



# Survey of the Consumption of Energy Drinks and Frequency of Obesity in a Population of Academics from Casablanca

Imane M'Touguy<sup>1\*</sup>, Nadia Iounes<sup>2</sup>, Fatema Zehra Mahfoud<sup>1</sup>, Marwa Chhail<sup>1</sup>, Amine El Khatib<sup>1</sup>, Rachid Saile<sup>3</sup>, Souad El Amrani<sup>2</sup>, Houriya Mestaghanmi<sup>1</sup>

<sup>1</sup>Laboratory of Physiopathology and Molecular Genetics, Metabolism Team Nutrition Toxicology, Ben M'Sik Faculty of Science, University Hassan II-Casablanca, Casablanca, Morocco

<sup>2</sup>Laboratory of Ecology and Environment, Department of Biology, Faculty of Sciences Ben M'Sik, University Hassan II-Casablanca, Casablanca, Morocco

<sup>3</sup>Laboratory of Biology and Health Research Unit Associated with CNRST-URAC 34, Faculty of Sciences Ben M'Sik, University Hassan II-Casablanca, Casablanca, Morocco

Email: \*i.mtouguy14@gmail.com

**How to cite this paper:** M'Touguy, I., Iounes, N., Mahfoud, F.Z., Chhail, M., El Khatib, A., Saile, R., El Amrani, S. and Mestaghanmi, H. (2016) Survey of the Consumption of Energy Drinks and Frequency of Obesity in a Population of Academics from Casablanca. *Open Access Library Journal*, 3: e3259.

<http://dx.doi.org/10.4236/oalib.1103259>

**Received:** November 25, 2016

**Accepted:** December 19, 2016

**Published:** December 22, 2016

Copyright © 2016 by authors and Open Access Library Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Background:** An energy drinks supposed to give a boost of energy to the consumer. It usually contains caffeine and lot of sugar. We studied the risks associated with the consumption of these drinks, the conditions in which they are consumed and the frequency of obesity in the determination of body mass index among 195 students of the Faculty of Sciences Ben M'Sik. **Methods:** This is a survey conducted by students of the Ben M'sik Faculty of Sciences, Hassan II Casablanca University, during the year 2015, using a questionnaire exploring the consumption of energy drinks. **Results:** Our study shows 195 of surveyed students consuming energy drinks, of which 22.0% are girls and 78.0% are boys, of which 16.5% were overweight, 5.5% moderate and 2% severe obesity. 9.2% of students consume them to quench the thirst, 10.8% to bring their body energy, 7.7% for their taste, 21.5% to mitigate fatigue, 6.2% to stimulate and 44.6% for all the reasons cited. 4.6% say they associate them with tobacco, 4.0% with alcohol and 6.8% with some drugs during review periods. The consequences of poisoning these drinks can be serious health and manifest as tachycardia (3.2%), agitation or confusion (29.3%), abdominal pain (7.9%), hypertension (19.4%). These symptoms experienced are significantly higher among consumers of these drinks compared to controls. Witnesses consume either energy drinks or sugary drinks. **Discussion/Conclusion:** That frequent consumption of energy drinks may pose a risk and a danger to the health of consumers, hence the need for awareness especially young people against their effects. Public health organizations must also keep a close watch on this new trend.

## Subject Areas

Epidemiology, Nutrition, Public Health

## Keywords

Energy Drinks, Students, Obesity

---

## 1. Introduction

The term “energy drinks” includes drinks which supposed to “mobilize the energy” by stimulating the nervous system and usually contain supposedly “stimulating” ingredients such as taurine, caffeine, guarana, ginseng and vitamins. These elements are naturally present in the diet, but are in high concentration in these drinks [1]. The main active ingredient in these energy drinks is caffeine, extracted from guarana and found in coffee and tea [2] [3]. The acute and long-term effects resulting from the excessive and chronic consumption of these additives alone and in combination with caffeine are not fully known.

Having become very popular especially among young people, energy drinks are often used in preparation of explosive cocktails, cut, for example, with other fruit juice or alcohol. People consume them to get mental and physical stimulation for a short time or to quench their thirst after exercise. But rather than rehydrate the body, these drinks can produce the opposite result because they contain lots of sugar, caffeine and other components [3]. Caffeine in energy drinks is able to provide consumers with the desirable effects of increased vigilance with improved memory and mood. However, it can have many harmful side effects. Indeed, Riesenhuber and collaborators [4] observed that caffeine in energy drinks favors diuresis and natriuresis. In addition, acute consumption of caffeine reduces insulin sensitivity [5] and increases mean arterial pressure [6]. Its high intake is associated with chronic daily headaches, particularly in young women (<40 years old) [7]. Chronic ingestion may have effects on the central nervous system, the cardiovascular system and gastrointestinal and renal dysfunction [8]. Moreover, these effects are different depending on the brand of energy drinks, the amount consumed of these drinks and the age. They can be severe especially in children [9]. In addition, the association of these drinks with alcohol or other substances such as drugs, tobacco or drugs can increase their toxicity especially among young people [10]. In Morocco, some statistics show that, on average, 5 million cans of energy drinks are consumed every year, including all brands, including those derived from smuggling. These estimates show the magnitude of the phenomenon [11]. Students also increasingly consume these drinks. They restore lost energy, promote wakefulness, increase vigilance, delay sleep, increase concentration and allow them to perform better. They are consumed mainly during exams preparation periods.

