



# Drinking motives supporting binge drinking of Inuit adolescents

Béatrice Decaluwe<sup>1</sup> · Marilyn Fortin<sup>2,3</sup> · Caroline Moisan<sup>1,4</sup> · Gina Muckle<sup>1,4</sup> · Richard E. Belanger<sup>1,5</sup> 

Received: 20 November 2017 / Accepted: 1 April 2019 / Published online: 6 May 2019

© The Canadian Public Health Association 2019

## Abstract

**Objectives** Binge drinking has been identified as a public health concern among several Indigenous communities in Canada. Drinking motives have been shown to significantly influence drinking patterns among youth, but no research has been conducted among Inuit populations. This article assesses whether specific drinking motives are related to the number of binge drinking episodes among Inuit adolescents from Nunavik.

**Methods** The data are drawn from the Nunavik Child Development Study, a longitudinal study conducted in the Canadian Arctic. Questions on alcohol use, binge drinking and drinking motives were asked to 174 adolescents (mean age of 18.5 years). Analyses of variance were used to test the relation between drinking motives and number of binge drinking episodes over the last year.

**Results** Most Inuit participants mentioned drinking for enhancement reasons. A higher number of binge drinking episodes were reported among both adolescent males and adolescent females who frequently endorse enhancement motives, while social and coping motives have been exclusively related to binge drinking episodes among males.

**Conclusion** Findings highlight that motivational aspects supporting binge drinking among Inuit adolescents vary across sex and slightly contrast with studies conducted in non-Indigenous populations. Culturally relevant preventive interventions that target motivational aspects and take into account sex differences are needed.

## Résumé

**Objectifs** La consommation excessive d'alcool a été identifiée comme un problème de santé publique par plusieurs communautés autochtones du Canada. Il a été démontré que les motifs pour lesquels les jeunes boivent de l'alcool influencent de manière significative leurs habitudes de consommation, mais aucune recherche n'a été menée auprès des populations inuites. Cet article évalue si des motifs spécifiques de consommation sont liés au nombre d'épisodes de consommation excessive d'alcool chez les adolescents inuits du Nunavik.

**Méthodes** Les données sont tirées de la Nunavik Child Development Study, une étude longitudinale menée dans l'Arctique canadien. Des questions sur la consommation d'alcool, la consommation excessive et les motifs de consommation ont été posées à 174 adolescents (âge moyen de 18,5 ans). Des analyses de variance ont été utilisées pour examiner la relation entre les motifs de consommation décrits et le nombre d'épisodes de consommation excessive d'alcool au cours de la dernière année.

**Résultats** La plupart des participants inuits ont décrit une consommation d'alcool pour des motifs de renforcement. Un nombre plus élevé d'épisodes de consommation excessive d'alcool ont été observés chez les adolescents et adolescentes qui souscrivent fréquemment à des motifs de renforcement, alors que les motivations sociales et d'adaptation ont été exclusivement liées aux épisodes de consommation excessive d'alcool chez les garçons.

---

✉ Richard E. Belanger  
richard.belanger@chudequebec.ca

<sup>1</sup> Population Health and Optimal Health Practices Research Branch, CHU de Québec Research Centre – Université Laval, Quebec City, QC, Canada

<sup>2</sup> Department of Psychiatry, McGill University, Montreal, QC, Canada

<sup>3</sup> Douglas Hospital Research Centre, Montreal, QC, Canada

<sup>4</sup> School of Psychology, Université Laval, Quebec City, QC, Canada

<sup>5</sup> Department of Paediatrics, Centre mère-enfant Soleil, CHU de Québec – Université Laval, 2705, Laurier Blvd, R1742, Quebec City, QC G1V 4G2, Canada

**Conclusion** Ces résultats soulignent que les aspects motivationnels qui favorisent la consommation excessive d'alcool chez les jeunes inuits varient d'un sexe à l'autre, et contraste légèrement avec les études menées auprès de populations non autochtones. Des interventions préventives culturellement pertinentes qui ciblent les aspects motivationnels de la consommation d'alcool par les jeunes et qui tiennent compte des différences entre adolescents et adolescentes sont nécessaires.

