Abstract

Background: Alcohol use in early adolescence is associated with increased health concerns and other negative consequences. Given the needs of this vulnerable population, it is critical to understand their risk factors and clinical characteristics. Objective: This cross-sectional study explores the clinical and demographic characteristics of service-seeking youth with and without early alcohol use onset. Method: 655 youth seeking services at a Canadian substance use and concurrent disorder service participated. Evaluations of mental health, substance use, demographic characteristics, and other risk factors were collected and compared among youth who reported an age of onset for alcohol use of under 14 years of age versus 14 years or older. Results: Youth who started using alcohol before age 14 were significantly more likely to report mental health difficulties, indicate use of a greater number of substances, and report experiencing more crime and violence problems. They also reported exposure to more types of trauma. Notably, more problems with crime and violence were significantly, and uniquely associated with an earlier age of alcohol use onset in a multivariate model. Conclusion: The present study identifies unique and clinically significant differences among youth who initiated alcohol use in early adolescence compared to later in adolescence. Stronger integrations between mental health and substance use services for youth with early alcohol use should be considered, given the vulnerability and concurrent difficulties they tend to face.

Key Words: youth, alcohol, mental health, substance use, age of onset
Introduction

Alcohol is among the most commonly used substances by adolescents (1). Over a quarter of 15-19-year-olds worldwide are considered current drinkers (2). As reported by the World Health Organization (2), among youth aged 15-19 years of age, the Region of the Americas has the second highest prevalence rate of current alcohol users. Moreover, results from the Canadian Student Tobacco, Alcohol and Drugs Survey in 2018-19 found alcohol remains the most frequently used substance among Canadian students from grades 7-12, with 44% of students using alcohol (3). The mean age at first use of alcohol among grades 7 to 12 students in Canada was 13.4 years (4). It is well established that alcohol use among youth is associated with several negative consequences, such as academic difficulty (5), illicit substance use (6), violence, and other harmful behaviours (7). This serves as a cause for concern, given that the literature suggests the risks and potential consequences of drinking are magnified among youth (8).

Adolescence is a neurodevelopmental period marked by heightened vulnerability whereby alcohol consumption may present unique developmentally contextualized risks (9). Research suggests early alcohol use, prior to 18 years of age is associated with a susceptibility for deficits in neuropsychological performance (10) including damage to memory, impulse control, and the development of cognitive-behavioural abilities (11). Furthermore, alcohol use in adolescence has been found to be associated with high-risk behaviours, including unprotected sexual activities and driving under the influence of alcohol (11). Research suggests alcohol use by youth between the ages of 15-18 is associated with a 281% increase in the number of self-reported issues the morning after drinking, including getting into trouble with parents or police, engaging in verbal or physical violence, and risky sex in comparison to adolescents with no substance use (12). An earlier alcohol onset is positively correlated with alcohol intoxication, which in turn is associated with heavier drinking among adolescents in comparison to those with a later alcohol onset (13). The likelihood of developing alcohol-related problems, such as lifetime alcohol abuse and dependence, increases the earlier an adolescent initiates alcohol use (14).

The presence of a prior mental health disorder in adolescents has been linked to alcohol initiation as well as problematic alcohol use (15). Research suggests that adolescents receiving mental health care are more likely to have alcohol and drug use problems than the general adolescent population (16). Moreover, alcohol use and mental health factors predict suicidal behavior among adolescent outpatients with depression (17). Furthermore, adolescent outpatients with alcohol and drug abuse or dependence have a significantly greater risk for psychiatric conditions in comparison to adolescents without a substance use disorder (18). Externalizing behavioural problems, such as aggression, appear to be strongly associated with alcohol use in adolescence as well as into adulthood (19-23). Findings from research regarding the link between internalizing behaviours and alcohol use are inconsistent (24, 25). Several studies suggest internalizing symptoms are a predictor of later alcohol use problems (26, 27); however, this association may be accounted for through shared variance with externalizing symptoms (28). With respect to polysubstance use, several studies suggest an association between alcohol and other substance use, such as cannabis and tobacco (29, 30).

