

AMERICAN UNIVERSITY OF BEIRUT

ASSESSMENT OF ENERGY DRINK CONSUMPTION
PATTERNS AND PERCEPTIONS AMONG A SAMPLE OF
UNIVERSITY STUDENTS IN BEIRUT, LEBANON: A
MIXED METHODOLOGY APPROACH

by
MALAKE HASSAN GHOZAYEL

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Science
to the Department of Nutrition and Food Sciences
of the Faculty of Agricultural and Food Sciences
at the American University of Beirut


Beirut, Lebanon
September 2015

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MALAKE HASSAN GHOZAYEL

Approved by:



Sept 2015

Dr. Lamis Jomaa – Assistant professor
Department of Nutrition and Food Sciences

Advisor



Dr. Lara Nasreddine – Associate professor
Department of Nutrition and Food Sciences

Member of Committee



Dr. Ali Ghaddar – Assistant professor
Department of Arts and Sciences, LIU

Member of Committee

Date of thesis defense: September 15th, 2015

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ACKNOWLEDGEMENT

Towards the end of this journey, I would love to thank everyone who have stood by me and gave me academic and emotional support to achieve this research project.

I would like to express my gratitude to my academic advisor Dr. Lamis Jomaa who guided me throughout this challenging journey. Thank you for sharing your expertise, for your support, your friendly advice and constructive criticism to make me complete this work.

I would also like to extend my appreciation to Dr. Lara Nasreddine and Dr. Ali Ghaddar for serving as my committee members and for their insightful comments and suggestions on my thesis.

This project could not have been accomplished without the contribution of participants, faculty, students, staff and friends. Thank you for your efforts and valuable input! To Samia Joueidi, it was a pleasure having you with me on this journey. Thank you for donating your time to assist me throughout the recruitment and data collection for my thesis.

My biggest gratitude goes to my parents, my brother and my sister. Thank you for always believing in my ability, and patiently supporting and encouraging me. Mom, words cannot express how grateful I am for all of the sacrifices that you've made on my behalf, without you this work wouldn't be possible.

My deepest recognition is granted to my supportive husband; you have demonstrated continuous understanding and encouragement throughout these two years. To my little princess Celine, thanks for your patience during my lengthy working hours and for your smiles that always gave me the greatest feeling in the world.

God, I thank you for all of the above, for lighting my way and letting me through all the difficulties.

AN ABSTRACT OF THE THESIS OF

Malake Hassan Ghozayel for Master of Science
Major: Nutrition

Title: Assessment of Energy Drink Consumption Patterns and Perceptions among a Sample of University Students in Beirut, Lebanon: A Mixed Methodology Approach

The consumption of energy drinks (EDs) by university students has become widespread despite the established evidence of its detrimental health effects. In Lebanon, the high prevalence of energy drink consumption alone or combined with alcohol has been observed among young adults. However, little is known about the patterns of EDs consumption and the motivational factors driving Lebanese youth towards the consumption of these drinks. Thus, the objectives of this study were to assess the correlates of EDs consumption and explore the perceptions and attitudes of Lebanese university students towards energy drinks as well as identify main facilitators and barriers for this drinking behavior.

A mixed methods approach was adopted to meet the objectives of this study. The quantitative component of the thesis included the recruitment of a total of 227 university students aged between 18 and 30 years old from two private universities in Lebanon. Study participants were asked to complete a 36-items semi-quantitative questionnaire assessing their socio-demographic and lifestyle characteristics, as well as their beverage consumption patterns, mainly EDs and EDs mixed with alcohol (AmEDs), together with other caffeinated and alcoholic beverages. Results of the quantitative component of the study assisted in developing the objectives and questions for the focus group discussions (FGDs) conducted to explore the perceptions and attitudes of participants towards EDs. A total of 29 university students, who reported regular ED consumption, from the same private universities participated in six FGDs. The main purpose of these discussions was to explore the attitudes, beliefs, and practices of young Lebanese adults towards these drinks. Bivariate and multivariate analyses were performed using the statistical package for social sciences (SPSS 20) to explore correlates of EDs. Thematic analysis was conducted for the qualitative component of this thesis to identify recurrent themes from FGDs.

The results of this study revealed that among the survey participants (N=227; mean age: 20.67±1.96; 52% from AUB; 53% females) 45% consumed energy drinks at least once during their lifetime, and were defined as "ever consumers of EDs". Among ever consumers, around 55% consumed at least 1 drink per month and 46% mixed EDs with alcohol. ED users were mainly males, physically active subjects and consumers of coffee, sports drinks and alcoholic beverages. Red Bull® (38%) and XXL® (32%) were the most commonly consumed brands of EDs in this study. For the majority of participants, EDs were used to "get energy" to study (47%), work (36%) or play sports (35%) while AmEDs were considered as "common drinks" mainly used to celebrate (47%) and socialize (33%). Major side effects experienced by study participants following the intake of either EDs or AmEDs were headaches (52%), tachycardia (42%), shakiness (36%), dizziness (30%), anxiety and irritability (29%), as well as fatigue (27%), insomnia (25%) nausea and vomiting (19%). Moreover, 13% of participants reported getting involved in an argument or fight, 12% having required medical treatment and 10% having engaged in unsafe sexual practices. Results from the logistic regression analysis showed that physical activity, sports drinks consumption and frequent coffee consumption ($\geq 2c/\text{week}$) were positively associated with 'ever' ED consumption after adjusting for age, gender, BMI and alcohol intake. Among males, sports drinks consumers were around seven times more likely to consume EDs whereas in females, frequent coffee consumers were four times more likely to consume EDs. Sports drinks consumption was also positively correlated with alcoholic ED consumption, after adjusting for other covariates, including age, gender, BMI, physical activity, alcohol and coffee consumption.

Thematic analysis of the FGDs lead to the identification of 13 recurrent themes related to the consumption of EDs and AmEDs. These themes converged with the results of the survey in regard to the reasons of ED use and its related adverse effects. Furthermore, males and females had different emphasis on the perceptions of EDs' benefits and harms and knowledge about their content. Other themes emerged from the discussions including psychological effects, alcohol, advertisements, peer pressure and social image in addition to others such as branding and reputation, affordability and accessibility as well as lack of regulations. Moreover, facilitators and barriers to ED consumption were discussed and their contributions to the popularity of these energetic beverages among Lebanese young adults were highlighted.

This study showed that the consumption of EDs (alone or mixed with alcohol) is highly prevalent among Lebanese university students. Legislative and non-governmental measures should be considered to address this behavior given its documented health hazards. In addition, educational interventions are needed to correct misconceptions and prevent the high consumption of these highly caffeinated drinks among Lebanese youth.

Keywords: energy drinks; alcohol mixed with energy drinks; young adults; perceptions; attitudes; focus groups; qualitative research; mixed methodology.

CONTENTS

ACKNOWLEDGEMENT	III
ABSTRACT.....	VI
LIST OF ILLUSTRATIONS	XII
LIST OF TABLES.....	XIII
LIST OF ABBREVIATIONS.....	XV

Chapter

I. INTRODUCTION.....	1
II. LITERATURE REVIEW	5
A. Introduction	5
1. Worldwide dietary and lifestyle changes.....	5
B. Energy Drinks.....	6
1. History	6
2. Composition	7
3. Types	8
4. Marketing	9
C. Prevalence of EDs and AmEDs consumption	11
D. Causes of EDs consumption.....	14
E. Perceived benefits of EDs.....	16
F. Perceptions and Attitudes of ED Consumers.....	18
G. Adverse effects of EDs and AmEDs	19

1. The role of caffeine	20
2. The role of taurine	21
3. The role of alcohol	22
4. Other implications	24
H. Policies and Regulations	25
I. Prevalence, causes and consequences of EDs use in Lebanon	27
J. Rationale	28
III. METHODOLOGY	32
A. Setting.....	32
B. Materials and Methods	33
1. Design	33
a. Quantitative Phase.....	34
b. Qualitative Phase	35
2. Sampling strategy and participants' characteristics.....	37
3. Recruitment	39
4. Data Collection	41
5. Data Interpretation	44
a. Questionnaires.....	44
6. Data Analysis	52
a. Questionnaires.....	52
b. Focus Groups	53
C. Ethical Considerations.....	54
IV. RESULTS	55
A. Questionnaires	55
1. Characteristics of Study Participants	55
2. Lifestyle characteristics and beverage consumption pattern of study participants	58
3. EDs: prevalence and patterns of consumption.....	62
4. Multivariate analysis	66
B. Findings from FGDs (Qualitative study).....	70
1. Socio-demographic characteristics of consumers and ED consumption patterns	71

2. Thematic analysis results	74
a. Topic 1: knowledge of participants about EDs' content	75
b. Topic 2: Reasons of ED consumption	77
c. Topic 3: Factors influencing ED consumers' choice.....	82
d. Topic 4: The impact of marketing on ED consumption patterns.....	84
e. Topic5: Side effects of EDs and AmEDs.....	86
f. Topic 6: Other perceived effects of EDs	90
g. Topic 7: Facilitators and barriers to ED consumption.....	91
V. DISCUSSION.....	96
A. Consumption of ED and AmED among Study Participants.....	96
B. Reasons and consequences of EDs and AmEDs consumption among Study Participants	99
1. Reasons of ED consumption	99
2. Reasons of AmED consumption.....	101
3. Consequences of ED and AmED consumption	102
C. Correlates of ED consumption among Study Participants	105
D. Perceptions and attitudes of Lebanese university students towards ED consumption	107
1- Misconceptions and lack of knowledge among study participants	108
2- Reasons to drink included mainly getting energy to study and to play sports	110
3- Impact of peer pressure and social image on ED consumers	112
4- Taste as a reason for ED consumption	114
5- ED branding and reputation	115
6- Consumers' perceptions of AmEDs.....	116
7- Influence of advertisements on ED consumption.....	117
8- Perceived risks and experienced adverse effects from the consumption of EDs and AmEDs	119
9- Psychological effects of EDs.....	121
10- Parental influence on ED consumers.....	122
11- Affordability and accessibility of EDs	123
12- Regulation of ED purchasing and consumption.....	124
VI. CONCLUSION AND RECOMMENDATIONS	128
A. Conclusion.....	128
B. Recommendations.....	133

Appendix

I. CONSENT FORM (QUANTITATIVE PHASE)	139
II-A. CONSENT FORM (QUALITATIVE PHASE, ARABIC)	
II-B. CONSENT FORM (QUALITATIVE PHASE, ENGLISH)....	140
III. SURVEY'S QUESTIONNAIRE	
IV-A. FGDS' QUESTIONNAIRE (ARABIC)	
IV-B. FGDS' QUESTIONNAIRE (ENGLISH).....	143
V-A. FOCUS GROUP SCRIPT (ARABIC)	143
V-B. FOCUS GROUP SCRIPT (ENGLISH).....	145
VI. RECRUITMENT FLIERS	145
BIBLIOGRAPHY	147

ILLUSTRATIONS

Figure	Page
1. Consumption of caffeinated products by male and female participants.	61
2. Most frequently consumed ED brands.....	63

TABLES

Table	Page
1. Original responses and their recoded variables as interpreted in the questionnaire's analysis.....	49
2. Socio-Demographic and Anthropometric Characteristics of Participating University Students (N=227)	57
3. Lifestyle characteristics and beverages consumption patterns of participants (N=227)	59
4. Differences between ED ever consumers and non consumers based on socioeconomic, anthropometric& lifestyle factors (N=226).....	64
5. Logistic regression analysis of predictors of ED consumption among participants, N=188 (adjusted for gender and age).....	67
6. Logistic regression analysis of predictors of ED consumption among male participants, N= 90 (adjusted for BMI and age)	68
7. Logistic regression analysis of predictors of ED consumption among female participants, N= 98 (adjusted for BMI and age)	69
8. Logistic regression analysis of predictors of AmED consumption among all participants, N= 128 (adjusted for gender, age and BMI)	70
9. Logistic regression analysis of predictors of AmED consumption among male participants, N= 64 (adjusted for age and BMI)	70
10. Socio-demographic, anthropometric and lifestyle characteristics of participants of the focus group discussions, N=29	72
11. Frequency of ED and AmED consumption among FGD participants.....	74

ABBREVIATIONS

AmED	Alcohol mixed with energy drink
AUB	American University of Beirut
BMI	Body mass index
Cm	Centimeter
ED	Energy Drink
Hr	Hour
Kg	Kilograms
KSA	Kingdom of Saudi Arabia
LIU	Lebanese International University
MENA	Middle East and North Africa
MET	Metabolic Equivalent of Task
Min	Minutes
UAE	United Arab Emirates
Yrs	Years

*To the memory of
my beloved father-in-law*

CHAPTER I

INTRODUCTION

Caffeine is one of the most commonly consumed substances worldwide as it is a constituent of many foods including chocolate and cocoa-containing products as well as non-food items such as drugs, specifically pain killers (Ríos, Betancourt et al. 2013). Essentially, caffeine is found in a wide range of beverages including soft drinks, coffee, tea, energy drinks/shots, and fruit-flavored beverages among others.

According to the “Caffeine Intake by the U.S. Population” report of the FDA, sodas and carbonated beverages are the principal daily source of caffeine in children and adolescents (FDA 2010). After the age of 22, major dietary caffeine comes from the increased consumption of coffee, tea and other caffeinated beverages such as EDs. The high prevalence of caffeine consumption by adolescents and young adults explains the wide selection of newly emerging caffeinated products including EDs (James, Kristjansson et al. 2015).

Energy drinks (EDs) represent a range of beverages that contain caffeine and other ingredients such as sugar, amino acids and herbal extracts. EDs were at first derived from soft drinks and were used for several years as beverages that aid in recovery after severe illnesses, as versions of soft drinks with lower caffeine content, or as fortified nutritional drinks (*Collins* 2015).

The market size of EDs realized a rapid global growth from 2004 to 2009, which in the US alone, reached almost 240% (Heckman, Sherry et al. 2010). The

BCC Research (2012) estimated that the global growth for EDs alone will be more than 79 billion dollars in 2016 and is expected to continue rising similarly until 2018 (Investopedia 2014). When EDs were first introduced, athletes were the primary consumers. However, as the ED market expanded, athletes were no longer the main target of advertisements, and the major consumers became mostly teenagers and young adults (Bunting, Baggett et al. 2013). Studies found that adults younger than 35 years old represent 50% of the consumers of EDs (McLellan and Lieberman 2012), thus this proves the success of social marketing strategies in associating these beverages with power, strength and extreme sports as well as portraying these beverages as ‘cool drinks’ from the perspective of young individuals. In another round of the EDs’ race, companies launched a variety of ED versions and forms: shots, powders, effervescent tablets, and a broad spectrum of products like flavored, light, diet, sugar-free and zero-calorie EDs in addition to alcoholic EDs. This variety of products is in fact an essential part of the marketing strategies adopted by ED producers.

Numerous studies were published worldwide showing a high prevalence of consumption of caffeinated EDs. In the United States and Australia, 51% and 48% of university students respectively consumed greater than one ED per month (Malinauskas, Aeby et al. 2007, Trapp, Allen et al. 2014). Moreover, studies on young adolescents showed that EDs have also gained popularity among school students aged between 13 and 16 years old, where 56.2% and 20% of youth in two studies conducted in Italy and Canada respectively, reported consuming at least one serving of EDs per month (Gallimberti, Buja et al. 2013, Azagba, Langille et al. 2014).

Recent studies have shown that EDs are broadly consumed in the MENA region. In Turkey and Saudi Arabia, around half of the sampled college students are EDs consumers (Attila and Cakir 2011, Alsunni and Badar 2011, Ibrahim, Iftikhar et al. 2014). In Lebanon, only one study has been published to date, showing a prevalence of 63.6% of EDs consumption among students from private and public schools and universities aged between 13 and 30 years old (Itany, Diab et al. 2014).

The trend of consuming EDs combined with alcohol is also prevalent among college students. Studies from the United States and Italy showed that at least half of the regular consumers of EDs do combine the beverages to alcohol (Malinauskas, Aeby et al. 2007, Gallimberti, Buja et al. 2013). Findings from a previously published study in Lebanon confirmed these results, whereby 50.5% of surveyed school and college participants combined alcohol with EDs (Itany, Diab et al. 2014).

Different studies concluded that EDs consumption was significantly greater among males compared to females (Azagba, Langille et al. 2014, Ibrahim, Iftikhar et al. 2014, Itany, Diab et al. 2014). Furthermore, few lifestyle behaviors were found to be common among EDs consumers, including smoking, alcohol consumption and physical activity (Gallimberti, Buja et al. 2013, Jeffers, Vatalaro Hill et al. 2014). Findings from multiple studies agreed that the most common reported reason for trying caffeinated EDs is to stay awake and increase physical and mental energy (Azagba, Langille et al. 2014, Trapp, Allen et al. 2014). On the other hand, the most frequently reported side effect of EDs consumption in studies published worldwide is tachycardia, insomnia and headaches (Malinauskas, Aeby et al. 2007, Bawazeer and AlSobahi 2013, Trapp, Allen et al. 2014). The increased possibility of engaging in

risky behavior was found to be another side effect linked to the consumption of AmEDs (O'Brien, McCoy et al. 2008).

Serious side effects of caffeinated EDs have led to reported deaths among EDs consumers in several countries (Jackson, Cotter et al. 2013, 2014). Consequently, EDs' consumption and health implications have become a serious concern for health physicians.

Few studies, mostly in Australia and New Zealand, have gone beyond the mere assessment of consumption patterns of EDs and have been interested in exploring the perceptions and attitudes of young adults towards EDs. Results revealed that perceptions of products differ according to demographic and environmental factors including age, gender, taste, price, efficacy on energy, as well as the products' safety and advertisements (Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014).

ED consumption has not been fully explored in Lebanon or the MENA region where only limited studies have been published to date exploring frequency, reported benefits and side effects, as well as reasons of consumption. Therefore, further research is needed to better assess young adults' perceptions of EDs and the underlying factors affecting their preferences. Therefore, the objectives of this study are:

1) to explore correlates of EDs consumption and 2) assess the attitude of Lebanese young adults towards caffeinated EDs and their perceptions of the benefits and harms of these drinks.

CHAPTER II

LITERATURE REVIEW

A- Introduction

1- Worldwide dietary and lifestyle changes

Significant dietary and lifestyle changes have occurred worldwide over the last 30 years (Rush, Schulz et al. 2006). Driven by global trade liberalization, economic growth and rapid urbanization, a nutritional transition towards an increased consumption of animal fats and proteins, refined grains and added sugar along with sedentary lifestyle were found to be at the origin of the global rise in obesity and related chronic diseases (Malik, Willett et al. 2013).

The occurring transition does not only involve the quality and quantity of consumed foods but also those of beverages. For example, water, the primary drink for maintaining overall health, is being gradually replaced by other non-nutritive beverages. According to the USDA, less than one-third of children and teens in the US meet the recommended daily water intake for their age group, and one-fourth of adolescents drink less than one serving of water a day (2014). Calorically dense low nutrient drinks including soda, fruit drinks, tea, coffee, energy/ sports drinks and flavored milks were found to be responsible of approximately 293 Kcal of the daily

caloric intake of American male adolescents (Miller, McKinnon et al. 2013) and for 20% of the daily energy intake of US high-school adolescents (Park, Sherry et al. 2012).

In the MENA region, a rise of approximately 730 calories per person per day was noticed between 1970 and 2005 (Sibai, Nasreddine et al. 2010). Most of this increase is explained by the excessive sugar intake, sometimes exceeding 20% of total energy. Moreover, the consumption of soft drinks globally rose from 9.5 gallons to 11.4 gallons per person per year from 1997 to 2010 (Basu, McKee et al. 2013). In New- Zealand, 74% of surveyed students aged 13 to 17 years are high to moderate consumers of soft drinks (Sundborn, Utter et al. 2014), which are not only rich in sugar but are also one of the major sources of caffeine. In the United Arab Emirates, 8-14% of individuals' total daily calories are from the consumption of sweetened beverages (Ng, Zaghoul et al. 2011).

EDs, which are types of highly caffeinated sweetened beverages, recently gained popularity in various countries in the world.

B- Energy Drinks

1- History

Initially, EDs were an active subset of the early soft drink industry. In 1929, "Lucozade Energy" was promoted in the UK as a "hospital" drink that enhances recovery and was later advertised in the early 1980s for its ability to replenish lost energy (Collins 2015). In America, "Dr. Enuf" was formulated as an alternative to

sugar sodas with empty calories in 1949, and was known as an energy booster drink containing B-vitamins, caffeine and cane sugar (AL-ZAREI 2014). It was argued that the very first ED was developed even earlier, and that was in Japan in 1962. The beverage named "Lipovitan D" was created in an attempt to increase productivity and performance of factory workers during their night shifts (Buck, Dixon et al. 2013). In Europe, EDs were pioneered by a product named "Power Horse", before the introduction of Red Bull in Austria in 1987, a worldwide bestseller in the 21st century (Reissig, Strain et al. 2009). Red Bull became the dominant brand after its introduction in 1997, with a market share of approximately 47% in 2005 (Dolan 2007). Red Bull was introduced in the Middle East in 2000 and became since then one of the favorite and most consumed brands in the region (Alsunni and Badar 2011, Ibrahim, Iftikhar et al. 2014).

2- Composition

By definition, EDs are types of beverages containing methylxanthines, chiefly caffeine. They also contain sweeteners, herbal extracts such as guarana, yerba mate, açai ginseng, ginkgo biloba and amino acids' derivatives such as taurine, carnitine, creatine. EDs may or may not be carbonated and may also contain B-vitamins and sugar derivatives like maltodextrin, inositol, glucuronolactone and sucralose (Meier 2013). The average 12 oz ED contains approximately 115 mg of caffeine, which is slightly less than the amount found in the same quantity of American coffee (Caffeine informer).

EDs contain a variety of other ingredients. Some of the most common, taurine, guarana and ginseng, have aroused the interest of the scientific community.

Taurine is an amino acid that is found naturally in meat, fish and breast milk, and commonly available as a dietary supplement. Though evidence remains controversial, taurine is used in EDs based on findings from studies suggesting that it may improve athletic and mental performance (Zeratsky 2012). Effective dosages of taurine range from 2,000 to 6,000 mg (Clauson, Shields et al. 2008) and although its usage was associated with a boost of energy and concentration, potential health risks of taurine arise from its interactions with other compounds, especially caffeine (Blonski 2011). Guarana, another ingredient in EDs, is a Brazilian plant known mainly for its stimulant property due to its high caffeine content. It was stated that one gram of this substance is able to cause the same physiological response as the one triggered by 40 mg of caffeine (Buck, Dixon et al. 2013). However, guarana contains other components that have not yet been explored enough to determine their safety border and effects on health (Schimpl, da Silva et al. 2013).

Ginseng, an herbal supplement from East Asia, is generally used in for its various reported benefits including improved immune function, increased physical performance, and improved memory (Buck, Dixon et al. 2013). However, an excessive amount of ginseng ingestion has been linked to mild to moderate side effects varying from diarrhea, headache and high blood pressure to insomnia, tachycardia and palpitations (Zeratsky 2012).

3- Types

EDs belong to the category of functional beverages, which includes as well sports drinks and nutraceutical drinks. Sports drinks are generally addressed to athletes and have a role in preventing dehydration, supplying carbohydrates and

electrolytes to the body during and after physical activity. On the other hand, nutraceutical beverages contain bioactive compounds such as concentrated extracts from tea, fruits and herbs and are sometimes fortified with vitamins and minerals in order to promote and enhance health(Zeratsky 2012). Although EDs fall in the same category as sports and nutraceutical drinks, they only share few ingredients in common.

Over the past ten years, new versions of the original caffeinated ED products have been advertised, such as fruit flavored and sugar free EDs, energy powders and effervescent tablets. These products contain different amounts of caffeine (70 up to 200mg per serving) and other ingredients (Zeratsky 2012). The unique blend of an ED owes its characteristics to the various ingredients assorted inside. The specific combination of ingredients in each type of ED gives the product its distinct flavor, amount of energy and the duration at which that energy will last. One of the current trendiest practices is to mix EDs with other beverages such as fruit juices, sodas, cocktails and alcohol. The beverage cannot only be easily prepared, but is also found as ready-to-drink cans where vodka is the main type of alcohol used in the mixture with ED. The concept of alcoholic EDs has been a subject of debate where the alcohol industry has been much criticized because of the dangers that have been associated with this trend (Zeratsky 2012).

4- Marketing

The ED market has grown exponentially with almost 500 new brands launched internationally in 2006 and 200 new brands launched in the US in the 12 months period ending July 2007 (Reissig, Strain et al. 2009). Between 2008 and 2012,

EDs industry grew by 60% in the US and a growth of 17% was reported between 2012 and 2013 (Facts 2013). By the end of 2013, caffeinated EDs created a 27.5 billion dollar business (Ferdman and Roberto 2014) and the energy beverages industry is expected to continue rising similarly until 2018 (Technologists 2014).

When EDs were first introduced, athletes were the primary consumers. However, as the ED market expanded, athletes were no longer the main target of advertisements, and the major consumers became mostly teenagers and young adults (Bunting, Baggett et al. 2013). Social marketing strategies of the EDs industry are designated to associate these beverages with power, strength and extreme sports, giving them a very cool image in the eyes of young individuals (Shakeri 2008). Also, EDs are promoted as a means to feel more energetic, stay awake, have increased attention, and higher cognitive performances which make university students specifically, more prone to their consumption (Attila and Cakir 2011). Studies showed that adults below the age of 35 represent 50% of the consumers of EDs (McLellan and Lieberman 2012). Moreover, ED companies use efficient tactics to reach their consumers by involving their product into sporting events, sponsoring parties, advertising their drinks in connection with celebrities or simply distribute them for free in universities and public events. In addition to that, ED companies choose creative and attractive names for their products to impress consumers (Zeratsky 2012).

Years ago, EDs started to be used in mixtures creating the energetic alcoholic cocktails. Since 2005, these beverages were introduced to the market in pre-mixed alcoholic ED cans with beer and marketed as "energy beer" or "premium malt

beverage" (Schelle 2009). A typical young adult is unconsciously exposed to hundreds of ED advertising campaigns shown on TV, radio, billboards, prints and social media (Marc, Byron et al. 2012). There is evidence from research that advertising exposure and individuals' drinking behaviors are positively associated, and that each dollar per capita spent on advertising of alcoholic drinks is linked to a 3% increase in the number of drinks consumed each month (Snyder, Milici et al. 2006). In addition to the advertisement, the consumption of AmEDs was actively promoted by making these beverages easily accessible to the consumers. In many countries as well as in Lebanon, alcoholic EDs are readily and widely available almost everywhere in small shops, supermarkets, pubs and sports facilities which can make consumers confuse them with nonalcoholic versions and buy them without much interest in their content. For instance, a drink called Four Loko was introduced as an ED in the United States and Europe while it contained up to 12% alcohol by volume, which is 3 times as much as a regular beer(Snyder, Milici et al. 2006). Moreover, the pricing of alcoholic EDs being much below other alcoholic drinks made them much affordable to the young population.

C- Prevalence of EDs and AmEDs consumption

ED consumption is currently a field of research interest and its prevalence varies with respect to regions and cultures. Numerous studies were published worldwide showing a high prevalence of consumption of caffeinated EDs. Among university students, 51% and 48% in the United States and Australia (Malinauskas, Aeby et al. 2007, Trapp, Allen et al. 2014) respectively, consume greater than one ED

per month. Moreover, studies on young adolescents showed that EDs have also gained popularity among school students aged between 13 and 16 years old, where 56.2% and 20% of participants in Italy and Canada respectively, reported consuming at least one ED per month (Gallimberti, Buja et al. 2013, Azagba, Langille et al. 2014).

Recent studies have shown that EDs are broadly consumed in the MENA region as well. In Turkey (Attila and Cakir 2011) and Saudi Arabia (Alsunni and Badar 2011, Ibrahim, Iftikhar et al. 2014), around half of surveyed college students are ED consumers. In 2012, 27.2% of participants among Medical Students of Umm Al-Qura University- KSA reported consuming at least one ED per month (Bawazeer and AlSobahi 2013), whereas in Oman, a study conducted on a sample of 802 secondary school students found that the percentages of students who consume EDs at least 3 times per week are 65% and 47% for males and females, respectively (Kilani, Al Hazzaa et al. 2013). The highest rate of EDs consumption among university students was found in the United Arab Emirates with a prevalence of 92% (Jacob, Tambawel et al. 2013).

In Lebanon, only one study has been published to date, showing a prevalence of 63.6% of EDs consumption among students from private and public schools and universities aged between 13 and 30 years old (Itany, Diab et al. 2014).

Most of the studies investigating the consumption of EDs confirmed that the prevalence and frequency of consumption can vary based on multiple factors. Gender wise, males were found to consume EDs 1.5 times on average more than females (Gallimberti, Buja et al. 2013, Itany, Diab et al. 2014) and this is the case almost in all countries where the beverage is commonly used. An explanation for this difference is

that females are maybe less physically active than males in general, and ED drinks are mostly marketed for their ability to enhance physical performance (Gallimberti, Buja et al. 2013). Besides gender, also age affects the frequency of ED consumption, where older individuals have a lower likelihood than young adults for drinking these beverages (Malinauskas, Aeby et al. 2007, Alsunni and Badar 2011). However, differences in ED consumption based on gender has not been closely explored.

Furthermore, students' field of study, parental education, income and lifestyle were also factors that influence EDs consumption. A study conducted on students from Hacettepe University in Turkey showed that students from the college of sports and those from the college of arts were 9.2 and 2.5 times respectively, more likely to consume EDs than students of the faculty of medicine (Attila and Cakir 2011). This shows that among university students, those enrolled in medical or health-related majors are more likely to be non-consumers or less frequent consumers (Itany, Diab et al. 2014). Students whose parents received post-secondary education are less likely to consume EDs while those who live with only one parent or alone are at increased risk of consuming EDs at a higher frequency (Gallimberti, Buja et al. 2013). Also, alcohol consumption, smoking, urbanism, physical activity and higher personal monthly income are positively associated with ED consumption (Attila and Cakir 2011, Park, Sherry et al. 2012, Itany, Diab et al. 2014, Trapp, Allen et al. 2014).

After the trend of mixing EDs with alcohol became widely spread, studies have found that it is a very common practice among college students (Marc, Byron et al. 2012). Consumers of AmEDs initiated their drinking habit at an average age younger than consumers of EDs alone (O'Brien, McCoy et al. 2008).

The prevalence of consumption of AmEDs differs significantly between different regions of the world. Among Canadian high school students (Azagba, Langille et al. 2014), 20% are consumers of AmEDs while in University of Ankara, 40% of regular consumers of EDs (Attila and Cakir 2011) drink them mixed with alcohol. Similarly in the United States (Malinauskas, Aeby et al. 2007) and Italy (Gallimberti, Buja et al. 2013), there is evidence that at least half of the regular consumers of EDs among college students do mix them with alcohol. Findings from the Lebanese study conducted by Itani et al. (2014) confirmed these results, where 50.5% of surveyed participants combined alcohol with EDs (Itany, Diab et al. 2014). It is worth noting that in the Islamic countries of the Arab World, no data is available on whether mixing alcohol with EDs is practiced since the consumption of alcoholic beverages in general is culturally unacceptable.