**Keywords** Adolescents · Inuit · Indigenous · Alcohol · Binge drinking · Drinking motives

**Mots-clés** Adolescents · Inuit · Autochtones · Alcool · Consommation excessive d'alcool · Motifs de consommation d'alcool

## Introduction

Throughout the teenage years, youths increase their experience and use of psychoactive substances, mainly alcohol (Schulenberg and Maggs 2002). Adolescents usually use alcohol to socialize and have a good time with friends. However, even if adolescents are seldom affected by the serious conditions associated with chronic alcohol use, they are not protected from its acute consequences and related adverse effects, many of which are associated with binge drinking (Brewer and Swahn 2005). Binge drinking, defined as excessive alcohol consumption measured during a single occasion (usually five or more drinks) (Adlaf et al. 2005; Wechsler et al. 1995), is a regular consumption pattern among adolescents who have not yet reached the legal drinking age. High rates of alcohol use among youth are strongly related to increased risk of unintentional injury, attempted suicide, violence (social and family), delinquency and episodes of depression (Brewer and Swahn 2005; Kuntsche et al. 2013; Boden and Fergusson 2011). In Canada, the highest proportion of heavy drinkers is among individuals aged 18 to 34 years old, with 36% of adolescent males and 25% of adolescent females reporting binge drinking at least once a month over the last year (Statistics Canada 2015). In 2014–2015, 40% of Canadian students in grades 7 to 12 reported drinking alcohol in the past 12 months; among them, one quarter reported binge episodes, peaking at nearly half of twelfth graders (Propel Centre for Population Health Impact 2016).

In several Canadian Indigenous communities, binge drinking has been identified as a serious problem by both national authorities (Health Canada and Public Health Agency of Canada 2012; National Collaborating Centre for Indigenous Health 2012) and local organizations (Société Makivik 2014). From the most recent population data available for Nunavik, an Arctic region located north of the 55th parallel in the province of Quebec, the proportion of drinkers who reported binge episodes in 2004 was two times higher than reported rates for all Canadian adults (regardless of Indigenous status, provincial legal drinking age, or alcohol accessibility) during the same period (Fortin et al. 2015a). Previous studies suggest that Inuit adults present a consumption pattern distinct from their southern counterparts: while a lower proportion drink on a

regular basis, individuals consume a greater volume of alcohol per drinking episode (Muckle et al. 2007; Korhonen 2004). The most recent published data focusing on Inuit adolescents from Nunavik originate from a study of high school students; these data reveal a consumption pattern similar to the one reported for Inuit adults. Accordingly, the proportion of young alcohol users is lower than elsewhere in Quebec; however, a greater proportion, especially Inuit girls, binge drink (Brunelle et al. 2010). In a nationally representative school-based survey, high rates of binge drinking and gender-related differences have been reported among Canadian Indigenous youth living off-reserve compared with their non-Indigenous counterparts (Elton-Marshall et al. 2011). This occurrence of binge drinking puts Indigenous youth at early and heightened risk for adverse physical and mental health impacts from alcohol use. Furthermore, how individuals experiment with psychoactive substances during their adolescence forecasts the development of tenacious habits and related disorders later on as adults (Resnick et al. 1997).

From a behavioural standpoint, motivation for drinking offers insight into youth alcohol consumption patterns. This key component of prevention strategies is currently neglected in public health interventions in Nunavik. Despite the high frequency of binge drinking among Inuit adolescents, no research regarding related drinking motives has been conducted in this population. Studies conducted in the general population already show that drinking motives discriminate between different drinking patterns among adolescents and college students (White et al. 2016; Lac and Donaldson 2016; Kuntsche et al. 2006). Enhancement motives and, to a lesser extent, coping motives have been significantly associated with binge drinking among adolescents and young adults, while social motives have been linked to moderate alcohol use (Kuntsche et al. 2004; Kuntsche et al. 2005). Drinking motives reflect the expected effect attributed to alcohol that drives people to drink (Cooper 1994). The aims of this paper, therefore, are to (1) document which drinking motives are endorsed by Inuit adolescents; (2) analyze the relationship, if any, between drinking motives and number of reported binge episodes; and (3) assess sex differences regarding reported drinking motives and their relation with binge drinking.

