

Caffeinated Energy drinks consumption and awareness among medical students of Benghazi University

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Abstract

Energy drinks (EDs) are a type of caffeinated beverages that are marketed to rising energy, the performance of athletes and mental concentration. Caffeine is the main ingredient in all energy drinks. These EDs are very popular and consumed by young adults especially among the students to increase their physical performance and mental activities. Caffeine in energy drinks is main content. Caffeine is CNS stimulant and it is added to the energy drinks to increase physical and mental activities of consumers such as; alertness and improvement of memory. The main goal of this study is to determine the consumption of caffeinated EDs among the medical students and their awareness about it. A questionnaire was carried out on 200 medical students in Benghazi University containing: the use of energy drink, reasons for use, knowledge about content and effect, benefits and side effects. In this study, EDs were consumed by 65% of students and the males were drinking them two times more than females. Most students knew about the contents of EDs and their effects on the body (59% and 65.0% respectively). The consumers were drinks the energy drinks to increase their mental activities for example, before the examinations (46.88%) and they were feeling well after the EDs drinking (70.31%). Most of the students consume the EDs with other caffeine-containing beverages, for instance, coffee and tea, and this habit may increase the incidence of caffeine toxicity. This study concludes that a significant proportion of students use EDs, especially in males. The common reason for using the EDs was to increase mental performance. The questioned students were conscious the adverse effects and health hazard of the energy drinks. Most of the students use EDs with other caffeine-containing soft drinks such as coffee and tea which potentially increase risk of caffeine overdose and toxicity

Keywords: Energy drinks, caffeine, health risks, students.

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1. Introduction

In recent years the consumption of energy drinks (EDs) increasing in the world, so that the health effects of these products were raised both in the scientific community and among the public.

Historically, The first energy drinks appeared in the US in 1949 and in Europe and Asia in 1960, but they became very popular after launching Red Bull as a new trademark in Austria in 1987 and in the USA in 1997[1]. Since then, the energy drinks consumption was growing rapidly in the world.

The annual consumption of these drinks in 2013 was exceeding 5.8 billion liters in around 160 countries. The consumption of energy drinks was increased annually, for example, the EDs consumption was increased by 17% in 2006 compared to the previous year [2].

Globally, energy drinks are highly consumed by young people because they are marketed to improve energy, performance of athletes and increase mental concentration. According to Mintel reports (2006)[3], most of the consumers

were males and less than 35 year old (65% and 66% respectively). In 2008, the Pennsylvania Medical Society's Institute for Good Medicine (2008) found that the student of high schools use EDs to enhance their mental activities and increase concentration such as to stay awake longer to study and most of the students knew this effect. In the US, energy drinks are classified as the second most common dietary beverage used by adolescents [1]. Now, most of the energy drinks producers address these drinks to new groups of consumers such as elderly people and they advise consumers about new functional features such as improvement of memory, suggesting that these drinks are natural and healthier [2].

Every year there is hundreds of brands of energy drinks issued to the market, for example in 2006, five hundred new brands of energy drinks were issued worldwide [4]. So that regulation and legalization of these types of beverages became necessary but the market approval and restrictions for energy drinks sales are variable. For example in France, The energy drink was not approved after the death of 18-year athlete, due to consuming 4 cans of ED after playing game but in the United Kingdom, the EDs allowed for marketing with warning against its consumption by a group of consumers such as children and pregnant women (Consumer report, 2012). While in the United States, energy drinks producers were marketing them as beverages rather than as a dietary supplement because as beverages they would be approved by the FDA reporting requirements [5].

The EDs could be defined as a type of drinks that contains caffeine as the main ingredient and other ingredients such as taurine and vitamins [6]. Generally, the EDs contain five types of ingredients (1) CNS stimulant, caffeine, (2) sweetener such as sugar, (3) amino acids (mainly taurine), (4) vitamins B and (5) herbal extracts such as Ginkgo biloba [2]

The caffeine in energy drinks is the major constituent and its level is variable widely but usually a can or a bottle of energy drink contains from 50 to 505 mg of caffeine, depending on the capacity [7] and [8].

Energy drink is safe for the typical healthy adult to consume a total of 400 mg of caffeine a day that's confirmed by a panel of the EFSA (2015) which it is equivalent to 4 cups of coffee (90 mg each) or 5 standard cans (250 ml) of energy drink (80 mg each) [9].

Caffeine in EDs have many central nervous effects, they provide increased alertness and improved memory. When accurate doses are used caffeine improves performance by reducing reaction times and improving attention performance and Improve psychomotor and vigilance tasks [10]. In addition, Caffeine use is associated with modulation of mood and reducing fatigue [11]. The cognitive

performance and mood were improved, even when low doses of caffeine were used [12].

