Patterns of Energy Drink Advertising Over US Television Networks
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ABSTRACT
Objective: To describe programming themes and the inclusion of adolescents in the base audience for television channels with high levels of energy drink advertising airtime.
Design: Secondary analysis of energy drink advertising airtime over US network and cable television channels (n = 139) from March, 2012 to February, 2013. Programming themes and the inclusion of adolescents in each channel’s base audience were extracted from cable television trade reports.
Main Outcome Measure: Energy drink advertising airtime.
Analysis: Channels were ranked by airtime; programming themes and the inclusion of adolescents in the base audience were summarized for the 10 channels with the most airtime.
Results: Over the study year, 36,501 minutes (608 hours) were devoted to energy drink advertisements; the top 10 channels accounted for 46.5% of such airtime. Programming themes for the top 10 channels were music (n = 3), sports (n = 3), action-adventure lifestyle (n = 2), African American lifestyle (n = 1), and comedy (n = 1). MTV2 ranked first in airtime devoted to energy drink advertisements. Six of the 10 channels with the most airtime included adolescents aged 12–17 years in their base audience.
Conclusions and Implications: Energy drink manufacturers primarily advertise on channels that likely appeal to adolescents. Nutritionists may wish to consider energy drink media literacy when advising adolescents about energy drink consumption.
Key Words: energy drinks, adolescents, marketing, television (J Nutr Educ Behav. 2015;47:120-126.)

INTRODUCTION
Energy drinks are ready-to-drink beverages, shots, and drops that contain caffeine and often a mix of other stimulants and ingredients purported to increase energy (eg, guarana, herbal supplements, B vitamins, taurine).1-3 The caffeine content of energy drinks varies. Concentrations for many popular brands range from 70 mg/8-oz serving to 200 mg/16-oz serving.4 In comparison, the caffeine content of many popular soft drink brands ranges from 23 to 69 mg/12 oz.5 Caffeine is considered “generally recognized as safe” by the US Food and Drug Administration,5 yet concerns have been raised about the potential health risks associated with high caffeine intake among adolescents.5 For example, short-term adverse effects associated with caffeine intake among adolescents include anxiety, irritability, and withdrawal symptoms.5,6,7 Adolescence is a critical time of cognitive development, and caffeine intake during this period may have a negative impact on learning, particularly if intake contributes to disrupted sleep.5,7 More serious adverse effects related to energy drink intake among adolescents, including serious cardiovascular events,5,8 have been reported. Importantly, 34 deaths related to energy drink use have been reported to the Food and Drug Administration since 2004.9 Although the extent of any health risks associated with energy drink consumption is currently under debate,10 the American Academy of Pediatrics1 advises against energy drink consumption among adolescents, stating that energy drinks offer no therapeutic benefits.1

In June, 2013, the American Medical Association11 supported a ban on the marketing of energy drinks to adolescents, and in September, 2013, a US Senate Commerce Committee demanded that energy drink manufacturers stop marketing their products to adolescents.12 However, current data regarding the marketing practices of energy drink manufacturers have been largely qualitative.1,13 Specifically, qualitative data highlight several methods of advertising that energy drink manufacturers use, including featuring young athletes in marketing campaigns, using edgy and attention-grabbing packaging, and sponsoring events popular with adolescents and young adults.1,13 Two quantitative studies measured adolescent exposure to energy drink advertisements and...
reported that adolescents were more likely to be exposed to energy drink advertisements over television and the Internet than were adults.\textsuperscript{14,15} Using 2012 Nielsen data, researchers from the Yale Rudd Center for Food Policy and Obesity illustrated that adolescents aged 12–17 years viewed more advertisements for energy drinks than did adults on many cable channels popular with young adults. Adolescents viewed 2.26 times as many advertisements for 5-Hour Energy, 2.14 times as many advertisements for Red Bull, and 2.44 times as many advertisements for Street King energy drinks on MTV2 than did adults watching MT2.\textsuperscript{14} Results from that study demonstrated that advertisements aired on those channels effectively reached an adolescent audience. Nielsen data are based on a sample of households and reflect viewership; a study that specifically assesses patterns of airtime placement for energy drink advertisements on television would be useful by informing a more complete representation of the marketing intents of manufacturers.