## Methods

### The Nunavik Child Development Study

Our study is part of a larger longitudinal research program conducted in Nunavik. The Nunavik Child Development Study (NCDS) sample consisted of newborns recruited at birth (1994–2001) and followed during infancy, preschool and school-aged periods, especially to document the effects of prenatal exposure to environmental contaminants on child development (Muckle et al. 2001). From 2013 to 2016, participants from the NCDS who were between 16 and 21 years of age were contacted and invited to participate in a follow-up study, which provided the foundation of the current paper. In addition to neurocognitive assessments that document memory, attention and learning abilities, a semi-structured face-to-face interview was conducted to provide information on demographic characteristics, food security, housing, behaviours and current life habits, such as alcohol, drug use and gambling. All assessments were conducted in the three largest Nunavik villages (Kuujuaq, Puvirnituk and Inukjuak), and participants who resided in other communities were transported by plane to the closest village for testing. Most interviews were conducted in English (95.2%) (and 1% in French) by one non-Indigenous trained research professional (C. Moisan), who is familiar with community health research in Nunavik but does not reside there. The other interviews were conducted in Inuktitut with the assistance of a local interpreter. This study was endorsed by community stakeholders and public health authorities (the Nunavik Regional Board of Health and Social Services, the Kativik Regional Government, the Municipal councils of Kuujuaq, Puvirnituk and Inukjuak, the Inuulitsivik and Tulattavik Health Centres, as well as the Nunavik Nutrition and Health Committee) and approved by CHU de Québec-Université Laval ethics committee. As recommended by the ethics committee, written informed consent was obtained from the youth participants themselves since this study involved minimal risk. An iPod was offered to compensate participants for their time and contributions. From the 289 newborns recruited at birth and followed during school age (2005–2010), 212 adolescents were reassessed, and 203 completed the full interview process. Among them, one participant refused to complete the substance use section and two were excluded due to inconsistent answers. Of the 200 remaining adolescents, questions related to drinking motives were exclusively asked to participants who used alcohol in the last 12 months; 26 participants (13% of the sample) abstained from alcohol during the year preceding the survey and were excluded from the current analysis. Analyses were performed on a final convenience sample of 174 participants.

## Measures

**Binge drinking and drinking motives** The number of binge drinking episodes in the last year was measured as a continuous variable (“In the last 12 months, how many times have you had 5 drinks or more on the same occasion?”). One drink was defined as one beer or 1.5 oz of strong alcohol shots. Participants rated the frequency at which they endorse each one of the 15 drinking motives (“When you drink, how often is it to...?”) using a 5-point scale (“Never”, “Rarely”, “Sometimes”, “Often”, “Always”). Based on explanatory analysis, to maximize power and obtain analogous group size, answers were further recoded in three groups: “Never–Rarely”, “Sometimes” and “Often–Always”, which were identified, respectively, as rarely, occasionally and frequently endorsed motivations in subsequent analysis. According to recognized work in the field of alcohol studies (Kuntsche et al. 2005; Cooper et al. 1992), and derived from a previous study conducted among the Canadian population (Fortin et al. 2015b), items were clustered in three broad categories of motivations: enhancement motives (6 items), social motives (4 items) and compensatory motives (4 items). Enhancement motives involve the strategic use of alcohol to increase positive affective states or emotional experience; social motives apply to the positive social use of drinking in order to obtain social rewards; and compensatory motives refer to using alcohol to cope or to regulate unpleasant emotions (Kuntsche et al. 2005; Cooper et al. 1992). The following demographic characteristics are presented for descriptive and analysis purposes: age, sex, living coast (Ungava Bay/Hudson Bay), highest level of schooling completed (grouped as Presecondary, Secondary 1–2, Secondary 3–5 and Individualized Paths for Learning (IPL), and Attended college) and employment status (current, yes/no).

## Statistical analysis

Chi-square and *t* tests were performed to assess sex differences regarding reported drinking motives and number of binge drinking episodes. Analyses of variance were used to test whether specific drinking motives were related to the number of binge drinking episodes reported for the past 12 months. Given the heterogeneity of variance within drinking motive groups, sex interaction could not be tested in the same model and analyses were conducted separately for adolescent males and adolescent females. For each significant ANOVA, post-hoc comparisons allowed us to document differences within drinking motive groups, using the Bonferroni correction or Games-Howell nonparametric test when the homogeneity of variances assumption was not respected based on Levene’s test.

## Results

### Sample characteristics and binge drinking among adolescents

Descriptive statistics are summarized in Table 1. The sample includes an equal proportion of adolescent females and adolescent males. Seven out of ten participating adolescents who drank in the past year had attended secondary school, but only one out of ten had graduated from high school at the time of our study. Among all of them, only 5% did not report any binge drinking episodes during the past year. In our sample, about 28% binged fewer than 12 times in the last year, 43% reported up to 51 binge drinking episodes and another 24% binge drank roughly at least once a week ( $\geq 52$  times). No significant differences were observed between adolescent males and adolescent females regarding demographic characteristics and the number of binge drinking episodes during the year prior to the interview.

