

Perceptions and Knowledge of Caffeinated Energy Drinks: Results of Focus Groups With Canadian Youth

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ABSTRACT

Objective: To examine use, knowledge, and perceptions of caffeinated energy drinks (CEDs) among youth.

Design: Qualitative research using focus group discussions (n = 4).

Setting: Two Canadian cities (Toronto and Montreal).

Participants: Youth aged 12–18 years (n = 41).

Phenomenon of Interest: Perceived definitions of CEDs, reasons for use, knowledge of health effects, use with alcohol, marketing perceptions, and use and understanding of cautionary statements on packaging.

Analysis: Data were analyzed using a modified grounded-theory approach.

Results: Youth identified CEDs as products that provide energy and contain caffeine and sugar. Compared with mainstream CED brands and energy shots, youth were less likely to perceive Gatorade, Coca-Cola, and a Starbucks beverage as energy drinks, despite some ambiguity. The majority of participants believed that CEDs, including mixed with alcohol, were not necessarily harmful in moderation and that marketing was targeted toward older youth and young adults. Awareness of cautionary statements on CEDs was low; cautionary statements were perceived as difficult to find and read owing to the design and small font.

Conclusions and Implications: Findings suggest a need to increase public education regarding the potential risks of CED consumption, including enhancements to the mandated cautionary statements, with greater attention to the impact of CED marketing on youth.

Key Words: energy drinks, caffeine, policy, adolescent (*J Nutr Educ Behav.* 2017;49:304-311.)

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INTRODUCTION

Caffeinated energy drinks (CEDs) are a multibillion-dollar industry with strong growth in the North American market over the past decade.¹ They typically contain caffeine (ranging from 70 to 180 mg) in combination with other ingredients such as taurine, glucuronolactone, B vitamins, minerals, and herbal ingredients, and usually feature health claims about restoring energy and alert-

ness.²⁻⁵ These beverages are increasingly popular, including among youth. For example, a recent study in Ontario indicated that nearly 1 in 5 grade 9–12 students consumed CEDs in a usual week,⁶ and a US study found the greatest proportion of CED use was among youth (aged 13–17 years) and young adults (aged 18–24 years).⁷

There are growing concerns regarding CED consumption among youth, particularly given increased reporting

of CED-related adverse events among this age group.^{2,8,9} Excessive caffeine consumption may cause irritability, anxiety, dizziness, dehydration, gastrointestinal problems, decreased bone mineralization, insomnia, and sleep disturbances. In more severe cases, CEDs may cause arrhythmia, tachycardia, seizures, hallucinations, and even death in rare instances.^{2,10-12} The high sugar content of many CEDs is also a concern given the association between sugar-sweetened beverage consumption and unhealthy weight.¹³ A recent study also found that students who reported CED consumption were significantly more likely to be at risk for hyperactivity and inattention.¹⁴

Marketing campaigns for CEDs have high levels of reach among children and youth.¹⁵ A 2013 US marketing study found that CEDs made up 15% of all beverage ads viewed on television by children (aged 6–11 years) and 23%

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of those viewed by teens (aged 12–17 years); Red Bull ads were even viewed by preschoolers (aged 2–5 years).¹⁵ In Canada, although the promotion of CEDs to children (aged ≤ 12 years) is prohibited, they may be exposed to advertising meant for general audiences.⁵

In 2012, Health Canada reclassified CEDs as food products rather than natural health products; as such, they are now covered under Food and Drug Regulations.⁵ While Health Canada reviews evidence and considers further regulations, CEDs that meet current requirements may be granted temporary permission to be sold through a regulatory tool known as a Temporary Marketing Authorization.⁵ Current packaging requirements for CEDs include standard nutrition labels, total caffeine content, and several cautionary statements: Not recommended for children, pregnant or breastfeeding women and individuals sensitive to caffeine; Do not consume more than (X) containers daily; Do not mix with alcohol; and High caffeine content.⁵ Although these requirements apply to CEDs, energy shots remain classified as natural health products and thus are subject to Natural Health Product Regulations.^{5,16}

Currently, little is known about perceptions of CED use and marketing among youth and the extent to which they notice, understand, and use labeling information and cautionary statements. This study sought to gain insight into behaviors and awareness regarding CEDs among Canadian youth by engaging them in discussion about their experiences with, understanding of, and perceptions of CEDs. Most information on CED use among Canadian youth has come from quantitative surveys focused on prevalence of use;^{6,17} to the authors' knowledge, this study represents the first qualitative study to examine perceptions of energy drinks, including some regulatory (labeling) measures.

METHODS

Research Design and Methods

This exploratory study employed a qualitative research design that included focus group (FG) interviews to investigate the perceptions, use, and experiences of youth with CEDs. Four FGs were conducted in 2 Canadian urban centers: Toronto, Ontario; and Mon-

treau, Quebec. Two FGs were held in each city: 1 with participants aged 12–15 years, and 1 with participants aged 16–18 years. The FGs were held in 2 cities/provinces, in 2 languages, and with different age groups to obtain a diverse sample.¹⁸ The FGs in Toronto were conducted in English and FGs in Montreal were conducted in French. Each FG lasted approximately 90 minutes and was digitally recorded.

The sample was recruited through Leger, a commercial market research firm with a consumer panel of Canadians. Panelists residing in the Toronto or Montreal area who reported having children aged 12–18 years were contacted by Leger via e-mail; their children were invited to participate in an FG. Of the 47 youth recruited by Leger, a total of 41 participated in the FGs (with 8–12 youth/FG). Participants were provided with \$75 in appreciation of their time.

All FGs were moderated by the same bilingual, trained researcher (CM), who had previously lived and worked in both locations. The moderator had completed ethics training and graduate-level coursework in qualitative research methods and data collection protocols, and had several years of experience conducting and coding FG research.¹⁹

Focus groups used a semistructured interview guide (see [Supplemental Material 1](#)).^{18,19} The guide and protocol were developed in a multistage process by the research team, which included experts in qualitative research. First, the research team completed a literature review and identified previous findings on energy drinks. Next, the team met and discussed their general theoretical approach and decided upon using a modified grounded-theory approach.¹⁹ The team also identified the main concepts related to CEDs to be explored through the FGs. An interview guide was drafted based on the discussion, and reviewed and finalized by the team. The guide was translated by the bilingual moderator into French.

