

## Energy drinks consumption in Erbil city: A population based study

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### Abstract

**Background and objective:** Energy drinks have become increasingly prevalent among young adults and adolescents in recent years, particularly young students and athletes who see the consumption of energy drinks as an easy and quick way to boost academic and athletic performance. This study was conducted to determine the prevalence of consumption of energy drinks in a sample of adolescent and adults in Erbil city as well as perceived benefits and its health hazards.

**Methods:** A convenience sample of 600 individuals from different sectors and social groups of Erbil city was selected. Data was obtained through direct interview. The data was managed through SPSS program version 18, using appropriate statistical tests.

**Results:** The prevalence of energy drinks consumption among the study population was 42.7%, especially adolescents and young adults (those  $\leq 25$  years) and was more common among males than females (55.7% and 29.8%, respectively). The main reasons for its consumption were related to getting energy and improving the mood and performance (66.0% and 30.4%, respectively). 62.7% of participants think that it is harmful and could have adverse effects such as heartbeat irregularity and blood pressure swinging, addiction, and osteoporosis (46.2%, 33.7% and 13.2%, respectively). Televisions were the major source of advertisement (71.45). A significant statistical association had been found between the age, gender and educational status of the participants and consuming energy drinks ( $P = 0.001, 0.001$  and  $0.002$ , respectively).

**Conclusion:** Energy drinks consumption found to be highly prevalent in adolescents and young adults in Erbil city, which calls for review and regulating the sale of these drinks including adolescents' education, raising community's awareness, banning selling it in public places and increasing taxes.

**Keywords:** Energy drinks; Adolescents; Perception; Erbil

### Introduction

Energy drinks are beverages that provide a boost of energy by using a mixture of caffeine, carbohydrates, vitamins, taurine, herbal supplements, and sweeteners or sugar, advertised to both public and athletes as one of the quick and easy means of relieving fatigue, increase attention, boost energy, losing weight and enhancing performance.<sup>1-3</sup> The increasing consumption of energy drinks by adolescents and young adults have created concerns regarding overall health and well-being of the consumers.<sup>2-5</sup> Adolescents and young adults are

frequently unfamiliar with the contents of energy drink.<sup>6,7</sup> Different case studies and the media had linked adverse reactions with the consumption of energy drinks, while limited research has studied the concerns of specific ingredients and effect of the combined constituents.<sup>8,9</sup> Energy drink consumption is a probable health hazard for the general population, particularly frightening for youth due to extraordinary levels of caffeine and unusual ingredients not naturally found in the food supply. The American Academy of Pediatrics (AAP) stated that energy drinks should not be included in the diet of

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children and adolescents due to their intoxicating content.<sup>10,11</sup> One of the undesirable effects of energy drinks, which have extraordinary percentages of carbohydrates, is that they frequently slow down the degree at which nutrients are absorbed into the bloodstream. In addition, a high amount of carbohydrates decreases the rate of fluid absorption or creates dehydration during an exercise. Intake extraordinary levels of sugar can cause a high sugar crash.<sup>9</sup> This happens when sugar moves into the bloodstream and delivers high energy allowing the athlete to a sense of well-being and attain better results, once that energy is consumed, within 30 to 45 minutes, there will be a possibility of a sugar crash.<sup>9,12</sup> Other health consequences include reported cases of epilepsy attacks and cardiac standstill; even dental carries could result from the high acid content of energy drinks.<sup>12</sup> Daily or weekly energy drink consumption is highly associated with alcohol dependency. Many adolescents used to mix energy drinks with alcohol to get high energy without being sleepy and for more fun and excitement. The mixture of alcohol with energy drinks could be even more challenging. Energy drinks can hide the feeling of alcoholism, which may lead to more drinking and more alcohol-associated adverse reactions.<sup>12,13</sup> Up to the researcher's knowledge, data are scarce on the prevalence of energy providing drinks consumption in Kurdistan region and at the national level. Nowadays, there are many advertisements about energy drinks everywhere (in TV channels, shopping centers, Highways, different public places and ...etc.). Unfortunately, it is sold at low prices, and consumed in large amounts particularly by children and young adults. The aim of the study was to find out the prevalence of energy drinks consumption and their consumption pattern, as well as perceived benefits and health hazards among a sample of Erbil population.