### Drinking motives of adolescents

All drinking motives rated by Nunavik Inuit adolescent participants are presented in Table 2. Inuit adolescents mainly identified enhancement reasons as a frequent motivation for

drinking. A large proportion of participants described “it is fun” and “I like the feeling” as a frequent drinking motive. Other social and compensatory motives were less often endorsed by youth; only three out of ten participants mentioned “it is what friends do”, “it is customary” or “to forget worries” as frequent motivations for drinking. Sex-specific comparisons showed one significant difference: while most of adolescent males rarely reported “helping when depressed” as a motive for drinking, a greater proportion of adolescent females sometimes did ( $\chi^2 = 9.14, p = 0.01$ ).

### Drinking motives and number of binge drinking episodes in the last year

Table 3 presents the results of the ANOVAs separately for adolescent males and adolescent females. Significant differences were found between the frequency at which Inuit adolescents endorse specific drinking motives and the number of reported binge drinking episodes. Furthermore, results differed by sex. Among males, differences were observed within all three categories of drinking motives (enhancement, social, coping), while only one category among adolescent females (enhancement) was revealed to be significant. First, among males, regarding enhancement motives, analyses revealed two significant results: the number of binge drinking episodes was significantly higher

**Table 1** Descriptive characteristics and binge drinking of Inuit adolescents who reported alcohol use in the past year (NCDS)

	<i>N</i>	<i>n (%)</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>Range</i>
Participant characteristics						
Sex (% female)	174	90 (51.7)				
Age	174		18.5	18.5	1.1	16–21.5
Living coast	174					
Ungava Bay		72 (41.4)				
Hudson Bay		102 (58.6)				
Schooling	174					
Presecondary school or less		14 (8.0)				
Secondary school 1 or 2		60 (34.5)				
Secondary school 3 to 5 or Individualized Paths for Learning (IPL)		97 (55.7)				
Attended college		3 (1.7)				
Employed (% yes)	174	96 (55.2)				
Binge drinking, last year						
Binge drinking (% yes)	174	166 (95.4)				
Number of binge drinking episodes	174		39.1	12.5	45.1	0–175
0		8 (4.6)				
1–11		49 (28.2)				
12–51		75 (43.1)				
52+		42 (24.1)				

Binge drinking corresponds to five drinks or more in a single occasion. Schooling refers to the highest level of schooling completed, further grouped as cohesive categories

**Table 2** Frequency at which Nunavik Inuit adolescents report drinking motives that support their alcohol use, according to sex (NCDS)

	Males ( <i>n</i> = 84)			Females ( <i>n</i> = 89)			$\chi^2$	<i>p</i>
	Never–Rarely (%)	Sometimes (%)	Often–Always (%)	Never–Rarely (%)	Sometimes (%)	Often–Always (%)		
<b>Enhancement motives</b>								
To celebrate	27.4	34.5	38.1	21.3	41.6	37.1	1.22	.54
Like the feeling	15.7	37.3	47.0	16.9	38.2	44.9	0.09	.96
Is exciting	26.2	50.0	23.8	36.0	43.8	20.2	1.93	.38
To get high	35.7	33.3	31.0	38.2	32.6	29.2	0.12	.94
Is fun	14.3	32.1	53.6	10.1	36.0	53.9	0.81	.67
Makes me feel good	23.8	56.0	20.2	36.0	41.6	22.5	4.06	.13
<b>Social motives</b>								
To be sociable	26.2	31.0	42.9	34.8	39.3	25.8	5.58	.06
Is what your friends do	27.4	41.7	31.0	32.6	46.1	21.3	2.11	.35
Is customary	26.2	47.6	26.2	30.3	41.6	28.1	0.68	.71
Social gathering is more enjoyable	36.9	33.3	29.8	40.4	37.1	22.5	1.20	.55
<b>Compensatory motives</b>								
To relax	31.0	50.0	19.0	39.3	46.1	14.6	1.51	.47
To forget worries	46.4	23.8	29.8	38.2	31.5	30.3	1.61	.45
To feel self-confident	58.3	32.1	9.5	58.4	33.7	7.9	0.17	.92
Help when depressed	64.3	21.4	14.3	44.9	42.7	12.4	9.14	.01
To cheer up	47.6	33.3	19.0	38.2	41.6	20.2	1.71	.43

