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Original quantitative research

Age at first alcohol use predicts current alcohol use, binge drinking and mixing of alcohol with energy drinks among Ontario Grade 12 students in the COMPASS study

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Abstract

Introduction: This study investigates the influence of age at first use of alcohol on current alcohol use and associated behaviours in a large sample of Canadian youth.

Methods: This descriptive-analytical study was conducted among Ontario Grade 12 students enrolled in the COMPASS Host Study between 2012 and 2017. We used generalized estimating equations (GEE) modelling to determine associations between age at first alcohol use and likelihood of current versus non-current alcohol use, binge drinking and mixing of alcohol with energy drinks among respondents.

Results: Students reporting an age at first alcohol use between ages 13 and 14 years were more likely to report current alcohol use versus non-current use (OR = 2.80, 95% CI: 2.26–3.45) and current binge drinking versus non-current binge drinking (OR = 3.22, 95% CI: 2.45–4.25) compared to students reporting first alcohol use at age 18 years or older. Students who started drinking at 8 years of age or younger were more likely to report current versus non-current alcohol use (OR = 3.54, 95% CI: 2.83–4.43), binge drinking (OR = 3.99, 95% CI: 2.97–5.37), and mixing of alcohol with energy drinks (OR = 2.26, 95% CI: 1.23–4.14), compared to students who started drinking at 18 years or older.

Conclusion: Starting to drink alcohol in the early teen years predicted current alcohol use, current binge drinking and mixing of alcohol with energy drinks when students were in Grade 12. Findings indicate a need for development of novel alcohol prevention efforts.

Keywords: *youth, alcohol, initiation, first drink, binge drinking, public health*

Highlights

- Prevalence of current alcohol use among Grade 12 students ranged between 45% and 53% across the six-year study period.
- Students who started drinking between the ages of 13 and 14 years were nearly 3 times more likely to drink alcohol and over 3 times more likely to binge drink in Grade 12 compared to those who started drinking at age 18 years or older.
- Students who started drinking at age 8 years or younger were nearly 3.5 times more likely to drink alcohol and 4 times more likely to binge drink in Grade 12 compared to those who started drinking at 18 years of age or older.

Introduction

Alcohol use in adolescents negatively affects their mental and physical development;[1] peer and parental alcohol use are key influences on such behaviour.[2] For these reasons, the minimum legal drinking age has been set at 18 years for Alberta, Quebec and Manitoba, and at 19 years for all other Canadian provinces and territories. Psychosocial factors including pubertal changes, emotional vulnerability and sensation-seeking behaviour have been shown to promote alcohol use in adolescents who are transitioning to high school.[2,3] Using data from the Mental Health Supplement of the Ontario Health Survey, DeWit and colleagues[4] demonstrated associations between early age at first use of alcohol and development of lifetime alcohol abuse and dependence at 10 years since first use of alcohol. Survival analyses showed that respondents who had their first drink of alcohol between ages 13 and 14 were five times more likely to develop alcohol abuse than those who started to drink at 19 years or older.[4] Respondents who reported first drinking between ages 11 and 12 were over nine times more likely to develop alcohol dependence than those who started to drink at 19 years or older.[4]

Binge drinking, or the consumption of five or more alcoholic drinks on one occasion,[5] has been associated with lower academic performance and other risk behaviours including smoking and the use of illicit drugs.[6] Data from the Canadian Community

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Health Survey showed that, of youth aged between 12 and 17 years, 4.2% (n = 94300) reported engaging in heavy drinking in 2017, and 3.4% (n = 77100) reported engaging in heavy drinking in 2018.[7] Data from the Youth Risk Behaviour Survey further suggested that while binge drinking rates were similar among girls and boys, rates rose with increasing age and grade level.[6] Binge drinking during adolescence has also been predictive of binge drinking into early adulthood. Data from the National Longitudinal Survey of Youth indicated that binge drinking between 17 and 20 years of age increased the relative risk of binge drinking between 30 and 31 years of age by over twofold for males and over threefold for females.[8] Mixing of alcohol with energy drinks has also been associated with increased alcohol intake per drinking occasion,[9] and is deemed a strong indicator of risk-taking behaviour among youth.[10] Additional studies have shown associations between early adolescent alcohol use and alcohol-related injuries,[11] as well as increased likelihood of alcohol dependence later in life.[12]