## Methods

Erbil city is the center of Erbil Governorate, and the capital of Kurdistan region, located in the Northern part of Iraq, inhabited by around 1,750,000 populations.<sup>14</sup> In this cross-sectional study, respondents from different sectors and social groups of Erbil city were included. A convenient sample of 600 individuals of two groups was selected. The first group comprised 300 individuals, obtained from those attending large shopping centers and students from two secondary schools, one of them was private. The second group comprised 300 respondents from those attending public places like parks and youth gathering places. Data collection was done from September 25<sup>th</sup> through December 15<sup>th</sup>, 2014. A close-ended questionnaire was used to collect information related to socio-demographic characteristics of the participants, in addition to the amount of energy providing drinks consumption and their perceived benefits and health hazards. A pilot study was conducted on 10 participants before the actual survey to determine its validity. Verbal permission was obtained from management office of the shopping centers and the administration of the included schools. In addition, a verbal approval was obtained from the participants before data collection. All the individuals between 10 and 55 years old of both genders who agreed to participate were included in the study. Those who had participated in the pilot study were excluded. This study was conducted without any support or grant from anybody; it was approved by the Research Ethics Committee from the College of Medicine of Hawler Medical University. The questionnaire was completed through direct interview. Data entry was completed and the statistical package for the social sciences (version 18.0) was used for data analysis. A *P* value of  $\leq 0.05$  was considered statistically significant.

**Results****Socio-demographic characteristics of the study sample:**

A total of 600 respondents had participated in the study. Their age ranged from 10 to 54 years, with a mean $\pm$  SD age of 20.3 $\pm$  6.97 years. Nearly half of them, (46.7%)

were between 10- 17 years old, and 39.0% of them were between 18- 25 years. Around half (50.3%) of the participants were females. Other socio-demographic characteristics of the respondents are shown in Table 1.

**Table 1:** Socio-demographic characteristics of the study sample (n= 600)

<b>Variables</b>		<b>No. (%)</b>
Age in years	10-17	280 (46.7)
	18- 25	234 (39.0)
	$\geq$ 26	86 (14.3)
Gender	Male	298 (49.7)
	Female	302 (50.3)
Residence	Rural	32 (5.3)
	Urban	568 (94.7)
Occupation	Student	414 (69.0)
	Public employee	144 (24.0)
	Private sector employee	42 (7.0)
Education level	Illiterate	8 (1.3)
	Read and write	6 (1.0)
	Primary school	10 (1.7)
	Intermediate school	142 (23.7)
	Secondary school	236 (39.3)
	University graduates	198 (33.0)
Total		600 (100)

**Knowledge and attitudes of respondents towards energy drinks consumption:**

Regarding the prevalence of energy drinks consumption among the study population, 256 (42.7%) did drink it; among them, 32.8% had consumed it once weekly, 35.9% twice weekly, and 31.3% three times and more weekly. Almost two thirds (62.7%) of the respondents thought that energy drinks are harmful, compared to 37.3% who thought it is useful. Out of those who indicated it is harmful, 46.2% of them said it affects heartbeat and blood pressure, 33.5% thought it had an addictive effect, 13.2% said it causes osteoporosis, and only 6.9% indicated that it can cause a headache. Nearly two-thirds (66%) of the respondents who said it is useful, reported that they drink it to get energy, 30.4% to improve mood and performance and

3.6% to lose weight. The majority of the participants (78.7%) did not agree on advising or encouraging family members and friends to consume energy drinks. On the other hand, most (83.3%) of the participants have seen advertisements for such drinks, more than two-thirds (71.4%) of such advertisement were seen in TVs, 21.6% in the shopping centers, and 7% in the highways. More than three-quarters (76.3%) thought that advertisement play a role in encouraging them to consume these drinks. About actions that could be taken to reduce energy drinks consumption, 43.7% stated that through advocating more rules and regulation by the Ministry of Health, 27% responded to be through health education, 18% of them suggested banning selling such drinks in public places, and 11.3% suggested to increase prices (Table 2).

