



## Energy Drink Consumption among University Students in Accra, Ghana

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**Abstract:** Although the presence of energy drinks on the market has increased significantly in recent times, there has been little research in the developing world regarding pattern of consumption, reasons for consumption and knowledge of side effects of excessive consumption. The purpose of this study was to assess students' knowledge and reasons for consumption of energy drinks. In a cross-sectional survey, 120 students were interviewed using a self administered questionnaire to evaluate the frequency of consumption of energy drinks and knowledge of its side effects. Consumption of energy drinks was high among the respondents. Seventy seven percent (77%) of the students drank 5 to 6 cans of energy drinks a week while 23% drank 7-8 cans a week. Majority (91%) have been users for 1 – 3 years. Energy drinks were drank mainly to study and to reduce stress. The respondents were well informed about the side effects associated with energy drink use, but only 24% have experienced some side effects such as stomach pains, headaches and increased heart beats. It is recommended that universities create awareness and sensitize students on the negative effect of energy drinks on health through seminars and talk-shows so as to lower the risks of the negative effects of caffeine ingestion and development of chronic diseases later in life.

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**Running Title:** Energy Drink Consumption Patterns

### 1. Introduction

The term “energy drink” refers to beverages that contain caffeine in combination with other ingredients such as sugar, taurine, guarana and B vitamins, and that claims to provide its consumers with extra energy (European Commission on Food Safety, 1999). Energy drinks have become ubiquitous on University campuses and recreational hot spots around the world (Hawkes *et al.*, 2009) and Ghana is no exception. This wide usage has probably been as a result of the aggressive promotional advertisements in the mass media which generally target the youth (Miller, 2008). There are several brands of energy drinks on the Ghanaian market including Red bull, Burn, Blue jeans, Lucozade, Smart and Bullet. Tertiary students have busy schedules and can be under great stress at times. One way they may combat the problem is by consuming energy drinks. As a result, some students may consume energy drinks more frequently than desirable. If energy drinks are used to replace meals, it may result in inadequate nutrient intake leading to undesirable health consequences (Nawrot *et al.*, 2003; King *et al.*, 2007).

Energy drinks are marketed for their stimulant effects. These drinks derive their energy-boosting properties chiefly from sugar and caffeine (Finnegan, 2003). The caffeine provides the desirable effects of increased alertness, improved memory, and enhanced mood. However, caffeine can have harmful health consequences including suppression of appetite which may reduce the urge to eat proper meals resulting in primary malnutrition. Besides, increased consumption of sugar contributes to excessive weight gain. Caffeine and taurine found in high amounts in energy drinks have been reported to have negative effects on heart function and blood pressure (Aranda and Morlock, 2006; Clauson *et al.*, 2008). High caffeine consumption has also been found to be associated with chronic daily headaches (Cureton *et al.*, 2007). A study conducted in Wayne State University in the United States by Steinke *et al.* (2009) revealed that energy drinks may pose risks for people with high blood pressure and heart disease. The seven day study, which was conducted among a small group of 45 healthy adults, revealed that within four hours of energy drink consumption, maximum systolic blood pressure increased by 7.9% on day one and 9.6% on

day seven. It was also found that heart rate increased by 7.8% on day one and 11% on day seven. Although the increases in heart rate and blood pressure were not enough for something to happen acutely, a person on hypertension medication or who has cardiovascular disease may have his condition worsened (Steinke *et al.*, 2009) if he/she consumes energy drinks.

Although the presence of energy drinks on the Ghanaian market has increased significantly in recent times, there has been little research regarding energy drink consumption. This study was conducted with the aim of assessing the frequency of energy drink use by students; identify the reasons why students use energy drinks and determine their knowledge about the side effects associated with energy drink use.

## 2. Subjects and Methods

The study, which was a cross-sectional survey, was conducted at the Methodist University College (MUC) campus in Dansoman, Accra, Ghana. The target population comprised all energy drink users at MUC campus. For the purpose of this study, an energy drink user was classified as a MUC student who consumed at least 5 cans of energy drink a week and had done so for at least a month. Purposive sampling was used to select one hundred and twenty students who met the set criteria and were willing to participate in the study. A structured questionnaire with both open and close-ended questions was used to collect data on personal information such as age, gender and level of study; frequency of energy drink consumption; reasons for consuming energy drinks; and knowledge of side effects associated with energy drink use. The data were analyzed using the Statistical Package for Social Sciences (SPSS; Version 17) software. Ethical approval was obtained from the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB), University of Ghana, Legon. Informed consent was obtained from the respondents after details of the nature and procedures of the study were clearly communicated to them. Confidentiality was maintained throughout the study period. Respondents had the right to discontinue with the study at any time, should they opt to do so.