D- Causes of EDs consumption

Based on data from published articles, the majority of ED consumers tried the beverage for the first time at around the age of fifteen to sixteen (Jacob, Tambawel et al. 2013) with males being more likely to start at a younger age than females. Most of the surveyed ED consumers in the University of Dammam in KSA (Alsunni and Badar 2011), reported trying EDs for no particular reason the first time while around 24% tried them under peer pressure. Some of the reasons for first use were found to be significantly different between genders; for instance, females are more motivated and influenced by ED advertisements than males who are more driven by curiosity to try new things than females (Alsunni and Badar 2011).

Findings from multiple studies agreed that the most common reported reasons for consuming caffeinated EDs are to boost energy and stay awake (Malinauskas, Aeby et al. 2007, Attila and Cakir 2011). Other causes behind the consumption of EDs by young adults are to improve physical and cognitive performance (Alsunni and Badar 2011) , and enhance brain development and intellectual capacities (Buck, Dixon et al. 2013) while studying for an exam or preparing for an important project. Similarly in Lebanon, 78.5% of participants considered an ED beverage as an energizer that stimulates wakefulness and 15.7% use it while playing sports as an alternative of sports drinks while 5.9% believe the ED stimulates intellectual capacities (Itany, Diab et al. 2014). Many of the ED consumers do not recognize the stimulating and energizing effect of the beverages and declare that the only reasons for consuming them are their taste and to spend time (Attila and Cakir 2011).

When investigating the places where EDs are consumed the most, night clubs and pubs appear on the top list which explains why partying and socializing (Bunting, Baggett et al. 2013) are also among the common reasons for ED consumption. In some Arab countries like Saudi Arabia, where culture does not perceive partying in night clubs as an acceptable social norm, consumers use EDs mostly to "give company to friends", "stay awake", and "get energy to study for an exam or project" (Alsunni and Badar 2011, Bawazeer and AlSobahi 2013).

In the United States, one study investigated the relationship between ED consumption and weight loss attempts, body image, and eating disorders among undergraduate college students. This study found that ED consumers were more likely

to find their personal appearance difficult to handle and were more likely to try to lose weight through dieting, exercising or taking weight loss pills than non-consumers (Jeffers, Vatalaro Hill et al. 2014).

In a web-based survey conducted on 4,271 undergraduate college students from 10 universities in North Carolina (US), 55% of AmED consumers (48% of male mixers and 61% of female mixers) reported drinking these beverages to hide the flavor of alcohol (O'Brien, McCoy et al. 2008). In this same survey, AmED consumers reported mixing their alcohol with EDs in order to drink more without feeling and/or looking as drunk. However, in another survey assessing motivations of psychology undergraduate students at Northern Kentucky University (US) for consuming AmEDs, getting drunk faster was one of the major reported reasons (Marczinski 2011). Other causes behind mixing alcohol with EDs include avoiding a hangover, celebrating, lengthening pleasure time and feeling less tired (Marczinski 2011).

E- Perceived benefits of EDs

EDs are promoted for their stimulant effects and claim to offer a variety of benefits such as improving cognitive functions (McLellan and Lieberman 2012), decreasing fatigue, increasing athletic performance, promoting the feeling of pleasure (Itany, Diab et al. 2014), looking attractive, "making a difference" and helping in weight loss (Reissig, Strain et al. 2009). Multiple studies looked into the promises made by ED companies; some of them identified few health benefits while others insisted that these claims are inaccurate (Buck, Dixon et al. 2013). Studies that

surveyed athletes' performance after ED consumption suggest that in comparison to a placebo, the caffeine content of EDs can improve exercise endurance and increase speed, especially among non-regular consumers (Reissig, Strain et al. 2009) and can also lengthen the time of activity before exhaustion (Heckman, Sherry et al. 2010). The proposed explanation for this effect is that caffeine can mobilize fat stores and allow muscles to use fat as fuel, which will consequently spare muscle glycogen and prolong exercise (Higgins, Tuttle et al. 2010). Consumers of EDs report that these beverages allow them to stay up late at night while driving (Buck, Dixon et al. 2013), studying, or partying (Attila and Cakir 2011, Bawazeer and AlSobahi 2013) and that they feel less tired and more alert after drinking them (Buck, Dixon et al. 2013). An analysis of the perceived benefits of EDs proposed that their consumption may reduce lane swerving and sleepiness but that these results are temporary and only due to the caffeine dose present in EDs and would be the same if that dose was provided by another caffeinated beverage (Ishak, Ugochukwu et al. 2012). There is documented scientific evidence that consumed caffeine can exert physiological effects. When consumed moderately (400 mg/day), it is not associated with adverse health effects, but is more likely to improve mental alertness, concentration and physical performance and to fight fatigue.

Many studies related the effects of EDs to their caffeine content or to the combination of caffeine with sugar; however some tried to understand the impact of the mixture of ingredients they contain. A study assessing the effect of Red Bull on human performance found that concentration and memory improved in 36 volunteers who consumed Red Bull in comparison to those who received a placebo drink

(Alford, Cox et al. 2001). Another study evaluated cognitive performance and mood state of individuals after consumption of an ED in comparison to the consumption of five different beverages containing one ingredient of the ED including glucose, caffeine, ginseng, ginkgo biloba and a placebo (Scholey and Kennedy 2004). The study results showed that subjects who received the whole drink, as compared to those who received the placebo drink had significantly better performance on “secondary memory”(delayed picture and word recognition), word recall, and “speed of attention” factors (simple reaction time, choice reaction time, and digit vigilance). None of the beverages containing a single ingredient led to significantly improved performance on the assessed tasks, except the one with caffeine, which demonstrated a trend toward an improved quality of memory, delayed word recognition, and accuracy of attention. Findings from this study addressed the role of the combined ingredients and their connection in providing these cognition-modulating effects (Scholey and Kennedy 2004).

F- Perceptions and Attitudes of ED Consumers

Few studies, mostly in Australia (Costa, Hayley et al. 2014) and New Zealand (Bunting, Baggett et al. 2013) assessed the perceptions and attitudes of young adults consuming EDs. Results revealed that perceptions of products differ according to demographic and environmental factors including age, gender, taste, price, effect on energy and alertness, safety and advertising. In New Zealand, a qualitative study surveying ED consumers aged between 16 and 35 years old showed that age played an important role in modulating EDs consumers' decisions and attitudes (Bunting,

Baggett et al. 2013). Younger adults (16 to 21 years old) consumed EDs under the direct influence of advertisements, peer pressure and the cool image they wish to have in the society. Older age groups (22 to 35 years old) purchased EDs mainly for their efficacy in boosting energy and were more aware and worried about their detrimental health effects. Furthermore, most of the young adolescents (12-15 years old) who consume EDs in Australia had limited knowledge of the products' ingredients while some had difficulty differentiating them from soft and sports drinks (Costa, Hayley et al. 2014). Consistently with surveys that have explored the reasons behind EDs consumption, taste was considered a main motivational factor when purchasing and consuming the beverage, independently from age (Costa, Hayley et al. 2014). However, further research is needed to better understand young consumers' perceptions and underlying factors affecting their preferences.

G- Adverse effects of EDs and AmEDs

According to the 2003 Drug Abuse Warning Network report in the US, the number of visits to the emergency department after ED consumption doubled between 2007 and 2011 with most visitors being aged 18 to 39 years old (Substance Abuse and Mental Health Services Administration 2013). The same report points out that 58% of the emergency visits were caused by ED intake alone, not mixed with any other substances and in 12% of these visits, patients required hospitalization. Other data compiled from the US local poison centers as well as from the Poison Control Centre in Australia (Gunja and Brown 2012), Ireland and New Zealand (Seifert, Schaechter et al. 2011) are consistent with these findings.

1- The role of caffeine

Health effects of EDs consumption were examined in several studies and many have reported mild to severe side effects following EDs consumption. Worldwide, the most frequently reported side effect of EDs is tachycardia followed by insomnia and headaches (Alford, Cox et al. 2001, Attila and Cakir 2011, Itany, Diab et al. 2014). Other consequences experienced include frequent urination, nausea, vomiting, nervousness, abdominal pain, dyspnea, hypotension, dizziness and redness of the skin (Itany, Diab et al. 2014). Long term outcomes of EDs consumption were reported and included liver damage and kidney failure (Seifert, Schaechter et al. 2011).

A review by Reissig et al. explained that these adverse effects are most probably linked to caffeine, the major ingredient in EDs. Following an excessive intake of caffeine from different beverages throughout the day, dependence, withdrawal or even "caffeine toxicity" can occur (Reissig, Strain et al. 2009). Caffeine has been scientifically proven to be harmful for health when consumed excessively (Rath 2012) and to alter academic performance by triggering symptoms such as headaches, restlessness and nausea.

Serious side effects of caffeinated EDs whether through caffeine toxicity or other mechanisms, have led to reported deaths in several countries. In Germany, two deaths attributed to EDs were reported between 1999 and 2005 (Seifert, Schaechter et al. 2011). In 2009, a 21-year-old student died after drinking several cans of Red Bull in the UK (Telegraph 2009). In 2011, an adolescent died after drinking two cans of Monster Energy over a 24 hour period in the US (Star 2012). The case is not different

in the Arab world where a 21-year-old Kuwaiti national team squash player died after drinking four cans of an ED (Toumi 2013). Also in Saudi Arabia, a young male citizen and a 46-year-old Bangladeshi died between January and March 2014 after consuming EDs, which urged the government to pass legislations in order to control their consumption (2014).

2- The role of taurine

To date, little is known about the effects of heavy consumption or the long-term consequences of taurine and guarana when used alone or combined to caffeine(Schimpl, da Silva et al. 2013).

In Australia in 2009 (Substance Abuse and Mental Health Services Administration 2013), a healthy 28 years old man who had a cardiac arrest after a day of motocross racing was reported to have consumed excessive amounts of a caffeinated ED throughout the day of the accident. The case was investigated and researchers hypothesized that excessive ingestion of caffeine combined with taurine accompanied or followed by intense physical activity can produce myocardial ischemia by inducing coronary vasospasm(Berger and Alford 2009). Similarly, a study conducted to determine the cardiac effects of a commercially available ED in 15 healthy volunteers, found a 5 to 7 heart beats increase along with a 10 mmHg increase in systolic blood pressure after ED consumption (Steinke, Lanfear et al. 2009). However, the role of taurine in the reported cardiovascular complications following EDs consumption has been controversial. While some studies concluded that taurine has an inotropic effect on cardiac muscle when ingested in large doses(Schneider and

Benjamin 2011), others stated that the amount of taurine found in common EDs is not likely to produce either a positive or a negative effect (Buck, Dixon et al. 2013).

3- The role of alcohol

Between 2006 and 2010, about 88,000 deaths each year were attributed to excessive alcohol consumption in the United States (ARDI) and half of these deaths were associated with binge drinking (Stahre M., Brewer R. et al. 2004), which was proven to be behind many health and social problems (Naimi TS, Brewer RB et al. 2003). The consumption of premixed alcoholic EDs deliver to the body a combination of alcohol, caffeine and other stimulants. The caffeine in these drinks can mask the effect of intoxication caused by the depressant characteristic of alcohol thus increasing the risk of heavy episodic drinking (O'Brien, McCoy et al. 2008, Miller, McKinnon et al. 2013). However, caffeine does not affect the metabolism of alcohol in the liver and consequently alcohol concentrations in breath are not decreased nor the risk of alcohol-attributable harms (O'Brien, McCoy et al. 2008).

One of the most potential negative consequences of the consumption of AmEDs is that their risk is beyond being personal and is rather a public health one (Marczinski 2011). Researchers believe that because people tend to drink bigger quantities when alcohol is mixed to EDs (Gallimberti, Buja et al. 2013), the possibility of engaging in risky behaviors is increased. Such behaviors include not using a seat belt, driving fast, having unsafe sex, applying violence against friends and carrying guns/weaponry, being physically hurt or injured, requiring medical treatment, being taken advantage of sexually or taking advantage of another sexually (O'Brien, McCoy et al. 2008). The risks of driving a car under the influence

of alcoholic EDs do not much differ from those of driving under the effect of alcohol, and are mainly dependent on the number of consumed drinks(Ferreira, De Mello et al. 2006). A study analyzing the relationship between ED use and high-risk behaviors in North Carolina (US) (O'Brien, McCoy et al. 2008) concluded that consumers of AmEDs had the same risk of driving a car under the influence of alcohol as consumers of alcohol alone. The significant difference is that, fewer cups of AmEDs are enough to produce the same effect of many more cups of a regular alcoholic beverage on the subject's ability to perform tasks such as driving. This suggests that regardless of the quantity of alcohol ingested, consuming AmEDs constitutes “high-risk drinking” for college students (Berger and Alford 2009). In 26 healthy male volunteers, a double-blinded study investigated the difference in the effects of a same serving of either alcohol alone, or ED alone, or a mixture of both on consumers. Researchers found that although breath alcohol concentration was not changed by the addition of ED to alcohol, participants reported that the subjective signs of intoxication including dizziness, fatigue, and headache were improved in the group who consumed AmEDs in comparison to the one who consumed alcohol alone. Other findings proved that consumption of AmEDs not only decreases the consumers' subjective sensation of drunkenness but also impairs their ability to judge others' intoxication and thus, they are more than twice as likely to ride with a drunk driver (Berger and Alford 2009). In addition to the physiological adverse effects resulting from the consumption of AmEDs, scientific data suggested that the rush of stimulants included in EDs may urge consumers to seek a more intense effect through the use of non-medical prescriptions and forbidden drugs (Reissig, Strain et al. 2009).

According to an online survey, consumers of AmEDs are more likely to report using marijuana, cocaine, and ecstasy and are more prone to alcohol dependence, binge drinking, and potential sexually transmitted diseases (Snipes and Benotsch 2013).

In Lebanon, 15.6% of AmEDs consumers among surveyed schools and university students reported having experienced adverse health effects such as nausea (25.3%), tachycardia (20%) and dizziness (16%) after the consumption of these beverages (Itany, Diab et al. 2014).

Similar to what was previously reported regarding serious side effects of EDs alone (not mixed with alcohol), different cases of deaths were attributed to the consumption of AmEDs. For instance, two cases involved underage drinkers, one 15-year-old adolescent who was struck by a car after he became paranoid and disoriented following the ingestion of 2 cans of AmEDs (Four Loko) and a 20-year-old who shot himself in the head after consuming a large amount of the drink (Pearce W., Zamboanga L. et al. 2012).

4- Other implications

Consumed alone or mixed with alcohol, studies have established a relationship between ED consumption and other negative social, emotional, and behavioral health outcomes. Daytime sleepiness and anger (James, Kristjansson et al. 2015) as well as irritability and restlessness (Steinke, Lanfear et al. 2009) are common consequences reported by consumers of caffeinated beverages specifically ED consumers, who are more likely to report that they had “gotten into trouble at home, school, or work” and been involved in violent behaviors and conduct disorders (James, Kristjansson et al. 2015) than consumers of other types of caffeinated

beverages (Jackson, Cotter et al. 2013). In addition, findings from clinical, pharmacological and epidemiological studies suggest a possible link between ED consumption and abuse of unhealthy substances such as nicotine, alcohol and illegal drugs (Reissig, Strain et al. 2009).

Briefly, hypotheses explaining how EDs can cause all the mentioned adverse events are many. Whether these are due to the presence of individual ingredients such as caffeine, taurine and guarana or to the combination of all of them inside one drink is not well elucidated. Moreover, evidence has not been concluded on whether side effects are only seen in heavy drinkers or linked to heavy physical activity accompanying ED consumption, or if they occur in predisposed individuals regardless of the frequency of consumption. That being said, the consumption of ED and its health implications especially in adolescents and young adults are now a serious concern for consumers and health physicians.

H- Policies and Regulations

The Food and Drug Administration (FDA) has set limits to caffeine content in soft drinks because of the related health consequences, but since EDs are considered dietary supplements rather than food products, there are no such limitations on their caffeine content (Seifert, Schaechter et al. 2011).

Numerous complaints were received by the FDA regarding the adverse effects of EDs and have urged an increased examination of these beverages (FDA, 2012). EDs are still to date not regulated by the FDA because they are labeled as dietary supplements. On the other hand, companies are using massive marketing

strategies targeting adolescents and young adults who, despite making the major proportion of consumers, do not know about the potential life-threatening effects of EDs consumption(Administration 2013).

Multiple countries have taken different actions regarding the regulation of ED use. Ireland and the UK have recommended that EDs be restricted for adolescents less than 16 years old, and Sweden has recommended a similar restriction for children less than 15 years old, while Norway only allowed the sale of EDs in pharmacies (Knudsen 2013). However, Uruguay and Denmark were the only countries that have completely banned EDs(Telegraph 2009), while Germany only banned Red Bull after finding trace amounts of cocaine inside cans of this product (Reynolds 2011). Other actions were taken in a growing number of countries such as Ireland, Australia, Sweden, Finland and France where statements were issued warning people about the potential health effects resulting from the consumption of AmEDs and requiring from manufacturers to provide a warning label on every can/bottle of AmEDs.

In 2014, the Lebanese Ministry of economy and trade in collaboration with the Ministry of health, issued a decree banning the import, manufacturing, selling and marketing of AmEDs. Essentially, the ban targeted alcoholic beverages containing the common stimulants caffeine and taurine, based on studies considering them as "unsafe". Consequently, the implementation of the decision to ban the import of AmEDs and prevent their marketing under penalty of legal action was circulated by the responsible ministries. However, to the best of our knowledge, the decree was not put into practice and the policy has not been applied yet and EDs are still advertised

and sold on the Lebanese market.

I- Prevalence, causes and consequences of EDs use in Lebanon

In Lebanon, only one pilot cross-sectional survey determined the prevalence of ED consumption (Itany, Diab et al. 2014). That study was undertaken on students aged between 13 and 30 years in private and public schools and universities and showed that the prevalence of ED consumption was 63.6%, but that most participants (51.1%) consumed less than one drink per month. The highest rate of consumption was found among the 19-23 years age group (67.9%) and males constituted the highest proportion of consumers (75%) (Itany, Diab et al. 2014). In addition, the prevalence of consumption was found to be lower in Beirut (59.9%) compared to other regions (67.3%) and in households of a lower economic status. Furthermore, consumption of EDs was significantly higher among participants of nonmedical fields and students with higher personal incomes.

According to the same study, EDs were reported to be most commonly consumed in nightclubs, and the Lebanese consumers (70.9%) selected Red Bull as the most preferred brand. In consistence with other studies, participants of the Lebanese survey considered EDs as energizers and consumed them to stimulate wakefulness, intellectual and physical capacities. Approximately 30% of surveyed ED consumers in Lebanon reported having experienced at least one adverse effect, mostly tachycardia followed by insomnia (14.4%), polyuria (10.9%), tremor (9.7%), headache (8.7%), flushing (8.4%), abdominal pain (7.5%), nausea (6.8%), vomiting (4.2%), agitation (3.5%), redness of the skin (2.4%), pruritus (0.5%) and other side

effects such as dyspnea, hypotension, nervousness and dizziness. Around 11% of ED consumers among the study participants, admitted being dependent on these beverages and one participant reported being hospitalized because of tachycardia following ED ingestion.

This single survey conducted in Lebanon found that more than half the consumers of EDs are also consumers of AmEDs. Of those, 24% never consume EDs alone and always use them in alcoholic cocktails where vodka is the most (77.5%) used type of alcohol. Nausea, tachycardia and vertigo were experienced in 15% of AmEDs consumers. However, this study did not explore perceptions and attitudes of ED consumers towards the drinks neither did it determine facilitators and barriers to that behavior.

In Lebanon, many other policies have been partially applied for a short period of time before being neglected, such as the decision that has forbidden smoking in closed and public areas. Multiple factors may be preventing the implementation of this policy about EDs, including the lack of communication and coordination between ministries or other sectors in charge, poor strategies of enforcement in addition to the particular regulatory system in Lebanon, which is highly influenced by the political challenges of the country.

J- Rationale

The market and popularity of caffeinated EDs is continuously increasing worldwide and in the region. Studies showed that EDs are highly consumed by young adults who are prone to uncontrolled overuse. According to the recent report

published by EFSA (Nowak and Jasionowski 2015) where 16 European countries and over 52,000 participants were surveyed, prevalence of ED consumption was approximately 68%. Among these, 12% were considered “high chronic” users of EDs as the frequency of their consumption reached 4 to 5 times per week, resulting in a total of approximately 7 liters of EDs per month.

ED consumption is causing multiple adverse health effects varying from mild symptoms such as headaches and nausea to more serious ones like heart palpitations and nervousness leading to death. In the single study published in Lebanon, 30% of participants admitted having experienced side effects after consuming EDs; however the prevalence of consumption is high, exceeding 60% of the surveyed schools and university students. Health effects of EDs predict a serious warning to the health of the Lebanese young community, and although governmental regulations prohibiting the import, selling and advertisements of AmEDs have been declared, none were applied yet (Star 2014).

Data from published qualitative studies worldwide showed that demographic and environmental factors do influence consumers' attitudes towards EDs. When it comes to Lebanese young adults, little is known about the perceptions they hold in relation to EDs, their knowledge about their content, the factors driving their behavior and their beliefs about possible benefits and risks of consuming EDs. Therefore, this study was designed to explore individual and environmental factors affecting consumers' choices in addition to the perceived advantages and side effects of the regular consumption of EDs alone or combined to alcohol among consumers. Since consumers' attitudes differ within and between defined socioeconomic groups as per

the evidence from the literature, findings from this study will be helpful for the development and implementation of behavioral strategies and interventions that are culturally-oriented to target young Lebanese adults. These interventions would help raise awareness about EDs among young adults and consumers, in general, in an attempt to affect their choices of beverages and EDs intake.

Thus, the main purpose of this study is to determine correlates and patterns of ED consumption among Lebanese university students and assess young adults' preferences, knowledge, perceptions and attitudes towards caffeinated EDs.

Objectives of the study are as follows:

- 1-Explore socio-demographic and lifestyle correlates of ED consumption.
- 3-Assess the attitude of Lebanese young adults to caffeinated EDs and perceptions of benefits and harms
- 4-Explore facilitators and barriers to EDs consumption, influence of social and physical environment on behavior of ED consumers

CHAPTER III

METHODOLOGY

A- Setting

This study was conducted among young adults who were recruited from two private universities in Beirut, Lebanon, namely the American University of Beirut (AUB) and the Lebanese International University (LIU) - Beirut campus. Both universities were selected considering the difference in demographics and socio-economic background of their students. Although both are private universities located in Beirut, they differ greatly in terms of tuition. The cost of a credit varies between 155\$ and 270\$ for undergraduate and graduate majors in LIU (LIU, tuition 2014) versus 530\$ to 926\$ in AUB(AUB 2014-2015). While there are no official figures reflecting students' and/or their parents' incomes in either universities, AUB tuition fees are 3.5 times higher than LIU's, which mirror the economic status of the families engaged. The economic factor was important in our study because in previous studies, students with higher personal incomes had significantly higher odds for drinking EDs than their counterparts with a lower income (Attila and Cakir 2011, Itany, Diab et al. 2014). In addition, the literature revealed that males were more likely to consume EDs than females (Alsunni and Badar 2011, Ibrahim, Iftikhar et al. 2014). Thus, recruited males and females of each academic institution were divided into separate focus groups, in order to better observe and compare gender differences.

B- Materials and Methods

1- Design

A mixed methods research design was used for this study. This is a procedure for collecting, analyzing, and mixing both quantitative and qualitative research and methods in a single study (Creswell 2002). The quantitative research collects quantifiable data from participants and uses statistics to analyze numbers and deduce objective results. The qualitative research relies on the views and opinions of participants and collects words, texts and quotes instead of numbers (Fischler).

Quantitative data for the pilot study was first collected at AUB and LIU through a self-administered questionnaire. Preliminary results of the survey revealed some discrepancies in the answers of participants and raised additional questions on young adults' drinking behavior. To answer those questions, and given the sensitivity of the topic, experiences, perceptions and attitudes of participants towards EDs had to be explored in a qualitative approach. Consequently, a sequential explanatory design was adopted, where qualitative data was collected through FGDs in a second phase.

The importance of using both quantitative and qualitative data is that it provides a better understanding of the research problem than either type of study by itself. Mixed research can provide stronger evidence of the findings through the confirmation and convergence of the results from both methodologies. Because our research has in part a social behavioral perspective, some insights of the study could be missed if only a single method was to be used; thus, the combination of

quantitative and qualitative data was meant to better explain young adults' behaviors in regards to EDs (Fischler).

a- Quantitative Phase

A cross-sectional survey was conducted for the assessment of beverage consumption patterns among young Lebanese adults. The survey was distributed and completed by trained field surveyors within the AUB and LIU Beirut campuses during the spring semester of year 2014.

The questionnaire was developed by the study investigators and questions were adapted from other questionnaires and studies conducted on the same drinking behavior and formulated to be culturally appropriate to understand beverage consumption preferences of young adults with a focus on caffeinated beverages, especially EDs (2004, University 2007, Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014). The questionnaire consisted of 36 closed questions that were divided into 3 sections (See appendix2).

The first section of the questionnaire (Q1 to Q15) covered socio-demographic and anthropometric information; it included questions with general information about participants' age, gender, level of education (Q8), years of study (Q9), field of study (Q10), weekly hours of study (Q11) and existence of a job (Q12) that were designed referring to the literature and were culturally adapted to our target population. Questions about participants' nationality (Q5), region of origin (Q6) and personal income (Q7) were inspired by a local study about ED consumption (Itany, Diab et al. 2014). Based on the International Physical Activity Questionnaires (2004), questions about physical activity performance, types, frequency and duration (Q13 to

Q15) were added. Anthropometrics were assessed based on the weight (kg) and height (cm) as reported by the participants.

The second section (Q16 to Q22) assessed the frequency of consumption of selected beverages (water, coffee, tea, soft drinks, sports drinks and EDs) as well as caffeine-containing foods and medications. Those questions were formulated in reference to the Dietary Assessment Questionnaire developed by Walter Willet from Harvard university (Willet 2007).

The third section (Q23 to Q36) focused on studying the consumption of EDs and alcoholic beverages. Questions about ED consumption (Q23), alcohol consumption (Q28), time of consumption (Q26) and reasons and consequences of consumption of EDs alone or mixed with alcohol (Q33 to Q36) were included in reference to two similar studies conducted in Turkey (Attila and Cakir 2011) and the United States (Malinauskas, Aeby et al. 2007). Questions 27, 30 and 31 were added in order to assess the average use of EDs and AmEDs during the fall/ spring academic semesters and the summer separately. These were adapted from the questionnaire entitled "Gathering Consumption Data on Specific Consumer Groups of EDs" issued from the European Food Safety Authority in March 2012 (EFSA 2012).

b- Qualitative Phase

Based on the preliminary results of the survey from the quantitative component of this study, our research group has identified gaps and discrepancies that brought up the need to further investigate patterns of EDs and AmEDs consumption among young adults. Thus, research investigators agreed that focus groups are the most suited to explore perceptions and attitudes of Lebanese young adults towards EDs in order to

explain and validate the survey's results. The focus group setting provides a comfortable atmosphere for participants to freely share their thoughts and opinions about the subjects and thus allows for in-depth investigations beyond semi-quantitative surveys.

The focus group script was developed by the study investigators based on preliminary findings from the quantitative survey as well as other qualitative studies on ED consumption among young adolescents (Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014).

The script was written and administered in spoken Arabic language and consisted of a brief introduction of the study and a total of 24 open-ended questions with probing questions that can help stimulate the discussion and clarify any ambiguities. The focus group questions aimed to assess the perceptions and attitudes of ED consumers covering various areas of the researched subject including knowledge about EDs and their ingredients, first experience with EDs, reasons for consumption, potential benefits of EDs, potential adverse health effects, prices, advertisements, personal and social image of consumers, possible quitting circumstances, consumers' attachment to the drinks, policies and regulations in Lebanon. These questions were elaborated in order to identify subtle factors, such as social norms, gender differences and socio-economic status and their influence on young adults' perceptions and attitudes towards the consumption of EDs.

Moreover, the focus group questions tackled new aspects of the subject that were not approached in the quantitative part of the study, such as the participants' knowledge about the drinks as well as the marketing and advertisement perspective.

Some of the questions included in the focus group script were already asked in the survey, such as the reasons behind ED consumption and the experienced side effects. However, this redundancy was intended in order to further explore and depict if similar themes to those earlier reported by university students could be captured through verbal messages and nonverbal communication signals.

2- Sampling strategy and participants' characteristics

The sample size for this study was calculated using the below formula:

$$\text{Sample size} = \frac{Z^2 P(1-P)}{d^2}$$

Where Z is a standard normal variate of 1.96, for 95% confidence interval (type1 error=5%), P the expected prevalence based on previous studies and/or pilot studies and d the absolute error or precision.

Prevalence was estimated using results from studies assessing the prevalence of EDs among a population of the same age range.

Confidence	95%			
Precision	0.05			
Prevalence	48.3% ¹	62% ²	51% ³	92 ⁴
N	384	362	384	113

¹(Attila and Cakir 2011), ²(Azagba, Langille et al. 2014), ³(Malinauskas, Aeby et al. 2007), ⁴(Jacob, Tambawel et al. 2013)

Based on the above, a minimum of 113 participants should be recruited for this survey. Therefore, a convenience sample of 240 participants was recruited from the two identified universities to assess correlates of ED consumption among young adults. Recruited participants were Lebanese AUB and LIU graduate and undergraduate students between 18 and 30 years old. All participants satisfying these

criteria were eligible to complete the questionnaire assessing the prevalence of beverages consumption with a focus on EDs and alcoholic drinks among university students.

For the qualitative phase, the sampling strategy was based on the goal of obtaining the most accurate and rich descriptions of Lebanese students' thoughts, perceptions and beliefs about EDs. Because focus groups are intended to draw conclusions that apply only to the context in which they are conducted (Millward 1995), participants are recruited from the population that can provide meaningful information about the topic discussed and are able to meet the project's objectives. Thus, groups must be homogeneous, sharing specific common characteristics including being Lebanese university students, aged between 18 and 30 years old and who consume EDs on a regular basis. As defined earlier by Malinauskas et al. and Bawazeer et al. in USA and Saudi Arabia respectively, the criteria adopted to recruit participants for the study was their consumption of at least one ED per month to be considered as a "regular" ED user.