Study Protocol

The FGs sessions were held in downtown Toronto and Montreal on Saturday afternoons in October and November, 2014. Before each FG, written parental consent was obtained for participants aged 12–15 years in Ontario, and aged 12–17 years in Quebec, as per provincial regulations. All partici-

pants provided written informed consent; an assent version was completed by participants whose parents had already provided parental consent. Participants also completed a brief background questionnaire.

During the FG, the moderator followed the guide composed of a series of open-ended questions and encouraged youth to share and discuss the questions among themselves, prompting when necessary.²⁰ The questions assessed perceived definitions of CEDs; reasons for use; knowledge of health effects, ingredients, and caffeine levels; use of CEDs with alcohol; perceptions of CED marketing; and use and understanding of cautionary statements on packaging. At the end of each session, the moderator summarized key statements for which there seemed to be consensus within the group, and participants were given the opportunity to agree or disagree and add further comments. The Office of Research Ethics at the University of Waterloo reviewed the study and granted ethics clearance.

Data Collection

During the FGs, youth were asked to answer questions about their perceptions of CEDs. First, participants were shown 5 beverage products (Coca-Cola, Starbucks Refresher, Gatorade Perform, AMP Energy Lemonade, and 5-Hour Energy) and asked to identify which beverages they would classify as energy drinks. AMP Energy Lemonade was the only product authorized by Health Canada as an energy drink.²¹ Participants were then shown some examples of what is classified as a CED by Health Canada and told that these products would be the focus of the discussion. The participants were then asked to discuss if, when, and why they or their friends used CEDs. Participants were also asked about the health effects of CEDs and their ingredients, whether CEDs were safe to consume for all types of people, and a series of questions pertaining to caffeine and health. Participants aged 16–18 years were asked about the use of alcohol mixed with energy drinks (AmEDs) by people their age. To assess perceptions of marketing, participants were shown 2 English print ads featuring CEDs and asked about the message and target audience for each). Finally, to assess use and understanding of cautionary statements on

CED containers, participants were asked whether they had previously looked at these statements, were shown examples on real cans (NOS, Red Bull, and Rockstar Energy Drink), and were asked about their understanding of the cautionary information, resulting concerns about CED use, and recommendations for improving the labels.

Analysis

All FG interviews were audio-recorded; they were transcribed verbatim by a commercial company (Centretown Corporate, Ottawa, Ontario) and French transcripts were translated to English. Back-translation was not completed; however, the transcripts were reviewed by the bilingual moderator.

Two coders (the moderator, as well as another researcher with similar training [CB]) analyzed the transcripts following a modified grounded-theory and constant comparative approach,^{22,23} in which coding and analysis occurred simultaneously to help gain new perspectives on the data.²⁴ A multi-staged coding process consisted of 3 steps: (1) open coding: thoroughly reading the raw data to search and document first impressions and then line-by-line review to conceptualize the data; (2) focused coding: using the most significant and/or frequent earlier codes to sift through the data and compare participants' perspectives; and (3) axial coding: relating, making connections (comparisons), and fitting data back together descriptively into a coherent, interpretative portrayal.²⁵ Thematic analysis involving the creation and application of codes to the data was completed using MAXQDA 11 (Verbi GmbH, Berlin, Germany).

The 2 independent coders undertook an interrater reliability exercise to ensure that the theme code set was both reliable and systematically refined, with each coder independently coding the same interview transcript. Based on the coding dependability assessment procedure of Miles and Huberman,²⁶ after line-by-line examination of agreement, an interrater reliability score was calculated: the number of agreements divided by the total number of all agreements, disagreements, code-no-codes (in which text is coded on only 1 of 2 transcripts) and second-level disagreements (in which the same text is coded with the same

topic and main categories, but with different subtheme codes). This process was repeated for a total of 5 rounds of review; the result was 87% agreement, which was deemed adequate for intercoder reliability.²⁷ Subsequently, a revised theme code set was developed through discussion of meaning and interpretation of codes. One researcher (not the moderator) then coded the remaining FG transcripts using the final coding system and selected quotations that illustrated the FG findings. Examples of this coding are included in [Supplemental Material 2](#).

RESULTS

Sample Characteristics

In total, 41 youth aged 12–18 years participated in the 4 FGs: 18 in Ontario (English) and 23 in Quebec (French). Specifically, there were 8 participants aged 12–15 years in Toronto, 10 aged 16–18 years in Toronto, 12 aged 12–15 years in Montreal, and 11 aged 16–18 years in Montreal. Approximately half of the sample was female.

Identification of CEDs

Participants defined CEDs as products that give you a boost, wake you up or give you energy, and contain caffeine and sugar. The majority of youth identified caffeine and sugar as the ingredients that give you a boost, but had little knowledge of other ingredients found in CEDs. When participants were shown the 5 example beverages, the majority identified AMP Energy as a CED. Participants also identified 5-Hour Energy as a CED because it promises 5 hours of energy, but recognized that the container size was different from other popular CEDs. Participants were less certain about the Starbucks Refresher; nearly half thought it could be considered a CED because the can was labeled as containing revitalizing energy, and because of the association of Starbucks with coffee and thus energy, although some identified the beverage as distinct from CEDs. Some identified Coca-Cola as a CED because it contains caffeine and sugar; others thought that it did not have a strong enough effect to be considered a CED. One respondent identified Gatorade as a CED because of “the commercials” (female, Toronto [T]16–18).

