



Bullying victimization and illicit drug use among students in Grades 7 to 12 in Manitoba, Canada: a cross-sectional analysis

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Abstract

Objectives There is inconsistent evidence examining the relationship between bullying victimization and illicit drug use, with most studies only examining the association between bullying victimization and marijuana use. The current study aims to (1) determine the relationship between bullying victimization and six types of illicit drug use among boys and girls in grades 7 to 12 and (2) examine gender and grade differences in the relationships between bullying victimization and drug use.

Methods Data were drawn from the Manitoba Youth Health Survey ($N = 64,174$) collected in the 2012–2013 school year among students in grades 7 to 12 from Manitoba, Canada. Logistic regression models were used to analyze the relationships between nine different types of bullying victimization and marijuana, cocaine, methamphetamines, ecstasy, hallucinogens, and prescription/over-the-counter drugs used to get high. All analyses were stratified by gender and grade.

Results Bullying victimization was associated with increased odds of all types of drug use among boys and girls in grades 7 to 12. A dose-response relationship was noted with more frequent bullying victimization corresponding to greater odds of drug use. Grade and gender differences were found for some drug use types.

Conclusions There are strong relationships between bullying victimization and illicit drug use among boys and girls in grades 7 to 12, indicating that reductions in bullying victimization may result in reductions in illicit drug use. Grade and gender differences may signify the need for early and gender-specific bullying prevention and intervention strategies.

Résumé

Objectifs Les études qui examinent le lien entre être victime d'intimidation et l'utilisation de drogues illicites varient et la plupart examinent seulement le lien à l'utilisation de la marijuana. Cette étude vise à : 1) déterminer la relation entre être victime d'intimidation et l'utilisation de six types de drogues illicites chez les élèves de la 7^e à la 12^e année et 2) examiner les différences entre sexe et niveaux scolaires.

Méthodes Les données provenaient de l'Enquête sur la santé des jeunes au Manitoba en 2012–2013 ($N = 64,174$). Des modèles de régression logistique, stratifiés selon le sexe et niveaux scolaires, ont été adoptés pour analyser les liens entre neuf types d'intimidation et la marijuana, la cocaïne, les méthamphétamines, l'ecstasy, les hallucinogènes, et les médicaments sur ordonnance ou sans ordonnance.

Résultats Être victime d'intimidation était associé à une augmentation des risques d'utilisation de chaque type de drogues parmi les deux sexes et chaque niveau scolaire. La probabilité d'utilisation de drogues augmentait avec la fréquence accrue d'intimidation. Des différences de niveaux scolaires et de sexe ont été observées pour l'utilisation de certains types de drogues.

Conclusions Il existe de fortes relations entre être victime d'intimidation et l'utilisation de drogues illicites chez les garçons et les filles de la 7^e à la 12^e année. Ceci suggère que la réduction d'intimidation pourrait être associée à une réduction d'utilisation de drogues illicites. Les différences de niveaux scolaires et de sexe suggèrent le besoin de stratégies de prévention et d'intervention précoces et adaptées selon le sexe.

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Introduction

Bullying victimization is one of the most common forms of victimization in childhood and adolescence (Radford et al. 2013) and is often defined as experiencing any unwanted aggressive behaviour by an individual or a group of individuals with more social power that is intended to harm and is repeated over time (Nansel et al. 2001; Freeman et al. 2011). Bullying victimization can result in both immediate and long-term consequences such as the following: increased risk of developing mental disorders and suicidal behaviours (Takizawa et al. 2014; Arseneault 2017; Skapinakis et al. 2011; Moore et al. 2017); poor educational achievement (Wang et al. 2014; Wolke and Lereya 2015); difficulty maintaining stable employment (Wolke et al. 2013); increased risk of falling below the poverty line (Wolke et al. 2013); and increased risk-taking behaviours such as smoking, alcohol use, and illicit drug use (Moore et al. 2017; Wolke et al. 2013; Niemelä et al. 2011; Tharp-Taylor et al. 2009; Radliff et al. 2012). A recent systematic review and meta-analysis quantified the magnitude of risk associated with bullying victimization and determined a 1.60 increased odds of poor mental health, 2.21 increased odds of depression, 1.77 increased odds of anxiety, 1.77 increased odds of suicidal ideation, and 2.13 increased odds of suicide attempts when bullying victimization were experienced (Moore et al. 2017). Importantly, bullying victimization was also associated with a 1.41 increased odds of illicit drug use (Moore et al. 2017).

The definition of bullying victimization, pioneered by Olweus in 1993, includes three components: (1) aggressive behaviour, (2) power imbalance, and (3) repetition over time (Olweus 1993). Since the 1990s, researchers have adapted and modified this definition, resulting in the inability of consistent assessment or comparison of prevalence between populations or over time (Modecki et al. 2014; Griffin and Gross 2004). Discrepancies in how bullying victimization is defined and measured have been documented, highlighting differences in the assessment time frame and number of experiences measured (Vivolo-Kantor et al. 2014). Several studies have assessed past 12-month reports of physical aggression, verbal aggression, and cyber-victimization and determined that between 4.0% and 44.6% of youth experienced victimization (Kann et al. 2014; DeVoe and Murphy 2011; Carlyle and Steinman 2007; Haynie et al. 2001; Hemphill et al. 2015; Schneider et al. 2012). In Canada, the national prevalence of adolescents experiencing bullying victimization, including physical, relational, verbal, indirect, sexual harassment, racial,

religious, and/or electronic victimization once or twice in the past 2 months, was approximately 60.0% for both boys and girls combined (Freeman et al. 2011). It is possible that differences in how bullying victimization was assessed, including the number of experiences that were asked about, the time frame for occurrence, and the frequency of occurrence account for some of the discrepancy between these findings. It is also important to note that demographic differences in the prevalence of bullying victimization exist, with boys often reporting a higher frequency of bullying than girls, and differences in the prevalence of bullying victimization across grades (Nansel et al. 2001; Freeman et al. 2011; Radliff et al. 2012; Carlyle and Steinman 2007; Berthold and Hoover 2000; Carbone-Lopez et al. 2010). Therefore, bullying victimization should be assessed separately for boys and girls and for different grades, but ideally with comparable assessment tools.

Adolescence and youth are also peak times for exposure and experimentation with illicit drugs (Canadian Centre on Substance Abuse 2007; Boak et al. 2014). In 2015, approximately 20.6% of Canadians aged 15 to 19 years old used marijuana in the past year, while 5.0% used other illicit drugs (i.e., hallucinogens, cocaine, ecstasy, methamphetamines, and heroin) (Health Canada 2015). These estimates are higher than the reported prevalence estimates for Canadians age 25 years or older, which are 9.9% for marijuana and 1.5% for any other illicit drug use. Representative Canadian statistics do not exist for the prevalence of illicit drug use for youth below the age of 15. However, the 2004 Health Behaviour in School-Aged Children survey showed an increase in illicit drug use from grade 9 to grade 10 (Boyce 2004) and in the USA, the 2016 National Survey on Adolescent Drug Use showed that illicit drug use increases from grade 8 to grade 12 (Johnston et al. 2017). Previous literature has also identified that boys are more likely to use illicit drugs than girls (Health Canada 2015; Boyce 2004; Johnston et al. 2017).

There is a growing literature on the relationship between bullying involvement and illicit drug use (Wolke and Lereya 2015; Wolke et al. 2013; Niemelä et al. 2011; Tharp-Taylor et al. 2009; Radliff et al. 2012; Luk et al. 2010; Kaltiala-Heino et al. 2000; Sigurdson et al. 2014; Bender and Losel 2011; Bouffard and Koeppel 2017; Valdebenito et al. 2015). However, these studies have indicated inconsistent findings, with some studies noting significant relationships between bullying victimization and illicit drug use (Tharp-Taylor et al. 2009; Luk et al. 2010; Sigurdson et al. 2014; Valdebenito et al. 2015; Goebert et al. 2011), while others find little or no effect (Wolke and Lereya 2015; Wolke et al. 2013; Niemelä et al. 2011; Radliff

et al. 2012; Kaltiala-Heino et al. 2000; Bender and Losel 2011; Bouffard and Koeppel 2017). Furthermore, many studies are limited by only assessing marijuana use and using a population of either middle school or high school youths (Tharp-Taylor et al. 2009; Berthold and Hoover 2000; Carbone-Lopez et al. 2010; Luk et al. 2010; Goebert et al. 2011). How bullying victimization is related to specific drug types and if these relationships vary according to grade or gender is currently unknown. We also do not know if a dose-response relationship exists with frequency of bullying victimization corresponding with increased drug use. One previous study examined the relationship between bullying victimization and drug use among students in middle school (grades 6 to 8) and high school (grades 9 to 12) and found similar trends among the two grade groupings; however, the authors did not test for statistical differences (Radliff et al. 2012). A different study indicated significant gender differences in the relationships between bullying victimization and substance use (Carbone-Lopez et al. 2010), although substance use was measured using an aggregate variable consisting of alcohol, tobacco, marijuana, and inhalant use. Some studies have noted a dose-response relationship with increasing bullying victimization corresponding with poorer outcomes (Evans et al. 2014; Kelleher et al. 2013) but not in relation to drug use. Examining the relationships between the frequency of different bullying victimization types and drug use types between younger and older grades and among boys and girls is important for understanding possible grade- and gender-related differences, which can provide evidence for grade- and gender-specific intervention and prevention strategies.