The objective of our study is to know the effects of the consumption of energy drinks on health with the frequency of obesity, the reasons for consumption in a population of

academics from Casablanca.

## 2. Material and Methods

This is a survey carried out among of 195 students from the Ben M'sik Faculty of Sciences, University Hassan II Casablanca, during the year 2015, using a questionnaire exploring the consumption of energy drinks to other beverages, according to age, sex and body mass index. The weight (Kg) and size (m) were determined using a scale (electronic TZ150 of size and weight), and consent was approved by all participants.

The data entry was carried out by Microsoft Office Excel (2007) and the analysis of variances by the SPSS 21.0 software. The association study by crossing the variables between the different groups was evaluated by the chi-square test. The test is considered to be significant when  $p < 0.05$ .

## 3. Results

Our study showed that 195 of those surveyed are consumers of energy drinks, of which 22.0% are girls and 78.0% are boys. Among drinkers, 6.7% consume them daily, 26.7% consume them regularly (1 to 3 times a week), 33.3% often enough (three to five times/month). On the other hand, 33.3% rarely consume it, 12.5% during the exam periods, 18.8% during family occasions, 28.1% in evenings with friends and 40.6% at different times. Regarding the quantity consumed per week in the study population, 10.0% less than 2 cans per week, 16.0% consume 2 to 4; 5.5% from 4 to 6; 1.0% from 6 to 8; 4.0% from 8 to 10 and 2.5% more than 10 cans per week.

The students mentioned several reasons for consumption of energy drinks. Thus, 9.2% consume them to quench thirst, 10.8% to provide their body with energy, 7.7% for their taste, and 21.5% to alleviate fatigue (**Table 1**).

**Table 1.** Periods and patterns of consumption of energy drinks.

Consumption period of energy drinks	Percentage (%)
Examination periods	12.5
Family opportunities	18.8
Evening with friends	28.1
Different moments	40.6
<b>Consumption patterns of BE</b>	
Quenching thirst	9.2
Energy supply	10.8
Taste	7.7
Alleviate fatigue	21.5
Excitation	6.2
Many reasons	44.6

In our study, only 20.0% of consumers surveyed know several constituents of energy drinks, 7.3% think that sugar is their main constituent, 2.7% that it is rather the vitamin B, 6.7% think that caffeine, 2.0% taurine and glucuronolactone, while 1.3% believe that mineral salts are the main constituents of energy drinks. We note that 48.0% of the population studied has a normal weight, 31.0% is overweight, 11.0% moderate obesity, 3.0% severe obesity and 7.0% are lean. Our results show that the frequency of obesity increases with increasing consumption of energy drinks. 16.5% of consumers are overweight, 5.5% are moderately obese, and 2.0% are severely obese ( $p = 0.04$ ). This obesity could be related to the sugar richness of these drinks.

The consumption of energy drinks may cause various symptoms, 3.2% of the respondents felt tachycardia, 22.6% observed an improvement in intellectual performances and their level of awakening, 19.4% had high blood pressure, 9.7% experienced abdominal pain and vomiting, 6.5% had anxiety, 29.3% had agitation or confusion and 11.7% had headache (Table 2).

#### 4. Discussion

Energy drinks have been designed to increase physical and mental performance during sports and leisure activities. Indeed, energy drinks are promoted to encourage young people to consume these sweetened and caffeinated liquids by promoting such benefits as increased energy, prolonged wakefulness, and increased physical and mental performance. In different contexts, some authors deplore the fact that marketing strategies are targeted mainly at high school and college youth, thus encouraging them to consume caffeine by trivializing the consumption of these drinks [12] [13]. Our study showed that 195 of those surveyed are consumers of energy drinks, of which 78.0% are boys and 22.0% are girls. We found that the consumption of these drinks has become a popular practice among students, especially during the period of exam preparation. The improvement of physical and intellectual performances is of great interest to them. Simon et al. obtained similar results [14]. Those who consume only take them under extreme conditions which oblige them to remain awake longer, especially during the examinations. Thus, the effects of energy drinks would be due to the stimulating effects of caffeine (the essential ingredient of these drinks) on the body. The consumption of these drinks masks the effects of fatigue, without bringing new energy. Caffeine is often associated with other products (ginseng, taurine) that could contribute to the stimulating