Other indicators of health status also compound early initiation of alcohol use in youth. Findings from the first cycle of the COMPASS Host Study showed that students who smoked were 61% more likely to use alcohol and had a twofold increased likelihood of binge drinking, while students who used marijuana had a tenfold increased likelihood of using alcohol and a twelvefold increased likelihood of binge drinking.[13] Students who were physically active according to Health Canada guidelines were also 29% more likely to use alcohol and 35% more likely to engage in binge drinking, suggesting a strong influence of schools' sporting culture on alcohol use behaviours among youth.[13] There was no difference in likelihood of current alcohol use or current binge drinking between males and females.[13] From a resilience perspective, resources that protect against youth binge drinking can be grouped into factors that include the strength of personal relationships[14] and school structure.[15]

The goal of the current study was to gain knowledge about youth who use alcohol, specifically on predictors of their alcohol use and related behaviours within the current policy environment. To our knowledge, this paper is the first to investigate whether age at first alcohol use predicts current alcohol use, binge drinking or mixing of alcohol with energy drinks among a large sample of Canadian youth.

Methods

Study description

The COMPASS Host Study is a prospective cohort study (2012 to 2021) designed to collect data from a convenience sample of Canadian secondary schools and the students between Grades 9 and 12 who attend these schools. Annual student-level assessments are made on rates of alcohol use, marijuana and tobacco use, obesity, school connectedness, bullying, academic achievement and mental health via the COMPASS Student Questionnaire, described elsewhere.[16] Comprehensive details on the COMPASS Host Study, including sampling, data collection and linkage process, are available online (www.compass.uwaterloo.ca). Ethics approval for this study was obtained from the University of Waterloo's Office of Research Ethics (ORE # 17264) and respective school boards.

Sample

In our investigation, we used data from Ontario Grade 12 students in year 1 (2012) through year 6 (2017) of the COMPASS Host Study. The inclusion criteria comprised all English-speaking school boards that had secondary schools with Grades 9 through 12 and a student population of at least 100 students or greater per grade level; had schools that operated in a standard school/classroom setting; and permitted the use of active-information passive-consent parental permission protocols.[16] We approached all school boards meeting the inclusion criteria.

There were 5699 participating Grade 12 students (from 43 schools) in year 1; 9370 (from 79 schools) in year 2; 8322 (from 78 schools) in year 3; 8046 (from 72 schools) in year 4; 7146 (from 68 schools) in year 5; and 6505 (from 61 schools) in year 6. Study participation rates in each year ranged from 78% to 82%, with the primary reasons for non-response being absenteeism or scheduled spare at the time of survey. Students with missing data on any of the study variables were removed, resulting in a final sample of 4813 Grade 12 students in year 1; 7749 in year 2; 6736 in year 3; 6470 in year 4; 5685 in year 5; and 5389 in year 6.

Measures

Demographics, alcohol use behaviours and risk factors were queried via the COMPASS Student Questionnaire. To assess sex, students were asked, "Are you female or male?" To assess ethnicity, students were asked, "How would you describe yourself?" Responses were grouped as: *White* for "White"; and *non-White* for "Black" or "Asian" or "Off-Reserve Aboriginal" or "Latin American/Hispanic" or "Mixed/Other." To assess levels of school connectedness, we used a six-item derived measure. These items assessed students' agreement with the following statements, as previously reported:[15] "I feel close to people at my school"; "I feel I am part of my school"; "I am happy to be at my school"; "I feel the teachers at my school treat me fairly"; "I feel safe in my school"; and "Getting good grades is important to me." Scores range between 6 and 24, with higher scores indicating higher levels of school connectedness. Cronbach's α for this measure was 0.83.

