THE UNIVERSITY OF THE WEST INDIES
AT ST. AUGUSTINE, TRINIDAD AND TOBAGO

A Research Paper

Submitted in partial requirements

for HUEC 3012

of

The University of the West Indies

Title: The link between the consumption of Fast Foods and Cardiovascular risks in University Students

Student Name: Kerri Puckerin

Project Supervisor: Dr. Selby Nichols

Year Submitted: 2014

Department of Agricultural Economics & Extension
Faulty of Food and Agricultural

THE LINK BETWEEN THE CONSUMPTION OF FAST FOODS AND THEIR CARDIOVASCULAR RISKS IN UNIVERISTY STUDENTS

A Research Paper

Submitted in Partial requirements for AM312

of

The University of the West Indies

Kerri Puckerin

Supervised by Dr. Selby Nichols

2014

Acknowledgement

I would like to acknowledge all the faculty and administrators at the University of the West Indies. I would like to thank all the professors for sharing their knowledge during classes and advisement.

Table of contents

List of tables

List of figures

Abstract

Background

Fast-food consumption is increasing around the world as fast foods are high in fat, salt and sugar and it has nutritional implications on health. This study was conducted to determine the link between the consumption of fast-foods and their cardiovascular risks in university students.

Method

A cross sectional study was conducted among 150 university students to analyze their dietary intake, food preference and anthropometric measurements.

Results

94.7 % of the sample consumed fast foods, in which 27.3 % of fat was above 35% of fat from energy. Females significantly reported $p < 0.001$ lower BMI than males and BMI were inversely related to fat and drink intake.

Conclusion

The study revealed there is a link between fast food between fast food consumption and cardiovascular disease.

Introduction

According to the World Health Organization (WHO) (2003) frequent fast food consumption is a health concern because most of these foods are rich in saturated and trans-fats, simple carbohydrates and sodium which are associated with hypertension, cardiovascular disease and type 2 diabetes. However, the increase in non- communicable diseases is a result of globalization which has negatively impacted the agri-food systems, thereby altering the quantity, type, cost and desirability of foods available for consumption as advanced by Popkin, (1980).

Factors influencing food preferences

According to Khan (1981), there are seven factors that influence food preferences. These are: personal, socio-economic, educational, cultural, religious and regional, intrinsic, extrinsic, biological, physiological and psychological.

Personal Factors

Personal factors can influence people eating preferences because individuals are attracted to products or information about healthy food, (e.g. reduced-fat labels) which can have a positive effect causing an increased liking for the product. However, it can cause a negative effect for the food item (eg. liking the full fat labeled version) and sometimes have no effect at all (Martins et al.1997). Furthermore, the marketing of food products via subtle wording, packaging design, and advertising can influence people perception of the food even before they have tasted the product.

Khan (1981) also stated that individuals' response to social and cultural pressures; select, consume and utilize portions of the available food supply shape food habits. As a result, changing an adult food habit is a huge challenge, as traditional familiarities with certain foods drive eating habits, which can be pleasant or nauseating to the individual. Hence, from a psychological perspective, food consumption is used for some to express certain emotions, such as coping with stress and tension by eating "comfort foods" and or

avoiding others (Sims, 1998). Clark (1998) noted that food is not just eaten for its nutritional value but for many people, it is a source of pleasure.

Holt (1993), noted that personal ideology affect food choices of the affluent consumers. Today, persons are more health conscious about what they consume, they are reading labels and engaging in research about the benefits and dangers of foods. However, it is evidently seen in the rise surrounding organic produces; genetically modified foods, and the types of packaging used to influence individual's food choices. As, public concerns over food safety issues are higher than before, to encourage healthy eating (Frewer et al. 1998).

Socio – economic factors

Socio-economic factors are important aspects that affect food preferences. They are many stereotypes associated with eating habits amongst the social classes. According, to Tanumihardjo et al (2007), healthy foods with high energy intake are affordable by the wealthy, whilst, the poor struggles with low micronutrient intake from fatty-food due to low income, resulting in higher risk to contracting chronic diseases. In addition, the rich have the means to travel and acquire healthy foods that are not accessibility in their immediate vicinity, which the poor lack (Freil et al, 2007), hence, making the accessibility to healthy foods a privilege rather than a right.

According to the World Health Organization (2014) in accordance with the World Food Summit of 1996 defined food security as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life". Food security also includes both physical and economic access to food that meets people's dietary needs and their food preferences.

In reference to the opposite, according to the Oxford dictionary (2014) food insecurity is defined as the state of being without reliable access to a sufficient quantity of affordable, nutritious food. As a result,

food insecurity can lead to under and over nutrition in the population as it would cause a strain of the health sectors and by extension the productive capabilities of a country.

According, to Reicks et al (1994), price is an influential food choice that affects people of the lower socioeconomic group, for example students, the retired and the unemployed. As individuals in the lower socioeconomic groups are sometimes forced to purchase unhealthy foods to survive, as fresh fruits and vegetables are more costly to purchase.

Educational Factor

Families are typically children's first significant models of eating behaviour (Golan & Weizman 2001) as the primary care-givers. They have a great influence over the foods the children consume at home. The pressure on children to eat more food or "clear your plate" can encourage excessive unhealthy food intakes and unwise eating habits that can lead to the over-increase of energy intake, which will lead to obesity and other chronic diseases (Benton 2004). Hence, when parents excessively control their children meal consumption it can contribute to overweight and obese (Scaglioni et al 2008). Furthermore, Satter (2011) stated that children should be encouraged to identify their own feelings of satiety and hunger and to use those signals as gages to control calorie intake. This is why good eating habits and education is the platform for parents and teachers to encourage proper eating practices for children.

Cultural, Religious and Regional Factors

Kittler (1989) noted that culture is defined as the knowledge, beliefs, customs, and habits a group of people share. These are not inherited behaviours, but learned. Culture is passed on from generation to generation. Culture, may influence consumption behaviour directly, but affect other variables to determine individuals differences on food likes and eating habit (Chrisler, 1997). Traditional societies are adopting the food habits of the western society, as eating patterns are changing to a diet high in fat. The

reason for this change is due to the dietary shift away from healthy coarse grains and starchy roots, toward more energy-dense fats, saturated fats, and sugars (Popkin, 1994).

Furthermore, the nutritional transition to foods high in fat over the years are as a result of people being too busy to prepare healthy-foods and adopting sedative life-styles have led to an increase in convenience foods that are heavily processed with fats, salts and sugars. In addition, the cultural preferences for high-fat meat products and other traditional foods may serve as obstacles for switching to low-fat food, as the body builds up a tolerance and liking for unhealthy foods (Bardbard et al 1997).

Religious factors can affect food preferences by dietary prohibition, mode of preparation and the type of food consumed. Ethical and religious practices, such as the avoiding of healthy-meats may limit the range of foods consumed on a daily basis and thus deprive the body of the necessary food sources which are high in protein, iron and vitamin B12.

Also, regional factors can affect food preferences due to the availability of products, cooking techniques and dietary habits. People in the Caribbean are known for their ground provisions and their various meat dishes. However, globalization has changed how Caribbean people consume foods due to advertising and marketing from the Western society. People are now consuming more fat, salt and sugar which have led to the prevalence of diseases.

Intrinsic factors

Intrinsic factors are important in foods preferences and dietary intake because if food is not appealing in terms of appearance, smell, texture or taste it is not going to be eaten (Hetherington and Rolls, 1996). There are certain flavourings like salt and fat that adds to the flavour profile of food. Salt is used as a preservative and a flavoring to enhance foods like meats and other processed foods. Some of the properties of fats are to impart flavour, texture, aroma and it adds to the overall appearance of food. According to McBride and Anderson (1990), there are various factors that contribute to the overall

flavour perception and taste profile of food. These factors are taste, smell, appearance, texture, fat content, temperature, pain sensations (caused by, for example, chilli pepper), and the sound of chewing.

Extrinsic Factors

The eating patterns of individuals have changed over the years as well as the settings in where they consumed foods. According to Mintel (2001a), family meal patterns have changed, from sitting down together to snacking on unhealthy meals to meet their demanding schedules, which has led to an increase in consumer demand for ready-made and convenience foods. The increase in conveniently package products are a result of the time constraints of individuals as some of these foods are high in sodium and fat which can lead to nutritional and chronic diseases.

According to Story et al (2002), the physical food environment in the community, including the presence of fast-food restaurants, supermarkets, schools, and convenience stores, influences access to and availability of foods and beverages. Access to good quality foods can affect people's choices as people of lower economic status may not be able to access good quality food due to high costs, for example fresh fruits and vegetables.

Moreover, food marketing, media and peer pressure (Marshall et al 2004) have affected individual eating patterns as they want to purchase products they see advertised of television. Also, eating while watching television can affect satiety cues (Smith and Ditschun 2009) as this can lead to increase calorie consumption.

Biological, Physiological and Psychological Factors

Mac Evilly and Kelly (2001) stated that distorted self-image, low self-esteem, non-specific anxiety, obsession, stress and unhappiness are associated with eating disorders. As people are not satisfied with their appearance and they try extreme dieting, smoking to help lose the weight or maintain their current body and this can have a negative effect on their food choices. Shepherd and Farleigh 1986 noted that

personality can influence an individual's food choice. As people prefer to consume salty and sweet foods in stressful situations and this can result in excessive weight gain which can further lead to nutritional and chronic diseases.

Cardiovascular diseases

Atherosclerosis

According, to the American Heart Association (2012) arteriosclerosis is defined as the thickening and hardening of arteries. The development of plaque begins as a fatty, fibrous growth and hardens over time. This plaque can cause a restriction of blood flow and results in a myocardial infarction (MI) or in a stroke (Nelms et al 2011). Furthermore, cardiovascular disease is the leading cause of death in the United States and throughout the world, and 50% or more diagnoses related to cardiovascular disease result from atherosclerosis (American Heart Association 2006).

The risk factors of atherosclerosis are divided into two categories alterable and unalterable. Unalterable risk factors are family history, ethnicity and sex and alterable risks factors include dyslipidemia, obesity, physical inactivity, cigarette smoking and physical inactivity (Nelms et al). Some of the medications used to reduce the risk of atherosclerosis are HMG CoA reductase inhibitors (statins), bile acid sequestrants, nicotinic acid and fibric acids (Goldenberg et al 2009).

Ischemic Heart Disease

According to the American Heart Association (2012) ischemia is a condition in which the blood flow (and thus oxygen) is restricted or reduced in a part of the body. However, ischemic heart disease is the term given to heart problems caused the narrowing of the heart arteries. When these arteries are narrowed, less blood and oxygen is able to reach the heart muscle. Ischemic heart disease is also called coronary artery disease, coronary heart disease and it can lead to a heart attack. Furthermore, the American Heart Association, 2006 stated that ischemic heart disease is the single largest killer of Americans, accounting

for 20 % of all deaths in 2003. It has been estimated that by 2020, ischemic heart disease will be the leading cause of death and disability (Pasternal et al 2004).