The current study extends the existing literature with population-based data that assesses the frequency of nine different bullying victimization types and six different drug use types separately among boys and girls in grades 7 to 9 and grades 10 to 12 in Manitoba, Canada. The objectives of this study were to (1) determine the relationships between the frequency of nine different types of bullying victimization and six different drug use types among boys and girls in grades 7 to 9 and grades 10 to 12 and (2) examine grade and gender differences in the relationships between bullying victimization and drug use. We hypothesized that bullying victimization would be related to all drug use types, with increasing frequency of victimization corresponding with increased drug use. We also hypothesized that there would be grade and gender differences in the relationships between bullying victimization and drug use.

Methods

Data and sample

The data used for this study were from the Youth Health Survey (YHS; $N=64,174$, response rate 67%; 49% female and 51% male), collected during the 2012–2013 school year in Manitoba,

Canada. Partners in Planning for Healthy Living (PPHL), a network of government and non-government bodies and Manitoba Regional Health Authorities, partnered to facilitate and support the administration of this survey in all schools in Manitoba (Partners in Planning for Healthy Living 2013). A self-administered, paper-and-pencil questionnaire was offered to all schools with students in grades 7 to 12 across the province including public, independent, Colony, Francophone, and First Nations schools, making it a population-based design. Participation was voluntary, and students could stop participating at any time. Passive parental consent (i.e., parent/guardian is given the option to withdraw their child, but if they do not, consent is implied) or active parental consent (i.e., parent/guardian must sign a consent form and return it to the school to allow their child to participate) was obtained depending on the consent process chosen by the school division. Ethical approval to conduct the current study was granted from the University of Manitoba Health Research Ethics Board. Further details of the YHS data collection process and survey content can be found elsewhere (Partners in Planning for Healthy Living 2013).

Primary measurements

Bullying victimization

Bullying victimization was measured using the following items: “How many times in the past year (12 months) has anyone done any of the following to you: 1) physically threatened or injured you, 2) threatened or injured you with a weapon such as a gun, knife or club, 3) bullied, taunted or ridiculed you, 4) said something bad about your race or culture, 5) said something bad about your sexual orientation, 6) said something bad about your body shape, size or appearance, 7) asked for personal information over the internet, 8) made you feel unsafe when you were in contact with them over the internet, and 9) bullied or picked on you through the internet.” Response options included the following: never, one to five times, six or more times, and everyday (internal consistency as measured by Cronbach’s $\alpha=0.77$). To calculate gender by drug type and grade by drug type interaction terms, a dichotomous variable was also created that categorized respondents who indicated they experienced any of these *one time or more* in the past year as experiencing any bullying victimization, and those who reported *never* for all victimization items as not experiencing any bullying victimization.

Drug use

Respondents were asked about their use of six different types of drugs in the past month including: marijuana, cocaine, methamphetamines, ecstasy, LSD or other hallucinogens, and prescription or over-the-counter (OTC) drugs used to get high. Response options included the following: *0 times*, *1–2 times*, *3–9 times*, and *10 or more times*. A dichotomous

variable for each drug was computed to categorize respondents who used the drug one time or more in the past month compared to never.

Stratification variables

The analysis was stratified by two grade groupings and gender. All analyses are presented separately for boys and girls in grades 7 to 9 and 10 to 12.

Covariates

Two measures of mental and emotional health were included as covariates in the analyses. First, mental health functioning and emotional well-being were measured using the 14-item Mental Health Continuum Short Form (MHC-SF) developed by Corey Keyes (Keyes 2002; Keyes et al. 2008; Westerhof and Keyes 2010). The MHC-SF measure constructs such as happiness and satisfaction with life, sense of belonging to a community, presence of trusting relationships with others, and believing that life has a meaning or direction. Based on the MHC-SF responses, a developed algorithm classifies respondents as having either (a) flourishing, (b) moderate, or (c) languishing mental health. Second, the presence of sadness/hopelessness was measured using the question: “during the past 12 months, did you ever feel so sad or hopeless that you stopped doing some usual activities for a while?” Respondents could answer either *yes* or *no*.

Statistical analysis

Descriptive statistics of the sample were computed using crosstabs. The frequencies of bullying victimization by each drug type were calculated separately for boys and girls and for grades 7 to 9 and 10 to 12. Logistic regression models were conducted to determine the relationships between the frequency of bullying victimization and drug use, stratified by gender and grade categories and adjusting for mental and emotional well-being and feeling of sadness/hopelessness. Gender by drug type and grade by drug type interaction terms were calculated to test moderation effects in the relationship between any bullying victimization and drug use.

Results

Table 1 describes the sample. Table 2 provides the prevalence of past-year bullying victimization among boys and girls in grades 7 to 12. Marijuana was the most commonly used drug among boys and girls and in both grade groupings.

Table 3 (boys in grades 7 to 9), Table 4 (boys in grades 10 to 12), Table 5 (girls in grades 7 to 9), and Table 6 (girls in grades 10 to 12) present the associations between frequency of past-

Table 1 Demographic characteristics of the sample

Characteristic	Total sample % (n)	Any bullying victimization % (n)	No bullying victimization % (n)
Sex			
Female	49.4 (29510)	53.2 (20006)	43.0 (9504)
Male	50.6 (30188)	46.8 (17588)	57.0 (12600)
School grade			
Grade 7	17.4 (10408)	15.2 (5696)	21.3 (4712)
Grade 8	17.7 (10592)	17.4 (6530)	18.4 (4062)
Grade 9	18.2 (10855)	18.7 (7033)	17.3 (3822)
Grade 10	16.6 (9885)	17.7 (6642)	14.7 (3243)
Grade 11	15.6 (9312)	16.3 (6119)	14.4 (3193)
Grade 12	14.5 (8646)	14.8 (5574)	13.9 (3072)
Age			
11 or younger	0.5 (272)	0.4 (157)	0.5 (115)
12	15.6 (9293)	13.5 (5065)	19.1 (4228)
13	17.6 (10502)	17.2 (6468)	18.3 (4034)
14	17.7 (10548)	18.1 (6794)	17.0 (3754)
15	16.3 (9691)	17.3 (6488)	14.5 (3203)
16	15.5 (9216)	16.1 (6050)	14.3 (3166)
17	13.3 (7934)	13.7 (5138)	12.7 (2796)
18 or older	3.6 (2168)	3.7 (1385)	3.5 (783)
Positive mental health			
Languishing	5.7 (3348)	7.5 (2785)	2.6 (563)
Moderate	36.1 (21398)	41.9 (15629)	26.3 (5769)
Flourishing	58.2 (34489)	50.7 (18922)	71.1 (15567)
Feeling of sadness/hopelessness			
Yes	43.3 (25457)	55.0 (20328)	23.7 (5129)
No	56.6 (33151)	45.0 (16613)	76.3 (16538)

Denominators for each variable vary due to missing data

year bullying victimization and past-month drug use. For boys and girls in all grade levels, experiencing any bullying victimization type everyday was significantly associated with increased odds of drug use, after adjusting for mental and emotional well-being and feelings of sadness/hopelessness. For many bullying victimization types, experiences that occurred one to five times a year and six or more times a year were also significantly associated with drug use. For boys and girls in all grade levels, the largest effect sizes were seen for the relationship between being threatened or injured with a weapon, and drug use, with methamphetamine use having the largest effect size (AOR for methamphetamine use range from 42.76 to 243.00). Large effect sizes were also noted for boys in grades 7 to 9 and 10 to 12 for some internet-related victimization experiences. Strong dose-response relationships were noted for both boys and girls in grades 7 to 9 and 10 to 12 with increased frequency of bullying victimization corresponding to increased drug use.