To assess age at first alcohol use, students were asked, "How old were you when you first had a drink of alcohol that was more than a sip?" Responses were grouped as: age 8 years or younger; 9–10 years; 11–12 years; 13–14 years; 15–16 years; 17 years; and 18 years or older. To assess alcohol use, students were asked, "In the last 12 months, how often did you have a drink of alcohol that was more than just a sip?" Responses were grouped in three categories: *Current* for "Once a month" or "2 or 3 times a month" or "Once a week" or "2 to 3 times a week" or "4 to 6 times a week" or "Every day"; *Non-current* for "I did not drink alcohol in the last 12 months" or "I have only had a sip of alcohol" or "Less than once a month"; and *Never* for "I have never drunk alcohol." To assess binge drinking behaviour, students were asked, "In the last 12 months, how often did you have 5 drinks of alcohol or more on one occasion?" Responses were grouped as: *Current* for "Once a month" or "2 to 3 times a month" or "Once a week" or "2 to 5 times a week" or "Daily or almost daily"; *Non-current* for "I did not have 5 or more drinks on one occasion in the last 12 months" or "Less than once a month"; and *Never* for "I have never done this." To assess mixing of alcohol with energy drinks, students were asked, "In the last 12 months, have you had alcohol mixed or pre-mixed with an energy drink (such as Red Bull, Rock Star,

Monster or another brand)?" Responses were grouped as: *Current* for "Yes"; *Non-current* for "I did not do this in the last 12 months"; and *Never* for "I have never done this."

To assess smoking status, students were asked, "On how many of the last 30 days did you smoke one or more cigarettes?" Responses ranged from "None" to "30 days (every day)" and were grouped in two categories: *Current smoker* for responses ranging from 1 to 30 days; and *Non-smoker* for a response of 0 days. To assess marijuana use, students were asked, "In the last 12 months, how often did you use marijuana or cannabis?" Responses were grouped in three categories: *Current* for "Once a month" or "2 or 3 times a month" or "Once a week" or "2 to 3 times a week" or "4 to 6 times a week" or "Every day"; *Non-current* for "I have used marijuana but not in the last 12 months" or "Less than once a month"; and *Never* for "I have never used marijuana." To assess levels of physical activity, students were queried on how many minutes of hard and moderate physical activity they did on each of the last seven days. Following the Canadian Society for Exercise Physiology 24-hour movement guidelines, students who completed at least 60 minutes of moderate and/or hard physical activity on each day in the past seven days were classified as *Meeting physical activity guidelines*, while students who completed less than 60 minutes of activity in the past seven days were classified as *Not meeting physical activity guidelines*.

Statistical analyses

We used descriptive statistics to show the distribution of the study variables. Marginal logistic regression using generalized estimating equations (GEE) models were then used to examine whether age at first alcohol use influences current versus non-current alcohol use, binge drinking and mixing of alcohol with energy drinks in the last 12 months among students who drink. Full models were fitted for each outcome. All models controlled for sex (male/female), ethnicity (White or non-White), school connectedness, year of data collection, smoking status, marijuana use and physical activity level, and accounted for within-school clustering.

We fitted GEE models using the SAS PROC GEE procedure with a binomial distribution and a logit function. All models used an exchangeable working correlation structure based on the results of initial analyses. We used empirical standard error estimates to calculate confidence intervals and test statistics. Analyses were conducted using the statistical software package SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

Demographics

As shown in Table 1, the most frequently reported age at first alcohol use was between ages 15 and 16 years; proportions ranged between 31.0% and 34.0% across years. An average of 24.5% of Grade 12 students reported an age at first alcohol use between 13 and 14 years of age, while an average of 4.5% reported an age at first use of 8 years of age or younger across years. Among Grade 12 students, prevalence of current alcohol use ranged between 45.0% and 53.0% across years (Figure 1). Prevalence of current alcohol use increased modestly in 2013 ($p = .003$), and steadily declined between 2013 and 2017 ($p < .001$). As shown in Table 2 and Figure 2, prevalence of current binge drinking ranged between 29.0% and 38.0% across years, with steady declines from 2013 to 2017 ($p < .05$). Prevalence of mixing alcohol with energy drinks was highest in 2012 at 26.0%, and steadily declined across years to 17.0% in 2017 ($p < .001$), as shown in Table 2 and Figure 3. Students reported school connectedness scores between 18.0 ± 3.5 and 18.3 ± 3.5 across years (Table 1).

