Consumption’s Pattern and Knowledge of Athletes about Energy Drink in South of Iran (Shiraz)

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Abstract

Objective: During the last years, sports and energy drink consumption has continued to gain popularity among young people in Iran. Obviously, according to the fact that 66% of 70-million population in Iran are aged less than 30 years, and also a growing consumer purchasing power as a result of a growing economy, urbanization, and access to quality raw material have been the main drivers of the rapid growth of the energy drinks industry and clients. The purpose of this study is to determine the consumption’s pattern of energy drinks among athletes.

Material and Method: Totally, 850 athletes (425 males and 425 females) from Fitting and bodybuilding Clubs in Shiraz were included in this study. Subjects were expected to do a questionnaire which was about their personal characteristics, knowledge about energy drinks and their consumption frequency.

Results: Mean age was 24.9 ± 6.6 in sport men and 27.5 ± 9.4 in sport women. Participants were divided into two groups: 54.7% consumers of energy drinks, and 45.3% non-consumers. Male consumers were 57.5% which was higher than female consumers. 51.4% of energy drink consumers had university degree, 36% had diploma and 12.6% did not finish high school while none of them were illiterate.

Conclusion: Using energy drinks is common among athletes especially in Fitting and bodybuilding Clubs for a variety of reasons. Furthermore, side effects from consuming energy drinks are not sensible. Results of this study showed that most of the participants do not know about ingredients of energy drinks. Our findings have numerous practical applications for athletes.

Keywords: Knowledge; Consumption; Athletes; Energy drink

Introduction

Soft and energy drink consumption has exploded over the past three decades [1]. Sugar sweetened energy drinks became a major source of added sugar in the American diet and have been linked to adverse nutritional and health consequences such as dental caries and obesity [2]. Furthermore, evidence also supports an association between soft drink consumption and decreased Bone Mineral Density (BMD) [3].

Similar to global pattern energy drinks consumption in Iran has continued to gain popularity among young people especially in athletes. Those drinks have been promoted to increase performance and endurance. A growing consumer purchasing power as a result of a growing economy, urbanization, and access to quality raw material have been the main results of the rapid growth of the energy drinks industry. Moreover, almost 66% of 70-million population in Iran is aged less than 30 years and they are eager to use energy drinks [4].

The main consumers of energy drinks are athletes between 18 to 35 years old. Studies about Energy drinks were mainly conducted in non-athletic population. However, among athletes, in a highly competitive world of sports, the concern about energy must go beyond health and socially desirable activity. These facts motivated us to do this research.

Fluids are a vital requirement for humans, but fluid intake can be obtained from a variety of fluid sources other than water. The selection of appropriate fluids, timing of the intake, and supplement choices are important for optimal health, especially in young people. The Beverage Guidance Panel had initiated by Popkin et al. [5]. Energy drinks are beverages (e.g., Red Bull, Venom, Burn, and Adrenaline Rush) that contain large doses of caffeine and other legal stimulants such as taurine, carbohydrates, glucuronolactone, inositol, niacin, panthenol, and B-complex vitamins. Hundreds of different brands on the market have high caffeine content, ranging from a modest 50 mg to an alarming 505 mg per can or Bottle [6]. Energy drinks have been found to improve attention and/or reaction times and indices of alertness in some studies; the combination of caffeine and glucose can ameliorate deficits in cognitive performance and subjective fatigue during extended periods of cognitive demand. However, several ingredients of energy drinks, with sucrose and caffeine taking the lead, may have unwanted health consequences in youngsters and should be used carefully. Energy drinks have stimulating properties that can boost heart rate and blood pressure, dehydrate the body, may aggravate the effects of other stimulants, and prevent sleep.

Unlike, sports drinks (the use of which is supported for athletes), energy drinks should not be used while exercising because the combination of fluid loss, sweating, and the diuretic quality of the caffeine can leave the user severely dehydrated. The aim of this study was to assess knowledge of bodybuilder athletes and to provide the much needed guidelines on energy drinks intakes for the athletes during training.

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Material and Methods

This cross-sectional study was conducted in Shiraz, Iran, from January to June 2011. After the participants were given explanatory information, they were asked to provide their oral consent for participation. Then participants were asked to take part in an interview, which was conducted by a trained interviewer. The athletes and types of sports selected were based on type of sport as determined by the Sports Council. A total of 425 male athletes and 425 female athletes participated in the study. All measurements were conducted during training. An investigator was available throughout the data collection session to provide clarification or to answer any queries on the survey.

Data collection

The investigation was carried out in Shiraz city the capital of Fars province as there were a lot of sports clubs. A sample of 850 athletes was drawn randomly from the sport clubs in Shiraz city.

