Informing Intervention Strategies to Reduce Energy Drink Consumption in Young People: Findings from Qualitative Research

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INTRODUCTION

Energy drinks (EDs) are non-alcoholic caffeinated beverages containing various carbohydrates, amino acids, vitamins and sweeteners.¹ The purported benefits of EDs include improved energy, concentration, metabolism and performance.¹ Global sales of EDs exceed \$30 billion,² with EDs available in over 160 countries.³

The popularity of EDs parallel growing concerns about harmful ED consumption. The adverse health effects of EDs typically mirror caffeine toxicity, such as headaches, nausea, sleep difficulties, seizures, anxiety, cardiac abnormalities, and sudden death.⁴⁻⁶ People with existing medical conditions, such as cardiovascular, renal or liver disease, diabetes, seizures, and mood disorders, may be particularly vulnerable to the negative health consequences of EDs.⁷

Given their lower tolerance to caffeine, children and adolescents may be more susceptible than adults to the negative side-effects of EDs.^{7, 8} Indeed, there is no established 'safe level' of caffeine intake for children and adolescents. Furthermore, reports from the US and Australia indicate that caffeine overdoses and adverse reactions to EDs are prevalent and increasing in adolescents.^{7, 9} Evidence also suggests that some young adults use EDs in combination with alcohol and illicit drugs, potentially affecting brain and cardiovascular functioning and injury risk.^{10, 11}

ED regulations vary internationally. In the US there are no restrictions on ED caffeine levels or caffeine quantity labelling requirements.⁷ By contrast, within the European Union, all EDs

must be labeled as ‘high caffeine content’, while products containing more than 150mg/L of caffeine must state the caffeine level in mg/100mL.¹² In Australia, EDs contain a maximum of 320 mg/L of caffeine and average quantities of all ED ingredients must be stated on a nutritional panel.¹³ While ED sales are unrestricted in Australia, ED labels must recommend a maximum daily intake amount and state that EDs are not recommended for children, pregnant or lactating women, or caffeine sensitive persons.¹³ However, a recent study of 1992 Australians aged 16 years and over found fewer than two-fifths of ED consumers were aware of the recommended maximum daily intake guidelines present on ED labels.¹⁴

Australian health professionals and the lay community have expressed concern about the health effects of EDs and support tighter ED regulations. An analysis of pooled data from 3 West Australian Nutrition Monitoring surveys (3196 people) indicated that in 2012, 89% of participants aged 18 to 64 years were concerned about the sale of EDs to children, with the proportion of people ‘very concerned’ (79%) increasing from 59% in 2001.¹⁵ The Australian Medical Association has recommended banning the sale of EDs to individuals younger than 18 years; a strategy employed within Denmark, Turkey, Norway, Uruguay, Iceland and Lithuania.^{16, 17} In 2014, the Australian Federal Parliament received a petition calling for the ban of ED sales to people under 18 years, signed by over 13,500 people.¹⁸

Despite recent calls to tighten ED regulations and a growing evidence base of health risks associated with these drinks, many countries such as Australia and the US have not enforced age-specific restrictions on the sale of EDs. Although there is a critical need to identify ways to minimize the potential harm from ED consumption, there is a paucity of research investigating intervention strategies to reduce ED consumption amongst young people. Thus,

using group interviews with young people aged 12-25 years, this study aimed to explore i) young people's knowledge of EDs; ii) the factors influencing ED consumption or non-consumption in young people; and iii) intervention strategies to decrease ED consumption in young people.

METHODS

Participants and Recruitment

Forty-one young people attended 1 of 8 group interviews, with participants ranging in age between 12 and 25 years (Table 1). As factors influencing ED use may vary according to age, participants within each group interview fell within a 5-year age-range. Participants were recruited using a convenience sample of young people attending 1 youth group and 2 independent high schools. Young people were also recruited after responding to an advertisement for study participants shared on social media pages of the Telethon Kids Institute and the National Heart Foundation of Australia's Live Lighter Campaign.