It is well established that trauma during childhood or adolescence is associated with later alcohol use problems (31-33). For instance, a study by Schwandt, Heilig, Hommer, George, Ramchandani (34) found among people who were dependent on alcohol, childhood trauma was significantly more severe and prevalent when compared to healthy controls. Research suggests that higher stress resiliency is associated with less alcohol use and fewer alcohol-related problems, such as risky alcohol consumption and alcohol dependence later in life (32, 35). This suggests that higher levels of resiliency in adolescence may serve as a protective factor against later alcohol problems, although more...
research needs to be conducted to clarify the relationship (32).

The current study explores the clinical and sociodemographic characteristics of service-seeking youth with and without early-onset alcohol use. Early age of alcohol initiation was identified as under 14 years of age, as age 14 represents the typical transition to secondary education in the province of Ontario, Canada. Increasing knowledge of substance use service seeking youth with varied alcohol use characteristics in regards to internalizing and externalizing disorders, violence, polysubstance use, resiliency, and trauma will help to enhance understanding of the service needs of youth and young adults using alcohol.

Methods

Participants

All participating individuals were recruited from an outpatient treatment service at the Youth Addictions and Concurrent Disorder Service at the Centre for Addiction and Mental Health (CAMH) located in Toronto, Canada. Youth were referred to the outpatient treatment service by family, physicians, other community organizations, or through self-referrals. The service provides treatment for youth aged 14-24 with substance use problems with or without concurrent mental health issues. All participants provided written informed consent for the use of their data for research purposes (72.5% of all patients treated during this study period consented to research) during a service orientation session between 2013-2019. To be included in the current study, participants indicated use of alcohol on at least one occasion and provided an age of onset for alcohol: 65.8% of youth who consented to research met these criteria. The total sample size was N = 655. The study was approved by the Research Ethics Board of the Centre for Addiction and Mental Health in Toronto, Ontario, Canada.

Measures

Demographic information was collected from each participant, including age, ethnicity, employment, sex, education status, justice system involvement, and current housing situation using a questionnaire. Demographic information was assessed using the following categories. Ethnicity was collected using 15 categories (e.g., Aboriginal, Black, Arab, Chinese, Filipino, Japanese, Korean, Latin American, South Asian, Southeast Asian, West Asian, White/European, Other, Don’t know, Mixed). Sex was divided into 4 categories (e.g., Male, Female, Transgender, and Other). Education status was collected using 16 categories (e.g., Grade 8 or less, Grade 9 or 10, Grade 11, High school completed without diploma, High school with diploma, Non-university certificate from college, Bachelor’s degree, Master’s degree). Legal system involvement was separated into three categories (e.g., Never, Yes in the past 12 months, Yes more than a year ago). Lastly, current housing situation was divided into 12 sections (e.g., Own apartment/home, With parent(s)/family home, Share place with friends/peers, Rooming/boarding house, Supportive/transitional housing, Shelter, Street, Other). Each participant also filled out questionnaires assessing mental health and substance use, which were administered during the service orientation session. Youth were identified as having N.E.E.T (not in employment, education, or training) status based on demographic data. Participants were identified with a precarious or institutional housing status, if participants indicated living in a rooming or boarding house, supportive/transitional housing, group home, foster care, treatment facility, shelter, couch surfing, or living on the street (36).

Adolescent Alcohol and Drug Involvement Scale (AADIS). This is a reliable and valid standardized screening tool which assesses frequency of substance use by youth, using a scale ranging from 0 (never used) to 7 (several times a day) (37, 38). The tool screens for 11 substances: alcohol, cannabis, tobacco, hallucinogens, opiates, barbiturates, rock cocaine, powder cocaine, amphetamines, inhalants, and benzodiazepines. Inhalants, barbiturates, and rock cocaine were omitted from analyses as a result of low frequency use, which limited variability (cell sizes < 7). Responses were collapsed for analysis based on ratings endorsed per substance. A question was added to the scale to identify age of onset for each substance tried. In the current sample, the Cronbach’s alpha for the total AADIS score across all assessed substances was 0.72.