The sample size for focus groups can vary widely and different approaches have been used to calculate sample size, however no one gold standard has been defined. In this study, the sample size was calculated considering the principle of saturation, which is the guiding principle of sample size determination among researchers engaged in qualitative research (DePaulo 2000). It was estimated that saturation of data would be achieved with a sample size of 30 to 40 students. This complies with the empirical rationale of Griffin and Hauser for focus group studies that suggests starting with a sample of 30 participants and adding up additional groups

if needed later. After conducting focus groups with this initial sample size, the research team can choose to include supplementary groups until data saturation is reached and where no relevant additional information is provided (DePaulo 2000).

The number of focus group sessions conducted was dependent on both the sample and group size (Millward 1995). First, the number of participants in each focus group should be small enough to give everyone the opportunity to express an opinion and large enough to provide diversity of opinions. With a sample of 30 to 40 participants, participants would be stratified by university and gender into 4 to 6 focus groups with each group having 6 to 8 participants involved in the discussion.

Because of recruitment challenges, a total of 29 participants were recruited to the FGDs by August 2015. An approximately equal distribution of male (n=14) and female (n=15) young adults was aimed to ensure that perceptions of both genders are considered within the study. A total of 6 focus groups were conducted: 2 at AUB and 4 at LIU.

3- Recruitment

During the academic year 2013-2014, students were recruited to participate in the survey. The procedure consisted of directly approaching university students around the AUB and LIU campuses. Trained undergraduate students were responsible of briefly explaining the concept of the study to potential participants and performing a verbal screening for eligibility. Participants were considered eligible if they are of Lebanese nationality. In addition, participants should be 18 to 30 years old and registered at AUB or LIU. Before participating in the study and after meeting inclusion criteria, students were provided with a consent form (appendix I) where the

purpose, procedure and duration of the study were indicated as well as the possible risks, discomforts and benefits expected from the participation in the study. Also, confidentiality of participation and participants' rights of withdrawal at any time during the study were underlined in the consent form. Students were given all the needed time to read and understand the consent form and those who decided to participate in the study were asked to sign the document of which a copy was kept with the participant.

During the academic year 2014-2015, recruitment of participants for the FGDs was performed. Fliers introducing the study and explaining inclusion criteria were hung around both university campuses and inside academic and non-academic departments. In addition, fliers (appendix VI) were distributed to students by hand around campus and were shared on the social media website where applicable. Fliers with the same content were addressed separately for males and females in order for students to know that FGDs will be stratified by gender. Given that the topic may be sensitive to some, the stratification by gender was meant to reassure and comfort those who may not feel at ease sharing their thoughts freely in mixed groups. In addition to fliers, students around both campuses were directly approached by the research team and were verbally screened for eligibility to participate. Interested students were asked to share their contacts with the student researcher and were later communicated the specific date, time and location of the FGD. All recruitment material and procedures were approved by the Institutional Review Boards of AUB and LIU prior to the initiation of both studies.

4- Data Collection

During the spring semester of the academic year 2013-2014, a sample of 120 participants from AUB and 107 participants from LIU were recruited for the quantitative part of this study. Consent forms were provided and explained to interested students and those who wished to participate were asked to document their participation by signing the paper. Then, participants filled out a self-administered questionnaire assessing beverages consumption patterns and prevalence of ED consumption among Lebanese university students.

After one academic year and during the spring and summer semesters of 2014-2015, 6 focus groups were carried out at LIU and AUB to assess perceptions and attitudes of ED consumers towards these beverages. Groups were stratified by university and by gender in order to capture differences in opinions between participants, and taking into consideration several socio-demographic characteristics and differences. Between the periods of March to July 2015, four FGDs (two for males and two for females) were conducted at LIU and two were conducted at AUB. For each focus group, a minimum of 10 participants were contacted to schedule a convenient common time and location on their respective campuses for all the participants to be able to attend the FGDs. The final number of participants who attended each focus group varied because of unexpected absences and/or apologies at the time of the scheduled FGDs. The recruitment and data collection for the FGDs were very challenging because students were either not interested in participating or did not feel comfortable sharing their thoughts in group. Further to that, some students denied using EDs when friends referred to them as regular consumers while others

seemed to avoid participating in the study by reporting having a very random consumption that may not help the study.

Students invited to participate in the study were gathered in a safe and private meeting room in the Department of Nutrition at the Faculty of Agricultural and Food Sciences at AUB and at a conference room within the university library at LIU. Both rooms were easily accessible to all participants and had a relatively quiet environment.

Students were seated in a U-shaped setting to encourage open discussion and to allow better eye contact. The moderator was sitting in the middle to allow easy communication with participants and one note-taker was sitting in the back of the arranged circular setting a way to be able to observe participants' faces and non-verbal expressions. Both the moderator and note taker presenter themselves and their roles before the start of the FGDs.

Signed consent forms (appendix 2) were collected before initiating the discussion and participants were reminded of the importance of respecting each other's opinions and keeping discussions confidential. Each student was given a self-administered brief questionnaire (appendix IV) to complete prior to the start of the FGD, eliciting data about age, education level and field, socioeconomic status as well as questions about average monthly alcohol and EDs consumption patterns. A selection of common ED brands was placed as focal stimuli on a table in the center of the U-shaped setting. The moderator placed two digital audio-recorders (SONY, ICD-PX333) in each side of the room and briefly introduced the topic of the study referring to the cans of EDs as the common factor gathering the participants in the discussion.

The moderator then followed a set of previously prepared questions in order to sustain a general framework of questioning and to provide a flexible setting for open-ended inquiry. The moderator intended to catch all participants' responses and thoughts, using general interviewing techniques in order to encourage quiet or shy participants to feel more comfortable sharing their opinions and to avoid the influence of more vocal participants. The investigator was alert not to show any verbal or non-verbal reactions to any awkward or surprising answers and thoughts shared by the participants and to respect their right to refrain from answering a particular question. The assistant researcher developed a code sheet listing the participants' names with an assigned code next to each name based on their seating order (OMNI). The code that uniquely identified each respondent was used during the note-taking process where particular points of interest, non-verbal reactions, and other factors corresponding with the audio recordings were documented. It was also ensured that no personal identifiers or names are attached to comments or included in the notes to guarantee anonymity and confidentiality of participants.

FGDs lasted between 45-60 minutes, including the needed time for the collection of consent forms and the completion of the questionnaires. The data was collected with the assistance of AUB and LIU nutrition students and volunteers (CITI certified and trained on dietary assessment and basic research ethics and methods) Data was then gathered at AUB and entered using the Statistical Package for Social Sciences SPSS version 21.0. All entered data was then spot-checked and cleaned by the student researcher and some variables were computed to create other new variables needed for the analysis.

5- Data Interpretation

a- Questionnaires

For the anthropometric data, weights and heights were self-reported by study participants and the Body Mass Index (BMI) were calculated later by data collectors. The BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults, and it is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). The BMI values were then divided into four categories: Underweight ($\text{BMI} < 18.5$), Normal ($18.5 \leq \text{BMI} < 25$), Overweight ($25 \leq \text{BMI} < 30$) and Obese ($\text{BMI} \geq 30$), based on the WHO International Classification (WHO 2004).

In the demographics/background section, participants' fields of study were divided into health-related (health sciences, medicine, nursing, human nutrition and food sciences, pharmacy, etc.) and non-health related categories (agriculture, landscape, arts, engineering, architecture, business, physics, mathematics, computer sciences, etc.). In the "place of origin" question, Nabatieh was collapsed with South Lebanon as it is considered as part of the South region. Because of low number of responses, the first two categories in the monthly income question ($< 500\$$ and $500-1000\$$) were both merged to create the sub-category $< 1000\$$.

Physical activity was evaluated using the shortened version of the self-reported International Physical Activity Questionnaire (2004). First, participants who answered "Yes" to question 11 (In a typical week, do you participate in any physical activities or exercises?), were identified as physically active subjects and those who answered "No" were defined as sedentary. Frequency (times per week), duration

(minutes per time) and intensity of physical activity were assessed and Metabolic Equivalent of Tasks (METs), a physiological measure expressing the cost of physical activities was calculated. In accordance with the standard IPAQ scoring procedures, light, moderate and vigorous intensity activities were assigned an average of 2METs, 4.5 METs and 6METs, respectively (CDC). Accordingly, physically active participants were classified into one of the following groups: "low" physical activity (< 500 MET/min/week), "moderate" physical activity (500-2500 MET/min/week) or "vigorous" physical activity (> 2500 MET/min/week).

In part II of the questionnaire (Consumption of Selected Beverages, Caffeine Containing Foods and Medications), each of the listed beverages was followed by nine options of frequency of consumption (never, less than once per month, 1-3 cups per month, 1 cup per week, 2-4 cups per week, 5-6 cups per week, 1 cup per day, 2-3 cups per day, 4 or more cups per day). Responses were recoded differently for each time:

Based on the Dietary Reference Intakes (DRIs) for water and electrolytes issued by the Food and Nutrition Board and the Institute of Medicine, the adequate intake (AI) of water for the 18-30 years old age group is 3.7L/d (15 cups) and 2.7L/d (11 cups) for males and females respectively (USDA 2004). Thus, the frequency of water intake among participants was divided into 3 categories: "Very low" for less than 1 cup/day, "Low" for 2-3 cups/day and "Adequate" for 4 or more cups/day.

Scientific research have shown that up to 400mg of caffeine per day, equivalent to 4 cups of brewed coffee, is safe to most healthy individuals. However, no specific definition was given to explain what is considered "regular" regarding the

consumption of caffeinated beverages. Thus, based on the frequencies of consumption derived from participants' answers, consumption of coffee, tea, chocolate drinks, sodas and soft drinks was considered "regular" in this study if participants drink 2 or more cups/ week.

As for the frequency of consumption of sports drinks, and due to a lack of variability, responses were collapsed into two levels: participants who answered that they "never" drank sports drinks during the past year were considered "non-consumers" and those who drank at least one were considered "consumers".

Part III of the questionnaire addressed different aspects of ED and alcohol consumption including the prevalence and frequency of consumption, brands and types, places and times of consumption as well as the causes and consequences of consumption.

The first question in this section (Q23: have you ever consumed any type of EDs?) was used to predict the prevalence of ED ever consumption among university students. It is a yes or no question, on which participants who answer "yes" have tried ED at least once in their lifetime and are consequently considered "EDs ever consumers". Those who answer "no" have never tried EDs and are accordingly asked to skip all ED-related questions and move to the "alcohol" section.

In order to catch variability of the frequency of ED (not mixed with alcohol) consumption between academic semesters, "ever consumers" were asked to choose one of the available options (never, less than one per month, 1-3 cans per month, 1 can per week, 2-4 cans per week, 5-6 cans per week, 1 can per day, 2-3 cans per day,

4 or more cans per day) regarding their average monthly use of EDs during the fall/winter/spring semesters first, then during the summer.

In reference to the literature (Malinauskas, Aeby et al. 2007, Bawazeer and AlSobahi 2013) , consumption of EDs is considered "regular" when at least one beverage/can is used per month. Thus, participants who consumed at least 1 ED per month between the beginnings of October 2013 until the end of May 2014 were considered "frequent fall/spring" consumers of EDs while those who drank none or less than one ED during that period were considered "non-frequent fall/spring" consumers. Similarly, participants who consumed at least 1 ED per month between the beginnings of June until the end of September 2014 are considered "frequent summer" consumers and those who didn't are considered "non-frequent summer" consumers.

Based on the above interpretation, the prevalence of "frequent yearly ED consumption" was calculated. Participants who are "frequent fall/spring" and/or "frequent summer" consumers are considered "frequent yearly consumers". Those who are not frequent consumers in either semester are considered "non-frequent yearly consumers" which is equivalent to "EDs ever consumers".

All ED consumers were then asked to rate on a scale from 1 to 5, how much they agree or disagree on each of the listed statements regarding the reasons for them to drink EDs alone (Q34). Participants' ratings were divided into three categories: agree (rating <3), neutral (rating = 3) or disagree (rating >3) with the statement.

Questions referring to the frequency and patterns of alcohol consumption and types of alcoholic beverages consumed (Q28 to Q33), were addressed to alcohol

and/or AmEDs consumers. Participants who answered "no" to Q28 (Do you consume alcohol?) are asked to skip this section. Alcohol consumers then selected their frequency of consumption of alcoholic beverages (Araq, wine, beer and alcoholic cocktails). Answers were re-coded into "non-consumers" for those who never consumed a selected drink during the past year and "consumers" for those who drank it at least once. Among alcohol consumers, only consumers of AmEDs are asked to complete the frequency of their consumption during the fall/spring semesters and the summer separately. The same interpretation as in the ED section is applied in order to assess the prevalence of AmEDs consumption per semester and per year.

On a scale from 1 to 5, consumers rated how much they agree or disagree on statements regarding AmEDs, the reasons they drink for and adverse effects they have experienced following their consumption. Table1. presents original responses as suggested in the administered questionnaire and the recoded variables of each question.

Table 1. Original responses and their recoded variables as interpreted in the questionnaire's analysis

Original Responses	Recoded Variables
QI-3. What is your weight in Kg? QI-4. What is your height in cm?	$BMI = \text{weight}(\text{kg})/\text{height}^2(\text{cm})$
QI-6. Where are you from in Lebanon? North Lebanon Mount Lebanon Beirut Bekaa South Lebanon Nabatieh	Place of origin: North Lebanon Mount Lebanon Beirut Bekaa South Lebanon
QI-7. What is the average income of your family per month? below \$500 \$500 – \$1000 \$1000 – \$1500 \$1500 - \$2000 above \$2000	Family average monthly income: below \$1000 \$1000 – \$1500 \$1500 - \$2000 above \$2000
QI-10. What is your field of study? Agriculture/ Animal Sciences/ Landscape Arts (Literature, History, Geography, Archeology, Anthropology, Public administration, Political Sciences, Journalism, Tourism, etc.) Business Engineering/ Architecture Health Sciences (Medical Lab, Environmental, Sciences, Public health) Medicine Nursing Nutritional Sciences (Human Nutrition and Food Science) Pharmacy Sciences (Biology, Chemistry, Physics, Mathematics, Computer Science)	Field of study: Health-related Non-health related

<p>QI-14. How many times do you take part in a physical activity during a typical week? -----times per week -----minutes duration every time</p> <p>QI-15. What types of activities do you perform?</p> <p>Light Moderate Vigorous</p>	<p>METs: Times/week*Minutes duration*2 (light) or 4.5 (moderate) or 6 (vigorous)</p> <p>PA classification:</p> <p>Low if <500METs/min/wk Moderate if 500-2500 METs/min/wk Vigorous if >2500METs/min/wk</p>
<p>QII-16. Past year average total use of:</p> <p>Water: Never Less than once per month 1-3 cups per month 1 cup per week 2-4 cups per week 5-6 cup per week 1 cup per day 2-3 cups per day 4 or more cups per day</p> <p>Coffee with caffeine, Tea, Sodas: Never Less than once per month 1-3 cups per month 1 cup per week 2-4 cups per week 5-6 cup per week 1 cup per day 2-3 cups per day 4 or more cups per day</p> <p>Sports Drinks: Never Less than once per month 1-3 cups per month 1 cup per week 2-4 cups per week 5-6 cup per week 1 cup per day 2-3 cups per day</p>	<p>Past year average total use of water:</p> <p>Less than 1c/day: Very low 2-3c/ day: Low 4 or more c/day: Adequate</p> <p>Past year average consumption of caffeinated coffee or tea or sodas: Less than 2c/week: Irregular 2 or more c/week: Regular</p> <p>Sports Drinks: Never = Never + Less than once per month: defined as "non-consumers" 1 or more cup/month in the past year: Defined as "consumers"</p>

4 or more cups per day	
<p>QIII-23. Have you ever consumed any type of EDs?</p> <p>Yes</p> <p>No</p>	<p>Energy Drinks:</p> <p>Yes: ever consumers</p> <p>No: non-consumers</p>
<p>QIII-27.a) Average monthly use of *EDs alone during the fall/spring semesters:</p> <p>Never</p> <p>Less than once per month</p> <p>1-3 cups per month</p> <p>1 cup per week</p> <p>2-4 cups per week</p> <p>5-6 cup per week</p> <p>1 cup per day</p> <p>2-3 cups per day</p> <p>4 or more cups per day</p> <p>QIII-27.b) Average monthly use of EDs during the summer semester:</p> <p>Never</p> <p>Less than once per month</p> <p>1-3 cups per month</p> <p>1 cup per week</p> <p>2-4 cups per week</p> <p>5-6 cup per week</p> <p>1 cup per day</p> <p>2-3 cups per day</p> <p>4 or more cups per day</p>	<p>EDs use during the fall/spring semesters:</p> <p>Less than 1c/month: non-frequent fall/spring consumers</p> <p>At least 1c/month: frequent fall/spring consumers</p> <p>EDs use during the summer semester:</p> <p>Less than 1c/month: non-frequent summer consumers</p> <p>At least 1c/month: frequent summer consumers</p> <p>Yearly ED consumption:</p> <p>Frequent fall/spring AND/OR frequent summer consumers: frequent yearly consumers of EDs</p> <p>Non-frequent fall/spring AND summer consumers: non-frequent yearly consumers OR ever consumers</p>
<p>QIII-32. Average total use of specified drinks during the past year:</p> <p>Araq, wine, beer and alcoholic cocktails:</p> <p>Never</p> <p>Less than once per month</p> <p>1-3 cups per month</p> <p>1 cup per week</p> <p>2-4 cups per week</p> <p>5-6 cup per week</p>	<p>Consumption of alcoholic beverages:</p> <p>Never: non-consumers</p> <p>At least once/last year: consumers</p>

1 cup per day 2-3 cups per day 4 or more cups per day	
QIII-33. On a scale from 1 to 5, rate how much you agree or disagree on each of the following statements regarding AmEDs QIII-34. On a scale from 1 to 5, rate how important are these reasons for you to drink EDs alone QIII-34. On a scale from 1 to 5, rate how important are these reasons for you to drink AmEDs	1 or 2: disagree 3: neutral 4 or 5: agree 1 or 2: not important 3: neutral 4 or 5: important 1 or 2: not important 3: neutral 4 or 5: important

*Same interpretation applies on Q30 and Q31 regarding AmED consumption.

6- Data Analysis

a- Questionnaires

The questionnaire included five continuous variables: age, weight, height, hours of study and duration of physical activity which were reported as means. All other variables were categorical and were described by frequencies and percentages.

Normality tests were performed to make sure that the data is normally distributed and non-parametric tests were used when applicable. Independent sample T-test and Mann-Whitney U-test were used to determine differences in age, weight, height, BMI, hours of study and METs/min/week between males and females as well as between non-consumers and ever consumers of EDs.

Chi-square test was used to examine differences among categorical variables including socio demographics, lifestyle and ED consumption patterns between males and females as well as between non-consumers and ever consumers of EDs.

In each statistical analysis, p-values were reported to indicate statistical difference which was considered significant when p-value <0.05. To further investigate determinants and correlates of ED consumption, a multiple logistic regression model was performed. The purpose of logistic regression was to make inferences about the association of a set of independent variables with a dependent variable. In this study, a standard regression analysis was used to examine each variable's statistical relevance. The dependent variable is ever ED use where (0) represents the absence of consumption of ED and (1) represents the use of ED at least once in a lifetime. The logistic regression estimated the probability of ED use as a function of independent variables including gender, age, physical activity, sports drink consumption, alcohol consumption and coffee consumption.

b- Focus Groups

Simple statistical analysis was performed to describe demographic and general information from the brief questionnaires completed before the initiation of FGDs. After each of these discussions, the recordings were transcribed verbatim by the moderator and with the help of the notes taken by the note-taker, some comments were added, ideas clarified and non-verbal expressions highlighted.

Thematic analysis, which is one of the most commonly used methods of analysis in qualitative research, was used in this study for the analysis of the

transcribed FGDs. Interviews were read carefully, and codes for each idea were written. Each discussion was read repeatedly in order to identify new themes, gain further insights into the participants' experiences and to ensure that all ideas that relate to each other are grouped to create a theme. Minor ideas related to each major theme were identified as sub-themes. A description for each theme was written and illustrated by quotes extracted from the transcribed interviews. After that, a close comparison of themes and sub-themes of each of the FGDs was performed to determine any similarities and differences between the groups.

C- Ethical Considerations

Proposals of the quantitative and qualitative studies were both submitted and approved by the Institutional Review Board (IRB) office at the American University of Beirut (AUB) and the respective review board at the Lebanese International University (LIU).

All participants were asked to read and sign a written consent form before they get enrolled in the quantitative and qualitative components of the study, undertaken between 2014 and 2015. Participants of the focus groups had to also give their written consent for audio recording the discussion and for anonymously quoting any parts of the interview in published materials. Confidentiality of questionnaires, interviews and transcripts was established.

CHAPTER IV

RESULTS

A mixed methods study design was employed to meet the specified objectives of the thesis. Results from the semi-quantitative questionnaires and the FDGs conducted with university students are presented in this chapter.

A- Questionnaires

1- Characteristics of Study Participants

After data cleaning, a total of 227 questionnaires from AUB (n=120) and LIU (n=107) were available for analysis: 47% of participants were males (n = 106) and 53% of females (n=121) were represented in the sample.

Respondents' mean age was 20.67 ± 1.96 years, ranging from 18 to 30 years old. Around half of the participants (n=97) were from Beirut (26%) and Mount Lebanon (22%) and the other half was distributed between South Lebanon (33.5%), Bekaa (11.7%) and North Lebanon (7.8%).

The vast majority of respondents were undergraduate students (92%) of non-health related majors (64%) and slightly more than one third were juniors. A significant statistical difference ($p=0.013$) was noticed between male and female participants with regards to the field of study; 43.2% of females were enrolled in

health related majors while most male respondents (72.6%) were of non-health related majors. The average weekly time dedicated for studying was 15 ± 12.3 hours per participant.

In total, 180 respondents (79.6%) were non-working students. The average family income of half of the participants (48%) was above 2000\$ per month. However, the average income was found to vary significantly ($p < 0.001$) between families of AUB and LIU students; 72% of AUB participants answered that their monthly family income is above 2000\$ versus 21% from LIU, where students' answers were distributed evenly between three categories: 1500-2000\$/month (21%), 1000-1500\$/month (28%) and 500-1000\$/month (25%). Slightly less than two thirds of participating students (65.8%) were classified in the normal category of body mass index (BMI) with a mean of 23.3 ± 3.69 kg/m², while 24% were overweight, 5% underweight and 5% obese. However, analysis showed a significant statistical difference of BMIs ($p < 0.001$) between males and females. The average mean BMI for males was 24.7 ± 3.7 kg/m² which was in the upper limit of the normal weight to height category, while the average mean for females was 22 ± 3.1 kg/m². In addition, 7.8% (n=9) of female participants were underweight (BMI < 18.5) versus 2% (n=2) of male participants while 15.6% (n=18) and 44.2% of females and males respectively fell into the overweight or obese categories. A summary of participants' characteristics and demographics are presented below in Table 2.

Table 2. Socio-Demographic and Anthropometric Characteristics of Participating University Students (N=227)

Variables		Total	Males n=106	Females n=121	X ²	P-value
Socio-demographic characteristics						
Age (yrs)		20.67±1.9	20.6±2.1	20.7±1.8		0.795
Origin	North Lebanon	16 (7.8)	5 (5.2)	11 (10.2)	7.72	0.172
	Mount Lebanon	43 (20.9)	24 (24.7)	19 (17.4)		
	Beirut	54 (26.2)	25 (25.8)	29 (26.6)		
	Bekaa	24 (11.7)	10 (10.3)	14 (12.8)		
	South Lebanon	69 (33.5)	33 (34.0)	39 (33.1)		
Income (\$)	below \$1000	36 (17.4)	20 (20.4)	16 (14.7)	3.38	0.336
	\$1000 - \$1500	40 (19.3)	17 (17.3)	23 (21.1)		
	\$1500 - \$2000	31 (15.0)	11 (11.2)	20 (18.3)		
	above \$2000	100 (48.3)	50 (51.0)	50 (45.9)		
University	AUB	120 (52.9)	60 (56.6)	60 (49.6)	1.12	0.291
	LIU	107 (47.1)	46 (43.4)	61 (50.4)		
Education Level	Undergraduate	210 (92.9)	96 (91.4)	114 (94.2)	0.66	0.415
	Graduate	16 (7.1)	9 (8.6)	7 (5.8)		
Year of study	Freshmen	14 (6.2)	5 (4.7)	9 (7.6)	6.82	0.145
	Sophomore (1 st year)	46 (20.4)	21 (19.8)	25 (21)		
	Junior (2 nd year)	80 (35.6)	31 (29.2)	49 (41.2)		
	Senior (3 rd year)	63 (28)	36 (34)	27 (22.7)		
	4 th year or more	22 (9.8)	13 (12.3)	9 (7.6)		
Field of study	Health related	80 (35.7)	29 (27.4)	51 (43.2)	6.12	0.013
	Non-health related	144 (64.3)	77(72.6)	67 (56.8)		
Hours of study/wk		15±12.3	16.4±11.9	13.7±12.5		0.102
Job	No	180 (79.6)	82 (78.1)	98 (81.0)	0.41	0.814
	Yes Part-time	35 (15.5)	18 (17.1)	17 (14.0)		
	Full-time	11 (4.9)	5 (4.8)	6 (5.0)		
Anthropometrics						
Weight (kg)		68.8±14.6	79±12.8	59.8±9.3		<0.001
Height (m)		171.2±93	178.5±6.4	164.7±6.2		<0.001
BMI (kg/m²)		23.3±3.69	24.7±3.7	22±3.1		<0.001
BMI categories	Underweight	11 (5.0)	2 (1.9)	9 (7.8)	23.32	<0.001
	Normal	144 (65.8)	56 (53.8)	88 (76.5)		
	Overweight	53 (24.2)	38 (36.5)	15 (13.0)		
	Obese	11 (5.0)	8 (7.7)	3 (2.6)		

Categorical variables are presented as N (%)

Continuous variables are presented as mean ± sd

2- Lifestyle characteristics and beverage consumption pattern of study participants

The analysis of the participants' responses to the questions related to the lifestyle and beverage consumption patterns showed that a total of 64% (n=145) of participants were physically active, with a male proportion of 71% versus 58.7% of females (p=0.05). In addition, the type of practiced activity significantly differed between the two genders: 77% (n=57) and 21.6% (n=16) of active males were engaged in vigorous intensity and light to moderate intensity physical activity respectively, while females practiced more light to moderate intensity physical activity (48.2%) than vigorous intensity physical activity (38%). These results were confirmed when combining the intensity to the frequency and duration of physical activity, expressed in METs/Hr/week. Males perform physical activities with average METs/Hr/week (24.8 ± 26.3) that are twice higher than females (12 ± 13.6 ; $p < 0.001$).

Table 3. Lifestyle characteristics and beverages consumption patterns of participants (N=227)

Variables		Total	Males n=106	Females n=121	X ²	P-value
Lifestyle						
Regular physical activity	No	80 (35.6)	30 (28.8)	50 (41.3)	3.80	0.05
	Yes	145 (64.4)	74 (71.2)	71 (58.7)		
PA type	Light	26 (17.9)	4 (5.4)	22 (20.0)	25.48	<0.001
	Moderate	32 (22.1)	12 (16.2)	20(28.2)		
	Vigorous	84 (57.9)	57 (77.0)	27 (38.0)		
METs/h/week		18.6±22	24.8±26.3	12±13.6	4.04	<0.001
Medication consumption	No	71 (61.7)	36 (85.7)	35 (61.4)	7.05	0.008
	Yes	28 (28.3)	6 (14.3)	22 (38.6)		
Frequency of beverage consumption						
Water	≤1c/d	26 (11.6)	7 (6.7)	19 (15.8)	5.30	0.070
	2-3c/d	79 (35.1)	36 (34.3)	43 (35.8)		
	≥4c/d	120 (53.3)	62 (59.0)	58 (48.3)		
Coffee	No	59 (26.0)	32 (30.0)	27 (22.0)	1.82	0.170
	Yes	168 (74.0)	74 (70.0)	94 (78.0)		
Tea	No	55 (51.4)	22 (47.8)	33 (54.0)	0.41	0.520
	Yes	52 (48.6)	24 (52.2)	28 (46.0)		
Sodas	No	106 (47.0)	39 (37.0)	67 (55.4)	7.50	0.006
	Yes	120 (53.0)	66 (63.0)	54 (44.6)		
Sports drinks	No	159 (70.4)	54 (51.4)	105 (87.0)	33.60	<0.001
	Yes	67 (29.6)	51 (48.6)	16 (13.0)		
Chocolate drinks	No	34 (32.4)	15 (33.3)	19 (31.7)	0.03	0.850
	Yes	71 (67.6)	30 (66.7)	41 (68.3)		
ED consumption	No	124 (54.9)	47 (44.8)	77 (63.6)	8.09	0.004
	Yes	102 (45.1)	58 (55.2)	44 (36.4)		
Alcohol consumption	No	120 (60.3)	50 (53.2)	70 (66.7)	3.76	0.052
	Yes	79 (39.7)	44 (46.8)	35 (33.3)		

C = cup of water or any other beverage

METs = metabolic equivalent of tasks

P-value <0.05 were considered statistically significant

In response to the question about medication consumption, 62% of participants reported not consuming any type of medications. However, 38.6% (n=22)

of females versus 14.3% (n=6) of males reported consuming over-the-counter drugs mostly pain killers ($p=0.008$) in the week preceding the interview.

In the series of questions assessing the average consumption of selected beverages during the previous year, results were the following:

Water was found to be consumed in an average of at least 4 cups a day by 53% of the respondents. In total, females consumed water less frequently than males, as more than half the female respondents did not reach the 4 cups of water per day.

Caffeinated coffee was consumed by three quarters of the participants with a slightly higher prevalence found among females (78%) than male participants (70%).

Consistently, coffee abstainers were more frequent among males (30%) than females (22%). The average frequency of consumption of caffeinated coffee was 1 cup per day for most respondents.

Only 47% of participants selected their consumption of tea during the previous year. Contrary to coffee consumption, tea consumption (49%) and non-consumption (52%) were almost equally prevalent, while a higher consumption was found among male participants (52.2%) and a higher percentage of non-consumers found among females (54%). Consumers of tea had an average intake of Tea of at least 2 cups per week.