Television remains the most popular media outlet among adolescents in the US.\textsuperscript{16} In 2009, adolescents aged 11–18 years averaged over 4.5 hours of television time on any typical day.\textsuperscript{16} In 2012, television advertising accounted for 96% of all US advertising expenditures for 6 major energy drink manufacturers.\textsuperscript{14} Thus, television advertising as a medium to reach youth remains highly relevant. This study quantified the airtime devoted to energy drink advertisements over all US network and cable television stations for 1 year. For the 10 channels with greatest amount of airtime devoted to energy drink advertisements, programming themes and the frequency of adolescents in the base audience were summarized to gauge how likely it was that adolescents were exposed to energy drink advertisements on television.

METHODS

Television Advertisements for Energy Drinks

A database of television advertisements was purchased from an advertising monitoring company (AdScope, Kantar Media, Atlanta, GA) in March, 2013. That database included all food and beverage advertisements aired on US network and cable television channels (n = 139) between March, 2012 and February, 2013. For each advertisement in the database, the following data were included: manufacturer, product name, title of advertisement, length of advertisement, channel of advertisement airing, and date and time of airing. Manufacturer and product names were reviewed to identify energy drinks. Caffeinated sodas and non-caffeinated sports drinks were not included. Energy drinks were defined as ready-to-drink beverages, shots (concentrated liquids, roughly 1.9 fluid ounces, intended for rapid consumption), powder mixes, or drops (concentrated liquids, roughly 1.0 or 1.6 fluid oz, intended to be added to other beverages) containing caffeine and at least 1 additional ingredient promoted as increasing energy. Manufacturers' Web sites were visited to review product ingredients.\textsuperscript{17-29} This study was exempt from institutional board review because human subjects were not enrolled.

Audience Demographics

Audience demographics for the top 10 channels were extracted from publicly available reports compiled by the Cable-television Advertising Bureau (CAB).\textsuperscript{30} The CAB is a 501-(c)-(6) trade group including advertisement-supported cable and television networks; its board of directors includes senior leadership of most major television and cable networks. The mission of the CAB is to “increase awareness of the power of cable as an advertising medium and to make cable an increasingly effective marketing environment for advertisers throughout the US.”\textsuperscript{30} Thus, the CAB lobbies manufacturers and advertising firms with the intent of increasing advertising revenue for cable television networks. The CAB reports for each channel included specific age ranges for the base audience sourced from marketing research firms (Nielsen or MRI Doublebase); channels were considered to include adolescents in their primary target audience if the base audience included 12- to 17-year-olds. Data reported in each CAB report varied across channels; however, reports for several channels also included the proportion of adolescents aged 12–17 years in the base audience. Such information is often reported as an index value, which is the proportion of adolescent viewers in that channel's base audience relative to the proportion of adolescent viewers in the general network and cable television audience. An index value of 200 implies that a channel has twice as many 12- to 17-year-old viewers in its base audience compared with the general television viewing audience. Adolescents currently constitute 8% of the general television viewing audience;\textsuperscript{30} thus, an index value of 200 for a specific channel would indicate that adolescents constitute 16% of that channel's base audience. Index values for adolescents are reported when those values were available.

Data Analysis

The total number of advertisements and total number of advertising minutes (airtime) devoted to energy drinks were summed for each network and cable television channel. Channels were then ranked by airtime devoted to energy drink advertisements and the 10 channels with the greatest total airtime over the study year were selected for further analyses. For each of those top 10 channels, the average daily total airtime (minutes) during the period was computed and 95% confidence intervals were computed to illustrate statistically significant differences in daily airtime by channel at $P < .05$, unadjusted for multiple comparisons. When comparisons between specific channels were presented, $P$ for a $t$ test comparing mean minutes of airtime per day is also presented. Minutes per day were summarized overall and by air block for the top 10 channels; air blocks were selected to reflect common viewing classifications such as prime time and late night. All summaries and analyses were completed with the R Language and Environment for Statistical Computing, version 3.0.1 (R Core Team, Vienna, Austria, 2013).
RESULTS

