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A Prospective and Repeat Cross-Sectional Study of Bullying Victimization Among Adolescents From Before COVID-19 to the Two School Years Following the Pandemic Onset

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ABSTRACT

We examined bullying victimization spanning from before the pandemic to the two school years post COVID-19 onset in adolescents. We used survey data from Canadian secondary school students collected during the 2019–20, 2020–21, and 2021–22 academic years. Generalized Estimating Equations models were used to estimate the population average odds of past 30-day bullying victimization by other students, using both longitudinal ($N = 3716$) and repeat cross-sectional ($N = 23,862$; 19,413; 21,897) data. The odds of bullying victimization were lower in 2020–21 and higher in 2021–22 relative to 2019–20. Elevated odds of bullying victimization were found among gender diverse, higher weight, and relatively less affluent students. While remote schooling during the pandemic may have provided a reprieve for some students, bullying appears to have rebounded with the lifting of COVID-19 restrictions to exceed pre-pandemic levels. More effective strategies are essential to prevent bullying and improve school contexts for equity denied populations.

The pervasiveness and consequences of bullying make it an important global public health issue. Bullying victimization as a child or adolescent predicts a wide range of adverse psychosocial outcomes into adulthood, including depression, anxiety, poor mental health, non-suicidal self injury, suicidality, aggression, and lower academic achievement (Armitage, 2021; Moore et al., 2017). Exposure to bullying may be particularly detrimental in adolescence, given the heightened importance placed on peer acceptance and as a critical period of identity development (Salmivalli et al., 2021). Despite increased attention, the prevalence rates remained largely stable for at least a decade prior to the pandemic (Craig et al., 2020). Estimates are wide-ranging due to variations in measurement (NASEM, 2016; UNESCO, 2019; Vaillancourt et al., 2008); 10–35% of adolescents report recurrent victimization (Moore et al., 2017). In a 2018 nationally representative sample, 20% of Canadian youth in Grades 6–10 reported being bullied more than once or twice in the last two months, with higher rates in girls than boys (Craig et al., 2020).

Bullying is typically defined as intentional, repeated, and unwanted aggressive behavior toward an individual carried out by one or more people, where a power imbalance exists between the target and perpetrator (Olweus, 1993). This power imbalance can manifest through numerous domains, such as popularity, athleticism/physical strength, wealth, and age (Felix et al., 2011). Bullying can take various forms,

including physical (e.g., hitting, stealing or harming property), verbal (e.g., name calling, threatening), social (e.g., exclusion), and cyber (online bullying via connected devices) aggression. Various theoretical frameworks have been applied to bullying, often based on premises that victims are not chosen randomly, that bullying serves a function for perpetrators, and that contexts support the occurrence of bullying (Thomas et al., 2018). Bronfenbrenner's (1979) Socioecological Theory is a prominent systems perspective which proposes that behaviors and development are shaped by complex and reciprocal interactions between individuals, situations, and the multiple contexts that they are nested within. Applying this theory, bullying is understood to be influenced by transactions amongst characteristics of adolescents and those of their family, peers, schools, and neighborhoods, as well as broader cultural values, social norms, and political and economic systems. More recent conceptualizations of Socioecological Theory also incorporate dimensions of time and historical events (Thomas et al., 2018). The COVID-19 pandemic can be considered one such event that directly and indirectly altered adolescents' lives through their various environments.

Most bullying takes place in schools (Cosma et al., 2020), which closed to in-person learning in March 2020 and remained closed for the remainder of the academic year. In the following school year, safety protocols included schedule changes and cohort models to reduce contact among students (e.g., blended learning [half virtual, half in-person], lunches reduced in time/restricted to classrooms), with further closures to in-person learning and shifts to online school delivery at times and in areas with high case rates (Gallagher-Mackay et al., 2021; People for Education, 2021). Thus, the reduced face-to-face interactions with peers during the lockdown limited opportunities for in-person bullying. Evidence supports a reduction in victimization experiences during the early school lockdown (Repo et al., 2022; UNICEF, 2020; Vaillancourt et al., 2021; Yang et al., 2023; Yourtown, 2021). For example, when comparing students' retrospective reports of pre-COVID-19 bullying to other students' reports during the first two months of the fall 2020 term, higher rates were noted pre-pandemic across all forms of bullying in a Canadian school board (Vaillancourt et al., 2021).

Bullying trends during the prolonged pandemic response remain less clear. Internet search data for school bullying dropped as schools shifted to remote learning in spring 2020 but searches partially returned to pre-pandemic levels with the gradual return to in-person instruction starting fall 2020 (Bacher-Hicks et al., 2022). Likewise, contrary to early pandemic findings, research from a Norwegian city found a higher prevalence of bullying a year into the pandemic relative to 2017 results (Forsberg & Thorvaldsen, 2022). Several factors potentially led to increased bullying rates with the return to in-person learning and lifting of measures. For instance, bullying can serve a function for students to (re) establish social hierarchies in peer networks, which school closures and alternative learning modes may have disrupted. Further, necessary shifts in attention and resources to COVID-19 measures likely affected various protective factors, including positive school climates and student-teacher relationships, opportunities for extracurricular activities, and implementation and enforcement of bullying policies and programs (NASEM, 2016). Changes outside of the school context can also contribute to school bullying rates. Economic impacts of pandemic response may have impacted the functioning of some families and eroded social cohesion in the wider communities (NASEM, 2016).

In addition to understanding trends in bullying, Socioecological Theory has demonstrated utility in research identifying populations at greater risk of victimization (NASEM, 2016; Thomas et al., 2018). School norms often perpetuate wider social structures and inequities. At the macro-level, cultural and social norms shape the characteristics and identities that are devalued in society and are propagated by laws and policies that disadvantage stigmatized groups over others (NASEM, 2016). Traditional and social media, which is rife with stigmatizing content, can further enhance these influences; exposure is ubiquitous among adolescents and increased during the pandemic (Duncan et al., 2022). Youths with higher weights (herein used in this paper to refer to Body Mass Index [BMI] classifications of overweight/obesity to avoid stigmatizing language [Meadows & Daníelsdóttir, 2016; R. M. Puhl & Himmelstein, 2018]), belonging to gender and sexually diverse populations, and from lower socio-economic status households (Bucchianeri et al., 2013; Vaillancourt et al., 2021) are at greater risk of peer victimization; however, evidence is mixed on race and ethnicity differences (NASEM, 2016; Vitoroulis & Vaillancourt, 2014).

Further research is needed to determine whether changes in bullying victimization during the early lockdown period were sustained over time or if bullying levels returned to pre-COVID-19 rates with the lifting of restrictions. Additionally, given the long-term ramifications of bullying victimization (Moore et al., 2017), understanding the subgroups disproportionately targeted will be integral for providing adequate support, resources, and interventions to those most affected by victimization, and to inform prevention efforts moving forward. The purpose of this study was to examine changes in self-reported experiences of bullying victimization spanning from before to the two academic years after the onset of the COVID-19 pandemic. A secondary objective was to examine bullying victimization by sex, gender, weight status, race, socioeconomic position, and school learning mode.