The classes of drugs used in the treatment of ischemic heart disease are diuretics which include "loop" diuretics, thiazides, carbonic anhydrase inhibitors and potassium sparing diuretics. Loop diuretics (furosemide, bumetanide, torsemide) act by inhabiting sodium, chloride and potassium reabsorption in the loop of Henle of the kidney. The collective summary of the other diuretics and their treatment processes have the following effects: increasing prostaglandins resulting in vasodilation, inhibiting the reabsorption of sodium, chloride and potassium, preventing the exchange of hydrogen ions with sodium and water by blocking the enzyme carbonic anhydrase, preventing sodium potassium exchange and reduce aldosterone stimulation, which reduces stroke volume and blood pressure, as advanced by Nelms et al (2011).

Peripheral Arterial Disease

According to the American Heart Association (2011) peripheral arterial disease is a narrowing of peripheral arteries, most commonly in the arteries of the pelvis and legs, which affects about 8 million Americans (American Heart Association 2009). Peripheral arterial disease increases with age and disproportionately affects blacks and Hispanics who are at a higher risk than whites (Allison et al 2007).

The risk factors for peripheral arterial disease are cigarette smoking and diabetes mellitus (Pasternak 2004). Smokes are 2 to 5 times likely to develop peripheral arterial disease and 8 -10 times likely to develop intermittent claudication. However, cessation of smoking significantly reduces the risk factors associated with peripheral arterial disease. Additionally, diabetes is the leading cause of non-traumatic amputation in the United States (Faxon et al 2004).

Heart Failure

Heart failure is an impairment of the ventricles' capacity to eject blood from the heart or to fill it with blood and it is the end stage of all forms of cardiovascular disease (Barnard 2005). About 5 million

Americans were diagnosed with heart failure from data collected in 2005 and it was the contributing cause of death in 292,215 individuals. The death rates from heart failure are higher for black males and females compared to their white counterparts (American Heart Association, 2009). The primary causes of heart disease are ischemic heart disease, hypertension and dilated cardiomyopathy. Hypertension is the most common cause in women and ischemic heart disease in men (Hunt et al 2005).

Some of the complications from heart failure that contribute to nutritional problems include:

1. Decrease blood flow to the gastrointestinal tract causing slowed peristalsis and early satiety.

2. Possible impairment of nutrient absorption due to this decreased blood flow.

3. Side effects from drugs such as nausea, vomiting and anorexia, which are common with the use of ACE inhibitors, beta blockers, cardiac glycosides and digoxin (Sharma et 2002;Tangalos 2002; Berger et al 2003; Anker et 2004; Carson et al 2004).

Fat

Total Dietary Fat

According to the National Cholesterol Education Program (NCEP), Adult Treatment Panel III Guidelines (ATP III) and American Dietetic Association (ADA) the current recommendations for the maintenance of dietary fat intake is 20-30 % of total caloric intake. Similarly, the fat that is consumed as part of the normal diet is comprised of saturated, polyunsaturated and monounsaturated fatty acids (Van Horn et al 2008).

Equally, Aladana et al (2004); Marshall et al (2006) and Mohanka et al (2006) agreed that reducing cardiovascular risk factors can be achieved by very low fat diets combined with other lifestyle modifications such as increased physical activity and smoking cessation. As exercise and having a healthy

diet low in fat can be achieved through lifestyle changes that are necessary to reduce the risks of cardiovascular disease.

Saturated Fat

According to the American Heritage® Science Dictionary (2014) saturated fat is when a triglyceride molecule contains three saturated fatty acids and all the carbon atoms in the fatty acid chains are connected by single bonds. Saturated fats are primary found in animal sources, palm and coconut oils. Also consuming foods high in saturated fats can lead to elevated cholesterol levels in the blood.

Trans Fat

According to the Merriam Webster Dictionary (2014) trans-fat is defined as an unsaturated fatty acid characterized by a trans-arrangement of alkyl chains that is formed especially during the hydrogenation of vegetable oils and has been linked to an increase in blood cholesterol.

Trans-fat is used in foods products to increase the shelf life. On the other hand, unsaturated products have a lower melting point and can reach rancidity faster that saturated fatty acids. In the diet, trans-fatty acids appear to behave similarly to saturated fatty acids in that they increase total cholesterol and LDL levels and perhaps lower HDL levels (Eckel et al 2007).

Gropper et al (2009) stated that the process of hydrogenation gives the product a higher degree of hardness (remaining solid at room temperature) and plasticity (spreadability), which is more desirable to both the consumer and the food manufacturer. The frying of oils has been hydrogenated to enhance their stability. In the hydrogenation process, as hydrogen atoms are catalytically added across double bonds, electronic shifts take place that cause remaining, unhydrogenated cis double bonds to revert to a trans configuration that is energetically more stable. As a result this has led to the change in food labeling (which took effect in January 2006) that requires the listing of trans-fatty acids in the Nutrition Facts

Panel (U.S. Food and Drug Administration 2003). This labeling is important because of the health risk of consuming too much trans-fat which could lead to health problems like cardiovascular disease.

Additional research indicates that an increased amount of trans-fatty acids is associated with an increased risk of myocardial infraction (Baylin et al 2003; American Dietetic Association Evidence Analysis Library). Similarly, trans-fatty acids appear to be associated with an increased inflammatory response that may contribute to the atherogenic process (Mozaffarian et al 2004). U.S. Food and Drug Administration (2003) current recommendations are to consume less than 1 % of energy from trans-fat. However, today we are consuming more trans-fat and saturated fat from convenience and fast foods.

Monounsaturated Fat

Nelms et al (2009) stated a monounsaturated fatty acid occurs when one carbon–carbon double bond is within its chemical structure. Evidence indicates that monounsaturated fatty acids tend to lower both LDL and apolipoprotein AII lipoprotein levels (U.S. Department of Health and Human Services 2005; Rodenas et al 2005). According to Nicklas et al (2004), the most common food sources of oleic acid in the United States include French fries, whole mile, peanut butter and pizza.

The benefits of the monounsaturated fat intake have been linked to the dietary habits of populations living within the Mediterranean region of the world. People in the Mediterranean region have depicted lower cardiovascular disease rates than people from other regions despite their higher fat intakes (Giugliano et al 2008; Trichopoulou et al 2003). The Mediterranean diets, which are predominantly filled with fruits, vegetables and whole grains, and do not have greater amounts of monounsaturated fat, as oppose to the U.S diet that is the opposite in nutritional content and increase vulnerability to nutritional and chronic diseases. Additionally, it includes seafood which provides increased amounts of omega -3 fatty acids (Nelms et al 2009).

Polyunsaturated fatty acids

According to the U.S Department of Health and Human Services (2001), polyunsaturated fat are fatty acids that contain more than one double bond in their chemical structures. However, n-6 linoleic acid which is an essential fatty acid is predominantly found in the American diet. Sources of polyunsaturated fat are oils from vegetables such as corn, cotton seed, soybean, safflower and sunflower oils. Also, polyunsaturated fatty acids have been linked to a reduction of LDL and decrease risk of cardiovascular disease.

Cholesterol

According to the National Heart, Lung and Blood Institute (2014) cholesterol is a waxy, fat like substance that's found in all cells of the body. Hormones such as estrogen, testosterone and vitamin D provitamin (dehydrocholesterol) are precursors for cholesterol in humans. Cholesterol is also a major component of cell membranes and other cellular structures. Additionally, the Centers for Disease Control and Prevention (2011) stated that about 71 million Americans have high cholesterol and only 1 out of every 3 adults with high cholesterol has the condition under control. High cholesterol increases ones risk of heart disease and stroke which is the two leading cause of death in the United States.

Dietary cholesterol intake was a major point of nutrition therapy for treatment of heart disease. However, the primary concern for dietary cholesterol intake is centered around its effect in raising LDL levels, not on its effect on serum cholesterol levels (Van Horn et al 2008; Jenkins et al 2005; Connelly et al 2005).

U.S. Department of Health and Human Services (2001) stated that the United States, dietary intake of cholesterol has steadily decreased over the past two decades. Also, the National Cholesterol Education Program currently recommends an intake of less than 200mg/day.

Fast food consumption and health

Fast food is defined as food that can be prepared quickly and easily and is sold in restaurants and snack bars as a quick meal or to be taken out (New Oxford American Dictionary, 2010). According to Stuckler et al (2012) they have been changes in people dietary intake as they are consuming more processed and fast foods. In the United States, consumption of sugar-sweetened beverages, particularly soft drinks, has been associated with rising obesity and diabetes (Hu et al 2010). The consumption of unhealthy foods has now become a global health epidemic problem that is engaging the attention of governments and the healthcare sectors.

Moreover, sugar-sweetened beverages contain large amounts of refined sugars, resulting in a high glycemic load and it is believed that these factors contribute to excessive weight gain, metabolic syndrome, and insulin resistance (Ludwig 2002). These factors are intensified by individuals who live sedentary life-styles void of adequate exercise and poor dieting to reduce these risks which can lead to nutritional health problems. Brownell et al (2009) stated sugar sweetened beverages may cause individuals to become heavily dependent to the point of addiction after frequent consumption.

As stated by Khan (1981) food habits are described as the way in which individuals respond to social and cultural pressures, consume and utilize portions of the available food supply, thus making strategic live-style changes from traditional food-habits very difficult.

In an article carried by the Trinidad and Tobago Newsday (newspaper) entitled, "**We Must Save Our Children**" published 30th October 2011. Dr. Faud Khan Minister of Health in his 2011-2012 budget-presentations stated that the donations from fast-food restaurants should not be seen and encouraged as a license to be silent on the fatty-diets and over-sized portions that predispose the population to health risks when consumed indiscriminately from these establishments. He outlined that his strategy to promote better health was to; encourage proper eating habits, healthier lifestyles, tackle the calorie content in food,

examine more closely the effect of junk food and the subliminal impact of the promotion of junk food on their bodies.

In response, Acros Dorados from the Mc Donald's franchise, defended the company position, stated that they donations are designed to build communities and help charities. He further assured the public that his company was offering healthier menu choice through its Happy Meals package, which is inclusive of a fourth item which is a fruit, that has a combined calorie count of less than 600 in accordance with the World Health Organization's (WHO) standards in accordance with children between the ages of 6 and 10 years old.

President of the Diabetes Association of Trinidad and Tobago, Carlton Philip added to the debate and stated that the organization did not support companies which promised saturated fats and sugar products on their menus. He further noted that that saturated fats increased cholesterol levels more than any other food.

Furthermore, in another article in the Trinidad and Tobago Newsday (newspaper) entitled "**Faud: Fast Food Wrecks Kidneys**" published September 15th 2013. Dr. Faud Khan Minister of Health stated that there is a correlation between the consumption of processed foods and obesity, non-communicable diseases (NCDs) such as diabetes, hypertension and kidney problem, and concluded that the national treatment cost of care and lost productivity is very huge, as the health problem prevalence increased in Trinidad. His stated the strategy for combating the emerging problem was to have extended opening hours at the clinics, recruiting more doctors from the Caribbean, enhancing the technical capabilities at the hospital which would improve efficiency and reduce long lines.

It is clearly seen that the link between fast food consumption, cardiovascular and other non-communicable diseases are increasing all over the world as government officials are making policing and improving health care to try and alleviate this problem.

Rationale

I chose this topic because I wanted to know the dietary intake and practices of university students. My topic is aimed at investigating the prevalence of fast food consumption and its implications on health.