Grade interaction terms between any bullying victimization and each drug type indicated that the relationship between

Table 2 Prevalence of past-month drug use and bullying victimization among boys and girls in grades 7 to 9 and 10 to 12 in Manitoba

Bullying victimization and past-month drug use	Boys		Girls	
	Grade 7–9 (<i>n</i> = 17,872) % (<i>n</i>)	Grade 10–12 (<i>n</i> = 15,040) % (<i>n</i>)	Grade 7–9 (<i>n</i> = 16,768) % (<i>n</i>)	Grade 10–12 (<i>n</i> = 14,494) % (<i>n</i>)
Any bullying victimization				
Never	43.9 (7100)	39.3 (5500)	35.1 (5496)	28.9 (4008)
1 time or more	56.2 (9090)	60.7 (8498)	64.9 (10169)	71.1 (9837)
Marijuana				
Never	93.0 (15491)	77.8 (11141)	92.3 (14749)	82.0 (11530)
1 time or more	7.1 (1175)	22.2 (3174)	7.7 (1229)	18.0 (2535)
Cocaine/crack				
Never	98.9 (16402)	96.1 (13636)	99.3 (15821)	98.0 (13762)
1 time or more	1.1 (186)	3.9 (555)	0.7 (115)	2.0 (275)
Methamphetamines				
Never	99.0 (16366)	97.3 (13781)	99.5 (15839)	99.4 (13926)
1 time or more	1.0 (168)	2.7 (385)	0.5 (73)	0.6 (82)
Ecstasy				
Never	98.9 (16344)	96.2 (13627)	99.3 (15788)	98.3 (13757)
1 time or more	1.2 (190)	3.8 (538)	0.8 (119)	1.7 (242)
LSD or hallucinogens				
Never	98.8 (16266)	96.1 (13578)	99.3 (15735)	98.5 (13737)
1 time or more	1.2 (202)	4.0 (559)	0.7 (111)	1.5 (206)
Prescription or OTC drugs				
Never	97.7 (15728)	94.6 (13133)	96.7 (14971)	95.0 (12982)
1 time or more	2.3 (368)	5.4 (756)	3.3 (509)	5.0 (684)
Any drug use				
Never	91.2 (14629)	75.3 (10540)	90.0 (13871)	78.7 (10759)
1 time or more	8.8 (1406)	24.7 (3457)	10.0 (1547)	21.3 (2910)

Denominators for each variable vary due to missing data

bullying victimization and drug use was significantly stronger for boys in grade 7 to 9 compared to boys in grades 10 to 12 for all drug types except for prescription or OTC drugs. For girls, grade interaction terms indicated that the relationship between any bullying victimization and marijuana use and any drug use was significantly stronger for girls in grades 7 to 9 compared to girls in grades 10 to 12.

Gender interaction terms indicated that in grades 7 to 9, the relationship between any bullying victimization and using marijuana, and any drug use was stronger for girls compared to boys. In grades 10 to 12, significant interaction effects between any bullying victimization and drug use were found for marijuana, ecstasy, prescription drug use, and any drug use, with the relationships stronger for girls compared to boys.

Discussion

This study has several important findings: (1) all past-year bullying victimization experiences were associated with increased

odds of all past-month drug use types including marijuana, cocaine, methamphetamines, ecstasy, LSD or other hallucinogens, and prescription or OTC drugs among boys and girls in grades 7 to 12; (2) across gender and grades and dose-response relationships were noted with increased frequency of bullying victimization corresponding to increased odds of drug use; (3) the relationships between any past-year bullying victimization and several drug use types were stronger in grades 7 to 9 than in grades 10 to 12; however, differences exist between boys and girls; and (4) the relationship between any past-year bullying victimization and some specific drug use types was stronger for girls compared to boys in grades 7 to 9 and 10 to 12.

The majority of previous studies on the relationship between bullying victimization and drug use has limited measures of drug use types, often only examining marijuana use (Tharp-Taylor et al. 2009; Radliff et al. 2012; Luk et al. 2010; Goebert et al. 2011) or multiple types of illicit drug use grouped together (Wolke et al. 2013; Niemelä et al. 2011; Kaltiala-Heino et al. 2000; Sigurdson et al. 2014; Bender and Losel 2011). The robust relationships found for nine different bullying

Table 3 Association between past-year bullying victimization and past-month drug use among boys in grades 7 to 9 in Manitoba

Bullying experience type	Marijuana		Cocaine		Methamphetamines		Ecstasy		LSD		Prescription or OTC drugs	
	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)
1. Physically threatened or injured you												
Never	52.7 (584)	1.00	36.9 (62)	1.00	36.4 (65)	1.00	38.4 (66)	1.00	39.3 (73)	1.00	46.2 (160)	1.00
1–5 times	33.8 (374)	1.94 (1.68, 2.24)	28.0 (47)	2.25 (1.52, 3.33)	25.8 (39)	2.09 (1.36, 3.21)	27.9 (48)	2.13 (1.44, 3.15)	27.4 (51)	2.10 (1.44, 3.05)	29.2 (101)	1.86 (1.43, 2.42)
6+ times	8.6 (95)	2.23 (1.75, 2.85)	10.1 (17)	3.58 (2.03, 6.29)	8.6 (13)	3.16 (1.68, 5.95)	11.1 (19)	3.63 (2.11, 6.23)	11.3 (21)	3.70 (2.20, 6.20)	12.1 (42)	3.51 (2.43, 5.06)
Every day	5.0 (55)	6.41 (4.46, 9.23)	25.0 (42)	40.77 (25.31, 65.68)	29.1 (44)	50.92 (31.42, 82.55)	22.7 (39)	32.35 (19.93, 52.52)	22.0 (41)	32.19 (20.06, 51.66)	12.4 (43)	16.55 (10.87, 25.22)
2. Threatened or injured you with a weapon such as a gun, knife, or club												
Never	70.1 (767)	1.00	45.8 (76)	1.00	43.0 (64)	1.00	45.0 (77)	1.00	43.7 (80)	1.00	68.2 (236)	1.00
1–5 times	21.5 (235)	5.51 (4.62, 6.59)	21.7 (36)	6.67 (4.34, 10.24)	22.3 (33)	7.08 (4.47, 11.21)	24.6 (42)	7.31 (4.84, 11.02)	25.7 (47)	7.87 (5.29, 11.70)	15.9 (55)	3.19 (2.32, 4.40)
6+ times	3.8 (42)	8.21 (5.44, 12.37)	8.4 (14)	20.65 (10.83, 39.37)	6.7 (10)	15.79 (7.46, 33.43)	6.4 (11)	14.22 (6.98, 28.96)	8.2 (15)	20.04 (10.70, 37.54)	3.8 (13)	6.11 (3.32, 11.25)