Materials and methods

Design and sample

The *Cannabis, Obesity, Mental health, Physical activity, Alcohol, Smoking, and Sedentary behavior (COMPASS) Study* is an ongoing school-based study designed to collect data annually from a rolling cohort of students in Grades 9 through 12 (Secondary I-V in Quebec) attending a convenience sample of Canadian secondary schools (Leatherdale et al., 2014). Student-level data are collected each school year via a self-reported questionnaire from full school samples. Each year, using a rolling cohort design, most students in Grade 12 and Secondary V graduate out of the cohort, and students in Grade 9 and Secondary I enter into the cohort. Schools were purposefully recruited based on the following criteria: a total enrollment of at least 100 students, inclusion of students in Grades 9–12 (Secondary I-V in Quebec), and permitted use of active-information passive-consent parental permission protocols (Leatherdale et al., 2014; Thompson-Haile et al., 2013). Using these protocols, all students not withdrawn from the study by a parent/guardian were eligible to participate and could withdraw at any time (Thompson-Haile et al., 2013). To create the longitudinal cohort, the questionnaires included a series of five questions for which responses are not likely to change within individuals over the study period (e.g., "the name of the month you were born in"); responses to these items were used to generate anonymous student alphanumeric identification codes, which allowed individual student data to be linked across waves of participation without requiring student names (Battista et al., 2019). Student data were first linked within schools and additional restrictions to linkage were applied for accuracy of the linked sample (for further details on linkage see Battista et al., 2019; Qian et al., 2015). Students that did not attend the school in the previous year were removed from the linked sample.

COMPASS data are collected once annually from students and schools, with individual school data collection dates kept similar across study years to reduce potential seasonal effects. Time 1 (T1) data were collected in the 2019–20 school year (between October 2019 and February 2020) using a paper-based survey during class time, before the COVID-19 pandemic onset and first school closures in March 2020. While schools resumed in-person learning in September 2020, given the ongoing pandemic response, data collection was conducted via an online survey for Time 2 (T2) and Time 3 (T3) in the 2020–21 and 2021–22 school years, respectively. In the 2020–21 school year in Canada, schools were again mandated to close in areas and at times of high COVID-19 case counts, including during the second (January-February 2021) and third pandemic waves (May-April 2021). Vaccination become available in Canada in December 2020. In the 2021–22 school year, waves four and five emerged in September 2021 and December 2020-January 2022, respectively, although schools remained open to in-person learning and most COVID-19 measures were lifted. The paper-based and online surveys are described elsewhere (Reel et al., 2019, 2020). All procedures were approved by the University of Waterloo Office of Research Ethics (ORE# 30118), Brock University Research Ethics Board (REB #18-099), *CIUSSS de la Capitale-Nationale – Université Laval* (#MP-13-2017-1264), and appropriate school board committees. A full description of COMPASS methods is available online (*https://www.compass.uwaterloo.ca*).

We examined whether rates of bullying victimization differed in the two post-pandemic onset school years relative to the pre-pandemic onset year, using both repeat cross-sectional data and sequential cohort longitudinal data. The former allowed us to examine overall population trends

while avoiding a cohort effect, given typical declines in bullying with increasing grade over secondary school (Ladd et al., 2017), and the latter helps to control for potential sample differences between waves. To further reduce potential sample bias, only data from students attending the 50 schools ($n =$ 16 Quebec, $n = 26$ Ontario, $n = 6$ British Columbia, and $n = 2$ Alberta) that participated at all three waves were used. For the cross-sectional data 23,862 students completed the survey at T1, 19,413 at T2, and 21,897 at T3. In T1, 93.3% of students had complete data and 5.9% were missing only one response for the included variables. In T2, 84.8% had complete data and 13.9% were only missing a response to one variable. In T3, 77.6% had complete data and 19.3% had only one missing response. For the longitudinal cohort, only students in Grade 9 or 10 (Secondary I, II or III in Quebec) at T1, who continued attending the same school in the two subsequent years, had the potential to be included in the 3-year linked sample. Survey data were successfully linked across 3 years from 3,716 secondary school students that participated in T1, T2, and T3. For the three waves of survey data for the sample of 3716 students (i.e., 11,148 records), 6.3% of records had only one missing response for the study variables and 0.5% had more than three missing responses.

Measures

Bullying was assessed based on whether students indicated having not been bullied in the last 30 days by other students. Students were provided the explanation: "Bullying can take many forms and usually involves intimidating, threatening, or otherwise hurtful behavior. Bullying includes any sort of harassment related to sexual orientation, gender identity, gender expression, or sexual harassment." Overall bullying victimization was determined based on whether students indicated "I have not been bullied in the last 30 days." Type of bullying victimization experiences were examined descriptively only based on student responses to a "mark all that apply" question: "In the last 30 days, in what ways were you bullied by other students?." Responses included: "physical attacks (e.g., getting beaten up, pushed, or kicked)," "verbal attacks (e.g., getting teased, threatened, or having rumours spread about you)," "cyber-attacks (e.g., being sent mean text messages or having rumours spread about you on the internet)," and "had someone steal from you or damage your things." Also, "Social bullying (e.g., being purposefully excluded from a group, being humiliated by others with gestures or graffiti)" was added as an option in T2 and T3. Given this measurement change, and small cell sizes, models were only conducted for the overall bullying item and not for specific types of bullying.

New *sex and gender* measures were added to the study in T3. For this reason, T3 data were used for *gender identity* in the longitudinal cohort. A two-stage process was applied, with separate items for sex assigned at birth (female, male, I prefer not to say) and gender identity ("Which gender do you most identify with?" girl/ woman, non-binary person, Two-Spirit, boy/man, I describe my gender differently, I prefer not to say). Responses were classified as cis-girl (female sex and girl/woman gender), cis-boy (male sex and boy/man gender), and transgender and gender diverse/prefer not to say (all other response combinations). In the repeat-cross-sectional data, the older measure of *sex/gender* ("Are you a female or male?" Female, Male, I describe my gender in a different way, I prefer not to say) was used in T1 and T2, and categorized as female, male, gender diverse/I prefer not to say (collapsed due to small cell sizes). In T3 repeat cross-sectional data, to best allow comparison with T1 and T2 data given the change in measures, students that reported "I describe my gender differently" for the gender identity measure and students that are reported "I prefer not to say" for the sex assigned at birth item were categorized as gender diverse/prefer not to say, and excluding those students, any students that reported male and female to the sex assigned at birth measure were categorized as male and female, respectively.