Alcohol use

Compared to students reporting an age at first alcohol use of 18 years or older, students reporting an age at first alcohol use between 13 years and 14 years (odds ratio [OR] 2.80, 95% CI: 2.26–3.45), 11 years and 12 years (OR 2.86, 95% CI: 2.29–3.56), and 8 years or less (OR 3.54, 95% CI: 2.83–4.43) had an increased likelihood of current versus non-current alcohol use (Table 3). For every 1-unit increase in school connectedness, there was an associated 5% increase in likelihood of current alcohol use versus non-current alcohol use (OR 1.05, 95% CI: 1.04–1.06). Boys were more likely to report current versus non-current alcohol use over girls (OR 1.20, 95% CI: 1.12–1.28).

Binge drinking

As shown in Table 3, compared to students with an age at first alcohol use of 18 years or older, students reporting an age at first alcohol use of 16 years or younger were more likely to report current binge drinking over non-current binge drinking (ages 15 to 16 years, OR = 1.97, 95% CI: 1.51–2.55; ages 13 to 14 years, OR = 3.22, 95% CI: 2.45–4.25; ages 11 to 12 years, OR = 2.96, 95% CI: 2.27–3.87; ages 9 to 10 years, OR = 3.36, 95% CI: 2.49–4.54; ages 8 years or younger, OR = 3.99, 95% CI: 2.97–5.37). Boys were more likely to report current binge drinking over non-current binge drinking compared to girls (OR = 1.32, 95% CI: 1.24–1.40). For every 1-unit increase in school connectedness, there was a 3% increase in likelihood of current over non-current binge drinking (OR = 1.03, 95% CI: 1.02–1.04). Students were less likely to report current versus non-current binge drinking between 2015 and 2017, compared to the baseline year of 2012 (2015, OR = 0.82, 95% CI: 0.71–0.94; 2016, OR = 0.81, 95% CI: 0.71–0.93; 2017, OR = 0.68, 95% CI: 0.60-0.78).

Mixing alcohol with energy drinks

Compared to students reporting an age at first alcohol use of 18 years or older, students reporting an age at first alcohol use of 8 years or younger had a twofold increase in the likelihood of current versus non-current mixing of alcohol with energy drinks (OR = 2.26, 95% CI: 1.23–4.14); see Table 3. Boys were more likely to report current versus non-current mixing of alcohol with energy drinks over girls (OR = 1.25, 95% CI: 1.13–1.39). Non-White students were more likely to report current versus non-current mixing of alcohol with energy drinks compared to White students (OR = 1.15, 95% CI: 1.02–1.29). School connectedness did not influence likelihood of current versus non-current mixing of alcohol with energy drinks. Students were less likely to report current versus non-current mixing of alcohol with energy drinks between 2013 and 2017, compared to the baseline year of 2012 (2013, OR = 0.74, 95% CI: 0.63–0.87; 2014, OR = 0.74, 95% CI: 0.63–0.87; 2015, OR = 0.72, 95% CI: 0.61–0.85; 2016, OR = 0.68, 95% CI: 0.58–0.80; 2017, OR = 0.80, 95% CI: 0.66–0.96); see Table 3.

TABLE 1
Demographics of Ontario Grade 12 student respondents in the COMPASS Host Study between 2012 and 2017

