

Frequency of Energy Drinks Consumption and its Determinants among undergraduate Students

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ABSTRACT

Background: Energy drink consumption has continued to gain in popularity since 1997 after the entry of Red bull in market, which is known as current leader in energy drink market. Young adult, teenagers and students of college are the main target of energy drinks manufacturing companies.

Aims: To identify the frequency of energy drinks and to compare the frequency of consumption among the students of various colleges and to identify the determinants of energy drinks consumption in undergraduate students.

Methods: Data collected by cross-sectional survey conducted in 2016 in undergraduate students. A pre-tested structured questionnaire was used to interview the eligible participants. Basic demographic information and data regarding consumption, type and reasons, and side effects of energy drinks etc. of using energy drinks were recorded.

Results: Prevalence of consumption of energy drinks amongst 426 surveyed undergraduate students was 90.61%. Boys were consuming more energy drinks compared to girls (64.5% VS 35.5%). Majority of the participants, (52.8%) using energy drinks for more than one year and 96% of study participants did not know about the active ingredients. Sting was the most commonly used brand (88.6%) followed by the Red bull (10.9%). The major reasons for using energy drinks including for test (62%), increase working capacity (25.4%), increase waking hours (10.4%), Increase memory (10.4%). Most commonly experienced side effect of using energy drink was diarrhea (54.4%), increased heart rate (12.4%), fatigue (19%) increased blood pressure (9.3%).

Conclusion: Study results indicated that energy drink consumption is popular practice among undergraduate students for variety of reasons. Further, most of the students are not aware about the contents and the side effects which are also common after the consuming energy drinks.

Key words: Energy drinks, undergraduate students, prevalence, side effects

INTRODUCTION

Energy drinks are the beverages which contains the large amount of caffeine and in 1960s these appeared in Asia and Europe¹.

Intake of Energy drink has succeeding since the 1997 specifically after introduction of Red Bull, the existing leader in the market of energy drinks. In 2006 more than 500 different energy drinks were publicized worldwide and corporations are earning 5.7 billion dollar profits².

Consumption of energy drinks is common amongst high school and college students and Sports players mostly due to the term "energy drink" deliver message that it must have a link with physical activity. Resultantly, an unfamiliar buyer may have Acceptance of some benefits after intake of these drinks^{3,4}.

The substances of energy drinks are different, depending upon brand and type, however these may contain caffeine, glucuronolactone, carnitine, water, taurine, vitamin B complex, ginkgo, glucose, biloba, saccharose, inositol and ginseng⁵.

Even though many side effects have been reported, usage of energy drinks became greater than before particularly in college students, it is reported that they drink it to support their finish school work⁶.

In some developed countries like Norway, France, Iceland and USA the deaths were reported which were associated to high intake of energy drinks, for that reason the authorities of some countries have imposed banned on their sale and importation⁷.

There is strong evidence by Research study which suggests an association between increased intake of caffeine and other drug complications. Caffeine toxicity, heavy intake of caffeine and dependence on caffeine have been shown to considerably upsurge the chances of developing a substance use disorder, including dependence on alcohol, cocaine or cannabis⁸.

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In a new-fangled competition of energy drink businesses, the manufacturing companies started marketing “alcoholic energy drinks”, which is promoting combinations of alcohol, mixed with energy drinks; their main targeted group is youth age. Furthermore, these companies are presenting a broad spectrum of products like, sugar free, diet and zero calorie like Red Bull (Total Zero). Competitors are working to add more flavors like Blueberry, Lemon lime and Berry Blast etc⁹.

Medical students are exposed to various stressors that may precipitate a variety of health risk behaviors, such as smoking and consumption of high levels of caffeinated beverages¹⁰.

Objectives:

1. To identify the frequency of energy drinks in undergraduate students.
2. To compare the frequency of energy drinks among the students of various colleges.
3. To identify the determinants of energy drink consumption among the undergraduate students.

METHODOLOGY

This descriptive cross-sectional study was conducted after the approval by University Ethical committee, among the students of CMC (Chandka Medical College) Larkana, GMMC (Ghulam Muhammad Mahar Medical College) Sukkur, SZABIST (Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology) Larkana and Quaid e Awam College of Engineering Larkana.

Eligible undergraduate students between 18 to 24 years of age, both male and female were included after taking verbal informed consent. While Students suffering from any disease and not willing to participate were excluded from the study.