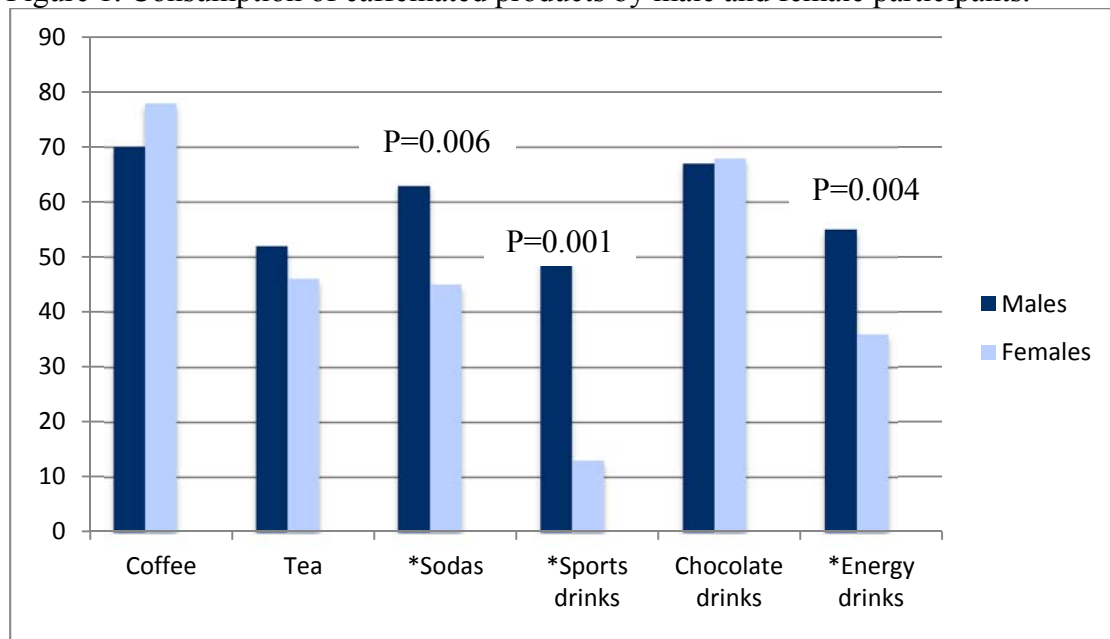
Soft drinks were significantly more consumed among male respondents (63%) than female respondents (44.6%; $p=0.006$) with an average of 2 to 4 cups per week. In contrary, sports drinks were only consumed by a minority of students (29.6%), mostly male participants. Significantly, 87% of female participants never consumed sports drinks in comparison to 51% of male participants ($p<0.001$).

Out of the 47% of participants who selected their average frequency of chocolate consumption, a total of 92.5% (n=98) including 95% of female respondents and 89% of male respondents, consumed chocolate during the previous year. The average frequency of consumption was divided almost equally between 2 to 4 chocolate bars per week and 1 bar a day.

An approximately equal proportion of each gender reported consuming chocolate-based drinks (67% and 68% of males and females respectively) with a frequency of at least one cup a week.

Almost one-third of total participants (41.5% of males and 29% of females) consumed alcoholic beverages of all kind in the previous year and 53% never consumed them.

Figure 1. Consumption of caffeinated products by male and female participants.



*Beverages of which consumption differs significantly between males and females.

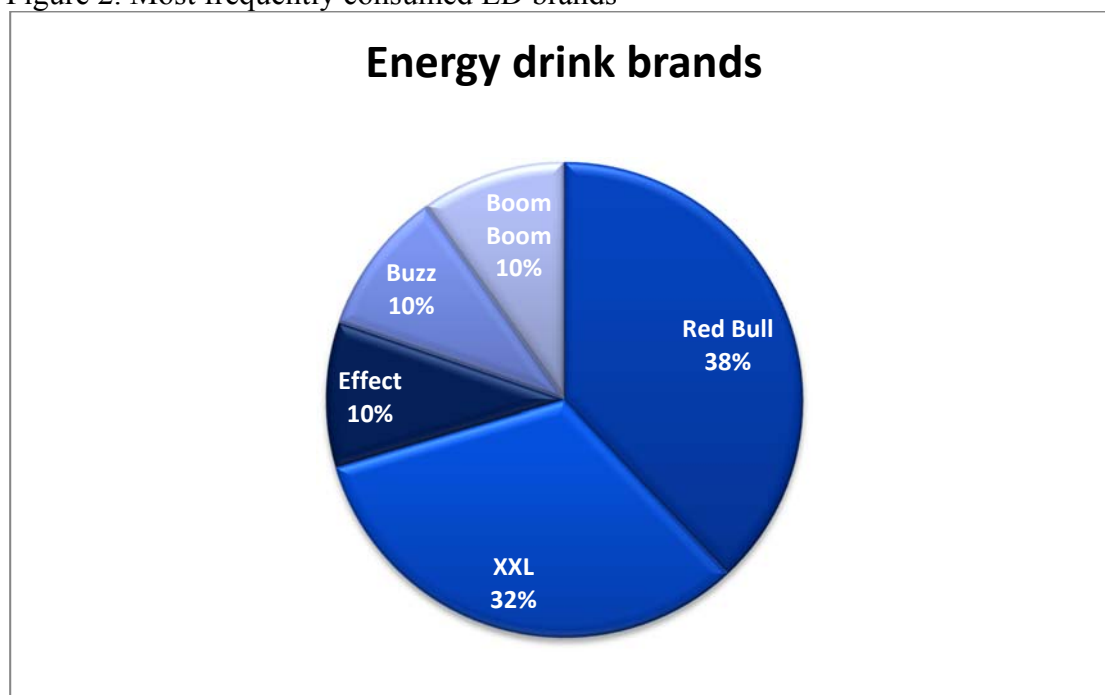
A total of 57% of study participants who reported alcohol consumption drank alcoholic beverages only when mixed with other drinks including juices, sodas and EDs. Around 28% consumed alcohol when alone as well as in mixtures, while 15% drank alcohol alone only. Of all the listed alcoholic beverages, beer (80%) and wine (73%) were the most frequently consumed by alcohol consumers.

3- EDs: prevalence and patterns of consumption

According to our findings, EDs are consumed by 45% (n=102) of participating university students. ED consumption was significantly higher in male respondents compared to females (55.2% vs 36.4% respectively, $p=0.004$). Among all those who ever used EDs, 54.7% consumed at least 1 drink each month of the previous year and were thus considered frequent consumers of EDs. Referring to the past year, ED consumption was found to be more frequent during the fall and spring semesters than during the summer. Around 51% of ED ever consumers drank at least one can of the beverage each month from October 2013 to May 2014. During the summer, EDs were consumed by around 28% of ED ever consumers. No differences of consumption frequency were seen between males and females during that period.

Red Bull and XXL were the most commonly consumed brands by male and female consumers of EDs as well as by students of AUB and LIU. However, XXL was significantly more consumed by males ($p=0.003$) while Red Bull was almost equally consumed by males and females. Figure2 represents the consumption of ED brands by AUB and LIU students.

Figure 2. Most frequently consumed ED brands



As revealed by consumers, EDs are mostly bought from gas stations' shops (29%) and supermarkets (24%). However, chi-square analysis showed that buyers from gas stations are significantly more likely to be males ($p=0.032$) and LIU students ($p<0.001$). During the past year, around one quarter of ED consumers, males and females equally, used these beverages mostly around exams rather than in weekends and during semester break, where male and LIU students are significantly the major consumers ($p=0.012$).

With respect to socio demographic characteristics of ED ever consumers and non-consumers, chi-square analysis revealed that ED users were significantly more likely to be males ($p=0.02$), physically active ($p=0.015$), and consumers of sports

drinks ($p < 0.001$), coffee ($p = 0.013$), and alcoholic beverages including beer, alcoholic juices as well as alcoholic sodas ($p < 0.012$). These findings are summarized in table 4.

Table 4. Differences between ED ever consumers and non-consumers based on socioeconomic, anthropometric & lifestyle factors (N=226)

Variables		ED ever consumers n=104	ED non-consumers n=122	X ²	P-value
Anthropometrics					
Age (yrs)		20.59±1.6	20.65±2.0		0.809
Weight (kg)		68.11±14.3	72.3±16.4		0.080
Height (cm)		170.9±9.6	172.9±8.8		0.190
BMI (kg/m ²)		23.2±3.6	23.8±3.9		0.303
Underweight/Normal		65 (66.3)	89 (74.2)	1.59	0.206
Overweight/ Obese		33 (33.7)	31 (25.8)		
Demographics					
Gender	Male	58 (56.9)	47 (37.9)	5.39	0.004
	Female	44 (43.1)	77 (62.1)		
Origin	Beirut	28 (30.0)	26 (23.0)	1.24	0.265
	Outside Beirut	65 (70.0)	86 (77.0)		
Income	Below 1000	18 (16.7)	18 (18.4)	3.16	0.367
	1000-1500\$	14 (14.3)	26 (24.1)		
	1500-2000\$	15 (15.3)	16 (14.8)		
	Above 2000\$	49 (51.0)	50 (45.4)		
University	AUB	57 (54.8)	62 (50.8)	0.36	0.550
	LIU	47 (45.2)	60 (49.2)		
Education	Undergraduate	94 (93.1)	115 (92.7)	0.01	0.924
	Graduate	9 (7.3)	7 (6.9)		
Yrs of study	Freshman	5 (5.0)	9 (7.3)	4.74	0.315
	Sophomore (1 st year)	21 (21.0)	25 (20.2)		
	Junior (2 nd year)	30 (30.0)	50 (40.3)		
	Senior (3 rd year)	34 (34.0)	28 (22.6)		
	4 th year or more	10 (10.0)	12 (9.7)		
Field of study	Health related	36 (36.4)	43 (34.7)	0.07	0.794
	Health related	63 (63.6)	81 (65.3)		
Hrs of study		16.4±11.9	13.7±12.5		0.102
Physical activity	Yes	73 (73)	71 (57.3)	5.97	0.015
	No	27 (27)	53 (42.7)		
Coffee	*Frequent	65 (63.7)	58 (47.2)	6.18	0.013
	Non frequent	37 (36.3)	65 (52.8)		
Tea	Yes	43 (91.5)	53 (88.3)	0.28	0.594

	No	4 (8.5)	7 (11.7)		
Chocolate drinks	Yes	34 (73.9)	37 (62.7)	1.48	0.224
	No	12 (26.1)	22 (37.3)		
Sodas	Yes	89 (87.3)	104 (83.9)	0.51	0.473
	No	13 (12.7)	20 (16.1)		
Sports Drinks	Yes	49 (48)	18 (14.5)	30.15	<0.001
	No	53 (52)	106 (85.5)		
Alcohol	Yes	44 (47.3)	34 (32.4)	4.60	0.032
	No	49 (52.7)	71 (67.6)		

Categorical variables are presented as N (%)

Continuous variables are presented as mean \pm sd

*Participants who drink ≥ 2 cups of caffeinated coffee per week are considered frequent consumers.

AmEDs were consumed by 46% of ED ever consumers. Most AmED consumers agreed that these drinks were "common" and that they help increase tolerance. However, consumers of AmEDs did not agree that the mixed drinks taste better than other alcoholic drinks nor are they the same as other mixed beverages. When asked to rate how important the stated reasons to consume EDs or AmEDs were, the majority of ED and AmED consumers found none of the reasons important.

However, the reasons that seemed more important than others for consumers to drink EDs were getting energy to study (47%), work (36%), and play competitive sports (35%). In addition, "not getting enough sleep" (20%) is another reason for ED consumption. In addition, the reasons that were revealed more important for consumers to drink AmEDs were to celebrate (47%), socialize (33.3%), relax and chill alone (20%) as well as to quench thirst (19%), "for the taste" (17%) and "because it's cheap" (16%).

The analysis of the question reporting the side effects experienced by participants after the consumption of EDs alone or mixed with alcohol showed that

half the consumers suffered from headache at least once following their ED or AmED consumption. In addition, a variety of mild to moderate symptoms were noticed by some consumers including increased heart beat (42%), jitteriness/ tremor/ shakiness (36%), dizziness (30%), anxiety/ nervousness/ irritability (29%), fatigue (27%), insomnia (19%) and nausea and vomiting (15%). And if they have ever taken any risky behavior following ED use, 13% of participants mentioned having got into a verbal or physical argument or fight while 10% noted not using a condom in sexual practices. Around 12% of all participating ED consumers required medical treatment at least once after drinking the beverage.

4- *Multivariate analysis*

Multivariate analysis was conducted to explore correlates of ever ED consumption including socio-demographic and lifestyle characteristics as well as other beverages consumption patterns. The logistic model examined the association of ever use of EDs with the independent variables: BMI categories (underweight/ normal and overweight/ obese), physical activity (active versus sedentary), alcohol consumption (users versus non users), sports drinks consumption (users versus non users) and coffee consumption (frequent versus non-frequent users) while adjusting for gender and age.

A Hosmer-Lemeshow goodness-of-fit test indicated a good fit ($\chi^2=4.614$, $p=0.798$) for this model. The Cox & Snell R Square and the Nagelkerke R Square showed that 16.8% to 22.5% of the variance accounting for ED use was captured. Adjusted odds ratios for the variables in the final model are shown in Table 5.

Table 5. Logistic regression analysis of correlates of ED consumption among participants, N=188

*Variables in the model		B	P-value	Odds Ratio	95% CI
BMI	Underweight/normal (ref) Overweight/ obese	.088	.817	1.092	.520-2.293
Physical Activity	Sedentary (reference) Active	.770	.033	2.160	1.064-4.383
Alcohol consumption	No (reference) Yes	.469	.171	1.598	.817-3.125
Sports drinks consumption	No (reference) Yes	11.449	.000	4.259	1.989-9.118
Coffee consumption	Non-frequent (<2c/week) Frequent (≥2c/week)	.833	.017	2.300	1.161-4.557

*Adjusted for gender and age
Nagelkerke R²:22.5%

The overall model found that physical activity, sports drinks and frequent coffee consumption to be significantly associated with ED use. That is, individuals who consume sports drinks were around 4 times more likely to consume EDs than those who do not consume sports drinks [OR 4.2, 95% CI (1.98-9.11)]. In addition, physically active participants were twice more likely to use EDs [OR 2.1, 95% CI (1.06 – 4.38)] than their sedentary counterparts. Moreover, ED ever use was twice higher in those who consumed caffeinated coffee greater than twice a week than those who consumed it less frequently [OR 2.3, 95% CI (1.16-4.55)]. According to the Nagelkerke R², the multivariate logistic regression model in this study accounted for

22.5% of the variance with regard to ED consumption. This means that 77.5% of variance accounting for ED use remains unclear. Therefore, more studies are needed to examine other variable contributions related to ED consumption.

For this same model, regression analysis was run for males and females separately. For male participants, the model explained 26.1% (Nagelkerke R²) of the variance in ever ED consumption. Sports drinks consumers were 6 times more likely to consume EDs than non-consumers of sports drinks [OR 6.17, 95% CI (2.36-16.13)].

For female participants, frequent coffee consumption remained a significant predictor of ED consumption, suggesting that female participants who consumed coffee more than twice per week had higher odds for consuming EDs [OR 4.33, 95% CI (1.5-12.5)]. Results are presented in Table 6 and Table 7 below.

Table 6. Logistic regression analysis of correlates of ED consumption among male participants, N= 90

*Variables in the model		B	P-value	Adjusted odds ratio	95% CI
BMI	Underweight/normal (ref)				
	Overweight/ obese	.247	.616	1.280	.488-3.360
Physical activity	Sedentary (reference)				
	Active	.729	.187	2.073	.702-6.119
Alcohol consumption	No (reference)				
	Yes	.394	.425	1.483	.563-3.908.
Sports drinks consumption	No (reference)				
	Yes	1.821	.000	6.179	2.367-16.132
Coffee consumption	Non-frequent (<2c/week)				
	Frequent (≥2c/week)	.173	.733	1.188	.441-3.203

*Adjusted for age
Nagelkerke R² :26.1%

Table 7. Logistic regression analysis of correlates of ED consumption among female participants, N= 98

*Variables in the model		B	P-value	Adjusted Odds ratio	95% CI
BMI	Underweight/normal (ref)				
	Overweight/ obese	-.222	.739	.801	.650-1.123
Physical activity	Sedentary(reference)				
	Active	.748	.131	2.11	.800-5.580
Alcohol consumption	No (reference)				
	Yes	.608	.221	1.836	.694- 4.855
Sports drinks consumption	No (reference)				
	Yes	.710	.307	2.033	.522-7.924
Coffee consumption	Non-frequent (<2c/week)				
	Frequent (≥2c/week)	1.467	.007	4.337	1.502-12.519

*Adjusted for age
Nagelkerke R²: 19%

A regression analysis exploring the association of AmEDs ever use with physical activity, sports drinks and frequent coffee consumption was performed, adjusting for gender and age. This model explained 14.2% (Nagelkerke R²) of the variance in ever AmED consumption. Similarly to ED consumption, users of sports drinks were 4 times more likely to consume AmEDs [OR 4.37, 95% CI (1.405-13.60)] and male users in particular had 7 times higher odds for drinking AmEDs than males who don't consume sports drinks AmEDs [OR 7.45, 95% CI (1.357-40.908)]. Analysis could not be performed among female participants because of the small sample of female AmED and sports drink consumers. A summary of the results is presented in Table 8 and Table 9.

Table 8. Logistic regression analysis of correlates of AmED consumption among all participants, N= 128

*Variables in the model		B	P-value	Adjusted Odds ratio	95% CI
Physical activity	Sedentary(reference)				
	Active	.709	.230	2.032	.638-6.470
Sports drinks consumption	No (reference)				
	Yes	1.475	.011	4.371	1.405-13.602
Coffee consumption	Non-frequent (<2c/week)				
	Frequent (≥2c/week)	.354	.538	1.424	.462-4.392

*Adjusted for gender and age
Nagelkerke R²: 14.2%

Table 9. Logistic regression analysis of correlates of AmED consumption among male participants, N= 64 (adjusted for age and BMI)

*Variables in the model		B	P-value	Adjusted odds ratio	95% CI
Physical activity	Sedentary(reference)				
	Active	.165	.836	1.180	.247-5.636
Sports drinks consumption	No (reference)				
	Yes	2.008	.021	7.451	1.357-40.908
Coffee consumption	Non-frequent (<2c/week)				
	Frequent (≥2c/week)	-.026	.974	.974	.203-4.660

*Adjusted for gender and age
Nagelkerke R²: 23.4%

B- Findings from FGDs (Qualitative study)

A total of 29 subjects volunteered to participate in the FGDs. All participants were AUB or LIU students aged between 18 and 30 years old and consumed EDs at least once a month. Six focus groups were conducted with an inconsistent number of participants in each group: two focus groups included nine participants each and the other groups included four or less subjects each. Due to failure of some participants to

show up on the days of the scheduled FGDs, the research team decided to still conduct the discussion even when the number of participants is less than the previously intended one. Focus groups were stratified by university and gender.

The FGDs involved two tools of data collection. Initially, socio-demographic and lifestyle information as well as participants' ED consumption patterns were obtained utilizing a short 16-items questionnaire. Then, discussions were conducted and field notes were taken. A focus group script of 12 questions was used during the discussions.

1- Socio-demographic characteristics of consumers and ED consumption patterns

The characteristics of the respondents are summarized in Table 8. The sample included 52% females and 48% males. The respondents' average age was 20.8 years and the majority of them (86%) were LIU students. The participants had almost all a healthy body mass index ($22.6 \pm 3 \text{ kg.m}^{-2}$), however the average BMI for males ($24.5 \pm 3 \text{ kg.m}^{-2}$) was on the upper limit of the acceptable range which differed significantly ($p < 0.001$) from females' BMI ($20.7 \pm 1.8 \text{ kg.m}^{-2}$).

One quarter of the participants were graduate students and the others were undergraduate, divided almost equally between health related and non-health related fields of study. Most of the participants (76%) lived with their parents who were mostly with a university-level education.

Around 69% of the participants did not have a job; however, of those who worked 78% are females. As for the personal income, around 80% of respondents had an income of 500\$ per month or less. Around 62% of participants were physically active, 59% were smokers and 65% had irregular sleeping habits. In average,

participants had a moderately stressful life, rated 6.3 in average, on a scale of 1 to 10.

In total, participants were equally trying to either lose or gain weight during the current period of the study. Characteristics of FGDs' participants are summarized in Table 10.

Table 10. Socio-demographic, anthropometric and lifestyle characteristics of participants of the FGDs, N=29

Variables		Mean ± sd	
Anthropometrics			
Age (yrs)		20.8 ± 2	
Weight (Kg)		1.69 ± 0.09	
Height (cm)		66.5 ± 14.7	
BMI (kg/m ²)		22.6 ± 3	
Variables		N	%
Socio-demographic characteristics			
Gender	Male	14	48
	Female	15	52
University	AUB	4	14
	LIU	25	86
Education level	BS	21	72
	Higher education	8	28
Field of study	Health-related	13	48
	Non-health related	14	52
Living with	Parents	22	76
	Friends	6	21
	Alone	1	3
Father's education	Not educated	2	7
	Elementary	2	7
	Middle	4	14
	Secondary	5	17
	University	16	55
Mother's education	Not educated	0	0
	Elementary	2	7
	Middle	7	24
	Secondary	7	24
	University	13	48
Lifestyle			
Work	No	20	69
	Yes	9	31

Average working hours/ week		14 ± 8	
Personal monthly income	≤500\$	23	79
	500-1000\$	6	21
Crowding index		1.1 ± 0.5	
Physical activity	No	11	38
	Yes	18	62
Smoking	No	11	40
	Yes	17	59
	I quit	1	3
Weight management	None		
	Trying to lose weight	6	21
		9	31
	Trying to gain weight	5	17
	Trying to maintain	9	31
Sleeping habits	Regular	10	34.5
	Irregular	19	65.5
Stress level		6.3 ± 1.5	

Categorical variables are presented as N (%)

Continuous variables are presented as mean±sd

Regarding the frequency of ED consumption, participants were equally divided between those who drink a maximum of 2 cups per month and those who drink at least once a week. Significantly, males had a higher frequency of ED consumption compared to females ($p < 0.001$). Around 34% of participants consumed alcohol, of which 60% consumed AmEDs. Half the consumers of AmEDs drank them once a week, while the other half consumed them more frequently. These results are summarized in Table 11.

Table 11. Frequency of ED and AmED consumption among FGD participants

Variables		N	%
Frequency of ED consumption	≥2cups/month	14	50
	≥1 cup/week	13	46
	≥1 cup/day	1	4
Alcohol consumption	No	19	65.5
	Yes	10	34.5
Frequency of alcohol consumption	None	3	30
	1 cup/week	3	30
	2-3 cups/week	2	20
	5-6 cups/week	2	20
AmEDs consumption	No	4	40
	Yes	6	60
Frequency of AmEDs consumption	1 cup/week	3	50
	2-6 cups/week	2	33
	≥1 cup/day	1	17

2- Thematic analysis results

The focus group script was developed in the purpose of answering specific topic areas selected by the research team based on the findings from the quantitative component of this study and other research in the literature (Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014):

Topic 1: knowledge of participants about EDs' content

Topic 2: reasons for ED use

Topic 3: factors influencing ED choices

Topic 4: the impact of marketing on ED consumption

Topic 5: perceived effects and benefits of EDs

Topic 6: perceived risks and experienced side effects of EDs

Topic 7: facilitators and barriers to ED consumption

Thematic analysis of the six FGDs lead to the identification of twelve key themes within these topic areas, related to the perceptions and attitudes of participants towards EDs. The identification of themes did not result from the direct answers of participants to specific questions asked by the moderator, because themes were reiterated during the conversation when discussing different aspects of the subject at hand. The cross-cutting themes that emerged within each of the six conducted FGDs are presented below according to main topic areas, with illustrative quotes representing participants' thoughts and opinions.

a- Topic 1: knowledge of participants about EDs' content

All six focus groups discussed what EDs were and the different ED brands participants had either used or seen. In response to the first question asked by the moderator about the meaning/ definition of EDs and their major ingredients, participants shared their knowledge and beliefs.

i- Theme 1: Misconceptions and lack of knowledge

When asked about what the main ingredients in EDs were, many male participants readily identified caffeine and sugar. Few participants identified ginseng and taurine and some others mentioned acids, electrons, artificial colorings as key ingredients of EDs. Only one out of the fifteen female participants identified caffeine as an ingredient excessively present in EDs, while most of other female participants recognized sugar combined to water as the major component. Female participants attributed the stimulant effect of EDs to their sugar or taurine content. Very few

consumers of EDs ever tried to read the ingredients on the can or did a research about the drink. Only those who researched over the internet were able to give the most accurate information about the content of energy beverages.

"Taurine is the ingredient that wakes you up, but taurine is good..it only depends on how much your body can handle" (female, LIU)

"...because they say it's not good, I decided to do a research and know what's inside... it has around 1000mg of taurine which is a natural amino acid related to happiness and has about 80mg of caffeine...I'm not sure about the other ingredients" (male, AUB)

Six out of 29 participants had no idea about EDs content while few identified some random and awkward substances such as "vanilla", "torbin", "mice's urine", "an ingredient related to the Mad Cow Disease" and "bulls' sperm and testosterone" to be ingredients of EDs.

"...there are other things in Boom Boom and those EDs, I'm not sure about them but things related to the mad cow disease" (female, LIU)

"There are very bad things inside, I heard something about bulls' sperm or something like that" (female, AUB)

"It has the sperm of cows or horses"(male, LIU)

There was some confusion among participants about whether the caffeine content of EDs was high or similar to that in regular coffee.

"Every can of EDs is equal to 4 cups of coffee" (male, LIU)

"Red Bull for example has 80mg of caffeine...so why not using it as an alternative to coffee" (male, AUB)

b- Topic 2: Reasons of ED consumption

The average age for the first use of EDs was around 15-16 years old in both males and females. Most participants consumed EDs with friends (gathering, party, beach, etc) for the first time. Few subjects consumed them without a company.

ii- Theme 2: Getting energy to study and play sports

When asked to define an ED and what it means to them, many participants rushed into answering spontaneously that EDs mean "nothing" to them, that they are common drink used for fun just like regular sodas and juices and that they can just stop using them whenever they want. Some of these same respondents had a contradictory opinion later on and mentioned that EDs provide "energy" and give them a "boost".

The most common reason given by participants to try EDs for the first time and to regularly use them after that was to "get energy" or "stay awake/ alert" to study, work or play sports. Most of participants agreed that EDs are the only alternative when coffee does not make any effect. Also, some indicated that no beverages but EDs are able to help them when under stress. Participants explained the concept of "energy" in many different ways. When consumed while studying, EDs do not only allow the consumer to stay awake but also help him study more and

assimilate better, unlike coffee. Similarly, EDs can give a physical "boost" to the body and allow the consumer to play sports even when very tired after a long day of work.

"You will take anything when you need to stay awake" (female, LIU)

"Sometimes I want to stay awake to study and coffee doesn't do the job so I take an ED that keeps me up" (male, LIU)

"Honestly, EDs are very important. To study for example, for those who have no time in the morning and need to stay up late at night to study" (male, LIU)

iii- Theme 3: Impact of peer pressure and social image of ED consumers:

Some participants highlighted the fact that EDs do not have a specific effect on them, but that they are "casual" drinks to use when chilling out or partying with friends. Some participants attributed their first drink to the encouragement of friends and others mentioned they had no other choices, because soft drinks and fruit juices were not perceived as an acceptable alternative. In addition, when having friends over, serving EDs or mixing them with alcohol is the trend that pleases guests.

"I drank it once, then for a long time I didn't, until I came to university... In university you hear more about it (ED), everybody here nags about being up all night" (female, AUB)

"My friends were all drinking the vodka ones so I tried the non-alcoholic one" (female, AUB)

"If your friends are coming over, you cannot serve tea or orange juice. These days, 70% of people like EDs, you cannot but have them at home" (female, LIU)

When asked about what they would do to a friend who refuses to have an ED while all the others are drinking in a group gathering, participants' quick answer was "nothing". However, when other responses were shared, the majority of male participants agreed that they would rather encourage that person to share a drink with them, unless the abstainer has a health condition that prevents him/her from having an ED. Some female participants reported having experienced that situation when "they" were the person refusing to drink and how the group pressured them to go with the flow. Few male participants and most of female participants explained that they would always respect the choice of others and would probably praise their decision because they are convinced that EDs are not healthy.

"Of course at first I would tell him "come on man, we're all drinking!", but if later I feel that he really has a valid reason not to drink I won't push him to drink. Like once my friend was taking antibiotics and he refused to drink, so in that case of course I won't encourage him to drink" (male, AUB)

"No I don't say anything...I would tell him: take a sip, just a little sip" (male, LIU)

"No, this is not of my business...I tell him: try it, I was like you I didn't like it at first but now I'm attached to it" (male, LIU)

Participants' opinions about ED consumers were divided into different points of view. All female participants had one common opinion about guys who consume EDs: they do not attract or impress them in any way, although guys do actually feel themselves "cool", "different" and "special" when they "walk with" their ED can in

the hand. It was obvious how females discussed that matter with much sarcasm, showing that they are aware of guys' intentions but that they don't get impressed.

"Guys are addicted, they live the moment, they really think like they have wings, that they're important" (female, LIU)

"Holding this Red Bull all the day...like telling everybody 'hey I have wings'. No, they don't attract me!" (female, LIU)

"The one who drinks it may feel like he's cooler but I don't think that others look at him that way just because of the ED" (male, LIU)

"let them(guys keep thinking what they think (sarcasm)" (female, AUB)

While some male respondents recognized that the feeling of being "powerful" and "more attractive" to people, may be all in their heads, few male participants had a different thought. Those confessed that the brand of ED consumed by a subject can reflect on some characteristics of his personality such as his taste or even his socio-economic status. For instance, if someone is drinking Boom Boom which is cheaper than Red Bull, then he might be of a lower socio-economic status.

"When I see someone walking in the university with a Red Bull not during the reading period, why? And in the afternoon! ...It's kind of a way to say yes I'm that kind of person, I buy Red Bull!"

"It's effective to people...I mean the view is effective, when people see you drinking, it's attractive" (male, LIU)

"First I look to what brand he/she's drinking, I think you can tell to what socio-economic level he/she belongs from the ED can" (male, LIU)

A number of participants thought that consuming EDs is a totally normal behavior that does not give any special feeling to the consumer or a particular impression about him.

"It is like coke and orange juice, the difference is that you don't drink it with food" (male, LIU)

"It's just normal, it depends on the context. If I see someone around AUB (drinking ED), I'd know it's for studying or it's someone who probably works all night...if it's in a public place for example, it's for the fun of it" (female, AUB)

When male participants were asked about female ED consumers, the majority responded they find it "normal" only when it is not alcoholic. The image of a girl drinking AmEDs in a public place was not appreciated by most of the guys and it was not perceived as an "adequate" behavior. One participant highlighted that on a personal level, he doesn't like to see a girl "walking with the can" although he finds it perfectly normal for her to drink the ED while sitting with a table in front of her. Another male participant explained hesitantly, that a girl holding an ED may catch his attention because it gives him the impression that she is "mature" or "confident".