Analyses are conducted on a sample of 173 Inuit adolescents due to missing data

for adolescent males who describe drinking “to make them feel good” ( $M_s = 62.2$  and  $8.75$ ,  $p = 0.001$ ) and because “it is fun” as a frequent motivation compared with those who rarely identified so ( $M_s = 46.3$  and  $12.6$ ,  $p = 0.02$ ). Regarding social motives, adolescent males who identify drinking because it “is what friends do” as a frequent motivation reported more binge drinking episodes than those who occasionally or rarely endorse the same motive ( $M_s = 64.4$  and  $28.1$  and  $16.2$ ,  $p = 0.001$ ). Finally, for compensatory motives, only one result achieved significance: adolescent males who frequently endorsed to “cheer up” as a drinking motive binge drank more than those who rarely reported the same motive ( $M_s = 63.1$  and  $23.7$ ,  $p = 0.02$ ). For females, only those who frequently drank to “celebrate” (enhancement motive) significantly reported a greater number of binge drinking episodes than the others ( $M_s = 58.9$  and  $40.6$  and  $15.8$ ,  $p = 0.001$ ).

## Discussion

This study documents drinking motives of Nunavik Inuit adolescents, an Indigenous group with a high frequency of binge drinking (Brunelle et al. 2010). Our findings demonstrate that the frequency at which certain drinking motives are endorsed by Nunavik Inuit youths is associated with their reported

number of binge drinking episodes over the previous year. Our results also show that adolescent males and adolescent females who identified enhancement motives as being a frequent motivation for drinking reported significantly more binge drinking episodes. In contrast, the frequency at which adolescent males reported other types of drinking motives—those associated with social and coping motivations—was also related to the sum of their binge drinking episodes.

Binge drinking is common among Inuit adolescents: 95% of drinkers in our sample binge drank during the previous year, and only 13% of the sample abstained from alcohol during the year preceding the survey. This prevalence of binge drinking among Inuit adolescents is higher than reported rates among students from the rest of Canada. In 2014–2015, only 24% of Canadian students in grades 7 to 12 reported binge drinking in the last year, peaking to nearly half of the students in grade 12. This difference between Nunavik Inuit adolescents and their southern Quebec peers has already been exposed in one previous study conducted in 2004 (Brunelle et al. 2010). Even though our sample of participants was not meant to be representative of all Inuit Nunavik adolescents, consumption behaviours depicted in this study indicate that Inuit adolescents appear particularly at risk to acute and long-term impacts of heavy drinking.

**Table 3** Number of binge drinking episodes in the last year according to the frequency at which each drinking motive was reported by Nunavik Inuit adolescent alcohol users (NCDS)