Socio-economic position was assessed by a single item that asked students whether they perceived their family to be more, less, or as comfortable financially compared to the families of other students in their class. This measure was not added to the study questionnaire until T2 and T3, and thus T2 responses were applied to T1 for longitudinal data and comparison across waves was not possible in repeat cross-sectional data.

Weight status was assessed in each year based on self-reported height and weight to determine body mass index (BMI), categorized based on age and sex-adjusted World Health

Organization BMI classification and collapsed into categories: lower weight ("underweight" BMI), higher weight (including students with BMIs classified as "overweight" or "obesity"), "healthy weight" ("normal weight" BMI), and "missing." Students missing weight or height responses were classified in a separate category given the high prevalence of missing weight data and likelihood that it is not missing at random (Doggett et al., 2022). Self-report height and weight, and derived BMI measures, demonstrate acceptable reliability and validity in adolescent populations when objective measures are not appropriate or feasible (Goodman et al., 2000; Leatherdale & Laxer, 2013).

Student reported *race* was measured at baseline by asking students "how would you describe yourself? (mark all that apply)." Due to small cell sizes, responses were collapsed into two categories: Black and persons of color (including students that indicated the response options of Asian, Black, Latin American/ Hispanic, or "Other" and students that indicated multiple response options) and White.

The *learning mode* in which students were attending school at the time of data collection was assessed in T2 only, as there were no mandated school closures due to COVID-19 in T3 and most students were learning fully in-person. Students were asked how they were attending school: 100% in person, 100% virtual, or blended [alternating cohorts in which students attend school in-person half of the time and online for the other half]). Students learning online were further divided; students learning online when schools were mandated to be closed due to COVID-19 rates were classified as "virtual mandated" and students that reported virtual learning while schools remained open to in-person learning were classified as "virtual optional."

Covariates included student grade-level at baseline (Grade 9–12 in Ontario, Alberta, and British Columbia; Secondary 1–5 in Quebec, equivalent to Grade 7/8–11) and province (Alberta, British Columbia, Ontario, Quebec).

Statistical analysis

Frequency statistics were examined for all study variables. We used marginal logistic regression models with a Generalized Estimating Equations (GEE) approach with a binary outcome and logit link function to account for the correlation between repeated measurements of participants over the three years when estimating the population average odds of bullying victimization. GEE approaches have the advantage of not requiring strict distribution assumptions and being robust to model misspecification; GEE models produce reliable population estimates when a sufficient number of clusters is present in the data (Hubbard et al., 2010). The model accounted for within-student association among the multiple responses over time for participants with more than one observation. A working exchangeable correlation structure was used. The odds of bullying victimization were examined by study year, comparing the pandemic waves (T2 and T3) to the pre-pandemic school year (T1), and by sex/gender, weight, and race, controlling for grade, province, and school clustering. The longitudinal model also included socioeconomic position and learning mode. Gender stratified results were not presented because results were comparable, and the sample size for gender diverse students impeded separate models. All statistical analyses were performed using SAS 9.4.

Results

Descriptive statistics in the repeat cross-sectional data

Frequency statistics are reported in Table 1 for all measures in the repeat cross-sectional data. Past 30-day bullying victimization was reported by 11.3% of students at T1, 10.4% at T2, and 15.7% at T3, 4.4% higher than before the pandemic. Verbal bullying as the most common form of bullying, reported by 8.6% of students at T1, declining to 6.4% at T2, and then increasing to 10.3% at T3. Other forms of bullying had similar patterns across the three waves (i.e., decreased rates in T2 followed by increases in T3), except for cyberbullying, which was reported by 3.1% of students at T1, and 3.7% and 3.8% at T2 and T3, respectively.

See Figure 1 for the unadjusted frequencies of students that reported bullying victimization by year and sex, race, and weight status, using the repeat-cross-sectional data. Bullying victimization was reported by almost three times the proportion of gender diverse/prefer not to say students in comparison to males and females; 30.2% reported past 30-day bullying at T1, 25.9% at T2, and 34.9% at T3, to exceed the pre-pandemic rate by 4.7%. In females, bullying victimization remained stable in T1 and T2 at 11.3% and 11.1%, respectively, before increasing to 16.9% at T3; 5.6% higher than before the pandemic. Bullying reports among males dropped from 10.2% at T1 to 8.3% at T2, and then rose to 13.5% at T3, a 3.3% increase since pre-COVID-19 onset. By race, students that were Black or persons of color had relatively stable reports of being bullied across T1 (12.6%) and T2 (12.1%), followed by an increase to 17.3% at T3. Bullying victimization was relatively less frequent in White students, but the pattern across waves was similar; about one-tenth of White students reported being bullied in T1 (10.7%) and T2 (9.9%), with a 5% increase to 15.0% at T3. Bullying frequencies in students with higher weights, and those missing weight data, were higher in each wave than "healthy weight" students. In students with higher or lower weights, bullying frequencies increased by about 6% in total from T1 to T3, relative to a 4.5% increase among "healthy weight" students.

Table 1. Sample sociodemographic characteristics in Canadian secondary school students from the COMPASS study (2019–20, 2020–21, 2021–22).

	Longitudinal	Cross-sectional		
	T1: 2019–20 (N = 3716)	T1: 2019–20 (N = 23,862)	T2: 2020–21 (N = 19,413)	T3: 2021–22 (N = 21,897)
	n (%)	n (%)	n (%)	n (%)
Province				
Alberta	73 (2.0)	905 (3.8)	800 (4.1)	694 (3.2)
British Columbia	351 (9.4)	4613 (19.3)	2314 (11.9)	2833 (12.9)
Ontario	742 (20.0)	7570 (31.7)	7911 (40.7)	7442 (34.0)
Quebec	2550 (68.6)	10774 (45.1)	8388 (43.2)	10928 (49.9)
Grade				
Secondary I/II	1782 (48.0)	5278 (22.3)	4155 (21.7)	5454 (25.3)
9 or Secondary III	1373 (37.0)	5213 (22.0)	4361 (22.7)	5076 (23.5)
10	555 (15.0)	5259 (22.2)	4478 (23.3)	4883 (22.6)
11	N/A	4905 (20.7)	3820 (19.9)	4046 (18.7)
12	N/A	2995 (12.7)	2361 (12.3)	2116 (9.8)
Gender identity				
Cis-girl	2057 (55.4)			
Cis-boy	1526 (41.1)			
Transgender and gender diverse/Prefer not to say	132 (3.6)			
Sex/gender				
Female		11405 (48.4)	9749 (50.8)	10015 (46.3)
Male		11499 (48.8)	8628 (45.0)	9931 (46.0)
Gender diverse/Prefer not to say		665 (2.8)	800 (4.2)	1655 (7.7)
Race				
White	2972 (80.0)	16641 (70.5)	14023 (73.3)	14940 (75.2)
Black and Persons of Color	723 (20.0)	6972 (29.5)	5107 (26.7)	4919 (24.8)
Weight				
Lower weight	80 (2.2)	459 (1.9)	253 (1.3)	272 (1.2)
"Healthy weight"	2036 (54.8)	12781 (53.6)	8063 (41.5)	8986 (41.0)
Higher weight	560 (15.1)	3937 (16.5)	2217 (11.4)	2550 (11.6)
Missing	1040 (28.0)	1257 (28.0)	620 (45.7)	750 (46.1)
Bullying Victimization				
Any bullying in last 30 days	327 (9.1)	2556 (11.3)	1727 (10.4)	2897 (15.7)
Physical	54 (1.5)	532 (2.2)	268 (1.4)	577 (2.6)
Verbal	262 (7.1)	2046 (8.6)	1241 (6.4)	2253 (10.3)
Cyber	74 (2.0)	746 (3.1)	714 (3.7)	834 (3.8)
Stolen/Damaged Belongings	49 (1.3)	464 (1.9)	270 (1.4)	613 (2.8)
Social	Not available	Not available	701 (3.6)	969 (4.4)