Recruitment ceased upon data saturation. Eligible participants were those aged 12-25 years, English speaking and living in the Perth metropolitan area, Western Australia. The Greater Perth region contained approximately 2.04 million people in 2015 – 79% of the State's population. The median age of Perth residents was 35.7 years, with children under 15 years of age comprising approximately 20% of the population.¹⁹

Procedure

Ethical approval was granted by The University of Western Australia's Human Ethics Committee. Participants received a study information sheet via email or post prior to the

group interviews, and were contacted the day before the interviews to confirm attendance. Signed, informed consent was obtained from all participants, with signed informed parental consent also obtained for participants aged 12-17 years. An 'opt-out' method of consent was used at 1 school whereby parents received an information sheet and a request to notify the research team if they did not want their child to participate. Participants were offered \$25 cash (or the equivalent store voucher) as a token of appreciation for their participation and to reimburse costs associated with attendance.

A discussion guide was developed prior to the group interviews using themes from existing research^{7, 20} and refined after review by an expert panel of 11 researchers (all of whom had experience in qualitative or ED research). The discussion guide contained semi-structured questions framed around participants' awareness of ED brands and ingredients, ED consumption patterns and experienced health effects, factors influencing ED consumption (or non-consumption), and strategies for reducing ED consumption. The guide was pilot tested with 4 adolescents and 5 young adults for comprehension and feasibility.

Group interviews were conducted during September and October 2015, in rooms at schools, community centers and libraries throughout metropolitan Perth, Western Australia.

Participants completed a brief demographic survey prior to the group discussion, including the question '*How often do you drink EDs?*' At the commencement of the group interviews, participants were shown EDs sold in Australia, as well as non-ED beverages (e.g., sports drinks, sodas and iced coffee), to gauge their awareness of ED brands and clarify which drinks were classified as EDs. The views of different age-groups and genders were considered during the group interviews, with the facilitator inviting less-vocal participants to

provide their opinions and experiences to the extent they felt comfortable doing so. Female and male voices were represented within all of the mixed group interviews. Group interviews were 30-50 minutes in duration and facilitated by the same researcher (first author) who had over 10 years experience facilitating focus groups and group interviews as both a doctoral student and post-doctoral fellow.

Discussions were recorded and transcribed verbatim by the group interview facilitator (first author). All identifying data were removed, and a qualitative content analysis was conducted with the assistance of NVivo. A coding framework was developed around the study objectives and questions in the discussion guide pertaining to knowledge of EDs, factors influencing ED consumption, and intervention strategies to decrease consumption in young people. The framework was refined upon repeated readings of the transcripts and the emergence of new sub-themes. Thematic saturation occurred once new sub-themes stopped appearing in the data. Themes and sub-themes were verified by a second researcher, with minor inconsistencies between the 2 researchers discussed until a consensus was reached. An inter-rater reliability of 80% was achieved. Recurring themes are presented in the results.

RESULTS

Participant demographics are described in Table 1. Although some participants responded ‘never’ to the question in the background survey *How often do you drink EDs?*, their responses during group interviews indicated that while they no longer consumed EDs, most had tasted an ED, with some previously consuming EDs in large quantities. The key themes are presented according to the 3 objectives – i.e., to determine i) knowledge of EDs; ii)

factors influencing ED consumption or non-consumption; and iii) strategies to decrease ED consumption in young people.