Table 1 lists all of the energy drinks advertised on television during the study year. Thirteen manufacturers accounted for 83,071 advertisements for energy drinks over the 139 network and cable channels, totaling 36,501 minutes of airtime (> 608 hours). One manufacturer, 5-Hour Energy, accounted for 63.2% of total airtime devoted to energy drink advertisements. All products contained caffeine and at least 1 of the following ingredients: B vitamins, guarana, taurine, or herbal supplements including ginseng; most varieties also contained sugar.

Table 2 presents the 10 channels that devoted the most airtime to energy drink advertisements. Three of the top 10 channels were primarily music-related (MTV2, MTV, and Fuse), 3 were sports-related (ESPN News, ESPN-2, and Speed), 2 were specific to a male lifestyle (G4 and Spike), and 2 had other programming themes (Comedy Central and BET). Those 10 channels accounted for 46.5% of all airtime devoted to energy drink advertisements. Among the remaining 9 channels, MTV2 devoted the most airtime to energy drink advertisements, at 2,959 minutes over the study year (8.1% of total airtime). Among the top 10 channels, MTV2 had the greatest proportion of adolescents in its base audience, at 31.8%, as reported from the CAB reports. Further, 6 of the top 10 channels included adolescents as young as age 12 years in their primary target audience as reported from the CAB reports. Specific index values for adolescents (12- to 17-year-olds) were available from CAB reports for 4 of the top 10 channels: MTV2 (398), Fuse (250), MTV (281), and BET (127). Those available index values were greater than 100, reflecting a greater proportion of adolescents for each of those channels compared with the general television viewing audience. Specifically, the proportion of 12- to 17-year-olds in MTV2’s base audience was 398% greater than the portion of 12- to 17-year-olds in the general television viewing audience of the US. Index values were not available for the remaining 6 channels in the top 10 (ESPN News, Comedy Central, ESPNU, Spike, Speed, and G4).

Figure 1 presents the average daily airtime devoted to energy drink advertisements for each of the top 10 channels, overall and by specific brand. MTV2 devoted an average of 8.1 min/d (95% confidence interval [CI], 7.7–8.5 min/d) to energy drink advertisements, significantly more airtime than ESPN News, which ranked second (mean, 6.3 min/d; 95% CI, 6.0–6.7 min/d; P < .001). When considering specific brands, the most airtime was devoted to 5-Hour Energy, which was greatest on ESPN News (mean, 4.8 min/d; 95% CI, 4.6–5.0 min/d) and MTV2 (mean, 4.7 min/d; 95% CI, 4.6–4.9 min/d), followed by Comedy Central (mean, 4.0 min/d; 95% CI, 3.9–4.2 min/d). Red Bull energy drinks were the second most highly most advertised energy drinks. Airtime for Red Bull was the greatest on MTV2 (mean, 2.4 min/d; 95% CI, 2.1–2.7 min/d), followed by ESPN-2 (1.3 min/d; 95% CI, 1.1–1.5 min/d) and MTV (1.2 min/d; 95% CI, 1.0–1.4 min/d). Among the top 10 channels, MTV2 accounted for 33.9% of all airtime devoted to Red Bull energy drink advertisements.