While increasing consumption and an increase in the number of reported cases of adverse health effects associated with energy drink consumption, concerns have been elevated about the toxicity of these products in both the scientific community and among the public. Adverse effects and toxicity from high-energy drinks consumption mainly are due to caffeine content [12]. Adverse effects associated with caffeine consumption in amounts greater than 400 mg include nervousness, irritability, sleeplessness, arrhythmia, and stomach upset [13]. Chronic consumption of caffeinated beverages such as EDs causes chronic headaches, Neural adverse effects, cardiovascular, gastrointestinal, and renal dysfunctions [14]. Most of caffeinated ED adverse effects and toxicity is due to the sympathomimetic effects of high-dose caffeine which lead to cardiac problems, such as arrhythmias and heart attacks [15].

The young adults and adolescents are most common people consuming energy drinks so that this paper insight the energy drink consumption among the students of medical colleges of Benghazi university and identify the knowledge of their effects and amounts of energy drinks and their effects after consuming by students.

2. Materials and methods

2.1 Subjects

Two hundred undergraduate students of medical colleges of Benghazi university were randomly included in this study. All Participants were purely voluntary and no names or IDs were asked for.

2.2 Method

Questionnaire based survey was carried out at the medical colleges in Benghazi University , within April and May 2017.

Questionnaire was designed by the authors and they were distributed during the lectures breaks and trained undergraduate students handed out of copies of questionnaires and who subsequently collected them from the students individually and voluntarily.

The questions were in Arabic. The first set of questions was for general surveys which determine the gender, age and weight of the students and energy drinks users.

The second set of questions was used for energy drinks consumers only to determine: reasons for the use of ED, frequency and amount of EDs used, the feeling after EDs (Physical and mental benefits). The last set of questions addressed knowledge of the student about constituents and unwanted effects of EDs.

2.3 Statistical analysis

The data were analyzed statistically by the Chi square test. The significance of the test is decided when *P*-value is less than 0.05.

3. Results

A total of 200 students (101 males and 99 females) responded to the questionnaire, aged 18-28Yrs (average age 22.85±0.28) and body weight 67.78Kg±1.12. 121(Mean ± SEM)of students (65%) were ED users, 71.88% males and 28.13% females (Fig. 1&2).

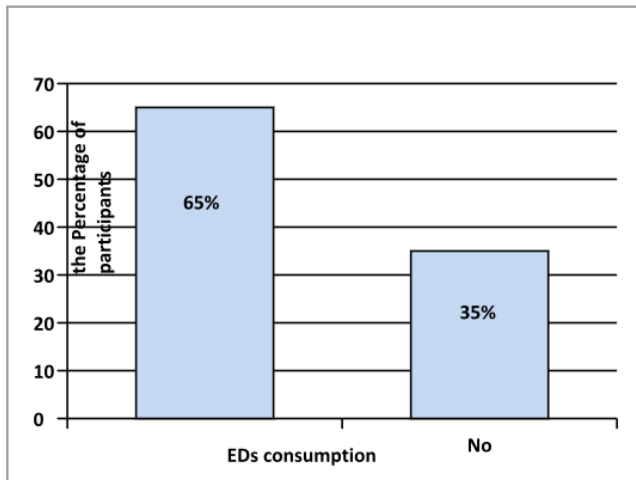


Figure 1: EDs consumers among the students

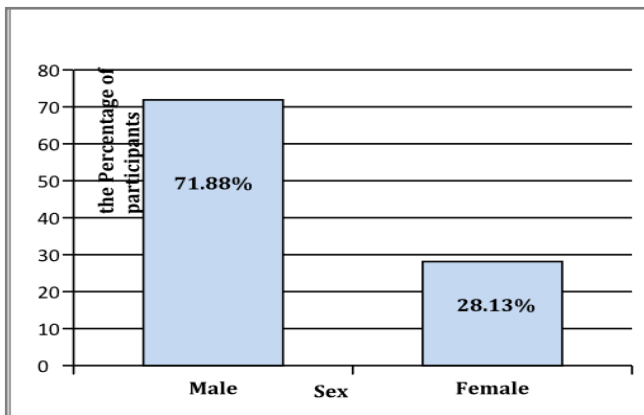


Figure 2: Distribution of EDs consumers according to the gender

This study showed that the students aware the main contents and effects (59% and 65% respectively) of energy drinks (Fig. 3 and 4). 56.25% of students aware the bad effects especially if consume large amount of energy drinks.