Everyday	4.6 (50)	35.48 (20.13, 62.51)	24.1 (40)	178.12 (101.29, 313.23)	28.2 (42)	243.00 (136.30, 433.24)	24.0 (41)	180.54 (102.16, 319.03)	22.4 (41)	188.89 (105.76, 337.34)	12.1 (42)	69.21 (39.81, 120.33)
3. Bullied, taunted, or ridiculed you												
Never	61.0 (664)	1.00	45.7 (74)	1.00	43.8 (64)	1.00	45.5 (76)	1.00	47.0 (85)	1.00	45.0 (154)	1.00
1–5 times	24.6 (268)	0.94 (0.81, 1.10)	17.9 (29)	0.93 (0.60, 1.45)	17.1 (25)	0.97 (0.60, 1.57)	18.6 (31)	0.97 (0.63, 1.50)	19.3 (35)	1.00 (0.66, 1.50)	25.4 (87)	1.33 (1.01, 1.76)
6+ times	7.9 (86)	0.70 (0.55, 0.89)	9.3 (15)	1.14 (0.63, 2.06)	6.9 (10)	1.01 (0.51, 2.01)	10.2 (17)	1.24 (0.71, 2.18)	8.3 (15)	0.97 (0.54, 1.74)	13.5 (46)	1.84 (1.29, 2.62)
Everyday	6.5 (71)	1.75 (1.30, 2.35)	27.2 (44)	10.01 (6.39, 15.68)	32.2 (47)	13.70 (8.65, 21.70)	25.8 (43)	9.09 (5.79, 14.26)	25.4 (46)	8.79 (5.69, 13.58)	16.1 (55)	6.71 (4.65, 9.68)
4. Said something bad about your race or culture												
Never	64.0 (692)	1.00	46.0 (75)	1.00	43.8 (64)	1.00	49.4 (84)	1.00	45.9 (83)	1.00	56.9 (197)	1.00
1–5 times	20.4 (220)	1.63 (1.38, 1.93)	13.5 (22)	1.48 (0.90, 2.42)	13.7 (20)	1.54 (0.90, 2.62)	12.4 (21)	1.25 (0.76, 2.05)	16.0 (29)	1.81 (1.17, 2.81)	19.4 (67)	1.75 (1.31, 2.34)
6+ times	7.9 (85)	2.07 (1.61, 2.67)	8.0 (13)	2.81 (1.53, 5.17)	7.5 (11)	2.92 (1.51, 5.64)	8.2 (14)	2.63 (1.47, 4.74)	7.7 (14)	2.71 (1.51, 4.88)	7.2 (25)	2.07 (1.34, 3.20)
Everyday	7.8 (84)	5.96 (4.43, 8.02)	32.5 (53)	29.64 (19.50, 45.03)	34.9 (51)	35.06 (22.70, 54.17)	30.0 (51)	24.05 (15.82, 36.54)	30.4 (55)	27.51 (18.23, 41.53)	16.5 (57)	12.83 (8.97, 18.35)
5. Said something bad about your sexual orientation or gender identity												
Never	77.9 (845)	1.00	55.2 (91)	1.00	51.0 (74)	1.00	55.9 (95)	1.00	57.5 (104)	1.00	68.7 (235)	1.00
1–5 times	13.0 (141)	1.93 (1.58, 2.36)	10.9 (18)	2.18 (1.28, 3.72)	13.8 (20)	2.77 (1.61, 4.76)	10.0 (17)	1.78 (1.02, 3.11)	12.7 (23)	2.27 (1.40, 3.69)	12.0 (41)	1.88 (1.31, 2.68)
6+ times	4.0 (43)	1.75 (1.23, 2.44)	6.7 (11)	3.76 (1.90, 7.44)	4.1 (6)	2.81 (1.19, 6.63)	8.2 (14)	4.51 (2.45, 8.31)	5.0 (9)	2.42 (1.15, 5.11)	6.1 (21)	2.77 (1.68, 4.55)
Everyday	5.2 (56)	5.80 (4.02, 8.37)	27.3 (45)	40.10 (25.50, 63.07)	31.0 (45)	50.30 (31.52, 80.26)	25.9 (44)	34.76 (22.05, 54.80)	24.9 (45)	31.63 (20.19, 49.56)	13.2 (45)	16.09 (10.65, 24.28)
6. Said something bad about your body shape, size, or appearance												
Never	60.2 (653)	1.00	44.5 (73)	1.00	42.5 (62)	1.00	46.7 (78)	1.00	43.7 (79)	1.00	49.9 (171)	1.00
1–5 times	23.6 (256)	1.30 (1.11, 1.53)	18.9 (31)	1.39 (0.90, 2.15)	17.8 (26)	1.33 (0.82, 2.17)	19.8 (33)	1.30 (0.84, 2.00)	21.6 (39)	1.61 (1.07, 2.41)	27.4 (94)	1.77 (1.35, 2.31)
6+ times	8.3 (90)	1.25 (0.98, 1.59)	10.4 (17)	2.04 (1.16, 3.57)	8.9 (13)	1.87 (0.99, 3.54)	9.0 (15)	1.53 (0.85, 2.77)	10.5 (19)	2.06 (1.21, 3.52)	9.6 (33)	1.75 (1.19, 2.60)
Everyday	7.9 (86)	3.06 (2.33, 4.03)	26.2 (43)	12.22 (7.88, 18.97)	30.8 (45)	16.02 (10.22, 25.12)	24.6 (41)	9.71 (6.24, 15.11)	24.3 (44)	10.96 (7.11, 16.89)	13.1 (45)	5.47 (3.73, 8.01)
7. Asked for personal information over the internet (e.g., address, phone number, or last name)												
Never	70.0 (760)	1.00	43.6 (72)	1.00	40.5 (60)	1.00	45.3 (77)	1.00	47.5 (87)	1.00	60.6 (209)	1.00
1–5 times	17.7 (193)	2.13 (1.79, 2.54)	19.4 (32)	3.58 (2.32, 5.52)	18.2 (27)	3.53 (2.19, 5.70)	20.0 (34)	3.26 (2.12, 5.00)	19.1 (35)	3.00 (1.98, 4.56)	18.8 (65)	2.46 (1.84, 3.30)
6+ times	7.4 (80)	4.25 (3.24, 5.57)	10.3 (17)	8.63 (4.95, 15.04)	10.1 (15)	9.34 (5.16, 16.91)	10.0 (17)	7.73 (4.45, 13.44)	8.7 (16)	6.41 (3.66, 11.22)	8.1 (28)	4.57 (2.98, 7.01)
Every day	5.1 (56)	15.73 (10.22, 24.23)	26.7 (44)	111.45 (67.62, 183.68)	31.1 (46)	144.89 (87.06, 241.13)	24.7 (42)	86.72 (52.62, 142.94)	24.6 (45)	92.08 (56.15, 151.01)	12.5 (43)	37.87 (23.91, 59.99)
8. Made you feel unsafe when you were in contact with them over the internet												
Never	83.2 (905)	1.00	54.0 (88)	1.00	49.3 (72)	1.00	55.3 (94)	1.00	57.9 (106)	1.00	74.6 (259)	1.00
1–5 times	9.4 (102)	2.03 (1.61, 2.56)	12.9 (21)	3.96 (2.36, 6.63)	14.4 (21)	5.47 (3.25, 9.20)	14.1 (24)	3.97 (2.42, 6.51)	14.8 (27)	4.04 (2.54, 6.43)	9.8 (34)	2.12 (1.43, 3.13)
6+ times	2.7 (29)	4.01 (2.56, 6.30)	6.8 (11)	14.71 (7.39, 29.27)	5.5 (8)	13.34 (6.05, 29.38)	7.1 (12)	14.36 (7.39, 27.92)	5.5 (10)	9.97 (4.91, 20.27)	3.2 (11)	4.67 (2.43, 9.00)
Everyday	4.8 (52)	27.47 (15.93, 47.37)	26.4 (43)	163.15 (94.02, 283.11)	30.8 (45)	238.30 (135.21, 419.97)	23.5 (40)	125.25 (72.07, 217.67)	21.9 (40)	114.90 (65.91, 200.31)	12.4 (43)	63.73 (36.99, 109.80)
9. Bullied or picked on you through the internet (e.g., posted something on Facebook or emailed you)												
Never	77.8 (846)	1.00	51.2 (84)	1.00	46.6 (69)	1.00	49.4 (84)	1.00	54.1 (100)	1.00	70.2 (245)	1.00
1–5 times	13.0 (141)	1.95 (1.60, 2.39)	15.9 (26)	3.64 (2.29, 5.79)	17.6 (26)	4.54 (2.80, 7.37)	17.7 (30)	3.99 (2.55, 6.24)	16.2 (30)	3.41 (2.20, 5.29)	12.9 (45)	2.06 (1.47, 2.90)
6+ times	4.1 (44)	2.74 (1.92, 3.91)	7.3 (12)	6.38 (3.20, 12.72)	5.4 (8)	5.71 (2.54, 12.84)	7.1 (12)	6.17 (3.09, 12.31)	7.0 (13)	5.77 (2.98, 11.15)	4.9 (17)	3.45 (2.01, 5.91)
Everyday	5.2 (56)	11.05 (7.30, 16.70)	25.6 (42)	65.73 (40.53, 106.62)	30.4 (45)	93.96 (57.32, 154.02)	25.9 (44)	67.88 (41.77, 110.30)	22.7 (42)	52.86 (32.61, 85.70)	12.0 (42)	23.18 (14.70, 36.57)