Data was collected with a questionnaire designed by a scientific group. Content validity was verified by two pharmacologists and a community medicine specialist. The reliability of the questionnaire was checked in a pilot study consisted of 31 sports women and 29 sports men with a Cronbach’s alpha = 0.80. A questionnaire and observation schedule having questions related to the following parts: social and demographic, knowledge and practice, as well as side effects and withdrawal symptoms experienced by energy drink consumers. The demographic part composed of information about age, sex, education level (illiterate to university degree), job, and frequency of exercise ranged from every day to occasionally. In the next part, we asked them about energy drinks ingredients, side effects, and contraindications. If respondents named at least two ingredients and two side effects, they scored 1 for each question. In contraindication questions we asked whether energy drinks are allowed for everybody or not, then they expressed their opinion about contraindication of energy drinks for diabetic patients, pregnant women, children, and patients with renal and cardiovascular problems. For each correct answer they got 1 mark. So, the minimum and maximum score in knowledge part was between 0 and 8. In practice part, the first question was about energy drink consumption. If the participant answered “yes”, the interview continued otherwise it was stopped. The rest of questionnaire was about the frequency of usage (every day, every other day, twice a week, weekly, twice a month, occasionally), situations made interviewee to consume and sources of recommendation for consumption. Additionally, they were asked about the places where they mostly bought energy drinks, the places they usually use energy drinks, and the reasons encourage them to insist on consuming. In the last part the interviewer asked energy drink consumer whether they experienced reflux, headache and palpitation after consumption. If their answers were “yes”, they would ask about the frequency of each mentioned side effect. In the last part drinkers were asked to name experienced withdrawal symptoms in the lack of energy drinks. The collected data were scored, categorized and analyzed statistically.

Statistical analysis

The data were analyzed with SPSS V. 16 software. The Mann-Whitney U test was used to identify the differences in knowledge, attitude, and practice between males and females, and also between university faculty members and high school teachers. The Pearson correlation coefficients were calculated to determine the relationships between different items. Differences with a P value less than 0.05 were considered statistically significant.

Results

Generally, 821 out of 850 (96.6%) athletes accepted to be interviewed. Mean age was 24.9 ± 6.6 in sport men and 27.5 ± 9.4 in sport women. In accordance to the objectives of the study the data were collected with the help of questioner and observation schedule were analyzed and presented in following tables and figures. Participants were divided into two groups: 449 consumers of energy drinks (54.7%), and 372 non-consumers (45.3%). Male consumers were 258 individuals (57.5%), significantly (P < 0.001) higher than female consumers. 51.4% of energy drink consumers had university degree, 36% had diploma and 12.6% did not finish high school while none of them were illiterate. In non-consumers group 49.2% had university degree, 39.9% had diploma, 12.2% did not finish high school and 1.1% were illiterate. Most of the athletes consume energy drink (50.2%) used to exercise every day, while in non-consumer’s group most of them (56.3%) exercise every other day (Figure 1).

Mean score of knowledge was higher in non-consumer’s group (3.8 ± 2.3) compare to consumer’s (3.7 ± 2.1) without any statistical significance (P = 0.16). The percentage of having acceptable knowledge about energy drinks in con-consumers and consumers athlete were 27.2% and 22.9%, respectively. In consumers group 232 out of 449 (51.7%) named at least two ingredients of energy drinks while it was 27.3% and 25.6%, respectively in non-consumers group. 56.3% energy drink consumer were asked about contraindication of energy drinks in con-consumers and consumers athlete were asked at least two ingredients of energy drinks while it was 52.7% and 53.6%, respectively in non-consumers group.

Figure 1: Frequency of exercise in athletes who consumed energy drink versus non consumers.

Figure 2: Percentage of athletes who thought energy drink was prohibited for diabetic patients, pregnant ladies, children, patients with cardiac and nephrology problem.
and at the restaurant (5.3%). They also were asked about the factors
clubs (31.6%), at parties (24.1%), at the university (6%), at work (6%),

The most prevalent place for drinking were at home (34.7%), at health
clubs (28.7%), their coach (9.6%), family member (5.8%), health club

receiving recommendation from others. Other athletes received a
try as new experiment (3.7%), and longtime driving (2.7%) (Table 2).

sever exhaustion (37.2%), fluid compensation (13.1%), need for
energy drink was need for excess energy (57%). Other reasons were

shown in (Table 2). The most frequently stated reason for consuming
consuming between male and female athletes is shown in (Table 1).

for diabetic patients, pregnant ladies, children, and those who had
renal problems. Most of the respondents in both consumers (85.5%)

(17.5%), palpitation (13.8%), gastrointestinal discomfort (11.7%);

one side effect for energy drinks while it was 50.3% in consumers


Table 1: Frequency of energy drinks consumption among athletes who admitted using it.