Percentages may not add to 100% due to rounding. Sex and gender measures were added/revised in T3; cohort data use sex assigned birth and gender identity measures at T3. A new social bullying item was added in T2. Overall bullying was assessed by their indication of "I have not been bullied in the last 30 days." Bullying measures were specific to victimization by other students at school. Weight is based on age and sex adjusted BMI categories, relabeled to avoid stigmatizing language.

Sex/gender
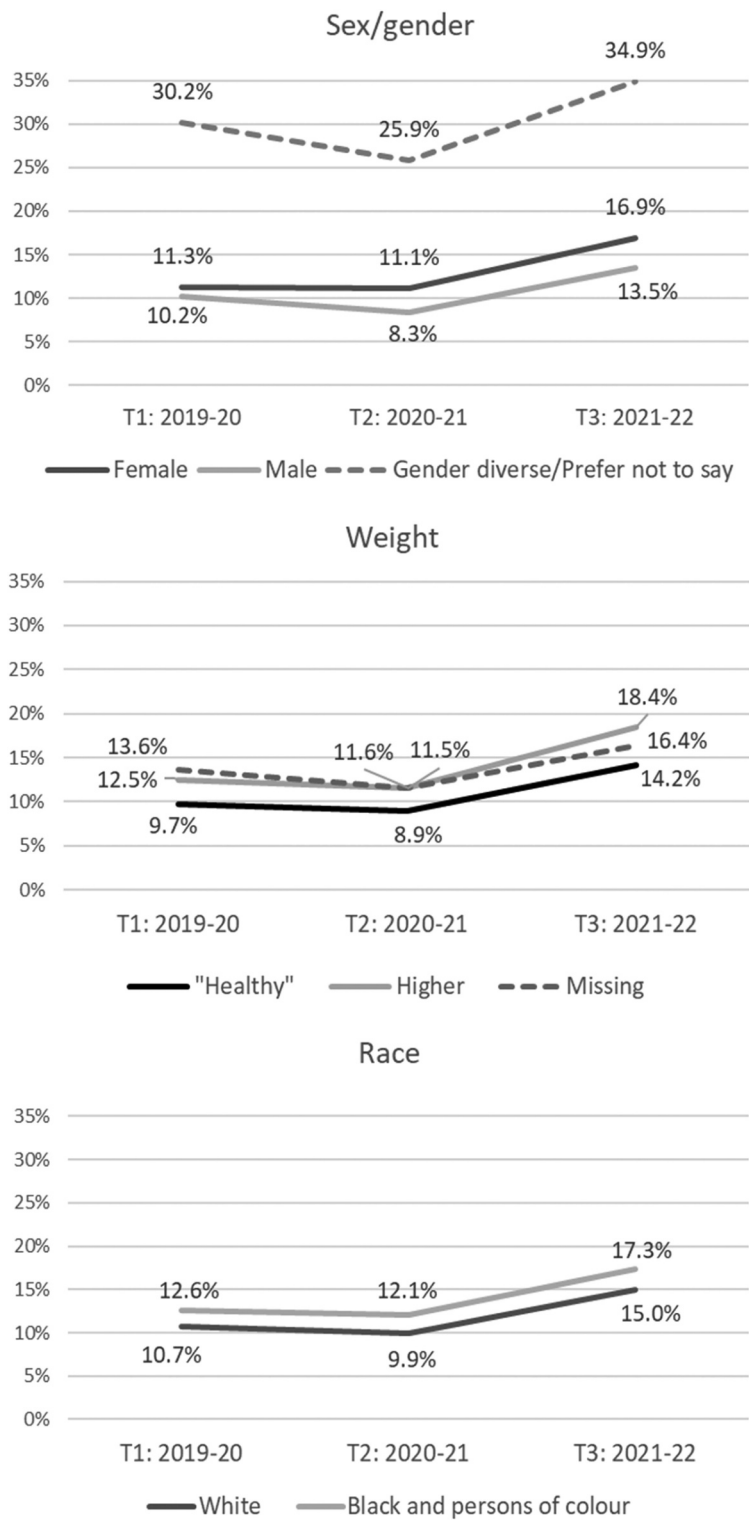
Weight

Race

Figure 1. Unadjusted last 30-day bullying victimization rates by sex/gender, weight, and race using repeat cross-sectional data from Canadian secondary school students in the COMPASS study (2019–20, 2020–21, 2021–22).

### Descriptive statistics in the longitudinal cohort

For the longitudinal cohort sample, frequency statistics are reported in Table 1 for variables treated as time-invariant and baseline measures for time-variant measures, and Table 2 for time-variant measures in T1-T3. The frequency of cohort students experiencing bullying victimization in the last 30 days was 9.1% at T1 and 7.5% at T2, and then increased at T3 beyond the pre-pandemic rate (10.7%). Similar trends by year are suggested for all types of bullying victimization, with the exception of cyberbullying, which remained relatively stable (T1 = 2.0%, T2 = 2.4%, T3 = 2.9%).

Figure 2 displays the unadjusted proportions of students in the longitudinal cohort reporting bullying by year and socio-economic position, gender, baseline weight, and race. Students that perceived their family to be relatively less financially comfortable reported approximately double the victimization rates of more affluent students across all three waves. Before the pandemic onset, the prevalence of bullying victimization among students with higher weights at baseline was more than four times the rate reported by students with "healthy weights" (28.4% *vs.* 6.9%). Students with higher weights at baseline experienced a 10.4% reduction in bullying in T2 but rates rebounded to exceed pre-pandemic levels by 3.9% in the following school year. About one-third of participants with higher weights reported bullying victimization in T3, in comparison to one-tenth of "healthy weight" students. Given the small cell sizes for lower weight students, these results were not interpreted. Transgender and gender diverse/prefer not to say students had higher reports of being bullied and greater changes across waves than cisgender students; 14.9% reported being bullied at T1, followed by a 3.0% drop at T2 and then a 6.4% increase to reach 18.3% at T3. In comparison, about one-tenth of cisgender girls and boys were bullied in T3. Cisgender boys and girls had a similar prevalence and pattern in bullying victimization across waves, with a slight decline (1.2–1.7%) in victimization in T2, which then rebounded by 2.9–3.2% to exceed pre-pandemic levels in T3. While more students identifying as Black and persons of color reported being bullied before the pandemic onset than White students (11.2% vs. 8.4%), reports were equivalent by race in the following two school years. Lastly, students attending school fully in-

Table 2. Descriptive statistics of time dependent variables in Canadian secondary school students with 3-year linked longitudinal data from the COMPASS study (*N* = 3716).

