cigarette use and PSWB extends findings from the HBSC survey.²⁹ The HBSC survey found that youth in Canada who indicated that they never smoke were less likely to report emotional problems and more likely to report high emotional well-being.²⁹ The lower PSWB observed among Canadian youth who recently used cannabis replicates previous (non-representative) findings in high school students in Ontario and British Columbia: Butler et al.²³ found that the likelihood of ever using cannabis or using cannabis more frequently was higher among students who reported lower levels of flourishing.

The link between e-cigarette use and lower PSWB is of particular importance given evidence of increasing rates of e-cigarette use by Canadian adolescents,⁴²⁻⁴⁴ and cases of vaping-associated lung illnesses in Canada and the United States.⁴⁵ The unique association between PSWB and e-cigarette use in this current research

TABLE 2
Linear regression models examining how overall CINSS scores are associated with sociodemographic, psychosocial and substance use variables, CSTADS, 2016/2017

Variables	Both sexes (N = 37 897)		Males (N = 18 302)		Females (N = 19 595)	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
	B ^a (95% CI)	B ^a (95% CI)	B ^a (95% CI)	B ^a (95% CI)	B ^a (95% CI)	B ^a (95% CI)
Sex						
Male	(Ref.)	(Ref.)	–	–	–	–
Female	0.73*** (0.64, 0.82)	–0.11** (–0.19, –0.03)	–	–	–	–
Grade	–0.56*** (–0.60, –0.53)	–0.30*** (–0.33, –0.28)	–0.59*** (–0.64, –0.55)	–0.26*** (–0.29, –0.23)	–0.52*** (–0.57, –0.47)	–0.36*** (–0.41, –0.31)
School area						
Rural	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Urban	0.25** (0.09, 0.41)	–0.33*** (–0.43, –0.23)	0.55*** (0.33, 0.76)	–0.14 (–0.28, 0.002)	–0.03 (–0.24, 0.19)	–0.55*** (–0.73, –0.37)
Bullied by others						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–4.75*** (–4.90, –4.59)	–4.20*** (–4.34, –4.05)	–4.54*** (–4.80, –4.28)	–3.75*** (–3.98, –3.51)	–5.15*** (–5.30, –4.99)	–4.54*** (–4.71, –4.38)
Bullied others						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–4.88*** (–5.04, –4.72)	–0.68*** (–0.88, –0.49)	–4.83*** (–5.13, –4.53)	–0.94*** (–1.25, –0.63)	–4.90*** (–5.11, –4.69)	–0.49*** (–0.72, –0.27)
Prosocial behaviour	0.34*** (0.34, 0.35)	0.35*** (0.34, 0.35)	0.36*** (0.35, 0.38)	0.37*** (0.36, 0.38)	0.33*** (0.32, 0.34)	0.31*** (0.30, 0.32)
Behavioural problems	–0.59*** (–0.61, –0.58)	–0.43*** (–0.45, –0.42)	–0.57*** (–0.60, –0.53)	–0.43*** (–0.45, 0.40)	–0.62*** (–0.64, –0.60)	–0.45*** (–0.47, –0.43)
Cigarette use						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–6.17*** (–6.45, –5.90)	–1.95*** (–2.14, –1.75)	–5.78*** (–6.18, –5.39)	–1.27*** (–1.51, –1.03)	–6.59*** (–6.88, –6.30)	–2.84*** (–3.15, –2.54)
E-cigarette use						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–3.91*** (–4.11, –3.71)	–0.41*** (–0.58, –0.24)	–3.76*** (–4.06, –3.47)	–0.25* (–0.50, –0.01)	–3.96*** (–4.15, –3.77)	–0.57*** (–0.76, –0.38)
Alcohol use						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–2.46*** (–2.57, –2.35)	–0.04 (–0.16, 0.08)	–2.79*** (–3.00, –2.59)	–0.48*** (–0.64, –0.31)	–2.12*** (–2.30, –1.95)	0.43*** (0.26, 0.60)
Cannabis use						
No	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)	(Ref.)
Yes	–4.80*** (–5.02, –4.59)	–1.39*** (–1.60, –1.19)	–4.80*** (–5.09, –4.51)	–1.52*** (–1.80, –1.24)	–4.71*** (–4.92, –4.50)	–1.22*** (–1.45, –0.98)

Abbreviations: CINSS, Children's Intrinsic Needs Satisfaction Scale; CSTADS, Canadian Student Tobacco, Alcohol and Drugs Survey; Ref., reference group.

Note: Dummy coding was used to create the reference groups for the categorical variables.

^a B is the unstandardized regression coefficient.

*p < 0.05.

**p < 0.01.

***p < 0.001.

suggests that the negative effect of e-cigarette use may not be limited to physical health.

Caution is warranted in inferring causality from the current cross-sectional data, however, especially considering that pre-existing mental health problems have been identified as a risk factor for substance use and dependence.^{41,46} While abstaining or minimizing substance use during adolescence may promote higher psychological/social functioning, it is also plausible that intrinsic need satisfaction may act as a protective factor against using substances during this developmental period. Using data from 2014/2015 cycle of the CSTADS, Enns and Orpana²⁵ found that alcohol and cannabis use tends to be less common among youth who report higher levels of competence and relatedness. We decided to include substance use variables as explanatory variables in our analyses because substance use is included as a determinant of positive mental health outcomes in the PMHSIF for youth.¹⁸ Future prospective longitudinal research could examine the potentially bidirectional relationship between substance use and PSWB.