Sample size of 426 was calculated by using the World Health Organization sample size calculation software by taking a prevalence of previously conducted study at 43% and 95% confidential level. A list of total students was obtained from the administration of the respective colleges and sample was draw from that sampling frame by systematic random sampling technique. Total sample size of 426 divided in these institutes according to proportions.

A group of students of 4th year and final year comprises of boys and girls were trained by the principal investigator for collection of data. A pre-tested structured questionnaire was used to interview the participants. Basic demographic information and data regarding consumption, type and reasons, and side effects of energy drinks etc. of using energy drinks were recorded.

Data were entered analyzed by SPSS version 17. The means and standard deviations have been

computed for quantitative variables such as age and duration of using energy drinks. The frequency and percentages have been calculated for qualitative variables such as gender and accommodation and chi-square test of significance has been applied. P value ≤ 0.5 has been considered significant.

RESULTS

Out of total 426 undergraduate students selected by using the systematic random sampling technique 386(90.61%) were using the energy drinks while 40(9.38%) students replied that they are not using energy drinks of any kind. Out of total using energy drinks, 249(64.5%) were boys and 137 (35.5%) were girls students. The male to female difference was statistically significant ($p < 0.05$). Respondents were between the ages of 18 – 24 year with mean age of 20.5 ± 1.66 (boys 20.5 ± 1.66 and girls 20.6 ± 1.76) They belonged to different colleges i.e. 150 (38.86%) students were from Chandka Medical College (C.M.C) Larkana, 68(17.61%) from SZABIST Larkana, 56(14.5%) students were from Ghulam Muhammad Mahar Medical College (GMMC) Sukkur and 112 (29%) students were selected from Quaid-e-Awam University College of Engineering, Science & Technology (Campus) Larkana (QUCEST). Majority of study participants (52.8%) said they are using energy drinks for more than one year and 22.5% students are using since last one year. Majority of the students (88.6%) are using sting and 10.9% are using red bull while monster and boots used by less than 1% students (Table 1)

Table 1: Socio-demographic characteristics of respondents

| Variables | Frequency | %age |
|---|-----------|-------|
| Using energy drinks (n=426) | | |
| Yes | 386 | 90.61 |
| No | 40 | 9.38 |
| Gender | | |
| Male | 249 | 64.5 |
| Female | 137 | 35.5 |
| Name of college | | |
| C.M.C. Larkana | 150 | 38.86 |
| SZABIST Larkana | 68 | 17.61 |
| GMMC Sukkur | 56 | 14.5 |
| QUCEST Larkana | 112 | 29 |
| Duration of energy drinks (N=386) | | |
| One week | 27 | 7 |
| More than one week | 17 | 4.4 |
| One month | 20 | 5.2 |
| One year | 87 | 22.5 |
| More than one year | 204 | 52.8 |
| Students using different brands of energy drinks | | |
| Red Bull | 42 | 10.9 |
| Sting | 342 | 88.6 |
| Boots | 1 | 0.3 |
| Monster | 1 | 0.3 |

Awareness of students regarding energy drinks:

Concerning the awareness of ingredients of energy drinks i.e. Caffeine, Taurine, nicotine, Vitamins, Guarana, salts, vegetable Juice, sugar etc. majority of the students 370 (96%) were not aware about the ingredients, even they don't bother to read the brand's ingredients, only 16(4.%) students said they are aware about the ingredients. (Graph 1)

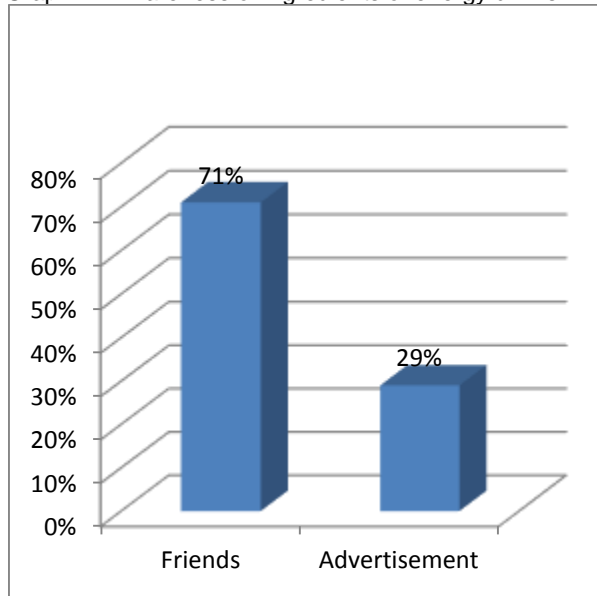
Majority of the students 275 (71%) motivated for taking energy drinks by their friends and 110 (29%) students got motivation to take energy drinks by advertisement. (Graph 2)