		2012		2013		2014		2015		2016		2017	
		N = 4813		N = 7749		N = 6736		N = 6470		N = 5685		N = 5389	
		n	%	n	%	n	%	n	%	n	%	n	%
Sex	Girls	2430	50	3916	51	3477	52	3251	50	2938	52	2727	51
	Boys	2383	50	3833	49	3259	48	3219	50	2747	48	2662	49
Ethnicity	White	3844	80	6237	80	5392	80	5021	78	4437	78	4085	76
	Non-White[a]	969	20	1512	20	1344	20	1449	22	1248	22	1304	24
Age at first use of alcohol	≤ 8 years	217	5	329	4	324	5	300	5	238	4	222	4
	9–10 years	107	2	235	3	152	2	173	3	140	2	121	2
	11–12 years	307	6	451	6	371	6	357	6	335	6	249	5
	13–14 years	1252	26	1978	26	1664	25	1535	24	1319	23	1251	23
	15–16 years	1545	32	2639	34	2217	33	2059	32	1747	31	1754	33
	17 years	218	5	367	5	329	5	327	5	290	5	269	5
	≥ 18 years	47	1	55	1	48	1	67	1	61	1	59	1
	Only a sip/never	1120	23	1695	22	1631	24	1652	26	1555	27	1464	27
Alcohol use in past 12 months	Current	2455	51	4102	53	3323	49	3155	49	2669	47	2449	45
	Non-current	1803	37	2676	35	2422	36	2247	35	2019	36	2007	37
	Never	555	12	971	13	991	15	1068	17	997	18	933	17
Binge drinking in past 12 months	Current	1783	37	2940	38	2359	35	2189	34	1830	32	1584	29
	Non-current	1488	31	2372	31	2087	31	2005	31	1715	30	1720	32
	Never	1542	32	2437	31	2290	34	2276	35	2140	38	2085	39
Mixing alcohol with energy drinks in past 12 months	Current	1270	26	1817	23	1437	21	1290	20	971	17	907	17
	Non-current	446	9	814	11	634	9	556	9	451	8	358	7
	Never	3097	64	5118	66	4665	69	4624	71	4263	75	4130	77
Smoking status	Current	695	14	1188	15	1002	15	1059	16	885	16	759	14
	Non-smoker	4118	86	6561	85	5734	85	5411	84	4800	84	4630	86
Marijuana use	Current	1084	23	1772	23	1557	23	1488	23	1308	23	1307	24
	Non-current	1162	24	1850	24	1541	23	1480	23	1256	22	1262	23
	Never	2567	53	4127	53	3638	54	3502	54	3121	55	2820	52
Meeting physical activity guidelines	Yes	2142	45	3458	45	3039	45	2992	46	2601	46	2193	41
	No	2671	55	4291	55	3697	55	3478	54	3084	54	3196	59
School connectedness[b]	Mean (SD)	18.3 (3.2)		18.2 (3.3)		18.2 (3.5)		18.3 (3.5)		18.0 (3.5)		18.0 (3.6)	

[a] Refers to Black, Asian, Off-Reserve Aboriginal, Latin American/Hispanic, and Other/Mixed.

[b] Scores range from 6 to 24, with higher scores indicating higher levels of school connectedness.

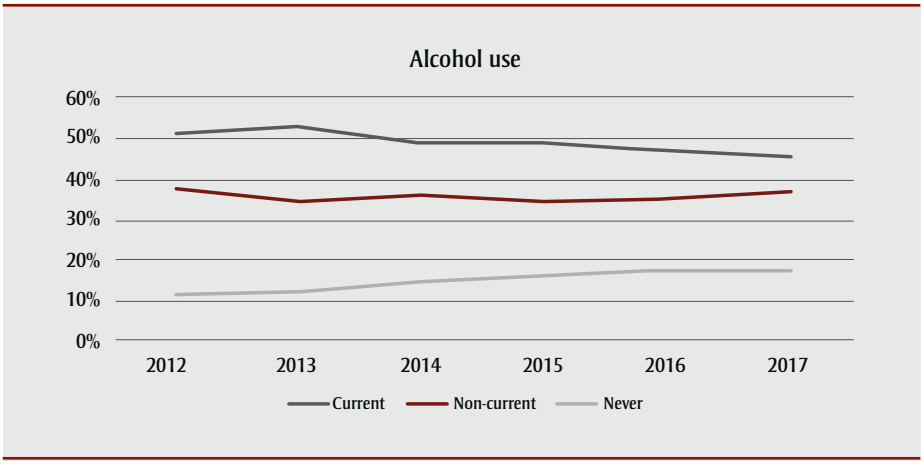
Other indicators of risk

Students who reported current smoking had an increased likelihood of current versus non-current alcohol use (OR = 2.15, 95% CI: 1.93–2.39), current versus non-current binge drinking (OR = 2.37, 95% CI: 2.15–2.60), and current versus non-current mixing of alcohol with energy drinks (OR = 1.57, 95% CI: 1.41–1.76), compared to non-smoking students. Current marijuana users had an increased likelihood of current versus non-current alcohol use (OR = 3.83, 95% CI: 3.49–4.21), current versus non-current binge drinking (OR = 4.12, 95% CI: 3.80–4.48), and current versus non-current mixing of alcohol with energy drinks (OR = 1.54, 95% CI: 1.37–1.73), compared to students who never used marijuana. Physically active students had an increased likelihood of current versus non-current alcohol use (OR = 1.31, 95% CI: 1.24–1.39), and current versus non-current binge drinking (OR = 1.38, 95% CI: 1.30–1.46), compared to relatively inactive students.