	T1: 2019–20	T2: 2020–21	T3: 2021–22
	n (%)	n (%)	n (%)
Weight			
Lower weight	80 (2.2)	49 (1.3)	43 (1.2)
"Healthy weight"	2036 (54.8)	1839 (49.5)	2079 (56.0)
Higher weight	560 (15.1)	454 (12.2)	505 (13.6)
Missing	1040 (28.0)	1374 (37.0)	1089 (29.3)
Socio-economic position			
More comfortable	936 (25.4)	936 (25.4)	1032 (27.9)
As comfortable	2539 (68.8)	2539 (68.8)	2386 (64.6)
Less comfortable	217 (5.9)	217 (5.9)	277 (7.5)
School Learning Mode			
In-person	3716 (100.0)	843 (22.8)	3489 (94.2)
Virtual Mandated		995 (26.9)	0 (0)
Virtual Optional		1180 (31.5)	136 (3.7)
Blended		698 (18.8)	79 (2.1)
Bullying Victimization			
Any bullying in last 30 days	327 (9.1)	260 (7.5)	368 (10.7)
Physical	54 (1.5)	34 (0.9)	49 (1.3)
Verbal	262 (7.1)	203 (5.5)	303 (8.2)
Cyber	74 (2.0)	90 (2.4)	106 (2.9)
Stolen/Damaged Belongings	49 (1.3)	22 (0.6)	56 (1.5)
Social	Not available	92 (2.5)	124 (3.3)

Percentages may not add to 100% due to rounding. New sex and gender measures were added in T3, and socioeconomic position and social bullying items were added in T2. Bullying measures are specific to victimization by other students at school. Weight is based on age and sex adjusted BMI categories, relabeled to avoid stigmatizing language.
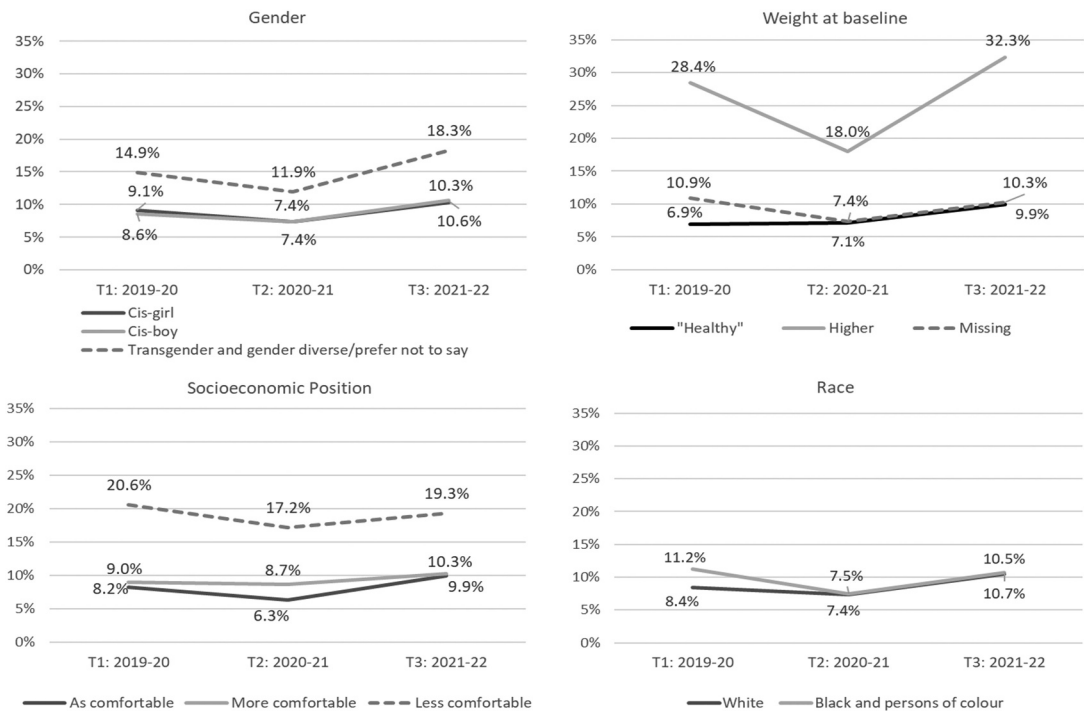
Figure 2. Unadjusted last 30-day bullying victimization rates by gender, baseline weight, socioeconomic position, and race in Canadian secondary school students with 3-year linked data from the COMPASS study (2019–20, 2020–21, 2021–22) ($N = 3716$).

person during the T2 data collection had the highest bullying rates (11.9%), relative to their peers who were learning in blended (7.6%), virtual mandated (6.2%), and virtual optional (5.5%) learning modes ($p < .001$) (Not included in figure).

Repeat cross-sectional GEE model

See Table 3 for results of the model examining the odds of being bullied in the past 30 days using repeat cross-sectional data. Students had lower odds of being bullied in T2 (AOR 0.86, 95% CI: 0.81, 0.92) and higher odds of being bullied in T3 (AOR 1.49, 95% CI: 1.41, 1.58) relative to T1. Females (AOR 1.30, 95%: CI 1.24, 1.38) and, particularly, gender diverse students and those that preferred not to say (AOR 3.67, 95%: CI 3.20, 4.20) were more likely to report bullying victimization than males. Black and persons of color students had marginally higher odds of bullying victimization than White students (AOR 1.12, 95% CI: 1.04, 1.19). Students with higher weights (1.33, 95% CI 1.23, 1.44) and marginally, students with missing BMI data (AOR 1.07, 95% CI: 1.00, 1.13), had higher odds of victimization than their "healthy weight" peers. Students in Secondary I/II had higher odds of being bullied (AOR 1.40, 95% CI: 1.28, 1.53) than their counterparts in Grade 9/Secondary III, while students in Grade 10/Secondary IV (AOR 0.90, 95% CI: 0.83, 0.96), Grade 11/Secondary V (AOR 0.68, 95% CI: 0.63, 0.74), and Grade 12 (AOR 0.63, 95% CI: 0.58, 0.70) had lower odds.