AOR adjusted odds ratio. AOR adjusted for mental and emotional well-being and feelings of sadness/hopelessness

Table 4 Association between past-year bullying victimization and past-month drug use among boys in grades 10 to 12 in Manitoba

Bullying experience type	Marijuana		Cocaine		Methamphetamines		Ecstasy		LSD		Prescription or OTC drugs	
	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)
1. Physically threatened or injured you												
Never	56.8 (1724)	1.00	42.8 (222)	1.00	41.3 (148)	1.00	42.2 (213)	1.00	44.5 (234)	1.00	45.1 (324)	1.00
1–5 times	31.6 (959)	1.60 (1.46, 1.76)	23.5 (122)	1.49 (1.18, 1.87)	16.5 (59)	1.18 (0.86, 1.61)	24.8 (125)	1.53 (1.22, 1.93)	23.4 (123)	1.41 (1.12, 1.77)	29.7 (213)	1.73 (1.44, 2.08)
6+ times	6.8 (206)	2.15 (1.79, 2.60)	11.2 (58)	4.32 (3.15, 5.93)	10.6 (38)	4.55 (3.09, 6.72)	10.1 (51)	3.72 (2.66, 5.18)	9.1 (48)	3.28 (2.34, 4.59)	8.9 (64)	3.10 (2.31, 4.17)
Everyday	4.9 (148)	4.82 (3.70, 6.28)	22.5 (117)	27.07 (20.06, 36.52)	31.6 (113)	42.36 (30.79, 58.29)	23.0 (116)	27.25 (20.15, 36.86)	23.0 (121)	26.81 (19.89, 36.13)	16.3 (117)	18.50 (13.83, 24.74)
2. Threatened or injured you with a weapon such as a gun, knife, or club												
Never	76.7 (2324)	1.00	49.5 (257)	1.00	43.8 (156)	1.00	47.7 (240)	1.00	51.2 (268)	1.00	58.8 (421)	1.00
1–5 times	16.3 (493)	3.02 (2.65, 3.44)	21.0 (109)	4.92 (3.86, 6.27)	17.7 (63)	4.84 (3.53, 6.62)	22.3 (112)	5.22 (4.10, 6.65)	20.0 (105)	4.45 (3.49, 5.68)	21.0 (150)	3.88 (3.16, 4.77)
6+ times	3.0 (91)	4.68 (3.37, 6.50)	7.5 (39)	13.24 (8.86, 19.77)	7.0 (25)	14.08 (8.69, 22.82)	7.0 (35)	12.15 (8.01, 18.42)	7.1 (37)	12.00 (8.02, 17.95)	4.8 (34)	6.69 (4.46, 10.05)
Everyday	4.1 (123)	10.22 (7.11, 14.70)	22.0 (114)	80.60 (55.89, 116.23)	31.5 (112)	144.70 (98.36, 212.86)	23.1 (116)	92.19 (63.49, 133.87)	21.8 (114)	79.31 (54.78, 114.83)	15.5 (111)	48.41 (33.65, 69.63)
3. Bullied, taunted, or ridiculed you												
Never	62.6 (1886)	1.00	49.6 (255)	1.00	41.9 (148)	1.00	46.7 (232)	1.00	49.2 (256)	1.00	50.0 (357)	1.00
1–5 times	23.2 (699)	0.87 (0.78, 0.96)	16.0 (82)	0.83 (0.64, 1.07)	12.2 (43)	0.84 (0.59, 1.18)	17.9 (89)	0.94 (0.73, 1.21)	16.2 (84)	0.83 (0.65, 1.08)	22.3 (159)	1.08 (0.89, 1.32)
6+ times	8.2 (247)	0.88 (0.75, 1.03)	9.5 (49)	1.41 (1.02, 1.94)	12.2 (43)	2.44 (1.69, 3.51)	10.7 (53)	1.62 (1.18, 2.22)	10.8 (56)	1.58 (1.16, 2.15)	9.8 (70)	1.32 (1.00, 1.74)
Everyday	6.0 (181)	2.09 (1.69, 2.58)	24.9 (128)	11.11 (8.53, 14.48)	33.7 (119)	20.43 (15.20, 27.46)	24.8 (123)	11.06 (8.45, 14.49)	23.9 (124)	10.48 (8.03, 13.68)	17.9 (128)	7.68 (5.97, 9.88)
4. Said something bad about your race or culture												
Never	68.4 (2067)	1.00	47.2 (244)	1.00	40.7 (144)	1.00	48.1 (241)	1.00	50.1 (263)	1.00	56.2 (402)	1.00
1–5 times	18.2 (549)	1.17 (1.05, 1.31)	18.4 (95)	1.85 (1.45, 2.37)	14.4 (51)	1.78 (1.28, 2.48)	17.6 (88)	1.66 (1.29, 2.15)	17.0 (89)	1.56 (1.21, 2.00)	17.5 (125)	1.33 (1.08, 1.65)
6+ times	6.7 (203)	1.33 (1.12, 1.59)	8.7 (45)	2.55 (1.82, 3.57)	9.0 (32)	3.34 (2.23, 5.00)	8.6 (43)	2.36 (1.68, 3.33)	8.4 (44)	2.17 (1.54, 3.05)	8.7 (62)	1.90 (1.43, 2.55)
Everyday	6.7 (202)	2.96 (2.41, 3.64)	25.7 (133)	15.06 (11.66, 19.46)	35.9 (127)	26.47 (19.95, 35.12)	25.8 (129)	14.11 (10.90, 18.28)	24.6 (129)	13.00 (10.06, 16.79)	17.7 (127)	8.33 (6.52, 10.66)
5. Said something bad about your sexual orientation or gender identity												
Never	82.3 (2470)	1.00	58.8 (300)	1.00	48.3 (168)	1.00	58.0 (289)	1.00	58.2 (303)	1.00	67.4 (477)	1.00
1–5 times	9.2 (275)	1.21 (1.04, 1.41)	10.6 (54)	1.99 (1.46, 2.70)	11.2 (39)	2.77 (1.91, 4.01)	10.8 (54)	2.01 (1.48, 2.73)	11.1 (58)	2.13 (1.59, 2.86)	10.7 (76)	1.62 (1.25, 2.10)
6+ times	3.6 (107)	1.51 (1.18, 1.93)	7.7 (39)	4.69 (3.25, 6.79)	8.9 (31)	7.45 (4.90, 11.34)	8.2 (41)	4.96 (3.46, 7.12)	8.1 (42)	4.95 (3.46, 7.07)	6.1 (43)	3.02 (2.13, 4.27)
Everyday	5.0 (151)	4.39 (3.38, 5.71)	22.9 (117)	24.93 (18.71, 33.21)	31.6 (110)	44.81 (32.84, 61.15)	22.9 (114)	24.02 (17.99, 32.06)	22.7 (118)	24.76 (18.58, 32.98)	15.8 (112)	14.18 (10.71, 18.76)
6. Said something bad about your body shape, size, or appearance												
Never	62.7 (1894)	1.00	50.3 (259)	1.00	44.6 (157)	1.00	50.2 (250)	1.00	50.9 (265)	1.00	52.3 (372)	1.00
1–5 times	22.6 (681)	1.12 (1.01, 1.24)	17.5 (90)	1.10 (0.86, 1.42)	13.1 (46)	1.04 (0.74, 1.46)	17.1 (85)	1.07 (0.83, 1.39)	16.3 (85)	1.02 (0.79, 1.31)	23.0 (164)	1.35 (1.11, 1.64)
6+ times	8.2 (248)	1.28 (1.10, 1.50)	8.4 (43)	1.62 (1.15, 2.28)	9.7 (34)	2.45 (1.65, 3.63)	8.2 (41)	1.54 (1.09, 2.18)	8.6 (45)	1.68 (1.21, 2.34)	7.2 (51)	1.25 (0.92, 1.70)
Everyday	6.5 (197)	2.76 (2.24, 3.40)	23.9 (123)	11.29 (8.68, 14.70)	32.7 (115)	20.18 (15.06, 27.04)	24.5 (122)	11.24 (8.62, 14.66)	24.2 (126)	11.18 (8.60, 14.53)	17.6 (125)	7.68 (5.97, 9.87)
7. Asked for personal information over the internet (e.g., address, phone number, or last name)												
Never	73.7 (2221)	1.00	53.3 (275)	1.00	45.7 (161)	1.00	53.6 (266)	1.00	52.5 (272)	1.00	60.1 (428)	1.00
1–5 times	16.0 (482)	1.34 (1.19, 1.50)	14.2 (73)	1.64 (1.25, 2.15)	11.9 (42)	1.81 (1.28, 2.57)	13.7 (68)	1.57 (1.19, 2.07)	15.6 (81)	1.87 (1.45, 2.43)	16.0 (114)	1.53 (1.23, 1.91)
6+ times	5.3 (159)	1.75 (1.43, 2.14)	8.9 (46)	4.04 (2.89, 5.65)	9.9 (35)	5.86 (3.98, 8.64)	8.1 (40)	3.49 (2.45, 4.97)	8.3 (43)	3.79 (2.69, 5.35)	7.6 (54)	2.87 (2.11, 3.90)
Everyday	5.0 (152)	7.31 (5.41, 9.87)	23.6 (122)	39.86 (29.25, 54.32)	32.4 (114)	67.16 (48.23, 93.52)	24.6 (122)	40.93 (30.00, 55.84)	23.6 (122)	42.51 (31.11, 58.09)	16.3 (116)	23.15 (17.11, 31.32)
8. Made you feel unsafe when you were in contact with them over the internet												
Never	89.3 (2695)	1.00	62.0 (321)	1.00	50.0 (177)	1.00	62.6 (313)	1.00	63.7 (333)	1.00	72.0 (515)	1.00
1–5 times	5.4 (164)	1.20 (0.99, 1.45)	10.2 (53)	3.50 (2.55, 4.80)	11.9 (42)	5.92 (4.12, 8.52)	9.4 (47)	3.01 (2.16, 4.20)	9.4 (49)	3.00 (2.17, 4.16)	9.7 (69)	2.61 (1.98, 3.45)
6+ times	1.4 (43)	2.15 (1.42, 3.26)	5.2 (27)	12.17 (7.52, 19.72)	6.2 (22)	18.00 (10.54, 30.76)	5.0 (25)	10.78 (6.58, 17.66)	4.8 (25)	11.31 (6.93, 18.47)	3.4 (24)	6.25 (3.80, 10.28)
Everyday	3.9 (177)	11.22 (7.52, 16.73)	22.6 (117)	109.45 (72.05, 166.27)	31.9 (113)	190.62 (124.78, 291.19)	23.0 (115)	108.44 (71.54, 164.39)	22.2 (116)	113.06 (73.68, 173.48)	15.0 (107)	53.98 (36.21, 80.46)
9. Bullied or picked on you through the internet (e.g., posted something on Facebook or emailed you)												
Never	84.1 (2538)	1.00	59.7 (310)	1.00	47.6 (169)	1.00	61.0 (306)	1.00	60.4 (317)	1.00	67.4 (481)	1.00
1–5 times	9.0 (272)	1.23 (1.06, 1.43)	12.3 (64)	2.51 (1.88, 3.36)	13.5 (48)	4.08 (2.90, 5.75)	10.8 (54)	2.01 (1.48, 2.74)	12.4 (65)	2.46 (1.84, 3.27)	12.6 (90)	2.14 (1.67, 2.72)
6+ times	2.7 (82)	1.90 (1.42, 2.54)	6.2 (32)	5.96 (3.95, 9.00)	8.5 (30)	12.20 (7.87, 18.93)	6.4 (32)	5.77 (3.82, 8.70)	5.9 (31)	5.76 (3.82, 8.68)	5.0 (36)	4.25 (2.90, 6.23)
Everyday	4.1 (125)	6.98 (5.01, 9.72)	21.8 (113)	47.95 (34.25, 67.12)	30.4 (108)	91.05 (63.78, 129.96)	21.9 (110)	46.06 (32.87, 64.53)	21.3 (112)	47.18 (33.65, 66.15)	15.0 (107)	28.17 (20.22, 39.23)

AOR adjusted odds ratio. AOR adjusted for mental and emotional well-being and feelings of sadness/hopelessness

Table 5 Association between past-year bully victimization and past-month drug use among girls in grades 7 to 9 in Manitoba