Discussion

Our study shows associations between age at first alcohol use and current alcohol use and related behaviours among a large sample of Ontario Grade 12 students. Students who reported first drinking alcohol between ages 13 and 14 years were nearly 3 times more likely to engage in drinking alcohol, and over 3 times more likely to binge drink, compared to those who reported first drinking at age 18 or older. Students who reported first drinking

FIGURE 1
Prevalence of alcohol use among Ontario Grade 12 students in the COMPASS Host Study, 2012–2017



alcohol at age 8 years or younger were 3.5 times more likely to engage in drinking alcohol, nearly 4 times more likely to binge drink, and over 2 times more likely to engage in mixing alcohol with energy drinks than those who reported first drinking at age 18 or older. As evidenced elsewhere,[4] the younger students were at the time of their first use of alcohol, the more likely they were to display current alcohol use and maladaptive patterns of use upon transition to adulthood. While Miller and colleagues[6] showed similar rates of binge drinking among boys and girls in high school, results from the present study showed that boys in Grade 12 were more likely to engage in binge drinking and mixing of alcohol with energy drinks than girls. As indicated in previous work,[13] students who smoked, used marijuana and were physically active were more likely to use alcohol, display binge drinking, and engage in mixing alcohol with energy drinks. Moreover, increasing levels of school connectedness among these Grade 12 students were found to increase likelihood of drinking alcohol and binge drinking, indicating the potential influence of peer drinking networks within the school environment.[2] Our study also showed that physically active Grade 12 students and Grade 12 students with higher levels of school connectedness were more likely to use alcohol and binge drink. While resilience frameworks have shown associations between measures of school connectedness and alcohol use behaviours among youth,[6,17,18] we hypothesize that such associations may show a nonlinear, U-shaped relationship. Consistently high school connectedness may be indicative of other factors, such as involvement in school sports,[19] which has been linked to increased likelihood of alcohol use.[13,15]

Prevalence of current alcohol consumption was relatively high among the sample of Grade 12 students, with rates above 45% across years. Prevalence of current binge drinking among these students was also relatively high, with rates fluctuating between 29% and 38% across years. Modest declines in rates of binge drinking from 2012 through 2017 may be attributed to relative increases in students who reported never binge drinking, as the proportion of students reporting non-current binge drinking remained stable. While not evaluative, declines in binge drinking rates have paralleled emphasis on municipal alcohol policies by Public Health Ontario,[20] along with a focus on alcohol-related injuries by the Alcohol Locally Driven Collaborative Project (LDCP) Team.[21]

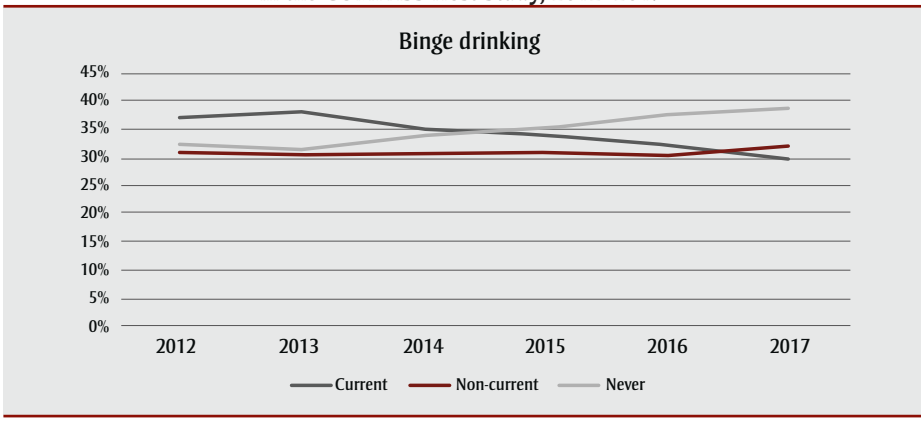
Mixing of alcohol with energy drinks has been considered a marker for risk-taking behaviour,[10] with a meta-analysis showing that consumers who combined alcohol with energy drinks over alcohol alone tended to consume more alcohol per drinking occasion.[9] Health Canada regulations for food and natural products manufacturers stipulates labelling of energy drinks with text including "not recommended for children" and "do not mix with alcohol." The deadline for compliance with this labelling regulation was