Longitudinal cohort GEE model

The longitudinal model results are also presented in Table 3. In the cohort, students had marginally higher odds of being bullied in T3 relative to T1 (AOR 1.22, 95% CI: 1.06, 1.41), but no difference in odds of being bullied in T2 relative to T1 was found (AOR 0.96, 95% CI: 0.77, 1.20]). Students that participated while learning virtually during school closures in T2 had lower odds of being bullied relative to students who were attending school fully in-person (AOR 0.69, 95% CI: 0.49, 0.96). Students

Table 3. Adjusted odds ratios of experiencing bullying victimization in Canadian secondary school students from the COMPASS study (2019–20, 2020–21, 2021–22).

	Longitudinal cohort	Repeat cross-sectional
	AOR (95% CI)	AOR (95% CI)
Time (ref. T1: 2019–20)		
T2: 2020–21	0.96 (0.77, 1.20)	**0.86 (0.81, 0.92)**
T3: 2021–22	**1.22 (1.06, 1.41)**	**1.49 (1.41, 1.58)**
Gender (ref. Cis-boy)		
Cis-girl	1.05 (0.89, 1.24)	
Transgender and gender diverse/Prefer not to say	**1.49 (1.01, 2.21)**	
Sex/gender (ref. male)		
Female		**1.30 (1.24, 1.38)**
Gender diverse/Prefer not to say		**3.67 (3.20, 4.20)**
Race (ref. White)		
Black and Persons of Color	0.95 (0.76, 1.20)	**1.12 (1.04, 1.19)**
Grade (ref. Grade 9)		
Secondary I/II	**2.13 (1.64, 2.77)**	**1.40 (1.28, 1.53)**
Grade 10/Secondary IV	0.99 (0.77, 1.28)	**0.90 (0.83, 0.96)**
Grade 11/Secondary V		**0.68 (0.63, 0.74)**
Grade 12		**0.63 (0.58, 0.70)**
Weight (ref. "Healthy weight")		
Lower weight	Not reported	1.18 (0.96, 1.45)
Higher weight	**1.56 (1.28, 1.91)**	**1.33 (1.23, 1.44)**
Missing	1.13 (0.96, 1.32)	**1.07 (1.00, 1.13)**
Socioeconomic position (ref. As comfortable)		
More comfortable	1.17 (0.99, 1.39)	
Less comfortable	**2.41 (1.88, 3.09)**	
Learning mode in 2020–21 (ref. in-person)		
Virtual mandated	**0.69 (0.49, 0.96)**	
Virtual optional	0.86 (0.66, 1.12)	
Blended	0.92 (0.67, 1.25)	

Statistically significant (*p* < .05) Odds Ratios (OR) are bolded. Small cell sizes impeded interpretation of results for students with lower weights in the longitudinal cohort. Both models controlled for province and all other variables included in the table for that model. Bullying measures are specific to victimization in last 30 days by other students at school. Weight is based on age and sex adjusted BMI categories, relabeled to avoid stigmatizing language. Sex and gender measures were added/revised in T3; cohort data use sex assigned birth and gender identity measures at T3.

with less financially comfortable families had higher odds of experiencing bullying relative to students that perceived their families to be as comfortable financially as those of their classmates (AOR 2.41, 95% CI: 1.88, 3.09). Students with higher weights had greater odds of being bullied relative to "healthy weight" students (AOR 1.56, 95% CI: 1.28, 1.98). Results for lower weight students were not interpreted due to small cell sizes. Transgender and gender diverse/prefer not to say students were more likely to be bullied than cisgender boys (AOR 1.49, 95% CI: 1.01, 2.21), but no difference was found between cisgender girls and boys. No statistically significant differences were found in the odds of bullying victimization by race.

Discussion

In a large sample of Canadian adolescents, we used both repeat cross-sectional and longitudinal cohort designs to examine whether reports of being bullied by other students in the past 30-days differed during the first two full school years following the onset of the COVID-19 pandemic compared to the 2019–20 school year, before the enactment of the first lockdown. Overall, our results add to research demonstrating a reduction in bullying in association with remote schooling during the pandemic response in 2020–21, and provide new evidence that bullying victimization rebounded to exceed pre-pandemic levels in 2021–21, when most restrictions were lifted and schools remained fully open.

Our repeat cross-sectional results indicate lower odds of bullying victimization in the 2020–21 school year than the preceding year. In the longitudinal cohort model, bullying victimization in the 2020–21 school year did not significantly differ from the pre-pandemic year, however, this model adjusted for school learning mode. As expected, and in line with other studies (Schacter et al., 2022), students learning virtually due to school closures in 2020–21 were less likely to report being bullied than their peers that were attending school fully in-person. Consistent with our results from the 2020–21 school year, research from the early lockdown when all schools were closed to in-person learning, and into early fall 2020, has indicated a decline in bullying relative to pre-pandemic levels (Repo et al., 2022; UNICEF, 2020; Vaillancourt et al., 2021; Yang et al., 2023; Yourtown, 2021). As the first full academic year after COVID-19 onset, many students were learning online in 2020–21, either due to mandated school closures or by choice; when open, most schools implemented cohorting approaches (e.g., quadmester schedules, blended learning [half online, half in-person]), meaning students were in contact with fewer peers. Also, lunch and other break times were shortened and/or restricted to the classroom in some schools, likely further reducing opportunities for potential victimization. Unfortunately, this reduction was not sustained into the following school year when most pandemic measures were lifted, and most students were back learning fully in-person.

Results from both designs support increased odds of students reporting bullying victimization during the 2021–22 academic year relative to the year before the pandemic onset. In the repeat cross-sectional analysis, 15.7% of students reported past 30-day bullying victimization in 2021–22, 4.4% higher than the 2019–20 school year before the pandemic onset. Rates were relatively lower in the longitudinal cohort; the frequency of bullying victimization in 2021–22 was 10.7%, up 1.6% from 2019–20. Our results align with a Norwegian study which found elevated bullying rates in April 2021 relative to reports from students attending the same schools in 2017 (Forsberg & Thorvaldsen, 2022). Our longitudinal cohort findings are more concerning considering that bullying victimization prevalence and frequency typically decrease as students progress through secondary school (Ladd et al., 2017). The pandemic measures potentially interrupted social processes that usually contribute to declines. From a developmental perspective, social status is said to increasingly drive bullying in adolescence (Salmivalli et al., 2021). Adolescence is a period of rapid growth and development, with greater priority placed on peer acceptance and comparisons. Returning in-person to school contexts after the lockdown may have heightened sensitivity to differences amongst their peers and reignited concerns about social standing. Further research to explore mechanisms contributing to changes in bullying is necessary, as well as continued research on bullying trends and trajectories post-pandemic response.