Bullying experience type	Marijuana		Cocaine		Methamphetamines		Ecstasy		LSD		Prescription or OTC drugs	
	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)
1. Physically threatened or injured you												
Never	48.7 (576)	1.00	31.5 (34)	1.00	39.7 (27)	1.00	33.0 (37)	1.00	32.7 (34)	1.00	47.9 (235)	1.00
1–5 times	41.3 (489)	2.53 (2.20, 2.91)	51.9 (56)	4.38 (2.74, 6.98)	41.2 (28)	2.52 (1.41, 4.50)	50.0 (56)	4.03 (2.58, 6.31)	50.0 (52)	4.09 (2.55, 6.58)	41.6 (204)	2.61 (2.12, 3.21)
6+ times	8.3 (98)	2.70 (2.09, 3.48)	13.0 (14)	5.97 (3.06, 11.65)	13.2 (9)	4.63 (2.08, 10.31)	14.3 (16)	6.22 (3.32, 11.65)	13.5 (14)	5.69 (2.91, 11.14)	7.9 (39)	2.74 (1.89, 3.97)
Everyday	1.7 (20)	3.00 (1.74, 5.17)	–	8.21 (2.73, 24.72)	–	10.60 (3.45, 32.60)	–	5.70 (1.67, 19.50)	–	7.78 (2.57, 23.50)	2.7 (13)	4.89 (2.58, 9.24)
2. Threatened or injured you with a weapon such as a gun, knife, or club												
Never	81.4 (954)	1.00	65.7 (71)	1.00	69.1 (47)	1.00	55.0 (61)	1.00	59.6 (62)	1.00	80.9 (394)	1.00
1–5 times	15.9 (186)	4.50 (3.66, 5.54)	23.2 (25)	5.83 (3.54, 9.62)	19.1 (13)	4.64 (2.40, 9.00)	31.5 (35)	10.38 (6.56, 16.42)	28.9 (30)	7.89 (4.87, 12.79)	15.4 (75)	3.60 (2.72, 4.78)
6+ times	2.4 (28)	5.03 (3.00, 8.45)	7.4 (8)	15.89 (7.08, 35.66)	–	14.61 (5.42, 39.35)	10.8 (12)	31.91 (15.79, 64.49)	8.7 (9)	20.61 (9.38, 45.27)	2.5 (12)	4.84 (2.50, 9.34)
Everyday	–	2.55 (0.74, 8.79)	–	41.14 (11.48, 147.40)	–	42.76 (10.71, 170.63)	–	34.99 (8.94, 137.01)	–	28.31 (7.09, 113.08)	1.2 (6)	14.71 (4.60, 47.03)
3. Bullied, taunted, or ridiculed you												
Never	40.6 (475)	1.00	41.9 (44)	1.00	39.7 (27)	1.00	36.7 (40)	1.00	36.9 (38)	1.00	33.1 (159)	1.00
1–5 times	35.6 (416)	1.18 (1.02, 1.37)	38.1 (40)	1.09 (0.69, 1.71)	27.9 (19)	0.93 (0.51, 1.70)	30.3 (33)	1.11 (0.69, 1.80)	27.2 (28)	0.93 (0.55, 1.55)	36.6 (176)	1.64 (1.30, 2.06)
6+ times	15.1 (177)	0.95 (0.78, 1.16)	12.4 (13)	0.61 (0.32, 1.20)	16.2 (11)	0.93 (0.43, 1.98)	20.2 (22)	1.43 (0.82, 2.49)	24.3 (25)	1.57 (0.91, 2.71)	19.1 (92)	1.83 (1.38, 2.42)
Everyday	8.6 (101)	1.33 (1.03, 1.73)	7.6 (8)	0.70 (0.30, 1.64)	16.2 (11)	1.86 (0.82, 4.23)	12.8 (14)	1.88 (0.95, 3.71)	11.7 (12)	1.37 (0.66, 2.85)	11.2 (54)	2.58 (1.81, 2.68)
4. Said something bad about your race or culture												
Never	56.7 (666)	1.00	48.1 (51)	1.00	54.4 (37)	1.00	47.2 (51)	1.00	49.5 (50)	1.00	58.1 (282)	1.00
1–5 times	27.7 (325)	2.03 (1.75, 2.36)	25.5 (27)	1.99 (1.22, 3.26)	25.0 (17)	1.76 (0.96, 3.22)	25.9 (28)	2.21 (1.37, 3.56)	27.7 (28)	2.22 (1.37, 3.58)	22.7 (110)	1.62 (1.28, 2.04)
6+ times	11.3 (133)	2.83 (2.27, 3.53)	16.0 (17)	4.07 (2.28, 7.26)	11.8 (8)	2.64 (1.19, 5.83)	16.7 (18)	4.39 (2.50, 7.73)	13.9 (14)	3.18 (1.71, 5.93)	13.6 (66)	3.23 (2.40, 4.34)
Everyday	4.3 (50)	3.12 (2.16, 4.51)	10.4 (11)	7.38 (3.63, 15.03)	8.8 (6)	5.61 (2.23, 14.07)	10.2 (11)	8.03 (3.96, 16.27)	8.9 (9)	4.80 (2.15, 10.68)	5.6 (27)	3.89 (2.46, 6.15)
5. Said something bad about your sexual orientation or gender identity												
Never	70.9 (825)	1.00	66.7 (72)	1.00	60.6 (40)	1.00	61.8 (68)	1.00	59.8 (61)	1.00	67.8 (329)	1.00
1–5 times	18.3 (213)	1.99 (1.67, 2.37)	18.5 (20)	1.86 (1.10, 3.15)	18.2 (12)	2.31 (1.18, 4.52)	17.3 (19)	1.85 (1.08, 3.17)	21.6 (22)	2.23 (1.32, 3.77)	17.9 (87)	2.08 (1.61, 2.69)
6+ times	7.6 (88)	2.62 (2.01, 3.42)	8.3 (9)	2.49 (1.21, 5.13)	13.6 (9)	4.94 (2.30, 10.61)	12.7 (14)	4.24 (2.31, 7.78)	9.8 (10)	3.06 (1.52, 6.16)	9.3 (45)	3.42 (2.42, 4.84)
Everyday	3.2 (37)	2.56 (1.69, 3.90)	6.5 (7)	3.90 (1.68, 9.06)	–	5.96 (2.17, 16.37)	8.2 (9)	5.93 (2.75, 12.76)	8.8 (9)	5.44 (2.51, 11.80)	5.0 (24)	4.35 (2.66, 7.11)
6. Said something bad about your body shape, size, or appearance												
Never	31.5 (369)	1.00	36.5 (39)	1.00	33.3 (22)	1.00	37.2 (42)	1.00	37.9 (39)	1.00	31.4 (154)	1.00
1–5 times	37.2 (435)	1.54 (1.33, 1.80)	29.0 (31)	1.04 (0.63, 1.71)	24.2 (16)	0.92 (0.47, 1.80)	32.7 (37)	1.06 (0.67, 1.69)	27.2 (28)	0.82 (0.49, 1.37)	34.5 (169)	1.52 (1.21, 1.92)
6+ times	19.0 (222)	1.51 (1.25, 1.83)	16.8 (18)	1.10 (0.60, 2.00)	22.7 (15)	1.53 (0.75, 3.15)	18.6 (21)	1.05 (0.59, 1.84)	21.4 (22)	1.09 (0.62, 1.93)	18.2 (89)	1.64 (1.23, 2.18)
Every day	12.3 (144)	2.01 (1.59, 2.54)	17.8 (19)	1.87 (0.99, 3.52)	19.7 (13)	2.44 (1.12, 5.33)	11.5 (13)	1.14 (0.57, 2.27)	13.6 (14)	1.14 (0.58, 2.26)	15.9 (78)	3.03 (2.20, 4.16)
7. Asked for personal information over the internet (e.g., address, phone number, or last name)												
Never	53.3 (624)	1.00	49.1 (52)	1.00	40.4 (27)	1.00	41.3 (45)	1.00	41.2 (42)	1.00	51.8 (252)	1.00
1–5 times	30.3 (354)	1.99 (1.72, 2.30)	24.5 (26)	1.60 (0.98, 2.63)	31.3 (21)	2.56 (1.40, 4.67)	28.4 (31)	2.28 (1.42, 3.67)	27.5 (28)	2.20 (1.34, 3.62)	30.2 (147)	2.06 (1.66, 2.56)
6+ times	12.8 (150)	3.56 (2.87, 4.41)	17.0 (18)	4.12 (2.34, 7.26)	14.9 (10)	4.10 (1.87, 9.00)	18.4 (20)	5.08 (2.89, 8.92)	21.6 (22)	5.51 (3.13, 9.69)	13.1 (64)	3.55 (2.62, 4.81)
Every day	3.6 (42)	4.79 (3.18, 7.23)	9.4 (10)	9.61 (4.59, 20.13)	13.4 (9)	18.16 (7.99, 41.28)	11.9 (13)	15.75 (7.98, 31.06)	9.8 (10)	11.97 (5.63, 25.44)	4.9 (24)	6.29 (3.87, 10.25)
8. Made you feel unsafe when you were in contact with them over the internet												
Never	69.7 (819)	1.00	63.6 (68)	1.00	63.2 (43)	1.00	63.1 (70)	1.00	61.0 (64)	1.00	66.1 (325)	1.00
1–5 times	20.7 (243)	1.74 (1.48, 2.04)	24.3 (26)	2.10 (1.30, 3.38)	20.6 (14)	1.86 (0.99, 3.47)	18.9 (21)	1.64 (0.99, 2.71)	23.8 (25)	2.18 (1.34, 3.53)	21.1 (104)	1.96 (1.55, 2.49)
6+ times	7.6 (89)	2.64 (2.02, 3.46)	8.4 (9)	2.64 (1.27, 5.46)	10.3 (7)	2.95 (1.21, 7.18)	11.7 (13)	3.46 (1.82, 6.58)	10.5 (11)	3.06 (1.52, 6.18)	9.8 (48)	3.65 (2.58, 5.16)
Everyday	2.0 (24)	2.46 (1.50, 4.04)	–	3.76 (1.30, 10.85)	–	6.46 (2.19, 19.05)	6.3 (7)	6.96 (3.01, 16.06)	–	4.90 (1.86, 12.93)	3.1 (15)	4.05 (2.25, 7.31)
9. Bullied or picked on you through the internet (e.g., posted something on Facebook or emailed you)												
Never	49.2 (577)	1.00	49.5 (52)	1.00	50.0 (33)	1.00	49.6 (55)	1.00	50.0 (52)	1.00	54.4 (267)	1.00
1–5 times	30.2 (355)	2.45 (2.11, 2.85)	28.6 (30)	2.05 (1.27, 3.31)	18.2 (12)	1.38 (0.69, 2.75)	23.4 (26)	1.57 (0.96, 2.57)	24.0 (25)	1.58 (0.95, 2.63)	23.6 (116)	1.63 (1.29, 2.07)
6+ times	14.4 (169)	2.90 (2.36, 3.55)	15.2 (16)	2.60 (1.43, 4.73)	22.7 (15)	3.85 (1.96, 7.56)	15.3 (17)	2.36 (1.32, 4.24)	18.3 (19)	2.72 (1.54, 4.83)	15.7 (77)	2.84 (2.14, 3.76)
Everyday	6.2 (73)	3.26 (2.39, 4.43)	6.7 (7)	2.41 (1.03, 5.60)	9.1 (6)	3.75 (1.46, 9.61)	11.7 (13)	4.63 (2.38, 8.99)	7.7 (8)	2.43 (1.09, 5.41)	6.3 (31)	2.74 (1.80, 4.18)