	Males (n = 84)					Females (n = 89)				
	Never–Rarely M (SD)	Sometimes M (SD)	Often–Always M (SD)	F	p	Never–Rarely M (SD)	Sometimes M (SD)	Often–Always M (SD)	F	p
<b>Enhancement motives</b>										
To celebrate	31.1 (43.1)	31.1 (31.2)	44.1 (46.1)	0.99	.37	15.8 (17.2)	40.6 (48.5)	58.9 (55.3)	5.15	.00*
Like the feeling	22.7 (41.3)	27.6 (29.2)	48.2 (46.5)	3.19	.05	26.3 (41.9)	46.2 (54.5)	44.6 (46.2)	0.95	.39
Is exciting	31.4 (40.4)	27.9 (35.6)	58.3 (46.0)	4.21	.02	32.3 (44.7)	44.5 (50.4)	54.3 (52.0)	1.26	.29
To get high	33.9 (42.3)	38.2 (41.8)	36.2 (40.2)	0.08	.93	32.9 (45.6)	52.1 (51.8)	43.1 (49.3)	1.23	.30
Is fun	12.6 (27.9)	29.4 (34.8)	46.3 (44.5)	3.98	.02*	20.2 (19.0)	43.3 (53.4)	45.5 (49.3)	1.02	.36
Makes me feel good	8.75 (9.51)	38.2 (40.1)	62.2 (48.2)	9.58	.00*	34.0 (52.9)	46.8 (49.3)	46.3 (41.5)	0.68	.51
<b>Social motives</b>										
To be sociable	23.7 (26.7)	45.9 (44.5)	36.5 (44.5)	1.78	.18	36.7 (48.7)	45.2 (47.7)	44.8 (52.3)	0.29	.75
Is what your friends do	16.2 (19.8)	28.1 (33.5)	64.4 (49.2)	12.13	.00*	28.9 (38.4)	54.1 (55.4)	36.4 (44.0)	2.49	.09
Is customary	20.3 (23.6)	39.5 (43.0)	45.5 (47.7)	2.42	.10	27.2 (40.9)	55.7 (52.2)	38.1 (48.0)	2.87	.06
Social gathering is more enjoyable	29.6 (39.1)	38.9 (42.8)	40.9 (40.9)	0.63	.54	39.4 (53.1)	45.2 (46.3)	42.1 (45.5)	0.12	.89
<b>Compensatory motives</b>										
To relax	27.5 (35.1)	37.4 (39.5)	46.5 (52.3)	1.11	.34	31.3 (42.0)	49.3 (52.0)	50.7 (52.6)	1.54	.22
To forget worries	32.7 (40.9)	29.7 (29.9)	46.3 (47.8)	1.15	.32	38.8 (50.2)	41.2 (55.1)	47.2 (41.2)	0.23	.80
To feel self-confident	27.8 (32.0)	44.2 (47.8)	59.4 (55.8)	2.95	.06	40.1 (51.2)	48.0 (48.3)	32.1 (34.8)	0.40	.67
Help when depressed	27.7 (36.1)	52.5 (37.7)	48.8 (57.1)	3.31	.04	35.7 (47.9)	51.8 (53.6)	31.9 (28.9)	1.34	.27
To cheer up	23.7 (33.9)	38.3 (37.6)	63.1 (50.7)	5.98	.00*	38.9 (54.3)	42.1 (48.6)	48.3 (39.8)	0.22	.81

Analyses are conducted on a sample of 173 Inuit adolescents due to missing data

Post-hoc comparisons using Bonferroni correction unless specified otherwise

\* Games-Howell nonparametric post-hoc test

While assessing drinking motives of Inuit adolescents, both males and females endorsed “it is fun” and “they like the feeling” as frequent reasons for drinking, which suggests that alcohol is used for both enjoyment and to increase pleasure and arousal in these two groups. These findings corroborate those from previous studies conducted among non-Indigenous groups that reported that most adolescents (Comasco et al. 2010) and young adults (Kuntsche et al. 2005) drink either for social facilitation or enhancement reasons. Drinking motives also discriminate between nondrinkers, moderate drinkers and binge drinkers (Lac and Donaldson 2016), revealing a higher quantity and frequency of alcohol use among college students when drinking is related to social and enhancement motives (White et al. 2016). Alcohol researchers commenting on young people, regardless of culture, suggest that adolescents tend to binge drink for multiple reasons: for arousal, disinhibition and fun, or for tension reduction (for review, see Kuntsche et al. 2004). In Nunavik, more binge drinking episodes are reported by Inuit adolescents who identify the enhancement of their emotional state as a frequent motivation for sustaining their consumption behaviours.

Our results also show that young Inuit adolescent males endorsed coping motives less frequently than

their female counterparts, which corroborates previous studies with non-Indigenous populations that report that enhancement drinkers tend to be adolescent males, while coping drinkers are more likely to be adolescent females (for review, see Kuntsche et al. 2006). Similarly, sex differences were observed in a Canadian study of adults (Fortin et al. 2015b); males drank more often to enhance and socialize than females.

Investigating differences across sex, our study showed that the frequency at which Inuit adolescents endorse enhancement motives is related to their reported number of binge drinking episodes for both sexes. However, slight differences were observed between adolescent males and adolescent females. Higher numbers of binge drinking episodes were reported among adolescent males who frequently reported motives associated with the achievement of positive feelings (“makes them feel good”, “it is fun”), while among adolescent females a higher number of binge drinking episodes was related to enhancement reasons in the sense of enjoyment (“to celebrate”). Moreover, coping (“to cheer up”) and social (“it is what friends do”) motives were only related to a higher number of binge drinking episodes for males. In previous studies conducted among Indigenous youth in Canada, drinking to cope has already been associated with higher quantity

and frequency of drinking and more binge drinking (Stewart et al. 2011). Using alcohol to cope during adolescence is associated with greater alcohol-related problems (Merill and Read 2010). Our results thus suggest that among Inuit youths from Nunavik, adolescent males may be at heightened risk for adverse consequences of alcohol use.