**Table 2:** Knowledge and attitude of respondents towards energy drinks consumption (n= 600)\*

Variables		No. (%)
Consumption of energy drinks during the past 7 day	None	344 (57.3)
	Once	84 (14.0)
	Twice	92 (15.3)
	Three times and more	80 (13.3)
Whether it is useful or harmful	Useful	224 (37.3)
	Harmful	376 (62.7)
Usefulness	Get energy	148 (66.0)
	Improve mood and performance	68 (30.4)
	weight loss	8 (3.6)
Harmful effects	Addiction	126 (33.7)
	Affects heartbeat and blood pressure	174 (46.2)
	Osteoporosis	50 (13.2)
	Headache	26 (6.9)
Do you advise your family or friends to drink? ( for consumers)	Yes	51(21.5)
	No	201 (78.5)
Have you seen advertisements?	Yes	500 (83.3)
	No	100 (16.7)
Where have you seen the advertisement?	TVs	357 (71.4)
	Shopping centers	108 (21.6)
	Highways	35 (7.0)
Does the advertisement encourage people to consume it?	Yes	458 (76.3)
	No	142 (23.7)
How to reduce the consumption of energy drinks?	Health education	162 (27.0)
	Increasing prices	68 (11.3)
	Banning selling in public places	108 (18.0)
	Advocating for more rules and regulation	262 (43.7)

\* Not all the variables are out of 600, accordingly we cannot add total to the end of the table.

**Association of consumption of energy drinks with some socio-demographic characteristics of the respondents:**

Among participants  $\leq 17$  years of age, more than half (58.6%) of had not consumed energy drinks in the past seven days, 12.9% had consumed it once, 17.9% twice, and 10.7% three times or more in the same period. Among those between 18- 25 years of age, 51.3% did not consume energy drinks in the past seven days, compared to those who had consumed it once, twice and three times and more (13.7%, 16.2%, and 18.8%, respectively. On the other hand, 69.8%

of those  $\geq 26$  years had not consumed it at all, with a significant statistical association ( $P = 0.001$ ). Males found to consume more (54.6%) energy drinks than females (29.8%), with significant statistical association ( $P = < 0.001$ ). Also, a significant statistical association had been found between the consumption of energy drinks and the educational status of the participants, ( $P = 0.002$ ) There was no statistical association between the employment status of the respondents and energy drinks consumption, ( $P = 0.327$ ) as shown in Table 3.

**Table 3:** Association of energy drinks consumption with age, gender, educational and occupational status of the respondents

Variables	Energy drinks consumption, No. & (%)				P value
	None	Once	Twice	Three times or more	
<b>Age groups in years</b>					
$\leq 17$	164 (58.6)	36 (12.9)	50 (17.9)	30 (10.7)	0.001
18- 25	120 (51.3)	32 (13.7)	38 (16.2)	44 (18.8)	
$\geq 26$	60 (69.8)	16 (18.6)	4 (4.7)	6 (7.0)	
<b>Gender</b>					
Male	132 (44.3)	46 (15.4)	60 (20.1)	60 (20.1)	0.001
Female	212 (70.2)	38 (12.6)	32 (10.6)	20 (6.6)	
<b>Educational status</b>					
Illiterate, Read /write and primary	12 (56.0)	6 (25.0)	2 (8.3)	4 (16.7)	0.002
Intermediate school	64 (45.1)	22 (15.5)	36 (25.4)	20 (14.1)	
Secondary school	154 (65.3)	26 (11.0)	28 (11.9)	28 (11.9)	
University graduates	114 (57.6)	30 (15.2)	26(13.1)	28 (14.1)	
<b>Occupation</b>					
Student	234 (56.5)	62 (15.0)	68 (16.4)	50 (12.1)	0.327
Public employee	82 (56.9)	16 (11.1)	22 (15.3)	24 (16.7)	
Private sector employee	28 (66.7)	6 (14.3)	2 (4.8)	6 (14.3)	

## Discussion

Energy drink consumption has been continuous to expand and been more attractive since its beginning in Australia in 1987 and the United States in 1997. From the first day of its initiation until 2012, its market had developed quickly with nearly 700 new brands produced in the United States. Energy drinks have reached more importance in young adult market; to improve vigilance or provide temporary memorial improvement and are readily easily accessible in public places.<sup>15</sup> The current study had shown that 42% of the respondents had consumed energy drinks (once or more / week). Almost similar results were reported in studies done in Pakistan, Saudi Arabia and Turkey (42.89%, 46% and 51.4%, respectively).<sup>15-17</sup> This might be due to the similar culture and ease of availability of energy providing drinks in such communities. The reasons why energy drinks were consumed, two-thirds of them consumed it to get energy, nearly similar results were reported in a study in Ghana stated that high percentage (53.6%) of the respondents who consume energy drinks indicated that they did so to replace lost energy after a competition or training.<sup>13</sup> This might be contributed to the ignorance of the respondents regarding health hazards of such drinks and easily access and low prices, in addition to the effect of local advertisements. About two-thirds of the participants in this study perceived that consumption of energy drinks is harmful mostly due to its effect on heart and blood pressure and to a lesser extent; addiction, osteoporosis, and headache. A study in Saudi Arabia found that students experienced a number of adverse health effects. Increased frequency of urination and sleeplessness were more common in males than females. Only 36.70% males and 14.28% of females had not ever shown any adverse health effects.<sup>18</sup> Another study in Australia found that most respondents who indicated recreational use; showed experiencing symptoms (87%). These