AOR adjusted odds ratio. AOR adjusted for mental and emotional well-being and feelings of sadness/hopelessness—data suppressed due to confidentiality restrictions (*n* < 6)

Table 6 Association between past-year bully victimization and past-month drug use among girls in grades 10 to 12 in Manitoba

Bullying experience type	Marijuana		Cocaine		Methamphetamine		Ecstasy		LSD		Prescription or OTC drugs	
	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)	% (n)	AOR (95% CI)
1. Physically threatened or injured you												
Never	56.5 (1401)	1.00	44.8 (117)	1.00	38.9 (28)	1.00	41.6 (96)	1.00	40.1 (79)	1.00	48.5 (321)	1.00
1–5 times	36.3 (899)	2.43 (2.19, 2.69)	40.6 (106)	2.70 (2.05, 3.57)	34.7 (25)	2.83 (1.59, 5.03)	42.4 (98)	2.97 (2.21, 3.99)	44.7 (88)	3.21 (2.33, 4.42)	40.8 (270)	2.70 (2.27, 3.22)
6+ times	6.1 (152)	2.80 (2.25, 3.48)	10.3 (27)	4.25 (2.71, 6.65)	12.5 (9)	6.28 (2.80, 14.09)	11.7 (27)	5.18 (3.28, 8.17)	10.2 (20)	4.55 (2.70, 7.65)	8.8 (58)	3.92 (2.87, 5.36)
Everyday	1.1 (26)	3.37 (1.99, 5.72)	4.2 (11)	12.02 (5.96, 24.22)	13.9 (10)	41.96 (18.08, 97.38)	4.3 (10)	13.08 (6.32, 27.10)	5.1 (10)	15.37 (7.35, 32.15)	2.0 (13)	6.07 (3.19, 11.54)
2. Threatened or injured you with a weapon such as a gun, knife, or club												
Never	88.7 (2195)	1.00	71.7 (185)	1.00	50.0 (35)	1.00	70.5 (160)	1.00	66.8 (129)	1.00	85.4 (565)	1.00
1–5 times	9.6 (237)	3.62 (2.99, 4.39)	19.0 (49)	5.71 (4.06, 8.05)	20.0 (14)	8.45 (4.28, 16.67)	18.5 (42)	5.45 (3.78, 7.86)	21.8 (42)	6.97 (4.78, 10.16)	11.0 (73)	3.00 (2.28, 3.94)
6+ times	1.2 (29)	3.67 (2.12, 6.33)	5.0 (13)	15.07 (7.81, 29.08)	15.7 (11)	76.27 (34.54, 168.40)	6.6 (15)	20.47 (10.91, 38.41)	6.7 (13)	22.10 (11.33, 43.09)	2.1 (14)	5.61 (2.98, 10.57)
Every day	0.5 (13)	8.69 (3.37, 22.39)	4.3 (11)	67.95 (27.50, 167.87)	14.3 (10)	214.64 (79.58, 578.95)	4.4 (10)	61.93 (25.06, 153.04)	4.7 (9)	60.37 (24.15, 150.91)	1.5 (10)	18.57 (7.50, 45.96)
3. Bullied, taunted, or ridiculed you												
Never	48.0 (1184)	1.00	48.7 (127)	1.00	34.8 (24)	1.00	41.5 (95)	1.00	35.0 (69)	1.00	40.8 (268)	1.00
1–5 times	33.0 (814)	1.16 (1.05, 1.29)	25.7 (67)	0.79 (0.58, 1.08)	14.5 (10)	0.69 (0.32, 1.51)	30.6 (70)	1.12 (0.81, 1.54)	33.0 (65)	1.45 (1.02, 2.06)	34.7 (228)	1.41 (1.17, 1.70)
6+ times	14.6 (359)	1.33 (1.16, 1.54)	15.7 (41)	1.18 (0.81, 1.71)	21.7 (15)	2.87 (1.43, 5.75)	16.6 (38)	1.45 (0.98, 2.15)	18.8 (37)	2.03 (1.34, 3.09)	17.2 (113)	1.77 (1.40, 2.25)
Every day	4.5 (110)	1.72 (1.34, 2.21)	10.0 (26)	2.73 (1.71, 4.35)	29.0 (20)	13.28 (6.62, 26.64)	11.4 (26)	3.74 (2.32, 6.03)	13.2 (26)	5.31 (3.23, 8.74)	7.3 (48)	3.08 (2.17, 4.36)
4. Said something bad about your race or culture												
Never	70.5 (1738)	1.00	59.5 (154)	1.00	35.2 (25)	1.00	57.6 (132)	1.00	58.2 (114)	1.00	65.6 (434)	1.00
1–5 times	19.9 (491)	1.16 (1.03, 1.30)	20.1 (52)	1.31 (0.95, 1.82)	26.8 (19)	3.56 (1.93, 6.57)	24.0 (55)	1.64 (1.19, 2.26)	23.5 (46)	1.55 (1.09, 2.20)	20.5 (136)	1.23 (1.01, 1.51)
6+ times	6.8 (168)	1.50 (1.24, 1.82)	10.0 (26)	2.30 (1.49, 3.54)	18.3 (13)	8.61 (4.26, 17.40)	10.0 (23)	2.32 (1.47, 3.67)	10.2 (20)	2.32 (1.42, 3.80)	10.3 (68)	2.26 (1.71, 2.98)
Everyday	2.8 (70)	2.68 (1.93, 3.73)	10.4 (27)	8.97 (5.66, 14.22)	19.7 (14)	27.04 (13.13, 55.67)	8.3 (19)	6.81 (4.03, 11.52)	8.2 (16)	6.24 (3.54, 11.01)	3.6 (24)	2.82 (1.79, 4.46)
5. Said something bad about your sexual orientation or gender identity												
Never	79.2 (1951)	1.00	70.4 (183)	1.00	56.9 (41)	1.00	64.9 (150)	1.00	66.7 (130)	1.00	73.4 (484)	1.00
1–5 times	13.6 (334)	1.58 (1.37, 1.82)	15.4 (40)	1.63 (1.13, 2.34)	16.7 (12)	2.21 (1.12, 4.39)	19.1 (44)	2.23 (1.57, 3.17)	19.5 (38)	2.21 (1.51, 3.22)	16.4 (108)	1.88 (1.50, 2.35)
6+ times	5.3 (130)	1.95 (1.56, 2.45)	6.9 (18)	2.17 (1.30, 3.65)	9.7 (7)	3.70 (1.52, 9.01)	9.1 (21)	3.10 (1.90, 5.05)	8.2 (16)	2.86 (1.67, 4.92)	6.2 (41)	2.20 (1.55, 3.10)
Everyday	2.0 (50)	3.32 (2.21, 4.99)	7.3 (19)	9.40 (5.47, 16.14)	16.7 (12)	22.41 (10.85, 46.26)	6.9 (16)	9.01 (5.07, 16.02)	5.6 (11)	6.51 (3.34, 12.72)	4.0 (26)	5.58 (3.45, 9.02)
6. Said something bad about your body shape, size, or appearance												
Never	34.7 (854)	1.00	36.5 (95)	1.00	38.0 (27)	1.00	27.5 (63)	1.00	35.4 (69)	1.00	30.4 (200)	1.00
1–5 times	40.7 (1002)	1.50 (1.35, 1.66)	34.6 (90)	1.03 (0.77, 1.40)	23.9 (17)	0.73 (0.38, 1.37)	39.3 (90)	1.57 (1.13, 2.19)	34.9 (68)	2.21 (1.51, 3.22)	40.1 (264)	1.58 (1.30, 1.92)
6+ times	18.1 (445)	1.84 (1.60, 2.11)	19.2 (50)	1.42 (0.99, 2.04)	18.3 (13)	1.34 (0.65, 2.75)	22.3 (51)	2.19 (1.49, 3.24)	19.0 (37)	2.86 (1.67, 4.92)	21.2 (140)	2.21 (1.75, 2.79)
Every day	6.6 (163)	2.14 (1.73, 2.65)	9.6 (25)	2.00 (1.25, 3.22)	19.7 (14)	3.94 (1.91, 8.12)	10.9 (25)	3.09 (1.88, 5.08)	10.8 (21)	6.51 (3.33, 12.72)	8.4 (55)	2.50 (1.79, 3.49)
7. Asked for personal information over the internet (e.g., address, phone number, or last name)												
Never	57.3 (1412)	1.00	52.9 (138)	1.00	33.3 (24)	1.00	48.3 (111)	1.00	49.5 (97)	1.00	49.8 (328)	1.00
1–5 times	28.6 (704)	1.62 (1.46, 1.81)	24.9 (65)	1.35 (0.997, 1.83)	22.2 (16)	2.20 (1.16, 4.18)	27.8 (64)	1.65 (1.21, 2.26)	24.5 (48)	1.43 (1.01, 2.03)	32.3 (213)	2.00 (1.67, 2.40)
6+ times	11.7 (289)	2.54 (2.16, 2.98)	13.4 (35)	2.27 (1.53, 3.35)	20.8 (15)	6.29 (3.16, 12.52)	13.5 (31)	2.46 (1.62, 3.73)	15.3 (30)	2.86 (1.87, 4.37)	13.2 (87)	2.74 (2.13, 3.54)
Everyday	2.4 (58)	3.92 (2.67, 5.74)	8.8 (23)	10.48 (6.30, 17.42)	23.6 (17)	45.07 (22.19, 91.55)	10.4 (24)	14.04 (8.45, 23.33)	10.7 (21)	12.47 (7.22, 21.53)	4.7 (31)	7.02 (4.48, 11.00)
8. Made you feel unsafe when you were in contact with them over the internet												
Never	78.0 (1930)	1.00	67.8 (179)	1.00	47.3 (35)	1.00	62.9 (146)	1.00	59.6 (118)	1.00	70.0 (465)	1.00
1–5 times	16.0 (395)	1.40 (1.23, 1.59)	18.6 (49)	1.70 (1.23, 2.36)	16.2 (12)	2.51 (1.28, 4.95)	22.4 (52)	2.19 (1.58, 3.03)	25.3 (50)	2.59 (1.84, 3.66)	22.0 (146)	2.09 (1.71, 2.55)
6+ times	4.8 (119)	2.21 (1.73, 2.81)	8.0 (21)	3.14 (1.95, 5.08)	18.9 (14)	12.77 (6.47, 25.18)	8.6 (20)	3.74 (2.28, 6.13)	9.6 (19)	4.42 (2.64, 7.38)	5.1 (34)	2.15 (1.48, 3.14)
Everyday	1.3 (31)	2.44 (1.50, 3.99)	5.7 (15)	9.62 (5.13, 18.04)	17.6 (13)	43.41 (20.06, 93.92)	6.0 (14)	11.05 (5.78, 21.12)	5.6 (11)	10.75 (5.36, 21.54)	2.9 (19)	5.95 (3.41, 10.37)
9. Bullied or picked on you through the internet (e.g., posted something on Facebook or emailed you)												
Never	44.8 (117)	1.00	58.0 (152)	1.00	44.4 (32)	1.00	53.5 (123)	1.00	52.0 (102)	1.00	62.1 (410)	1.00
1–5 times	40.6 (106)	1.91 (1.70, 2.14)	21.4 (56)	1.54 (1.12, 2.12)	15.3 (11)	1.73 (0.85, 3.50)	27.0 (62)	2.14 (1.56, 2.94)	24.0 (47)	1.94 (1.35, 2.78)	23.6 (156)	1.73 (1.42, 2.10)
6+ times	10.3 (27)	2.40 (2.00, 2.88)	14.1 (37)	3.08 (2.09, 4.53)	18.1 (13)	5.59 (2.74, 11.38)	11.7 (27)	2.68 (1.72, 4.18)	13.3 (26)	3.30 (2.10, 5.19)	10.3 (68)	2.37 (1.79, 3.14)
Everyday	4.2 (11)	2.75 (1.93, 3.93)	6.5 (17)	5.64 (3.23, 9.83)	22.2 (16)	26.41 (13.17, 52.99)	7.8 (18)	7.58 (4.37, 13.12)	10.7 (21)	10.96 (6.44, 18.65)	3.9 (26)	3.60 (2.27, 5.71)

