

A survey of energy-drink consumption among medical students

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Abstract

Objective: To determine the frequency and pattern of energy drink consumption among medical school students, their knowledge of its effects and side effects and to see its relation with alcohol and cigarette usage.

Method: The descriptive analytical study was conducted at Marmara University Medical School, Istanbul, Turkey from October 2011 and January 2012. A semi-structured questionnaire was filled by students who were asked about their socio-demographic status and their energy drink consumption. SPSS 12 was used for statistical analysis.

Results: The mean age of the 390 students in the study was 20.98±1.96 years (range:16-27). Of them, 204 (52.3%) were females and 186 (47.7%) were males. Overall 52(13.3%) were smoking regularly at least one cigarette per day; 122(31.3%) were consuming alcohol; 127 (32.6%) had consumed energy drinks at least once and 73(18.8%) more than once. In terms of perception, 110(28.2%) students said energy drinks were similar to sports drinks, while only 121(41.1%) named the brands correctly; 96 (24.6%) students did not answer this particular question.

Conclusion: Although consumption of energy drinks was common among medical students, the knowledge of ingredients and knowledge of health risks of energy drinks among them was unsatisfactory.

Keywords: Energy drink, Medical students, Survey, Alcohol, Caffeine. (JPMA 63: 842; 2013)

Introduction

Energy drinks are defined as "drinks containing caffeine, taurine, carbohydrates, glucuronolactone, inositol, niacin, pantanol, and B vitamins as well as proprietary substances."¹⁻⁴

Energy drinks are on the market for more than 10 years in Europe, but they were earlier banned in Turkey due to their high caffeine content. Marketing was set free after legislative changes in 2005. According to the new Turkish stipulations, the maximum amount of ingredients are as follows: caffeine 350mg/l, inositol 200mg/l, glucuronolactone 2400mg/l, taurin 400mg/l.⁵

Heavily caffeinated energy-drinks offer increased energy, stamina and alertness which are attractive for young people. The drinks are available over the counter, and their excessive consumption is of concern at many levels. The adverse effects of energy drink can be related to either the toxicity of its ingredients or specific settings in which energy drinks are consumed in combination with

alcohol. This form of energy drink consumption explains the enhanced risk of both caffeine and alcohol toxicity in youths. Consumption of energy drinks with alcohol during heavy episodic drinking increases the risk of serious injury, sexual assault, drunk driving, and even death. It has been reported that subjective perceptions of some symptoms of alcohol intoxication are less intense after the combined ingestion of alcohol and energy drink.

In Turkey, energy drinks are now available freely. Most people do not know the side effects and usually it is stored close to the sports drinks in shops which leads to their misinterpretation as sports drinks by many young people.

The aim of this study was to determine the frequency and pattern of energy drink consumption among medical students, their knowledge of the effects and side effects of energy drinks, and to compare its relation between alcohol and cigarette usage with socio-demographic status.

Subjects and Methods

The descriptive, analytical study was conducted between October 2011 and January 2012 in Marmara University Medical School located in Istanbul, which is one of the most crowded cities of Turkey with a population of 12 million. Marmara is a public sector

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university and students are enrolled from all over the country. The total number of students at Marmara University Medical School at the time of the study was 801, and the sample size was calculated using GraphPad INSTAT programme with a power of 95% and estimated prevalence of 1-7%. The sample required was 334. The number of students in our sample came proportionally from the number of students present in classes. Data was collected using a self-administered standard questionnaire which asked students' about their socio-demographic-characteristics, personal habits, knowledge about energy drinks, and their smoking habits.

To distinguish energy drinks from other beverages, the students were asked to write down the actual brands of drinks. Written approval was obtained from the faculty's administrators before the study, and informed consent was obtained from each participant.

A semi-structured questionnaire was distributed among all students present in the classes. The final number of students enrolled in the study was 390. The data collected was analysed using SPSS 12.0. Chi-square test was used to compare the categorical data. Statistical significance was defined as a *p* value of less than 0.05.

Results

The mean age of the 390 students in the study was 20.98 ± 1.96 years (range: 16-27 years). There were 204 (52.3%) females and 186 (47.7%) males. Of these, 273 (70%) were still residing with their families while the remaining 117 (30%) were away from their families, residing in dormitories, with friends or just living alone. Of the total, 52 (13.3%) students smoked at least one cigarette every day, 122 (31.3%) were consuming alcohol; 127 (32.6%) had consumed energy drinks at least once; and 73 (18.8%) more than once, 110 (28.2%) students perceived that energy drinks were similar to sports drinks and only (41.1%) named the brands correctly, with 96(24.6%) students choosing not to answer this question.

The 127 students who had consumed energy drinks at least once stated the reasons as curiosity, to increase cognitive performance, and to increase physical performance. Curiosity was aimed mostly related to the taste of energy drinks ($n=64$, 50.3%). Answers grouped for cognitive performance were to keep awake while studying ($n=15$; 11.8%) and before examinations ($n=2$; 1.5%). Answers grouped for physical performance were; during any sporting activity ($n=21$; 16.5%), to relieve fatigue ($n=3$; 2.3%), all other physical activities (dancing, sexual intercourse, travelling etc) ($n=10$; 7.8%).