"Alcohol in public places? No, this is very inappropriate" (male, LIU)

"A girl holding an XXL can I public? It's ugly, I don't like it" (male, LIU)

"When it's a girl, obviously it would catch my attention. It makes me think that she's a girl that knows what she wants, has a set of special lifestyle and euh.. maybe I'm generalizing, maybe I'm wrong but the girls I know are..euuh I don't know if "mature"

is the right word, maybe they have a higher level of maturity..I don't want to use maturity because it's not maturity..maybe they're more "confident", they know what they do and what they want"(male, AUB)

iv- Theme 4: Taste as a reason for ED consumption

Few participants responded that EDs had no significant physiological effect, and that the only reason for using them is for their good taste, the feeling of freshness they provide and to have fun. However, many female participants underlined the fact that EDs taste really bad and can even induce bad breathe in those who consume them frequently, but that they still drink them for fun.

Some of the consumers of AmEDs insisted that their consumption of EDs is only related to their consumption of alcoholic cocktails and that they wouldn't consume EDs if they weren't just added to their cocktails to make them taste better. Taste was also found a strong factor to consider when preferring one brand over another one.

"EDs do not mean that much to me, I drink them for the taste" (male, LIU)

"I drink alcohol a lot. I recently discovered that EDs are added to the cocktail I consume and that I've been taking EDs without knowing it" (female, LIU)

c- Topic 3: Factors influencing ED consumers' choice

v- Theme 5: ED branding and reputation

Red Bull was reported to be the most commonly used EDs by the majority of male and female respondents. To some participants, Red Bull is the definition of an ED. It was the first brand marketed in Lebanon and is still the most famous one. The

majority of participants agreed that being an international brand, Red Bull has a better reputation than other local brands such as Boom Boom and Buzz. Many participants explained that Red Bull has the same taste as other cheaper brands, but that they won't replace it because they feel it is "clean" and "safe". Very few participants admitted that when the taste is the same, they wouldn't buy Red Bull which is more expensive, just for its name and reputation. However, others think that brands that are cheaper, have definitely a lower quality and they won't be taking the risk of trying them.

"Red Bull we know it..it's Red Bull! The others I didn't try them" (female, AUB)

"Red Bull has been here for a very long time, you know it's a big company, they're not gonna cheat with the quality" (male, AUB)

"A lot of people won't admit buying the cheaper ED because of the price. But actually, it has the same taste, they would buy 2 for the price of 1!" (female, LIU)

"In Lebanon we know how much they cheat and fraud, I might not be tempted to try Lebanese brands" (female, AUB)

vi- Theme 6: Consumers' perceptions of AmEDs

Alcohol was a recurrent theme in all of the six focus groups and was mentioned many times during different parts of the conversation. For people who don't consume alcoholic beverages, "alcohol" was an important factor to consider when choosing one specific brand. Moreover, non-alcoholic EDs were considered as alternatives to alcoholic drinks, according to some females and few males who do not consume alcohol. To them, ordering soft drinks or juices does not make them feel comfortable when others are consuming alcohol. EDs are better choices in this case.

"I know I can live without it since I don't drink it for the energy, but when I go out, I don't want seven-up so I take Red Bull. Usually that's what happens" (female, AUB)
"The first time I drank it, it gave me joy, I don't drink alcohol so it was like an alternative to me" (female, LIU)

"If someone does not drink alcohol, I recommend him/her an ED" (female, LIU)

For some of those who consume alcohol, cocktails containing a mix of EDs and alcohol, not only taste better than alcohol alone but are also safer. Participants agreed that when they add EDs to their alcoholic beverage, they are more likely to stay alert and awake which makes them feel more comfortable driving back than if they consumed alcohol alone. However, when the health implications of mixing EDs with alcohol were discussed, these same individuals expressed their objections to the fact that EDs are added to alcohol and served without prior notice, explaining that the consumer does not really have the choice.

"If I haven't slept all night, I think that I wouldn't drive without an ED (I prefer to take ED, than to be sleepy and drive without it)" (female, AUB)

"I used to work in a place where most of alcoholic cocktails contained EDs. We don't usually tell the clients that the beverages have EDs" (female, LIU)

d- Topic 4: The impact of marketing on ED consumption patterns

vii- Theme 7: Influence of advertisements on ED consumption

One of the key influences on participants' ED consumption discussed in the focus groups was advertisements of these EDs across various media types.

Participants readily recalled ED advertising slogans and campaigns. The majority of participants liked Red Bull ads and described them as "different", "strange", "smart" and "catchy". These advertisements were also known for their small stories or dialogs presented by the little "Red Bull" cartoon character and are always concluded with the same slogan: "Red Bull gives you wings". All consumers and non-consumers of Red Bull easily recalled the slogan as it is said in the TV ad in its English and Arabic versions. Other slogans were also remembered during the discussions such as "خلي الجو ولعان" (keep it on fire), for a local ED brand.

Male participants mostly recognized ED ads that included sports and remembered their content in details. However, females only talked about funny ads that included singing and dancing and considered them humorous and entertaining. Advertisements that hosted celebrities were also "catchy" in the eyes of ED consumers. However, it's only when the celebrity is "their preferred one" that the ad did truly influence them. All participants seemed aware of the marketing strategies the advertising is using to target them as "young adults". Many of them admitted trying EDs for the first time after being exposed repetitively to these advertisements.

However, there is a small group of participants who found that EDs were too frequently advertised on Tvs, radio stations and billboards which turned to be annoying especially that in their opinion, only a limited number of brands were making relevant ads while others were "intrusive".

When asked about what they dislike about ED ads, "exaggeration" was a common word expressed by almost all focus groups respondents. However, many participants seemed hesitant about their opinion; for instance, participants from different groups eloquently expressed their admiration to the Red Bull slogan "gives you wings" then aggressively criticized it when talking about what they hate about the ad.

"Everytime there is a new one (ad), we want to see it" (female, AUB)

"It sticks to you because they're smart, like Red Bull we remember it since we were kids we grew up hearing them" (female, AUB)

"I think the ads are just silly, really irrelevant...they have nothing to do with the drinks, the repetition is just what sticks in your head" (female, AUB)

"I really like them, one of the reasons for me to like Red Bull is the advertisement. What I like is that they make you believe that you can do better just by drinking ED. I don't personally believe it but the ads are nice" (male, AUB)

"I'm influenced by the ads, most of the times I buy it just to get, I only sip a little bit" (female, LIU)

"I'm annoyed by the exaggeration, like "it gives you wings"! It doesn't give anything [frustrated]" (male, LIU)

"I like the one where the guy is at the gym and all the girls are looking at him, I searched for it on youtube but didn't find it" (male, LIU)

e- Topic5: Side effects of EDs and AmEDs

viii- Theme 8: Perceived risks and experienced adverse effects from the consumption of EDs and AmEDs

Not all participants were aware of the possible adverse effects resulting from the consumption of EDs. Some had no idea about any side effect while others knew

and heard about a number of symptoms but attributed them to specific consumption patterns including consumption of AmEDs, very frequent consumption of EDs, consecutive drinking of coffee and EDs, subject's health issues and/or predisposition and drinking before or after physical activity. The majority of male respondents believed that any side effect of EDs is a long term potential while females assumed it was all a matter of frequency.

"AmEDs have side effects, many of my friends had some problems but the regular one [without alcohol] no, maximum it can cause stress" (male, LIU)

A defensive attitude was noticeably depicted among participants when discussing this issue. Respondents considered that all the foods and beverages they consume as well as their lifestyle have undesired implications on their health and that EDs cannot be the most harmful. Few possible side effects of EDs were known by the participants, mostly tachycardia, nervousness and shakiness. In three out of six focus groups, participants mentioned a story about a university male student who was dead after the consumption of an ED. The details of the story were not consistent as some respondents reported that the reason of death was not EDs but other supplements/substances the young student was taking for his bodybuilding training and that may have interacted with the ED.

"I didn't hear about anyone who suffered from side effects, but I guess that anyone who has heart problems, any stimulants including EDs will cause him side effects" (male, LIU)

"My friends shake when they drink a lot, like everyday. I never felt anything, I don't drink a lot" (male, LIU)

During the discussion about experienced side effects of EDs, almost all participants repeated constantly they were not frequent consumers of EDs and were therefore not affected by their side effects. However, "frequent consumption" was not defined nor discussed by the group, thus participants' evaluation of their own consumption was totally relative to their subjective perception of frequency. Moreover, most consumers answered they haven't personally experienced side effects after the consumption of EDs. Nevertheless, among these same respondents, many mentioned having felt dizzy, stressed out and nervous as well as having experienced increased heart rate and shakiness but to them, those were not "significant" side effects. Most of participants who reported adverse effects after the consumption of EDs, explained that those were very rarely experienced, mostly after the first couple of time consumption and that they were most probably caused by a combination of causes rather than by the exclusive consumption of EDs.

"You can feel you're hyper, like it's not you, but it happened like the first two times, later it became like normal I guess" (male, AUB)

When talking about their personal experiences, some participants tended to report their symptoms in a funny indifferent way, showing that these were very mild while others simply did not consider "what they felt" as noticeable and shouldn't be concerned about.

"I have experienced fast heart beats, but it not because of EDs. That time, I drank a lot of coffee besides EDs" (male, LIU)

"You start to laugh for no reason, but this is maybe due to the lack of sleep" (male, LIU)

"Once I drank four cans, but I felt nothing I slept normally. I may have felt dizzy..." (male, LIU)

Few female participants reported having experienced a disturbed menstrual period that was attributed by their health practitioner to their ED consumption even when it was taken less than twice a month.

"When I drink Boom Boom while smoking water pipe, I feel my heart beats increasing" (female, LIU)

"Once I took it before the exam and I couldn't write, the pen was shaking in my hand, I lost control on my extremities and it was so awkward that it happened from a onetime consumption" (female, LIU)

"Once I lost count of how many I was drinking, I felt my heart beating fast and couldn't sleep all night" (female, AUB)

"My cousin was a very frequent consumer and had amenorrhea. The Dr. told her she should stop. Now I have problem with my period so I'm worried it's because of it" (female, LIU)

EDs perceived and experienced side effects were not conclusive to a number of participants, particularly males. When asked about what may drive them to stop consuming EDs, the majority of male respondents needed more evidence that proves EDs were really harmful to their health. When discussing some EDs-related deaths, some participants reported having decreased their consumption after the story was

published only to go back to their usual consumption habits after a while, when the story was no more spoken about. Female participants however, showed more concern about the subject and were more serious and tensed while talking about it.

"I may stop if a family member dies because of it" (male, LIU)

"No, I don't consider stopping EDs, their side effects aren't that serious" (male, LIU)

f- Topic 6: Other perceived effects of EDs

ix- Theme 9: Psychological effect:

Almost half the participants mentioned many times during the FGDs that the effects of EDs are psychological. They described EDs as "placebo" because their effect was not consistent; consumers can get the feeling and effect they want from an ED only if they have that idea in mind. They never felt or experienced any of the effects they hear about in the media or by their friends. Sometimes, the effect is only felt after the first two consumptions then "the body gets used to it" otherwise consumers should increase their drinking frequency so they can get the same energy. Even participants who used EDs to get energy for weight lifting or training admitted that the drink did not actually help them lift more weight or perform better.

"EDs mean nothing to me, I drink them because I like their taste and I think that they don't even provide energy, it's all psychological" (male, LIU)

"I used to drink them before my training, I never felt more energetic and I know it would be the same if I drink water instead, but I don't know...I feel like I want to drink something, it's psychological" (female, LIU)

However, other participants insisted that EDs can really provide all the marketed physiological effects including physical and mental stimulation. Some also noted that specific brands of EDs are healthier than others, and can be safely used by athletes or people who have diarrhea, because of their minerals content.

"Red Bull is good...in its ingredients, it has a high concentration of ions, and athletes can take it! Even someone with diarrhea can take it, once a week is fine" (female, LIU)

g- Topic 7: Facilitators and barriers to ED consumption

Many male and female participants repeatedly mentioned the word "addiction/ dependence" throughout the conversation. More females than males were trying to explain they were consumers by coincidence because EDs are added to their alcoholic cocktails, that EDs do not "mean" to them and that they can just stop them anytime. Females tended to continuously defend themselves as if they were "accused" of consuming EDs. In some of the groups, few keywords usually used when referring to illegal drugs/ substances were used for EDs, such as:

*"I drink Boom Boom, I never **used** the other ones"* (meaning lost in translation)

"أنا بشرب بس بوم بوم، الباقيين ما بتعاطاهن"

"Males who drink Red Bull...addict" (meaning lost in translation)

"الشباب اللي بيشربو RedBull..إدمان!"

None of the respondents admitted being addicted or dependent on EDs. However, some of them unconsciously confessed in many parts of the discussion that

they were actually dependent on EDs. Whether to be able to stay awake and focused or to get energy to study, to work or to play sports, consumers found themselves "obliged" to use an energy beverage because no other drink was able to give them the same effect.

Moreover, when asked about whether they usually keep ED cans in their fridge or only buy them before consumption, only few participants answered that they always keep at least one can while the others said that there was no need for that, since EDs were readily available everywhere and can buy them anytime. Some participants were more honest about this subject and explained that they actually intend not to keep EDs in their fridge because they will eventually drink them as soon as they see them there.

"No, I don't keep ED cans at home. As long as they are there, I will drink them so I prefer not to have them" (female, LIU)

"I keep them away from me. Otherwise, I would drink one in the morning and one at night" (male, LIU)

"Aren't there any alternative? A vitamin, a juice, anything? We want an alternative!" (female, LIU)

When asked if they would ever think about stopping EDs, few participants readily gave an affirmative answer while others had different opinions. Some participants reported that the idea of stopping EDs never crossed their mind because their consumption was not frequent and that they've never suffered from any side effect. Others explained that they may think about stopping only if they felt serious

symptoms or if their health got severely affected and that they made sure it was caused by the consumption of EDs.

"I'm feeling sick because of it, but I told you, it's my lifestyle, I have to be always awake and alert, I have work after university and I sleep only for 1 or 2 hours...did you get my point? I'm also diabetic and I know I'm hurting myself but let them invent an alternative, something good something healthy!" (female, LIU)

"Yes, the idea comes to my mind (to stop EDs) but...in finals and before exams it's difficult because I'm used to it!" (male, AUB)

"If the shakiness increased and I made sure it was because of EDs, I may stop drinking them" (male, LIU)

"Until now, I didn't hear about the evidence of its harms. If I see proofs of its side effects, I may stop or not" (male, LIU)

"If I get hospitalized because of it, I may think about quitting EDs" (female, LIU)

x- Theme 10: Parental influence

Lack of knowledge was also noticed among parents of consumers, as reported by the participants. According to participants input, parents were against their children consumption of EDs but that was not particular to EDs as they are also against soft drinks, fast foods and other unhealthy foods and beverages. Few parents were not aware of any risks related to the consumption of EDs, based on participants' input, because they were consumers themselves.

"My dad always consumes EDs, he drinks more than I do and mom keeps telling us to reduce our intake..she never drinks EDs" (male, LIU)

"At first, consuming EDs was a catastrophe [to my parents], now it's no more a big deal" (male, LIU)

"My mom drinks from my can so little is left for me to drink" (male, LIU)

"My mom reads a lot and makes my life complicated. The first story she told me is that Red Bull increases cholesterol. Later I knew that it does worse than that [cholesterol]" (female, LIU)

"After all these years you want me to tell them I drink Red Bull?! It's not that I do it in secret but I try to avoid listening to their [parents] lessons and stories, so whenever I want to drink EDs I do it outside" (female, LIU)

xi- Theme 11: Affordability and accessibility

Most participants considered that prices of EDs are affordable since they are comparable to the prices of juices and soft drinks.

Participants discussed how the price, ease of access to EDs and their availability are factors that facilitate their consumption. All participants mentioned that they don't have to go to specific places to drink EDs because all shops, restaurants, pubs and night clubs sell them. Interestingly, participants admitted the importance of using caution labels on EDs to warn consumers from their side effects and inform them about the upper limit intake, setting clear guidelines for the consumption of EDs, limiting the points of sale of EDs and AmEDs particularly to specific shops, supermarkets or pharmacies. However, few male participants were against any type of regulations as they considered that the consumption of EDs is a personal choice. These participants added that the action that should be taken if any is maybe an awareness campaign about EDs. Many participants had little hope that any of the suggested regulations could possibly work in Lebanon.

xii- Theme 12: Regulation of ED purchasing and consumption

When asked if they have ever heard about any regulation regarding EDs in Lebanon, only few participants remembered having heard that AmEDs may be banned. And about their opinions regarding ED policies, the majority admitted it was a necessity. Participants did not suggest that EDs should be banned but were rather interested in having a regulation of their sale, purchase, marketing, packaging and storage.

Age was repetitively mentioned within the focus groups; however significantly more discussion surrounding the suitability of EDs for children was conducted in the females group. The potential dangers of children consuming EDs and the health impact that they could potentially have was emphasized. Females underlined the necessity of an age limit to purchase EDs and mentioned the impact of advertisements on children and adolescents, suggesting a regulation of the timing of TV ads well as of their content.

"They [government] should specify a legal age for ED consumption and give a notice to the sellers" (male, LIU)

"It annoys me when they use in their ads small cartoons characters that are appealing

"What they could do is maybe reduce the number of advertisements and maybe the timing of advertisements maybe not to put them a lot during the day, maybe to put them at night for older people" (female, AUB)

CHAPTER V

DISCUSSION

This mixed-methodology research used in this study allowed for exploring the correlates and patterns of consumption of caffeinated EDs among university students in Beirut-Lebanon. Furthermore, this design allowed for the examination of the attitudes of Lebanese young adults towards EDs and their perception of EDs' benefits and harms through FGDs. Results from the quantitative and qualitative components of this study are discussed in this chapter.

A- Consumption of ED and AmED among Study Participants

This study revealed that Lebanon is following the same trends of ED consumption as those observed in other countries among a similar age group (Malinauskas, Aeby et al. 2007, Buck, Dixon et al. 2013, Ibrahim, Iftikhar et al. 2014). In this study, 45% of participating university students ever consumed EDs. This result is in agreement with other studies that determined the prevalence of ED consumption among young adults. A cross-sectional study conducted on 4th year university students in Hacettepe University in Turkey (Attila and Cakir 2011) found that 48% of participants were ED consumers. Another survey observing drinking patterns among college students in the United States (Malinauskas, Aeby et al. 2007)

showed that 51% consumed at least one ED per month. However, the prevalence of ED consumption found in the present study is slightly lower than those reported in several investigations conducted on university students in Arab countries including Lebanon (Itany, Diab et al. 2014), KSA (Ibrahim, Iftikhar et al. 2014), and UAE (Jacob, Tambawel et al. 2013).

This study was the first to estimate the prevalence of ED consumption during different seasons of the year and across different academic semesters. When participants were asked to reflect on their ED consumption during the past year, ED use was found to be more frequent during the fall and spring compared to the summer months. Initially, a higher frequency of consumption was expected to occur during the summer since EDs are frequently used while partying (Attila and Cakir 2011). However, findings from this study suggest that ED use among university students has probably a strong association studies, delivering projects, and exams among other academic tasks that are more intense during the regular academic year compared to summer months.

In the present study, consumption of EDs was reported to be significantly higher among males compared to females and this was in line with findings from the literature (Bawazeer and AlSobahi 2013, Ibrahim, Iftikhar et al. 2014, Itany, Diab et al. 2014). A possible explanation for the higher intake of EDs among males is that they are the primary target of EDs advertisements (Miller, McKinnon et al. 2013). According to a study by Bunting et al., few international ED brands are actually developing "girly" versions of their original drink that is customized in terms of name, color, design, flavor and advertisement to target females exclusively, in an attempt to

increase ED consumption among them. Similarly, the current marketing strategy observed in the Lebanese advertisements of local ED brands is carefully trying to involve both males and females. Different versions of the same advertisement are being marketed in order to target both genders that appear to drink EDs in normal situations of their daily lives.

The trend of consuming AmEDs is not less prevalent among university students. In the present study, 46% of ED consumers were also users of AmEDs. This result is in line with a number of studies from the United States (Malinauskas, Aeby et al. 2007), Italy (Gallimberti, Buja et al. 2013) and Turkey (Attila and Cakir 2011) that showed that around half of the consumers of EDs do consume them mixed with alcohol. Itani et al. also confirmed our result, where 50.5% of the surveyed Lebanese youth combined alcohol with EDs. Given that the majority of participants (60.2%) were school students aged less than 18 years old in that study, ED and AmED consumption was expected to be less prevalent than in the present study (Itany, Diab et al. 2014). Studies on EDs conducted in Islamic Arab countries, did not investigate the consumption of AmEDs, as alcoholic beverages of all kind are banned by laws abiding by religious norms.

D- Reasons and consequences of EDs and AmEDs consumption among Study Participants

1- Reasons of ED consumption:

According to the surveyed university students in this research, one of the most important causes behind the consumption of EDs was to "get energy to study", which was reported by almost half the consumers. Additional common reasons were "getting energy to work" (36%) and "not getting enough sleep" (20%). This is in line with the results of Itani et al.'s study conducted in Lebanon, where the majority of participants used EDs to address sleep deprivation during exams or work or parties.

Moreover, this study showed that ED consumers were more likely to consume sports drinks and to be physically active. Consistently, one of the reasons for ED consumption in this study was "to get energy to play competitive sports" as reported by 35% of ED consumers. Besides powerful advertisements promoting EDs, other marketing strategies are being used to attract young athletes. These include sponsoring sporting events such as rally papers, extreme sports events and beach parties and distributing free samples of EDs during these events.

EDs are perceived to provide physiologic benefits and power when consumed before or during any physical activity. Scientific findings about the effect of EDs on physical performance are diverse. Some studies found that any significant effect of EDs is dependent on the dose of caffeine ingested and that the body needs a minimum dose of 3mg of caffeine per kg of body weight to increase its muscles performance. However, other studies revealed that improved alertness, reaction time and performance in aerobic and anaerobic activities were noticed at caffeine doses

that are as low as 1mg/kg of body weight (Del Coso, Salinero et al. 2012). Consequently, additional studies are needed to prove whether caffeinated EDs are effective in improving physical performance and if their effects are dose-dependent.

Reasons of consumption appeared to differ between countries and that can be due to differences in cultural and social norms. In Argentina for instance (Ballistreri and Corradi-Webster 2008), less than 5% of participating physical education students mentioned studying as a reason to use EDs because major reasons for them were to "extend evening leisure time" and "improve sports performance". In a study conducted on university students in Turkey (Attila and Cakir 2011), "the taste" was the most commonly reported reason for consuming EDs while in KSA (Alsunni and Badar 2011) and UAE (Bawazeer and AlSobahi 2013), "a better performance in examination" was one of the most mentioned uses of EDs.

To date, the evidence on the ability of EDs to provide the promoted mental and physical energy has not been validated. However, many studies investigated potential effects of each of the key ingredients of EDs including ginseng, caffeine, taurine and guarana. For instance, ginseng which is a slow-growing plant with fleshy roots has been known for its therapeutic role in improving cognitive performance, concentration, and memory (Clauson, Shields et al. 2008). Taurine, a common ingredient of EDs, is the most abundant amino acid found in the cells of the human body and is associated with increased cognition and memory. Furthermore, caffeine and a caffeine-like ingredient "guarana" are also important components of EDs. Caffeine is known for its stimulating effect that can be perceived after around 15

minutes of ingestion of only 30mg of the substance (Olson 2014). Guarana has a concentration of 3.6% to 5.8% of caffeine - its active compound, and has consequently similar effects to that of caffeine. Studies investigating potential physical or mental benefits of EDs through guarana, taurine and ginseng found that the amounts of ingredients found in EDs are not enough to deliver therapeutic benefits (Clauson, Shields et al. 2008). Whether the perceived effects of EDs are determined by the high content of caffeine or its combination with the other ingredients is not known yet.

2- Reasons of AmED consumption:

AmEDs appeared to be "common drinks" in the eyes of most of the consumers participating in this study, meaning that these beverages are popular and habitually consumed in their entourage. On the other hand, a quarter of those participants also agreed that AmEDs were beverages that "suppress tiredness" and "increase tolerance".

Similar findings were revealed in other studies where participants reported consuming AmEDs to "drink more and not feel as drunk". While investigating possible motivations for drinking AmEDs, the reasons that were revealed more important for consumers were "to celebrate", "to socialize", "to relax/chill alone", "to quench thirst" and "for the taste". Based on participants' responses, it is possible to link the consumption of AmEDs to situational context of use, mainly related to the involvement in social life and to pleasure-seeking motives which was also seen among Australian young adults in a study investigating the patterns and motivations for AmEDs consumption (Peacock, Bruno et al. 2013).

The affordable price of AmEDs was one of the encouraging reasons for their consumption as reported by 16% of participants. In the present study, participants are all university students with a non-working majority. Within the Lebanese social and cultural parameters, it is common for young adults to remain dependent on their parents in terms of personal income, until after graduation. Therefore, getting an alcoholic beverage for a price similar to that of a juice may seem an attractive idea to young adults with limited personal income.

3- Consequences of ED and AmED consumption

The current study investigated symptoms experienced following the intake of EDs alone or mixed with alcohol, therefore side effects that are typical to either drink separately were not assessed.

Consumption of EDs and AmEDs resulted in a variety of mild to moderate adverse consequences on consumers. More than half of the respondents reported suffering from headaches at least once after drinking EDs and AmEDs. Other symptoms noticed by consumers included increased heart beat (42%), jitteriness, tremor, shakiness (36%), dizziness (30%), anxiety, nervousness, irritability (29%), fatigue (27%) and insomnia (19%). Moreover, nausea and vomiting were experienced by female respondents only, which marked a significant difference between the two genders regarding side effects of EDs and AmEDs. These symptoms were also reported in other studies assessing side effects of EDs on young adults but with different proportions. Similarly to our results, Jacob et al.'s cross-sectional study on university students in UAE found that 52% of ED and AmED consumers ever had a headache due to their drinking. In addition, a study in KSA (Alsunni and Badar 2011)

found that participants who reported experiencing nausea and vomiting as a side effect of ED and AmED consumption were females in majority, which confirms our results.

Taurine, ginseng and guarana are present in most ED brands. An ED can contains 1000mg of taurine on average (Cornell 2008) and studies showed that taurine side effects were noticed at doses of at least 1.5g/day involving nausea, headache, dizziness, walk imbalance and temporary itching (Clauson, Shields et al. 2008). Therefore, besides caffeine, individuals may be affected by taurine adverse effects if they consume more than a single 8-ounce can of ED. This amount can be easily exceeded especially when EDs are served in glasses rather than cans in pubs and restaurants or during parties where consumers can lose count of their servings. Researchers at Weill Cornell Medical College in New York found that taurine was active on brain receptors and can interact with neurotransmitters in the regulatory area of the thalamus involved in the sleep cycle routes (McCusker, Goldberger et al. 2006), which can possibly result in insomnia. More studies are needed to determine the contribution of taurine present in EDs to the experienced adverse effects given that to date, no evidence on the amount of taurine that actually reaches the brain after its ingestion from EDs has been found. Ginseng is also present in a number of ED brands in amounts ranging between 0 and 90mg per serving. Studies showed that some adverse effects of ginseng can be experienced at doses exceeding 100mg to 200mg/day, insomnia being on the top list of these effects (McCusker, Goldberger et al. 2006).

Although the present study has not assessed adverse effects resulting from the direct ingestion of AmEDs, scientific evidence on the added harm caused by alcohol when combined to EDs has been built (O'Brien, McCoy et al. 2008). The risk of consuming AmEDs rises from the combination of alcohol with caffeine. While alcohol ingestion induces fatigue and sleepiness, caffeine intake stimulates alertness and wakefulness. Caffeine results in a decreased subjective perception of symptoms caused by either ingredients (Miller, McKinnon et al. 2013). Thus, consumers of AmEDs become significantly less aware of any experienced headache, imbalance and dizziness, which drive them to drink more without realizing the level of intoxication they have reached (Clauson, Shields et al. 2008).

Fears about the increasing use of AmEDs are not limited to the direct short and long term health implications of those beverages. A positive association has been drawn between the consumption of EDs and AmEDs and other unhealthy drinking patterns and lifestyle behaviors including smoking, intake of non-medical stimulant and analgesic prescriptions, use of marijuana and other illicit drugs (Amelia, Caldeira et al. 2008, Reissig, Strain et al. 2009, Miller, McKinnon et al. 2013).

It is worth noting that little research on the interaction between taurine, caffeine, guarana and ginseng or the interaction between these ingredients and alcohol, has been conducted (Clauson, Shields et al. 2008). Moreover, whether these ingredients affect males and females differently or if the experienced side effects are genes-dependent is still unknown.

E- Correlates of ED consumption among Study Participants

Multivariate analysis of ED use (ever versus never use) indicated that, controlling for gender, age and alcohol consumption, physically active individuals, sports drinks consumers and frequent coffee consumers had higher odds for using EDs. The association of ED consumption with physical activity and sports drinks was not surprising. According to Oteri et al and Itani et al., ED consumption is nowadays a common trend among college students, particularly athletes. In this study, around 35% of participants reported that "getting energy to play competitive sports" was one of the important reasons for consuming EDs. The promises made by advertisements about the ability of EDs to decrease fatigue and increase stamina and athletic performance may have motivated athletes and physically active individuals to use EDs (Seifert, Schaechter et al. 2011).

It has been suggested that the effects of EDs on physical performance are due to the caffeine content of EDs (Attila and Cakir 2011). In comparison with soft drinks, EDs contain a greater concentration of caffeine per serving, which is responsible of the experienced effects (Reissig, Strain et al. 2009). The stimulatory effect of caffeine and other components of EDs including taurine, guarana and ginseng is associated with a 5 to 7 heart beats increase with a 10 mmHg increase in systolic blood pressure (Steinke, Lanfear et al. 2009). Moreover, the combination of caffeine and taurine inside EDs was suspected to induce coronary vasospasm when ingested accompanied or followed by intense physical activity (Gunja and Brown 2012). In addition, caffeine is known for its diuretic effect that can increase the risk of dehydration,

which is a health-threatening condition particularly when it comes to athletes (Clauson, Shields et al. 2008).

Furthermore, regression analysis in the present study showed that participants who consumed at least 2 cups of caffeinated coffee per week during the previous year, were more likely to consume EDs than those who never consumed coffee or used it less than twice per week, after adjusting for gender, age, BMI, physical activity and sports drinks and alcohol consumption. The association between ED and frequent coffee consumption suggests that the experienced side effects of EDs and their severity can be caused by excessive caffeine ingestion from different sources, which may be leading to caffeine intoxication.

Our results showed that differences in drinking behavior exist between genders. Among males for instance, the consumption of sports drinks was the only variable significantly associated with ED ever use. Sports drinks are marketed as hydrating beverages with the ability to replenish the body's electrolytes after exercise and are thus perceived as part of the active lifestyle of young adults (Field, Sonnevile et al. 2014). Given that physical activity was correlated with ED consumption, it was not surprising for sports drinks, majorly consumed by physically active subjects, to be also associated with ED use. There is also the possibility that consumers of EDs do not necessarily differentiate between sports drinks and EDs. In a study investigating the perceptions of US youth about ED consumption, it was noticed that participants got confused between both forms of beverages and considered EDs and sports drinks as different versions of the same beverage (Kumar, Park et al. 2015). Similarly, around 16% of surveyed school and university students in Lebanon considered EDs as

sports drinks which may possibly explain the association between the consumption of these two beverages (Itany, Diab et al. 2014).