When considering the patterns of advertising over the course of the day, airtime devoted to energy drink advertisements was statistically greatest on MTV2 between 11 AM and 2 AM compared with all other channels (data not shown). Further, among the remaining 9 channels,

Table 1. Energy Drink Brands Advertised on US Network and Cable Television Channels (n = 139) During Study Year

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Manufacturer</th>
<th>Product Type(s)</th>
<th>Airtime Over Study Year, min</th>
<th>Total Airtime, %a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>--</td>
<td>--</td>
<td>36,501</td>
<td>100</td>
</tr>
<tr>
<td>By brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Hour Energy</td>
<td>Innovation Ventures</td>
<td>Shot</td>
<td>25,650</td>
<td>63.2</td>
</tr>
<tr>
<td>Mio Energy Water Enhancer</td>
<td>Kraft Foods</td>
<td>Drops</td>
<td>3,216</td>
<td>13.8</td>
</tr>
<tr>
<td>Red Bull</td>
<td>Red Bull GmbH</td>
<td>Beverage</td>
<td>4,665</td>
<td>10.8</td>
</tr>
<tr>
<td>V8 V-Fusion Energy</td>
<td>Campbell’s Soup Company</td>
<td>Beverage</td>
<td>1,408</td>
<td>6.8</td>
</tr>
<tr>
<td>Street King</td>
<td>Street King LLC</td>
<td>Shot</td>
<td>1,009</td>
<td>4.1</td>
</tr>
<tr>
<td>NOS</td>
<td>The Coca-Cola Company</td>
<td>Beverage</td>
<td>159</td>
<td>0.4</td>
</tr>
<tr>
<td>Mountain Dew Kick Start</td>
<td>PepsiCo</td>
<td>Beverage</td>
<td>145</td>
<td>0.4</td>
</tr>
<tr>
<td>Monster Energy</td>
<td>Monster Beverage Company</td>
<td>Beverage</td>
<td>123</td>
<td>0.3</td>
</tr>
<tr>
<td>Zipfizz</td>
<td>Zipfizz Corporation</td>
<td>Shot, powder</td>
<td>37</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>Full Throttle</td>
<td>The Coca-Cola Company</td>
<td>Beverage</td>
<td>25</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>Rockstar</td>
<td>Rockstar</td>
<td>Beverage</td>
<td>29</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>FRS Healthy Energy</td>
<td>FRS</td>
<td>Beverage, shot powder</td>
<td>12</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>Hydrive</td>
<td>Hydrive Energy LLC</td>
<td>Beverage</td>
<td>9</td>
<td>&lt; 0.1</td>
</tr>
</tbody>
</table>

aPercent of total airtime devoted to energy drink advertisements over 139 US network and cable television channels.

Note: Data were calculated from advertisements placed on network and cable television stations March 1, 2012 to February 28, 2013.
there were no consistent differences for patterns of airtime over the course of the day (data not shown). Therefore, the trends in airtime over the course of the day were computed as averages by programming theme (music, sports, lifestyle, and other), with MTV2 plotted separately. Figure 2 presents minutes per day devoted to energy drink advertisements (all brands combined) by air block. From 11 AM onward, MTV2 devoted the most airtime to energy drink advertisements over the course of the day compared with the other channels. Airtime for energy drink advertisements on MTV2 peaked between 8 PM and 11 PM. In contrast to MTV2, airtime devoted to energy drink advertisements on the remaining 9 channels peaked between 2 AM and 5 AM.

DISCUSSION

To the authors' knowledge, this study is one of the first quantitative studies to document the promotional practices of energy drink manufacturers on US television. Results from this study suggest that in 2012, energy drink manufacturers advertised primarily on channels that included adolescents in their base audience: 6 of the 10 channels with the most airtime devoted to energy drink advertisements in 2012 included 12- to 17-year-olds in their primary target audience. Furthermore, the bulk of airtime devoted to energy drink advertisements on MTV2 occurred between 8 and 11 PM, a time when 30.9% of MTV2’s viewing audience consists of 12- to 17-year-olds in their primary target audience.

Excess caffeine intake may cause short-term negative health effects such as increased heart rate and blood pressure, sleep disturbances, and gastrointestinal distress. However, the long-term health effects of energy drink consumption are not well-studied, and there is a need for further research to fully understand the potential risks associated with energy drink consumption.