Global Appraisal of Individual Needs – Short Screener (GAIN-SS). The 20-item GAIN-SS version 2.0 was developed based on the GAIN-Initial (39, 40). The Short Screener assesses the likelihood of meeting diagnostic criteria for a disorder within a given category across four domains, including internalizing disorders (e.g., depression, anxiety), externalizing disorders (e.g., conduct disorder, ADHD), and substance use disorders, or having crime/violence concerns. Respondents indicate presence and recency of symptoms, from 0 (never), to 3 (past month). For the current analyses, past year (including past month) symptoms were used. Scores on each scale range from 0-5 and are determined based on the number of symptoms a participant endorsed the previous year. Youth were considered to have a high likelihood for a diagnosis if three or more items in a given subscale were applicable in the previous year. An additional 7 items were added to the measure with permission from the Chestnut Health Systems (41). The 7 added items screen...
for traumatic stress (1 item), distorted thinking (2 items), excessive internet or videogame use (1 item), gambling issues (1 item), and eating concerns (2 items). In the current sample, the Cronbach’s alphas for the GAIN-SS subscales were 0.75, 0.69, 0.76, and 0.65 for internalizing, externalizing, substance use disorder, and crime/violence problems respectively. The Cronbach’s alpha for the total GAIN-SS scale score, including the additional items, was 0.86.

**Trauma History Screen (THS).** This screening tool inquires whether participants have experienced any of the 13 forms of traumatic experiences and “other” traumatic events (42). To better adapt the scale to adolescents, the item referring to military trauma was removed and two items were added, assessing bullying during adolescence and childhood (43). For this study, the trauma variable represents the count of different types of trauma that a participant endorses (0-15). In the current sample, the Kuder-Richardson 20 for the total THS scale score in its version used in this study was 0.78.

**Child and Youth Resilience Measure (CYRM).** This 28-item tool assesses social-cognitive resilience factors of children and youth (44). The measure consists of three subscales, assessing individual resilience factors including peer support, personal and social skills (e.g., “I know where to go in my community to get help.”), their relationships with primary caregivers (e.g., “I feel safe when I am with my caregiver(s).”), and the degree to which contextual factors, such as education, culture, and spiritual beliefs facilitate a sense of belonging (e.g., “I feel I belong at my school.”) Items are rated using a 5-point Likert scale. In the current sample, the Cronbach’s alpha for the CYRM subscales was 0.82, 0.82, and 0.73 respectively. Additionally, the Cronbach’s alpha for the total CYRM scale score was 0.90.

**Analyses**

Age of first use of alcohol was dichotomized as less than 14 years of age and 14 years of age or more. Chi-square analyses were conducted to compare participants in different age-of-onset categories on their demographic characteristics. A multiple logistic regression analysis was carried out independently for each of the different substance use variables. Substance use patterns regarding daily or near daily use of substances, as reported on the AADIS, were predicted. Information regarding duration of alcohol use was controlled for due to differences found between alcohol age of onset groups. Sex was controlled for given existing sex differences in alcohol use behaviours (45). Additionally, ethnicity and NEET status were controlled for based on differences identified in previous literature (46, 47). Due to small cell sizes, immigration and housing status were not controlled for. ANCOVAs were conducted to investigate the relationship between alcohol age of onset and GAIN-SS domains, CYRM subscales, and THS, while controlling for duration of use, sex, NEET, and ethnicity; logistic regressions were used for the GAIN-SS extension items. Approximately three quarters of participants in the sample completed at least one of the three subscales of the CYRM (75.73%). Scales had minimal missing item-level data. Mean scores minimized the impact of missing data since scales were pro-rated for up to 50% of item level missingness. Checklist total scores may under estimate actual participant scores due to some missing item-level data.

Lastly, an exploratory multivariate logistic regression analysis was carried out to identify statistical predictors of age of first alcohol use, which was treated as a categorical variable with a cutoff of 14 years of age. In block 1, sex, duration of use, NEET, and ethnicity were entered as control variables. In block 2, variables characterized as significant in between-group comparisons were incorporated. A collinearity diagnosis revealed that none of the variables were highly correlated. Pairwise deletions were conducted, and a False Discover Rate (FDR) correction was used for multiple comparisons; with 6 test variables, significance was determined at p < 0.0204 (48). IBM SPSS statistics was used to conduct statistical analyses (49).