Furthermore, sports drinks use was strongly associated with the consumption of AmEDs as well. The combination of alcohol and EDs has become a common practice among college students (Peacock, Bruno et al. 2013). Knowing that sports drink consumers are mainly physically active individuals as reported by this study results, it is alarming that a healthy behavior as such as physical activity can be associated to an unhealthy drinking pattern. Based on the literature and findings from the present study, patterns of ED and AmED consumption are found to share similarities with those of other unhealthy behaviors popular among young adults such as cigarettes and water pipe smoking and alcohol heavy drinking (Doumas, Turrisi et al. 2013, Snipes and Benotsch 2013, James, Kristjansson et al. 2015).

F- Perceptions and attitudes of Lebanese university students towards ED consumption

The present study adopted a mixed methodology approach in order to achieve a contextual understanding of ED consumption among young adults and to determine the perceptions of Lebanese university students regarding EDs with respect to cultural, social and gender influences.

Analysis of data from the completed questionnaires provided a general knowledge of the prevalence of ED consumption and its correlates among Lebanese university students. The focus group script was carefully developed, taking into consideration results of the quantitative research along with its gaps and discrepancies

and findings from similar research in the literature (Jones, Barrie et al. 2012, Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014). Questions of the FGDs were elaborated in order to answer unaddressed questions, highlight different aspects of the subject and cover seven topic areas related to ED consumption: knowledge of participants about EDs' content, reasons for ED consumption, factors influencing ED consumers' choice, the impact of marketing on ED consumption, perceived effects and benefits of EDs, perceived risks and experienced side effects of EDs and facilitators and barriers to ED consumption.

ED consumption beliefs and behaviors were differently perceived by males and females and twelve cross-cutting themes were recurrent within the six FGDs conducted in AUB and LIU:

1- Misconceptions and lack of knowledge among study participants

Given the relatively high prevalence of ED consumption found among university students, it was necessary to assess the knowledge of consumers, a factor that was not studied in length during the first quantitative phase of the study.

In general, participants had little or incomplete knowledge about the content of EDs. Caffeine and sugar were the most commonly recalled ingredients by focus group participants, which is consistent with the literature. For instance, in the study by Itani et al., participants were asked to select ingredients of EDs out of a given list of different substances. Caffeine and sugar were the most correctly marked components of EDs by the study participants.

In the present research, male participants mentioned that EDs essentially contained ginseng and taurine. Ginseng, an ingredient that was not recognized by any of the female participants within the FGDs is also the name of a range of drinks, pills and powders used to improve mood and concentration, boost endurance and alleviate fatigue and treat erectile dysfunction (WebMD, 2015). Although no evidence has been conclusive concerning the mentioned benefits of ginseng, yet the ingredient may still sound attractive to males in particular. This may be linked to the masculine aspect of ginseng, especially to its association with increased sexual activity as found in a research studying the effect of ginseng on male rats (Abdel-Wahhab, Joubert et al. 2014).

Within the same discussion about EDs content, females seemed to mostly recognize sugar as an essential component of the beverage. Sugar is probably the only calorific ingredient in EDs and the interest of females in "calories" may explain the reason why sugar was the first and sometimes the only substance mentioned by them. The concerns that females have regarding their weight and body image may explain their cautiousness and awareness about calorific ingredients. A study examining the gender differences in perception of body weight among college students (Connor-Greene 1988), found that females had a tendency to falsely see themselves as overweight and had therefore continuous weight loss attempts. Moreover, the same study pointed out that weight gain was less likely to be considered by underweight females.

Very few consumers gave accurate and detailed information about the content of EDs and those were particularly pre-med, pharmacy and biology students. These participants may have been motivated to read about EDs given their health-related background and their field of study. Despite the students' knowledge about EDs, their behavior was not affected, which infer that nutrition knowledge is one out of multiple factors that may together influence individuals' eating choices (Worsley 2002).

Besides the incomplete knowledge about the content of EDs, misconceptions were common among all male and female groups. At least one participant in each of the conducted FGDs indicated nonscientific ingredients within the EDs such as rats' urine, bulls' sperm, "torbin" and testosterone. However, the inclination of participants to drink EDs on a regular basis did not seem to be affected by these misconceptions.

2- Reasons to drink included mainly getting energy to study and to play sports

When reasons for EDs consumption were discussed, contradictory thoughts and attitudes were observed among the participants. When asked to define an ED, a number of participants spontaneously answered that it was a "common drink used for fun just like sodas and juices". These same participants however, explained later throughout the discussion that the most common reason to try EDs and to regularly use them after the first time was to "get energy" or "stay awake/ alert" to study, work or play sports.

The majority of focus group participants revealed that they mostly consume EDs while studying for exams, when having an important project or just before an

exam when being sleep deprived. These findings are consistent with the results from the survey completed by a similar population at the beginning of this study, where EDs were found to be more frequently consumed during the fall/spring semesters than during the summer. In addition, participants of this survey as well as participants of the focus groups strongly believed that EDs became a necessary study aid since they started college.

Moreover, focus groups participants were convinced that no other foods, beverages or drugs were able to help them cope with the "student life stress" and that EDs were their last salvation when coffee does not provide the needed effect. Many studies that observed determinants and correlates of ED consumption found that sleep deprivation and stress were major reasons for ED use (Malinauskas, Aeby et al. 2007, Ibrahim, Iftikhar et al. 2014) and that participants' perceived stress was positively associated with the frequency of ED consumption (Pettit and DeBarr 2011).

Despite the fact that 7% and 21% of FGDs' males and males respectively consumed EDs before being engaged in 'strenuous' sports activities, only a quarter of participants reported having really experienced the impact of the drinks on their weight lifting and/or endurance capacities. These findings support those by Bunting et al. whereby authors found that a minority of participants reported having better performance in sports activities after consuming EDs. However, this is worth further investigation as this study did not explore if there is an age or gender difference in the perception of positive effects on physical performance due to the consumption of EDs.

3- Impact of peer pressure and social image on ED consumers

In all the conducted FGDs, males and females appeared to be equally influenced by their peers when it comes to the use of EDs. This research and several similar studies (Bunting, Baggett et al. 2013) revealed that most of ED consumers tried their first drink with the company of a friend.

According to participants, consuming an ED was not always meant to be a source of energy or enjoyment. Sometimes, subjects "have" to purchase the drink because in some situations it is the "norm". "Pleasing others" and "going with the flow" were expressions repeatedly used by FGD participants when discussing the motives and reasons behind consuming EDs. This agrees with research by Bunting et al. indicating that being in conformity with the norms of the peer group is carefully considered when selecting, buying and consuming specific food products such as EDs.

Many participants mentioned throughout the discussions that although they knew about EDs and consumed them during their adolescence, it is particularly the transition between high school and university with all its new experiences, friends and social entourage that opened their eyes into new trends and behaviors that confer a distinct identity to young adults. Our findings were supported by a qualitative study exploring the determinants of eating behaviors among university students (Deliens, Clarys et al. 2014). Authors indicated that students' social networks including friends, the sudden decline of parental control accompanying the transition to university life, and the development of independence among university students have a great influence on their food and beverage choices.

When asked about their views about the opposite sex consumption of EDs, different opinions were shared within the FGDs. Female participants strongly believed that "guys" drink EDs in public in the intention of impressing. Moreover, all the participating females clearly indicated that this was never a factor of attraction to them and can rather generate a feeling of revulsion and apathy towards drinking males. On the other hand, most of the male participants agreed that the feeling of being cool and attractive to girls may be all in their imagination however few of them insisted that "having an ED in hand" does indeed give the consumer a feeling of power which is perceived and appreciated by females. In a study assessing beliefs of Canadian and English individuals about water pipe smoking (Roskin and Aveyard 2009), participants reported that "impressing ladies" is one of the enjoyable factor motivating people to smoke waterpipe. To the best of our knowledge, no studies have explored the association between ED consumption and the perceived attraction to the opposite sex.

The perceptions of young adults towards ED consumers are probably influenced by advertisements. In many of the promotions, consumers of EDs are shown to be good-looking and attractive ladies, strong, handsome and funny men, or well-known celebrities. In contrast, some ads communicate a more sensitive message; these depicts males who are rather not attractive but who are sexually active, which makes them much admired by attractive women, therefore highlighting the power of the drink regardless of the physical appearance.

The consumption of AmEDs by females however, was not perceived as "normal" as the consumption of EDs, especially when it is not within a specific

context such as a social party or celebration. Furthermore, consuming AmEDs by a female on the street, in a mall or at the university is perceived as an "inadequate" behavior by most of the participating males. The differences in the perceptions of "normal" versus "inadequate" behaviors between genders have been discussed for a variety of social behaviors. For instance, a study on the interpersonal attraction between males and females considering the smoking and non-smoking factor, showed that smoking females were considered less likable and attractive than non-smoking ones, while these differences were not perceived in males (Clark, Klesges et al. 1992). Moreover, males participating in this study reported being less likely to engage in intimate behaviors with smoking females than with non-smoking females.

4- Taste as a reason for ED consumption

In line with findings from the qualitative study conducted by Bunting et al., taste emerged as an important motivational factor for the consumption of EDs by both males and females. However, the first time consumption of an ED did not have the same impact in terms of taste. While almost all male participants liked the taste and considered it as their primary motive to drink EDs again, around third of the females did not like the taste at all on the first time but got used to it later. To these students, EDs have a sour taste similar to that of cough syrups. Moreover, males sounded picky about the tastes of different ED brands and would easily depict taste variances between each and every ED. Therefore, males were found to be much affected by sensory factors like taste which may influence their decision to prefer a specific product over another. In contrast, more than 30% of females couldn't differentiate between brands tastes and believed that original non-flavored versions of all brands

taste the same. Consequently, females consumed the brand that they happen to try first and were not as interested to try new brands as were males.

5- ED branding and reputation

In this study, as with other research assessing the same drinking behavior (Attila and Cakir 2011) , the Red Bull brand was reported to be the most preferred one of all EDs by the majority of male and female respondents. In fact, just like many trademarked brands have been used as generic terms such as "Kleenex", "Jacuzzi", "Scotch" and "Tupperware" (Harrell 2014), nowadays "Red Bull" defines an ED, according to this study participants.

Red Bull consumers praised the brand for its taste, advertising, fame and reputation and declared their loyalty to it. These findings are in line with those of Bunting et al. where "brand loyalty" emerged as a recurrent theme within the FGDs. In that same study, participants did not discuss the reasons driving them to purchase Red Bull over others, which led the authors to conclude that unconscious and emotional factors may be behind their loyalty.

In this study, reasons motivating consumers towards a specific ED were indirectly discussed. Besides being the first ED marketed in Lebanon, an important factor was raised by Red Bull fans within each of the focus groups. The "international" versus the "local" aspect of a product was an extremely influential factor on consumers. The Lebanese community has always suffered from the chaos existing in the various institutions and ministries in the country as well as of the lack of consistent control on the proper functioning of the food industry, based on international standards of food safety. Moreover, the gaps found on the Lebanese food

market in terms of food safety as revealed by the recent campaign carried out by the Lebanese Ministry of Health, further reduced the confidence of people in the quality of their local food production. Hence, Lebanese young adults seemed much assured when they consume international brands including Red Bull, and many of them perceived the consumption of locally produced brands as a "risky" behavior.

"Clean", "safe" and "high quality" were used by these study participants to describe Red Bull. Thus, the brand and its fame are tightly linked to the "quality" of the drink according to consumers. This observation is supported by a paper exploring the perception of brands by consumers, where it was noticed that physical characteristics of the product are not the only factors influencing consumers' choice and that the "brand" is essential for the evaluation of the quality of the product (Vranešević and Stancec 2003).

6- Consumers' perceptions of AmEDs

When asked about the factors to consider when purchasing an ED, "alcohol" was recurrent in each of the FGDs. Whether for religious reasons or personal choices, many participants who do not consume alcohol reported to carefully choose alcohol-free EDs whenever they ordered or purchased one. Moreover, when asked if they would drive after consuming AmEDs, one female student readily affirmed she would definitely "not" drive if EDs were "not" added to her alcohol.

In a cross-sectional study investigating patterns of ED consumption among undergraduate university students in the United States, respondents reported feeling "more aware about things around them", "able to make accurate decisions" and "able to accompany a drunk driver home safely" after the consumption of AmEDs (Faris

2014). In fact, the sense of security and confidence provided by the alcoholic beverage mixed with ED unlike the pure alcoholic drink, is due to the decreased perception of intoxication rather than to an actual decrease of intoxication. Because the energizing effect of caffeine present in EDs can mask the depressant effect of alcohol, consumers may not feel the drunkenness or other intoxication-related effects (Heckman, Sherry et al. 2010). This explains the reason why for some participants, alcohol is a factor of choice. The combination of EDs with alcohol is perceived as a "preventive measurement" against any risky consequence.

7- Influence of advertisements on ED consumption

Advertisements appeared as one of the key influences on participants' ED consumption. Often, participants reported that they got their very first drink for free during an event or bought it out of curiosity after seeing the ad, which highlights the strong role exerted by the different advertising strategies of the ED industry. In each of the conducted FGDs, most of the participants readily recalled slogans, songs and parts of their preferred ED ads.

In the study conducted by Bunting et al., the attitudes of participants towards the advertisements differed between age groups. Young adults were more skeptical about ED effects promoted in the different ads than adolescents and were more aware of the tactics used in the ads to target them, as consumers. However in the present study, many participants seemed hesitant about their opinion; for instance, participants from different groups eloquently expressed their admiration to the Red

Bull slogan "gives you wings" then aggressively criticized it when talking about what they hate about the advertisement.

According to Lebanese FGD participants, a successful ad should be "different", "strange", "smart" and "catchy". Marketing strategies of local ED brands seemed to be clever enough to attract both genders. Males were mostly attracted by ads involving athletes or extreme sports while funny characters, songs and entertainments caught females' attention mostly. A cohort study assessing the impact of food TV advertising on the diet of school children revealed that the exposure to soft drink and fast food advertisements was associated with a higher consumption of these food products among elementary school children and an increased consumption of other low-nutrient calorie-dense foods and beverages (Andreyeva, Kelly et al. 2011). Another cross-sectional survey of Australian secondary students showed that a higher level of exposure to commercial television and non-broadcast types of food marketing was associated with a greater consumption of fast food, sugary drinks and sweet and salty snacks (Scully, Wakefield et al. 2012). In similar fashion, findings of the present study support this association between exposure to ED ads and consumption.

Taking into consideration the previously discussed health consequences of EDs, the consumption of these drinks can be considered as unhealthy as other behaviors such as consumption of alcohol and fast food, smoking and use of illegal drugs. The effect of media on cigarettes smoking among school (Cavazos-Rehg, Krauss et al. 2013) and college (Rigotti, Moran et al. 2005) students in the United

States has been studied. Researchers concluded that non-smokers who were exposed to social-network and text messages marketing and those who attended events sponsored by the tobacco industry were significantly encouraged to initiate smoking. Furthermore, irregular smokers had higher odds to continue smoking on more regular basis.

8- Perceived risks and experienced adverse effects from the consumption of EDs and AmEDs

Participants discussed ED potential side effects from a safety angle rather than from the interaction of the ingredients and tended to associate the risks with the "quality" of the drink and therefore "the brand". In light of the recent food safety campaign launched by the ministry of health, participants repeatedly expressed their lack of confidence in the safety of the local ED brands and touched on their anxiousness regarding the storage of the imported brands.

Interestingly, the majority of females primarily attributed potential side effects of EDs to the frequency of consumption while males believed that any possible influence on consumers' health is only a long term potential. In our sample, 86% of females consumed EDs in a frequency of twice a month while more than 78% of males consumed 1 to 4 cans of EDs per week. Consequently, females considered themselves as non-frequent consumers of EDs and believed that this put them on the safe side of any adverse effect. Similarly, males who knew they were frequent consumers refused to admit that their behavior may be harmful and they projected therefore the possibility of harm to the future. The latter implies a defensive attitude or maybe a self-reassuring approach unconsciously adopted by consumers of EDs.

This was similarly depicted when participants discussed any experienced side effect following the consumption of EDs. Respondents considered any experienced side effect as "rare", "insignificant" and "barely noticed". Besides those reported symptoms, two female participants complained about suffering from irregular menstrual cycle that may be attributed to EDs. One of these respondents revealed having completely stopped the consumption of EDs just before her participation in the study and that her decision was made upon her doctor's request. According to a study published in the American Journal of Epidemiology, women who consume high levels of caffeine are more likely to suffer from irregular menstruation (Hickson 2013). In addition, another study reported that the regular consumption of ginseng-containing products can alter women's menstrual cycle (Kiefer 2015).

On the other hand, participants explained that the symptoms they experienced may be most probably caused by other causes such as coffee consumption, lack of sleep and fatigue rather than by the ED itself. In general, male consumers expressed much less concerns than females regarding ED health effects. They even questioned the validity of all the information they read and hear about the consequences of EDs and asked for evidence supporting all the "claims". These observed attitudes may be typical of university students and hence could be used to take efficient future measures for addressing the consumption of EDs among young adults. Females however, seemed anxious towards any experienced symptoms and showed much more readiness and willingness to stop consuming EDs. Some actually started thinking about it during the discussion and revealed that the conversation just made them realize to what extent they may be "hurting themselves".

Potential consequences from driving after the consumption of AmEDs was addressed in the discussions and different opinions were shared. Some respondents considered that the drunkenness is relative to the person's tolerance, habit and number of drinks consumed. Unlike the consumption of alcohol alone, participants perceived no or little risk in driving after the use of AmEDs, if the consumer does not feel intoxicated. However, many of those who reported that they normally and safely drive after the consumption of AmEDs expressed their concerns towards riding with someone else after drinking alcoholic EDs.

9- Psychological effects of EDs

Around 50% of the participants repeatedly mentioned that the effects of EDs were psychological throughout the conversation. To these students, any experienced "energy boost" is due to the "placebo" effect of EDs. Even when EDs were used for the purpose of increasing physical performance, participants admitted that the drink did not actually help them lift more weight or perform better. Our findings are supported by participants of the same age group who reported in the study conducted by Bunting et al. that the perceived functional benefits of EDs were rather psychological.

Furthermore, participants expressed a feeling of frustration when they didn't get the effect they hear about in the media or by their friends. This was in line with the findings of Costa et al. where some participants felt disappointed when they did not get the promised effect from EDs. It is possible that the dissatisfaction of consumers with the delivered effect may drive them to consume more EDs in order to achieve the desired feeling. In the present study, one female frequent consumer

admitted being obliged to drink two or three consecutive cans to get the energy she needs.

10- Parental influence on ED consumers

The present study did not interview parents of the participating students on their knowledge about EDs. However, based on the discussions and stories shared by the consumers about their parents' perceptions of ED use, lack of knowledge may be indirectly assumed. For instance, focus group participants reported that their parents knew that EDs were not "good" but did not have specific information about their ingredients and possible side effects. Moreover, other participants believed that their parents were not aware of the risks related to the consumption of EDs because they were consumers themselves.

According to focus groups' participants, most of the parents were in disagreement with their children consumption patterns of EDs. However, parents' opinions and advice were not taken into consideration and participants admitted drinking EDs despite their parents' opposition. In a study investigating perceptions, patterns, and contexts of ED use among Australian school students, young adults were less likely to stop using EDs under the influence of their parents because they were more prone to external influences such as friends and peers(Costa, Hayley et al. 2014).

Both male and female participants seemed indifferent to their parents' dissatisfaction from their ED consumption, and that may infer that parents of ED consumers did not have a stronger attitude towards EDs compared to other unhealthy foods and beverages. This may possibly explain the lack of parental influence

concerning the consumption of EDs in particular. The factors that may enable parents to be influential on their children behaviors in general or on their ED consumption in particular are yet to be investigated.

11- Affordability and accessibility of EDs

The majority of focus groups participants considered that the prices of EDs were reasonable. In general, the cost of one ED can be equal or slightly higher than the average price of a juice or soft drink bottle. Moreover, pre-mixed alcoholic EDs are even cheaper than other alcoholic beverages which make them affordable to most university students and sometimes to adolescents and kids, according to the study participants.

Several studies have investigated the effect of products' prices on the frequency of their purchasing. A randomized controlled study examined the effects of a price increase of sugar-sweetened beverages (SSBs) on their purchase by a group of customers, in comparison to a control group who accessed SSBs with the original prices. The study showed that participants in the "price increase group" purchased significantly less SSBs than the control group (Waterlander, Mhurchu et al. 2014). Similarly, in another study observing the relationship between affordability of alcoholic beverages and levels of consumption in Australia, a 10% increase in the price of alcohol was associated with a 2% decrease in the alcohol consumption of the population throughout the next year. Furthermore, an additional 4% reduction in the overall alcohol consumption was noticed during the following 8 years (Jiang and Livingston 2015). Tobacco use has also been a worldwide concern because of its association with several diseases and deaths. Interestingly, a study examining the

impact of the tax raise on cigarettes applied by the federal government in the US revealed that an increase of 0.62\$ per pack resulted in a significant reduction in smoking particularly among aged 12 to 17 years old and young adults aged 18 to 25 years old (van Hasselt, Kruger et al. 2015).

12- Regulation of ED purchasing and consumption

When asked on whether they know any regulations related EDs in Lebanon, few participants reported having heard about a "law" forbidding the sale of AmEDs. Female participants were completely supportive of regulations related to the sale and purchase of EDs, especially when it comes to children. These participants showed an increased awareness regarding the exposure of children to advertisements that often include messages to young adolescents and teens by using kids' voices within the ads or funny cartoons that may appeal to kids. However, few participating students were against the development of laws forbidding or regulating the consumption of EDs. According to the latter group, there should be regulations to ensure the safety of production, packaging and storage of ED cans. In addition, participants highlighted the need for educational programs that permit the individuals to make their own decisions about consuming EDs or not.

These observations were highlighted in the study by Bunting et al. where participants perceived a serious risk on underage persons from the consumption of EDs. These participants added that the action that should be taken if any maybe an awareness campaign about EDs. Many participants had little hope that any of the suggested regulations could possibly work in Lebanon.

Strengths and limitations of this study

The major strength of his research is in its mixed methodology approach. This study presented qualitative findings derived from the in-depth analysis of FGDs, in combination with quantitative data analyzed from questionnaires of a cross-sectional survey design. The outcomes of this thesis determined the frequency of ED and AmED consumption among a sample of university students in Beirut, explored correlates of ED consumption along with the reasons and consequences associated with the intake of these beverages. Furthermore, the study explored in more length the perceptions and attitudes of young adults towards EDs and AmEDs.

This study was the first in Lebanon and one of few in the literature to provide qualitative data about ED and AmED consumption in young adults and assess the frequency of intake separately within academic semesters. This permitted to observe a clear association between the use of energetic beverages and academic tasks such as studies, projects and exams. Furthermore, this study assessed the frequency of consumption of a list of caffeinated items referring to the previous year. Caffeinated items included coffee, tea, chocolate and chocolate drinks, pain killers and weight loss medications. The assessment of the intake of these selected foods, beverages and medications allowed to draw an overall image of young adults average caffeine intake.

In addition, the questionnaire used in the quantitative component of this study was designed by nutritional experts and epidemiologists and was based on other validated questionnaires used in the literature (Willet 2007). Similarly, the focus group script for FGDs, was developed based on qualitative scientific research

conducted among the similar targeted age group from other countries (Bunting, Baggett et al. 2013, Costa, Hayley et al. 2014).

In the recruitment of FGDs' participants, the research team noted the importance of obtaining an equivalent contribution of both genders regarding perceptions and attitudes towards EDs and thus anticipated an equal representation of males and females in the FGDs. Our findings consolidated our recruitment strategy and allowed a symmetrical comparison of data provided by males and females, suggesting that gender differences are evident. Moreover, qualitative data from the FGDs were supported by results of the survey and other studies from the literature, and no major contradictions or discrepancies were observed.

However, there are limitations that need to be considered in light of these findings. First, the sample size (N=227) of the survey was a convenient sample and the recruitment was limited to private universities, which may not be representative of all Lebanese university students. Similarly, a total of 29 participants were included in the FGDs, which was slightly below the number of participants intended by the research team. This was due to numerous challenges encountered during the recruitment process, particularly among students from the higher SES university, namely AUB. Individuals who rejected to take part in the FGDs considered the time of the discussions to be long and showed low level of motivation to be involved in discussion groups. Other possible barriers in recruitment include the intense schedule of students during regular academic semesters, which may have prevented them from participating in this study.

All the mentioned factors above contributed to an unequal recruitment from the participating universities and consequently resulted in a majority (86%) of participants from one university, namely LIU. Taking that into consideration, findings from the FGDs were based on the perceptions and experiences of a group of young adults majorly recruited from one university that hosts a larger number of students with low to middle income, thus this limits the generalizability of our findings.

Self-reporting is another limitation of this study. Given that ED and alcohol consumption may be perceived as a sensitive topic by study participants, under-reporting and/or over-reporting bias may have occurred. Future studies could validate reported caffeine and ED consumption through biochemical tests such as blood and urine analysis. Furthermore, this study did not explore associations between ED consumption and dietary intake as well as other potential lifestyle correlates including smoking and sleeping habits or stress level. In addition, participants were not asked to report symptoms caused by the consumption of EDs and AmEDs, separately, thus we could not differentiate between side effects from EDs alone compared to when mixed with alcohol.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

A- Conclusion

This study was conducted in order to assess correlates of ED consumption among young adults and describe the reasons and consequences of their use. These were consolidated by rich qualitative data about the perceptions and attitudes of Lebanese university students towards EDs and an examination of the relationships between ED consumption lifestyle, socio-demographic correlates and health behavioral outcomes. The study also explored facilitators and barriers to EDs consumption and the influence of social and physical environment on the behavior of consumers.

Data from this study revealed that similar to other countries (Malinauskas, Aeby et al. 2007, Attila and Cakir 2011), Lebanon has a relatively high consumption of EDs. Around 45% of the study sample has ever consumed EDs and more than half of those ever users consumed at least 1 drink/month during the last year. Among ED consumers, about 46% combined their drinks with alcohol following the current trend of AmEDs consumption.

ED consumption was found to be higher in males and physically active subjects, which suggests that marketing strategies aggressively targeting young males and promoting EDs ability to enhance athletics' performance are being successful.

However, a trend for promoting the consumption of EDs among females is currently observed in the Lebanese media and advertisements of local ED brands.

The main reason for ED use among university students was "to get energy" to perform specific tasks, such as studying, working and playing competitive sports while alcoholic mixtures were used to "suppress tiredness and increase tolerance" and were particularly consumed while celebrating and socializing. A majority of participants believed that EDs could help them stay awake, concentrate and cope with exam stress, which explains the higher frequency of ED intake observed around the exams period and during the fall and spring semesters in comparison to the summer, breaks and weekends. However, scientific findings about the efficacy of EDs in boosting physical, cognitive and mental performance are diverse and contradictory.

In light of the findings of this study and other research from the literature, a great disparity was found in the reasons of ED consumption. The most important reason reported in this research showing EDs as a "study aid" was the least reported in other studies (Ballistreri and Corradi-Webster 2008), which suggest that motives for the consumption of EDs are subject to cultural, social and socio-demographic norms of each population. However, regardless of the causes appealing for ED use, these beverages were found to perfectly fit young adults' lifestyles and provide pleasure and other real or perceived physiological and psychological effects.

Several research in the literature suggested that the promises made by ED companies concerning the physiological and mental benefits of the beverages were not completely accurate (Buck, Dixon et al. 2013) while others identified few health benefits of EDs (Reissig, Strain et al. 2009, Higgins, Tuttle et al. 2010). Contradictory

opinions were reported in this study as well, where a proportion of participants praised the benefits of EDs while others insisted on the "placebo" effect of EDs and how any experienced effects from the use of the drinks were dependent on the "mood" of the consumer and his perceived benefits. Whether EDs potential effects are dose-dependent or age, gender and genes related is yet to be explored.

In the present study, side effects experienced after the consumption of EDs alone or mixed with alcohol were mainly headaches, tachycardia, shakiness, irritability, fatigue and insomnia. Engaging into risky behaviors were not highly reported by the study participants and around 8% of the total students participating in the survey and FGDs reported having required medical treatment due to ED intake. Unlike in other countries, ED-related deaths have not yet been officially documented in Lebanon. Two cases of death possibly related to ED intake accompanied by intensive physical activity have been anecdotally reported by participants. Studies exploring the implication of ED ingredients in the side effects resulting from their intake have concluded that caffeine, taurine, ginseng and guarana may all be involved. Nevertheless, these studies have investigated the effect of each ingredient apart and thus, were not able to evaluate the outcome of the combined ingredients (Schimpl, da Silva et al. 2013). Although this research assessed the frequency of consumption of other caffeinated beverages but this data could not accurately inform on the average caffeine intake of the study population or on the occurrence of simultaneous or consecutive intake of different sources of caffeine and their possible association with adverse effects. Moreover, this study has not explored the possible impact of EDs on

individuals with present health conditions or those predisposed to specific illnesses and limited data is found in the literature.

On the other hand, scientific evidence on the added harm caused by alcohol when combined to EDs has been built (O'Brien, McCoy et al. 2008, Marczinski 2011). The consumption of AmEDs has been linked to greater health risks than those of the consumption of alcohol alone and many cases of AmED-related death have been documented worldwide (Marc, Byron et al. 2012). Although study participants acknowledged the risks associated with the consumption of AmEDs, a great proportion of males and females believed that the combination of EDs and alcohol was a balanced and safe mixture.

Fears about the increasing use of AmEDs are not limited to the direct short-term health implications of those beverages. A positive association has been drawn between the consumption of EDs and AmEDs and other unhealthy drinking patterns and lifestyle behaviors including smoking, higher video game use, increased consumption of sugar-sweetened beverages, intake of non-medical stimulant and analgesic prescriptions, use of marijuana and other illicit drugs (Amelia, Caldeira et al. 2008, Reissig, Strain et al. 2009, Miller, McKinnon et al. 2013, Larson, DeWolfe et al. 2014, van Hasselt, Kruger et al. 2015).

The influence of peers regarding ED consumption was evident in this study. ED consumers were strongly influenced by their friends and colleagues, which were found to play a role in the initiation as well as in the progression of ED consumption. The most negative role that peers could play is that they set their own "norms" in terms of behaviors, and unconsciously find themselves involved and subject to these

norms. Peer pressure has been implicated in the spread of several unhealthy practices in adolescents and young adults such as alcohol drinking, smoking and illicit drugs use. Findings from this study show that ED and AmED consumption share many similarities with these behaviors.