Knowledge of Energy Drinks

Sub-themes regarding knowledge of EDs included confusion over what constitutes an ED, awareness of ingredients and their effects, and serving size. While most participants could name popular EDs, there was confusion across all age groups as to whether EDs included coffee, sports drinks, nutritional supplements and soft drinks:

[Soft drink]. I definitely think it's an ED. It's full of sugar. (Male #3, 14 yrs)

Some participants were aware EDs contained caffeine and sugar (but not how much), however few could name other ED ingredients, or how these ingredients influenced energy levels:

I know they've got caffeine. I think they have a lot of sugar ... but I don't know that much [about EDs]. (Female #33, 23 yrs)

There's probably other stuff in there that they don't tell you that's addictive. (Male #4, 15 yrs)

Serving size also caused confusion. Few participants were aware of the advisory statements written on ED cans and how to interpret serving size. As labels on both 250ml and 500ml cans state '1 serving per package', many participants assumed this meant '1 standard drink' and concluded that amounts of sugar or caffeine in 500ml cans were equivalent to those in 250ml cans:

All of those cans over there are 1 serve. That one's just more concentrated ...they're just bigger to make you think you're getting more. (Male #27, 22 yrs)

Factors Influencing Energy Drink Consumption and Non-Consumption

Age and gender. Age and gender appeared to influence ED consumption. Young adults often replaced EDs with coffee or alcohol once they turned 18.

I used to drink them lots in high school, but not now. I drink coffee now instead. (Female #31, 21 yrs)

Most participants believed males consumed more EDs than females and noted ED advertisements generally targeted males.

Of all my friends, the guys drink more...my female friends are more health conscious. (Female #33, 23 yrs)

I don't know any girls at school who drink them ... some of the boys at school put [photographs of EDs] on [social media]. (Female #23, 12 yrs)

I think the promise of improved high performance – high physical performance, high sexual performance - is attractive to men mostly than women. I think that's why they market to men. (Female #30, 23 yrs)

Location and context. Participants noted that EDs were highly accessible. They were frequently purchased from supermarkets, petrol stations, festivals and nightclubs and

consumed at home, friends' houses, university, video game parties, nightclubs, the beach, music festivals/events and schools. Consuming EDs to stay alert while playing video games was a sub-theme that emerged across all age groups in discussions around the location and context of ED consumption. One participant described the following scenario:

They're called LAN [Localized Area Network] parties. You pay to bring your computer to an event...and you play multiplayer games ... this goes on all night...At a lot of these events the marketing car with the [ED] promo girls come and they hand out free [EDs] ... of my group of friends, maybe 6 out of 10 drink them...they bring an eski [ice box] full of little cans, so they can drink them throughout the night. (Female #30, 23 yrs)

Increased energy. Participants drank EDs for the perceived increase in energy. Reasons for requiring energy included playing lengthy video games, completing assignments/exams, participating in sporting activities and when driving at night or long distances.

I really only [drink EDs] to keep awake...I think everyone does it for that.
(Female #1, 15 yrs)

[My ED consumption increases during] exams and if I work late...if I need that extra boost to get through the shift or something. (Female #41, 19 yrs)

One participant believed EDs provided the energy required to manage competing demands:

You're under constant pressure to perform... You have to go to university, go to work, and go out with your friends at night, so [drinking EDs] keeps everything together. (Female #30, 23yrs)

Negative physiological effects. While some participants were unaffected by EDs, many reported experiencing negative physiological effects or knew someone who had. Effects included decreased energy, poor concentration and fidgeting, sleeplessness, stress, fainting, nausea, shaking, increased heart rate, hallucinations and addiction:

I had 5 cans of the little [EDs] in 1 day because I was really trying to cram, and I just felt like I was buzzing. Like my skin was tingling. I couldn't concentrate. (Female #30, 23yrs)

I had way too much once and I started hearing [things]. (Female #7, 15yrs)

My friend experienced heart palpitations and his hands were shaking...he called us up and said "I think I'm dying"...it was exam week so he drank 2 of these big cans [710ml] in...maybe 4 hours. (Female #33, 23yrs)

Other participants felt addicted to EDs and experienced withdrawal symptoms upon cessation. Participants also mentioned friends who had been hospitalized:

I had one friend... She had iced coffee, but ...she topped it up with [ED] and she ended up going to hospital because she had heart palpitations. (Female #32, 21yrs)

The number of EDs consumed before experiencing negative health effects depended on the individual. While some participants felt ill after drinking 1 small-sized (250ml) can of ED, others experienced the same effect after consuming multiple cans. However, negative

experiences did not deter all participants from consuming EDs, with some people reducing, rather than eliminating, the amount they drank.