A few limitations to the current study should be acknowledged. Most importantly, we used face-to-face interviews to document drinking variables instead of self-administered tools, which might result in an underestimation of alcohol use among Inuit adolescents. Yet the prevalence of binge drinking reported by participants remains quite high, which may in fact represent an accurate snapshot. Interviews also limit the risk of misunderstanding or unanswered items, which is important when performing research in the Inuit context. Other motives for drinking may emerge from studies that investigate culturally relevant, alcohol-related issues among Inuit.

The high prevalence of binge drinking in our study should be considered in the context of historical and cultural realities in Indigenous communities in Canada. Differences in the prevalence of drinking motives have been reported in distinct countries (Kuntsche et al. 2015), which suggest that one's drinking culture may affect young people's behaviours. In Nunavik, the context in which alcohol was first introduced in communities may have partly influenced the evolution of the drinking culture. Critically, forced settlement and relocation from traditional territories, which has affected access to country food and resources as well as traditional knowledge, has had a devastating impact on Inuit people. This history and ongoing experiences of colonization, racism, discrimination and socio-economic marginalization shape behaviours that directly impact health, including alcohol consumption (Reading and Wien 2009). Consequently, drinking culture in Nunavik differs from the drinking culture in North American/European cultures. In this context, the motivational aspects of drinking patterns may represent an accurate target for preventive intervention to decrease binge drinking among young Inuit. The significant differences observed across sex in our study highlight the importance of conducting sex-specific analyses regarding drinking motives and underline that further efforts should be made to develop a specific and distinct intervention for both adolescent males and adolescent females. Moreover, subsequent studies should also consider drinking settings and contexts to draw a better picture of mutual influences between individual and situational factors. A question for further exploration is the impact on drinking motives of living in a wet or dry community as well as coastal regions.

## Conclusion

This study adds to the discussion of binge drinking by documenting drinking motives of Inuit adolescents and tests

whether specific drinking motives and their frequency are related to the frequency of binge drinking. As revealed in previous studies conducted among Nunavik Inuit adults (Fortin et al. 2015a; Muckle et al. 2007), binge drinking is a relatively common drinking pattern among youth from the same Nordic region. This study documents drinking motives among Inuit youth, revealing that this group drinks mainly to increase fun and arousal. The number of binge drinking episodes was significantly higher for both adolescent males and adolescent females who frequently endorse enhancement motives, while social or coping motives were only significantly related to more binge drinking by males. This finding indicates that, in addition to requiring more culturally relevant interventions to decrease binge drinking in Inuit communities, these interventions may also need to be differentiated based on sex. These results pinpoint the motivational aspects of Inuit youth alcohol consumption behaviours, which may be appropriate targets for preventive interventions.

**Acknowledgements** We are grateful to our partners and collaborators: the Nunavik Regional Board of Health and Social Services, the Kativik Regional Government, the Municipal councils of Kuujuaq, Puvimirtuq and Inukjuak, and the Inuulitsivik and Tulattavik Health Centres. Special thanks to the Nunavik Nutrition and Health Committee for their constructive comments, and to each participant for their time and commitment.

**Funding** This study was supported by grants from the Canadian Institutes of Health Research and the Northern Contaminants Program from Indigenous and Northern Affairs Canada. MF obtained a postdoctoral fellowship from the Canadian Institutes of Health Research.

## Compliance with ethical standards

**Conflict of interest** The authors have no potential conflicts of interest relevant to this article to disclose.

## References

- Adlaf, E., Begin, P., & Sawka, E. (2005). *Canadian Addiction Survey (CAS): a national survey of Canadians' use of alcohol and other drugs: prevalence of use and related harms*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Boden, J. M., & Fergusson, D. M. (2011). The short and long term consequences of adolescent alcohol use. In J. Saunders & J. M. Rey (Eds.), *Young People and Alcohol: Impact, Policy, Prevention and Treatment* (pp. 32–46). Chichester: Wiley-Blackwell.
- Brewer, R. D., & Swahn, M. H. (2005). Binge drinking and violence. *JAMA*, 294(5), 616–618.
- Brunelle, N., et al. (2010). Patterns of psychoactive substance use among youths in Nunavik. *Revue internationale sur l'autochtonie*, 2, 15–27.
- Comasco, E., et al. (2010). Why do adolescents drink? Motivational patterns related to alcohol consumption and alcohol-related problems. *Substance Use & Misuse*, 45(10), 1589–1604.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: development and validation of a four-factor model. *Psychological Assessment*, 6(2), 117–128.