Objectives

1. The prevalence of high fat and high soda consumption

2. The differences in gender consumption behavior

3. Is body mass index (BMI) associated with consumption behaviours?

Hypothesis

Hypothesis: Foods high in fat, sodium and sugar are associated to an increase in non- communicable diseases.

Null hypothesis: Foods high in fat, sodium and sugar are not associated to an increase in non-communicable diseases.

Literature Review

Berlinguer (1999) stated that the consumption of foods high in fats and sweeteners are increasing throughout the developing world, while the share of cereals is declining; the intake of fruits and vegetables remains inadequate to population growth. This would give rise to the increase consumption of foods high in fat, which will lead to an increase in non-communicable diseases. Moreover, poor diets are associated with malnutrition which creates susceptible to diseases.

Changes in the environment

Notwithstanding, over the past few decades, food and home environments have changed drastically as more people are eating away from home and consuming more fast-foods. The dual income household family and extra-curriculum activities are contributing factors, as people are not having enough time to cook and prepare nutritious meals. According to Ganz et al (1998) and French et al (1999), the three dimensions that influence people food choices are; taste, perceived value which includes price and portion size and perceived nutrition.

Moreover, food prices, promotion, marketing, food advertising, consumption of foods away from home and the changing nature of the food supply are some of the environmental factors that affect the eating behaviour of individuals (French et al 2001). According to Solheim and Lawless (1996), people of lower economic status look at perceived value when purchasing food items because they are trying to spend their money wisely but sometimes perceived value could lead to unhealthy food choices. On the other hand some individuals would shop for nutritional quality of food as a way of life.

The differences between "home" and "away from home"

Over the years, they have been changes in the factors that influence individuals dietary and lifestyle practices as people are consuming foods "away from home "as compared to "home". According to Lin et al (1999) foods at "**home**" are foods purchased at stores (retail, grocery, convenience or supermarkets)

and are prepared for consumption at home. On the other hand, "**away from home**" are foods that consumers have less control over portion size and nutrient content, these include fast food establishments, schools, restaurants, other public places and vending machines. Furthermore, "away from home" foods are heavily processed and would have negative nutritional implications on health.

According to Labonte R, (2004), the combination of lifestyle and dietary changes has led to an increase in diabetes due to obesity, heart disease and other illnesses. Western societies like the United States have imparted their culture and dietary practices on the world. However, obesity has grown in countries not influence by the United Sates. The migration of people from the countryside to the cities may have also played a role in the increased number of non-communicable diseases (Dollar & Kraay 2001).

Increased in calories by 2030

According to the Food and Agriculture Organization of the United Nations (FAO) (2002) calorie count is expected to increase tremendously by 2030,with 3050 kilocalories available per person, compared to 2360 kilocalories per person per day in the mid-1960s and 2800 kilocalories today. These changes reflects the rising consumption in many developing countries whose average will be close to 3000 kilocalories in 2030. These increases in kilocalorie count would increase the number of people suffering from chronic and nutritional diseases. This would put a strain on governments as they would have to implement policies and programs to alleviate this growing problem, and combat the threat to national output.

Gender differences and food consumption

In today's society they have always been gender differences as it relates to food choices and consumption behaviour, as men and women are constantly dealing with body image perception and weight management. Beardsworth et al (2002) stated that women reported dissatisfaction with their weight and made attempts to control weight than men in studies conducted based on attitudes towards body weight

and dieting. This is a result of socialization mechanisms which includes family, school and the mass media.

Glanz et al (1998) stated that the factors that influence women food choices are weight control and body perception. On the contrary men gave lower priority to health when compared to other considerations, such as taste and convenience, in making their food choices (Steptoe et al. 2002). However, they felt more indecisive about healthy dietary choices (Povey et al 2001).

It has been indicated in studies that body imagine dissatisfaction among youth was as result of having a high body mass index (BMI) (Gardner et al 1997). Furthermore, Clark et al (2009) states that it has been observed that men are more interested in having a toned and muscular body structure and women are interested in becoming thin and some of them go to the extremes of developing eating disorders.

Prevalence of diseases in the Caribbean

According to the Pan American Association (PAHO) (2009) the Caribbean has the highest non-communicable (NCD) prevalence and mortality rates in the region of the Americas. Barbados is amongst the highest recorded in the world as it relates to the prevalence and mortality rate associated with diabetes related lower extremity amputations (Hennis et al 2004). Moreover, diabetes mortality rates in Trinidad and Tobago and in St. Vincent and the Grenadines is 600 % higher when compared to Canada and stroke mortality in Suriname is more than 400% higher (PAHO 2009). These rates would continue to increase if adequate health care, dietary and lifestyle practices are not implemented.

In addition, the leading causes of death in the Caribbean Community (CARICOM) by sex in 2004 as it relates to males are heart disease, cancer, injuries and violence, stroke, diabetes, HIV/AIDS, hypertension and influenza/pneumonia. For females it is heart disease, cancer, diabetes, stroke, hypertension, HIV/AIDS, influenza/pneumonia and injuries and violence (Source CAREC based on countries mortality

reports 2). It is clear from the report that heart disease is the number one cause of death in the Caribbean and it's a result of poor diets and lack of exercise.

Chronic non-communicable diseases can cause a negative impact on the economy as governments are forced to increase the health care industry to subsidize these costs. The Caribbean Community Secretariat (CARCIOM) (2007) purported that the estimated cost to manage and treat non-communicable diseases in the Caribbean was in the millions; the Bahamas was US $27 million compared to Trinidad and Tobago US $484 million for diabetes. The cost of hypertension in the Bahamas was US $46 million compared to Trinidad and Tobago US $259 million in 2001.

Additionally, when expressed as a percentage of Gross Domestic Product (GDP), Trinidad and Tobago costs of 5.21% surpassed Latin America and Caribbean average cost of diabetes which was 2 % to 4 %. This indicates that Trinidad and Tobago costs of diabetes were the highest in the Caribbean based on these figures when compared to the Brahmans 0.5%. Moreover, Barbados had the highest cost of hypertension which was 3.51 % when compared to Bahamas 0.86%. These numbers would only continue to increase if society does not adhere to the health care warnings as it relates to the indiscriminate consumption of fast foods.

Moreover, an article in Trinidad Express Newspaper titled "**Eating Ourselves To Death**," published April 2nd 2013, stated that recent comparative statistics ranked Trinidad and Tobago as the third fattest country in the world. Previous studies have placed Trinidad and Tobago in the top 20 nations with overweight populations. When an individual is overweight they are at risk for non-communicable diseases like heart attacks, strokes diabetes and cancers which has accounted for about 60 % of deaths.

In addition, another article published 29th March 2013, in the Daily Mail Newspaper in the United Kingdom, it was reported that Trinidad and Tobago males and females were overweight and obese. The Body Mass Index's (BMI) for men were 26.6 kg/m^2 and females 30.6 kg/m^2. From these figures it is

evidently seen that men were classified as overweight, in having a Body Mass Index (BMI) between 25.0-29.9 kg/m^2 and females being classified obese having a Body Mass Index (BMI) of 30 kg/m^2 and above. These classifications were in accordance to the guidelines by the National Heart, Lung and Blood Institute (1998). It is also an indication that the average person is 20 to 50 pounds overweight.

In Trinidad and Tobago the average life expectancy for women is 73 years and 68 years for men. Overconsumption of carbohydrates and lack of exercise is the reason for these increasing numbers. One of the factors that are causing these problems is the increased sugar consumption. The solutions to these problems are a balance diet, with no smoking, limited alcohol consumption and at least 30 minutes of exercise 3 times a week.

Materials and Methods/Methodology

Subjects/ participants

150 questionnaires were distributed to the population at the university of the West Indies St. Augustine. The study targeted students from ages ≤ 18-30, the seven facilities, various ethnicities, fulltime , part time students, undergraduate and post graduate students.

Design

The questionnaires were randomly distributed to the population at the university and the type of study used was a cross sectional study. The independent variable in the study was fast food and the dependent variable was cardiovascular risks.

Procedure

A brief self-administered questionnaire was developed to access university student's dietary fat intake, drink consumption, eating habits and personal variables. Fat intake was measured via the Block Simplified Fat Screener developed for adults (Millstein et al 1992). Modifications were made to the questionnaires to meet the demographics of the population for (e.g gyro, roti and fried hot appetizers). Although the screener was validated with adults (Block, Clifford, Naughton, Henderson and Mc Adams 1989; Block et al 2000) it has been used to measure the fat intake in other adolescents samples (Neutzling, Araujo, Vieira, Hallal and Menezes 2007; Ayala et al 2007). The responses were measured using responses options ranging from 0 (once a month or less) to 4 (five or more times a week). Scores at or below seven on this scale indicated a very low fat intake (less than 25 % of energy). Scores between 8 and 14 indicate an average fat intake (between 30 and 35 % of energy). Scores between 15 and 22 indicate high fat intake (above 35 % of energy). Scores above 23 indicate very high fat intake (40 % to 50 % of energy).

Drink consumption was rated on a scale ranging from 0 -4. 0 represented less than once a week, 1 represented about 1 time per week, 2 represented 2-3 times a week, 3 represented 4-5 times a week and 4 representing > 5 times a week. This scale was done to determine the frequency of drink consumption of the university students.

The eating habits of the university students was analyzed and divided into various sections. Analysis was done on how time constraints impacted their eating habits, reasons why did consumed fast foods, fast food vs healthy foods, how much they were willing to spend on a healthy meal, considerations when purchasing healthy food, rating of food options on campus, knowledge on healthy related material, food labels and purchasing behaviour.

As it relates to personal variables, every 5^{th} individual height and weight were measured using standardized equipment. Height was measured using a portable stadiometer and body weight was measured was measured using a Bioelectrical Impedance Analysis machine (BIA). Waist circumference was also taken for every participant with a measuring tape. Classification of overweight and obesity by BMI, waist circumference and associated diseases risk was based on figures by the National Heart, Lung and Blood Institute (1998).

Statistical analyses/empirical models

The data was analyzed using SPSS for Windows version 12.0. The tests used to analyze the data was t test, chi squared tests and correlation tests.

Results

Table 1: Characteristics of participants by sex

Variables	Female n 71	Male n 79	P value
Age			
≤ 18	2 (2.8%)	2 (2.5 %)	
19-24	64 (90.1 %)	68 (86.1%)	
25-30	5 (7.0%)	9 (11.4%)	0.41
Ethnicity			
Indo- Trinidadian	10 (14.3%)	9 (11.4%)	
Afro- Trinidadian	22 (31.4%)	21 (26.6%)	
Mixed	38 (54.3 %)	49 (62.1 %)	0.39
Faculty of origin			
Food & Agriculture	21 (29.6%)	9 (11.4%)	
Social Sciences	17 (23.9 %)	13 (16.5 %)	
Humanities & Education	5 (7.0%)	2 (2.5%)	
Science & Technology	13 (18.3%)	22 (27.8 %)	
Engineering	12 (16.9 %)	29 (36.7 %)	
Medical Sciences	3 (4.2 %)	4 (5.1 %)	$p < 0.001$
Student status			
Part time	1 (1.4 %)	1 (1.3%)	
Full time	70 (98.6 %)	77 (98.7 %)	1
Level of study			
Undergraduate	71 (100 %)	77 (97.5 %)	
Postgraduate		2 (2.5 %)	0.5

Table 1 shows the socio-demographic characteristics of the participants by gender. There were no significant difference between male and female participants as it relates to age, ethnicity and level of study. However, they were a significant gender difference by faculty. Females were predominately from Food & Agriculture and the males from Engineering. Students were predominately full time, undergraduate and in the 19-24 age group.