Taste and cost. Following the desire for increased energy, taste was the second most common reason for drinking EDs. However, taste also proved to be a deterrent, as many people disliked the taste of EDs, indicating their dislike by making faces or distasteful sounds.

Some of them taste good. But some of them are like 'ew'. (Male #4, 15 yrs)

The taste of EDs was sometimes masked by mixers. Reported mixers included alcohol (particularly vodka), orange juice, beer, soft drinks, sports drinks and coffee. Participants also reported mixing EDs with marijuana.

Like taste, cost was both a deterrent to, and facilitator of, ED consumption. A number of participants described the \$4-\$5 (AUD) price of a 250ml ED as too expensive to purchase. Others described EDs as cheap. Participants frequently purchased multi-packs on sale as they were similar in price to individual EDs. Multipack purchases tended to increase ED consumption. Some adult participants noted that EDs mixed with vodka were cheaper than other drinks at the nightclubs they frequented, and more prominently advertised.

Education. Education around ED ingredients and health effects was a deterrent to consuming EDs. Some adolescents heard about EDs high sugar and caffeine content at school.

In health...last year, we were taught about how they're not good for kids. [Female #23, 12 yrs]

Others saw stories on the news or social media about people who had died or were admitted to hospital after drinking EDs. Notably, some older participants questioned the legitimacy of the warnings they had seen on social media:

Sometimes it goes around on Facebook, and I know it's just fear mongering, like "don't drink this or you'll go to hospital, you'll have a heart attack"...But you don't know how true it is...Anyone could have wrote it. (Female #30, 23yrs)

Peer pressure. Peer pressure and social norms also influenced adolescent ED consumption:

I got shunned for not liking EDs... [friends would] try and force you to take it to prove to you that you will still survive after 1 sip. (Female #32, 21yrs)

[EDs are] like a legal way for [teens] to be all rebellious and still get the buzz and the rush, without having to actually take illicit drugs. (Female #32, 23yrs)

Many young adult participants believed peer pressure only influenced ED consumption during adolescence, but not young adulthood.

Parents. Parental beliefs and behaviors influenced ED consumption, particularly among the youngest participants. Many of the 12 year old participants who never drank EDs stated it was because "my mum and dad won't let me" (Female #22, 12 yrs). Parental beliefs were said to be particularly influential when reinforced from a young age:

My mum's always told me that they're bad, so that's why I've never really touched them. I think if she'd told me now when I was a teenager, I'd be like "nah, I'm going to drink it anyway". But she's constantly reinforced it since I was about 10. (Female #37, 16yrs)

By contrast, other parents appeared to normalize ED consumption through modeling ED use:

[My mum] drinks a lot of it...every morning she wakes up, she's really tired, so in the fridge, there's 4 cans of Mother in there when she's finished that, then 40 seconds later, she's just popping another one in. (Male #10, 17yrs)

Advertising, promotions and giveaways. Participants noted that ED advertisements, promotions and giveaways all encouraged ED consumption. Most participants were familiar with televised and online ED advertisements and described the advertisements as funny and entertaining. Promotional stickers were also mentioned:

Five people in my house have [ED] cars. All over the car there's advertising everywhere. It's like it's cool to drink it because other people drink it. (Male #13, 16yrs)

Strategies to Reduce Energy Drink Consumption

Five broad strategies were suggested by participants to discourage and reduce young people's ED consumption: i) ED restrictions; ii) change ED packaging; iii) increase price and reduce ED visibility in retail outlets; and v) ED research and education (Table 2).