<table>
<thead>
<tr>
<th>Reasons of consumption</th>
<th>Total (N = 449)</th>
<th>Men (N = 258)</th>
<th>Women (N = 191)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need energy (in general)</td>
<td>256 (57.0)</td>
<td>157 (60.9)</td>
<td>99 (51.8)</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>167 (37.2)</td>
<td>85 (32.9)</td>
<td>82 (42.9)</td>
</tr>
<tr>
<td>Fluid compensation</td>
<td>59 (13.1)</td>
<td>29 (11.2)</td>
<td>30 (15.7)</td>
</tr>
<tr>
<td>Need for supplement</td>
<td>57 (12.7)</td>
<td>41 (15.9)</td>
<td>16 (8.4)</td>
</tr>
<tr>
<td>Staying up for exams</td>
<td>49 (10.9)</td>
<td>24 (9.3)</td>
<td>25 (13.1)</td>
</tr>
<tr>
<td>As a new experiment</td>
<td>17 (3.7)</td>
<td>6 (2.3)</td>
<td>11 (5.7)</td>
</tr>
<tr>
<td>Long time driving</td>
<td>12 (2.6)</td>
<td>7 (2.7)</td>
<td>5 (2.6)</td>
</tr>
</tbody>
</table>

P value less than 0.05 is considered significant: 1(n/449)*100; 2(n/258)*100; 3(n/191)*100

Table 2: Situations that encourage athletes to use energy drink.

athletes categorized in non-consumers group (69.3%) named at least
one side effect for energy drinks while it was 50.3% in consumers
group, which was statistically significant (p < 0.001). The mentioned
side effects by respondents were hyperglycemia (27%), weight gain
(17.5%), palpitation (13.8%), gastrointestinal discomfort (11.7%),
osteoarthritis (11.1%), dependency (9%), and hypertension (8.4%).
Other stated side effects (1.5%) were stroke, hormonal imbalance, and

(1.5%) were stroke, hormonal imbalance, and hypertension (2.4%) (Table 4).

117 out of 449 (26.1%) athletes reported consuming energy supplements. 3 (2.5%) athletes did not answer how long they had
been using energy supplements. 114 athletes (35.1%) used energy
supplements for more than one year, 28% between 1 and 6 months,
22.8% less than 1 month and 14% between 7 and 12 months.

Discussion

The purpose of this study was to investigate knowledge among body
builder athletes. The energy-drink market has grown exponentially over the past decade. The absence of regulatory oversight in many countries has resulted in aggressive marketing of energy drinks over the world, targeted primarily toward young adults (men in particular). Using energy drinks is a popular practice among bodybuilder athletes for a variety of situations: excess energy, exhaustion, fluid compensation, need for supplement, need for staying up at exam night, try as new experiment and long time driving. Some previous work suggested that young people may use energy drinks as “natural alternatives” to other fluids, “to boost performance and concentration”, “to stay awake before exams” [7]. Almost all these reasons were mentioned as the underlying factor for “trying/using energy drinks” in our study population. In addition to the frequency of an agent, the associated

Source of recommendation Total (N = 449) Men (N = 258) Women (N = 191)

Myself 217 48.3 127 49.2 90 47.1
Friend 129 28.7 72 27.9 57 29.8
Advertisement 61 13.6 30 11.6 31 16.2
Coach 43 9.6 30 11.6 13 6.8
Family member 26 5.8 10 3.9 16 8.4
Club employee 4 0.9 2 0.8 2 1.0

P value less than 0.05 is considered significant: 1(n/449)*100; 2(n/258)*100; 3(n/191)*100

Table 3: Sources of recommendation for consumption of energy drink among ath-
estes.

consumption
Palpitation Headache Reflux
Frequency of consumption

<table>
<thead>
<tr>
<th>Frequency of consumption</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everyday</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every other day</td>
<td>7(21.9)</td>
<td>25(78.1)</td>
<td>3(9.4)</td>
<td>22(90.6)</td>
<td>10(31.3)</td>
<td>22(68.8)</td>
</tr>
<tr>
<td>Twice a week</td>
<td>10(15.4)</td>
<td>55(84.6)</td>
<td>9(13.8)</td>
<td>56(86.2)</td>
<td>13(20)</td>
<td>52(80)</td>
</tr>
<tr>
<td>Weekly</td>
<td>9(29)</td>
<td>22(71)</td>
<td>3(9.7)</td>
<td>28(90.3)</td>
<td>7(22.6)</td>
<td>24(77.4)</td>
</tr>
<tr>
<td>Occasionally</td>
<td>4(16.7)</td>
<td>20(83.3)</td>
<td>1(4.2%)</td>
<td>23(95.8)</td>
<td>7(29.2)</td>
<td>17(70.8)</td>
</tr>
<tr>
<td>P (Yes versus No)</td>
<td>0.028</td>
<td>0.072</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P value less than 0.05 is considered significant