Table 2: **Anthropometric characteristics of participants**

Variables	Female n 71	Male n 79	P value
Reported weight (lbs.)	147.5 (37.7)	168.5 (31.4)	p < 0.001
Reported height (inches)	65.3 (3.3)	70.2 (3.2)	p < 0.001
Current BMI from silhouette	21.0 (4.3)	23.3 (4.1)	p = 0.001
Desire BMI from silhouette	19.3 (2.0)	22.8 (2.0)	p < 0.001
BMI from reported weight & height	24.1 (5.3)	23.8 (4.1)	0.76
Negative body image perception %	41 (57.7 %)	47 (59.5%)	0.87

Table 2 shows the anthropometric characteristics by gender. Males were taller and heavier than females but they had similar BMI's. Females reported significantly lower BMI than males from current body image and wanted lower BMI's than males. They were no difference between negative body image perceptions between males and females. Females were more likely to desire a smaller body image to their current body image compared to the males (46.5% vs 29.1 %). Males were more likely to desire a larger body image to their current body image when compared to females 30.4 % vs 11.3 % ; p 0.003.

Table 3: Fast food consumption of the participants

Variable		Sex		Total	P value
		Female	Male		
Consume fast food	No	3 (4.2%)	5 (6.3 %)	8 (5.3 %)	
	Yes	68 (95.8%)	74 (93.7 %)	142 (94.7 %)	0.72

Table 3 shows the fast food consumption of the participants in which 94.7% consumed fast foods while a small minority of 5.3 % did not consume fast foods.

Table 4: Factors that influence participant's fast food consumption

Variable		Sex		Total	P value
		Female	Male		
Convenience	No	27 (38.0%)	39 (49.4 %	66 (44.0%)	
	Yes	44 (62.0%)	40 (50.6)	84 (56.0%)	0.19
Inexpensive	No	65 (91.5 %)	75 (94.9 %)	140 (93.3 %)	
	Yes	6 (8.5 %)	4 (5.1 %)	10 (6.7 %)	0.52
Too busy to cook	No	49 (69.0%)	65 (82.3%)	114 (76.0 %)	
	Yes	22 (31.0%)	14 (17.7 %)	36 (24.0%)	0.08
I like the taste	No	54 (76.1%)	64 (81.0%)	118 (78.7 %)	
	Yes	17 (23.9 %)	15 (19.0 %)	32 (21.3%)	0.55
Quick service	No	56 (78.9 %)	64 (81.0 %)	120 (80.0%)	
	Yes	15 (21.1 %)	15 (19.0 %)	30 (20.0%)	0.84

Table 4 shows the factors that influence fast foods consumption in which convenience was the most significant reason. However, inexpensive was not a significant reason with a total of 6.7 %.

Table 5: Fast foods vs healthy foods

Variable		Sex		Total	P value
		Female	Male		
Fast food vs healthy food	No	57 (80.3%)	65 (82.3 %)	122 (81.3 %)	
	Yes	14 (19.7 %)	14 (17.7 %)	28 (18.7%)	0.84

Table 5 shows that the participants did not prefer fast food to healthy food which was represented by 81.3%. While 18.7 % preferred fast food to healthy foods some of their reasons were taste, culture, satisfying, enjoyable, convenience, cheaper, too busy to cook and the quick service.

Table 6: Factors that influence participants when purchasing healthy food

Variable		Sex		Total	P value
		Female	Male		
Accessibility	No	65 (91.5%)	76 (96.2 %)	141 (94.0 %)	
	Yes	6 (8.5 %)	3 (3.8 %)	9 (6.0%)	0.31
Healthy & balance	No	47 (66.2 %)	43 (54.4 %)	90 (60.0%)	
	Yes	24 (33.8 %)	36 (45.6 %)	60 (40.0%)	0.18
Taste	No	31 (43.7 %)	50 (63.3%)	81 (54.0%)	
	Yes	40 (56.3%)	29 (36.7 %)	69 (46. 0%)	0.02
Price & promotion	No	48(67.6%)	62 (78.5 %)	110 (73.3 %)	
	Yes	23 (32.4 %)	17 (21.5 %)	40 (26.7 %)	0.14
Package	No	67 (94.4 %)	78 (98.7 %)	145 (96.7 %)	
	Yes	4 (5.6 %)	1 (1.3 %)	5 (3.3%)	0.19
Friends	No	71 (100%)	78 (98.7 %)	149 (99.3%)	
	Yes		1 (1.3 %)	1 (0.7 %)	1

Table 6 shows the factors that influence participants when purchasing healthy food. Taste was the most significant among females with 56.3 %. Also, health and balance was an important factor with males with 45.6 % compared to females 33.8 %. Price and promotion represented a 1/3 of the participants but there was no difference in gender.

Table 7: Food choices on campus

Variable		Sex		P value
		Female	Male	
Food choices on campus	Poor	43 (60.6 %)	42 (53.9 %)	
	Adequate	26 (36.6 %)	36 (46.2 %)	
	Very good	2 (2.8%)		0.31

Table 7 shows the food choices on campus in which half of the population thought it was poor, ¾ thought it was adequate and 2 % thought it was very good.

Table 8: How often does the participant read material on healthy life style eating?

Variable		Sex		P value
		Female	Male	
Read healthy material	Other	7 (9.9 %)	4 (5.1 %)	
	Rarely	40 (56.3 %)	52 (65.8%)	
	Weekly	17 (23.9 %)	12 (15.2 %)	
	Daily	7 (9.9 %)	11 (13.9 %)	0.75

Table 8 shows how often the participants read material on healthy life style eating. 1/3 of the population read weekly while half of the population rarely read any material on healthy life style eating.

Table 9: Showing if the participants read labels when purchasing food items

Variable		Sex		Total	P value
		Female	Male		
Read labels	No	29 (40.8 %)	35 (44.9 %)	64 (43.0%)	
	Yes	42 (59.2 %)	43(55.1%)	85 (57.0 %)	0.74

Table 9 shows that half of the population read labels with the other half did not read labels when purchasing food items.

Table 10: Factors that influence participants purchasing behaviour

Variable		Sex		Total	P value
		Female	Male		
Cost	No	27 (38.0 %)	20 (25.3 %)	47 (31.3%)	
	Yes	44 (62.0 %)	59 (74.7 %)	103 (68.7 %)	0.11
Location	No	31 (43.7 %)	30 (38.0 %)	61 (40.7 %)	
	Yes	40 (56.3 %)	19 (62.0 %)	89 (59.3 %)	0.51
Culture	No	55 (77.5 %)	68 (86.1 %)	123(82.0 %)	
	Yes	16 (22.5 %)	11 (13.9 %)	27 (18.0 %)	0.2
Peer pressure	No	71 (100%)	78 (98.7 %)	149 (99.3 %)	
	Yes		1 (1.3 %)	1 (0.7 %)	1
Perceived health benefits	No	44 (62.0 %)	57 (72.2%)	101 (67.3 5%)	
	Yes	27 (38.0 %)	22 (27.8 %)	49 (32.7 %)	0.22

Table 10 shows the factors that influence participants purchasing behavior. Cost was the most significant among the participants while location was significant among the females when compared to the males. Peer pressure was the least significant factor that influences purchasing behaviour with 1 %.

Table 11: How much money the participants were willing to spend on a healthy meal

Variable		Sex		P value
		Female	Male	
Spend on a healthy meal	< $50	50 (71.4%)	60 (75.9 %)	
	$51- $100	18 (25.7 %)	14 (17.7 %)	
	$ 101- $150	1 (1.4 %)	2 (2.5 %)	
	$ 151- $200	1 (1.4 %)	3 (3.8 %)	0.9

Table 11 shows the amount of money participants were willing to spend on a healthy meal. The majority of the participants were willing to pay < $50 for a healthy meal.

Table 12: Soft drink consumption among the participants

Variable	Sex		P value
	Female n 23	Male n 23	
Soft Drink	2.8 (1.8)		0.20
		4.3 (4.3)	0.62

Table 12 shows the soft drink consumption of the participants in which females consumed 3 soft drinks and males 4 soft drinks a week and there is no significance.

Table 13: The correlation between soft drink consumption, fat intake and BMI in females

Correlations[a]

		SOFTDERI	FATINTAK	BMI
SOFTDERI	Pearson Correlation	1.000	.712**	-.278*
	Sig. (2-tailed)	.	.000	.023
	N	67	52	67
FATINTAK	Pearson Correlation	.712**	1.000	-.286*
	Sig. (2-tailed)	.000	.	.038
	N	52	53	53
BMI	Pearson Correlation	-.278*	-.286*	1.000
	Sig. (2-tailed)	.023	.038	.
	N	67	53	71

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Sex = Female

Table 13 shows the correlation between soft drink consumption, fat intake and BMI in females. Females BMI were inversely related to fat and drink intake as it may reflect under reporting.

Table 14: The correlation between soft drink consumption, fat intake and BMI in males

Correlations[a]

		SOFTDERI	FATINTAK	BMI
SOFTDERI	Pearson Correlation	1.000	.469**	.116
	Sig. (2-tailed)	.	.000	.350
	N	67	53	67
FATINTAK	Pearson Correlation	.469**	1.000	-.194
	Sig. (2-tailed)	.000	.	.147
	N	53	57	57
BMI	Pearson Correlation	.116	-.194	1.000
	Sig. (2-tailed)	.350	.147	.
	N	67	57	79

**. Correlation is significant at the 0.01 level (2-tailed).

a. Sex = Male

Table 14 shows the correlation between soft drink consumption, fat intake and BMI in males and there is no significance.

Table 15: The caffeine consumption of the participants

Variable	Sex		P value
	Female n 23	Male n 23	
Caffeine	2.1 (4.4)		0.09
		1.1 (1.7)	0.96

Table 15 shows the caffeine consumption of the participants. Females consumed 2 caffeine drinks in comparison to males 1 drink a week.

Table 16: The correlation between BMI and caffeine drinks in females

Variables	BMI	Caffeine
BMI	1.000	-0.2233
	(0)	(64)
	P =.	P=.072
Caffeine	-0.2233	1.000
	(64)	(0)
	P=.072	P =.

Table 16 shows the correlation between BMI and caffeine drinks in females and it shows that smaller girls consume more caffeine drinks than bigger girls p = 0.72.

Table 17: The correlation between BMI and caffeine drinks in males

Variables	BMI	Caffeine
BMI	1.0000	0.1447
	(0)	(65)
	P = .	P=.243
Caffeine	0.1447	1.0000
	(65)	(0)
	P = .243	P =.

Table 17 shows the correlation between BMI and caffeine drinks in males and there is no significance p = .245.