Access to CEDs

Participants discussed the availability and accessibility of CEDs to youth. Two of the younger participants (aged 12–15 years) in Toronto mentioned that some stores near schools did not sell CEDs to people their age. One stated, “They don't sell it to us even if we buy it, like, even if you try and pay for it they won't sell it to you” (female, T12–15). Another participant described a nearby convenience store that would sell CEDs to youth. In Montreal, the age 12–15 FG highlighted the availability of CEDs in both stores and vending machines; 1 participant stated, “The drinks are super available. We can go in any convenience store and buy as much as you want and they let you do it. And they don't care because they're making money with us” (female, Montreal [M]12–15). Participants from the age 16–18 FGs did not mention barriers to accessing CEDs.

Reasons for Use

Participants discussed different reasons for consuming CEDs, including how useful the energy boost was for certain activities such as studying, playing sports, and working, particularly after a day at school. One participant said, “I normally have one [CED] if I have to stay up to do an assignment. I'll have one at, like, 8 or 9 o'clock and that will keep me going until 12 or 1” (female, T16–18). Some participants cited CEDs as useful for concentrating: “Yes, to better concentrate. I want to be able to concentrate more, and to stay awake. My friends, too; same thing for my friends” (female, M16–18). CEDs were also described by some male participants as helpful for staying awake and gaining energy for extracurricular sports and physical activities, especially those occurring later in the evening. One participant shared:

One kid on my team, like, he has one [CED] right before almost every [hockey] game or practice because we're usually like later at night, right, like by the time we get ice time. Plus, like, after a whole school day or something, too. (male, T16–18)

The boost provided by CEDs was also described as a way to improve athletic performance and strength: “It

[CED] gives them more energy [...] It gives them more strength" (female, T12–15).

Taste, addiction, and social setting were other reasons cited for consuming CEDs. Examples were given of friends who were addicted to CEDs; 1 participant shared his need for a CED to feel awake in the morning: "Well, I go to bed late and there are times I have to get up early, and even when I don't get up early, you reach a point where you start to need it" (male, M16–18). Many participants highlighted the influence of social context as a reason for consuming CEDs, particularly with friends or at parties. The CEDs were described by participants as something you would drink with friends, to have fun and stay out later. There was also an element of peer influence: "Well, sometimes I take it [CED] because my friends take it with me, so I say 'Okay, it's not a big deal. I'm going to have some with them'" (female, M12–15).

Health Concerns and Side Effects

When participants were asked to discuss the ingredients in CEDs and their potential health effects, they listed caffeine, sugar, and other unhealthy ingredients. Caffeine was the most frequently identified ingredient and was generally perceived by most participants as unhealthy. Participants noted negative health side effects of caffeine, including that it may stunt growth, cause anxiety, sleep disturbance, or insomnia, make you jittery, or become addictive. The majority of participants were aware that caffeine increases heart rate; 1 participant stated that an energy drink is "a drink that makes the heart beat faster" (female, M12–15). Many participants were aware of the caffeine crash that occurs after caffeine levels spike in your body. Participants thought the crash would be worse if the CED were used while playing sports.

Several participants voiced concern about unfamiliar or complicated-sounding ingredients in CEDs (ie, "The amount of ingredients you couldn't pronounce" [female, T12–15]) and about these being unhealthy. One participant noted,

I think there are ingredients in there with funny names that you don't

really see anywhere else. It's not necessarily good for our health, they don't necessarily react well together, the ingredients. (male, M12–15)

The sugar content of CEDs was primarily a concern for female participants; 1 participant stated, "For me, it's not good for our health because it contains too much sugar" (female, M16–18). Aside from caffeine and sugar, participants had limited knowledge of the additional ingredients contained in CEDs.

When asked whether energy drinks were safe for all people, some participants indicated that they did not think that CEDs were appropriate for older adults and those with heart problems. In addition, many participants indicated concern for children: "If adults and certain people can't take it, well, why would it be okay for kids, you know?" (female, M12–15).

Participants described several health problems that could arise from consuming CEDs. They thought that having too many CEDs could cause a blackout or vomiting because it would make your heart pump too fast, even if you were otherwise healthy. One participant said, "Doing sports makes your heart pump faster and energy drinks also make your heart beat faster, so you're more likely to have a heart attack" (female, M12–15). Another participant compared CED consumption with other addictions: "I think they're just like cigarettes or any other drug, just you get addicted to them, it's not good for you, but you do it anyway" (male, T16–18).

Although health concerns related to CEDs and caffeine consumption were mentioned frequently, most participants thought that in moderation, CEDs were not necessarily harmful. One youth said, "If you take too much, it's sure to be bad, but if you take some, like occasionally, well, I don't think it's necessarily bad for you. Maybe it doesn't help, but I don't think it's going to harm you" (female, M12–15). Coffee was frequently identified as a point of comparison: "Well, there's caffeine in coffee and coffee's not that bad unless you have a lot. Like, a lot of caffeine could be bad" (male, T12–15). Another participant said, "I think that a coffee, it's ... there is no harm in drinking some, let's say [...] But, like, energy drinks, I don't know how much is in there, but

it's, like, 8 cups of coffee in there, so ..." (male, M12–15). There was uncertainty about the amount of caffeine in CEDs, especially relative to the amount in coffee: "Caffeine isn't good for you at all. And those energy drinks are filled with, I think ... I'm assuming more than coffee" (female, T16–18).

Alcohol Mixed With Energy Drinks

Older participants (aged 16–18 years) were asked about mixing energy drinks with alcohol. All but 1 participant in this age group were aware of AmEDs; although younger respondents (aged 12–15 years) were not asked about AmEDs, a small number of younger participants spontaneously mentioned awareness of AmEDs.

Participants thought that teens and people in their early twenties would be the main consumers of AmEDs. One reason cited for mixing CEDs with alcohol was to mask the taste of the alcohol, allowing you to drink more: "It's very sweet, so it takes away the taste of the alcohol" (female, M16–18); "So you can drink more" (male, M16–18). Many others described the effect of AmEDs on energy level. In particular, 1 participant said, "Alcohol kind of puts you down. It [CED] brings you back up, I guess" (male, T16–18), "and it probably gives you more energy to, like, continue throughout the party or something, or whatever you're doing" (male, T16–18). Many youth in the older age group (Toronto) indicated that AmEDs were more likely to be consumed on a "special occasion" such as a concert. One participant shared, "Me, I've never drank that stuff alone. It's only to be with friends, we drink them with alcohol" (male, M16–18), reiterating the influence of social context.