Energy drink restrictions. A number of restrictions around ED consumption were suggested by participants. These restrictions were discussed in relation to ED cans of 710 mls, children and schools. Most participants believed that 710ml ED cans should be removed from the market as they exceed the maximum recommended intake of 500ml/day prescribed on the label. Similarly, participants felt that EDs should be illegal to purchase or consume by those aged 12 years and younger since they believed children rarely require more energy. Some older participants recommended a legal consumption age of 16 or 20 years when people had matured physically and were generally more responsible:

[At 16] you're responsible enough to manage how much you're drinking and you know when to stop. You can use it for things that matter, like exams, and work and staying up late. (Female #37, 16yrs)

Probably 20-ish. Anything that might damage their growth won't affect them too much because they've technically stopped growing at that point. (Male #28, 22yrs)

Notably, most participants who suggested restricting ED consumption according to age felt mature enough to drink EDs and chose age-restrictions that were younger than their current age.

Banning ED consumption at school was another popular strategy. Although the schools attended by some of the participants did not sell EDs, students at public and private schools were permitted to bring EDs from home:

I had a friend who would come to school with about 4 or 5 cans in his bag ... we used to have the same classes. He'd have it on the table, and we'd just sit there and go through 5 cans between us. (Female #7, 15yrs)

However, some schools that banned ED consumption on school grounds were lenient in enforcing the ban:

[The teacher] tells us it's bad for us. But then he tells us to skull it quickly so we can finish it before we walk through the door. (Male #10, 17yrs)

In contrast to restricting or banning EDs, some participants felt it was important to educate consumers so they chose to avoid EDs, rather than having the decision forced upon them:

[Banning] never works. Making anything taboo creates a black market. Kids, when you tell them "don't have this, it's bad for you" will be like "yeah, watch me". (Female #30, 23yrs)

You've got to make people think that it's their choice to not want it...make them think "oh, no, we don't want it", not "we're not allowed to have it". (Female #32, 21yrs)

Changes to energy drink packaging. Plain ED packaging (i.e., the use of plain fonts and dull colors) was proposed as a strategy to decrease the appeal of EDs to young people. Participants felt there were similarities between ED and alcohol packaging in terms of color and font appeal to young people, especially males.

It's kind of like they're made to look like it's alcohol. As a younger kid I thought they could be. (Female #35, 17yrs)

By contrast, many young adolescent females found ED packaging unappealing:

They don't look pretty, they look really ugly. (Female #23, 12yrs)

Opinion varied as to whether ED packaging should replicate tobacco packaging in Australia, where plain packaging is combined with unappealing graphics of smoking-related health issues (e.g., rotten teeth). Many participants considered graphics unwarranted as they felt the negative health effects of ED consumption were less severe than smoking.

Given many participants were unaware of the advisory statements written on ED labels, they suggested changing the font size and color of statements to increase their visibility. Changes to the way nutrition information was presented was another suggested change to ED packaging:

I think all ingredients look the same on packages... If you said 12 tablespoons instead of 60 grams, it's something people can see and measure. (Female #39, 19yrs)

Increasing purchase price and reducing visibility in retail outlets. Most participants felt that increasing the price of EDs would discourage consumption, as would positioning EDs on peripheral shelves in retail outlets, rather than eye level. Most participants did not agree with restricting sales to chemists or pharmacies as they associated these outlets with wellbeing and good health:

I don't know why [other countries] did that. I think it's making it seem like they're healthy. (Female #17, 16yrs)

Energy drink research and education. Participants knew little about research into the health effects of EDs. While some learned about the dangers of consuming too much caffeine, sugar, and EDs at school or via news programs, many were unaware of the potential health effects and research in this area.