TABLE 2
Prevalence of alcohol use, binge drinking, and mixing of alcohol with energy drinks in the past 12 months among Ontario Grade 12 students in the COMPASS Host Study, 2012–2017

		2012 (%)	2013 (%)	*p*-value[a]	2014 (%)	*p*-value[a]	2015 (%)	*p*-value[a]	2016 (%)	*p*-value[a]	2017 (%)	*p*-value[a]
Alcohol use in past 12 months	**Current**	51	53		49		49		47		45	
	Non-current	37	35	.003	36	< .001	35	< .001	36	< .001	37	< .001
	Never	12	13		15		17		18		17	
Binge drinking in past 12 months	**Current**	37	38		35		34		32		29	
	Non-current	31	31	.592	31	.040	31	< .001	30	< .001	32	< .001
	Never	32	31		34		35		38		39	
Mixing alcohol with energy drinks in past 12 months	**Current**	26	23		21		20		17		17	
	Non-current	9	11	< .001	9	< .001	9	< .001	8	< .001	7	< .001
	Never	64	66		69		71		75		77	

[a] *p*-value is for test of difference versus baseline 2012 year.

FIGURE 2
Prevalence of binge drinking among Ontario Grade 12 students in the COMPASS Host Study, 2012–2017

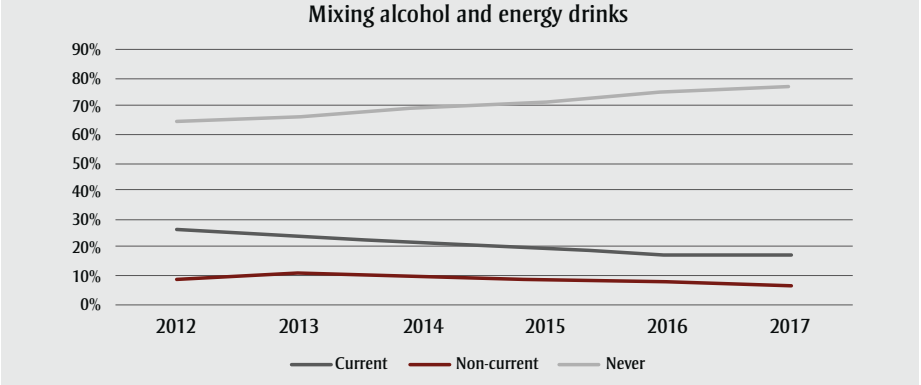


December 2013. Prevalence of mixing alcohol with energy drinks among Grade 12 students was below 30% in 2012 and steadily declined thereafter. Natural experiments would show whether the decline could have resulted from this policy; regardless, a near 10% decrease in prevalence across six years shows promise for future cross-sectoral strategies for prevention and cessation programming.[22]

Strengths and limitations

Our study utilized a large sample of Grade 12 students from a convenience sample of schools in the province of Ontario. COMPASS is a prospective cohort study (2012 to 2021) collecting data from a convenience sample of secondary schools and the students between Grades 9 and 12 who attend these schools. COMPASS utilizes purposive sampling for recruitment of participating schools from different geographical regions.[16] While this approach may impact external validity, data are comparable with other large-scale surveys on alcohol use and binge drinking prevalence among Canadian youth—namely, the Canadian Community Health Survey (2009/2010) and the Canadian Alcohol and Drug Monitoring Survey[23] and the Canadian Student Tobacco, Alcohol and Drugs Survey.[24] Data from the COMPASS Host Study's student questionnaire are self-reported, and though bias may have been introduced through self-report, this method provides an emic representation of students' health behaviours. The data collection procedures further limit social desirability bias by using an active-information, passive-consent permission approach, which has been found to maintain confidentiality and minimize underreporting.[25] While the repeat cross-sectional design of our study also accounts for changes in the sample over time, interpretation of findings may only be relevant to a substantive proportion of Grade 12 students.