Table 2. Distribution of Energy Drink Advertisements on Television During the Study Year, for the Top 10 Channels

<table>
<thead>
<tr>
<th>Rank</th>
<th>Channel</th>
<th>Programming Content Themes</th>
<th>Base Demographics Includes 12- to 17-Year-Olds</th>
<th>Energy Drink Advertisements/y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Advertisements, N</td>
<td>Airtime per Channel, min</td>
</tr>
<tr>
<td>1</td>
<td>MTV2</td>
<td>Music, lifestyle</td>
<td>Yes</td>
<td>6,501</td>
</tr>
<tr>
<td>2</td>
<td>ESPN News</td>
<td>Sports</td>
<td>Yes</td>
<td>5,425</td>
</tr>
<tr>
<td>3</td>
<td>Comedy Central</td>
<td>Comedy</td>
<td>No</td>
<td>4,137</td>
</tr>
<tr>
<td>4</td>
<td>FUSE</td>
<td>Music</td>
<td>Yes</td>
<td>4,043</td>
</tr>
<tr>
<td>5</td>
<td>MTV</td>
<td>Music, lifestyle</td>
<td>Yes</td>
<td>3,537</td>
</tr>
<tr>
<td>6</td>
<td>ESPN-2</td>
<td>Sports</td>
<td>Yes</td>
<td>3,322</td>
</tr>
<tr>
<td>7</td>
<td>Spike</td>
<td>Risk, adventure, competition</td>
<td>No</td>
<td>3,175</td>
</tr>
<tr>
<td>8</td>
<td>Speed</td>
<td>Automotive/motorcycle racing, performance, lifestyle</td>
<td>No</td>
<td>2,557</td>
</tr>
<tr>
<td>9</td>
<td>G4</td>
<td>Male-focused general entertainment</td>
<td>No</td>
<td>2,793</td>
</tr>
<tr>
<td>10</td>
<td>Black Entertainment Television</td>
<td>African American culture</td>
<td>Yes</td>
<td>2,065</td>
</tr>
<tr>
<td></td>
<td>Total over top 10 channels</td>
<td></td>
<td>37,553</td>
<td>16,973</td>
</tr>
<tr>
<td></td>
<td>Total over all channels</td>
<td></td>
<td>83,071</td>
<td>36,501</td>
</tr>
</tbody>
</table>

aDescription of programming content and base audience statistics was extracted from reports compiled by the Cabletelevision Advertising Bureau, a 501-(c)-(6) trade group supporting cable television networks.

Notes: Data were calculated from advertisements placed on network and cable television stations from March 1, 2012 to February 28, 2013. The top 10 channels are defined as the 10 channels with the greatest amount of airtime devoted to energy drink advertisements.
among adolescents, such as nervousness, confusion, and heart palpitations.\(^3,7\) Energy drinks also often include added sugars, which can contribute to dental carries and excess caloric intake possibly leading to weight gain.\(^31\) Importantly, there is the potential for serious adverse health effects related to energy drink use, including convulsions, myocardial infarctions, and even death.\(^4\) Energy drinks offer no therapeutic benefit to adolescents,\(^3\) and it is advised that adolescents avoid consuming energy drinks.\(^3\) In addition to the health risks associated with excessive caffeine intake, energy drink use among adolescents is concerning because of the increased risk for substance use and abuse. Energy drink use often clusters with other unhealthy behaviors among adolescents, including smoking,\(^32\) alcohol use,\(^33\) and illicit drug use.\(^33\) Cross-sectional studies cannot establish causality. Health professionals infrequently advise adolescents about the potential health risks associated with energy drinks\(^34\) and nutrition educators and practitioners can help adolescents and their families understand the potential dangers of energy drink consumption.