However, several participants from the older age groups noted that consuming AmEDs could be dangerous because of the potential for increased alcohol consumption. One participant said, "... It does mask the alcohol. You're going to think that you're drinking a lot less than you really are" (female, T16–18). Beyond individual health concerns, there was also concern about the broader effects of mixing CEDs and alcohol. One participant said, "You're mixing it both [...] basically it's almost like mixing chemicals together, right. There's always reactions and stuff"

(male, T16–18). Another said, “I think it's better to separate them because they create opposite effects so your brain doesn't know what to do between the 2, so it freaks out” (male, M16–18). Participants talked about more extreme side effects of blacking out: “... If you take too much, you're going to black out and risk falling to the ground” (male, M16–18).

Still, many participants reported occasionally consuming AmEDs and expressed little problem about consuming it in moderation. Older participants said, “Honestly there's a lot worse out in the world than mixing energy drinks with alcohol. It's not going to kill you, so it's just don't overuse” (male, T16–18), and “Maybe on occasion but I wouldn't make it a regular habit” (male, T16–18). Youth also discussed having AmED shots and thought that this, too, was acceptable in moderation. Although there was some awareness of the dangers of AmED consumption, many youth shared anecdotes about their personal use that justified their consumption.

Intended CED Consumers and Marketing

There were mixed opinions among participants about the intended consumers of CEDs. The majority of 12- to 15-year-olds did not think CEDs were intended for their age group because of the high caffeine content and the effects of caffeine. One participant said that “They [CEDs] have a lot of caffeine, and caffeine, like, stunts your growth” (male, T12–15). Another said, “Younger people aren't supposed to consume a lot of caffeine” (female, T12–15). Relatively fewer youth aged 16–18 years thought that they were too young to consume a CED. Many of the older youth believed that they were the intended users for CEDs because they thought people their age needed the boost that CEDs provide but may be less likely to consume coffee to get caffeine. One participant commented, “People often say youth don't really drink coffee; they don't really like it, they like stuff with carbonization, like that [gestured to CED]” (male, M16–18). Older youth highlighted the usefulness of CEDs because they often work and study at the same time.

Youth also believed that most CED marketing was targeted to their age group. There was an overall perception that the packaging on CEDs was designed to appeal to teenagers: “I find

that they are trying to attract the attention of young people with the colors and the style of the bottles” (male, M12–15). The sponsorship of extreme sporting events was also seen as a means to target adolescents. A male participant commented that “They [CED companies] sponsor extreme sports; it's not old people that will go check that out, it's mostly us who are going to check that out” (male, M16–18).

Participants were shown 2 real print advertisements for Red Bull. The first advertisement, which depicted youth playing various sports, was perceived by the younger participants (aged 12–15 years) to be targeting people “our ages and up, because a lot of our age group, like, we do sports, play basketball and stuff” (female, T12–15). When asked, participants identified the people in the advertisement as being aged 12 or 13 years. The second advertisement, featuring a DJ playing in a large dancing or concert venue, was perceived as targeting older teenagers and young adults. The 12- to 15-year-olds did not seem to identify with the DJ advertisement and thought it was intended for teenagers older than them. The 16- to 18-year-olds generally believed the advertisement was for “people who are still, like, young and looking for, like, a party life and stuff” (male, T16–18). Another participant commented, “Most people that go out and party are about ages 16 to 25” (female, T16–18). They also suspected that a CED would be mixed with alcohol in this context; 1 participant mentioned, “You know that there is going to be alcohol or something else in there, for sure” (male, M16–18).

Cautionary Statements

Most youth indicated that they did not know about or did not read the cautionary statements when purchasing CEDs, and did not think other youth would, either. When asked if they had ever looked at warning labels on CEDs, all but 1 participant aged 16–18 years in Toronto said, “No” (female), “I did not know there were warning labels” (male), “Me either” (female), “Me neither” (male), and “It's, like, really tiny” (female). Some individuals heard from peers that CEDs were not good to drink; otherwise they were unfamiliar with the cautionary statements on CEDs. Although 1 participant studied CEDs in her health class and some

had seen a cautionary statement, the majority had never noticed the statements on CED packaging.

When CEDs were circulated to participants to discuss the labeling, it took youth a substantial amount of time to locate the cautionary statements. Once the statements were identified, the participants appeared to struggle to read them. There was widespread agreement that the cautionary statements on CED products were hard to find and read because of small font and design characteristics. One youth said, “It's, like, at the end of the ingredients, it's, like, very hidden” (female, M16–18). Another stated, “... It's really small and the font is really small, so that's why people don't look at it. They just buy it” (female, T12–15). Youth were skeptical about the statements on CEDs, suspecting that these were included only to provide legal protection for companies: “Kind of like, it's just, like, the minimum they have to do to not get sued if something happens ... Yeah, they only put it there so they're not legally responsible” (male, T16–18).

Participants in both of the Toronto FGs thought that the wording *not recommended* did not explicitly mean *do not consume*: “It's just like it's not recommended so you can drink it” (female, T16–18). Many believed that this wording was intentionally vague and ambiguous. Youth also did not think that cautionary statements applied to them, stating that “On the warning they mostly talked about people like older women who are, like, pregnant or breastfeeding and it doesn't really relate to us” (female, T12–15). A minority of participants thought that reading the cautionary statements would make them think about the effects of CEDs; for example, 1 participant believed that the hidden nature of the statements made the drinks seem more dangerous. Another participant (female, T16–18) expressed that the NOS label *Do not consume if under 18 years* would persuade her to avoid that specific product.