**Results**

**Demographic Characteristics**

Demographic characteristics of the sample are presented in Table 1. Of the 655 youth in the sample, 239 (36.5%) endorsed having started using alcohol before the age of 14. The mean age for initiating alcohol use for youth under 14 years of age was 11.90, SD = 1.62, and 15.24 years of age for youth initiating at age 14 and over, SD = 1.38. The overall mean age for first alcohol use in this sample was 14.02, SD = 2.18. A greater percentage of youth who started to use alcohol before the age of 14 reported legal system involvement compared to youth who started using alcohol at age 14+ (p < 0.001). Youth in the under 14 age group were service seeking at a younger age (current age: M = 19.09, SD = 2.48) in comparison to youth in the 14 and over age group (current age: M = 19.77, SD = 2.17), t(424) = 3.44, p = <0.001.

**Substance Use and Mental Health Patterns**

Youth initiating alcohol use prior to the age of 14 reported a greater mean number of substances used (M = 6.75, SD = 2.00) than those initiating alcohol use at 14+ (M = 5.68, SD = 2.18), F(1,549) = 9.29, p = 0.002. Substance use patterns of youth are presented in Table 2, while controlling...
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Youth initiating alcohol before the age of 14 demonstrated significantly higher odds of daily or near daily use of tobacco (p = 0.001), and cannabis (p = 0.006), compared to the 14+ age group.

The mental health scores of the youth are presented in Table 3. Youth initiating alcohol before the age of 14 displayed a significantly greater mean value on the crime and violence problem subscale than youth 14+ (p < 0.001). A significantly larger proportion of youth starting to use alcohol before the age of 14 reported experiencing concurrent difficulties across the 4 domains of the GAIN-SS, including externalizing, internalizing, substance use, and crime/violence issues (31.0%) in comparison to youth initiating at 14+, (21.5%; Wald $\chi^2 = 6.50$, p = 0.011). An analysis of the GAIN-SS extension items revealed no statistically significant differences (Table 4). However, the p-value of 0.029 for “skipping meals, purging” showed a trend toward significance, but did not meet statistical significance with the FDR-corrected p value of 0.0193.

Youth who started using alcohol under the age of 14 revealed a significantly greater mean score on the Trauma History Screen subscale (p < 0.001) than youth who initiated alcohol at 14+ (Table 5). Youth who initiated alcohol use early demonstrated a lesser mean score on the sense of belonging subscale (p = 0.002) in comparison to youth who initiated at age 14 and over (Table 5).

A multivariate logistic regression analysis, conducted to determine the variables independently associated with early age of alcohol use onset, is presented in Table 6. After controlling for sex, duration of use, ethnicity, and NEET, one exposure variable was significantly and uniquely associated with an early age of alcohol use onset in a multivariate model: GAIN-SS crime and violence (p = 0.017). In addition, two variables showed a trend toward significance that did not meet the FDR corrected criterion for statistical significance with multiple comparisons: CYRM sense of belonging (p = 0.034) and THS trauma (p = 0.027). Having more problems with crime or violence was associated with early age of alcohol use onset; it is possible that experiencing more types of trauma and having a lower sense of belonging may be associated with an earlier age of alcohol use onset.

**Discussion**

In this cross-sectional study, the demographic, mental health, and substance use backgrounds of substance use service-seeking youth (14-24) initiating alcohol under the age of 14 in comparison to 14 years of age or over were explored. Youth who started to use alcohol younger than 14 years had significantly more legal system involvement, involvement in crime or violence, and polysubstance use; they were also more likely to endorse having experienced more types of trauma, and less sense of a belonging. Results suggest youth initiating alcohol under the age of 14 have specific vulnerability factors that require more attention.