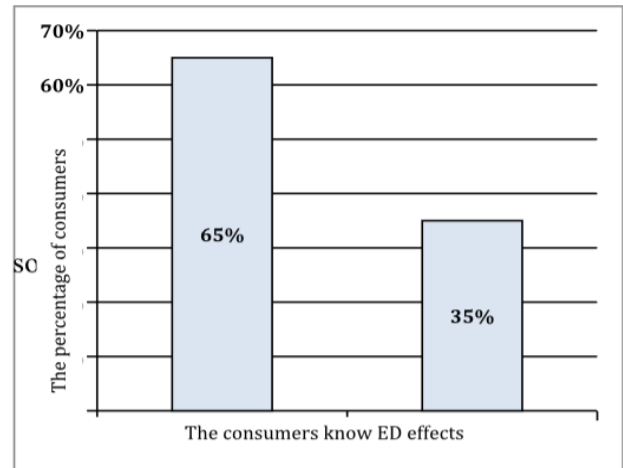


Fig. 3: Knowledge of students about effects of EDs

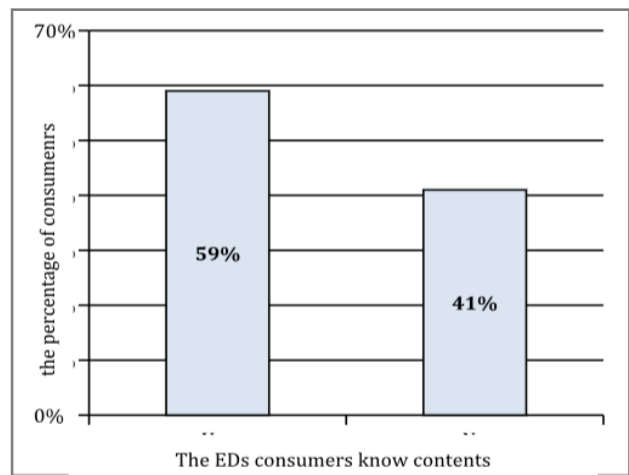


Fig. 4: Knowledge of students about contents of EDs

60.49% of students were consume one can of ED and within any time of the day (Fig. 5 and 7). Our study that the students use the energy drinks infrequently and the students feeling better after drinking the energy drinks and the effect depends on the amount consumed (Fig. 6).