- Cooper, M. L., et al. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4(2), 123–132.
- Elton-Marchall, T., Leatherdale, ST., Burhalter, R. (2011). Tobacco, alcohol and illicit drug use among indigenous youth living off-reserve: results from the Youth Smoking Survey. *CMAJ*, 183(8), E480–6.
- Fortin, M., et al. (2015a). Temporal trends of alcohol and drug use among Inuit of Northern Quebec, Canada. *International Journal of Circumpolar Health*, 74, 29146.
- Fortin, M., et al. (2015b). Tridimensionality of alcohol use in Canada: patterns of drinking, contexts and motivations to drink in the definition of Canadian drinking profiles among gender. *Canadian Journal of Public Health*, 106(2), e59–e65.
- Health Canada and Public Health Agency of Canada (2012). *First Nations and Inuit mental health and addictions*. Ottawa, ON.
- Korhonen, M. (2004). *Alcohol problems and approaches: theories, evidence and northern practices*. Ottawa, ON: National Indigenous Health Organization (NAHO).
- Kuntsche, E., Rehm, J., & Gmel, G. (2004). Characteristics of binge drinkers in Europe. *Social Science & Medicine*, 59, 113–127.
- Kuntsche, E., et al. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, 25, 841–861.
- Kuntsche, E., et al. (2006). Who drinks and why? A review of socio-demographic, personality, and contextual issues behind the drinking motives in young people. *Addictive Behaviors*, 31, 1844–1857.
- Kuntsche, E., et al. (2013). Not early drinking but early drunkenness is a risk factor for problem behaviors among adolescents from 38 European and North American countries. *Alcoholism: Clinical and Experimental Research*, 37(2), 308–14.
- Kuntsche, E., et al. (2015). Drinking motives mediate cultural differences but not gender differences in adolescent alcohol use. *Journal of Adolescent Health*, 56, 323–329.
- Lac, A., & Donaldson, C. D. (2016). Alcohol attitudes, motives, norms, and personality traits longitudinally classify nondrinkers, moderate drinkers, and binge drinkers using discriminant function analysis. *Addictive Behaviors*, 61, 91–98.
- Merill, J. E., & Read, J. P. (2010). Motivational pathways to unique types of alcohol consequences. *Psychology of Addictive Behaviors*, 24(4), 705–711.
- Muckle, G., et al. (2001). Prenatal exposure of the northern Québec Inuit infants to environmental contaminants. *Environmental Health Perspectives*, 109, 1291–1299.
- Muckle, G., et al. (2007). *Qanuippitaa? How are we? Alcohol, drug use and gambling among the Inuit of Nunavik: epidemiological profile*. Institut national de santé publique du Québec and Nunavik Regional Board of Health and Social Services, Québec, Qc.
- National Collaborating Centre for Indigenous Health. (2012). *State of the knowledge of Indigenous health: A review of Indigenous public health in Canada*. Prince George, BC.
- Propel Centre for Population Health Impact. (2016). *Summary of results, 2014/2015 Canadian Student Tobacco, Alcohol and Drugs Survey*. Waterloo, ON: University of Waterloo.
- Reading, C. L., & Wien, F. (2009). *Health inequalities and social determinants of Indigenous peoples' health*. Prince George, BC: National Collaborating Centre for Indigenous Health. Available at: <https://www.ccsa-nccah.ca/docs/determinants/RPT-HealthInequalities-Reading-Wien-EN.pdf>.
- Resnick, M. D., et al. (1997). Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health. *JAMA*, 278(10), 823–832.
- Schulenberg, JE., Maggs, JL. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol Supplement*(14), 54–70.
- Société Makivik (2014). *Parnasimautik Consultation Report*. Kuujuaq, QC.
- Statistics Canada (2015). *Canadian Community Health Survey*.
- Stewart, SH., et al. (2011). Hopelessness and excessive drinking among aboriginal adolescents: the mediating roles of depressive symptoms and drinking to cope. *Depression Research and Treatment*, 11, 970169.
- Wechsler, H., et al. (1995). A gender-specific measure of binge drinking among college students. *American Journal of Public Health*, 85(7), 982–985.
- White, H. R., et al. (2016). Do drinking motives distinguish extreme drinking college students from their peers. *Addictive Behaviors*, 213–218.

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.