I think there should be a study on the effects [of EDs] on little kids...then they can report that in the news or in the media and the message can get out. (Male #34, 25yrs)

In addition to delivering health messages, participants felt that interactive activities were important education tools:

If you were going around to schools then I'd get them to do experiments on it. Let them see how much sugar is in it themselves, and let them see what it does to you. (Female #18, 16yrs)

There's [an experiment] for [soft drink]...that's what made me stop drinking it. (Male #19, 16yrs)

Participants also wanted health messages communicated via news stories and television announcements. Indeed, some participants had specific ideas about what advertisements should contain:

You see one guy has the ED and the other guy has orange juice, and then show although the ED gives lots more energy, he makes more mistakes and then crashes out sooner. (Male #28, 22yrs)

Other suggested campaigns included informing parents of the negative health effects of EDs. While parents were important sources of information for children, trusted and known general

practitioners (GPs) were preferable to deliver health messages to adolescents and young adults:

If it was just on TV and the doctor was like “this is proven to do this” then I wouldn’t trust him because they do that with all other adverts. But I would if my own doctor was like “don’t”. (Female #18, 16yrs)

DISCUSSION

This study explored young people’s ED knowledge, factors influencing ED consumption and intervention strategies acceptable to 12-25 year olds to reduce ED consumption. Results showed young people often lacked a basic understanding of EDs, particularly in terms of ED ingredients and how EDs increase energy levels and potentially harm health. Another study also found adolescents aged 12-15 years from regional Australia (80% male) were often unaware of ingredients contained in EDs, attributed ED’s stimulant effect to sugar rather than caffeine, and sometimes confused EDs with carbonated fruit juices and soft drinks.²⁰ Many participants in this study were also confused about what constituted a serving size and were unaware of the advisory statements written on ED labels. Such findings reflect another Australian study of people aged 16 years and over (mean age 24 years; 58% male) that found fewer than two-fifths of ED consumers were aware of the recommended maximum daily intake guidelines written on ED labels.¹⁴

In terms of policy interventions to reduce ED consumption, restricting ED sales and consumption to adults only is a strategy employed in other countries and recommended by

Australian health professionals.^{16, 17} Indeed, setting a minimum age for purchasing alcohol has been a successful strategy in reducing alcohol consumption and related harm.²¹

Changing ED packaging was identified as another important intervention strategy. A number of participants suggested implementing strategies employed in tobacco-control campaigns, such as plain packaging. Plain cigarette packaging was introduced in Australia in 2012; all tobacco products are now sold in packets uniform in color, shape, and texture.²² Specific suggestions by participants included the use of plain fonts and dull colors to decrease the appeal of EDs to young people. Indeed, plain cigarette packaging has been shown to reduce the appeal of cigarettes amongst Australian 12-17 year olds.²³ Participants' also suggested increasing the size of ED advisory statements in order to make them more visible. This is an effective strategy used in tobacco control; studies of cigarette packs show that large and graphic health warnings are noticed more often and increase knowledge of the health effects of smoking better than small text-only warnings.²⁴

Increasing the price of EDs was another intervention strategy suggested by participants. Increasing purchase price has been effective in reducing consumption of sugary drinks, tobacco and alcohol.^{21, 25, 26} In response to Mexico's decision to tax sugared drinks (including EDs) in January 2014, purchases of taxed beverages decreased by 12% by the end of 2014, and by 17% in low SES households during the same period.²⁵ Anderson and colleagues (2009) found that increasing the price of alcohol was the most effective measure in reducing alcohol-related harm; policies affecting cost not only delayed the start of drinking, but slowed young people's progression towards heavy drinking and the volume consumed on each occasion.²¹

Of the factors influencing ED consumption, the strong link between electronic gaming and ED consumption for both adolescents and young adults is a noteworthy finding of this study. American research also found ED consumption was related to higher video game usage.²⁷ For example, boys who regularly drank EDs played an additional 4 hours of video games each week than boys who drank EDs less frequently.²⁷