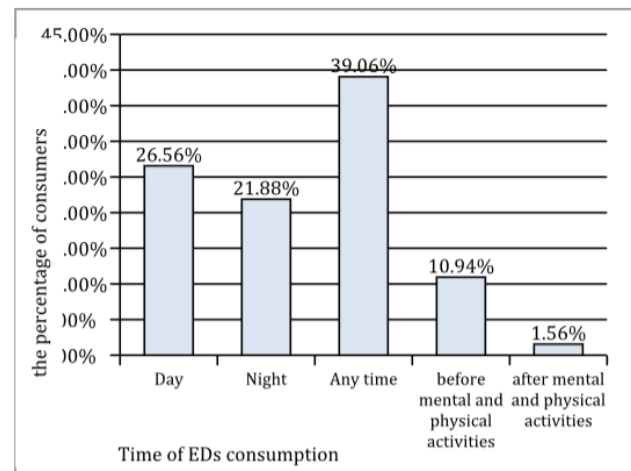


Fig. 5: Distribution of EDs consumers

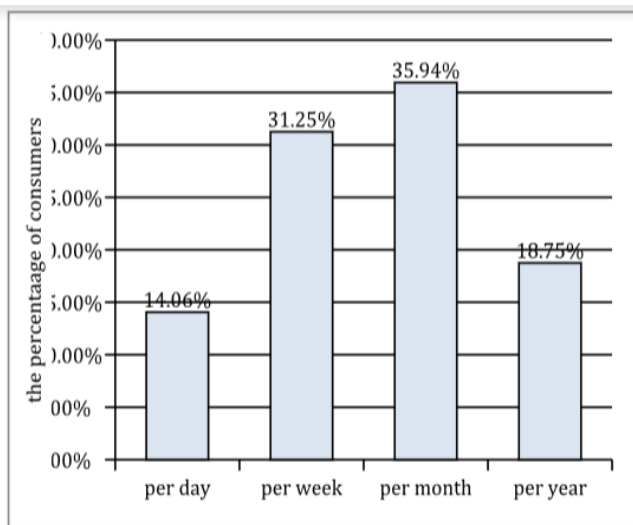


Fig.6: Frequency of EDs drinking regarding time of drinking

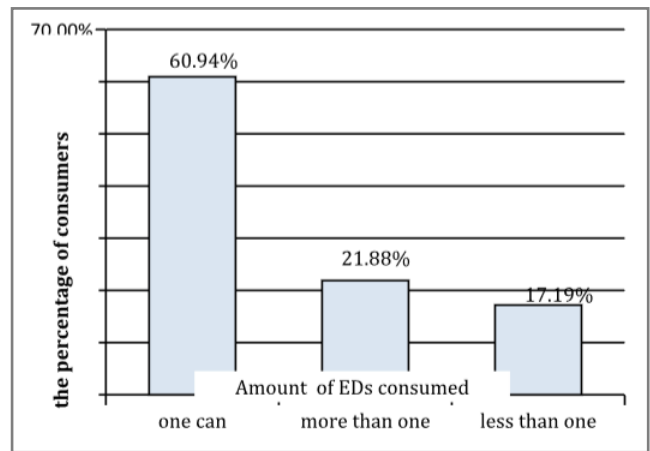


Fig. 7: Distribution of EDs consumers regarding amount of EDs consumed.

46.68% of The students were use the energy drinks to increase their mental activities such as before examinations, not more one stem in each time (Fig. 8).

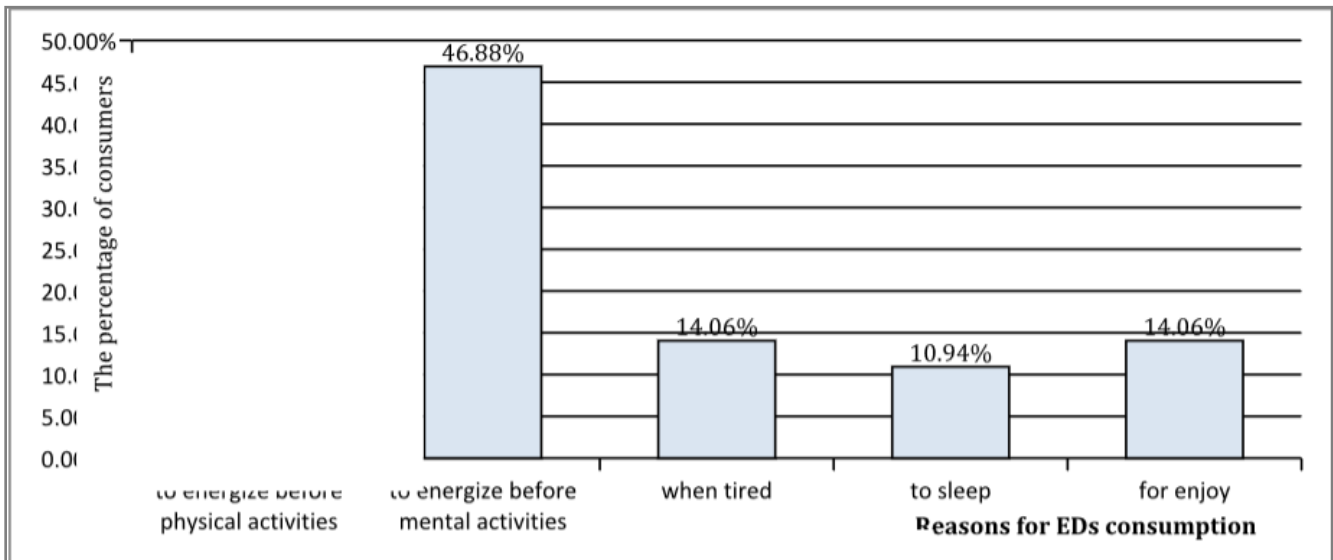


Fig. 8: Distribution of EDs consumers regarding reason for drinking.

The mental activities are better in 70.31% of the students after use the energy drinks (Fig. 9).