## 3. Results and Discussion

Of the 120 students who participated in the study, 61% were males and 39% females. Eighteen percent were at level 100, 33% at level 200, 35% at level 300 and 14% at level 400. The ages of the respondents ranged between 18 and 30 years with a mean age of  $22 \pm 1.9$  years. Most (67%) were aged between 22 – 25 years, 28% were between 18 – 21 years and the rest were between 26 – 30 years.

Seventy seven percent (77%) of respondents drank 5 to 6 cans of energy drinks a week while 23% drank 7-8 cans a week (Figure 1). According to Miller (2008), 11% of college students in the United States reported consuming energy drinks daily. Hawkes *et al.* (2009) also reported that 6% of college participants of their study reported drinking at least one energy drink per day. The data suggests that the students in Ghana consumed energy drinks more frequently than their counterparts elsewhere. Majority (91%) have been users for 1 – 3 years (fig 2). This long term use implies that respondents have formed a habit and when they start earning income, frequency of consumption and expenditure on energy drinks are likely to increase and the long term negative effects of caffeine cannot be overlooked (Dobrin, 2006; Harding, 2010).

A number of energy drinks were patronized by respondents. Popular among them were Red Bull, Lucozade and Blue Jeans (Figure 3). These brands have been listed as popular energy drinks globally. Red Bull has been cited as the number one selling brand of energy drinks worldwide (Bevnet Magazine, 2012). Since Ghanaians are following global trends, due to advertisements, it is apparent that most respondents have become familiar with these energy drinks. The favourite brands were chosen because of their tastefulness, availability and affordability. Similar observations were made by Heuberger and O'Boyle (2009), who reported that energy drinks were popular among United States college students due to their sweetness, competitive pricing and availability in supermarkets and vending machines on college campuses. In this study sample, the composition of energy drinks was not an attribute considered when respondents made choices. This probably means that respondents were not aware of the varying caffeine contents of energy drinks, so they could select those with lower caffeine contents to reduce the ill effects on their health. It should therefore be emphasized that users should form a habit of reading the labels on energy drinks so they know what they are drinking. According to Obesity, Fitness & Wellness Online Magazine (2010) most consumers are not aware that the energy boost they are getting from energy drinks is from the high levels of caffeine and sugar they contain. This inherently proposes a danger to those consumers who may have heart problems or other health risks that can be aggravated by high levels of caffeine.

The energy drinks were consumed for a number of reasons. Notable among them were to: study for examinations; reduce stress and relax; study in general; party; mix with alcohol; for sports and for energy to perform household chores. All the respondents used energy drinks to study for examinations and 86% used energy drinks to study in general (Table 1). Since improvements in mental

functioning were of interest to college students, it was not surprising that all respondents drank energy drinks while studying. These drinks by virtue of their high contents of caffeine increased wakefulness and concentration (Bryant, 2010; Smit *et al.*, 2004; Cureton *et al.*, 2007) which could help students focus on their study. This finding is similar to that of Malinauskas *et al.* (2007), who reported that 74% of USA college students drank energy drinks while studying or completing major course projects. They also reported the mixing of energy drinks with alcohol by 54%. Even though less than a quarter (18%) of this study sample were engaged in this practice, it is important to note that since Ghanaians are following global trends, the percentage could rise significantly in the near future. The practice should be discouraged because an individual may unknowingly overlook the effects of intoxication because of the sensation of alertness produced by the energy drink thereby increasing the ingestion of alcohol to the point of alcohol abuse (Thombs *et al.*, 2009). Furthermore, energy drinks when mixed with alcohol is known to lead to electrolyte disturbances, vomiting, irregular heartbeats, drowsiness, loss of coordination and increased dehydration (Carrillo and Benitez, 2000; Ferreira *et al.*, 2006; Oteri *et al.*, 2007), all of which could be fatal.