In terms of alcohol use, drinking alcohol in the past 30 days was also associated with lower PSWB in the unadjusted results, but was inconsistently associated with PSWB in the adjusted results. Recent Canadian research also provides inconsistent results. For instance, Butler et al.²⁴ found that positive and negative mental health outcomes were not significantly associated with binge drinking among high school students in Ontario and British Columbia. Enns & Orpana,²⁵ analyzing a previous cycle of the CSTADS, found that the association between PSWB and alcohol use depended on the subscale of the CINSS and the inclusion/exclusion of covariates. It might be beneficial for future research on this topic to take a cognitive rather than a behavioural approach and examine associations between the motives underlying drinking behaviours and PSWB in youth.⁴⁷

With regard to sociodemographic factors, being female was associated with higher PSWB in the unadjusted model, but with lower PSWB after adjustment. The unadjusted result is somewhat consistent with an analysis of an earlier cycle of the CSTADS that found that satisfaction of relatedness needs was significantly higher

among female students.²² Nevertheless, sex did not explain a lot of variance in PSWB in the unadjusted model in the current study ($R^2 = 0.002$), suggesting that differences in the psychological and social functioning of male and female students in Canada are fairly trivial in magnitude. The reversal of the association between sex and PSWB in the adjusted model may have been due to controlling for variables (e.g. externalizing behavioural problems) that tend to be more prevalent among male youth in Canada, and not controlling for internalizing problems (e.g. sadness/hopelessness) that tend to be more prevalent among female youth in Canada.^{29,48} When possible, future research should examine both internalizing and externalizing problems simultaneously.⁴⁹

Another inconsistent sociodemographic factor was the urban/rural setting of the student's school. Specifically, students who attended school in an urban area tended to report higher PSWB than students attending school in a rural area in the unadjusted model, with the opposite pattern found after adjustment. Given that previous Canadian research has found mixed evidence for differences in positive mental health outcomes in urban versus rural areas⁵⁰⁻⁵² and that associations between rural/urban school setting and psychological/social functioning were not consistently found across the sex-stratified analyses, we hesitate to consider school area to be a potentially important determinant of PSWB in Canadian youth.

In contrast to sex and school area, the results for the third sociodemographic factor—grade level—were consistent across both unadjusted and adjusted analyses. Specifically, PSWB was lower for male and female students in higher grades. This extends previous research based on data from the HBSC survey that found lower life satisfaction and higher subjective health complaints among older youth on average across Europe and Canada.¹⁹⁻²¹ To boost the positive mental health of Canadian youth, interventions may want to target students in higher grades as well-being appears to be lower in high school than in middle school (although prospective longitudinal research is needed to provide stronger evidence for within-person changes in positive mental health).

Strengths and limitations

As previously mentioned, due to the cross-sectional nature of the CSTADS data,

we cannot establish causality. Another limitation is the use of self-report questions to measure the constructs of interest; social desirability and recall biases cannot be ruled out (e.g. students may purposefully or unintentionally misreport the frequency of their substance use or their engagement in bullying).

Although we were able to control for many variables, our investigation of potential determinants was not exhaustive and was limited by the availability of constructs measured in the CSTADS, especially the dearth of sociodemographic variables. There could be other confounding or important variables that we were not able to account for (or interaction effects) that could have changed the results (e.g. household income, ethnicity, immigration status, sexual orientation, internalizing problems, sleep, physical activity, screen time).^{49,53-55} More comprehensive analyses could be conducted using recently released data from the Canadian Health Survey on Children and Youth.

As we only examined overall results across nine provinces, it is unclear whether all of the observed associations replicate in every province, the territories or other countries. While self-determination theory construes autonomy, competence and relatedness as universal needs, it acknowledges that the pathways to satisfy these needs can be shaped by context.¹⁶ Thus, future research could investigate similarities and differences in the determinants of youth PSWB across provinces/territories and countries.

Lastly, we referred to the male/female variable as “sex” to be consistent with CSTADS data labelling and previous research,^{22,25,28} but this variable could be construed as measuring “gender” as respondents were simply asked “Are you female or male?”.

While recognizing these limitations, the large representative sample, high statistical power, examination of different types of substance use and inclusion of validated measures of youth functioning (e.g. the CINSS) are major strengths of the CSTADS and the current research.

Conclusion

The current study reveals that a variety of sociodemographic, psychosocial and

substance use-related factors are associated with PSWB in Canadian youth. Lower PSWB was found among male and female students who were in higher grades; who were targets of bullying or who bullied others; who reported more behavioural problems; and who used cigarettes, e-cigarettes or cannabis at least once in the past 30 days. Male and female students who reported more prosocial behaviours tended to have higher PSWB.

The identification of these potential determinants of PSWB in Canadian youth is an important contribution to the existing literature and could be useful for informing public health policies and interventions.

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Conflicts of interest

The authors have no conflicts of interest.

Authors' contributions and statement

MV conceived the project. CC, MV and RD decided on the analytic approach. MV and CC conducted the statistical analyses. CC, MV and RD interpreted the results. CC drafted and revised the manuscript in response to feedback provided from MV and RD.

The content and views expressed in this article are those of the authors and do not necessarily reflect those of the Government of Canada.

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