Table 18: The high soda consumption in females

Variable		BMI Group		Total	P value
		0	1		
High soda	0	22 (50.0%)	20 (74.1 %)	42 (59.2%)	
	1	22 (50.0%)	7 (25.9%)	29 (40.8%)	0.052

Table 18 shows the high soda consumption in females. 50 % of smaller girls consumed high soda drink p =0.052.

Table 19: The high soda consumption in males

Variable		BMI Group		Total	P value
		0	1		
High soda	0	34 (65.4%)	18 (66.7%)	52(65.8 %)	
	1	18 (34.6%)	9 (33.3%)	27(34.2%)	1.000

Table 19 shows the high soda consumption in males and there is no significance p = 1.000.

Table 20: The high fat consumption of females

Variable		BMI Group		Total	P value
		0	1		
Fat group 2	0	26 (59.1%)	22 (81.5%)	48(67.6%)	
	1	18 (40.9%)	5 (18.5%)	23(32.4 %)	0.068

Table 20 shows the high fat consumption of females and 40.9% of smaller girls consumed foods high in fat p =0.068.

Table 21: The high fat consumption of males

Variable		BMI Group		Total	P value
		0	1		
Fat group 2	0	35 (67.3%)	21 (77.8%)	56 (70.9%)	
	1	17 (32.7%)	6 (22.2%)	23(29.1%)	0.436

Table 21 shows the high fat consumption of males and 32.7% consumed foods high in fat but there is no significance p = 0.436

Table 22: The correlation between high fat and BMI in females

Variables	Fat group 2	BMI group
Fat group 2	1.000	-0.2346
	(0)	(68)
	P = .	P=.051
BMI group	-0.2346	1
	(68)	(0)
	P=.051	P = .

Table 22 shows the correlation between high fat and BMI in females and there is a significant correlation p =0.51.

Table 23: The correlation between high fat and BMI in males

Variables	Fat group 2	BMI group
Fat group 2	1.000	-0.0841
	(0)	(76)
	P = .	P=.464
BMI group	-0.0841	1.000
	(76)	(0)
	P=.464	P = .

Table 23 shows the correlation between high fat and BMI in males and there is no significance p =0.464

Figure 1: The fat intake of the participants

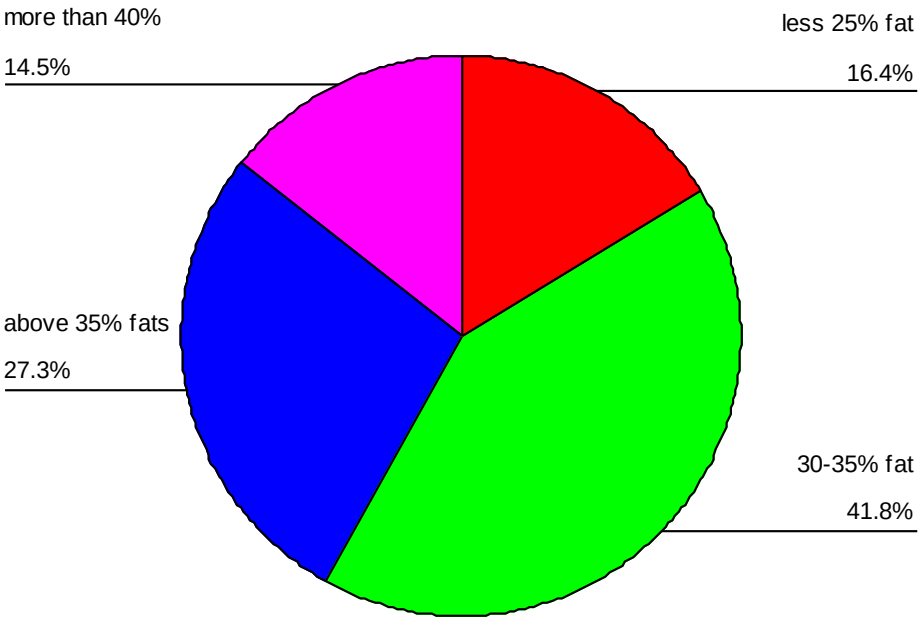


Figure 1 shows the fat intake of the participants based on the weekly consumption of high fat food products. The frequency of consumption was measured using response options ranging from 0 (once a month or less) to 4 (five or more times a week). Scores at or below 7 on this scale indicate a very low fat intake (less than 25 % of energy), 8 and 14 indicate an average fat intake (between 30 % and 35 % of energy), 15 and 22 indicate a high fat intake (above 35 % of energy) and above 23 indicate a very high fat intake (40 % to 50% of energy). Over 1/3 of the participants were above the recommended intake of fat above 35 %. The frequently consumed high fat foods are chicken, hotdogs, margarine, cheese, french fries, macaroni pie and chocolate. Gender differences were found in the intake of macaroni pie (n = 69), (M = 1.04, SD= 1.09 vs M = 0.83, SD =0.90) as female consumed macaroni pie more than males. Also, females consumed more chocolate than males. (n=71), (M =1.32, SD = 1.35 vs M =0.47, SD = 0.77).

Figure 2: Shows how often males and females are "pressed for time"

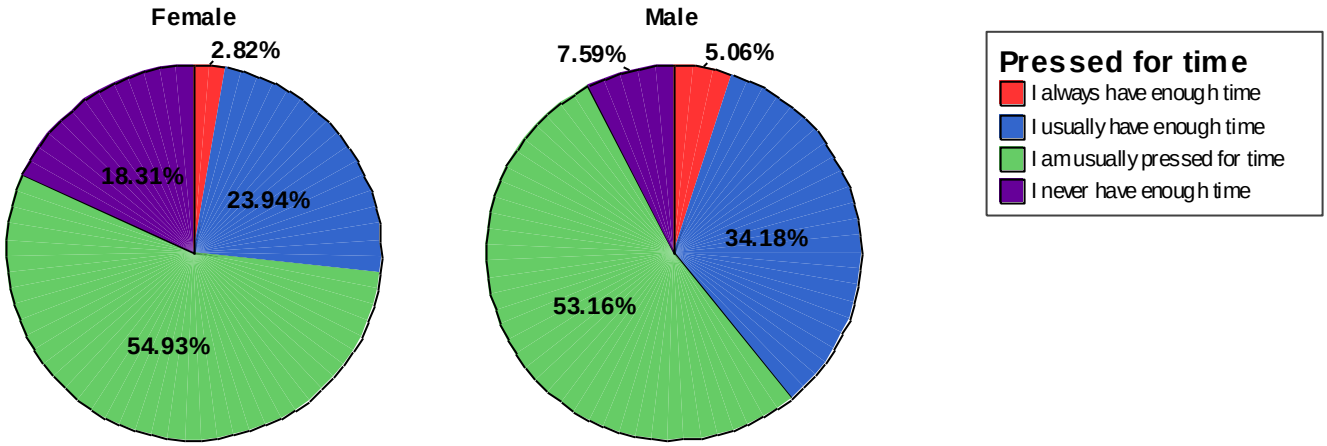


Figure 2 indicates how often the male and female students of the university are "pressed for time". The females indicated they were twice as much not to have enough time than males. While males had ¾ more time than females to engage in other activities. Overall both male and female showed that most of time they are pressed for time.

.

Figure 3: Shows how time affects the eating habits of males and females

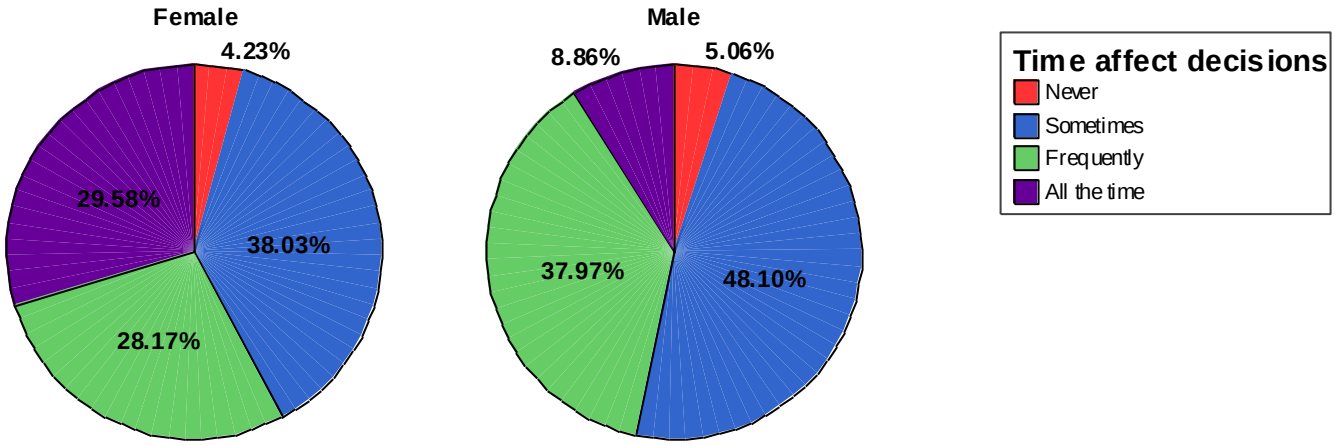


Figure 3 indicates how time constraints affect the eating habits of males and females at the university of the West Indies. The females showed that ½ of the time constraints affect they eating habits which was 4 times more than the males. A small percentage of 5 % indicated that time never affects they eating patterns. Time affected males decisions ¾ (37.97 %) of the time when compared to females (28.17%). Moreover, ½ of the males indicated that sometimes time affect they eating habits which were 10 % more than the females.

Discussion

Fast food consumption

Fast food consumption is a growing concern because of its association to chronic non-communicable diseases. In the study I conducted 150 participants were asked about their fast food consumption and it was reported that 94.7 % of the sample consumed fast foods, men consumed more fast foods that women 74 vs 68 and they was no significance amongst gender p =0.72. However, in a similar study conducted by Paeratakul et al (2003), Volume 103, Number 10, there was significance between gender consumption as men reported consuming more fast food than women. The sample size of this study was 17,370 in which 8658 were men and 8712 females. They reported fast food intake percentage for men was 44.4% and 40.2% women $p < .001$. Fast food consumption was also significant in age, education, household income and household size. Also, in this study by Paeratakul et al (2003), blacks consumed more fast foods with 45.8% more than whites, Hispanics and others (Asian, Pacific Islander, American Indian and Alaska native).

Also, in another study by Anderson et al (2011), Volume 8, Number 4, the prevalence of fast food consumption was 28%. However, there was significance in gender consumption as men consumed more than females (33 % vs 23 %). Also, in this study they was significance in regular fast food consumption with age and sex (World F test , $p < .001$) when tested within a multivariate frame work with age, sex, race, ubanicity, children in the household, education, income, fruit and vegetable consumption, physical activity and gender health as independent variables.

On the contrary Bowman et al (2004) , Volume 113, Number 1 indicated that increased fast food consumption was independently associated ($p <.05$) with male gender, old age, higher household income, non – Hispanic black race/ethnicity and residency in the south.

People consumed fast food for various reasons but most of the time it is because of their food preferences. Media and advertising play an important role in persuading individuals to consume these foods that are high in salt, fat and sugar knowing the health implications.