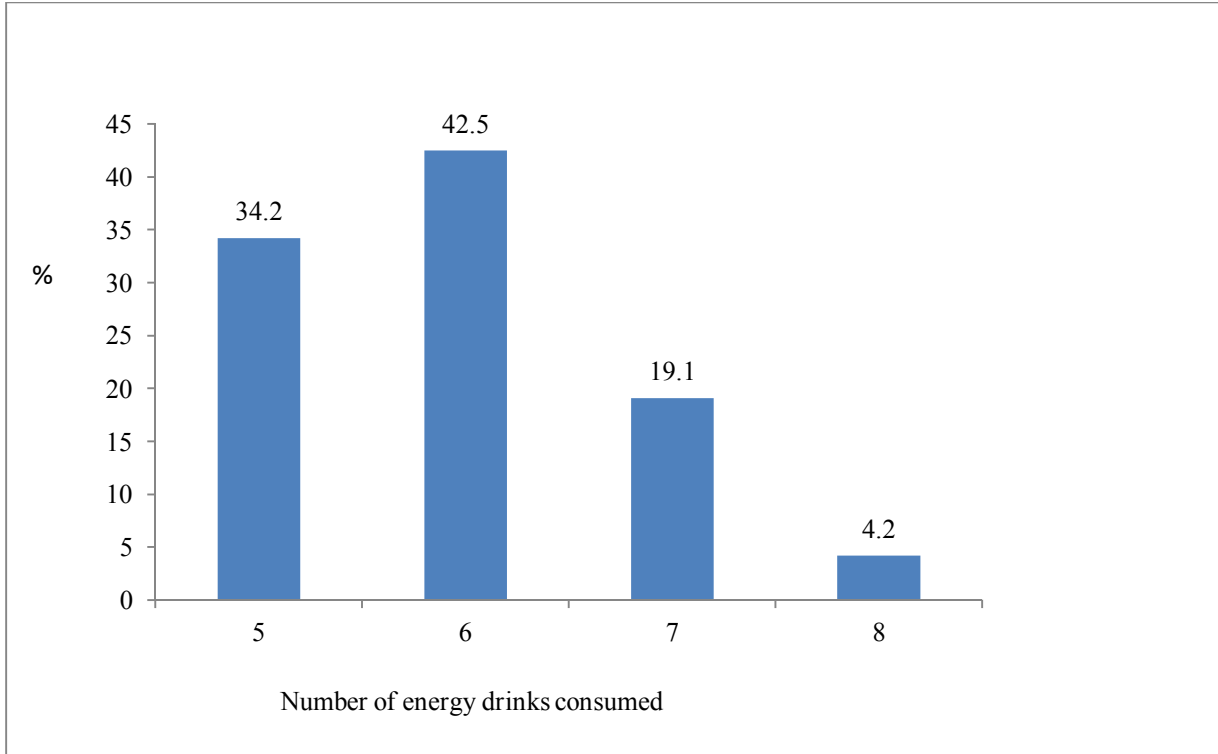
The media and friends were the main sources of information on energy drinks to the respondents. The electronic/print media were popular sources of information because they frequently advertised energy drinks to entice consumers. As pointed out by Miller (2008), the advertising campaigns feature extreme sports and young adults and as such the youth have become frequent buyers of energy drinks. The study

revealed a significant role of friends as a source of information on energy drinks. It is therefore important that all consumers become well informed about products including energy drinks so that the information they provide each other will be reliable and safe (Figure 4).