Parents and GPs appear to be key sources of ED-related information for youth, with health messages delivered or modelled by parents during childhood found to be particularly effective in reducing ED consumption in younger adolescents. Such findings support other research which showed disapproval of EDs by parents prevented year 7 students from consuming EDs.²⁰ However, our findings also indicated that influences and contexts of consumption can vary with age, as adolescents and young adults indicated that they would be more responsive to health messages delivered by GPs. Peers and parents were key influences of ED consumption in adolescence but not young adulthood, while combining ED consumption with alcohol and illicit substances was mentioned by participants over 15 years, but not 12-14 years. Similarly, ED consumption was perceived by participants as being higher in males than females, a finding reflected in other studies.²⁸

This novel study investigates potential intervention strategies to reduce ED consumption in young people, by young people. A strength of this study is participant diversity in terms of gender, ED consumption and age (12-25 years, with every age represented). However, 73% of all participants lived in high SES areas and only 2 adults resided in low SES suburbs. Adults also comprised 29% of participants, while 66% of the participants consumed EDs never or less than once a month (though notably most of these participants had tasted an ED

and some had consumed them in large quantities in years prior to the study). In comparison, Trapp et al's study of 18-22 year old Australian males found that 48% consumed EDs ≤ 1 /month. Costa et al's (2014) qualitative study of 12-15 year olds found that most year 7 students (approximately 12 years old) had consumed an ED only once, which is in keeping with this study's finding regarding 12 year old participants (Table 1). Nonetheless, the over-representation of high SES participants, adolescents, and those consuming small quantities of EDs affects the generalizability of the findings. In particular, comparisons between adults and adolescents require cautious interpretation.

Implications for Research and Practice

The confusion surrounding ED ingredients and their effects, as well as serving size and advisory statements on ED packages suggest educational campaigns increasing young people's knowledge around EDs are needed.²⁹ Specific interventions targeting parents and health practitioners, in addition to young people, may be effective in reducing harmful levels of ED consumption in young people. Indeed, given the influence of peers and parents on participants' ED consumption, interventions focusing on the consumption of healthy beverages may be particularly beneficial. Such interventions support Bandura's Social Learning Theory,³⁰ specifically the notion that people's actions are the result of observing and subsequently modeling the behavior of influential others in their environment. Specifically, interventions need to raise awareness around the potential physiological consequences of EDs and promote alternative ways of improving energy levels, such as good nutrition, physical activity and adequate sleep. Interventions might also involve the presentation of 'healthy' role models, such as respected public figures who model positive alternative behaviors. Providing information about the negative health effects of EDs may

address parental modeling behaviors and increase individuals' self-efficacy to resist negative peer models or ED advertisements. Health promotion programs could also target LAN parties to educate gamers about EDs. Other settings for health promotion campaigns could include universities, nightclubs, music festivals and schools.

Of the 5 key interventions identified by participants (Table 2), those relating to research and education may need to be targeted to specific age-groups. In particular, education campaigns for young adults might target general practitioners rather than parents and schools. Similarly, interventions targeting ED use in combination with alcohol and illicit substances may be more relevant to young adults than 12-14 year olds, while school-based activities only apply to adolescents. Because ED consumption was perceived by participants as being higher in males than females, campaigns designed to reduce ED consumption could also be targeted according to gender.

Given participants noted that ED advertisements, promotions and giveaways may encourage ED consumption, a policy implication of this research might be implementing and evaluating policies that regulate the marketing and promotion of EDs. In particular, ED visibility might be reduced by displaying EDs on peripheral rather than central eye-level shelves and banning in-store ED promotions. Advocating for changes to warning labels and ingredients may also help to reduce ED consumption given that participants believed quantities of ED ingredients (such as caffeine and sugar) would be easier to interpret if stated in common terms, such as teaspoons. Finally, implementing an adverse event reporting system, such as mandatory recording of hospital admissions related to EDs, may assist researchers and policy makers in

determining the total number of adverse reactions to EDs, and the quantity of EDs that precipitated the reaction.