**Table 2.** Different symptoms experienced by consumers of these drinks.

Symptoms	Percentage (%)
Improved performances	22.0
High blood pressure	19.4
Abdominal pain and vomiting	7.9
Anxiety	6.5
Agitation and confusion	29.3

effect. The use of these drinks in situations like lack of sleep, the need to work, study or drive is typical of the need to increase performance. The frequent repetition of this scenario could however prove harmful to the consumer [9]. The consumption of energy drinks is not always without risky, since excessive intake of caffeine can cause many side effects in individuals who consume them. Insomnia, palpitations, headaches, nausea and anxiety are examples of possible effects associated with this stimulant [15].

For this reason, 19.4% had hypertension, 7.9% experienced abdominal pain and vomiting, 6.5% suffered from anxiety, agitation or confusion 29.3% and 3.2% of tachycardia. Caffeine can be addictive. Indeed, 49.2% of respondents believe that energy drinks can be addictive. Only by consuming large quantities of these drinks can the amount of caffeine exceed the amount needed to promote cognitive stimulation. The practice of consuming larger amounts of caffeine has also been studied in American youth [15]. Simon and Mosher [16] obtained similar results. Those who consume only take them in extreme conditions that require them to stay awake longer. The same is true of Picard-Masson [17].

We noticed that some respondents are dependent on these energy drinks. Indeed, the organism of people who regularly consume it adapts to the continuous presence of caffeine, by substantially increasing the number of adenosine receptors from the central nervous system. This increase in the number of adenosine receptors makes the organism much more sensitive to this substance, with two main consequences. First, for the same dose, the stimulating effects of caffeine are significantly reduced; it is the phenomenon of habituation [18]. Caffeine is a soft drug; the effects are stronger at first due to a high concentration of caffeine in our body. Whereas when we consume them regularly, the effect felt is more constant. Next, caffeine can also exert other acute effects. It stimulates the release of cortisone and adrenaline, raises blood pressure and accelerates heart rate. It may also have diuretic effects [19], cause bronchial relaxation, increase gastric acid production and stimulate metabolism. In our study obesity type 1 and II are present among consumers of energy drinks (7.5%) and that 16.5% are overweight. This obesity is due to the wealth of these sugar beverages coupled with the sedentary lifestyle. Each can contains about 35 g of carbohydrates per serving of 250 ml, equivalent to seven and a half teaspoons of sugar. Too much sugar in energy drinks can be stored as fat in the body, which can lead to unwanted weight gain. In addition, excess sugar can lead to more retention of salt and water by the human body, which could lead to an increase in blood pressure [20]. Our results agree with those of Clauson and collaborator [9] Bergeron and [20] who argue that these drinks are being drunk like water in some countries.

It also appears from this study that the knowledge of the respondents with regard to energy drinks is very limited. Indeed, the majority of consumers of these drinks do not know the differences between energy drinks and energy, their constituents and their effects on health. Hence the need to educate young people against the risks of these drinks on their health.

Like any other study, our study has its strengths and limitations. This study presents

the frequency of consumption of energy drinks and its effects on student health, but the information is limited, only concerns students in the public sector, and does not concern students of private university.

## 5. Conclusion

We can conclude about our study on the effects of the consumption of energy drinks on health with the prevalence of obesity, consumption patterns that: these energy drinks may be very toxic and may increase the prevalence of obesity, especially among some young people. They are without interest and should be avoided in young people and adolescents. It is necessary to set up a consumer information program on the undesirable effects of these energy drinks, with a policy of prevention, aimed at distinguishing clearly between citizens the difference between energy drinks.