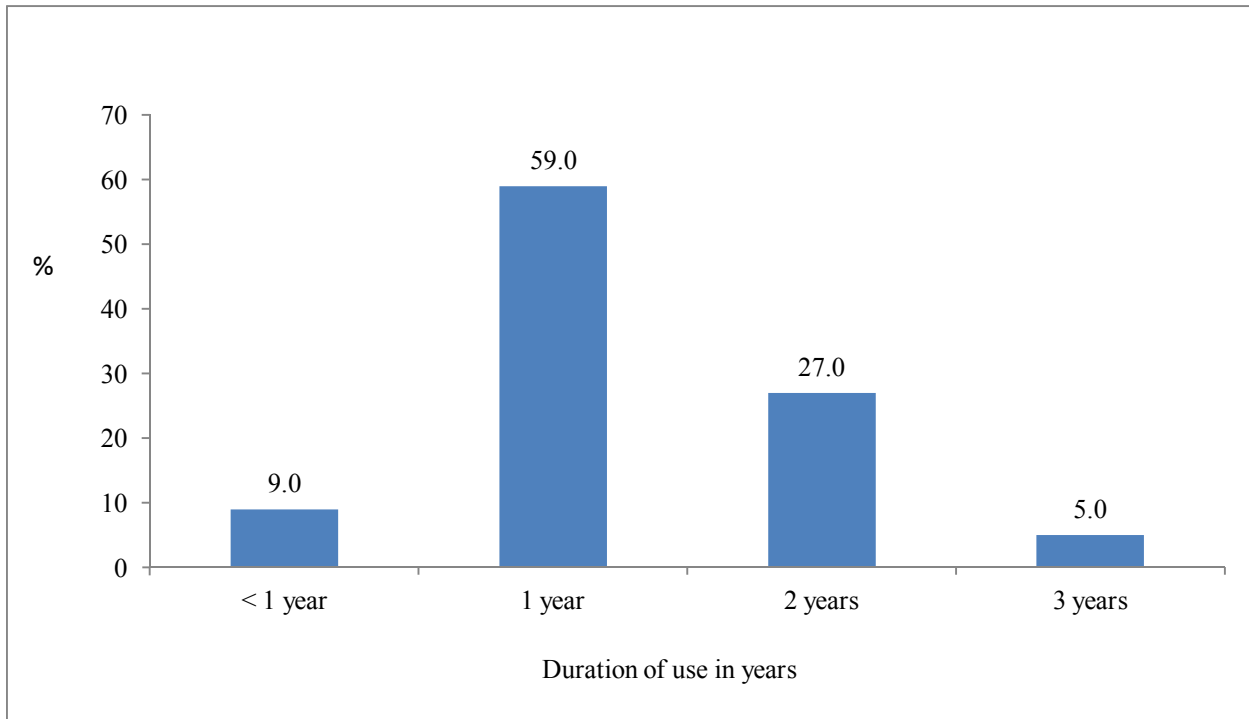
Seventy four percent (74%) of respondents were aware of side effects associated with energy drink use. Some of the side effects enumerated were headaches (82%); increased heart beat (75%); stomach ache (66%) and sleep deprivation (60%). The side effects listed by respondents were among those documented by Nawrot *et al.* (2003), Clauson *et al.* (2008), Bryant (2010), and Scher *et al.* (2004). This is an indication that although students were aware of some of the side effects associated with the use of energy drinks, they still chose to drink it. The fact that a quarter (26%) of the students were not aware of side effects is worrying since they may over indulge in using energy drinks and suffer side effects which they may never associate with energy drinks. While 76% said they had never experienced any side effects of energy drinks, 24% indicated that they had experienced some side effects. Of those respondents who had suffered side effects, stomach aches were the most experienced followed by headaches and increased heart beats (Figure 5). Even though Hawkes *et al.* (2009) reported side effects like racing heart beats (20%) and stomach upsets (9%) in their study, it is clear that the percentage reported in this study is much higher probably because the students in this study drank energy drinks more frequently than the sample they studied.

**Table 1. Respondents' reasons for using energy drinks**

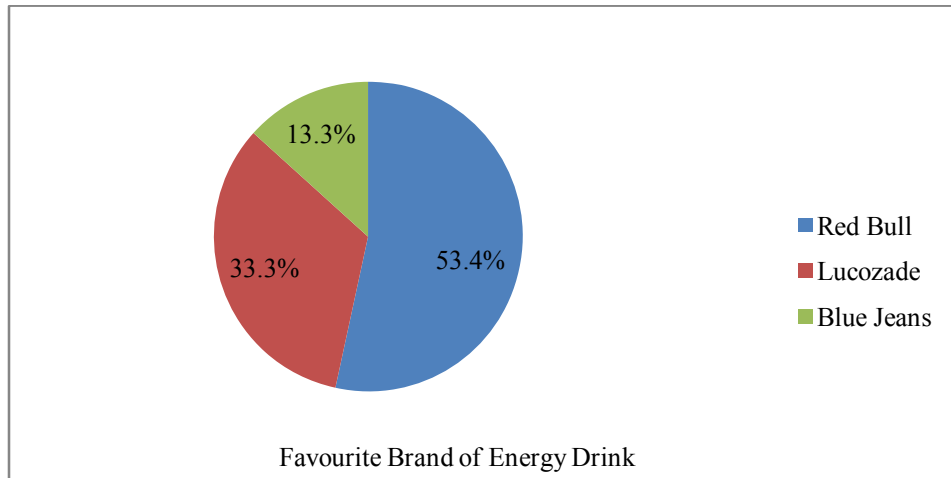
Reasons for use	Percent
To study for examinations	100.0
To reduce stress and relax	91.6
To study in general	85.5
To party	47.5
To mix with alcohol	18.3
For sports	13.3
For energy to perform household chores	12.5