Food preference

Food preferences are factors that influence people consumption behaviour and it can be divided into personal, socio-economic, education, cultural, religious, regional, intrinsic, extrinsic, biological, physiological and psychological factors. Participants were asked why they consume fast foods and the significant reason was convenience which represented 56% of the sample. Since university students are constantly busy and the variety of food outlets on campus is limited students are forced to frequent fast food outlets due to its convenience.

On the contrary in Patterson et al (2012) studied the significant reason why students purchase food and drink was for it taste which represented around 92% of the population. However, Anderson et al (2011), Volume 8, Number 4 found that 64 % of the participants indicated that quick service and convenience was the reason they consumed fast food and it was followed by taste 16 %.

According to Guthrie et al (2002); French et al (2001) they have been greater consumption of foods prepared away from home as it is associated with poor diets among adolescents. Foods prepared away from home are unhealthy and it leads to the overconsumption of calories and contributes weight gain and nutritional diseases. (Nielsen et al (2002).

The preparation techniques used in fast food preparation is frying and it is a common source of saturated and partially hydrogenated (trans) fat, which is known to increase cardiovascular disease (Litin et al 1993). According to Neumark et al 1999 the two major factors that influence adolescents food choices are time constraints and convenience. Since fast food outlets are strategically placed on campus it has become a frequently patronized area for students amidst the nutritional implications to health.

BMI and gender differences

Anthropometric measurements were taken of the participants in which there was a significance $p < 0.001$ in gender in terms of weight and height as men were taller and heavier that females but they had the same BMI as females with no significance $p = 0.76$. They were a significance $p < 0.001$ in females desiring a smaller body image to their current body image when compared to the males (46.5 % vs 29.1 %). On the other hand in a study conducted by Ettarh et al (2013), Volume 10, women desire to be heavier, 14.8 % of women chose an obese image as ideal and 15.5 % of the women were obese. Also, 20.6 % of the men chose an obese image as ideal whereas only 2.3 % men were actually obese according to their BMI. Furthermore, more than 1/3 of the women preferred body images classified as overweight or obese and men preference for overweight or obese body images were greater than women.

Also, in a study conducted by Mc Elhome et al (1999), 46 % men and 31 % women were contented with their current body image, while 10 % of the men desire to be heavier compared to women (5%). However, 51% women desired to be lighter compared to men 36%.

Gardner et al (1991) defines body image as the mental picture we have of our body's which involves its contours, shape and our overall feelings regarding its body parts. Body image perception has psychological and biological implications on health as individuals develop eating disorder or take drugs to achieve an ideal body image. However, Strauss et al 1998 further reiterated that the social culture environment is an important variable in the development of distortions as it relates to subjective body image disorders.

High soda consumption

In my study females consumed at least 3 drinks and a week and males 4 drinks. However, there was no significance in gender to drink consumption $p = 0.20$ and $p = 0.62$. According to Arcan et al (2009)

Volume 109, Issue 5, females were twice as likely to consume more soda than males as a rate of >5-6 times / week p value 0.099.

High fat consumption

The finding of my study indicated that 41.8 % of the participants consumed the average amount of fat which is 30-35 % of energy, while 1/3 consumed above 35 % of energy and 14.5 % more than 40 % of energy. On the contrary Arcan et al (2009) Volume 109, Issue 5 , the participants average intake of high fat foods was 26 times per week (SD=12.6) and the mean fat score for all students was 43.6 (SD=10.8) which represent an estimated fat intake of > 35 % of calories.

Limitations

One of the limitations of the study was the missing data from the food frequency questionnaire which was limited by human error, judgments, memory and truthfulness.

Conclusion

In order to reduce the prevalence of non- communicable diseases one must have a balance diet with regular exercise and a reduction in the consumption of fat, sugar and salt. This can become a strong reality if persons resist the luring messages from the fast-food markers to encourage them to consume foods that predisposed them to cardiovascular diseases.

Recommendations

Fast food consumption has been associated with non-communicable diseases as it consists of food high in fat, sugar and salt. It has been acknowledge that the population consumes more fast foods and soft drinks than fruits and vegetables which can have serious health implications. According to the United States Department of Agriculture (USDA) 2010, the dietary guidelines for the Americans involved regular physical activity, with a healthy diet, while limiting the consumption of fats, sugars and alcohol.

Some of the direct and indirect recommendations to help control the increasing number of non-communicable diseases and fast food consumption are:

1. For governments to implement policies on healthy lifestyle practices and to work with fast-food outlet and restaurant owners to encourage them on ways to improve their meal options, and to give tax incentives on compliance.

2. Have community programmes in which trained medical professionals give free health checks and screening to individuals. National health drive that would include walks and hikes.

3. Governments can work with local advertising companies to advertise the benefits of having a balance lifestyle and the implications of poor nutritional health on the gross economy.

4. Have better healthy food establishments and fitness classes from the primary to tertiary level education, and by restructuring the physical education programmes in the schools and higher-learning institutions.

5. The mandatory teaching of food and nutrition through-out the school system at the primary and secondary levels.

6. The granting of income-tax rebates to persons who get a full yearly medical check-up, to encourage self-care and management.

References

Aldana SG, Greenlaw R, Thomas D, Salberg A, DeMordaunt T, Fellingham GW, Avins AL. The influence of an intense cardiovascular disease risk factor modification program. Prev Cardiol. 2004;7:19-25.

Allison MA, Ho E, Denenberg J, Langer R, Newman A, Fabsitz R, Crisui M. Ethnic – specific prevalence of peripheral arterial disease in the United States. Am J Prev Med. 2007; 32:328-33.

American Dietetic Association Evidence Analysis. Disorders of lipid metabolism. Available at http://www.ebg.adavidenecelibrary.com

American Heart Association. Heart Disease and Stroke Statistics – Update. Dallas: American Heart Association; 2006.

American Heart Association. Heart Disease and Stoke Statistics_2009 Update: A Report From the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation.2009; 119:e21-e181

Anderson B, Rafferty AP, Lyon-Callo S, Fussman C, Imes G. Fast-food consumption and obesity among Michigan adults. Prev Chronic Dis 2011;8(4):A71. http://www.cdc.gov/pcd/issues/2011/jul/10_0186.htm. Accessed 14th April 2014

Anker SD, Steinborn W, Strasburg S. Cardiac cachexia. Ann Med. 2004;36:518-29.

Arcan, Chrisa, Kubik, MarthaY, Fulkerson, Jayne A, Story, Mary. Socio-demographic differences in selected eating practices among alternative high school students. 2009. Volume 109, Issue 5 pages 823-829. http://dx.doi.org/10.1016/j.jada.2009.02.001

Ayala, G.X., Baquero, B., Arredono, E.M., Campbell, N., Larios, S., & Elder, J.P. (2007). Association between family variables and Mexican American children's dietary behaviours. Journal of Nutrition Education and Behavior , 39,62-69

Bardbard S, Michaels I, Fleming K, Campbell M. Understanding the food choices of low-income families: summary of findings. Washington DC, USDA and TAS; 1997

Barnard DD. Heart failure in women. Curr Cardiol Rep. 2005;7:159-65.

Baylin A, Kabagambe EK, Ascherio A, Spiegelman D, Campos H. High 18:2 trans – fatty acids in adipose tissue are associated with increased risk of nonfatal acute myocardial infarction in Costa Rican adults. J Nutr.2003;133:1186-91.

Beardsworth, A., Bryman, A., Keil, T., Goode, J., Haslam, C. & Lancashire, E. (2002). Women, men and food: the significance of gender for nutritional attitudes and choices. British Food Journal, Vol. 104, pp. 470-491

Benton D. 2004. Role of parents in the determination of the food preferences of children and the development of obesity. International Journal of Obesity and Related Metabolic Disorders 28: 858–69. Satter, E. (2011). Ellen Satter's Division of Responsibility in Feeding. Retrieved 13 July 2011 from http://www.ellynsatter.com/ellyn-satters-division-of-responsibility-in-feeding-i-80.htm

Berger MM, Mustafa I. Metabolic and nutritional support in acute cardiac failure.Curr Opin Nutr Metab Care. 2003;6:195-201.

Berlinguer G: Globalization and global health. International Journal of Health Services 1999, 29:579-595.

Block G, Clifford C, Naughton MD, Henderson M, McAdams MA. A brief dietary screen for high fat intake. Journal of Nutrition Education. 1989;21:199–207.

Block G, Gillespie C, Rosenbaum EH, Jenson C. A rapid food screener to assess fat and fruit and vegetable intake. American Journal of Preventive Medicine. 2000;18:284–288.

Bowna, Shanty A, Gortmaker, Steven L, Ebbeling, Carra B, Pereira, Mark A, Ludwin , David S. Effects of fast – food consumption on energy intake and diet quality among children in a national household survey.2004. Pediatrics Vol 113 No .1 . pg 112-118.

Brownell KD, Farley T, Willett WC, Popkin BM, Chaloupka FJ, Thompson JW, Ludwig DS. The public health and economic benefits of taxing sugar-sweetened beverages. NEJM 2009;361:1599–1605.

Burke F, Hark L.eds. Cardiovascular Nutrition: Disease Prevention and Management. Chicago (IL): American Dietetic Association ; 2004 :109-48.

Caribbean Community (CARICOM). Working Document for the Summit of the CARICOM Heads of Government on CNCDs. Georgetown, Guyana: CARIOCM Secretariat; 2007.

Carson JAS, Grundy SM, Van Horn L, Stone N, Binkoski A, Kris – Etherton P. Medicak nutrition therapy for the prevention and management of coronary heart disease. In: Carson JAS,

CDC. Vital signs: prevalence, treatment, and control of high levels of low-density lipoprotein cholesterol—United States, 1999–2002 and 2005–2008. MMWR. 2011;60(4):109–14.

Chrisler, J. C. (1997) Adherence to weightloss and nutritional regimens. In Gochman, D. S. (ed.), Handbook of Health Behavior Research, Vol. 2: Provider Determinants. Plenum Press, New York, pp. 323–333.

Clark JE (1998) Taste and flavour: their importance in food choice and acceptance. Proceedings of the Nutrition Society 57, 639-643.

Clarke, P.J., O'Malley, P.M., Johnston, L.D., Schulenberg, J.E., & Lantz, P. (2009). Differential Trends in Weight-Related Health Behaviours Among American Young Adults by Gender, Race/Ethnicity, and Socioeconomic Status: 1984-2006. American Journal of Public Health, Vol. 99, No. 10, pp. 1893-1901

Connelly PW. Direct comparison of a dietary portfolio of cholesterol – lowering foods with a statin in hyper cholesterololemic particpants. Am J Clin Nutr. 2005;81(2):380-87

Dollar D, Kraay A. In: Growth is good for the poor. Washington DC: World Bank; 2001. (Policy Research Working Paper No 2587.).

Eckel RH, Borra S, Lichenstein AH, Yin- Piazza SY. Understanding the complexity of trans fatty acid reduction in the American Diet: American Heart Association Trans Fat Conference 2006: Report of the Trans Fat Conference Planning Group. Circulation.2007;115:2231-46.