AOR adjusted odds ratio. AOR adjusted for mental and emotional well-being and feelings of sadness/hopelessness

victimization types and six different illicit drug types create new knowledge about the specific relationships between bullying victimization and different types of drug use. Across grade and gender, being threatened or injured with a weapon everyday resulted in the largest odds of all drug use types, with methamphetamines being the drug type that was most strongly related. For boys in grades 7 to 9 and 10 to 12, internet-related victimization also resulted in large effect sizes for most drug types. These results may indicate that targeted interventions to reduce threats or injuries with a weapon and internet victimization may be associated with the largest reductions in drug use.

Across grade and gender, a strong dose-response relationship was noted with increasing frequency of bullying victimization corresponding to increasing odds of drug use. While other studies have examined the accumulation of victimization experiences on several mental health and social outcomes (Evans et al. 2014; Kelleher et al. 2013), none have examined this relationship with illicit drug use as the outcome. These results provide evidence for the cumulative effects of bullying victimization and may identify those most at risk for illicit drug use.

Significant grade differences in the relationships between bullying victimization and drug use types were found, with those in grades 7 to 9 noting stronger relationships than those in grades 10 to 12. These findings suggest that bullying prevention and intervention strategies should begin in elementary grades and continue through to grade 12. Gender differences were also noted for some drug use types, with girls indicating stronger relationships between any bullying victimization and drug use compared to boys. These results show that reductions in bullying victimization may have larger associations with reductions in some drug use types for girls compared to boys.

This study was unable to determine the mechanisms by which bullying victimization is related to drug use; however, it is possible that those who experience bullying victimization may use drugs as coping mechanisms to escape their painful reality—one they feel is out of their own control. This is important to understand so that bullying victims can be provided with healthy coping strategies and identified by professionals in the education and health care systems as potentially higher-risk individuals for using drugs. Additionally, an area for future research is identifying effective protective factors that can moderate the relationship between bullying victimization and poor outcomes such as illicit drug use (Sigurdson et al. 2014).

Limitations

These results should be interpreted in the context of several limitations. First, this study is cross-sectional in nature; therefore, causal inferences cannot be made. Second, due to the low prevalence of everyday bullying victimization and specific drug use types, many logistic regression models resulted in very large estimates with wide confidence intervals. This is an

indicator that both events are rare, but largely associated with one another. Third, bullying victimization was measured using retrospective self-report items, which may be subject to recall bias and social desirability bias. However, many previous studies have used past 12-month time frames for measuring bullying victimization (Carlyle and Steinman 2007; Haynie et al. 2001; Hemphill et al. 2015; Schneider et al. 2012) and others have noted that alternatives to self-reported bullying victimization (i.e., peer-reports) may also be inaccurate because peers may not always be present when bullying occurs (Branson and Cornell 2009; De Los and Prinstein 2004; Volk et al. 2017). Fourth, confounding variables such as socioeconomic status, diagnosed mental health problems, or experiencing violence in the home were not assessed.

This study provides evidence to support the relationship between nine bullying victimization types and six drug use types among both boys and girls in grades 7 to 12. Strong dose-response relationships indicate the importance of recognizing cumulative victimization experiences on adolescent outcomes. Significant grade and gender differences show that early and gender-specific bullying intervention and prevention strategies could be associated with the greatest reductions in illicit drug use; however, bullying prevention and intervention efforts are required for all students. Implementing evidence-based bullying prevention programs could also help to reduce illicit drug use and direct students towards a healthy and positive life trajectory.

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Compliance with ethical standards

Conflict of interest There are no conflicts of interest to declare by any author. The results and conclusions are those of the authors and no official endorsement by CancerCare Manitoba is intended or should be inferred.

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