Gender discrepancies in the perceptions of EDs have been also highlighted in this study. Females adopted a conservative attitude towards their ED consumption patterns although the prevalence of their ED intake was not low. Females' motivations towards the drinks are limited to their energy need or social life "demands" while males also drink for their "social image". This study emphasized the fact that for males, EDs may portray the level of attractiveness, personality and socio-economic status of the consumers.

The reasons behind the relatively high prevalence of ED and AmED consumption among university students in Lebanon were found to be many, according to this study. Catchy advertisements customized to satisfy young adults taste and simulate their ways of thinking, attractive promoted benefits of the drinks, affordable prices and easiness of purchase along with lack of scientific knowledge among young adults and their parents and the lack of regulations controlling the consumption of EDs, have all converged to provide the perfect environment to encourage the ED trend. There were no or little barriers found to prevent participants from using EDs and young adults underscored this belief by referring to EDs as "common", "available", "cheap" and "accessible".

The present thesis supports many other studies highlighting the potential health risks of increased exposure to EDs in young adults. It is hence important that

further research be conducted to explore the extent to which the practice of ED consumption holds public health threats to the youth.

Similar to the consumption of EDs combined to alcohol that gained popularity among Lebanese young adults, the following emerging trend is the combination of EDs with marijuana (Ahart 2010). Future studies should explore whether this recent practice has made her way to Lebanon and its possible impact on youth health.

B- Recommendations

This study has provided additional understanding of the patterns of ED consumption among Lebanese young adults and contributed to the scientific findings of the literature by highlighting gender-based perceptions of university students towards the use of EDs alone or in combination with other alcohol. Based on the discussion chapter of this thesis, several recommendations could be suggested:

1-Education for ED consumers, consumers' parents, educators and health professionals:

Findings from this research found that consumers of FDGs among university students have incomplete knowledge about EDs content and side effect. Thus, education about ED and AmED ingredients, effects and health implications should target consumers at the first place. This research has shown that young people are the primary targets of ED marketing. Therefore, the initiation of education programs to increase the awareness among younger adolescents and adults by correcting

misconceptions and providing accurate information about ED ingredients and their effects on health is recommended.

This study did not investigate parents' perceptions of EDs, but misconceptions and lack of efficient knowledge have been inferred from the FGDs. It is possible that parents are unaware of the risks of EDs on their children's health and therefore, interventions that raise awareness among parents and increase their knowledge about EDs may be necessary. Previous interventions targeting parents have proved their success in affecting children's behavior, such as in the case of decreasing adolescents' alcohol use in the United States(Doumas, Turrisi et al. 2013).

One case of "incomplete knowledge" in a dietitian who did not give accurate advice to her patient who consumes EDs was reported in this research. It is thus crucial for health practitioners to be aware of potential harms of EDs and their association with alcohol. Moreover, healthcare providers should be able to take preventive measures by educating their patients about EDs as well as to identify subjects suffering from ED-related adverse effects.

Education should not be limited to schools and universities' lectures, presentations or seminars but should also include mass media campaigns including TV ads, brochures, billboards, social media ads and posters. Anti-smoking campaigns developed in Australia using mass media have been effective in reducing the rates of smoking (Gilbert 2008).

2-Governmental measures

The ministries of economy and health submitted a decree back in 2013, to ban the import, manufacturing and marketing of all AmEDs in Lebanon. Until now, the ban has not been applied, which may have further increased ED and AmED use by young adults during that period of time. Therefore, it is highly recommended that the decision made regarding AmEDs gets implemented so that other decisions could be made regarding EDs, and those should include:

- a- Setting an age limit for the consumption of EDs and AmEDs to ensure the safety of younger children and adolescents.
- b- Limiting the sale of EDs and AmEDs to specific shops, supermarkets or pharmacies (Reissig, Strain et al. 2009) in order to limit the ease of access and availability of these drinks.
- c- Labeling: To prevent ED and AmED's hazards, cans/ bottles should hold warning statements readable in terms of font size and colors that clearly note the "high caffeine" and "high sugar" content of the drinks, the presence of alcohol when applicable, age limit and possible side effects.
- d- Advertising: Given the strong influence of marketing on young ED consumers and the association of the exposure to ED advertisements with the increased odds of consumption (Snyder, Milici et al. 2006), it is recommended that the marketing of EDs and AmEDs be regulated on several fronts:
 - i- Control the content of misleading TV commercials falsely praising surreal benefits of EDs.
 - ii- Decrease the number and frequency of TV commercials displayed

- iii- Forbid the sponsoring of sporting events by ED industries and the distribution of free samples
- iv- Impose specific packaging characteristics for EDs and AmEDs in order to limit the visual attraction caused by the design, the colors, the logo, etc.
- e- Pricing: the affordability of EDs has been perceived as a facilitating factor for their use by university students even by those with limited income. Pricing policies have been found effective in reducing alcohol consumption in Australia (Pennay, Lubman et al. 2014) therefore a similar policy may also be beneficial in decreasing EDs and AmEDs use in Lebanon. Furthermore, EDs and AmEDs should have fixed prices and not subjected to discounts at any time as young were found more likely to purchase AEDs when discounts were provided.

APPENDIX I

CONSENT FORM (quantitative phase)

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Appendix 3

Assessment of Beverage Consumption Patterns among University Students in Lebanon: Pilot Testing of a Questionnaire

PI: Lamis Jomaa

[Student Investigator to be determined at the beginning of the Spring 2013-2014 semester]

Hello. We are undergraduate students in the Department of Nutrition and Food Sciences at the American University of Beirut (AUB). We would like to invite you to participate in a pilot testing for a research study about the average beverage consumption behaviors of AUB students.

Before we begin, we would like to take a few minutes to explain why we are inviting you to participate and what will be done with the information you provide. You will be asked to fill in a self-administered questionnaire. It will include questions about your general demographic and educational background, as well as your beverage consumption patterns on average during the year. By filling this questionnaire, you agree to be part of this study.

We are doing this study as part of our studies at AUB. We will be asking 120 students to fill in the questionnaire as part of our data collection process and will use the information as the basis for our final tutorial project which is a requirement in our undergraduate studies at the Faculty of Agricultural and Food Sciences. We may also use this information in articles that might be published, as well as in academic presentations. Your individual privacy and confidentiality of the information you provide will be maintained in all published and written data analysis resulting from the study. There will be no collection of personal identifiers (eg. We will not collect your name or AUB ID number or any other data that can relate the questionnaire to your personal ID or record at the university) and all of the questionnaires will be stored in locked cabinets in the principal investigator's office.

Please note that you should be 18 years or older to be eligible to participate in this study. Your participation in completing the questionnaire should take approximately 25 minutes. Please understand that your participation is entirely on a voluntary basis and you have the right to withdraw your consent or discontinue participation at any time without penalty. Refusal to participate will involve no penalty or loss of benefits to which you as a student are entitled to at the American University of Beirut. There are no direct benefits and no anticipated risks associated with the participation in this study.

If at any time and for any reason, you would prefer not to answer any questions, please feel free to skip those questions. If at any time you would like to stop participating, please tell us. We can take a break, stop and continue at a later date, or stop altogether. You will not be penalized for deciding to stop participation at any time.

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A copy of this consent form will be left with you and if you have any questions or concerns about the research, you may contact:

Dr. Lamis Jomaa, Faculty of Agricultural & Food Sciences – AUB
Tel: 961-1-350000 (Ext: 4544) E-mail: lj18@aub.edu.lb

If you have any questions, concerns, or complaints about your rights as a participant in this research, you can contact the following office at AUB:

Social & Behavioral Sciences Institutional Review Board

Address: American University of Beirut, Riad El Solh, Beirut 1107 2020, Lebanon

Tel: 00961 1 374374 (Ext: 5445) Email: irb@aub.edu.lb

Documentation of Consent:

I have explained to the participant the study in detail including the proceedings and any disadvantages. I have answered all questions clearly to the best of my abilities.

Printed Name of Person Obtaining Consent: _____

Signature of Person Obtaining Consent: _____

Date: _____

Time: _____

Institutional Review Board
American University of Beirut

29 JAN 2014

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APPENDIX II-A

CONSENT FORM (Qualitative phase, Arabic)

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APPENDIX 1: CONSENT FORM

استمارة موافقة
الجامعة الأميركية في بيروت

عنوان الدراسة البحثية: تقييم أنماط استهلاك مشروبات الطاقة لدى طلاب جامعتين خاصتين في لبنان: دراسة نوعية
الباحث الرئيسي: الدكتورة لميس جمعة - قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.
الباحثون المساعدون: الدكتورة لارا نصر الدين - قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.
الطالب الباحث: ملكة غزير - قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

هذه الاستمارة هي لطلب مشاركتك في دراسة بحثية. قبل الموافقة على المشاركة في البحث، من المهم أن تقرأ المعلومات الواردة أدناه. يصف هذا البيان الغرض من هذه الدراسة بالإضافة إلى طريقة تنفيذها والفوائد والمخاطر المحتملة من خلالها. ستجد أيضاً أدناه شرحاً عن حقك في رفض المشاركة أو الانسحاب من الدراسة في أي وقت. لا تتردد في طرح أي أسئلة لديك إن كنت بحاجة إلى توضيح حول ما ورد في هذه الإستمارة أو إذا كنت بحاجة إلى أي معلومات إضافية.

A. الهدف من الدراسة:

الهدف الرئيسي من هذا البحث هو دراسة آراء ومواقف مستهلكي مشروبات الطاقة من طلاب الجامعات الخاصة. وتشكل هذه الدراسة أطروحة شهادة الماجستير لطالبة في الجامعة الأميركية في بيروت، أي أن المعلومات التي سيتم جمعها سوف تستخدم في تقرير الأطروحة النهائي. كما يجري هذا البحث بهدف النشر في مجلات علمية ذات صلة، وربما العرض في مؤتمرات علمية.

B. المشروع / وصف خطوات التنفيذ:

1. إذا وافقت على المشاركة في هذه الدراسة، سوف يتم الاتصال بك من قبل الباحث ليبلغك عن الزمان والمكان اللذين سيتم عقد مجموعات النقاش فيهما، وذلك في حرم جامعتك. في اليوم المحدد، سوف تنضم إلى مجموعة من حوالي 6 إلى 8 طلاب لمناقشة موضوع مشروبات الطاقة. عند حضورك هذه الجلسة، سوف يطلب منك أولاً تعبئة استمارة تتضمن أسئلة عامة حول نمط حياتك.

بعد ذلك، سيقوم الباحث بإدارة الحوار في المجموعة عن طريق طرح أسئلة عامة عن مشروبات الطاقة وسلوكيات استهلاكها. سوف يطلب منك أن تعطي رأيك و تتكلم عن

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خبراتك وتجاربك الخاصة. وسوف يقوم مساعد الباحث بتدوين الملاحظات والمداخلات الحاصلة خلال النقاش. سيتم تسجيل هذه الجلسة بالصوت للسماح بإجراء تحليل دقيق للحوار الجاري وتسهيل عملية تحليل المعلومات الواردة فيما بعد. عند نقل التسجيلات بالإضافة للملاحظات المدونة سوف تتم إزالة أي أسماء واردة حتى لا يرتبط أي كلام أو رأي بشخصه. نتائج البيانات المجموعة خلال هذه الدراسة ستقدم كمعلومات اجمالية لا يمكن ربطها مباشرة برأيك أو بأراء الأفراد المشاركين كما سوف يحفظ الباحث سرية المناقشات من أجل المحافظة على خصوصية المشاركين. نتائج هذه الدراسة ستستخدم لأغراض بحثية فقط. لن يتم ربط الأفكار المناقشة بالمشاركين لأن جميع المعلومات المجموعة خلال الدراسة لا تحتوي على أسماء أو أي بيانات تعريف بأي مشترك.

2. للتمكن من المشاركة ، يجب أن تكون طالب لبناني في الجامعة الأميركية في بيروت (AUB) أو الجامعة اللبنانية الدولية (LIU)، أن يتراوح عمرك ما بين 18 و30 عاماً، وأن تكون مستهلك منتظم لمشروبات الطاقة (قنينة واحدة على الأقل في الشهر الواحد).

سوف يتم مشاركة المعلومات الناتجة عن هذه الدراسة البحثية وتقاسم البيانات النهائية منها مع زملاء باحثين بين الجامعة الأميركية في بيروت والجامعة اللبنانية الدولية في بيروت (LIU). فريق عمل الجامعة اللبنانية الدولية لن يحصل على البيانات الأولية بل فقط على البيانات المجمعة كمحصلة نهائية للتحليل. سيتم تحليل البيانات التي تم جمعها بما في ذلك المناقشات والاستمارات ومناقشتها في تقرير أطروحة الماجستير النهائي لطالبة من طلاب كلية الزراعة والعلوم الغذائية في الجامعة الأميركية كما يمكن أن تستخدم المعلومات في مقالات قد تنشر في مجلات علمية وضمن مؤتمرات.

C. المدة:

تقتصر المشاركة في هذه الدراسة على لقاء واحد في مجموعة النقاش التي ستستغرق ساعة إلى ساعة ونصف الساعة من الوقت. يمكنك التوقف عن المشاركة في الدراسة خلال أي وقت. إذا قررت التوقف عن المشاركة، فهذا لن يؤثر على علاقتك بالجامعة ولن يحرمك من أي حقوق أو امتيازات تمتلكها.

D. المخاطر ، المضايقات والفوائد

لن ينجم أي خطر جسدي أو ذهني عن مشاركتك في هذه الدراسة عدى مخاطر الحياة اليومية. سوف تطرح الأسئلة بطريقة بسيطة ومفتوحة أمام الجميع بحيث يمكنك الإجابة بسهولة دون أن تشعر بأي حرج. إن شعرت بالإحراج أو عدم ارتياح أثناء المناقشة ، يمكنك الانسحاب في أي وقت وهذا لن يؤثر على علاقتك بجامعتك.

إن الفائدة المحتملة من المشاركة في هذه الدراسة هي أنك سوف تجتمع بطلاب آخرين مثلك وتتواصل معهم وتتشارك آراءهم وأفكارهم فيما يخص استهلاك مشروبات الطاقة. هناك احتمال أنك قد لا تستفيد من المشاركة في هذه الدراسة ، ومع ذلك فإن مشاركتك ستساعد الباحثين على فهم أنماط

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استهلاك مشروبات الطاقة ونظرة طلاب الجامعات إليها. نتائج هذه الدراسة قد تستخدم في وضع الأساس لمزيد من الدراسات و البرامج لتطوير جلسات تعليمية في إطار التوعية السلوكية. سوف يتم تقديم المرطبات خلال جلسات المناقشة.

E. إذن تسجيل صوت:

سوف يتم تسجيل الصوت خلال جلسة مجموعة النقاش وذلك للمساعدة على نقل وتحليل جميع المعلومات بدقة. التسجيلات ستحفظ في مكان آمن لدى الباحث الرئيسي ولن تكون متوفرة إلا لفريق عمل الجامعة الأميركية المشارك في الدراسة. سوف ينقل النقاش المسجل مع الحفاظ على السرية التامة واحترام خصوصية المشتركين دون ذكر أسمائهم.

F. إذن اقتباس أجزاء من النقاش:

بعد تحليل النقاشات، يمكن أن يتم اقتباس بعض من المحادثات المسجلة ليتم استخدامها في منشورات أو محاضرات علمية مع الحرص على عدم ذكر أسماء أو أرقام تعريف بالأشخاص المشاركين.

G. السرية

لن يتم تسجيل اسمك أو رقم بطاقتك أو أي بيانات شخصية تعنيك للحفاظ على السرية وضمان خصوصيتك و لن يتم الإبلاغ عن اسمك عند نشر نتائج البحث. قبل بدء جلسة النقاش، سيقوم الباحث بتذكيرك والتأكيد على جميع المشتركين بأن تبقى الآراء المناقشة محصورة في إطار الجلسة و ألا يتم تداول أي من المعلومات مع العائلة أو الزملاء أو أي طرف آخر خارج نطاق الدراسة. سيتم حفظ الاستمارات في خزائن مغلقة في وحدة البحوث لدى الباحث الرئيسي. سيتم تحويل التسجيل الصوتي إلى بيانات مكتوبة تحفظ في مكان آمن على جهاز كمبيوتر مخصص للدراسة. سوف تكون جميع البيانات والمعلومات المجمعة متوفرة فقط للمراجعة من قبل الباحث الرئيسي و الباحثين العاملين مباشرة في هذا المشروع في الجامعة الأميركية في بيروت. سيتم الحفاظ على خصوصيتك في جميع البيانات المنشورة والمكتوبة الناتجة عن هذه الدراسة وسيتم التخلص من جميع البيانات بعد فترة الاحتفاظ المطلوبة.

H. التعويض عن الإصابات المتعلقة بالبحث:

إن احتمال التعرض لإصابة ناجمة عن هذه الدراسة ضئيل جداً. لمزيد من المعلومات يمكنك الاتصال د. لميس جمعة ، كلية العلوم الزراعية والأغذية - AUB هاتف: 961-1-350000 (تحويل: 4544) البريد الإلكتروني: lj18@aub.edu.lb

I. معلومات الاتصال والأسئلة:

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FAFS- Department of Nutrition and Food Sciences

- إن كان لديك أي سؤال أو استفسار بشأن الدراسة، يمكنك الاتصال بالدكتورة لميس جمعة من خلال البريد الإلكتروني: lj18@aub.edu.lb
- إن كان لديك أي أسئلة، مخاوف أو شكاوى تتعلق بحقوقك كمشارك في هذه الدراسة، يمكنك الاتصال بمجلس مراجعة مؤسسي العلوم الإجتماعية والسلوكية
- العنوان: الجامعة الأميركية في بيروت؛ شارع رياض الصلح، بيروت 2020 1107، لبنان
هاتف: 00961 1 374374، تحويلة: 5445، البريد الإلكتروني: irb@aub.edu.lb

ل. حقوق المشاركين:

المشاركة في هذه الدراسة إختيارية. يمكن لأي مشترك الانسحاب والتوقف عن المشاركة في أي وقت دون أن يتعارض ذلك بأي طريقة مع علاقته بالجامعة. سوف تحصل على نسخة من هذه الاستمارة.

هل لديك أي سؤال يتعلق بكل ما ورد سابقاً؟ هل تودّ المشاركة في هذه الدراسة؟

موافقة على المشاركة:

عند التوقيع على هذه الاستمارة، أنت توثق موافقتك على:

- المشاركة في الدراسة
- التسجيل الصوتي للمحادثات
- اقتباس أجزاء من النقاش واستخدامها لاحقاً في التقارير والمنشورات

عند وضع علامة في المربع الموجود أمام كل بند، فإنك توافق على المشاركة في هذا الإجراء.

لقد قرأتُ وفهمتُ المعلومات الواردة أعلاه. أوافق طوعاً على المشاركة في هذه الدراسة البحثية.

التاريخ: _____

توقيع المشارك: _____

اسم المشارك: _____

في حال كان المشترك كفيفاً:

التاريخ: _____

توقيع الشاهد: _____

اسم الشاهد: _____

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FAFS- Department of Nutrition and Food Sciences

إسم الشخص المصرح له بالحصول على موافقة المشترك: ملكة غزير

توقيع الشخص المصرح له بالحصول على موافقة المشترك:

التاريخ:

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APPENDIX II-B

CONSENT FORM (Qualitative, English)

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APPENDIX 1: CONSENT FORM
AUB

Title of Research Study: Assessment of Perceptions and Attitudes of Students towards Energy Drinks among Two Private Universities in Lebanon: A qualitative approach
Principal Investigator: Dr. Lamis Jomaa/ Department of Agriculture Sciences/ Faculty of Nutrition and Food Sciences/ Assistant professor
Co-Investigator: Dr. Lara Nasreddine/ Department of Agriculture Sciences/ Faculty of Nutrition and Food Sciences/ Associate Professor
Student Researcher: Malake Ghozayel/ Department of Agriculture Sciences/ Faculty of Nutrition and Food Sciences/ Graduate student

Consent Document:

We are asking you to participate in a **research study**. Before agreeing to participate in the research, it is important that you read the information below. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the study, as well as your right to withdraw from the study at any time. You should feel free to ask any questions that you may have.

A. Purpose of the Research Study

The main purpose of this study is to examine perceptions and attitudes of energy drinks consumers among private university students. This study is done as part of a graduate student's studies at AUB who will use the collected information as the basis for the final thesis report which is a requirement for graduation at the Faculty of Agricultural and Food Sciences.

The research is being conducted with the goal of publication in relevant scientific journals and possibly presentation at academic conferences.

B. Project/Procedures Description

1. If you accept to participate in this study, you will be contacted by the study researcher who will inform you about the time and place where the focus groups will be held. On the event day, you will join a group of approximately 6 to 8 students for a small group discussion. First, you will be asked to complete a brief anonymous survey including general questions about your lifestyle and socio-demographic background. Then, the moderator will pose general questions about energy drinks and beverages drinking behaviors and you will be asked to give your opinion and share your experiences. These questions will help us better understand your perceptions and attitudes towards energy drinks and similar drinking behaviors. One note-taker will be present during the focus group session to write down the ideas expressed within the group. The focus group discussion

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American University of Beirut

19 FEB 2015

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FAFS- Department of Nutrition and Food Sciences

will be audio recorded to allow for an accurate analysis. The notes taken as well as the recorded session will be transcribed without any personal identifiers. All data will be represented as aggregated data and will have no identifiers that could be linked to your personal responses. Opinions shared during the discussions will be kept confidential and used only as collective information. Findings from this study will be used for research purposes only.

2. To be eligible to participate, you must be a Lebanese undergraduate/ graduate AUB or LIU student, aged between 18 and 30 years and a regular consumer of energy drinks (consume energy drinks at least once a month).
3. Information from this research study will be shared with my co-researchers at the Lebanese International University at Beirut. Only aggregated data will be shared with them. The collected data including focus group discussions and completed questionnaires will be analyzed and discussed in the final thesis report which is a requirement in the graduate studies at the Faculty of Agricultural and Food Sciences. The information may be used in articles that might be published, as well as in academic presentations.

C. Duration

This study will take place on one scheduled date and time for a total time period of 60 to 90 minutes. You may leave the study at any time. If you decide to stop participating, you will not be penalized and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with your academic institution.

D. Risks, Discomforts and Benefits

Your participation in this study does not involve any physical risk or emotional risk to you beyond the risks of daily life. Questions will be asked in an open manner so that you will not feel pressured to answer if you are uncomfortable. If you feel embarrassed or uncomfortable during the discussion, you may stop participating at any time and this will not affect your relationship with your university.

A potential benefit from participating in this focus group study is that you will meet other students like yourself and come to understand how you and others feel about consuming energy drinks. There is a possibility that you may not benefit from participating in this study, however your participation does help researchers better understand energy drinks consumption patterns among university students. Results from this study can be used for developing behavior-specific educational material or awareness sessions. Refreshments will be served during the sessions.

E. Permission to Audio Tape the Interview:

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American University of Beirut

19 FEB 2015

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FAFS- Department of Nutrition and Food Sciences

Focus groups discussions will be audio recorded so as to make sure that all provided information will be accurately reported. Records will be monitored and audited without violating confidentiality. The recorded data will be locked in a file cabinet in the primary investigator's research unit. The interview recordings will not be shared with collaborators and will only be used by the members of the research team.. Only the aggregated data from the interviews (which will have no identifiers) will be shared.

F. Permission to quote parts of the interview:

Records will be transcribed for analysis and parts of the conversation may be used in future publications or presentations but such quotes will be anonymous.

G. Confidentiality:

There will be no collection of personal identifiers (name or university ID number, etc.) and none will be attached to your answers so that your confidentiality can be maintained. Your privacy will be ensured in that all data resulting from this study will be analyzed, written, and published in aggregate form.

Before starting the discussion, the moderator will emphasize that all discussed opinions should remain confined within the group and should not be shared with family or peers or any other external party out of the scope of the study. Completed questionnaires will be stored in locked cabinets in the principal investigator's research unit. The audio recording of the session will be transcribed then destroyed and any identifying information will be removed after the audio recordings are analyzed. Your answers on the questionnaire and transcribed discussion of the focus group will be kept in a secure computer file listed only by the study number assigned to you during your participation. Data access will be limited to the Principal Investigator and researchers working directly on this project. Your privacy will be maintained in all published and written data resulting from this study. All data will be destroyed responsibly after the required retention period.

H. Payment for Research-related Injury:

There is no risk of getting injured as a result of participating in this study. For questions about a study-related injury, you may contact Dr. Lamis Jomaa, Faculty of Agricultural & Food Sciences – AUB
Tel: 961-1-350000 (Ext: 4544) E-mail:lj18@aub.edu.lb

I. Contact Information and Questions:

1) If you have any questions or concerns about the research you may contact Dr. Lamis Joumaa E-mail:lj18@aub.edu.lb

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19 FEB 2015

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FAFS- Department of Nutrition and Food Sciences

2) If you have any questions, concerns or complaints about your rights as a participant in this research, you can contact the following office at AUB:

Social & Behavioral Sciences Institutional Review Board
Address: American University of Beirut, Riad El Solh, Beirut 1107 2020,
Lebanon - Tel: 00961 1 374374 (Ext: 5445)Email: irb@aub.edu.lb

J. Participant Rights

Participation in this study is voluntary. You are free to leave the study at any time without penalty. Your decision not to participate in no way influences your relationship with your academic institution.

A copy of this consent form will be provided to you.

Do you have any questions about the above information? Do you wish to participate in this study?

Participant Consent:

By signing this form you are consenting to:

- participate in the study
- having the interview audio taped.
- having the recordings transcribed and parts of the transcripts quoted in presentations and reports.

By checking the box in front of each item, you are consenting to participate in that procedure.

I have read and understood the above information. I agree to participate in the research study.

Participant Name: _____ Date: _____

Participant Signature: _____

In case of visually impaired participants:

Witness Name: _____ Date: _____

Witness Signature: _____

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19 FEB 2015

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FAFS- Department of Nutrition and Food Sciences

Documentation of Consent:

Printed Name of Person obtaining Consent: Malake Ghozayel

Signature of Person obtaining Consent: _____

Date: _____

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APPENDIX III

SURVEY'S QUESTIONNAIRE

Appendix 4

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22 JAN 2014

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**Assessment of Beverage Consumption Patterns among
University Students in Lebanon: Pilot Testing of a
Questionnaire**

Study Questionnaire

2014

Institutional Review Board
American University of Beirut

29 JAN 2014

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Assessment of Beverage Consumption Patterns among University Students in Lebanon: Pilot Testing of a Questionnaire

This survey is about beverage consumption behavior.
It is conducted by students and researchers from the American University of Beirut
and in collaboration with other research institutions in Lebanon.

You are kindly requested to complete the questionnaire to the best of your
knowledge. There is no right or wrong answer.

Please make sure to read every question. If you do not want to answer a question,
just leave it blank. Please do not hesitate to ask questions if needed.

The answers you give will be kept private and completing the survey is completely
voluntary.

When you are done with the questionnaire, kindly return it back to the researcher
who handed it to you.

Thank you for your valuable time and input.

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29 JAN 2011

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This section is to be completed by study student researchers

Questionnaire ID: _____

University: _____

The questions below are to be completed by the student

*You are kindly requested to complete the questionnaire to the best of your knowledge.
Please do not hesitate to ask questions if needed.*

I. Demographic/ Background:

1. What is your date of birth? -----/----/----
2. What is your gender?
 - Male
 - Female
3. What is your weight in Kg (self-reported)? -----
4. What is your height in cm (self-reported)? -----
5. What is your nationality?
 - Lebanese
 - Non Lebanese

Please specify-----

6. Where are you from in Lebanon?
 - North Lebanon
 - Mount Lebanon
 - Beirut
 - Bekaa
 - South Lebanon
 - Nabatieh
7. What is the average income of your family per month?
 - below \$500
 - \$500 – \$1000
 - \$1000 – \$1500
 - \$1500 - \$2000
 - above \$2000

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8. What is your level of education?

- Undergraduate
- Graduate

9. What is your current year of study?

- Sophomore (1st year)
- Junior (2nd year)
- Senior (3rd year)
- 4th year or more

10. What is your field of study?

- Agriculture/ Animal Sciences/ Landscape
- Arts (Literature, History, Geography, Archeology, Anthropology, Public administration, Political Sciences, Journalism, Tourism, etc.)
- Business
- Engineering/ Architecture
- Health Sciences (Medical Lab, Environmental Sciences, Public Health)
- Medicine
- Nursing
- Nutritional Sciences (Human Nutrition and Food Science)
- Pharmacy
- Sciences (Biology, Chemistry, Physics, Mathematics, Computer Science)

Other: _____

11. What is your **average** number of studying hours per week? (weekdays and weekends)

-----hours/week

12. Do you currently have a job?

- yes
- Part – time**
Please specify job type: ----- Number of hours/week -----
- Full-time**
Please specify job type: ----- Number of hours/week-----
- No

13. In a typical week, do you participate in any physical activities or exercises such as running, swimming, aerobics, weight lifting, cooking or basketball playing?

- Yes
- No

If No, please skip questions 14 and 15

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14. How many times do you take part in this activity during a typical week?