Ettarh R, Van de Vijver S, Oti S, Kyobutungi C. Overweight, Obesity, and Perception of Body Image Among Slum Residents in Nairobi, Kenya, 2008–2009. Prev Chronic Dis 2013;10:130198. DOI:http://dx.doi.org/10.5888/pcd10.130198

Faxon DP, Fuster V, Libby P, Beckman, JA, Hiatt WR, Thompson RW, et al. Atherosclerotic vascular disease conference: writing group III: pathophysiology. Circulation. 2004; 109:2617-25.

Food and Agriculture Organization of the United Nations (FAO).2002. World Argriculture 2030: Main findings. http://www.fao.org/english/newsroom/news/2002/7833-en.html .Accessed 24th March 2014

French, S. A., Story, M., Hannan, P., Breitlow, K. K., Jeffery, R. W., Baxter, J. S. & Snyder, M. P. (1999) Cognitive and demographic correlates of low-fat vending snack choices among adolescents and adults. J. Am. Diet. Assoc. 99:471-475.

French SA, Story M, Jeffrey RW. Environmental influences on eating and physical activity. Annu Rev Public Health 2001; 22:309–35.

French SA, Story M, Neumark-Sztainer D, Fulkerson JA, Hannan P. Fast food restaurant use among adolescents: associations with nutrient intake, food choices and behavioral and psychosocial variables. Int J Obes Relat Metab Disord.2001;25 :1823– 1833

Frewer LJ, Howard C, Hedderely D & Shepherd R (1998) Methodological approaches to assessing risk perceptions associated with food – related hazards. Risk Analysis 18, 95-102.

Friel S, Chopra M, Satcher D. (2007). Unequal Weight: equity oriented policy responses to the global obesity epidemic. British Medical Journal 335, 1241-1243.

Gardner RM. Methodological issues in assessment of the perceptual component of body image disturbance. Br J Psychol. 1996;87:327–37

Gardner, R. M., Sorter, R. G., & Friedman, B. N. (1997). Developmental changes in children's body images. Journal of Social Behavior and Personality, 12, 1019–1037

Giugliano D, Esposito K. Mediterranean diet and metabolic diseases. Curr Op in Lipidology. 2008;19:63-68.

Glanz, K., Basil, M., Maibach, E., Goldberg, J. & Snyder, D. (1998) Why Americans eat what they do: taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. J. Am. Diet. Assoc. 98:1118-1126.

Goldenberg N, Glueck C. Efficacy , effectiveness and real life goal attainment of statins in managing cardiovascular risk. Vasc Health Risk Manag.2009, 5: 369-376.

Gropper SS, Smith JL, Groff JL. Advanced Nutrition and Human Metabolism (Fifth edition). Belmont (CA) :Wadsworth,Cenagage Learning; 2009

Guthrie JF, Lin BH, Frazao E. Role of food prepared away from home in the American diet, 1977–78 versus 1994–96: changes and consequences.J Nutr Educ Behav.2002;34 :140– 150

Health Situation in the Americas, basic indicators. Washington, DC: PAHO; 2009

Hennis AJ, Fraser HS, Jonnalagadda R, Fuller J, Chanturvedi N. Explanations for high risk of diabetes – related amputation in a Caribbean population of black African descent and potential for prevention. Diabetes Care 2004;27:2636-41

Hetherington, M. M. and Rolls, B. J. (1996) Sensory-specific satiety: theoretical frameworks and central characteristics. In Capaldi, E. D. (ed.), Why We Eat what We Eat: The Psychology of Eating. American Psychological Association, Washington, DC, pp. 267–290.

Holt GC (1993) Ecological Eating, Food Ideology and Food Choice. PhD Thesis. Bradford University.

Hunt AS, Abraham WT, Chin MH, Felman AM, Francis GS, Ganiats TG, et al. ACC/ AHA 2005 guideline update for diagnosis and management of chronic heart failure in adult- summary article: a report of the American College of Cardiology / American Heart Association Task Force on Practice Guidelines (Writing Committee to Update 2001 Guidelines for the Evaluation and Management of Heart Failure). Circ. 2005; 112:1825-52.

Hu FB, Malik VS. Sugar-sweetened beverages and risk of obesity and type 2 diabetes: epidemiologic evidence. Physiol Behav. 2010;100(1):47–54.

Jenkins DJ, Kendall CW, Marchie A, Faulkner DA, Wong JM, de Souza R, et al. Aldosterone receptor antagonism in heart failure. Pharmacotherapy.2005;25:1126-33

Kakeshita IS, de Sousa Almeida S. Relationship between body mass index and self-perception among university students. Rev Saude Publica. 2006;40:497–504

Khan MA (1981) Evaluation of food selection patterns and preferences. CRC Critical Reviews in Food Science and Nutrition 15, 129-153

Kittler PG, Sucher K: Food and Culture in America. New York, Van Nostrand Reinhold, 1989

Labonte R: Globalization, health, and the free trade regime: assessing the links. Perspectives on Global Development and Technology 2004.

Laura S. Sims, The Politics of Fat: Food and Nutrition Policy in America (Armonk, NY: M.E. Sharpe, 1998), 12.

Lin BH, Guthrie J, Frazao E. Quality of children's diets at and away from home: 1994–96. Food Rev 1999;22:2–10.

Litin L, Sacks F. Trans-fatty-acid content of common foods. N Engl J Med.1993;329 :1969– 1970

Ludwig DS. The glycemic index: physiological mechanisms relating to obesity, diabetes, and cardiovascular disease. JAMA. 2002;287(18):2414–2423.

Mac Evilly C & Kelly C. Conference report on 'Mood and Food'. Nutrition Bulletin 26 (no 4), December 2001

Martins, Y., Pelchat, M. L. and Pliner, P. (1997) `Try it; it's good for you': effects of taste and nutrition information on willingness to try novel foods. Appetite, 28, 89–102.

Marshall DA, Vernalis MN, Remaley AT, Walizer EM, Scally JP, Taylor AJ. The role of exercise in modulating the impact of an ultralow –fat diet on serum lipids and apolipoproteins in patients with or at risk of coronary artery disease. Am Heart J . 2006; 151: 484-91.

Marshall SJ, Biddle SJH, Gorely T, et al. 2004. Relationship between media use, body fatness and physical activity in children and youth: a meta-analysis. International Journal of Obesity 28: 1238–46.

McBride, R. L. and Anderson, N. H. (1990) Integration psychophysics in the chemical senses. In Anderson, N. H. (ed.), Contributions to Information Integration Theory, Vol. 1: Cognition. Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 295–319.

Millstein S, Irwin C, Adler N, Cohn L, Kegeles S, Dolcini M. Health – risk behaviors and health concerns among young adolescents. Pediatrics 1992; 3:422-8.

Mohammad Hossein Rouhani, Maryam Mirseifinezhad, Nasrin Omrani, Ahmad Esmaillzadeh, and Leila Azadbakht, "Fast Food Consumption, Quality of Diet, and Obesity among Isfahanian Adolescent Girls,"Journal of Obesity, vol. 2012, Article ID 597924, 8 pages, 2012. doi:10.1155/2012/597924

Mohanka M, Irwin M, Heckbert SR, Yasui Y, Sorensen B, and Chubak J, et al. Serum lipo- proteins in overweight / obese postmenopausal women: a one year exercise trial. Med Sci Sports Exerc.2006; 38:231-39.

Mozaffarain D, Pischon T, Hankinson SE, Rifai N, Joshipura K , Willett Wc, et al. Dietary intake of trans fatty acids and systemic inflammation in women. Am J Clin Nutr.2004;76:606-12.

National Heart, Lung and Blood Institute; 1998. Available at http://www.nhlbi.nih.gov/guidelines/obesity /e_txtbk/txgd/4121.htm.

Neumark-Sztainer DStory MPerry CCasey MA Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. J Am Diet Assoc1999;99929- 937

New Oxford American dictionary. 3rd ed. Oxford: Oxford University Press; 2010.

Nicklas TA, Hampl JS, Taylor CA, Thompson VJ, Heird WC. Monounsaturated fatty acid intake by children and adults:temporal trends and demographic differences. Nutr Rev. 2004;62:132-41.

Nielsen SJ, Popkin BM. Patterns and trends in food portion sizes, 1977–1998. JAMA.2003;289 :450– 453

Oxford dictionary. 2014. Food insecurity . http://www.oxforddictionaries.com/definition/english/food-insecurity?q=food+insecurity . Accessed 3rd April 2014

Paeratakul, Shasporan, Ferdinand, Daphne P, Champagne, Catherine M, Ryan , Donna H, Bray, George. Fast food consumption among US adults and children : Dietary and nutrient intake profile. Journal of the American Dietetic Association .2003Volume 103, Issue 10 , Pages 1332-1338. doi: 10.1016/S0002-8223(03)01086-1

Pasternak RC, Criqui MH, Benjamin EJ, Fowkes FGR, Isselbacher EM, McCullough PA, et al. Atherosclerotic vascular disease conference: Writing group I: Epidemiology. Circ.2004; 109:2605-12.

Patterson R, Risby A, Chan M-Y. Consumption of takeaway and fast food in a deprived inner London Borough: are they associated with childhood obesity? BMJ Open2012;2:e000402. doi:10.1136/bmjopen-2011-000402

Popkin B. The nutrition in low income countries: an emerging crisis. Nutr Rev 1994; 52:285-98

Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (2000). Application of the theory of planned behaviour to two health-related dietary behaviours: Roles of perceived control and self-efficacy. British Journal of Health Psychology, 5, pp. 121–139.

Reicks M, Randall JL and Haynes BJ (1994). Factors affecting consumption of fruits and vegetables by low income families. Journal of the American Dietetic Association 94, 1309-1311.

Rodenas S, Rodriguez Gil S, Merinero MC, Sanchez – Muniz FJ. Dietary exchange of an olive oil and sunflower oil blend for extra virgin olive oil decreases the estimate cardiovascular risk and LDL and apolipoprotein AII concentration in postmenopausal women. J am Coll Nutri. 2005;24:361-69.

Saturated fat. Dictionary.com. The American Heritage® Science Dictionary. Houghton Mifflin Company. http://dictionary.reference.com/browse/saturated fat (accessed: April 07, 2014).

Scaglioni S, Salvioni M, Galimberti C. 2008. Influence of parental attitudes in the development of children eating behaviour. British Journal of Nutrition 99: S22–5. Golan, M., & A. Weizman. 2001. "Familial Approach to the Treatment of Childhood Obesity." Journal of Nutrition Education 33 (2): 102–07.

Sharma R, Anker SD. From tissue wasting to cachexia: changes in peripheral blood flow and skeletal musculature. Eur Heart J Supp. 2002;4: D12-D17.

Shepherd R & Farleigh CA (1986) Preferences, attitudes and personality as determinants of salt intake. Human Nutrition: Applied Nutrition 40A, 195–208

Smith JM, Ditschun TL. 2009. Controlling satiety: how environmental factors influence food intake. Trends in Food Science and Technology 20: 271–7.

Solheim, R. & Lawless, H. T. (1996) Consumer purchase probability affected by attitude toward low fat foods, liking, private body consciousness and information on fat and price. Food Qual. Pref. 7:137-143.