| Table 1. Demographic variables of participants by age of onset of alcohol use |
|-----------------------------|-----------------------------|-----------------------------|--------|--------|--------|
| Demographic Item            | Alcohol initiation <14 (n = 239) | Alcohol initiation 14+ (n = 416) | $\chi^2$ | p     | $\phi$ |
| Sex                         | % (n)                        | % (n)                        |        |       |        |
| Female*                     | 50.0 (115)                   | 48.1 (192)                   | 0.21   | 0.650 | 0.02   |
| Male                        | 50.0 (115)                   | 51.9 (207)                   |        |       |        |
| Born in Canada              | 85.5 (201)                   | 85.0 (350)                   | 0.04   | 0.842 | 0.01   |
| Ethnicity                   |                              |                              |        |       |        |
| White / European            | 71.2 (168)                   | 65.2 (264)                   | 2.44   | 0.118 | 0.06   |
| Another background          | 28.8 (68)                    | 34.8 (141)                   |        |       |        |
| English as a first language | 90.2 (212)                   | 91.2 (373)                   | 0.17   | 0.676 | -0.02  |
| NEET$^b$                    | 38.7 (86)                    | 32.4 (127)                   | 2.52   | 0.113 | 0.06   |
| Government financial support| 24.5 (56)                    | 18.9 (76)                    | 2.72   | 0.099 | 0.07   |
| Precarious housing          | 8.6 (20)                     | 6.9 (28)                     | 0.59   | 0.443 | 0.03   |
| Legal system involvement    | 62.4 (113)                   | 41.8 (127)                   | 19.36  | <0.001| 0.20   |

*N = 10 identified as another sex
NEET = Not in employment, education, or training
$\phi = $ phi coefficient effect size
In regards to substance use patterns, youth initiating alcohol use before age 14 demonstrated higher odds of endorsing the use of a greater number of substances and reporting daily or near daily use of tobacco and cannabis, in comparison to youth initiating alcohol use at 14 years of age or over. This is consistent with prior research indicating a high correlation between alcohol, cannabis, and tobacco use among adolescents (50-52). Moreover, a study found that students in grades 8-12 had the highest likelihood of engaging in polysubstance use when they had high levels of both depressive symptoms and conduct problems (53). The current findings demonstrate the need for substance use and concurrent mental health challenges to be systematically evaluated among youth, especially in early adolescence.

It is crucial to note that both age of onset groups reported considerable symptoms of substance use-related problems, externalizing, and internalizing disorders. This aligns with prior research that has consistently found a strong positive association between externalizing disorders and hazardous alcohol use in adolescence (54). However, previous literature suggests the association between internalizing symptoms and alcohol use from childhood to adolescence is moderated by externalizing symptoms (55). Further research is required to better understand the interplay between externalizing and internalizing symptoms in relation to alcohol use in adolescence.

Reported exposure to more types of trauma among youth initiating alcohol use under the age of 14 compared to 14+ was a notable finding. This finding is consistent with previous research that demonstrated the total number of adverse childhood experiences had a strong graded relationship to starting alcohol use by age 14 years in a retrospective cohort (56). It is important to note, high levels of trauma exposure were present independent of the age of alcohol use.
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Legal system involvement as well as crime and violence problems were more strongly linked to an earlier onset of alcohol use. Previous research has supported the relationship between difficulties, such as violence (61), delinquency (62), and engaging in deviant activities (63), with initiating alcohol use in early adolescence. It is plausible that a combination of externalizing symptoms and crime/violence concerns may result in an earlier alcohol use onset and legal system involvement, although the directionality is unclear. Research suggests exposure to childhood trauma has a strong association with later alcohol use (64) and alcohol abuse (65) among youth involved in the justice system. Further research is needed to explore how risk factors, such as crime and violence as well as childhood trauma, may contribute to an earlier onset of alcohol use.

### Table 4. Logistic regression of GAIN-Short Screener extension items comparing initiation of alcohol use under 14 years of age to age 14 or over, while controlling for sex, duration of use, ethnicity and NEET status