Overall, there was consensus that the cautionary statements were general, lacked information about the potential consequences of exceeding the recommended amount, and left participants confused and curious about the drink's effects: “They [the labels] used certain words that confuses you” (female T12–15), and “They don't really tell you what can happen if you drink

it" (male, T12–15). Some participants thought that if they had information about side effects, they might consider altering their consumption of CEDs:

I don't really know the side effects [or that] it's bad. That might change [my use of energy drinks], but the label doesn't say anything like that, so [I don't know that I would change my CED use based on the label]. (female, T16–18)

All participants expressed that they had learned something new about CEDs after reading the labels more closely, although they still were uncertain about the potential side effects.

DISCUSSION

The current study indicates there is some confusion among youth about what products are considered CEDs and the criteria used to distinguish these products from other types of beverages containing caffeine. Whereas many participants considered the 5-Hour Energy shot and Starbucks Refresher to be CEDs, neither of these products were authorized as CEDs by Health Canada.²¹ Descriptors on packaging (ie, the term *energy*) were consumers' primary consideration when determining whether to identify a product as a CED. Although participants acknowledged that energy shots (eg, 5-Hour Energy) came in a smaller container, they still considered the shots to be CEDs given that they were branded with the word *energy*. Coffee-related products such as the Starbucks Refresher appeared to be confusing but sometimes were considered to be a CED given the inclusion of tag lines such as *revitalizing energy*. Overall, combined with other quantitative research, the current findings suggest that youth consider a range of products to be CEDs provided that they include the term *energy* in the brand name or on the packaging.²⁸

The findings indicated that CEDs are generally perceived by youth as accessible. Most participants indicated that they could purchase CEDs during their lunch hour at any convenience store and in any quantity. In November, 2014, the Toronto Board of Health requested that the Medical Officer of Health examine the possibility of banning the sale of energy drinks to persons aged <19 years on city properties and in Toronto retail outlets²⁹; this research is

still in progress (L. Vanderlinden, e-mail communication, 2016). In Toronto, 1 participant (aged 12–15 years) mentioned a location across from her school that would not sell CEDs to people her age; this may indicate that individual businesses may have their own policies of restricting sales to youth.

Youth described a variety of reasons for using CEDs, many of which related to providing consumers with an energy boost to stay awake longer and improve concentration and/or performance; others tended to consume CEDs with friends as part of a social event, especially when mixed with alcohol. Furthermore, despite the industry's voluntary marketing code against marketing CEDs to children,³⁰ the majority of participants in this study, both younger and older youth, believed that CED advertisements were targeted toward them, especially in terms of industry sponsorship of extreme sports as well as product packaging. Given this perception, extending prohibitions on advertising to those aged <18 years (rather than aged 12 years) may be warranted.

While participants expressed concerns related to CED consumption and were generally aware of the potential harm in mixing the beverages with alcohol, most indicated that they thought that consuming CEDs and AmEDs in moderation was relatively safe. Given the increase in reporting of adverse events related to CEDs,^{1,8} these findings suggest an urgent need to educate youth better regarding the potential dangers that can result from CED and AmED consumption. In particular, it may be useful to highlight that a single can may contain multiple servings, which makes it relatively easy to consume caffeine in excess.

Few youth had noticed or read cautionary statements on CEDs before the study, and most found it difficult to locate and read the statements when asked to do so during the FG session. Design, including font size, color, and contrast, as well as language complexity and the hidden nature of the statements, were all specified as barriers to seeing and reading warning labels on CEDs. These findings suggest that noticeability and the use of cautionary statements may be improved by modifying their format and design: for example, by increasing the text font size, using a contrasting background and/or border, adding a heading to identify the text better as a cautionary

statement, and/or separating the statement from other information (such as ingredients) printed on the can. These design elements were found to increase the salience of health warnings on other consumer products.^{31,32}

Use of the term *not recommended* in the statement Not recommended for children, pregnant/breastfeeding women, and individuals sensitive to caffeine was interpreted to mean that although the product was not recommended for use by these populations, it was not necessarily harmful. Furthermore, although the cautionary statement noted that the product was not recommended for children, the youth in this study did not think that the information applied to them; participants likely did not consider themselves to be children.

According to the guidance document for Temporary Marketing Authorization—Caffeinated Energy Drinks,⁵ the cautionary statement regarding mixing CEDs with alcohol should be phrased as Do not mix with alcohol, which is a more definitive phrasing than a recommendation, as discussed previously. In practice, some companies paraphrase and combine this cautionary statement with others, such that it, too, appears as a recommendation (eg, Not recommended for children, pregnant or breastfeeding women, or caffeine-sensitive persons, or to be mixed with alcohol). This may lead youth to interpret the statement about not mixing the product with alcohol with greater leniency, and take the recommendation less seriously, potentially resulting in greater AmED use.

Few participants thought that they would alter their consumption of CEDs based on the current cautionary statements, in part because they were too general; however, some participants indicated that if they were provided with more specific information about the side effects, they might consider altering their behaviors regarding CEDs. As such, it may be useful to consider adding additional details regarding potential side effects on CED packaging, or communicating this information through other means such as public education campaigns, including point-of-sale warning signage posted in retail outlets.²⁹

To the authors' knowledge, this is the first qualitative study to examine perceptions and knowledge of CEDs among youth in Canada, and among the first internationally. Study strengths include the rich in-depth information gained

from participants through the open-ended discussion format. In addition, the study involved some tasks intended to simulate real-life experiences, such as trying to find the cautionary statements on actual product containers.

A high level of consistency in the findings was observed across the 4 FGs; however, it is possible that different perceptions or issues might have been identified had additional FGs been conducted. Although the study included both French- and English-speaking participants from 2 cities, with an approximately equal balance of gender and age, the current findings might not be representative of all Canadian youth, and might have been subject to selection bias given the relatively small sample size, as well as the parental involvement and opt-in nature of the recruitment. Participants in the French FGs viewed advertisements with some English text (French versions were not available); youth in Montreal would be accustomed to viewing advertisements with English text because these advertisements are often distributed nationally.