When study participants asked why they are taking energy drinks majority of the students 239 (62%) replied they take energy drinks only for taste. While 98(25.4%) said that they take energy drinks because it increases working capability, increase memory 9 (2.3%), increases waking hours 40 (10.4%).

Regarding the question how often they use energy drinks, 111 (28.8%) said they take one bottle per week, 64 (16.6%) students take two bottles per week, 61 (15.8%) three bottles per week, 38 (9.8%) more than five bottles per week, while 112 (29%) students said it depends on need.

When study participants asked about the experience of unwanted effect of energy drinks, 36 (9.3%) students experienced increased blood pressure, 48 (12.4%) increased heart rate, 37 (9.6%) sleeplessness, 20 (5.2%) headache, 31 (8%) nervousness, 39 (10%) fatigue, 19 (4.9%) nausea, 19 (4.9%) vomiting, 210 (54.4%) diarrhea while 14 (3.6%) students said that they don't have experienced any of unwanted effect after using energy drinks. (Table 3)

Graph 1: Awareness of ingredients of energy drinks



Graph 2: Motivation of taking energy drinks

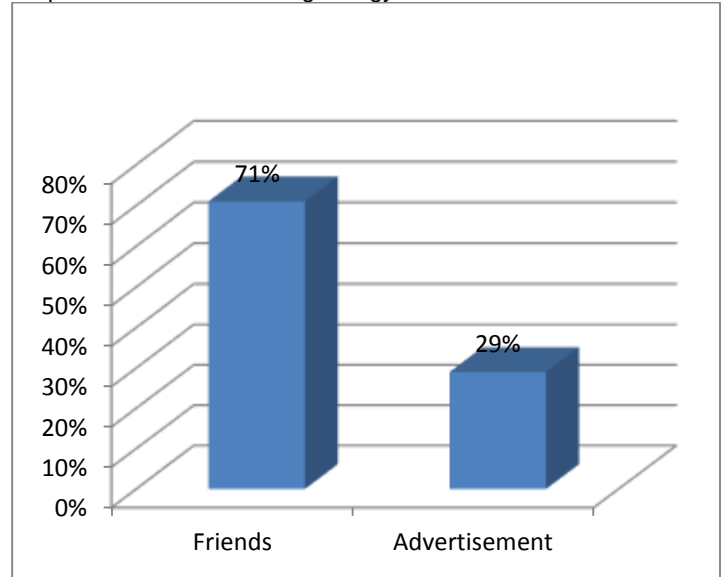


Table 2 Awareness of students regarding energy drinks (n=386)

| Variables | Frequency | %age |
|--|-----------|------|
| Reasons for taking energy drinks | | |
| For test | 239 | 62 |
| Increases working capacity | 98 | 25.4 |
| Increase memory | 09 | 2.3 |
| Increases waking hours | 40 | 10.4 |
| How often you use energy drinks | | |
| One bottle per week | 111 | 28.8 |
| Two bottles per week | 64 | 16.6 |
| Three bottles per week | 61 | 15.8 |
| More than five bottles per week | 38 | 9.8 |
| Depends on need | 112 | 29 |
| Experience of unwanted effect of Of energy drinks (Multiple choice) | | |
| Increase blood pressure | 36 | 9.3 |
| Increase heart rate | 48 | 12.4 |
| Sleeplessness | 37 | 9.6 |
| Headache | 20 | 5.2 |
| Nervousness | 31 | 8 |
| Fatigue | 39 | 10 |
| Nausea | 19 | 5 |
| Vomiting | 19 | 5 |
| Diarrhoea | 210 | 54.4 |
| No any | 14 | 3.6 |

DISCUSSION

Energy drinks have been promoted to young adults specifically college students are being appealed by the marketing efforts. The purpose of this study was to identify the frequency of consumption, its side effects, patterns and reasons of consumption of energy drinks amongst undergraduates.