## References

- [1] ANSES National Agency for Food, Environmental and Occupational Health Safety (2015) Energy Drinks. <https://www.anses.fr/fr/content/boissons-%C3%A9nergisantes>
- [2] Aranda, M. and Morlock, G. (2006) Simultaneous Determination of Riboflavin, Pyridoxine, Nicotinamide, Caffeine and Taurine in Energy Drinks by Planar Chromatography-Multiple Detection with Confirmation by Electrospray Ionization Mass Spectrometry. *Journal of Chromatography A*, **1131**, 253-260. <https://doi.org/10.1016/j.chroma.2006.07.018>
- [3] Bigard, A.-X. (2010) Dangers des boissons énergisantes chez les jeunes. *Archives de Pédiatrie*, **17**, 1625-1631. <https://doi.org/10.1016/j.arcped.2010.08.001>
- [4] Riesenhuber, A., Boehm, M., Posch, M. and Aufricht, C. (2006) Diuretic Potential of Energy Drinks. *Amino Acids*, **31**, 81-83. <https://doi.org/10.1007/s00726-006-0363-5>
- [5] Lee, W.J., Song, K.-H., Koh, E.H., Won, J.C., Kim, H.S., Park, H.-S., Kim, M.-S., Kim, S.-W., Lee, K.-U. and Park, J.-Y. (2005) Alpha-Lipoic Acid Increases Insulin Sensitivity by Activating AMPK in Skeletal Muscle. *Biochemical and Biophysical Research Communications*, **332**, 885-891. <https://doi.org/10.1016/j.bbrc.2005.05.035>
- [6] Bichler, A., Swenson, A. and Harris, M.A. (2006) A Combination of Caffeine and Taurine Has Not Effect on Short Term Memory but Induces Changes in Heart Rate and Mean Arterial Blood Pressure. *Amino Acids*, **31**, 471-476. <https://doi.org/10.1007/s00726-005-0302-x>
- [7] Scher, A.I., Stewart, W.F. and Lipton, R.B. (2004) Caffeine as a Risk Factor for Chronic Daily Headache: A Population-Based Study. *Neurology*, **63**, 2022-2027. <https://doi.org/10.1212/01.WNL.0000145760.37852.ED>
- [8] Carrillo, J.A. and Benitez, J. (2000) Clinically Significant Pharmacokinetic Interactions between Dietary Caffeine and Medications. *Clinical Pharmacokinetics*, **39**, 127-153. <https://doi.org/10.2165/00003088-200039020-00004>
- [9] Clauson, K.A., Shields, K.M., McQueen, C.E. and Persard, N. (2008) Safety Issues Associated with Commercially Available Energy Drinks. *Journal of the American Pharmacists Association*, **48**, 55-63. <https://doi.org/10.1331/JAPhA.2008.07055>
- [10] Reissig, C.J., Strain, E.C. and Griffiths, R.R. (2009) Caffeinated Energy Drinks—A Growing Problem. *Drug and Alcohol Dependence*, **99**, 1-10. <https://doi.org/10.1016/j.drugalcdep.2008.08.001>
- [11] Kherrati, B. (2008) Moroccan Association of Protection and Consumer Orientation

- (AMPOC). Journal Le Matin, 12.08.
- [12] Allard, P., Bélange, H. and Paqui, P. (2011) Boissons énergisantes prendre le taureau par les cornes! *Medecin du Québec*, **46**, 67-70.
- [13] Simon, M. and Mosher, J. (2007) Alcohol, Energy Drinks, and Youth: A Dangerous Mix. Marin Institute, California, 1-21.
- [14] Dubé, P.-A., Plamondon, L. and Tremblay, P.-Y. (2010) Boissons énergisantes: Risques liés à la consommation et perspectives de santé publique. 107-118.
- [15] Bridler, L., Remick, J. and Duffy, E. (2004) Is Caffeine Excess Part of Your Differential Diagnosis. *The Nurse Practitioner*, **29**, 39-44.  
<https://doi.org/10.1097/00006205-200404000-00007>
- [16] Picard-Masson (2014) Les liens entre la consommation de boissons énergisantes et la consommation de psychotropes chez les jeunes: Que connaissons-nous du phénomène? *Drogues, Santé et Société*, **13**, 25.
- [17] Green, R.M. and Stiles, G.L. (1986) Chronic Caffeine Ingestion Sensitizes the A1 Adenosine Receptor-Adenylate Cyclase System in Rat Cerebral Cortex. *Journal of Clinical Investigation*, **77**, 222-227. <https://doi.org/10.1172/JCI112280>
- [18] Massey, L.K. and Wise, K.J. (1992) Impact of Gender and Age on Urinary Water and Mineral Excretion Responses to Acute Caffeine Doses. *Nutrition Research*, **12**, 605-612.  
[https://doi.org/10.1016/S0271-5317\(05\)80030-2](https://doi.org/10.1016/S0271-5317(05)80030-2)
- [19] Margaritis, I. (2014) Energy Drinks: A Widely Underestimated Public Health Problem. Atlantico.  
<http://www.atlantico.fr/decryptage/boissons-energisantes-probleme-sante-publique-largement-estime-irene-margaritis-960520.html/page/0/1>
- [20] Bergeron, L. (2010) Taxing Soft Drinks to Curb Obesity? Protect yourself, Onlin, En ligne.  
<http://www.protegez-vous.ca/sante-et-alimentation/boissons-gazeuses.html>



Open Access Library

Submit or recommend next manuscript to OALib Journal and we will provide best service for you:

- Publication frequency: Monthly
- 9 [subject areas](#) of science, technology and medicine
- Fair and rigorous peer-review system
- Fast publication process
- Article promotion in various social networking sites (LinkedIn, Facebook, Twitter, etc.)
- Maximum dissemination of your research work

Submit Your Paper Online: [Click Here to Submit](#)

Or Contact [service@oalib.com](mailto:service@oalib.com)