As with many forms of research, there is the potential that participants offered what they believed to be socially desirable opinions,³³ a particular concern among youth, who may have a greater tendency to try to fit in and seek approval from their peers. The facilitator did not notice the occurrence of approval-seeking behaviors among the participants (such as glancing to see peers' reactions before responding, or refraining from expressing opinions that differed from others in the FG). This may have been minimized because participants were merely acquaintances and as such may have felt more free to express their opinions.³⁴ In addition, younger and older participants were separated into distinct FGs to prevent younger participants from feeling intimidated and to encourage them to share their perspectives in a comfortable environment.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The current study provides evidence that can inform the development of CED regulations by Health Canada. Although energy shots are not currently regulated as energy drinks under the

Food and Drug Act,⁵ the findings suggest that energy shots are indeed perceived by youth as CEDs. The study also highlights the importance of extending restrictions on CED advertising to all youth aged <18 years, and the need to better inform youth of the level of harm that may result from CED consumption, especially in terms of mixing CEDs with alcohol and consuming cans with multiple servings. Moreover, the study reinforces the need to display the cautionary statements in a larger font and in a more distinct way (eg, separated from the ingredient information),^{31,32} with more specific and definitive wording where possible. Additional research comparing different formatting options would be beneficial in providing direction regarding how to maximize and improve the visibility and use of the cautionary information for youth. Finally, commentary suggests that CEDs are widely accessible and reinforces the need to consider implementing age restrictions on the purchase of CEDs.

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CONFLICT OF INTEREST

The authors have not stated any conflicts of interest.

SUPPLEMENTAL MATERIAL 1. INTERVIEW GUIDE

Introductions:

Good afternoon (or evening). I'm [name of facilitator] and this is [name of recorder]. I am a Masters student at the University of Waterloo in the School of Public Health and Health Systems and am conducting these focus groups as part of a larger caffeinated energy drink study at the University of Waterloo. The goal of this project is to gather feedback on experiences with, understanding of, and perceptions of caffeinated energy drinks (CEDs). Popular brands of CEDs include Red Bull, Monster, Rockstar, NOS, Amp, and Full Throttle, but there are others. We do not include sports drinks such as Gatorade or Powerade in this beverage category. The discussion should last around 60–90 minutes. We would like to thank everyone for coming today.

We want to assure you that any comments you make will be kept strictly confidential. No individual participant will be identified. We will be audio taping the discussion so that we do not miss any of the valuable comments you make. The tapes allow us to go back and review the discussion so we can be sure to capture all of the points made.

I will be the moderator of the discussion. That means it is my job to keep the discussion focused on the issues. [Name of recorder] will be making notes of the discussion as we go along. The note taking helps us keep track of the conversation when we review the recorded discussion. Please feel free to express your view respectfully throughout the discussion.

Obtain consent:

Before we go any further, we ask that you sign a consent form. The cover page outlines what I have just explained—any information you provide in the discussion will be kept strictly confidential. We also ask that anything you hear in the discussion today is not shared outside the discussion. Please read this cover page now. You may take the cover page home with you should you have any questions or concerns after you leave today.

Please turn to the second page. The questions concern your general consent to participate, consent to be audio taped, and agreement to use of anonymous quotations in any reporting resulting from the focus group. Please check yes or no for each of the questions and sign the bottom part of this sheet.

Facilitator hands out consent forms for participation and audio taping. Give time to read the cover page. Verify whether everyone has provided written consent.

We would like to collect some background information about you to provide a general description of the participants in the focus groups we are conducting. Could you please take a few moments to complete this background questionnaire?

Hand out background questionnaires, provide sufficient time for completion, and collect.

Establish ground rules:

Before we begin, we ask that you try to speak one at a time so we do not miss any valuable comments. Please feel free to share your point of view even if it differs from what others have said. We are interested in hearing from each of you.

Group discussion:

If everyone has provided written consent, recorder turns on the tape recorder.

As you know, we are here to discuss caffeinated energy drinks. We are interested in hearing about your experiences with this product, understanding of the product, and perceptions of it.

Icebreaker:

Let's begin by introducing ourselves and briefly sharing why you decided to take part in the group.

1. PRODUCT PERCEPTIONS

A. Defining Energy Drinks

To start, I'd like you to think about what you think an energy drink is.

Show Coca-Cola, Starbucks Refresher, Gatorade Perform, AMP Energy Lemonade, 5-Hour Energy.

- A number of beverages are available on the market. I'd like to you to tell me which ones you would consider to be energy drinks and explain why. Which ones would you say are not energy drinks? Why not?

Remove non-caffeinated energy drinks.

Here are some examples of what Health Canada classifies as energy drinks. These are a few popular brands so that you can get an idea of what kind of drinks we'd like to talk more about today, but there are many others.

- Do you think these kinds of drinks are made for people like you?
- Are they used by people your age (your friends), or adults? What makes you think that?

B. Product Use

- Do you (or your friends) use these kinds of drinks? Why or why not?
- When would you (or your friends) have a drink like this?

- Why would you (or your friends) have a drink like this?
- Do you think this is something intended for use while playing sports or working out? Why/why not?
- [Ask groups of youth aged ≥ 16 years]: Do people your age use these kinds of drinks with alcohol? Why do you think they are used with alcohol?
- Do you think it is okay to use these drinks with alcohol?

2. PERCEPTIONS OF MARKETING

I'm going to show you a couple of print ads for energy drinks and ask some questions about what you think of each of them.

Show advertisement featuring sports

- What is the main message being communicated in this ad?
- Is this ad aimed at people your age, younger, or older? What makes you think that?
- What kind of person is this ad aimed at? What makes you think that?

Show advertisement featuring DJ at event

- What is the main message being communicated in this ad?
- Is this ad aimed at people your age, younger, or older? What makes you think that?
- What kind of person is this ad aimed at? What makes you think that?