<table>
<thead>
<tr>
<th>GAIN-SS Extension Item</th>
<th>Alcohol initiation &lt;14 % (n)</th>
<th>Alcohol initiation 14+ % (n)</th>
<th>Wald χ²</th>
<th>p</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skipping meals, purging (n=642)</td>
<td>45.0 (104)</td>
<td>49.9 (205)</td>
<td>4.76</td>
<td>0.029</td>
<td>0.62(0.41,0.95)</td>
</tr>
<tr>
<td>Binge eating (n=640)</td>
<td>52.4 (120)</td>
<td>51.3 (211)</td>
<td>0.48</td>
<td>0.489</td>
<td>0.86(0.56,1.32)</td>
</tr>
<tr>
<td>Disturbed by memories / dreams (n=644)</td>
<td>84.8 (196)</td>
<td>77.2 (319)</td>
<td>0.08</td>
<td>0.773</td>
<td>0.93(0.55,1.55)</td>
</tr>
<tr>
<td>Had thoughts that people are watching / following / out to get you (n=639)</td>
<td>60.3 (138)</td>
<td>50.7 (208)</td>
<td>3.56</td>
<td>0.059</td>
<td>1.47(0.99,2.19)</td>
</tr>
<tr>
<td>Saw / heard things no one else could      (n=633)</td>
<td>37.9 (86)</td>
<td>27.8 (113)</td>
<td>3.46</td>
<td>0.063</td>
<td>1.49(0.98,2.28)</td>
</tr>
<tr>
<td>Problematic videogame playing / internet use (n=640)</td>
<td>41.9 (96)</td>
<td>42.3 (174)</td>
<td>2.33</td>
<td>0.127</td>
<td>1.51(0.89,2.55)</td>
</tr>
<tr>
<td>Problematic gambling (n=643)</td>
<td>4.3 (10)</td>
<td>5.1 (21)</td>
<td>0.91</td>
<td>0.340</td>
<td>0.63(0.24,1.64)</td>
</tr>
</tbody>
</table>

FDR-corrected p value = 0.0193; NEET = Not in employment, education, or training; youth initiating alcohol at age 14 and over represents the reference value

### Table 5. Analysis of covariance on Child and Youth Resilience Measure subscreener total scores and Trauma History Screen total scores based on initiation of alcohol use at under 14 years of age compared to at age 14 or over, while controlling for sex, duration of use, ethnicity and NEET status.

<table>
<thead>
<tr>
<th>CYRM subscale and THS Item</th>
<th>Alcohol initiation &lt;14</th>
<th>Alcohol initiation 14+</th>
<th>F(1)</th>
<th>p</th>
<th>np²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>3.42 (154)</td>
<td>3.47 (267)</td>
<td>0.05</td>
<td>0.34</td>
<td>0.562</td>
</tr>
<tr>
<td>Relationship with caregivers</td>
<td>3.24 (155)</td>
<td>3.36 (266)</td>
<td>0.06</td>
<td>1.53</td>
<td>0.217</td>
</tr>
<tr>
<td>Context/sense of belonging</td>
<td>2.82 (155)</td>
<td>3.05 (267)</td>
<td>0.04</td>
<td>9.77</td>
<td>0.002</td>
</tr>
<tr>
<td>Trauma History Screen</td>
<td>6.37 (147)</td>
<td>5.22 (241)</td>
<td>0.19</td>
<td>11.96</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

EMM = Estimated marginal means. FDR-corrected p value = 0.0240; NEET = Not in employment, education, or training; youth initiating alcohol at age 14 and over represents the reference value

Initiation in this sample. Given that many individuals with alcohol and other substance use concerns have histories of trauma exposure, service providers should provide trauma-informed care for this patient population (57, 58). Specifically, integrated models of service delivery for both trauma-related sequelae (e.g., PTSD) and substance use disorders should be considered (59). Research has shown adolescents with posttraumatic stress symptoms and alcohol use may have coping-related drinking motives and use alcohol as a strategy to relieve internal negative affective states (60). Future work should focus on the patterns between traumatic experiences and drinking motives that may contribute to an earlier onset of alcohol use among youth, as well as trauma-informed clinical approaches to address youth substance use challenges.
Lower perceptions of belonging for participants was significantly associated with alcohol use at an earlier age. A sense of belonging can be defined as individual participation in an environment or system that facilitates feelings of being accepted, valued, and/or needed in said environment or system (66). Previous literature has demonstrated that higher levels of school connectedness and adjustment may serve as a protective factor against adolescent alcohol use (67, 68). A study found a sense of belonging is suggested to mediate the relationship between childhood trauma and later risky alcohol use, such that an increased sense of belonging may help to protect against risky alcohol use among individuals with adverse childhood experiences (69). By providing youth with more opportunities to gain stronger connections and become more involved in their community and school, it may help to protect against early initiation of alcohol use, especially among at-risk individuals with childhood trauma.