While only examined descriptively, our unadjusted results suggest the prevalence of cyberbullying was less influenced by the lockdown than other bullying types. Pre-occurring cyberbullying potentially persisted, but greater screen use during the pandemic (Duncan et al., 2022) and reductions in other types of bullying do not appear to have led to increased cyberbullying. Limited face-to-face interactions with peers during school closures and online learning plausibly removed the drive for bullying by temporarily diminishing students' focus on social standing amongst classmates. Existing evidence is mixed on changes in the prevalence of cybervictimization; some studies have reported a reduction (Repo et al., 2022; Vaillancourt et al., 2021), while others found an increase (Patchin & Hinduja, 2023; Trompeter et al., 2022). Further research is warranted on changes in cyberbullying and shifts amongst different types of bullying.

Our results also highlight populations that experienced greater risk of bullying victimization. Students that perceived their families to be relatively less financially comfortable had over double the odds of being bullied than their peers that perceived their households to be as financially comfortable. These findings add to literature demonstrating higher bullying victimization rates among adolescents belonging to relatively less affluent families (Tippett & Wolke, 2014). We measured perceived socioeconomic position relative to a salient reference group (i.e., their classmates), rather than absolute socioeconomic status, which appears to be less associated with bullying (Craig et al., 2009; Elgar, Pickett, et al., 2013). Also, traditional indicators (e.g., household income, parental education) are challenging to accurately and reliably assess among young people (Hammond et al., 2021; Svedberg et al., 2016). Perceptions of being

deprived relative to a standard of living perceived amongst one's peers is shown to contribute to poor health outcomes beyond material affluence (Elgar, De Clercq, et al., 2013). Elgar, Pickett, et al. (2013) proposed social inequality may contribute to bullying via heightened sensitivity to class differences and internalized social norms of power and domination. Income inequality at the school community level is associated with increased odds for bullying victimization and perpetration (Elgar, Pickett, et al., 2013; Pabayo et al., 2022), and cross-national evidence suggests a social milieu of violence may mediate this relationship (Elgar, Pickett, et al., 2013).

Adolescents with higher weights were more likely to experience bullying than their "healthy weight" peers in both models. Results are unsurprising given widespread recognition that weight-based bullying is the most common type of targeted bullying (Bucchianeri et al., 2013; Salmon et al., 2018). However, despite this knowledge, and the adverse consequences of weight stigma (R. M. Puhl & Lessard, 2020), weight and body size are often neglected in discussions of equity, diversity, and inclusion. The disruption of face-to-face contact with peers during the pandemic lockdown may have further intensified adolescents' focus on weight and body size upon the return to school. Physical changes related to adolescents' continued growth and development may have been more recognizable amongst their peers after school closures. These factors may have been exacerbated by increased screen and social media use, which is rife with weight-focused narratives (e.g., #quarantine15) (Lessard & Puhl, 2021; Lucibello et al., 2021). The ubiquitousness of weight stigma will necessitate comprehensive and systematic approaches to promote weight inclusive schools.

Further research is needed to explore whether the link between weight and bullying victimization is moderated by gender. Research among adults suggests women are more likely to experience weight discrimination and at lower body sizes than men (R. Puhl et al., 2008); however, evidence is mixed among youth (Janssen et al., 2004; Morales et al., 2019). Several studies indicate there is no difference between boys and girls in the weight-victimization association (Griffiths et al., 2006; Patte et al., 2021; van Geel et al., 2014), although some research suggests findings depend on age and type of bullying (Janssen et al., 2004; Morales et al., 2019). For instance, in a sample of younger children with higher weights, girls experienced greater social exclusion than boys, but gender did not moderate the association between weight and verbal bullying, and weight was not associated with physical bullying (Morales et al., 2019). A larger stature better aligns with masculine muscularity appearance ideals than feminine thin ideals, and may help fend off physical victimization, which is more common among boys (Morales et al., 2019). Relatedly, underweight has been shown to put boys but not girls at greater risk of being bullied (Kahle & Peguero, 2017). Scant research has included transgender and gender diverse youth when examining gender moderation effects.

Transgender and gender diverse students were more likely to experience bullying victimization than their peers. Similarly, Vaillancourt et al. (2021) found higher bullying victimization rates in gender diverse and LGTBQ+ students than gender binary or heterosexual students during the first two months of the 2020–21 school year. Our results help to answer calls for a gendered lens in COVID-19 research and improved population surveillance systems, which have historically excluded measures beyond the gender binary (DeMulder et al., 2020). No significant difference was found between cisgender girls and boys in the longitudinal cohort. In the repeat cross-sectional model, female students had elevated odds of bullying relative to their male counterparts. Most research from before (Craig et al., 2020) and during the early phases of the pandemic (Vaillancourt et al., 2021) indicates higher bullying victimization in girls than boys, although in the Norwegian study by Forsberg and Thorvaldsen (2022), females had a higher prevalence of bullying than males in 2017 but there was no difference one year into the pandemic. Continued research is needed to examine gendered disparities in bullying, including by bullying type and intersections with other identity factors such as race, weight, and socioeconomic position.

Our repeat cross-sectional results indicate that Black and persons of color students experienced marginally higher odds of bullying victimization relative to White students. In the longitudinal cohort model, we found no differences in bullying victimization between the two

groups. Evidence on differences in bullying prevalence by racial and ethnic groups is inconclusive; inconsistent results potentially reflect differences school and social environments (NASEM, 2016; Xu et al., 2020). For instance, more diverse secondary school environments have been shown to be protective (Basilici et al., 2022) and were not considered in the current study. There were concerns that racism increased over the pandemic, particularly targeting Asian populations. Some research has found Asian American adolescents were more likely to experience increased cybervictimization during the pandemic (Patchin & Hinduja, 2023); however, a Canadian study during early fall 2020 found no differences between East Asian and White students (Vaillancourt et al., 2021). Importantly, we were limited by sample size to example differences within Black and persons of color populations, and important differences may have been masked by dichotomizing this measure.

This study reinforces the need for reinvestment in bullying prevention post-pandemic and improved prevention strategies. The reallocation of public health resources to the pandemic response likely meant less focus was devoted to bullying prevention initiatives, which may have contributed to the rebound in bullying. Article 19 of the UN Convention of the Rights of the Child (1989), ratified by Canada in 1991, holds duty bearers accountable for taking all appropriate legislative, administrative, social, and educational measures to protect children from all forms of violence, abuse, and maltreatment. However, our understanding of how to effectively prevent bullying remains limited; the multiple interventions have had modest and varying effects, particularly among adolescents (Gaffney et al., 2021; Salmivalli et al., 2021; Yeager et al., 2015) and for bias-based bullying (Xu et al., 2020). Despite some increases in the number of universal interventions targeting bias-based bullying including gender identity, sexual orientation, ability, and race (Earnshaw et al., 2018), there remains a need for greater focus on specific stigma-related factors including diversity and inclusion of youth from underrepresented populations (e.g., Crooks et al., 2019; Walton, 2018). Salmivalli et al. (2021) argue for a developmentally informed approach; in adolescents, adult reproach may not be sufficient to override peer status drives, and instead, mobilizing influential students in prevention and providing prosocial alternatives to aggression to gain social status warrant further investigation. Generally, rather than one-off and limited-term interventions, a comprehensive whole school approach to bullying prevention is recommended to shift the school social environment and address systematic causes (NASEM, 2016). To better inform prevention programs, further research is needed to focus on wider school- and community-level factors that may have contributed to students' victimization experiences found in the current study, such as student composition and teacher/staff representation of equity denied groups, student-teacher relationships and school climate, weight-centric health curriculum, weight stigmatizing and gendered sport/physical activity spaces, access to gender neutral bathrooms and changerooms, and the enforcement and implementation of bullying policies and programs.