----- Times per week Duration every time----- (hours: minutes)

15. What type of activities do you perform?

- Light (stretching, yoga, cooking, slow walking or bowling)
- Moderate (driving a car, ping pong, walking downstairs, samba dancing, slow dancing or walking a pet)
- Vigorous (jogging, running, heavy lifting, aerobics, basketball playing, tennis, rugby, belly dancing, volleyball, swimming laps or fast bicycling)

II. Consumption of Selected Beverages:

16. Please fill in your average total use of each specified drink during the **past year**:

A. Water (1 drink=1 cup)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

B. Coffee with caffeine (1 drink= 1 cup)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

C. Decaffeinated coffee (1 drink= 1 cup)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week

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American University of Beirut
29 JAN 2014
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- 1 per day
- 2-3 per day
- 4 or more per day

D. Soft drinks/ Sodas (1 drink= 1can)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

E. Sports drinks like Gatorade (1 drink= 1 bottle)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

III. Consumption of Energy Drinks and Alcoholic Beverages:

17. Have you ever consumed any type of energy drink? (Example: Red Bull, XXL, Buzz, and Boom Boom)

- Yes
- No

18. Which of the following popular brands of energy drinks do you **usually** consume? *Please check all that apply.*

- Buzz
- XXL
- Boom Boom
- Monster
- X-plosive
- Effect
- Marinas Turbo
- Ozone

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- Power Horse
- Others, please specify: -----

19. Where do you mostly buy energy drinks from?

- Gas station supermarkets
- Supermarkets
- Night clubs
- Restaurants
- University cafeterias
- other, please specify: -----

20. When do you mostly consume energy drinks during your academic semester? ***Please check all that apply.***

- Around exam times
- On weekends
- During semester break
- Others, please specify: -----

Please answer the below questions separately for (Fall/Winter/Spring) and (Summer):

21. Please fill in your average total use of energy drinks during the past year in the questions below:

(a) During the Fall/Winter/Spring seasons (beginning of October – end of May), please fill in your **average total use**, during **one month**, of an energy drink alone (**not mixed with alcohol**) (Examples: Red Bull, Monster, Power Horse, Boom Boom, Ozone, X-plosive, Marinas Turbo and Effect) (1 drink = 1 can)

- Never
- Less than one per month
- 1-3 cans per month
- 1 can per week
- 2-4 cans per week
- 5-6 cans per week
- 1 can per day
- 2-3 cans per day
- 4 or more cans per day

(b) During the Summer season (beginning of June – end of September), please fill in your **average total use**, during **one month**, of an energy drink alone (**not mixed with alcohol**) (Examples: Red Bull, Monster, Power Horse, Boom Boom, Ozone, X-plosive, Marinas Turbo and Effect) (1 drink = 1 can)

- Never
- Less than one per month

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- 1-3 cans per month
- 1 can per week
- 2-4 cans per week
- 5-6 cans per week
- 1 can per day
- 2-3 cans per day
- 4 or more cans per day

22. Do you consume alcohol?

- Yes; *if yes, please complete all the below questions*
- No

If NO, please skip to question 29

23. How do you consume alcohol? ***Please check all that apply***

- Alcohol alone (no mixing with other beverages or flavors)
- Mixed with juice (cocktails like cosmopolitan, margaritas, mojito)
- Mixed with sodas
- Mixed with energy drinks

24. During the Fall/Winter/Spring seasons (beginning of October – end of May), please fill in your **average total use**, during **one month**, of an energy drink mixed with alcohol (1 drink = 1 glass) (Examples: XXL and Buzz)

- Never
- Less than one glass per month
- 1-3 glasses per month
- 1 glass per week
- 2-4 glasses per week
- 5-6 glasses per week
- 1 glass per day
- 2-3 glasses per day
- 4 or more glasses per day

25. During the Summer season (beginning of June – end of September), please fill in your **average total use**, during **one month**, of an energy drink mixed with alcohol (1 drink = 1 glass) (Examples: XXL and Buzz)

- Never
- Less than one glass per month
- 1-3 glasses per month
- 1 glass per week
- 2-4 glasses per week
- 5-6 glasses per week
- 1 glass per day
- 2-3 glasses per day
- 4 or more glasses per day

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26. Which cup/bottle best describes the proportions of alcohol and energy drink that you mostly drink?



27. Please fill in your average total use of each of the specified drinks below during the **past year**:

F. Araq (1 drink=1 glass=5 shots)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

G. Wine (1 drinks=1 glass)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

H. Beer (1 drink= 1 bottle)

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week

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American University of Beirut
29 JAN 2014
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- 1 per day
- 2-3 per day
- 4 or more per day

**I. Alcoholic cocktails (alcohol mixed with juice like Jamaica, Marguerita, Pina Colada)
(1 drink= 1 glass)**

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

**J. Alcoholic cocktails (alcohol mixed with soda like rum and coke, vodka and 7up)
(1 drink= 1 glass)**

- Never
- Less than once per month
- 1-3 per month
- 1 per week
- 2-4 per week
- 5-6 per week
- 1 per day
- 2-3 per day
- 4 or more per day

28. On a scale from 1 to 5, please rate how much you agree or disagree on each of the following statements regarding alcohol mixed with energy drinks (**AmEDs**):

1: Strongly disagree

5: Strongly agree

It is a common drink	1	2	3	4	5
AmEDs help increase your tolerance	1	2	3	4	5
AmEDs are the same as other mixed drinks	1	2	3	4	5
AmEDs taste better than other alcoholic drinks	1	2	3	4	5
I don't feel as tired when I drink AmEDs	1	2	3	4	5

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APPENDIX IV-B

FGDS' QUESTIONNAIRE (English)



05 FEB 2015

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FOCUS GROUP PARTICIPANTS QUESTIONNAIRE		
Date:	Age:	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female
Height:	Education level: <input type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate	Field of study: <input type="checkbox"/> Health related <input type="checkbox"/> Non-health related
Weight:		
<p>1. You currently share your residency with:</p> <p><input type="checkbox"/> Parents with/no siblings <input type="checkbox"/> Friends <input type="checkbox"/> lives alone</p>		<p>9. Are you currently trying to do any of the following about your weight?</p> <p><input type="checkbox"/> Keep the same weight <input type="checkbox"/> Lose weight <input type="checkbox"/> Gain weight <input type="checkbox"/> Do nothing about your weight</p>
<p>2. How many rooms are in your house (excluding the kitchen and bathrooms)? _____</p> <p>How many members (including you) are co-residents in your household? _____</p>		<p>10. How do you describe your sleeping habits?</p> <p><input type="checkbox"/> Regular <input type="checkbox"/> Irregular</p>
<p>3. What is the educational level of your father?</p> <p><input type="checkbox"/> No schooling <input type="checkbox"/> Primary school <input type="checkbox"/> Middle School <input type="checkbox"/> High School or technical diploma <input type="checkbox"/> University (including postgraduate degrees)</p>		<p>11. Indicate on a scale from 1 to 10, how stressful think your life is on average</p> <p>(1: not stressed at all, 10 = completely stressed)</p> <p>_____</p>
<p>4. What is the educational level of your mother?</p> <p><input type="checkbox"/> No schooling <input type="checkbox"/> Primary school <input type="checkbox"/> Middle School <input type="checkbox"/> High School or technical diploma <input type="checkbox"/> University (including postgraduate degrees)</p>		<p>12. Please fill in your average total consumption of energy drinks during the past month:</p> <p><input type="checkbox"/> 2 cans per month <input type="checkbox"/> 1 can per week <input type="checkbox"/> 2-4 cans per week <input type="checkbox"/> 5-6 cans per week <input type="checkbox"/> ≥1 can per day</p>
<p>5. Besides pursuing your university studies, do you currently have a job?</p> <p><input type="checkbox"/> Yes _____ working hours/week <input type="checkbox"/> No</p>		<p>13. Do you consume alcohol?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>

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<p>6. What is your average personal income per month:</p> <p><input type="checkbox"/> <500\$ <input type="checkbox"/> 500-1000\$ <input type="checkbox"/> 1000-2000 <input type="checkbox"/> >2000\$</p>	<p>14. Please fill in your average total consumption of type of alcohol during the past month:</p> <p><input type="checkbox"/> None <input type="checkbox"/> 1-2 cans per month <input type="checkbox"/> 1 can per week <input type="checkbox"/> 2-4 cans per week <input type="checkbox"/> 5-6 cans per week <input type="checkbox"/> ≥1 can per day</p>
<p>7. Do you regularly practice any moderate or vigorous physical activity? (ex. Jogging, cycling, heavy weight lifting, tennis, basketball, etc.)</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>15. Do you consume energy drinks mixed with alcohol?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>8. Do you smoke? (Cigarettes, e-cigarettes, cigars and/or arguileh)?</p> <p><input type="checkbox"/> Yes, I currently smoke <input type="checkbox"/> I quit <input type="checkbox"/> I never smoked</p>	<p>15. Please fill in your average total consumption of energy drinks mixed with alcohol during the past month:</p> <p><input type="checkbox"/> None <input type="checkbox"/> 1-2 cans per month <input type="checkbox"/> 1 can per week <input type="checkbox"/> 2-4 cans per week <input type="checkbox"/> 5-6 cans per week <input type="checkbox"/> ≥1 can per day</p>
<p>THANK YOU FOR YOUR VALUABLE INPUT!</p>	

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استمارة مجموعة نقاش	
التاريخ:	العمر:
الجنس: <input type="checkbox"/> ذكر <input type="checkbox"/> أنثى	
الطول:	المستوى العلمي: <input type="checkbox"/> بكالوريوس <input type="checkbox"/> دراسات عليا
الوزن:	المجال الدراسي: <input type="checkbox"/> متعلق بالصحة/ بالطب <input type="checkbox"/> متعلق بالصحة/ بالطب غير
١. تتشارك مكان إقامتك الحالية مع:	٩. هل أنت حالياً في محاولة ل:
<input type="checkbox"/> والدك مع/ أو دون إخوة <input type="checkbox"/> صديق/ أصدقاء <input type="checkbox"/> أسكن وحدي	<input type="checkbox"/> للمحافظة على وزنك <input type="checkbox"/> لخسارة وزنك <input type="checkbox"/> لزيادة وزنك <input type="checkbox"/> لا ينطبق أي من الاحتمالات
٢. كم غرفة في منزلك (عدى المطبخ والحمام) _____ كم عدد أفراد المنزل بما فيهم أنت؟ _____	١٠. كيف تصف نومك: <input type="checkbox"/> منتظم <input type="checkbox"/> غير منتظم
٣. ما هو مستوى التحصيل العلمي لوالدك: <input type="checkbox"/> غير متعلم <input type="checkbox"/> مرحلة ابتدائية <input type="checkbox"/> مرحلة متوسطة <input type="checkbox"/> مرحلة ثانوية <input type="checkbox"/> مرحلة جامعية	١١. اذكر على مقياس من ١ الى ١٠، كيف تقيم مستوى الاجهاد (stress) في حياتك بشكل عام (١: لست مجهداً على الإطلاق، ١٠: مجهد للغاية)
٤. ما هو مستوى التحصيل العلمي لوالدتك: <input type="checkbox"/> غير متعلم <input type="checkbox"/> مرحلة ابتدائية <input type="checkbox"/> مرحلة متوسطة <input type="checkbox"/> مرحلة ثانوية <input type="checkbox"/> مرحلة جامعية	١٢. الرجاء املأ المجموع التقريبي لعدد عبوات مشروبات الطاقة التي تناولتها خلال الشهر الماضي: <input type="checkbox"/> ٢ عبوة/ الشهر <input type="checkbox"/> عبوة واحدة / الاسبوع <input type="checkbox"/> ٢-٤ عبوة / الاسبوع <input type="checkbox"/> ٥-٦ عبوة / الاسبوع <input type="checkbox"/> ١ عبوة/ اليوم
٥. هل تعمل بالإضافة إلى دراستك الجامعية؟ <input type="checkbox"/> نعم _____ ساعات / الاسبوع <input type="checkbox"/> كلا	١٣. هل تناول المشروبات الكحولية؟ <input type="checkbox"/> نعم <input type="checkbox"/> كلا

Energy Drinks Study

<p>١٤. الرجاء املأ المجموع التقريبي لعدد حصص المشروبات الكحولية التي تناولتها خلال الشهر الماضي:</p> <p><input type="checkbox"/> لم أتناول الكحول خلال الشهر الماضي</p> <p><input type="checkbox"/> ٢-١ عبوة / الشهر</p> <p><input type="checkbox"/> عبوة واحدة / الاسبوع</p> <p><input type="checkbox"/> ٤-٢ عبوة / الاسبوع</p> <p><input type="checkbox"/> ٦-٥ عبوة / الاسبوع</p> <p><input type="checkbox"/> ١ ≤ عبوة / اليوم</p>	<p>٦. ما هو معدل مدخولك الفردي بالشهر؟</p> <p><input type="checkbox"/> \$٥٠٠ ≥</p> <p><input type="checkbox"/> \$١٠٠٠ - ٥٠٠</p> <p><input type="checkbox"/> \$٢٠٠٠ - ١٠٠٠</p> <p><input type="checkbox"/> \$٢٠٠٠ ≤</p>
<p>١٥. هل تتناول مشروبات الطاقة التي تحتوي على الكحول؟</p> <p><input type="checkbox"/> نعم</p> <p><input type="checkbox"/> كلا</p>	<p>٧. هل تمارس بانتظام أي نوع من الرياضات المنتظمة من الدرجة المعتدلة أو العالية؟ (مثلا الركض، ركوب الدراجات، رفع الوزن الثقيل، كرة المضرب، وكرة السلة، الخ)</p> <p><input type="checkbox"/> نعم</p> <p><input type="checkbox"/> كلا</p>
<p>١٦. الرجاء املأ المجموع التقريبي لعدد حصص مشروبات الطاقة التي تحتوي على الكحول والتي تناولتها خلال الشهر الماضي:</p> <p><input type="checkbox"/> لم أتناول الكحول خلال الشهر الماضي</p> <p><input type="checkbox"/> ٢-١ عبوة / الشهر</p> <p><input type="checkbox"/> عبوة واحدة / الاسبوع</p> <p><input type="checkbox"/> ٤-٢ عبوة / الاسبوع</p> <p><input type="checkbox"/> ٦-٥ عبوة / الاسبوع</p> <p><input type="checkbox"/> ١ ≤ عبوة / اليوم</p>	<p>٨. هل تدخن؟ (سجائر، سجانر إلكترونية، سيجار، أرجيلة...)</p> <p><input type="checkbox"/> نعم</p> <p><input type="checkbox"/> لقد توقفت</p> <p><input type="checkbox"/> كلا، لم أبدأ</p>
<p>شكراً لمساهمتك القيمة !</p>	

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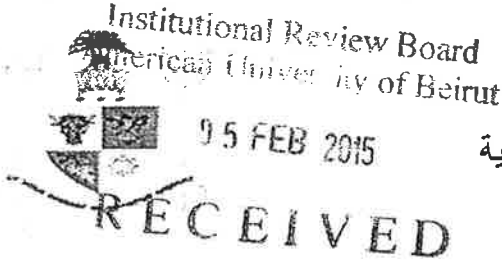
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APPENDIX V-A

FOCUS GROUP SCRIPT (Arabic)

جدول جلسة النقاش



دراسة مشروبات الطاقة
كلية الزراعة - قسم العلوم الغذائية



جدول جلسة النقاش

I. المقدمة:

مرحباً وشكراً لمشاركتم بهالدراسة وبجلسة النقاش اليوم.

اسمي ملكة، انا تلميذة ماجستير في الـAUB، والجلسة اليوم هي جزء من أطروحتي. زميلتي ربي رح تحضر معنا هالجلسة وتسجل النقاش يلي عم بدور.

السبب لتنظيم هاللقاء اليوم هو لنعرف شو نظرة ورأي طلاب الجامعات مثلكن، بمشروبات الطاقة. وبالتالي، إنتو مجتمعين لتتشاركوا تجاربكن، أفكاركن، آراءكن، بخصوص هيدي المشروبات.

أكيد ما في جواب صح وجواب خطأ، لهالسبب بتمنى اسمع آراء الكل وتعبروا عن نفسكن وعن آراءكن بكل شفافية ومن دون أي تردد حتى لو كان جوابكن بيتعارض مع رأي الباقيين بالمجموعة.

أولاً، خليني ذكركن إنو هيدي الجلسة رح تكون مسجلة صوتياً، لسبب واحد، هو مساعدتنا لنتذكر كل النقاش والأجوبة اللي نعطت. وبالتأكيد فريق البحث بالجامعة الأميركية هو الوحيد بس اللي بيقدريسمع التسجيل.

أكيد، ما رح نذكر أسماء أو أي شي بعرف عنكن أو بيربط إجاباتكن وتعليقاتكن، وهيدا النقاش رح يستخدم فقط للدراسة والنتائج اللي رح نحصل عليها رح تتعرض بإطار علمي عام وغير شخصي.

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كلية الزراعة - قسم العلوم الغذائية

بالرغم من أنو البعض من الطبيعيشعر انوالأمور اللي رح نحكيها اليوم ممكن تنحكي أو تتخبر بين الأصحاب والعيلة برات هالجلسة ، بتمنى عليكن انو هيدا النقاش يضل ضمن نطاق حوارنا اليوم، حفاظاً على خصوصية الجميع وحتى الكل يكون مرتاح بالتعبير عن آراؤه.

هالجلسة رح تاخذ ساعة لساعة ونصفمن الوقت تقريباً.

أولاً، رح اجمع منكن الأوراق (استمارة الموافقة) يلي وقعتوها قبل بوقت، ورح تضل نسخة موقعة معكن.

II. الإستمارة:

هلاً، رجاء إذا فيكن تعبو هالإستمارة السريعة، قبل ما نبلس نقاشنا. رح تاخذ كم دقيقة من وقتكن بس.

III. جلسة الحوار:

انتو مجتمعين بهالمجموعة اليوم لأنو بيجمعكن شي مشترك واحد وهو انكن بتستهلكو مشروبات الطاقة بشكل منتظم.

مثل ما شايفين، في مجموعة من مشروبات الطاقة موجودة بالوسط، هل كلكن بتعرفو هالمشروبات؟

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دراسة مشروبات الطاقة
كلية الزراعة - قسم العلوم الغذائية

A. شو بيغيلكن مشروب الطاقة؟

١. كيف بتعرفو عنو؟

٢. شو مكوناتو الأساسية؟

B. كيف تعرفتوا أول مرة على مشروبات الطاقة؟

١. مين وشو اللي شجعكن تجربوا هالمشروبات؟

(هل جربتوهن أول مرة لوحدهن أو مع أهلكن أو العيلة أو الأصدقاء)

(هل كانت التجربة الأولى على علاقة أو بسبب مناسبة معينة، مثل التحضير لامتحان مهم، أو لمشروع كبير، أو قبل منافسة رياضية، أو خلال احتفال، حفلة...)

٢. بأي عمر أول مرة جربتو مشروب الطاقة؟

C. شو السبب/الأسباب اللي بتخليكن تستهلكو مشروبات الطاقة؟

(شو يلي خلاكن تشترو مرة ثانية مشروب الطاقة بعد ما جربتو أول مرة؟ كيف صرتو مستهلكين دائمين لهيدا المشروب)

١. لما تشترو مشروب طاقة، شو أكثر عنصر أو شي بتأخذو بعين الاعتبار؟

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دراسة مشروبات الطاقة
كلية الزراعة - قسم العلوم الغذائية

D. هل تعتقدو انو مشروبات الطاقة عندها فوائد صحية؟
(كيف ممكن تأثر عليكن ايجابيا)؟

E. هل سمعتوا أو عانيتوا انتو شخصياً من أي عوارض جانبية بعد تناول مشروب الطاقة؟

١. شو بتشعرو لما حدن يخبركن عن بعض العوارض الجانبية المحتملة؟

٢. هل بتسوقو السيارة عادة بعد ما تكونوا متناولين مشروب الطاقة خالي من الكحول أو مع كحول؟

٣. هل السوافة بعد تناول مشروبات الطاقة تصرف آمن؟ هل بتعتقدو انو تناول مشروبات الطاقة بشكل عام آمن؟

F. شو رأيكن بأسعار مشروبات الطاقة؟

G. شو رأيكن بإعلانات مشروب الطاقة؟

١. أي نوع إعلانات برأيكن هني الأقوى؟

٢. شو يلي بيحبكن أكثر شي بهالإعلانات؟
(شو أكثر شي بتحبو؟ شو أكثر شي ما بتحبو أو ما بيعجبكن؟)

٣. شو يلي بخليكن تفضلو مشروب طاقة معين على غيره؟
(أي نوع مشروب طاقة بتتناولو أكثر شي؟ ليه؟)

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IV. كيف بتوصفوا الناس يلي بيشر بوا مشروبات طاقة؟
(cool، نشيطين، رياضيين، اجتماعيين....)

١. شو رأيكن وكيف بتنظروا انتو ورفقاتكن، للأشخاص اللي
ما بيتناولوا مشروبات طاقة؟
(مثلاً، إذا كنتو بمجموعة أصدقاء عم تتناولوا مشروبات طاقة،
وشخص ما بدو يشرب، شو ممكن تفكروا أو تقولوا عنو؟)

٢. شو رأي أهلكن بمشروبات الطاقة؟ شو رأي أصدقاءكن؟

V. هل فكرتوا شي مرة أو عم تفكروا حالياً تغيير عاداتكن بشرب
مشروبات الطاقة؟
(هل بتفكروا تخففوا أو توقفوا شرب مشروب الطاقة؟ ليش؟)

١. شو العوامل أو الأسباب اللي ممكن تخليكن تفكروا أنو
توقفوا أو تخففوا تشربوا مشروبات الطاقة؟

VI. هل بتخلوا قناني مشروبات الطاقة موجودة عندكن بالبراد دائماً أو
بتشتروها بس عند اللزوم؟ شو السبب؟

١. شو ممكن تعملو إذا كان بدكن مشروب طاقة وما توفر
بالمكان اللي موجودين في؟
(يعني إذا كنتو مثلاً بمطعم أو ملهى وعبالكن تاخذو مشروب طاقة وما كان
في، شو بتعملو؟ ممكن ما ترجعو تزوروا المكان لهالسبب؟)

دراسة مشروبات الطاقة
كلية الزراعة - قسم العلوم الغذائية

VII. هل سمعتموا عن أي قرار رسمي يتعلق بمشروبات الطاقة بلبنان؟

أ. بتعتقدو إنو لازم يكون في قرار رسمي لمراقبة سوق مشروبات الطاقة من ناحية التسويق، البيع، المكونات، الأنواع، إمكانية البيع، إلخ)

VIII. هل في أي فكرة ما حكينا عنا بتحبو انو ناقشا قبل ما نختم
جاستنا؟

شكراً كثير على مشاركتكن وعلى وقتكن!

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APPENDIX V-B

FOCUS GROUP SCRIPT (English)



Energy Drinks Study
FAFS- Department of Nutrition and Food Sciences

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FOCUS GROUP SCRIPT

I. Introduction

Hello everyone, thank you for participating in our focus group study.

My name is Malake, I'm a graduate student at AUB and the focus group session we are having today is part of my thesis project. My colleague Rouba will also be attending this session and will be taking notes of our discussion.

The reason we are having this focus group today is to mainly find out what are the perceptions and attitudes of young university students like you towards energy drinks. Thus, you are gathered here to share your experience, thoughts and opinions about these beverages. There are no wrong or right answers so I would like to hear everyone's point of view and hope you can be honest and express yourself with no hesitation even when your responses may not be in agreement with the rest of the group.

First of all, let me remind you that this session will be audio recorded only to help me remember all the information we will be sharing and no one besides the AUB research team will be allowed to access the recordings. No names or other identifiers will be attached to your comments and all your responses will be kept anonymous. Although it might be tempting for you to share what you've heard with your friends and family, I wish to bring your attention to the importance of keeping the group's responses confidential. This will make you all feel comfortable sharing your thoughts. This focus group session will take 60-90 minutes.

II. Consent forms

First, I would like to collect the consent forms you have read and signed earlier and will keep with you a copy of it.

(Collection of consent forms)

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III. Questionnaire

Now I will ask you to complete a brief anonymous survey before we start the discussion. It will only take you few minutes.

(Collection of completed questionnaire)

IV. Focus group discussion

You are all gathered in this group today because you share one common characteristic which is "energy drink consumption".

Icebreaker question: As you have noticed, we have placed a selection of beverages in the center, is everybody familiar with these beverages?

- 1- So what do EDs mean to you?
 - a. How do you define EDs?
 - b. What are the major ingredients of EDs?

- 2- How did you first know about EDs?
 - a. Who/What encouraged you to try EDs?

(Did you first try them alone, with parents, family, friends, etc.)

(Was your first trial related to/ triggered by a special event? : studying for an important exam, preparing a big project, before a competition, during a celebration/party, etc.)

- b. When (at what age) did you first try Energy drinks?

- 3- Why do you consume energy drinks?

(What made you repurchase EDs after the first time you consumed them? Why did u become a regular consumer of EDs?)

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Energy Drinks Study
FAFS- Department of Nutrition and Food Sciences

- a. When you purchase EDs, what are the factors you consider the most?
- 4- Do you think EDs have health benefits?
(How can EDs positively influence you?)
- 5- Have you heard about or experienced yourself any side effects while consuming energy drinks?
- a. How do you feel when told about possible EDs side effects?
 - b. Have you ever driven under the influence of EDs/ AmEDs?
 - c. Do you think this behavior is safe? Do you think overall consumption of EDs is safe?
- 6- What do you think about the price of EDs?
- 7- What do you think about EDs ads?
- a. What are the most powerful/ expressive Ads?
 - b. What catches your attention the most?
(What do you mostly like/dislike?)
 - c. What makes you choose one brand instead of another?
(Which brand(s) do you consume? Why?)
- 8- How do you describe people who drink EDs?
(Cool, energetic, sportive, social, etc.)
- a. What do you and your friends think about people who do not consume them?

(If you are with a group of friends drinking ED except one who refuses to, what will you probably think about this person?)
 - b. What do your parents think about the fact that you consume EDs?
What do your friends think?
- 9- Have you ever considered or are currently considering changing your energy drinks consumption habits?
(Do you consider reducing your intake or stopping EDs consumption? Why? Why not?)
- a. What factors may lead you to reduce or stop consuming EDs?

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Energy Drinks Study
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10-Do you keep EDs cans/bottles in your fridge or buy them only when needed?
Why?

- a. What would you do if you felt like having EDs when for some reasons they are not accessible?
(If you wanted an ED while you are in a restaurant, shop, pub, any place where EDs are not available, what will you do?)

11-Have you heard about any regulations concerning energy drinks in Lebanon?

- a. Do you think energy drinks should be regulated? (Ingredients, points of sale, drinking age, etc.)

12-Is there any idea you want to add that has not been mentioned during our discussion?

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APPENDIX VI
RECRUITMENT FLIERS

Are You a Lebanese Female AUB Student **05 FEB 2015**

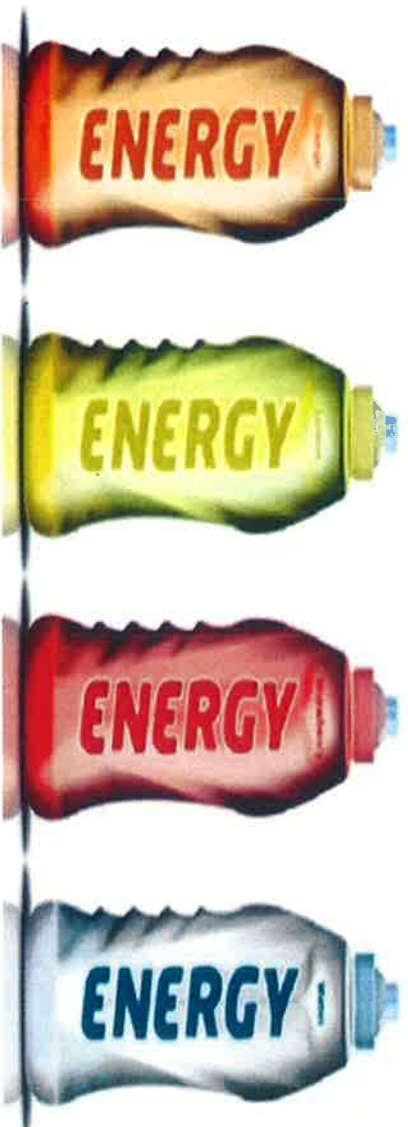
between 18 and 30 Years Old **RECEIVED**



Do you regularly consume Energy Drinks?

Would you like to participate in a study assessing young adults' attitudes and perceptions towards energy drinks?

Join us in a group discussion to share your thoughts and opinions!



Duration: 1hour
Place: AUB campus
Time: to be appointed

Refreshments **with the server!**
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19 FEB 2015

If interested, please contact student researcher Malake Ghozayel, Department of **APPROVED**

Food Sciences, FAFS - AUB: mhgg04@aub.edu.lb

Principal Investigator: Dr. Lamis Jomaa – For any inquiries, please contact 01350000/ext.4544

**Are You a Lebanese Male AUB Student
between 18 and 30 Years Old?**

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Do you regularly consume Energy Drinks?

Would you like to participate in a study assessing young adults' attitudes and perceptions towards energy drinks?

Join us in a group discussion to share your thoughts and opinions!



Refreshments will be served!

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If interested, please contact student researcher Malake Ghozayel, Department of **Nutrition** and

Food Sciences, FAFS - AUB: mhg04@aub.edu.lb

Principal Investigator: Dr. Lamis Jomaa – For any inquiries, please contact 01350000/ext.4544

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Are You a Lebanese Female LIU Student **9th FEB 2015**
between 18 and 30 Years Old? **E C C B I V E D**



Do you regularly consume Energy Drinks?

Would you like to participate in a study assessing young adults' attitudes and perceptions towards energy drinks?

Join us in a group discussion to share your thoughts and opinions!



Duration: 1hour
Place: LIU Beirut campus
Time: To be appointed

Refreshments will be served!
Board

American University of Beirut

If interested, please contact co-investigator Dr. Ali Ghaddar, Faculty of Arts and Sciences – **9th FEB 2015**

Tel.01706881 ext.2301 – Email: ali.ghaddar@liu.edu.lb or student researcher Malake Ghozayel

Email: mhg04@aub.edu.lb **APPROVED**

Principal Investigator: Dr. Lamis Jomaa – For any inquiries, please contact 01350000/ext.4544



Institutional Review Board
American University of Beirut

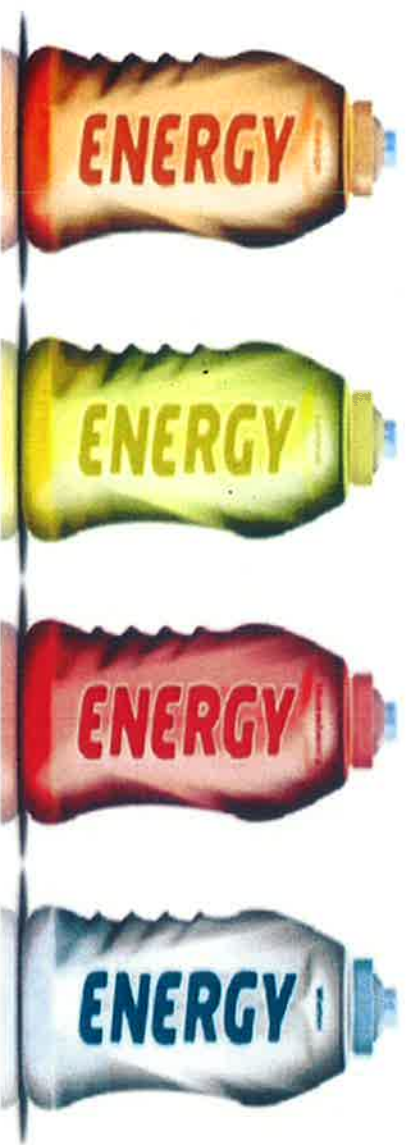
Are You a Lebanese Male LIU Student between 18 and 30 Years Old? RECEIVED FEB 2015



Do you regularly consume Energy Drinks?

Would you like to participate in a study assessing young adults' attitudes and perceptions towards energy drinks?

Join us in a group discussion to share your thoughts and opinions!



Duration: 1hour
Place: LIU Beirut campus
Time: To be appointed

Institutional Review Board
Refreshments will be served!
University of Beirut

If interested, please contact co-investigator Dr. Ali Ghaddar, Faculty of Arts and Sciences
Tel.011706881 ext.2301 – Email: ali.ghaddar@liu.edu.lb or student researcher mahg04@aub.edu.lb
Principal Investigator: Dr. Lamis Jomaa – For any inquiries, please contact 01350000/ext.4544

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