It is important to note that in addition to a variety of areas of increased vulnerability, the present study suggests youth initiating alcohol use under the age of 14 had a higher likelihood of experiencing concurrent difficulties across all 4 subscales of the GAIN-SS (e.g. substance use, crime/violence, internalizing and externalizing concerns) than youth initiating alcohol use at 14+. The association between mental health concerns, substance use, and delinquency among students who have exhibited violent behaviour has been previously demonstrated (70). Given the complex, overlapping areas of need of these youth, it is important to offer holistic, integrated services for this vulnerable population. Integrated youth service hubs present a unique opportunity to address many of the concurrent difficulties youth face in a single setting (71).

In interpreting the results, several limitations should be taken into consideration. The sample consisted of youth from one Canadian urban treatment centre and thus are not representative of all service-seeking youth, nor non-treatment seeking youth. The data collected was self-reported and included retrospective estimates of the age of onset of substance use, which may have introduced bias. Missing data may have resulted in under reporting of symptoms and characteristics of these samples. Furthermore, data were collected at only one point in time, which limits the understanding of the trajectories of symptom onset and severity at age of initiation and following initiation of substance use. Longitudinal research is required to further understand youth trajectories and the directionality or bidirectionality of the associations found in the current study.

| Table 6. Multivariate logistic regression analysis of demographic, substance use, and mental health backgrounds predicting early age of initiation of alcohol use |
|------------------|---|---|---|---|---|
|                  | B  | SE B| Wald χ² | p   | OR  |
| Block 1          |    |     |         |     |     |
| Sex              | 0.22 | 0.24 | 0.83 | 0.362 | 1.25(0.78,2.00) |
| Duration of use  | 0.39 | 0.05 | 59.52 | <0.001 | 1.48(1.34,1.64) |
| NEET*            | -0.25 | 0.25 | 1.07 | 0.302 | 0.78(0.48,1.26) |
| Ethnicity        | -0.07 | 0.26 | 0.07 | 0.791 | 0.93(0.56,1.56) |
| Block 2          |    |     |         |     |     |
| Sex              | 0.37 | 0.26 | 2.08 | 0.149 | 1.45(0.88,2.42) |
| Duration of use  | 0.39 | 0.06 | 45.62 | <0.001 | 1.48(1.32,1.66) |
| NEET*            | -0.17 | 0.26 | 0.42 | 0.519 | 0.84(0.51,1.41) |
| Ethnicity        | -0.11 | 0.28 | 0.15 | 0.700 | 0.90(0.52,1.55) |
| GAIN-SS watching | 0.11 | 0.28 | 0.16 | 0.693 | 1.12(0.64,1.95) |
| GAIN-SS seeing   | 0.12 | 0.29 | 0.18 | 0.670 | 1.13(0.65,1.98) |
| GAIN-SS crime and violence | 0.24 | 0.10 | 5.67 | 0.017 | 1.27(1.04,1.54) |
| CYRM context/sense of belonging | -0.42 | 0.20 | 4.49 | 0.034 | 0.66(0.45,0.97) |
| THS trauma       | 0.10 | 0.04 | 4.87 | 0.027 | 1.10(1.01,1.20) |
| AADIS mean number of substances | 0.02 | 0.07 | 0.13 | 0.720 | 1.02(0.90,1.17) |

*NEET = Not in employment, education, or training.  
FDR-corrected p value = 0.0204; youth initiating alcohol at age 14 and over represents the reference value
These findings suggest service-seeking youth initiating alcohol use at an earlier age may represent a particularly vulnerable, trauma-exposed population experiencing difficulties in multiple areas of life, including substance use, mental health, and legal system involvement, combined with a limited sense of belonging. As a result, it is important that screening for early onset of alcohol use be considered as part of healthy teen checks, and that a broad range of effective supports and interventions be considered in service planning for substance use. Service providers are encouraged to provide trauma-informed care to youth and consider the role trauma may play in early alcohol initiation. Stronger connections and integration between substance use, mental health, and legal system services should be considered to improve clinical outcomes for youth who initiate alcohol use at an early age.

Conflict of interest
The authors have no financial relationships or other ties to disclose.

References