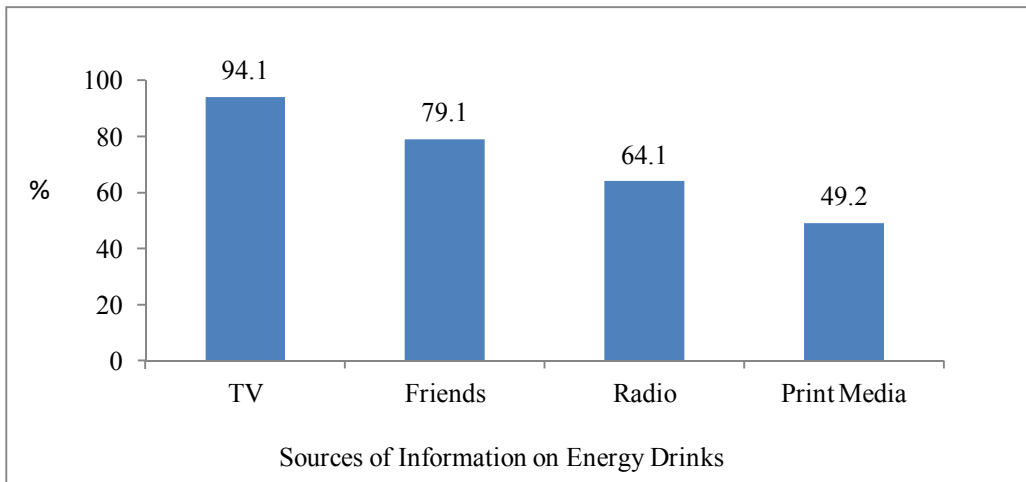
**Figure 1. Number of energy drinks consumed weekly by respondents.**



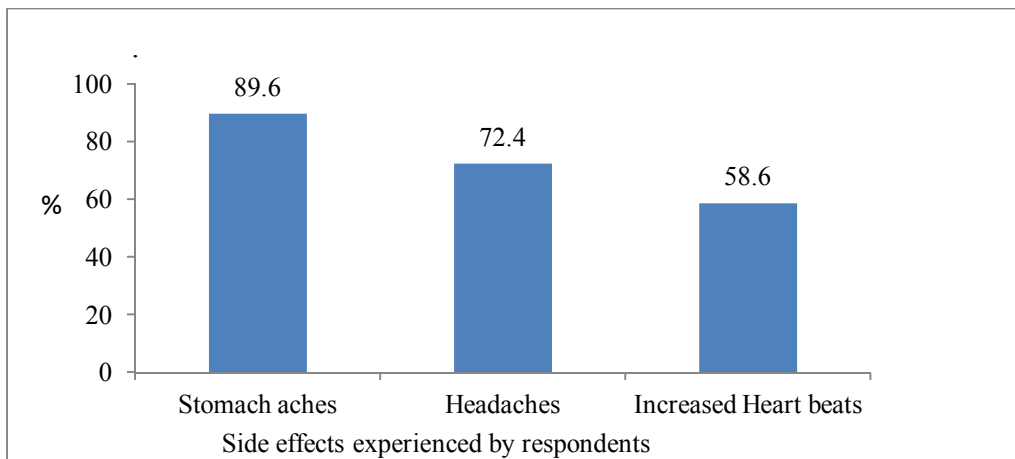
**Figure 2. Duration of use of energy drinks by respondents.**



**Figure 3. Respondents' favourite brand of energy drinks.**



**Figure 4. Sources of information on energy drinks.**



**Figure 5. Side effects experienced by respondents**

## Conclusion

Frequency of consumption of energy drinks was high among the study sample. Almost all respondents have been users for a year or more. The energy drinks were mainly consumed to study and to reduce stress. Most were well informed about the side effects of energy drinks but only a few had experienced them. Habitual consumption of energy drinks could lead to undesirable health consequences for the students. Given the potential increase in consumption of energy drinks in a developing country like Ghana, clear and relevant messages ought to be given to the whole populace especially the youth, the main targets of aggressive advertisement of these products. It is therefore recommended that universities create awareness and sensitize students on the negative effect of energy drinks on health through seminars and talk-shows. Such awareness creation could help reduce the frequency of energy drinks consumption among students thereby lowering the risks of the negative effects of caffeine ingestion and development of chronic diseases later in life.

## Conflict of Interests

The authors have not declared any conflict of interests.

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