Table 4: Frequency of palpitation, headache and reflux according, frequency of consuming energy drink.
burdens of morbidity and mortality determine its importance as a public health concern. Although energy drinks are targeted to young adult consumers, up to our knowledge, there are few researches regarding the health effects of energy-drink consumption by body builder athletes. Clauson et al. [8] recently published a review article on the benefits and adverse effects associated with the consumption of energy drinks. Based on published articles written on energy drinks, the investigators concluded that most energy drinks contain natural products and that amounts of guarana, taurine, and ginseng found in popular energy drinks are far below the amounts that is expected to deliver therapeutic benefits or adverse events. However, high amounts of caffeine and sugar in energy drinks caused a variety of adverse health effects. Caffeine in the quantities present in most energy drinks may lead to insomnia, nervousness, headache, tachycardia and seizures [7,8]. In children and adolescents who are not habitual caffeine users, vulnerability to caffeine intoxication may be markedly increased due to an absence of pharmacologic tolerance. Genetic factors may also contribute to an individual’s vulnerability to caffeine-related disorders including caffeine intoxication, dependence, and withdrawal [6]. Finding implied that the effects of caffeine on blood pressure may be significantly underestimated by the measurement of blood pressure at the brachial artery and caffeine-related circulatory health hazards could be underestimated in routine physical examination. Young individuals may have physiologic proneness to health hazards, may have some undiagnosed pathologic conditions (such as heart problems), may underestimate their pathologic signs and symptoms with the false belief that “diseases are for the elderly”, and may not seek help in the early stages [9,10]. Thus, it is important to make young individuals aware of the potential health hazards of energy drinks that they may face. It would be effective to introduce healthy nutritional habits and drinks to young adults, besides replacing “unhealthy” socializing tools (cigarette smoking, alcohol or energy drink consumption, etc.) with healthier ones [11,12]. Moreover, the consumption of energy drinks has enhanced rapidly in recent years. Energy drinks usually contain high fructose corn syrup, vitamin B, minerals, caffeine, keratin and other unhealthy addition. Energy drinks tend to have 140 calories per eight ounce and they may add unnecessary and excessive calories to athletes. Although there is no human requirement for caffeine, even low doses of caffeine (12.5 to 100 mg) improves cognitive performance and mood. There are increasing reports of caffeine intoxication from energy drinks [13]. The amount of caffeine in these drinks is about 80 to 360 mg in each can. The high level of caffeine may come from large amount of synthetic caffeine or natural form of caffeine like Guarana. This amount of caffeine is addictive. The other side-effects of this amount of caffeine are anxiety, depression, respiratory and cardiovascular disorders and headache. Caffeine often has the effect of making a person feel energized. Although low doses of caffeine (12.5 to 50 mg) have been found to improve cognitive performance and mood, and 200 mg doses have been found to improve cognitive task speed and accuracy and increase alertness among young adults. The high concentration of both carbohydrate found in energy drinks may also be a source of being bloated. Abdominal cramping may also occur. High concentration of both carbohydrate and caffeine can cause diarrhea [14,15].

In our study group, most participants reported that they prefer energy drinks to feel “energetic”, to concentrate while studying, and/or to stay awake. Most of these effects of energy drinks are related to the caffeine content of such drinks. The greater the caffeine concentration, the more likely will the bodybuilder athletes experience such effects and that they will continue consuming such drinks. It is important to note that the stimulating properties of energy drinks can boost the heart beat and blood pressure, dehydrate the body, and prevent sleep. Due to the fact that individual’s responses to caffeine vary between different persons, young individuals should be careful in consuming caffeine including drinks. [9]. Studies about the hemodynamic effects of acute caffeine intake in young adults aged between 21 and 26 had shown that heart rate was increased 4.5 hours after caffeine consumption. In a randomized, double-blind study found that acute caffeine intake significantly increases central blood pressure and large artery waveform transmission and decreased pressure amplification in healthy adults [10]. A limitation of this study is that a convenience sample without a control group was used. In addition, possible confounding factors were not controlled for.

Conclusion

The assessment and determination of the knowledge about the healthy usage of energy drinks is essential for a successful achievement of athletes not only during a game, but also along the whole sporting season, and such information can and must be used by the coach to change the player’s function with the purpose to maximize the performance. The current study revealed most of the participants do not have enough knowledge about energy drinks perhaps, suggesting that energy drink consumption did not intellectual in this population. This finding may imply that education needs to be addressed to ensure an adequate consumption of energy drink products. Thus, health policy makers should focus on strategies to promote the knowledge and awareness of the athlete about healthy usage of energy drinks for improving their health and performance.

References