3. HEALTH EFFECTS AND INGREDIENTS: GENERAL

- Do you think that energy drinks are good or bad for your health? Why?
- Do you think any of the ingredients in energy drinks are healthy? Which ones? Why?
- Do you think any of the ingredients in energy drinks are unhealthy? Which ones? Why?
- What ingredients in energy drinks give the energy boost?
- Are energy drinks safe for all kinds of people to drink, or should some people avoid them? Who? Why?

4. CAFFEINE

Let's talk more about caffeine specifically.

- Do you think that caffeine is good or bad for your health? Why/why not?
- Do you think there are any problems with someone your age drinking caffeine?
- How much caffeine should someone your age drink?

5. WARNING LABELS AND STATEMENTS

- Have you ever looked at the warnings on energy drinks before?

Here is an example of an energy drink with a warning on it.

Hand out cans.

- What do you notice about this warning?

- Does anything catch your attention? What in particular do you notice?
- Does this warning tell you anything new or that you didn't already know?
- What was new information to you?
- Can you find where on the can it tells you the amount of caffeine that this drink contains?
- What does that number mean to you? Is that a high or low amount?
- Was there anything you didn't understand or that wasn't clear in the warning?
- What was unclear?
- What about it applies/doesn't apply to you?
- Is there anything in this warning message that makes you feel concerned about using energy drinks? What? Why?
- Would this concern change your use of energy drinks? How?
- How would you improve this warning?
- Any other comments?

Summary

Give a brief summary (2–3 minutes) of main points raised in the discussion.

- If there are no further comments, I would like to summarize some of the main points raised today ...
- Do you agree that these are the main points that came out of today's discussion? Is there anything else you would like to add?

Hand out thank-you letter and provide remuneration.

- We would like to thank you for your participation in this discussion group.

Supplemental Material 2. Example Codes

Code	Quotation	Focus Group (location: age range, y)
Advertising: associated with extreme sports	Yeah, like Red Bull, they all like sponsor a lot. Yeah, like, Red Bull sponsors a lot of, like, dirt biking and mountain biking. Snowboarding too. Like, a lot of extreme sports, yeah.	Toronto: 16–18
Advertising: product recognition (brand)	Since I see that pretty much everywhere, so that the NOS, like, I just don't know that one, I don't even know what it is, really, I've never tasted it and my friends don't take any, either, so I'm more attracted to taking a Red Bull, Monster, or Rockstar, let's say, than an NOS.	Montreal: 12–15
Advertising: targeted to adolescents	Well, the labels on the bottle, how the bottle is made, they don't want to necessarily attract people, let's say in their thirties, they want to try to go get the teenagers maybe more, by creating a new format, a new font, how the bottle is designed and conceived.	Montreal: 16–18
AmED: mixing makes it worse	Yeah 'cause you're mixing, like, a lot more stuff instead of just having, like, just that energy—or just the—just the alcohol. You're mixing it both so that's, like, mixing—basically it's almost like mixing chemicals together, right. There's always reactions and stuff. You could probably have, like, either, like, a way worse effect on your body or a better effect on your body but you just don't know because there's so much stuff in both.	Toronto: 16–18
Amount of caffeine	How much we should have? Probably a small a day. A small coffee from, like, Tim Horton's a day.	Toronto: 16–18
Awareness of AmED	They mix alcohol and energy drinks. They sell stuff that's already all mixed up, so it must be really popular, mixing energy drinks and ... There is already something called, there is a type of small booze, there, a small shot.	Montreal: 12–15 Montreal: 16–18
Characteristics of CEDs: contains caffeine	It has a lot of caffeine in it.	Toronto: 12–15
Characteristics of CEDs: contains sugar	Just to know that it's an energy drink, we know that there is lot of sugar in it.	Montreal: 12–15
Characteristics of CEDs: gives energy/boost/wakes up	It's like a quick boost.	Toronto: 16–18
Coffee	Well, there's caffeine in coffee and coffee's not that bad unless you have a lot, like, a lot of caffeine could be bad. Well, I think that a coffee, it's ... there is no harm in drinking some, let's say, once a ... well, you know, you have some, like, not 3 times a day, but, you know, you want to have some once in a while, that's not dangerous. But, like, energy drinks, I don't know how much is in there, but it's, like, 8 cups of coffee in there, so ...	Toronto: 12–15 Montreal: 12–15
Consumption of CEDs	Yeah, my friend drinks it a lot. Most of us have them, like, literally every day, my friends, too.	Toronto: 12–15 Toronto: 16–18
Controls on access to CED	The drinks are super available. We can go in any convenience store and buy as much as you want and they let you do it. And they don't care because they're making money with us. They don't sell it to us even if we buy it, like, even if you try and pay for it they won't sell it to you.	Montreal: 12–15 Toronto: 12–15
Dose	I think it can be bad if you overdo it. Yeah, I think it's bad to a certain extent. Like, if you drink too much ...	Toronto: 12–15

(continued)