Limitations

Several limitations require consideration. The COMPASS study was not designed to be nationally or provincially representative. While full school samples, with schools located across four provinces, in rural and remote to large urban areas, with a range of median household incomes, help support generalizability, it is important to acknowledge that students that experienced bullying may have been less likely to participate and to be linked across study waves. The longitudinal sample includes a higher proportion of students from the province of Quebec and that identified as White, which may have contributed to lower bullying rates. While previous evaluation of linkage in the study before the pandemic found an approximately 80% success rate (Qian et al., 2015), the COVID-19 pandemic response and online learning likely impacted linkage success. In COMPASS, the limitations of imperfect linkage are weighed against the benefits on imposing restrictions on linked data to reduce false-linkage error and participation remaining anonymous, given the importance for collecting robust

youth data on sensitive topic areas (Battista et al., 2019; Qian et al., 2015). The potential limitations of the linked sample were one reason for also evaluating changes in repeat cross-sectional data. Relatedly, missing data rates were higher for bullying items in study waves after the onset of COVID-19 than before the pandemic. If nonresponse and non-linkage are associated with increased likelihood of having been bullied, the rates in the pandemic waves and the increased odds of being bullied in T3 relative to T1 may have been underestimated. Self-report measures may introduce recall error or social desirability bias. However, the passive consent protocols and not requiring student names help to preserve anonymity and improve response rates. The change from a paper-and-pencil to an online survey may have influenced students' responses but was necessary to safely collect data during the pandemic and given school closures.

Our design allowed us to examine changes in overall bullying and compare population subgroups within the study, but comparisons to prevalence estimates in other literature are challenging due to variations in measurement (Vaillancourt et al., 2008). Our bullying rates were comparable to some research (Forsberg & Thorvaldsen, 2022; Moore et al., 2017), but lower relative to other studies (Craig et al., 2020; UNESCO, 2019). Lower rates were expected as survey items range with various studies asking about bullying in the past month, past 2–3 months, and the last year (Craig et al., 2020; Forsberg & Thorvaldsen, 2022; Fredj et al., 2023; NASEM, 2016; UNESCO, 2019). Thus, the measures, along with the above-mentioned factors (e.g., missing data, nonlinkage or nonparticipation) may have contributed to lower rates and also have implications for interpreting results. That is, this study examined whether the odds of past month bullying victimization differed post-COVID-19 onset relative to pre-pandemic, and not trends in past year bullying experiences. Also, given our focus on school contexts, as the primary context for bullying (Cosma et al., 2020; Repo et al., 2022), our bullying measures specify being bullied by other students, and thus, do not capture bullying by individuals from outside of school, such as in the neighborhood or sports teams. Conversely, bullying is often operationalized as two or more occurrences, which is not specified in our measure, although would be expected to produce higher rates. Our analyses only focused on overall bullying, given small cell counts in certain bullying types and the addition of social bullying post-pandemic onset.

The small sample size of some subgroups precluded interpretation of some regression results (i.e., lower weight) and examination of intersecting social positions, and required some categories to be collapsed (e.g., race). Our sample was predominantly White. Due to questionnaire revisions across waves, the two-stage gender identity measures were only available in T3; as a result, we were unable to use these variables in the repeat cross-sectional model and to account for potential changes in gender identity in the cohort data. Also, sex/gender measurement changes may have impacted sex/gender comparisons across waves in the repeat cross-sectional analysis. Similarly, we applied the T2 responses for socioeconomic position to T1, as the survey item was not available in this study wave, and thus, we are unable to account for potential changes in perceived relative family affluence between T1 and T2 or examine differences in the repeat cross-sectional analysis. A single item was used for socioeconomic position and has not undergone formal validation. As we did not assess the motivation of bullying, we are unable to determine whether victimization was based on weight, race, gender, class, or other factors, and bias-based bullying is shown to have more adverse impacts than non-biased based bullying (Xu et al., 2020). Lastly, we did not have measures to examine all subgroups that experience higher victimization rates; further research is needed to examine bullying during the pandemic by intersecting identity factors, such as ability, sexuality, newcomer status, and religion (Children First Canada, 2021). Future research is also needed to consider subgroup interaction effects with different school contexts (e.g., school-level diversity).

Conclusion

Our study adds both repeat cross-sectional and prospective evidence of bullying victimization among Canadian adolescents from before the onset of the COVID-19 pandemic to the two

subsequent academic years. While remote schooling during to the COVID-19 pandemic may have provided reprieve from bullying for some students, experiences of victimization appear to have rebounded to exceed pre-COVID-19 levels with the lifting of restrictions and full return to school. Improved bullying prevention strategies are essential, particularly to improve school contexts for less affluent, higher weight, gender diverse, and Black and persons of color adolescents, as population subgroups that were more likely to be bullied. Continued population surveillance of bullying is needed to determine sustained changes and to better understand school- and community-level factors that contribute bullying rates, to inform more effective prevention strategies.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Ethics approval

All procedures received ethics approval from the University of Waterloo (ORE#30118), Brock University (REB#18–099), CIUSSS de la Capitale-Nationale – Université Laval (#MP-13-2017–1264), and participating school boards, including the use of active-information passive-consent parental permission protocols.

Consent to participate

All students attending participating schools were invited to participate using active-information passive-consent parental permission protocols. Parents were informed of the study and could withdraw their child by contacting study staff. Students not withdrawn from the study by their parents were considered eligible to participate. Under passive-consent protocols, parental informed consent is assumed for all students whose parents that did not contact COMPASS staff to withdraw their child from the study, and this pertained to all participating students.

Availability of data and material

COMPASS study data is available upon request through completion and approval of an online form: https://uwaterloo.ca/compass-system/information-researchers/data-usage-application The datasets used during the current study are available from the corresponding author on reasonable request.

Author contributions

KAP and KML led the writing. KAP conceptualized the study. MRG conceptualized and conducted all formal analysis. STL, KAP and REB secured funding. STL conceptualized the larger host study. All authors (KAP, MRG, KML, REB, AHF, STL) reviewed and edited drafts.

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