Male students consumed energy drinks more than the female students ($p < 0.001$). No difference was found between students who had lived in urban places since 12 years of age and others ($p < 1.00$). Those living away from their families and students having a monthly expenditure above \$500 were consuming energy drinks more than the others ($p < 0.001$ and $p < 0.001$ respectively). Students who were smoking and using alcohol consumed energy drinks more than the others ($p < 0.001$ and $p < 0.001$ respectively). Among alcohol consumers, those having more than once a month (21%; $n=26$) consumed energy drinks more than those consuming alcohol less than once a month ($p < 0.009$).

When consuming energy drinks with other substances, the students consumed energy drinks mostly with alcohol ($n=311$; 79.9%). One (0.2%) student said he consumed energy drinks with illicit drugs. Students knowing the side effects of energy drinks consumed energy drinks more, but there was no statistically significant difference. Students who knew that the energy drinks do not cause dependency ($n=173$; 44.4%) consumed them more than the others ($p < 0.005$).

Among students who consumed energy drinks at least once, the side effects observed were palpitations ($n=4$; 3.1%), sleep disturbances ($n=4$; 3.1%), pain in several locations ($n=3$; 2.3%) and fatigue ($n=2$; 1.5%).

Discussion

The study found the frequency of energy drink consumption among Marmara University Medical School students to be 32.6%. In an earlier study, the prevalence was reported as 48.3%.⁶ However, its description of energy drinks was different. Drinks containing high carbohydrate levels were also included by that study. Furthermore, it comprised not just medical students, but also sports academy and arts academy students. The prevalence rate was highest in the sports academy students. In our study, energy drink consumption increased with monthly incomes and it was also reported in the earlier study. This increase can be related to high standards of living. But there is no data comparing university students and the general population. Energy drink consumption also increased with cigarette and alcohol use and these findings are coherent with other studies. Crowded city life, examination stress and activity demanding performance can incite consumption of energy drinks among university students.

Some of the publications about energy drinks are focussed on their beneficial effects. Several studies show that they improve response time in multiple choice

question (MCQ) examinations, car driving performance or awareness. In studies it was said that the presence of caffeine and glucose together seems to have a synergetic effect.^{7,14}

Some of the studies were concerned about their negative effects. Most of the negative effects of energy drinks seem to be the result of high caffeine content. Although there is a tendency to believe that energy drinks cause dependency; but loose stools, sleep disorders, palpitations and loss of appetite were the only negative effects proven.¹⁵ In our study, the most cited side effects were sleep disturbances and palpitations. The students who knew that energy drinks did not cause dependency, consumed energy drinks more. It is difficult to say whether these students consumed energy drinks and learned that energy drinks did not cause dependency later, or they consumed energy drinks because they already knew that energy drinks did not cause dependency.

In our study, among the students using energy drinks, those who used it to enhance mental performance stated that their expectations were met. This can be explained because of the high caffeine content of energy drinks, and the finding is compatible with literature.^{9,14}

Students who used energy drinks to improve physical performance stated that their expectations were not met. This can be explained by the fact that energy drinks do not increase physical performance.

Students who consumed energy drinks, expressed that they did not enjoy the taste of the drink. Though containing carbohydrates, other substances contained in the composition may spoil the taste.

Compared to the general population, medical students are thought to have more knowledge about nutrition and health. They are supposed to counsel teenagers and young people about staying away from energy drinks. But even medical students seem to have a lack of basic knowledge about energy drinks and their effects. Although warnings on the containers advise users not to use it with alcohol, but the students used energy drinks mostly with alcohol (79.9%) which was similar to other studies in which consumption with alcohol was found to be 76%.¹⁶

Medical students also confused energy drinks with sports drinks which are used for isotonic mineral replacement during intensive exercise and have lower glucose content. It is also shown that they improve endurance and athletic performance.^{4,17} Energy drinks

also improve performance, but they do not provide mineral support and they even cause diuresis because of their high carbohydrate and caffeine content. Thus, they can be harmful if adequate rehydration is not supplied during exercise. Medical students can practise sports medicine in the future. It may be beneficial to educate them about energy drinks and make medical training more adaptive to new subjects in nutrition as there is a constant evolution in the field of nutrition, and nutrition is a major determinant of human health.

Although medical students had less knowledge about energy drinks and their side effects, they used energy drinks. According to this inference, it can be thought that awareness among the general population about consuming energy drinks would be very low.

This study is neither population-based nor represents all medical students in Turkey. Also, as this study is observational rather than experimental, real effects of energy drinks could not be assessed. In this study only knowledge, attitude and behaviour of Marmara University Medical students were assessed and only 7 students reported to have any side effects after consuming energy drinks. It is difficult to be sure if these effects were really related to energy drink consumption. There are not enough studies about energy drinks, and most of them focus on different aspects of the subject. There is controversy about energy drinks use in sporting activity. Some studies say they improve performance, but whether they are harmful or not remains undiscovered. Wider research about energy drinks combined with clinical experiments about effects of such drinks is needed.

Conclusion

Although consumption of energy drinks was common among students, the knowledge of ingredients and knowledge of health risks of energy drinks among medical students was unsatisfactory. Medical students should be educated in terms of energy drinks and related consequences as they will be involved in the education of young people in the future.

Conflicts of interest-None.

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