Steptoe, A. Wardle, J., Cui W., Bellisle F., Zotti A.M., Baranyai R., & Sanderman R. (2002). Trends in Smoking, Diet, Physical Exercise, and Attitudes toward Health in European University Students from 13 Countries, 1990–2000. Preventive Medicine, Vol. 35, No. 2, pp. 97-104

Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. J Am Diet Assoc 2002;102:S40--51.

Strauss A, Corbin J. Basics of qualitative research: Techniques and procedures for developing grounded theory. 2nd ed. Thousand Oaks CA: Sage; 1998

Stuckler D, McKee M, Ebrahim S, Basu S. Manufacturing epidemics: the role of global producers in increased consumption of unhealthy commodities including processed foods, alcohol, and tobacco. PLoS Med 2012; 9: e1001235 http://dx.doi.org/10.1371/journal.pmed.1001235 pmid: 22745605.

Tangalos EG. Congestive heart failure. Nutrition management for older adults. Washington (DC): Nutrition Screening Initiative (NSI); 2002.

Tanumihardjo SA, Anderson C, Kauger – Horwitz M et al. (2007). Poverty, obesity and malnutrition: An international perspective recognizing the paradox. Journal of the American Dietetic Association 107, 1966 -1972.

Trichopoulou A, Costacou T, Bamia C, Trichopoulos D. Adherence to a Mediterranean diet and survival in a Greek population. New England Journal of Medicine.2003;348:2599-2608.

Trinidad and Tobago Newsday. 2011. We must save our children. http://www.newsday.co.tt/sunday_special_report/0,149754.html . Accessed 13th January 2014

Trinidad Express Newspapers. 2013. Eating ourselves to death. http://www.trinidadexpress.com/commentaries/Eating-ourselves-to-death-201154201.html . Accessed 11th April 2014

Trinidad and Tobago Newsday. 2013. Faud: Fast food wrecks kidneys. http://newsday.co.tt/news/0,183658.html . Accessed 8th January 2014

U.S Department of Agriculture and U.S. Department of Health and Human Service, USDA (2010). Dietary guideline for Americans, 2010. 7th Edition, Washington DC: U.S. Government Printing Office. Retrieved from http://www.health.gov/DietaryGuidelines/

U.S . Department of Health and Human Services. Public Health Service National Institutes of Health National Heart Lung and Blood Institute Third Report in the National Cholesterol Education Program Adult Treatment Panel III Guidelines NIH Publication No.01-3305;2001.

U.S. Food and Drug Administration. Trans fatty acids in nutrition labeling;consumer research to consider nutrient content and health claims and possible footnote or disclosure statements; final rule and proposed rule. July 11,2003. Available at http://www.cfsan.fda.gov/~lrd/fr03711a.html

Van Horn L, McCoin M, Kris Etherton PM, Burke F, Carson JA, Champagne CM, Karmally W, Sikand G. The evidence for dietary prevention and treatment of cardiovascular disease. J Am Diet Assoc.2008 Feb;108(2) : 287 -331. Review.

WHO, 2003.Diet, nutrition and prevention of chronic diseases . Report of a Joint WHO/ FAO Expert Consultation, Technical Report Series 916, Geneva Switzerland

World Health Organization. 2014. Food Security. http://www.who.int/trade/glossary/story028/en/. Accessed 3rd April 2014

Appendix

Participant Code #_____

Research Topic:

"The link between the consumption of fast foods and their cardiovascular risks in university students"

Upon completion and submission of this questionnaire, you are giving consent for your responses to be used in the research of the above topic. Your identity remains anonymous. Thank you in advance for your willing participation. Any questions concerning the research, feel free to contact Kerri Puckerin at kerri.puckerin@my.uwi.edu.

GENERAL INSTRUCTIONS:

Use only a black or blue pen to complete this questionnaire. Tick the responses that correspond to you.

Section I- Socio-demographic

1. **Sex:** Male ☐ Female ☐
2. **Age:** ≤ 18 ☐ 19-24 ☐ 25-30 ☐
3. **Ethnicity:**

Indo-Trinidadian ☐

Afro-Trinidadian ☐

Hispanic ☐

Chinese ☐

Mixed ☐

Other ☐ Please Specify:_____

4. Faculty:

Food and Agriculture	☐	Science and Technology	☐
Social Sciences	☐	Engineering	☐
Humanities and Education	☐	Medical Sciences	☐
Law	☐		

5. Programme of Study:_____

6. **Student Classification:** Full-time ☐ Part-Time ☐ Evening ☐

7. Level of study:

Undergraduate ☐

Postgraduate ☐

Section 2

8. Do you consume fast-foods?

Yes ☐ No ☐

9. If you have a favorite fast-food restaurant, which is it?

Subway	☐	Burger King	☐
KFC	☐	I do not have a favorite	☐
Mario's	☐	Other, please specify	_____

10. As a university student, how often are you “pressed for time”?

I always have enough time ☐ I am usually pressed for time ☐

I usually have enough time ☐ I never have enough time ☐

11. How often does time affect your decisions about what to eat?

Never ☐ Frequently ☐

Sometimes ☐ All the time ☐

12. Why do you consume fast foods?

Convenient ☐ I like the taste ☐

They’re inexpensive ☐ They’re quick (service) ☐

I am too busy to cook ☐

13. Do you prefer fast-foods to healthy foods?

Yes ☐ No ☐

14. If Yes why?

_____

15. Do you purchase “healthy-food” choices from fast-food restaurants?

Depends on where you are eating at ☐

Yes, I always look for the healthy choices ☐

No, I order what I like not what’s is best for me ☐

16. How much are you willing to spend on a healthy meal?

< $ 50 ☐ $ 101 - $ 150 ☐

$51 - $ 100 ☐ $ 151 - $ 200 ☐

17. What do you consider most when you purchase healthy food?

Accessibility ☐ Price & promotion ☐

Healthy & balance ☐ Package ☐

Taste ☐ Friends ☐

18. How would you rate the food choices available to students on campus and the immediate environs?

Very good ☐ Adequate ☐ Poor ☐ Very Poor ☐

19. When was the last time you read any material on healthy life-style eating?

Weekly ☐ Daily ☐ Rarely ☐ Other ☐

20. When purchasing food items do you read the labels?

Yes ☐ No ☐

<u>Section 3 - Food Frequency:</u> How often do you consume these foods? (Please Tick for Time)

Food Item	**Time**				
Meats and Snacks	**Less than once per WEEK**	**About 1 time per WEEK**	**2-3 times a WEEK**	**4-5 times a WEEK**	**>5 times a WEEK**
Chicken (BBQ, Fried, curried, stewed etc.)					
Hamburgers or ground beef (Homemade, Burger King, Mc Donald's etc.)					
Beef or pork such as included in sandwiches, stew, pies, curried or BBQ					
Hot dogs, bacon, salami, ham or canned sausage					
Gyro					
Patties (beef, cheese, potato, chicken etc.)					
Pizza					
Margarine, butter, oil in cooking					
Ice-cream					
Cheese, cheese spread (not low-fat)					
Doughnuts					
French fries, fried potatoes					
Roti (Sada, Dhalpourie, Paratha)					
Macaroni Pie, Potato Pie, etc					
Fried hot appetizers (Doubles, Aloo Pie)					
Cake (chocolate, fruit, vanilla etc.)					
Chocolate (candy)					
Microwave popcorn					

<u>Section 3- Food Frequency:</u> How often do you consume these drinks? (Please Tick for Time)

Food Item	Time				
Soft Drinks	**Less than once per WEEK**	**About 1 time per WEEK**	**2-3 times a WEEK**	**4-5 times a WEEK**	**>5 times a WEEK**
Coke (can or bottle)					
Pepsi (can or bottle)					
Chubby					
Solo Apple J					
Busta					
Fruta (can or bottle)					
Peardrax					
Mountain Dew					
Gatorade					

<u>Section 4</u>

21. Based on your eating habits stated in the food frequency table, which of the following factors influences your purchasing behaviour of these foods? **(Please select all that apply)**

Cost ☐

Location ☐

Culture ☐

Peer pressure ☐

Perceived health benefits ☐

22. Do you suffer from any chronic or nutritional disease(s)?

Yes ☐ No ☐

23. If so, which ones?

Diabetes ☐ Heart disease ☐ Hypertension ☐ Obesity ☐ Other ☐

24. What is your current weight?

_____

25. What is your waist circumference?

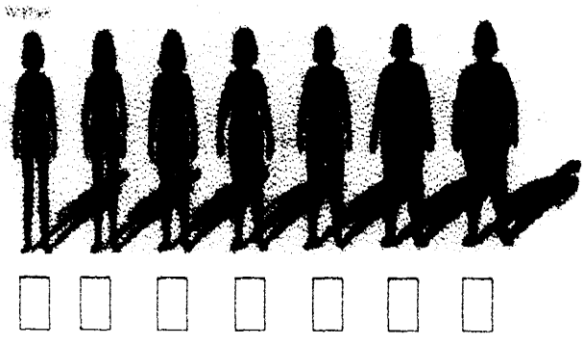
_____

26. What is your height?

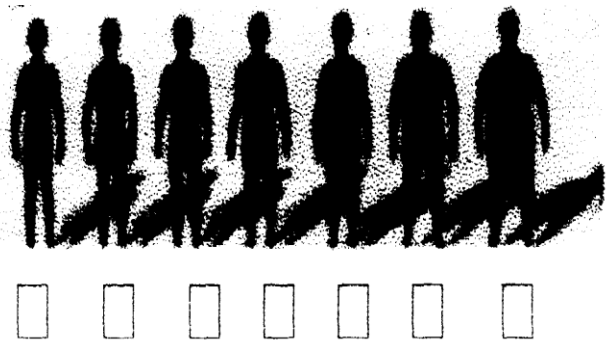
_____

27. Please indicate your current body image

FEMALE

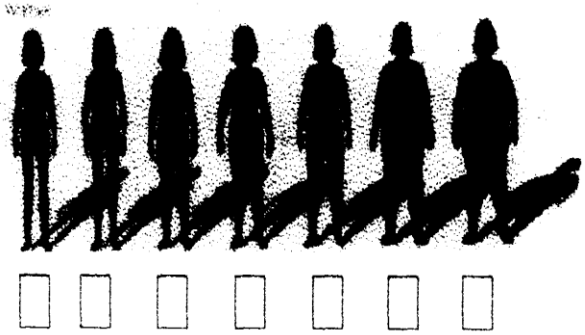


MALE



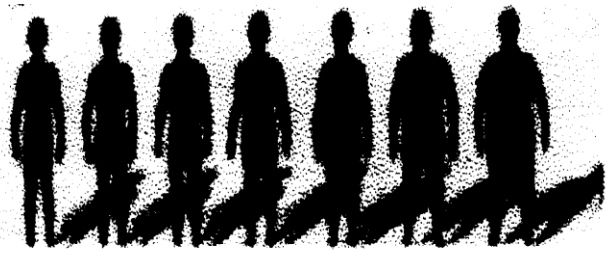
28. Please choose which one you would like to be

FEMALE



☐ ☐ ☐ ☐ ☐ ☐ ☐

MALE



☐ ☐ ☐ ☐ ☐ ☐ ☐