The US market for energy drinks has been rapidly expanding. Total spending for energy drink advertising increased 71% from 2010 to 2012,\(^14\) and industry estimates report that US sales of energy drinks will increase from $12.5 billion in 2012 to more than $21.5 billion by 2017.\(^35\) Thus, it is critical to understand the potential influence that energy drink marketing may have on the behaviors of adolescents. There is evidence to support that increased exposure to alcohol marketing relates to alcohol initiation and increased use among adolescents.\(^36\) Data on the prevalence of energy drink use among adolescents are sparse.\(^32,34,37,38\) Results from 5 separate large surveys in the US report that approximately 9% to 30% of adolescents were frequent energy drink consumers, measured as consuming at least 1 energy drink in any given week\(^32,34,37,38\) or on any given day.\(^33\) Data are also lacking regarding how frequently adolescents consume more than 1 energy drink in a day. In 1 study, undergraduate college students often consumed more than 1 energy drink on days when treating insufficient sleep or low energy or when studying.\(^39\)

In June, 2013, the American Medical Association adapted a policy supporting a ban on the marketing of energy drinks to children and adolescents under age 18 years\(^11\); to date, no federal or state level bans exist. Energy drink manufacturers have been encouraged to adapt a set of self-regulatory practices to reduce adolescents’ exposure to their marketing.\(^2\) As part of the 2013 US Senate Commerce Committee hearing related to the marketing of energy drinks to adolescents,\(^13\) it was recommended that manufacturers limit any marketing on media in which 35.0% or more of the audience is under age 18 years.
However, that criterion would cover none of the channels identified in this current report, including MTV2, in which 12- to 17-year-olds constitute 30.8% of that channel’s base audience.  

Self-regulatory measures to limit food and beverage advertising to youth on television can be insufficient; only half of the food and beverage advertisements viewed by children on television meet the industry-defined criteria for child-directed marketing (eg, 35% or more of the viewing audience is 12 years old or younger).  

Strengths of this study include the use of a complete database of all televised advertisements for 1 year, allowing for quantification of the total airtime of energy drinks advertisements by brand over all network and cable television channels by time of day. In addition, the researchers reviewed advertisements to confirm that products being advertised were energy drinks. This study was limited in that it cannot be concluded that adolescents specifically viewed the energy drink advertisements placed on the top 10 channels reported in this study, and data on viewership demographics over viewing day were not available. However, findings are supported by 2012 Nielsen data, which illustrated that adolescents view more energy drink advertisements than do adults on several of the same 10 channels identified in this current study, including MTV2. In addition, this study relied on publicly available data; complete data on the proportion of adolescents in the primary target audience of all top 10 channels were not available. The approach of this study highlights the intentions of manufacturers regarding the placement of their advertisements; whether these companies deliberately targeted adolescents was not known. Nevertheless, the audiences of television channels used to air advertisements for energy drinks frequently include adolescents as young as age 12 years. Finally, this study was limited to advertising on television. Although energy drink manufacturers devoted the majority of their 2012 marketing expenditures to television, there is considerable heterogeneity in the marketing practices of energy drink manufacturers. For example, marketing via social media and guerrilla marketing have been increasingly more prevalent.

**IMPLICATIONS FOR RESEARCH AND PRACTICE**

Results from this study provide quantitative data supporting that energy drink manufacturers advertise heavily on network and cable television channels that include adolescents in their primary audience. Studies are needed to understand how energy drink marketing may influence the intentions and consumption behaviors of adolescents related to energy drink use. Considering that the energy drink market has been rapidly expanding, nutrition educators and practitioners need to be aware of the potential dangers of energy drink consumption and should be encouraged to advise adolescents about the potential health risks associated with energy drinks. Such professionals are also in a position to help adolescents and their families understand the influence that energy drink marketing may have on energy drink consumption among adolescents, and may wish to include aspects of media literacy in programs to reduce energy drink consumption among adolescents.

While policies related to energy drink marketing are debated, nutrition educators may wish to include elements of media literacy when advising adolescents and their families about the risks of energy drink consumption. For example, greater levels of smoking media literacy among adolescents relate to a decreased likelihood of current smoking as well as a future propensity to smoke. Parents can also take immediate steps to help reduce their child’s exposure to energy drink marketing by limiting television exposure: Measures of increased television exposure among adolescents (television viewing time, number of televisions in the home, and the presence of a television in the bedroom) have been associated with heavier consumption of sugar-sweetened beverages such as soft drinks, sports drinks, and energy drinks.

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CONFLICT OF INTEREST

The authors have not stated any conflicts of interest.