Results of our study indicated that frequency of energy drink consumption is very high (90.61%) and prevalence was greater in boys than girls (65.5% V.S 35.5%). Outcomes of this research substantiate those of related type of researches which also suggests that frequency of energy drinks is very high in undergraduate students and more in boys are consuming more energy drinks than girls^{1,11,12}. Reason behind high consumption of energy drinks by boys can be advertisement which mainly target males (adult), moreover, boys have more desire of success as compared to girls and claims of marketing companies of these beverages as “energy drinks” and also increases the working capacity by effecting central nervous system, may attract more boys than girls¹³.

In our study majority of the students (52.8%) were using energy drinks for more than one year, while 22% since one year, 5.2% since one month 4.4% students for more than one month and only 7% students since last one week. Compared with results of other studies, a lower proportion of study participants reported having consumed energy drinks during last one year¹⁴. While another study conducted among the students of North Western Nigeria reported that majority of students (55.4%) had taken energy drinks at least once in their life, 25.7% are current energy drink users and 6.7% students take energy drinks on daily basis. While the results of another study reported that majority of respondents (81.4%) have tried an energy drink at least once in the past and 36.4% are current consumers of energy drinks^{15,16}.

Because of the growing craze over energy drinks, the number of energy drink brands has been increasing steadily as everyone wants to take advantage of the expanding market. Commonly available energy drinks in Pakistan are Red bull, Sting, Boots and Monster. In our study majority of the students (89%) were using the Sting, 11% were using Red bull, compared to the other study which reported that majority of respondents were using Power-Horse (35.6 %), followed by Red-Bull (28.9%), passion (20.8%), Bullet (6.0%), Matador (3.4%), Power Fist (2.7%), and Kukubima (2.7%).¹⁵ Reason for majority of our study participants were using the Sting is that it is easily available and cheap compared to other brands energy drinks.

Ninety six percent of our study participant responded that they are not aware about the ingredients of energy drinks, which is comparable with the study conducted in Turkey which reveals that most students could not correctly define the ingredients of energy drinks or their potential hazardous health effects¹⁷.

Regarding reasons for taking energy drinks, most of our study participants (62%) said that they use energy drinks only for test, 25.4% for increasing working capacity, 2.3% increase memory and 10.4% for increase waking hours. Compared to the results of study conducted in the undergraduate medical students of Karachi, which reported that, many of the respondents took energy drinks for completing their study projects 184 (52.5%), helping in wakefulness 166(47.4%) and for boosting energy levels 124 (35.4%). While another study reported that Insufficient sleep was the most common reason to drink energy drinks, as indicated by 67% of energy drink users, 50% drank while studying or completing a major course project, 45% while driving a car for a long period of time, and 17% to treat a hangover.^{1,2} While studies conducted to assess the association between energy drinks consumption and academic achievements reveals that energy drink intake is linked with lesser GPA^{18,19}.

In energy drinks the Caffeine is the main factor which stimulates the cognitive function. In energy drinks the amount of caffeine overdoes the sufficient quantity to augment performance, and if consumed more than one bottle per serving, could extent to intoxication stage.²⁰ In our study most frequent side effects experienced by students after consumption of energy drinks was diarrhea (54.4%), increased heart rate (12.4%), increased blood pressure (9.3%) fatigue (10%), and to a lesser degree sleeplessness, headache, nausea, vomiting and nervousness.

While a study which was conducted in Saudi Arabia, among Medical Students at Umm Al-Qura University, reported about heart palpitations which is commonest side effect observed in this research, and to a smaller degree of tremors, nervousness, nausea and vomiting²¹.

CONCLUSION

Intake of Energy drinks is common among undergraduates. Total of 386 were consuming energy drinks out of 426 students who participated in the study, 64.5% were boys and 35.5% were girls students. More than fifty percent students were consuming energy drinks for more than one year and majority of the students were taking sting brand. Students were taking the energy drinks for different reasons, mainly for test and increasing working capacity. Most of respondents reported various side effects after consumption of energy drinks; commonest reported side-effect was diarrhea.

It is suggested that there is need to generate awareness among the public regarding the contents

in energy drinks of different brands available in Pakistan and the potential side effects and adverse consequences after the consumption of energy drinks. Additional researches are suggested to assess characteristics involved in energy drink intake amongst undergraduates.

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