Supplemental Material 2. Continued

Code	Quotation	Focus Group (location: age range, y)
	I think anything in moderation; it's not something that's a huge deal. I mean, like, if you're drinking a ton—like, if you drink like 3 Red Bulls in a day, the amount of caffeine, I'm sure it does something to your heart.	Toronto: 16–18
Effects of CEDs: bad for health	Well, I think it's clear that it's bad. So, I don't think there are arguments that it's good because it's proven that it's bad, so ...	Montreal: 12–15
Effects of CEDs: caffeine related: addictive	I think they're just like cigarettes or any other drug, just you get addicted to them, it's not good for you but you do it anyway.	Toronto: 16–18
Effects of CEDs: caffeine related: crash after using	But you always crash. Like, after it runs out of, like, caffeine in your body you just, like, have nothing left and you just crash.	Toronto: 12–15
Effects of CEDs: caffeine related: heart: bad for heart	I've heard that some people got heart problems for drinking too much energy drinks.	Toronto: 12–15
Effects of CEDs: caffeine related: heart: makes heart beat faster	A drink that makes the heart beat faster.	Montreal: 12–15
Effects of CEDs: caffeine related: sleep	It throws your entire schedule off, like, if you drink a drink a day and then you don't sleep at night and the next day, like, you crash during the day and then your schedule will be off for, like, a long time.	Toronto: 12–15
Effects of CEDs: sugar content is bad for health	It's also way too much sugar, like, lots and lots of sugar. If you drink that every day, you don't realize it, but you're taking too much sugar.	Montreal: 16–18
Effects of CEDs: unhealthy ingredients	I think there are ingredients in there with funny names that you don't really see anywhere else. It's not necessarily good for our health; they don't necessarily react well together, the ingredients.	Montreal: 12–15
Effects of CEDs: when mixed with alcohol (AmED): drink more alcohol when mixed	Also, they're really sweet and it does mask the alcohol; you're going to think that you're drinking a lot less than you really are and then bad things happen.	Toronto: 16–18
Effects of CEDs: when mixed with alcohol (AmED): worse than alcohol alone	It's almost like mixing chemicals together, right. There's always reactions and stuff. You could probably have, like, either like a way worse effect on your body or a better effect on your body, but you just don't know because there's so much stuff in both.	Toronto: 16–18
How do they work	Sugar and caffeine, that's about it, right.	Toronto: 16–18
Perceived target audience for AmEDs	Young adults probably, too. Maybe not, like, a 40-year-old guy maybe sitting and watching the hockey game wouldn't really mix an energy drink with his alcohol.	Toronto: 16–18
Perceived target audience for CEDs	I see more youth drink it, that's why I think that it's more youth, but like people often say, youth don't really drink coffee, they don't really like it, they like stuff with carbonization—like that.	Montreal: 16–18
Perceived target audience for CEDs: target audience of ads shown	Like, any, like, age groups, like, our ages and up, like, because a lot of our age group, like, we do sports, play basketball and stuff.	Toronto: 12–15
	I think it's mainly for the 18-, 19-year-olds, like, when you start to be an adult because then you feel there are new things that are allowed, and I think it's pretty much a period where you want to experiment to the fullest the new things that are permitted. So, when you see an ad like that, you go, 'Hey!	Montreal: 12–15

(continued)

Supplemental Material 2. Continued

Code	Quotation	Focus Group (location: age range, y)
	That's exactly what I'm looking for,' new experiences, a way to exercise my new rights.	
Reasons for using AmED: for energy to party longer	Gives you more energy to, like, continue throughout the party or something, or whatever you're doing.	Toronto: 16–18
Reasons for using AmED: taste (with alcohol)	It's very sweet, so it takes away the taste of the alcohol, in my opinion.	Montreal: 16–18
Reasons for using AmED: to be able to drink more (alcohol)	So you can drink more.	Montreal: 16–18
Reasons for using AmED: to get drunk	I heard it gets you drunk faster, that's all. That's why some people do it.	Toronto: 16–18
Reasons for using CEDs: addiction	You reach a point where to start to need it.	Montreal: 16–18
Reasons for using CEDs: convenience or habit	If I see one at a store and I just, like, want it.	Toronto: 16–18
Reasons for using CEDs: energy or staying awake	It has a lot of caffeine in it so people have energy to stay awake.	Toronto: 12–15
Reasons for using CEDs: fun/social context	With my friends, when they have some sometimes I have some.	Montreal: 12–15
Reasons for using CEDs: sports/exercise	When you tell yourself, 'Ah, I've got a game,' let's say this evening, well, I don't know soccer or hockey, or whatever, you tell yourself, 'Okay, I might be a bit tired because I had school today,' so you're going to have some. A lot of my friends take some before training, for example.	Montreal: 12–15 Montreal: 16–18
Reasons for using CEDs: studying	For studying to stay awake or if they have to do assignments or projects. When you know that you have an exam the next day and you'll have to stay late, then I take one in the afternoon.	Toronto: 12–15 Montreal: 16–18
Reasons for using CEDs: taste	I used to like to Monster, like, every day, maybe, but not really anymore. I just like the taste.	Toronto: 16–18
Reasons for using CEDs: work	Mostly to be able to go to work and to school.	Montreal: 16–18
Risk perception of the warnings	It's just, like, not recommended. It's not like if you're a pregnant woman you could have these effects. It's just, like, it's not recommended so you can drink it. It's a little worrisome to see that they make them so small to hide them, it's, like, what's so dangerous that you want to hide it from us so much?	Toronto: 16–18 Montreal: 12–15
Warning labels	On the warning they mostly talked about people, like, older when who are, like, pregnant or breastfeeding and it doesn't really relate to us.	Toronto: 12–15
Warning labels: awareness	I saw them on one of the projections, I don't remember which, but, like, that isn't recommended for people under 18 years of age, so, you know, I suspected that, but I didn't know that it's really written on there. There must be some, but it must be written in very small letters in the back on the can.	Montreal: 12–15 Montreal: 16–18
Warning labels: company self-interest	They say not recommended on most of them. They don't say, like, you shouldn't 'cause they still want to make money off of it, so they use recommended, so that they leave it up to you,	Toronto: 12–15

(continued)

Supplemental Material 2. Continued

Code	Quotation	Focus Group (location: age range, y)
Warning labels: hard to find/see	and then if anything happens then they say you can't blame them because they give you the option. The warning, it's really small and the font is really small, so that's why people don't look it. They just buy it.	Toronto: 12–15
Warning labels: no effects listed	If the drink doesn't say what the side effects are, then they won't care and they'll just do it anyways. They don't really tell you what can happen if you drink it, so people might want to try to see what would happen.	Toronto: 12–15 Toronto: 12–15
Warning labels: reading/ using the label warning	Actually, I've never looked at the warnings. It's more, like, people telling me that it's not good to drink that stuff, but I've never looked at the warnings.	Montreal: 16–18

AmED indicates alcohol mixed with energy drinks; CED, caffeinated energy drinks.