symptoms were palpitations, anxiety, tremor and dyspepsia.<sup>19</sup> This might be due to the ignorance and unfamiliarity of adolescents about ingredients of such drinks and its adverse effect on health and even consumption of other beverages like alcohol. Regarding recommending the use of energy drinks to friends and family, one-fifth thought that they would recommend energy drinks, and few of them had brought energy drinks to their house. In a study in Saudi Arabia, 40% recommended using it.<sup>18</sup> This variability might be due to better awareness about adverse effects of such drinks among the study population. Regarding the role of advertisements in encouraging people to consume energy drinks, majorities have seen advertisements on TVs, and more than three-quarters thought that advertisements would encourage them to drink. A study in Ghana from seven public universities indicated that manufacturers of energy drinks usually target adolescents including students and athletes who are easily attracted to drink energy drinks after watching various attractive marketing announcements on TVs, in magazines and newspapers.<sup>13</sup> Another study in Saudi Arabia indicated that the main sources of information about the consumption of energy drinks were from friends and colleagues (32%) school/college or work friends (21%) electronic social networks (14%), and mass media (13%).<sup>16</sup> Less than half of the respondents indicated that through advocating more rules and regulations by the Ministry of Health, the consumption of such drinks could be reduced, in addition to other measures like health education, banning selling it in public places and increasing prices. A study in Lebanon highlighted the significance of health education to avoid the consumption of energy drinks in excessive quantities and to change some wrong understandings among adolescents concerning the benefits of energy drinks.<sup>20</sup> Also, results of the study had shown that those < 25 years, had consumed more

energy drinks than those  $\geq 25$  years, with a significant statistical difference. This might be attributed to the fact that younger age groups are more eager to consume such drinks, due to enjoying its taste, being more active, in addition to its intended effect to reduce sleeping hours and having better physical and mental activities. Studies in Ghana and Denmark had shown almost similar results, where increased consumption of energy drinks among young age groups was reported compared to other age groups.<sup>13,21</sup> Males found to consume energy drinks significantly more than females. Males in our community have more access to the external environment, in addition to other factors of the high tendency among males to consume such drinks as a sign of prestige to show more power and energy. Studies in Saudi Arabia showed that the male to female difference was also statistically significant.<sup>18,22</sup> Another study in Lebanon had revealed that males tend to consume energy drinks three times more than females.<sup>20</sup> Also, there was a significant statistical association between the consumption of energy drinks and educational status. Those with a low level of education had consumed it more than others. This might be due to the effect of advertisements, which address the younger age groups, low awareness and lacking enough education regarding health hazards of such drinks. A study in Denmark stated that energy drink consumption is more predominant among males and there is a strong social rise in the prevalence of energy drink consumption where the intake is much more common among people with low education levels than those with higher levels of education.<sup>21</sup>

### Conclusion

Energy drink consumption is highly prevalent among adolescent and young adults in Erbil city, which calls for more regulations and review the sale of these drinks. Adolescent's education and raising community awareness about adverse

reactions and health hazards of such beverages is a crucial issue, in addition to banning selling it in public places. Another regulation is through increasing taxes on such harmful drinks, which may lead to decrease its usage by adolescents. Findings of this study could be helpful for coaches and sports/ school managers who should be aware of the consumption practices of their students and sports players to correct misunderstandings regarding the expected benefits of energy drinks. Accordingly, it provides young drinkers with accurate information on consumption of energy drinks because these affect their school and athletic performance, and to ensure both safety and well-being of the adolescents. The findings and the conclusions of this study would be helpful to health policy planners in addressing possible strengths, weaknesses, and areas that need more attention and improvement in their future strategic plans to better review and regulate labeling and sale of energy drinks. Also, the study could provide a baseline data that could be used to conduct more in-depth research with larger sample size.

### Conflicts of interest

The author reports no conflicts of interest.

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