



Energy drink usage among university students in a Caribbean country: Patterns of use and adverse effects

Sandra D. Reid ^{*}, Jonathan Ramsarran, Rachel Brathwaite, Sarika Lyman, Ariane Baker, D'Andra C. Cornish, Stefan Ganga, Zahrid Mohammed, Avinash T. Sookdeo, Cathrine K. Thapelo

Department of Psychiatry, Faculty of Medical Sciences, The University of the West Indies, St. Augustine, Trinidad and Tobago

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Abstract *Objective:* There has been little inquiry addressing whether or not concerns about adverse effects of energy drink usage are relevant in the Caribbean. This survey investigated energy drink usage and adverse consequences among tertiary level students in Trinidad and Tobago.

Methods: A cross-sectional survey of 1994 students from eight institutions was conducted using a de novo questionnaire based on findings from a focus group of students. Chi-squared analyses and logistic regression were used to assess relationships between energy drink usage, adverse effects and other factors affecting energy drink use, and to verify predictors of energy drink use.

Results: Prevalence of use was 86%; 38% were current users. Males were more likely to use, used more frequently and at an earlier age. Energy drinks were used most commonly to increase energy (50%), combat sleepiness (45%) and enhance academic performance (40%), and occurred during sports (23%) and mixed with alcohol (22.2%). The majority (79.6%) consumed one energy drink per sitting; 62.2% experienced adverse effects, most commonly restlessness (22%), jolt and crash (17.1%) and tachycardia (16.6%). Awareness of adverse effects was associated with no use ($p = 0.004$), but adverse effects were not a deterrent to continued use.

Conclusion: Energy drink usage is prevalent among students. The use is not excessive, but associated with high rates of adverse effects and occurs in potentially dangerous situations like during exercise and with alcohol. There is a need to educate students about the potential adverse effects of energy drinks.

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^{*} Corresponding author. Address: Psychiatry Unit, School of Medicine, The University of the West Indies, St. Augustine, Trinidad and Tobago. Tel./fax: +1 (868) 662 3968.

E-mail address: reid.dr@gmail.com (S.D. Reid).

1. Introduction

Over the last two decades, energy drinks have experienced dynamic global growth in popularity [1]. The Caribbean has not been exempted from aggressive marketing. In spite of the ready availability of energy drinks, to date there has been little inquiry into patterns of consumption, effects of use and whether or not concerns about the adverse effects of the stimulant content are relevant in this region. Energy drink usage among university students is of particular concern since this youthful population, engaged in academic pursuit is an ideal target for the promoters of energy drinks, with promises to boost energy, promote wakefulness, increase alertness and improve mental and physical performance.

Previous reports have shown that energy drink usage in this population is prevalent globally. Among undergraduate university students in the United States, 39–80% had used at least one energy drink in the past [2–6], with the highest rates occurring among students who participate in athletics [6]. In Ghana, 62.2% of student athletes used energy drinks at least once weekly [7], and in Argentina the ever used prevalence among students of physical education was 64.9% [8]. Ever used prevalence rates are also reported among various university student groups in Saudi Arabia (40%) and Turkey (32.6%) [9,10]. Kopacz et al. reported the use of energy drinks by 49% of university students in Poland and noted that the quantity of energy drinks consumed during examinations was significantly greater than that during the academic year [11].

The potential adverse effects of energy drinks are in large part related to the stimulant caffeine, the main ingredient which provides the desired energy rush. Most energy drinks contain about 80 mg of caffeine per serving [1,12], the same amount as an eight ounce cup of coffee. Some, however, provide up to an estimated 300 mg of caffeine in a single serving [1,12]. Most also contain large quantities of sugar and other substances such as taurine, riboflavin, pyridoxine, nicotinamide, B vitamins, and various stimulating herbal derivatives (guarana, ginseng and ginkgo biloba) [13].

The U.S. Food and Drug Administration reports that the moderate use of caffeine is safe [14] – a position endorsed by the American Medical Association Council on Scientific Affairs [15]. A daily dose of 300 mg of caffeine or less is considered a moderate intake [16]. Daily consumption of more than 400 mg is considered a high intake and has been associated with a variety of adverse health effects,

including anxiety, insomnia, irritability, dehydration, nervousness, elevated blood pressure and accelerated heart rate [17,18]. Previous studies have shown that college and university students are ignorant of the adverse effects of energy drinks [19] although not immune from them [2].

Trinidad and Tobago, the southernmost country in the Caribbean, is a high-income developing country with a population of 1.3 million (2011) and a per capita GDP of 18,087 USD [20]. Little is known about the use of energy drinks among students in the Caribbean. This survey determined consumption patterns and occurrence of adverse effects among students in tertiary level institutions in Trinidad and Tobago. This information would be useful in informing interventions and policy recommendations pertaining to the use of energy drinks on the campuses of tertiary institutions in Trinidad and Tobago and the wider Caribbean.

2. Material and methods

2.1. Student survey

A cross-sectional survey of students in all tertiary institutions in Trinidad and Tobago was conducted. Approval was obtained from the Ethics Committee of the Faculty of Medical Sciences, University of the West Indies (UWI), St. Augustine campus. Nine tertiary institutions were approached and eight agreed to participate.

A questionnaire was designed to obtain data on student demographics, energy drink consumption patterns, associated adverse effects, and knowledge of the adverse effects of energy drinks. The design of the questionnaire was guided by findings from a focus group of 15 randomly chosen students in the UWI, St. Augustine School of Medicine, which collected data related to energy drink usage – circumstances of use, frequency patterns, brands used most commonly, quantity consumed and adverse effects experienced after use. The resulting 25-item questionnaire was piloted among 20 random students on the UWI campus, and minor modifications were made to the instructions for clarity.

A convenience sample was utilized. Quota sampling based on student enrollment ensured adequate representation of each institution. A representative number of students per faculty/department for each institution was determined using student census data in each faculty/department. Using lists of classes, timetables and class sizes, students were recruited from selected classes on different days of the week and times of day.

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