The popularity of EDs in recent decades has fueled concerns about the negative health effects of ED consumption. As Australia is yet to enforce a ban on the sale of EDs to people under 18 years, identifying ways to minimize the potential harm from EDs is critical, as is further research to confirm the varied health effects of EDs. This study has provided unique insights into intervention strategies suggested by young people to reduce the consumption of EDs. Implementing intervention strategies that are acceptable to young people may increase the likelihood of them adopting such strategies. Future research should examine the feasibility of implementing the interventions suggested by young people in this study – namely, restricting ED sales so they are not available to children or in schools; changing ED packaging to lessen their appeal; increasing ED purchase price; reducing ED visibility in retail outlets; and educational campaigns to increase knowledge of EDs in young people, parents and GPs.

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Table 1: Demographic Data for Study Participants (n=41)

Group Interview	n	Female Gender (n)	Age (yrs)		SES (n)		Frequency of Energy Drink Consumption (n)	
			mean	range				
1	6	2	16	14-17	Low	2	Never	0
					Mid	2	<1/month	3
					High	2	1-3 days/month	2
							1 day/week	1
							2 days/week	0
2	6	2	15	13-18	Low	4	Never	0
					Mid	0	<1/month	3
					High	2	1-3 days/month	1
							1 day/week	1
							2 days/week	1
3	7	4	16	16-17	Low	0	Never	2
					Mid	0	<1/month	3
					High	7	1-3 days/month	0
							1 day/week	1
							2 days/week	1
4	7	7	12	12	Low	0	Never	3
					Mid	0	<1/month	3
					High	7	1-3 days/month	1
							1 day/week	0
							2 days/week	0
5	2	0	22	22	Low	0	Never	2
					Mid	0	<1/month	0
					High	2	1-3 days/month	0
							1 day/week	0
							2 days/week	0
6	4	3	22	21-24	Low	1	Never	2
					Mid	0	<1/month	1
					High	3	1-3 days/month	1
							1 day/week	0
							2 days/week	0
7	2	1	24	23-25	Low	0	Never	0
					Mid	0	<1/month	2
					High	2	1-3 days/month	0
							1 day/week	0
							2 days/week	0
8	7	5	18	15-20	Low	0	Never	2
					Mid	2	<1/month	1
					High	5	1-3 days/month	1
							1 day/week	1
							2 days/week	2

Table 2: Intervention Strategies Suggested by Young People¹ to Reduce Energy Drink (ED) Consumption

Key intervention	Example strategies
ED restrictions	<p>Ban sale of EDs >500mL</p> <p>Legislation to prevent purchase and consumption of EDs by youth under 12 years</p> <p>Ban consumption of EDs in schools</p>
Change product packaging	<p>Mandatory plain ED packaging</p> <p>Large prominent advisory statements, health warnings and ingredient lists</p> <p>Nutritional information presented in quantities easily interpreted (e.g., teaspoons rather than grams)</p>
Increase price	<p>Increase price of purchase</p> <p>Remove multipack price incentives</p>
Reduce visibility in retail outlets	<p>Position EDs on low or high shelves in retail outlets</p> <p>Ban promotional displays of EDs</p>
Research and education	<p>Increase research into the health effects of ED use in children and young people</p> <p>Implement school visits and education sessions, including interactive activities and experiments</p> <p>Deliver health messages via news stories and television advertisements</p> <p>Education campaigns targeting parents</p> <p>Develop GP-based intervention strategies</p>

¹Forty-one participants aged 12-25 years.

Practice Points

1. Intervention strategies suggested by young people to reduce ED use may increase the likelihood of them adopting such strategies.
2. Young people suggested policy strategies to reduce ED use that targeted ED sales, packaging, price and visibility.
3. Educating young people, parents and GPs about the health effects of EDs was also suggested by young people to reduce ED use.