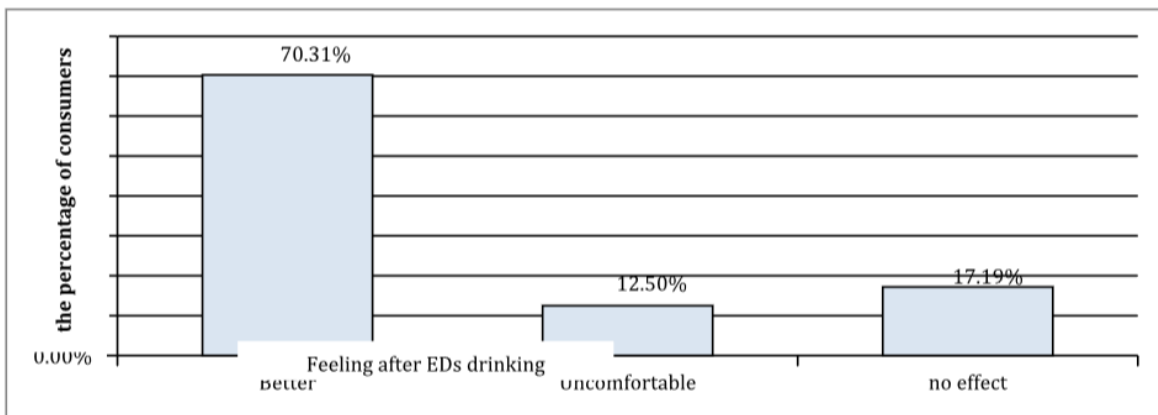


Fig. 9: Distribution of EDs consumers regarding the feeling of consumers after EDs drinking

This study showed that 76.6% of the students were consuming the EDs with other caffeinated beverages such as coffee and tea.

4. Discussion

Because the EDs were marketed and targeted at young people, many countries have legislation and regulation of caffeine content, labeling, and distribution in these drinks. For example, in Europe, the EDs regulated by European Food Safety Authority (EFSA), if caffeine content in EDs more than 150mg/l, the additional labeling is necessary for approval by EFSA [16]. In Australia and New Zealand, energy drinks are regulated under the Australia New Zealand Food Standards Code; which limiting the caffeine content of caffeinated beverages at 80mg/250ml[6]. According to Consumer Reports (2012), the caffeine content of EDs should be within 20% of what the label claims, but the product testing found variable caffeine contents in EDs [17] and [18].

4.1 Age of consumers

Energy drinks are highly attractive and consumed to young people as reported by EFSA (2015[9], Mintel report (2006) [3] and Alsunni (2015) [1]. In our study sixty five percent (65%) of the students were EDs users and this because the EDs are typically attractive to young people.

4.2 Gender of consumers

This study showed males were 2.6 times more energy drinks consumer than female, this is the same as reported by Alsunni and Badar (2011) [10]. The use of EDs might be less in females as typical Libyan girls are less physically active than the typical males and the EDs are mostly marketed for increasing physical performance of man.

4.3 Knowledge about content and effect of ED

The manufacturers advertise people to consume energy drinks to enhance performance in relation to special everyday situations. [19]. EDs consumption have positive effects such as elevated mood in low doses on other hand the caffeinated energy drinks have a potential negative effects on both physical and mental health, and particularly so in young consumers at whom they are often targeted this is due to high caffeine content in EDs[20]. This study showed that most of the students knew the basic ingredients of EDs (especially caffeine content) and their potential positive and negative effects on the body and they believe the effects depends on the amount of ED consumed and this is because the participants in this study were medical students and they had a good scientific background about health risks of these types of drinks.

4.5 Frequency of ED use:

Most of the students did not have any specific frequency of ED use and the students were use the ED

weekly or monthly and they restricted themselves to maximum one can in each time of drinking.

4.6 Reasons for use

One of the most important goals of this study was to understand the reasons that make medical students use EDs. The most common reason was to increase mental activities for better performance in examinations and this was expected especially before the studying for examinations, other reasons for EDs use were to increase physical activities especially for males, to keep awake and to just to enjoy [21].

4.7 Feeling and Effects after EDs use

Most of the students feeling better after EDs use like the ability to stay awake for a longer time, improvement of physical and mental performance. Evidence suggests, however, that such outcomes likely depend on the dosage consumed; for example, 250mg increased elation, whereas 500mg increased irritability [22]. Our study showed the students use the energy drinks infrequently and the students feeling better after drinking the energy drinks and the effect depends on the amount consumed.

One study showed that 71% of young people obtained caffeine from coffee as the main source and other sources beverages such as cola-type drinks. In our study most of EDs users were drinking caffeine containing beverages such as coffee. The combination of these drinks with EDs consumption can lead to health disorders and complications, due to excessive caffeine intake. It should emphasize that even moderated amounts of caffeine (more than 200-350mg) cause an increase in blood pressure and are potentially harmful [2].

We have now got a clear picture about the energy drinks consumption amongst students, knowledge about the compositions and effects of EDs consumption and reasons for usage and effects. This will serve as a baseline for further studies about the adverse effects and EDs consumption in younger people such as high school students.

5. Conclusions

A significant proportion of students at Benghazi University use energy drink especially in males. The commonest reason for use is to increase mental activities such as before the examinations. Because the main target in our study were medical students, so that they aware the adverse effects and health hazard of these products. Most of students use EDs with other caffeine containing soft drinks such as coffee this is lead to increase the adverse effects such as palpitation and insomnia and this depends on the amount consumed and the drinking of other caffeinated drinks such as coffee.

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