FIGURE 3
Prevalence of mixing of alcohol with energy drinks among Ontario Grade 12 students in the COMPASS Host Study, 2012–2017



Conclusion

There is a high prevalence of alcohol use among Grade 12 students in Ontario, with relative stability across a six-year time period. Binge drinking rates peaked and modestly declined across years, while mixing of alcohol with energy drinks generally decreased across years. An age at first alcohol use of 14 years or younger predicted current alcohol use among Grade 12 students. An age at first alcohol use of 16 years or younger predicted current binge drinking, while an age at first use of 12 years or younger predicted mixing of alcohol with energy drinks among Grade 12 students. Findings indicate a need for novel approaches for alcohol prevention and cessation programming for youth.

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Conflicts of interest

The authors have no conflicts of interest to report.

Authors' contributions and statement

SH conceptualized the study and wrote the manuscript. KB conducted the data analyses. SL designed the survey and collected the study data. All authors contributed to the interpretation of the findings and development of manuscript drafts, and approved the final version of the manuscript.

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

TABLE 3
GEE binomial logistic regression models examining the influence of age at first use of alcohol on current versus non-current alcohol use, binge drinking, and mixing of alcohol with energy drinks in the past 12 months among Ontario Grade 12 students in the COMPASS Host Study who drink, 2012–2017

		Current vs. non-current[a] alcohol use (n = 27 725)			Current vs. non-current[a] binge drinking (n = 24 072)			Current vs. non-current[a] mixing of alcohol with energy drinks (n = 10 506)		
		OR	95% CI		OR	95% CI		OR	95% CI	
			Lower	Upper		Lower	Upper		Lower	Upper
Sex	Girls									
	Boys	1.20	1.12	1.28	1.32	1.24	1.40	1.25	1.13	1.39
Ethnicity	White									
	Non-White	0.81	0.75	0.88	0.94	0.84	1.05	1.15	1.02	1.29
Year of collection	2012									
	2013	1.04	0.91	1.17	0.99	0.87	1.14	0.74	0.63	0.87
	2014	0.89	0.80	0.99	0.87	0.77	0.99	0.74	0.63	0.87
	2015	0.90	0.80	1.00	0.82	0.71	0.94	0.72	0.61	0.85
	2016	0.89	0.79	0.99	0.81	0.71	0.93	0.68	0.58	0.80
	2017	0.80	0.69	0.93	0.68	0.60	0.78	0.80	0.66	0.96
Age at first use of alcohol	≥ 18 years									
	≤ 8 years	3.54	2.83	4.43	3.99	2.97	5.37	2.26	1.23	4.14
	9–10 years	2.81	2.15	3.67	3.36	2.49	4.54	1.39	0.75	2.59
	11–12 years	2.86	2.29	3.56	2.96	2.27	3.87	1.73	0.97	3.10
	13–14 years	2.80	2.26	3.45	3.22	2.45	4.25	1.51	0.85	2.68
	15–16 years	1.69	1.39	2.06	1.97	1.51	2.55	1.43	0.80	2.53
	17 years	0.73	0.60	0.90	0.93	0.69	1.27	1.48	0.81	2.69
Smoking status	Non-smoker									
	Current	2.15	1.93	2.39	2.37	2.15	2.60	1.57	1.41	1.76
Marijuana use	Never									
	Non-current	1.90	1.76	2.05	2.01	1.89	2.14	1.13	1.01	1.27
	Current	3.83	3.49	4.21	4.12	3.80	4.48	1.54	1.37	1.73
Meeting physical activity guidelines	No									
	Yes	1.31	1.24	1.39	1.38	1.30	1.46	1.06	0.96	1.16
School connectedness[b]		1.05	1.04	1.06	1.03	1.02	1.04	0.99	0.98	1.00

Abbreviations: GEE, generalized estimating equation; OR, odds ratio.

Note: Reference categories are "Girls," "White," "2012," "≥ 18 years of age," "Non-smoker," "Never" and "No."

[a] Never users were excluded.

[b] Scores range from 6 to 24, with higher scores indicating higher levels of school connectedness.

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